

**From:** Ziegelbauer, Heather/MKE <Heather.Ziegelbauer@jacobs.com>  
**Sent:** Wednesday, May 20, 2020 9:27 AM  
**To:** Black, Christopher  
**Cc:** Carey, Angela J - DNR; Rick Dewey Bethel; Jeffrey Howard Danko; Dodds, Jennifer  
**Subject:** RE: Tyco - EPA Request for FA and VI Assessment Update  
**Attachments:** NonResIndoorAirEvalForm\_TycoBuilding14-20200520.pdf; All\_Attachments().pdf(1); All\_Attachments().pdf(1)

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

**Categories:** Green category

Chris, I wanted to first say hello and introduce myself as the Jacobs Project Manager for the Tyco Fire Products LP (Tyco) site in Marinette, WI (EPA ID: WID 006 125 215). I look forward to working with you on this Tyco project.

Attached is the non-residential building indoor air evaluation form to accompany the indoor air sampling laboratory reports from samples collected on February 11 and April 9, 2020 (already submitted, see details in email trail below) for Building 14 at the Tyco site, as requested by Jennifer Dodds in an April 29, 2020 email.

Please let us know if you have any questions.

Thanks,

**Heather Ziegelbauer, PE\*** | [Jacobs](#) | Project Manager  
O:+1.262.644.6167 | M:+1.312.933.1017 | [heather.ziegelbauer@jacobs.com](mailto:heather.ziegelbauer@jacobs.com)  
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**From:** Ziegelbauer, Heather/MKE  
**Sent:** Monday, May 4, 2020 3:58 PM  
**To:** Dodds, Jennifer <[dodds.jennifer@epa.gov](mailto:dodds.jennifer@epa.gov)>  
**Cc:** Angie Carey ([Angela.Carey@wisconsin.gov](mailto:Angela.Carey@wisconsin.gov)) <[Angela.Carey@wisconsin.gov](mailto:Angela.Carey@wisconsin.gov)>; Rick Dewey Bethel <[rick.dewey.bethel@jci.com](mailto:rick.dewey.bethel@jci.com)>; Jeffrey Howard Danko <[jeffrey.howard.danko@jci.com](mailto:jeffrey.howard.danko@jci.com)>  
**Subject:** RE: Tyco - EPA Request for FA and VI Assessment Update

Jennifer, On behalf of Tyco, attached are the April 9, 2020 Building 14 VI sampling laboratory reports. The same locations/samples were collected as the February 11, 2020 event that is detailed in the email trail below (with the same IDs, except for the date).

All air sample results were non-detect for the analyzed parameters (vinyl chloride, cis-1,2-dichloroethene, and trichloroethene) with reporting limits below applicable indoor air screening levels. The groundwater and wastewater treatment facility influent samples also were non-detect.

The non-residential building indoor air evaluation form sent in your April 29, 2020 email is currently being filled out for Building 14 and will be sent in a separate email.

Please let us know if you have any questions.

Thanks,

**Heather Ziegelbauer, PE\*** | [Jacobs](#) | Project Manager  
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**From:** Ziegelbauer, Heather/MKE  
**Sent:** Tuesday, March 3, 2020 4:49 PM  
**To:** Dodds, Jennifer <[dodds.jennifer@epa.gov](mailto:dodds.jennifer@epa.gov)>  
**Cc:** Angie Carey ([Angela.Carey@wisconsin.gov](mailto:Angela.Carey@wisconsin.gov)) <[Angela.Carey@wisconsin.gov](mailto:Angela.Carey@wisconsin.gov)>; Rick Dewey Bethel <[rick.dewey.bethel@jci.com](mailto:rick.dewey.bethel@jci.com)>; Jeffrey Howard Danko <[jeffrey.howard.danko@jci.com](mailto:jeffrey.howard.danko@jci.com)>  
**Subject:** FW: Tyco - EPA Request for FA and VI Assessment Update

Jennifer, On behalf of Tyco and per your request in the email below, here is a summary of the VI sampling at Building 14.

#### **Building 14 Preliminary VI Sampling Results**

Five indoor air samples, including one duplicate, and one outdoor air sample were collected at Building 14 on February 11, 2020. All air sample results were non-detect for the analyzed parameters (vinyl chloride, cis-1,2-dichloroethene, and trichloroethene) with reporting limits below applicable indoor air screening levels. See attached level 2 laboratory report 2002336. Samples were collected from the following locations:

- One indoor air sample and a duplicate were collected from the office/lunchroom area in the central portion of the building (sample IDs B14-IA004-20200211 and B14-IA004-20200211-D)
- One indoor air sample was collected from the wastewater treatment area in the eastern portion of the building (sample ID B14-IA003-20200211)
- One indoor air sample was collected from the groundwater treatment area in the western portion of the building (sample ID B14-IA002-20200211)
- One indoor air sample was collected in the extended western portion of the building where the Vibratory Shear Enhanced Processing units are located (sample ID B14-IA001-20200211)
- One outdoor (ambient) air sample was collected on the north side of the building near the air intake (sample ID B14-OA005-20200211)

Concurrent with the indoor air sampling, the groundwater and wastewater treatment facility influent samples also were non-detect for the same analyzed parameters (sample IDs B14-INGWCTS-20200211 and B14-INWWTP-20200211). See attached level 2 laboratory report J177806-1.

Please let us know if you have any questions.

**Heather Ziegelbauer, PE\*** | [Jacobs](#) | Project Manager  
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**From:** Dodds, Jennifer [<mailto:dodds.jennifer@epa.gov>]  
**Sent:** Tuesday, March 03, 2020 1:34 PM  
**To:** Jeffrey Howard Danko <[jeffrey.howard.danko@jci.com](mailto:jeffrey.howard.danko@jci.com)>  
**Cc:** [angela.carey@wisconsin.gov](mailto:angela.carey@wisconsin.gov); Rick Bethel <[rick.dewey.bethel@jci.com](mailto:rick.dewey.bethel@jci.com)>; Clarizio, Richard <[Clarizio.Richard@epa.gov](mailto:Clarizio.Richard@epa.gov)>; Abrams, Justin <[abrams.justin@epa.gov](mailto:abrams.justin@epa.gov)>  
**Subject:** Tyco - EPA Request for FA and VI Assessment Update

Mr. Danko,

Per EPA's February 4, 2020 letter (see attached) approving the 2020 Cost Estimate for the Tyco Fire Products Facility in Marinette, WI (EPA ID: WID 006 125 215), the financial assurance instrument was due into the Agency by February 28, 2020. To date, I have not received a copy of the required instrument. Please provide a status update on this by COB tomorrow, March 4, 2020.

Additionally, EPA is requesting an update on any preliminary data from the VI sampling that recently took place in Building 14.

I look forward to a quick response to both of these requests. Please respond via email so all parties are aware.

Thank you,

Jennifer Dodds  
U.S. Environmental Protection Agency, Region 5  
Land, Chemicals and Redevelopment Division  
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Tel: (312) 886-1484  
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**From:** Jeffrey Howard Danko <[jeffrey.howard.danko@jci.com](mailto:jeffrey.howard.danko@jci.com)>  
**Sent:** Thursday, February 6, 2020 1:43 PM  
**To:** Dodds, Jennifer <[dodds.jennifer@epa.gov](mailto:dodds.jennifer@epa.gov)>  
**Cc:** [angela.carey@wisconsin.gov](mailto:angela.carey@wisconsin.gov); Rick Bethel <[rick.dewey.bethel@jci.com](mailto:rick.dewey.bethel@jci.com)>  
**Subject:** RE: Tyco - EPA Request for VI Assessment Update

We are scheduled to be taking the samples in Building 14 next week. In addition, the response to comments on VI Work Plan are under internal review and should be to the agencies next week.

Also to let you know Jacobs is nearing completion of the draft porewater investigation report and the annual report. Following internal review, they will be submitted to the agencies.

Per discussion today, we will set up a meeting for the week of April 27, most likely for the 29<sup>th</sup> at the Marinette site.

**Jeffrey Danko**  
EHS Manager – Environmental Remediation  
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**From:** Dodds, Jennifer [<mailto:dodds.jennifer@epa.gov>]  
**Sent:** Wednesday, February 05, 2020 2:34 PM  
**To:** Jeffrey Howard Danko <[jeffrey.howard.danko@jci.com](mailto:jeffrey.howard.danko@jci.com)>  
**Cc:** [angela.carey@wisconsin.gov](mailto:angela.carey@wisconsin.gov)  
**Subject:** Tyco - EPA Request for VI Assessment Update

Mr. Danko,

Please provide an update on your progress related to the September 27, 2019 Vapor Intrusion Assessment and Work Plan. Additionally, EPA is requesting an update on the vapor intrusion assessment of Building 14 by COB February 7, 2020 as this pathway was identified as a priority by EPA and WDNR in our December 18, 2019 comment letter.

Thank you,

Jennifer Dodds  
U.S. Environmental Protection Agency, Region 5  
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**From:** Dodds, Jennifer  
**Sent:** Thursday, December 19, 2019 8:25 AM  
**To:** 'Jeffrey Howard Danko' <[jeffrey.howard.danko@jci.com](mailto:jeffrey.howard.danko@jci.com)>  
**Cc:** Moore, Tammy <[moore.tammy@epa.gov](mailto:moore.tammy@epa.gov)>; Clarizio, Richard <[Clarizio.Richard@epa.gov](mailto:Clarizio.Richard@epa.gov)>; 'Carey, Angela J - DNR' <[Angela.Carey@wisconsin.gov](mailto:Angela.Carey@wisconsin.gov)>  
**Subject:** EPA Review of Tyco 9-27-19 VI Work Plan - 12-18-19

Mr. Danko,

Please find attached an electronic copy of the December 18, 2019 EPA review of the September 27, 2019 Vapor Intrusion Assessment and Work Plan (VI Work Plan) for the Tyco Fire Products LP, Stanton Street Facility, located in Marinette, Wisconsin. The September 2019 VI Work Plan was reviewed by both EPA and WDNR and a signed copy of this comment letter was mailed out to you. Should you have any questions regarding this matter, please let me know.

Thank you,

Jennifer Dodds  
U.S. Environmental Protection Agency, Region 5  
Land, Chemicals and Redevelopment Division  
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# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

## PART 1: General Information

Business Name: Tyco Fire Products LP

Address: One Stanton St, Marinette, WI 54143

Contact Name: Jeffrey Danko

Phone: 262-349-2528 Email: jeffrey.howard.danko@jci.com

Facility Owner/Landlord Information (If different from above)

Name: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Other Building Contacts \_\_\_\_\_

Building/Business Type and Uses (Check appropriate boxes)

Office Space  Warehouse  Manufacturing  Multi-story  Multi-tenant  Warehouse

Single level Office/Warehouse  Other Groundwater and wastewater treatment building with control room and break room

Building Occupancy

Number of Occupants: ~1-2 per shift Adults: Gender M/F ~1-2 / ~0-1 General Age ranges: 25-55

Days/Hours of occupancy 7 days/week; 24 hrs/day Duration of work shifts 8 hrs weekday, 12 hrs weekend

Days/Hours of ventilation system operation 7 days/week; 24 hrs/day

Building Characteristics

Year/Decade Built: 2010 with addition in 2015 Number of Stories: 1

Approximate Building Area (square feet): Total ~15,000 First Floor ~15,000

Is there an attached warehouse/shop space? (Y/N) N describe its use: N/A

Is there a basement or underground garage? (Y/N) N describe its use: N/A

Foundation Type (Check appropriate boxes)

Slab-on-Grade  Slab-above-Grade (elevated/cap-slab on fill)  Crawl Space  Basement  None

Describe Building sits at or slightly above grade; slab also acts as secondary containment system

Survey Preparation Information

Preparer's Name: Laurent Levy, Heather Ziegelbauer Date Prepared: 2/11/2020 and 5/20/2020

Affiliation: Jacobs Engineering Phone: 262-644-6167 Email: Heather.Ziegelbauer@jacobs.com

# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

## PART 2: Factors Impacting Indoor Air Quality and Sampling

### Questions

Describe renovation activities over the last 6 months (what was done, what area, and when):

None

Describe any open combustion in the building. (smoking/incense/candles/cooking/burning)

None

Have site-specific contaminants of concern been used or stored in the building or nearby?  Yes  No

Please list the general types of chemicals Used paint cans and process water may contain VOCs (see Part 3)

Have any significant amounts of volatile chemicals been used recently?  Yes  No

Please list the chemicals N/A

Describe any instance of water/groundwater present in the basement/crawlspace (including sumps):

They are 4 sumps in the water treatment areas, but they only contain process water (not seepage water)

Are there conduits for sewer gases to enter the building (dry p-traps, open clean-outs, abandoned hook-ups, poorly installed/sealed/seated plumbing)? Describe:

Sewer utilities in operation under bathroom/breakroom, but no indication that they are conduits for vapors

### Observations

What is the temperature relative to outside? ~45 °F warmer than outside (Feb 2020)

VI is promoted when the interior is warmer than the exterior.

Were windows/doors/roll-up doors kept open? No, but bay doors open in other seasons

Increased ventilation from the outside will dilute vapors from the subsurface and may mitigate areas of negative pressure.

Mechanical ventilation system status and condition? Operating as needed / good condition

Are intake or exhaust fans being used? Yes

Are there ventilation hoods in use? No

Indicated by air moving from the outside in. Negative pressure is the main driving force that moves vapors into a building.

Is there evidence of negative pressure? Possible

Do parts of the indoor environment appear stagnant? Not apparent

Vapors may build up in areas with poor ventilation.

Describe any strong odors. None (except near paint can bin when opened)

Strong odors may indicate poor ventilation or an indoor air source that may interfere with analysis.

### Building Construction

Building Construction Materials?

Concrete  Concrete Block  Steel  Wood  Other Metal siding

# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

Does the building have an at-grade or below-grade garage? No How is it ventilated? N/A

Does the building have an attached mechanical room? No

Does the building have footers distinct from the slab or integrated footers? Integrated

Is the building slab constructed with post-tension concrete? No

What are the ceiling heights? ~23 ft in water treatment area, ~10 feet in office / breakroom area

## Pathway Analysis

Does the building have a basement or sub-surface structures that are/have:

Unfinished  Exposed soil  Damp or flooded  Unsealed utility lines  Other N/A

Are there utilities that penetrate the slab that may be conduits for soil vapor?  Yes  No

Are these:

Connected to subsurface vaults?  Yes  No

Connected to utilities closer to potential VI sources?  Yes  No

In areas where pressure differential would cause air to flow through them?  Yes  No

Is there non-ventilated spaces in the building (maintenance / electrical / server rooms)?  Yes  No

If Yes, describe: N/A

Are these spaces occupied?  Yes  No

At what frequency/duration? N/A

Are there potential pathways in these spaces?  Yes  No

If Yes, describe: N/A

Are there heat sources in these spaces (servers, transformers, etc.)?  Yes  No

If Yes, describe: Electrical room equipment for building / water treatment station

Are there heat sources or other systems that may generate a negative pressure near the floor/slab?

Yes  No

If Yes, Describe: Building heated and doors closed during cold season

Are there elevators in the building?  Yes  No

If the elevators are hydraulic how deep do the pistons penetrate below the slab? N/A

Are there utilities penetrating the floor/slab?  Yes  No



# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

Are there sumps, either interior or outside and adjacent?  Yes  No

What is the condition of the foundation/slab? Good condition

Was the building constructed with a subslab system or barrier?  Yes  No

If Yes, describe: 10 millimeter thick subslab vapor barrier

Are there floor drains?  Yes  No

If Yes, describe: A floor drain is located in the restroom, there are no floor drains in water treatment areas; as referenced previously there are 4 secondary containment sumps for process water only, which are equipped with pumps and have no seepage water: two in wastewater treatment area, one in groundwater treatment area, and one in VSEP treatment area

If the foundation design specifications and/or as-built drawings are available, please attach. The foundation record drawings are attached

**Other Information** (that may be of importance in understanding the indoor air quality):

Onsite manufacturing activities by tenant ChemDesign include specialty chemicals and use VOCs, including chlorinated VOCs (but not TCE), that may contribute background/ambient VOCs to indoor air. Idling trucks and vehicular traffic may also contribute VOCs to indoor air.

## Potential Sampling Locations

General notes on potential sample locations and type. Tentative sampling date(s) and preferred times.

Collected indoor air samples in wastewater treatment area, groundwater treatment area, VSEP treatment area, and office/breakroom (with duplicate); one outdoor air sample also collected near building air intake. Two sampling events conducted in February and April 2020

**On a separate page, draw/attach the general floor plan of the building and denote potential locations of sample collection. Indicate locations of doors, windows, ventilation system components, indoor air contaminant sources and field instrument readings. See attached floor plan**



# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

## PART 4: Building Heating/Cooling/Ventilation Systems

(Note: Complete this section as much as possible. Not all facility personnel or their contractors will readily have access to information in this section. Information from this section will help determine characteristics of some systems and it's impacts on vapor intrusion)

### Systems Present

What types of systems are used for heating, cooling and ventilation? Check all that apply.

- Air Handler(s)  Package Units  Window/Wall systems  Split System  
 Radiant heating (electric or water/steam)  Evaporative Coolers  Heat pump  Built-up  None

Comments Gas-operated unit heaters also used and located in corners of building

Do the systems present provide make-up/fresh air?  Yes  No

Fresh air should be supplied in all commercial/industrial/institutional settings. ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*, has guidelines on how much air should be supplied. Meeting these requirements generally helps to mitigate VI impacts.

Have the systems been evaluated for ASHRAE Standard 62 compliance?  Yes  No

Is a system commissioning report available?  Yes  No (attach)

When was the system last tested and balanced? 2010, after bldg. was constructed (attach report if available)

Is the ventilation system automated (building automation system)?  Yes  No

Automation systems can be used to record settings during sampling and to verify HVAC operation where an HVAC remedy is required

If yes is the data recorded or can it be recorded?  Yes  No

(Note that the ventilation settings should be evaluated in the automation system and verified manually where possible.)

### System operations

For each of the ventilation systems describe how is outdoor air supplied? [Refer to attached HVAC record drawings H-1, H-2, H-3](#)

- Economizers: No
  - minimum and maximum settings cfm or % \_\_\_\_\_
- Manual adjustable outdoor air intakes Yes
  - Settings \_\_\_\_\_
- Fixed outdoor air intakes? Yes
- Unused outdoor air intake (blank panel)? N/A
- Outdoor air intake not easily installed (e.g., split system, radiant heating) N/A

How frequently are the ventilation systems serviced? Annually in the fall

Generally, systems should be serviced quarterly to verify performance.

# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

Days and hours of operation for each ventilation system operation is 24/7, however the heaters are turned off in the process area during summer and the exchange vents and fans are automated

Do any of the ventilation systems operate during nights and weekends?  Yes  No

If yes, are they operating on reduced settings?  Yes  No

Are the temperature / ventilation settings locked or routinely adjusted by the occupants? they can be adjusted, but generally left alone once set for warmer or cooler weather

What are the temperature settings? (note if seasonally variable) Days winter: process 60/65, office and electric 65/70; summer: electric/office 65, process turned off, ventilation only Nights no change Weekends no change

If there is an economizer, does the system control outdoor air supply using: (check all that apply)

Outdoor air temperature/enthalpy  CO<sub>2</sub> concentration  Other \_\_\_\_\_

Is there power exhaust?  Yes  No

Is the power exhaust setting dependent on  economizer damper position  static pressure

Does the system use variable or constant air volume distribution (VAV/CAV)? \_\_\_\_\_

Is there a dedicated outdoor air system installed?  Yes  No

If Yes, describe: Make-up air unit for process area

## Other Ventilation Issues impacting vapor intrusion potential.

Does the ventilation system have any underground components? No

Having air flow on or below the building floor can draw in vapors from the subsurface.

Is ventilation being supplied or returned under a false floor above the building slab? No

This is common in server rooms

Are ducting components routed through a basement, crawlspace, or utility vault area? No

Is a boiler or heater present in a basement or crawlspace? No describe N/A

Is the make-up air balanced with the exhaust fans in kitchens, laboratories and similar spaces? N/A

Are there spaces of the building that are inherently at a negative pressure? Unknown

Certain rooms such as kitchens are generally kept at negative pressure other rooms may be negative due to system design/use

## Outdoor air intakes

Where are the outdoor air intakes located? Northern and southern sides of the building

Are any intakes near sources of contaminants / sewer vents? No

Are there carbon filters present in the ventilation system? No

What make and model of filters are present and how often are they changed? N/A

# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

**Ventilation zones and settings** See attached HVAC record drawings H-1, H-2 and H-3 for additional details

| Zone/<br>Room   | System Type  | Supply Air<br>Total cfm<br>(range if VAV) | Supply Air<br>% outdoor<br>(range)  | Ducted<br>y/n | Return Air<br>cfm     | Ducted<br>y/n |
|-----------------|--|---|-------------------------------------|---------------|-----------------------|---------------|
| Office areas    | Split system DX indoor unit                                | 650                                       | 15.4%                               | Y             | 550                   | Y             |
| Process area    | Make-up air unit, Industrial, Outside                      | 13,200                                    | 100%                                | N             | 0                     | N/A           |
| Electrical room | Split system DX indoor unit                                | 525                                       | <1% (0.06 CSM/SF from infiltration) | N             | ~14 from infiltration | N             |
| VSEP room       | Unknown, addition constructed to enclose open area in 2015 |   |                                     |               |                       |               |
|                 |  |   |                                     |               |                       |               |
|                 |  |   |                                     |               |                       |               |
|                 |  |   |                                     |               |                       |               |
|                 |  |   |                                     |               |                       |               |

# Non-Residential Indoor Air Quality Evaluation Form

Date: 5/20/2020

Facility Name: Tyco Fire Products LP,  
Marinette, WI

EPA ID No.: WID 006 125 215

## Additional Notes:

Samples collected in February and April 2020 indicated non-detect results for trichloroethene, cis-1,2-dichloroethylene, and vinyl chloride detections in indoor and outdoor air. For trichloroethene, the laboratory method detection limit was  $0.32 \mu\text{g}/\text{m}^3$  or less and the reporting limit was  $0.94 \mu\text{g}/\text{m}^3$  or less. The WDNR indoor air screening level in commercial/industrial setting for trichloroethene is  $8.8 \mu\text{g}/\text{m}^3$ .

**Attachment - Foundation Record Drawings**







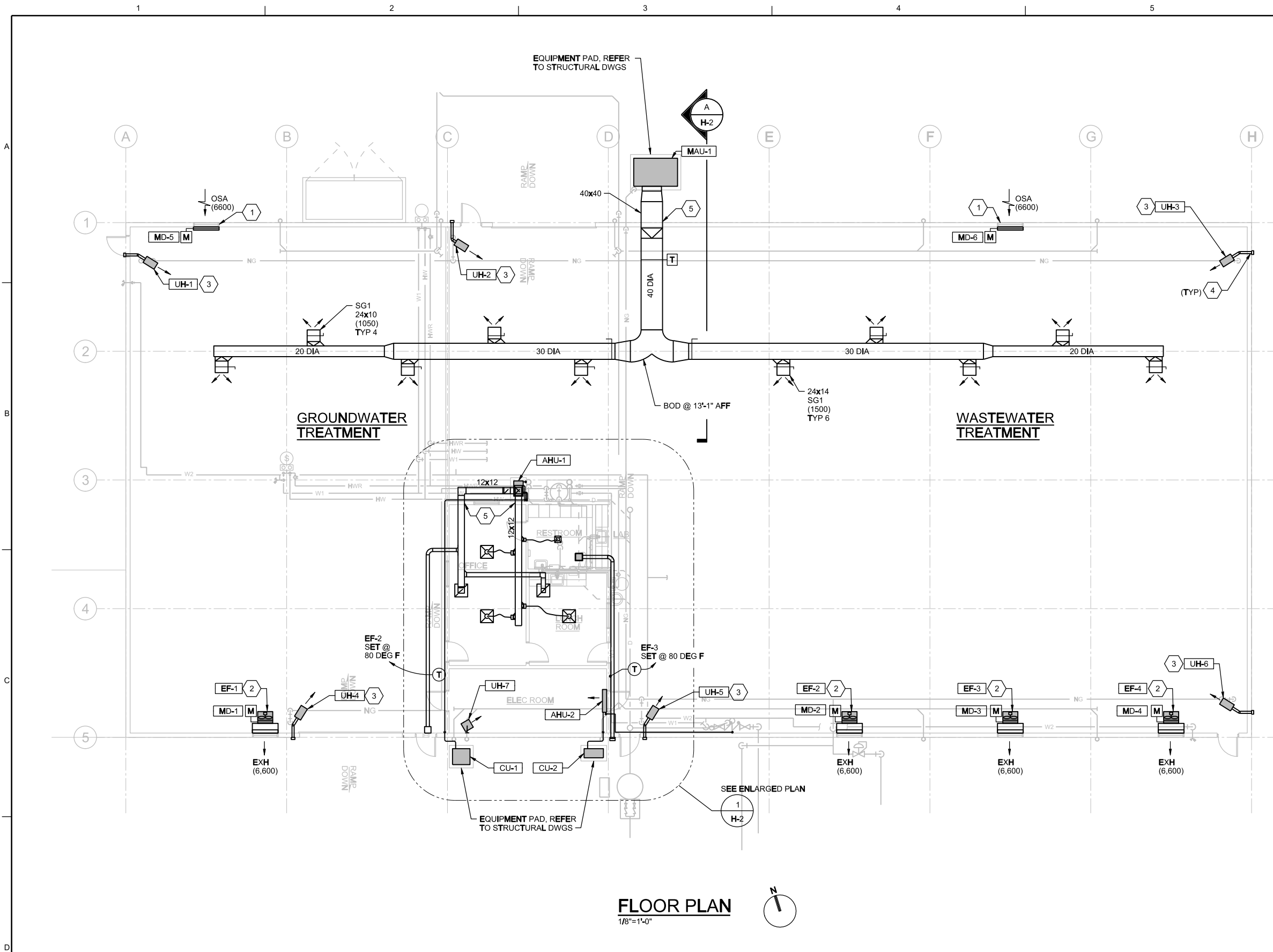




**Attachment - Floor Plan Drawing**



**Attachment - HVAC Record Drawings**



**FLOOR PLAN**  
1/8" = 1'-0"



**GENERAL SHEET NOTES**

1. PROVIDE BALANCING DAMPERS AT ALL SUPPLY AND RETURN GRILLES, SAME MATERIAL AS ASSOCIATED GRILLE. SOME DAMPERS NOT SHOWN FOR CLARITY.
2. FOR DUCT SUPPORT DETAILS REFER TO (2331-102)
3. FOR PIPE SUPPORT DETAILS REFER TO (4005-507)
4. TRANSITION ALL DUCT AND PIPE TO MATCH UNIT CONNECTION DIMENSIONS.
5. PROVIDE WALL SLEEVES FOR ALL PIPING PENETRATING WALL, ALL VOIDS TO BE SEALED WATER TIGHT. (4027-604)
6. FOR GROUND MOUNTED EQUIPMENT, PROVIDE 4" THICK CONCRETE EQUIPMENT PAD, 6" LAGER (MIN) THAN EQUIPMENT FOOTPRINT ON ALL SIDES. INTERIOR TYPE E, EXTERIOR TYPE G. (0330-056)
7. COORDINATE DIFFUSER AND REGISTER LOCATIONS WITH ELECTRICAL LIGHTING LAYOUT AND ARCHITECTURAL REFLECTED CEILING PLANS.
8. DUCT SIZES AND OPENINGS THROUGH ROOFS, SLABS AND WALL PARTITIONS SHALL SUIT EQUIPMENT FURNISHED. OPENINGS REQUIRED FOR HVAC INSTALLATIONS BUT NOT SHOWN ON DRAWINGS SHALL BE PROVIDED BY THIS TRADE.
9. ALL EQUIPMENT, DUCTWORK, ETC. SHALL BE SUPPORTED FROM STRUCTURAL MEMBERS AS REQUIRED TO PROVIDE A VIBRATION-FREE RIGID INSTALLATION.

**SHEET KEY NOTES**

1. WALL LOUVER, REFER TO ARCHITECTURAL DRAWINGS FOR EXACT SIZE AND LOCATION, PROVIDE BIRD SCREEN, PLENUM BOX AND MOTORIZED DAMPER WHERE SHOWN.
2. WALL MOUNTED FAN BEHIND LOUVER. (2334-832)
3. SUSPENDED GAS FIRED UNIT HEATER. (2380-427)
4. 4" DIA DOUBLE WALL TYPE B VENT THROUGH WALL WITH VENT CAP, INSTALL PER MANUFACTURER'S INSTRUCTIONS.
5. DUCT PENETRATES EXTERIOR WALL, SEAL WEATHER TIGHT.

**SEQUENCE OF OPERATION**

**PROCESS AREAS SEQUENCE OF OPERATION:**  
**MAKEUP AIR UNIT WITH GAS HEAT AND (MAU-1) AND EXHAUST FANS (EF-1 AND 4), CONTINUOUS VENTILATION AND HEAT RELIEF EXHAUST FANS (EF-2 AND 3)**

**GENERAL:**  
 THIS SEQUENCE DESCRIBES THE OPERATION OF MAKEUP AIR UNIT MAU-1 WITH GAS HEAT AND EXHAUST FANS EF-1, 2, 3 AND 4. THE SYSTEM PROVIDES CONTINUOUS VENTILATION TO THE PROCESS AREAS AS WELL AS SUMMER HEAT RELIEF VENTILATION.

**MAKE-UP AIR UNIT MAU-1 AND EXHAUST FANS EF-1 AND EF-4 RUN CONTINUOUSLY YEAR ROUND, EXHAUST FANS EF-2 AND EF-3 AND ASSOCIATED INTAKE DAMPERS PROVIDE HEAT RELIEF VENTILATION IN THE SUMMER.**

**SYSTEM CONTROL SHALL BE VIA UNIT MOUNTED CONTROLS AND WALL MOUNTED THERMOSTATS AS SHOWN ON THE PLANS.**

**TEMPERATURE CONTROL:**  
**HEATING:**  
 DURING THE HEATING SEASON (OUTSIDE AIR TEMPERATURE BELOW 50 DEGREES F AS SENSED BY THE UNIT OUTSIDE AIR TEMPERATURE SENSOR), MAU-1, EF-1 AND EF-4 WILL RUN CONTINUOUSLY. EF-2 AND EF-3 WILL REMAIN DE-ENERGIZED AND THE INTAKE DAMPERS WILL BE CLOSED. THE MAU UNIT CONTROLLER WILL CONTROL THE GAS-FIRED HEAT TO MAINTAIN THE UNIT LEAVING AIR TEMPERATURE OF 55 DEGREES F (ADJUSTABLE)

**COOLING:**  
 DURING THE COOLING SEASON, MAU-1 AND EF-1 AND EF-4 RUN CONTINUOUSLY. UPON A CALL FOR COOLING FROM EITHER OF THE WALL MOUNTED THERMOSTATS (ONE PER HEAT RELIEF FAN) EF-2 AND EF-3 WILL ENERGIZE AND THE ASSOCIATED INTAKE DAMPER WILL OPEN, AS THE SPACE TEMPERATURE SETPOINTS ARE SATISFIED, THE HEAT RELIEF EXHAUST FANS WILL DE-ENERGIZE AND THE INTAKE DAMPERS WILL CLOSE. PROVIDE TIME-DELAY RESTART FOR EF-2 AND EF-3 AND ASSOCIATED DAMPERS.

**INTERLOCKS**  
 MAU-1 SHALL BE INTERLOCKED WITH EF-1/MD-1 AND EF-4/MD-4.  
 EF-2/MD-2 SHALL BE INTERLOCKED WITH MD-5.  
 EF-3/MD-3 SHALL BE INTERLOCKED WITH MD-6.

**SAFETIES:**  
**EMERGENCY SHUTDOWN SWITCH:**  
 AN EMERGENCY SHUTDOWN SWITCH SHALL PROVIDED FOR THE VENTILATION SYSTEM AT EACH ENTRY DOOR AND AS REQUIRED BY THE APPLICABLE CODES. UPON ACTIVATION OF THE SWITCH THE ASSOCIATED EXHAUST FAN WILL SHUT DOWN AND PROVIDE AN ALARM SIGNAL AT THE ENTRY DOORS INTO THE SPACE.

|   |    |     |              |    |          |                      |    |      |
|---|----|-----|--------------|----|----------|----------------------|----|------|
| PK  | SL | NO. | DATE         | DR | REVISION | CHK                  | BY | APVD |
|   |    |     |              |    |          |                      |    |      |
| RECORD DRAWINGS   |    |     |              |    |          |                      |    |      |
| 03/2011   |    |     |              |    |          |                      |    |      |
| C. ANDERSON   |    |     |              |    |          |                      |    |      |
| Y. FITZGERALD   |    |     |              |    |          |                      |    |      |
| R. YOLO   |    |     |              |    |          |                      |    |      |
| M. JURY   |    |     |              |    |          |                      |    |      |
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| TYCO FIRE PRODUCTS LP   |    |     | GWCT SYSTEM  |    |          | MARINETTE, WISCONSIN |    |      |
| PHASE II: TREATMENT BUILDING DESIGN   |    |     | H-1          |    |          | FLOOR PLAN           |    |      |
| HVAC  |    |     | 1/8" = 1'-0" |    |          | VERIFY SCALE         |    |      |
| BAR IS ONE INCH ON ORIGINAL DRAWING.  |    |     | DATE         |    |          | JUNE 2010            |    |      |
| PROJECT   |    |     | PROJ         |    |          | 388522               |    |      |
| DRAWING   |    |     | DWG          |    |          | H-1                  |    |      |
| SHEET   |    |     | SHEET        |    |          | 33                   |    |      |
| RECORD DRAWINGS   |    |     |              |    |          |                      |    |      |

1 2 3 4 5 6

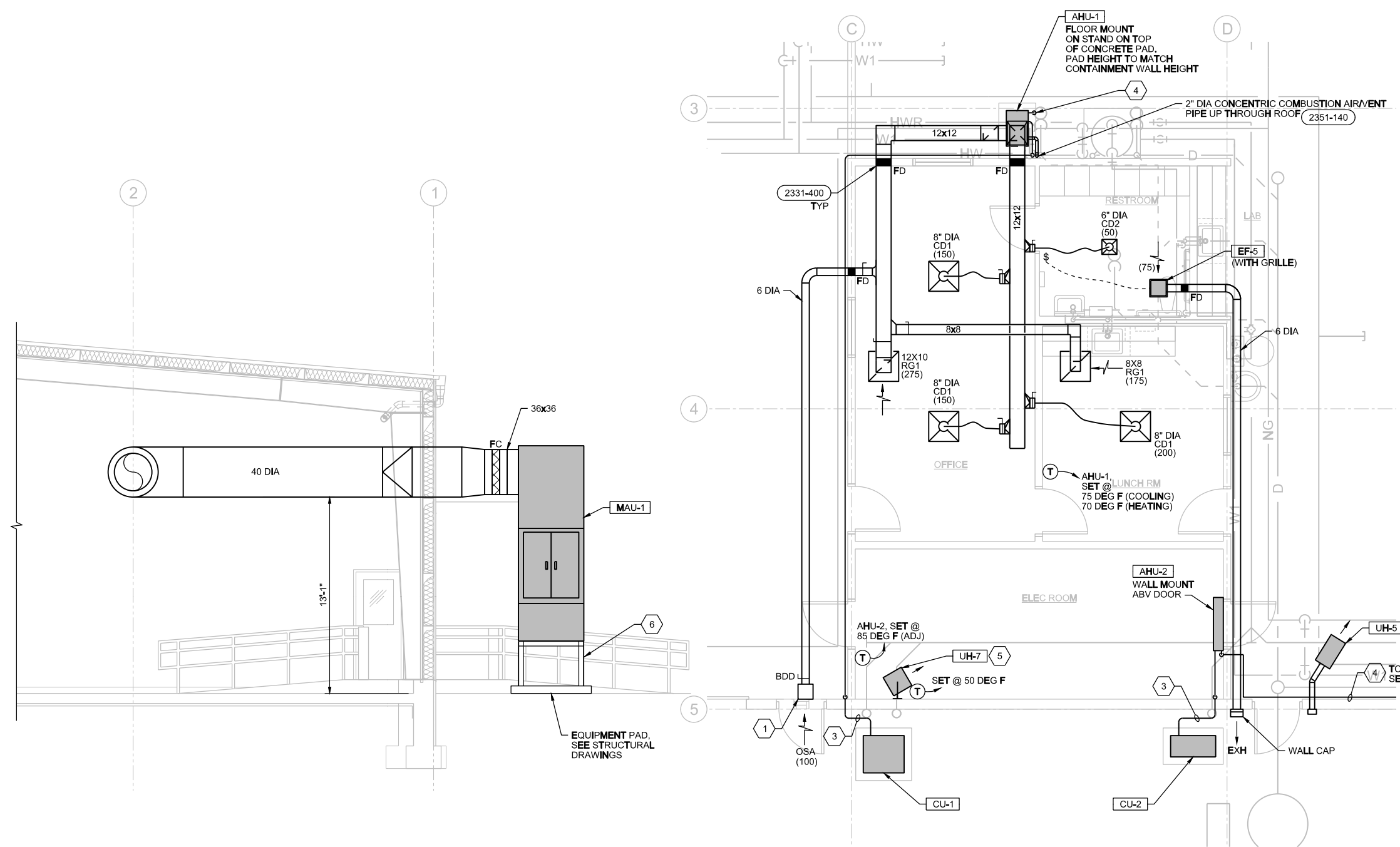
A B C D

**GENERAL SHEET NOTES**

1. PROVIDE BALANCING DAMPERS AT ALL SUPPLY AND RETURN GRILLES, SAME MATERIAL AS ASSOCIATED GRILLE. SOME DAMPERS NOT SHOWN FOR CLARITY.
2. FOR DUCT SUPPORT DETAILS REFER TO (2331-102)
3. FOR PIPE SUPPORT DETAILS REFER TO (4005-507)
4. TRANSITION ALL DUCT AND PIPE TO MATCH UNIT CONNECTION DIMENSIONS.
5. PROVIDE WALL SLEEVES FOR ALL PIPING PENETRATING WALL. ALL VOIDS TO BE SEALED WATER TIGHT. (4027-604)
6. COORDINATE DIFFUSER AND REGISTER LOCATIONS WITH ELECTRICAL LIGHTING LAYOUT AND ARCHITECTURAL REFLECTED CEILING PLANS.
7. DUCT SIZES AND OPENINGS THRU ROOFS, SLABS AND WALL PARTITIONS SHALL SUIT EQUIPMENT FURNISHED. OPENINGS REQUIRED FOR HVAC INSTALLATIONS BUT NOT SHOWN ON DRAWINGS SHALL BE PROVIDED BY THIS TRADE.
8. ALL EQUIPMENT, DUCTWORK, ETC. SHALL BE SUPPORTED FROM STRUCTURAL MEMBERS AS REQUIRED TO PROVIDE A VIBRATION-FREE RIGID INSTALLATION.

**SHEET KEY NOTES**

1. WALL LOUVER, REFER TO ARCHITECTURAL DRAWINGS FOR EXACT SIZE AND LOCATION. PROVIDE BIRD SCREEN, PLENUM BOX AND MOTORIZED DAMPER WHERE SHOWN. (2333-801)
2. AIR HANDLING UNIT ON STAND FOR BOTTOM RETURN PLENUM CONNECTION.
3. REFRIGERANT PIPING, ROUTE ABOVE GRADE AND AS SHOWN. (2323-184)
4. CONDENSATE DRAIN PIPING, FULL SIZE OF UNIT CONNECTION. PIPE WITH TRAP AND SLOPE 1/8" PER FOOT TOWARDS HUB DRAIN. REFER TO PLUMBING DRAWINGS. (2213-100)
5. ELECTRIC UNIT HEATER. (2380-427)
6. EQUIPMENT STAND



**A SECTION**  
1/4"=1'-0"  
H-1

**1 ENLARGED PLAN**  
1/4"=1'-0"  
H-1

|                 |           |      |    |      |                                      |
|-----------------|-----------|------|----|------|--------------------------------------|
| RECORD DRAWINGS |           | PK   | SL | BY   | APVD                                 |
| REVISION        |           | CHK  | BY | APVD | M. JURY                              |
| NO.             |           | DATE | DR | APVD | R. YOLO                              |
| DSGN            |           | DATE | DR | APVD | Y. FITZGERALD                        |
| DSGN            |           | DATE | DR | APVD | C. ANDERSON                          |
| DSGN            |           | DATE | DR | APVD | MARINETTE, WISCONSIN                 |
| DSGN            |           | DATE | DR | APVD | TYCO FIRE PRODUCTS LP                |
| DSGN            |           | DATE | DR | APVD | GWCT SYSTEM                          |
| DSGN            |           | DATE | DR | APVD | PHASE II: TREATMENT BUILDING DESIGN  |
| DSGN            |           | DATE | DR | APVD | HVAC                                 |
| DSGN            |           | DATE | DR | APVD | ENLARGED PLAN AND SECTION            |
| DSGN            |           | DATE | DR | APVD | CH2MHILL                             |
| DSGN            |           | DATE | DR | APVD | 1/4" = 1'-0"                         |
| DSGN            |           | DATE | DR | APVD | VERIFY SCALE                         |
| DSGN            |           | DATE | DR | APVD | BAR IS ONE INCH ON ORIGINAL DRAWING. |
| DATE            | JUNE 2010 |      |    |      |                                      |
| PROJ            | 388522    |      |    |      |                                      |
| DWG             | H-2       |      |    |      |                                      |
| SHEET           | 34        |      |    |      |                                      |

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# FANS

23 34 00.01

| TAG           | SERVICE          | TYPE                      | FAN DATA |              |       |        |       |      |         | SOUND DATA   |     |    |     |     |     |    |    | ELECTRICAL DATA |     |      |     | MAXIMUM DIMENSIONS   |     |    | MANUFACTURER | MODEL NO. | APPLICABLE REMARKS |             |                     |
|---------------|------------------|---------------------------|----------|--------------|-------|--------|-------|------|---------|--|-----|----|-----|-----|-----|----|----|-----------------|-----|------|-----|----------------------|-----|----|--------------|-----------|--------------------|-------------|---------------------|
|               |                  |                           | AIRFLOW  |              | SPEED | DRIVE  | WHEEL |      | MAXIMUM | MAX FAN SOUND POWER LEVEL dB (RE 10 <sup>-12</sup> W) @ MID OCTAVE BAND FREQUENCY (Hz) |     |    |     |     |     |    |    | MOTOR           |     | VOLT | PH  | PHYSICAL SIZE INCHES |     |    |              |           |                    | WEIGHT LBS. |                     |
|               |                  |                           | CFM      | @ SP IN. WG. |       |        | RPM   | TYPE |         | MIN DIA INCH   | BHP | 63 | 125 | 250 | 500 | 1K | 2K | 4K              | 8K  |      |     | HP                   | RPM | L  |              |           |                    |             | W                   |
| EF-1, 2, 3, 4 | PROCESS AREA     | WALL PROPELLER HEAVY DUTY | 6,600    | 0.25         | 861   | DIRECT | PROT  | 30   | 0.43    | 85   | 77  | 74 | 83  | 76  | 77  | 75 | 70 | 1               | 900 | MAC  | 460 | 3                    | 26  | 36 | 36           | 1510      | AEROVENT           | DDP 30      | A, B, C, D, E, J, K |
| EF-5          | BATHROOM EXHAUST | CABINET CENTRIFUGAL       | 75       | 0.25         | 640   | BELT   | FC    | -    | -       | 1.8 SONES  |     |    |     |     |     |    |    | 87 W            | 640 | ODP  | 120 | 1                    | 12  | 12 | 12           | 75        | AEROVENT           | T100        | B, D, F, G, H, I, J |

REMARKS:  
 A: DISCONNECT BY DIVISION 26 ELECTRICAL  
 B: FACTORY PROVIDED MOTOR STARTER  
 C: ALL ALUMINUM CONSTRUCTION  
 D: CORROSION PROTECTION COATING: EPOXY  
 E: MOTOR OPERATED SHUTTER, 120 V WITH BELIMO ACTUATOR  
 F: WALL CAP  
 G: WALL SWITCH WITH TIME DELAY  
 H: FACTORY PROVIDED VIBRATION ISOLATION  
 I: CEILING GRILLE, WHITE  
 J: ACCEPTABLE MANUFACTURERS: AEROVENT, GREENHECK, COOK  
 K: MOTOR GUARD

ABBREVIATIONS:  
 FC: FORWARD CURVED  
 BI: BACKWARD INCLINED  
 AF: AIR FOIL  
 PROP: PROPELLER

# SPLIT SYSTEM DX OUTDOOR UNITS

23 81 00.03

| TAG  | DX COOLING DATA  |                       |            | OUTDOOR FAN DATA |            |             | COMPRESSOR DATA |       |           |           | UNIT ELECTRICAL DATA |      |             |      | UNIT DIMENSIONS |        |    |    | APPLICABLE REMARKS |                     |
|------|------------------|-----------------------|------------|------------------|------------|-------------|-----------------|-------|-----------|-----------|----------------------|------|-------------|------|-----------------|--------|----|----|--------------------|---------------------|
|      | CAPACITY BTU/HR. | AMBIENT TEMP. DEG. F. | SEER @ ARI | NO.              | H.P. (EA.) | CFM (TOTAL) | NO.             | STEPS | RLA (EA.) | LRA (EA.) | # CONN               | MCA  | MOCP (FUSE) | VOLT | PH              | INCHES |    |    |                    | MAX WEIGHT LBS.     |
|      |                  |                       |            |                  |            |             |                 |       |           |           |                      |      |             |      |                 | L      | W  | H  |                    |                     |
| CU-1 | 18,000           | 90                    | 13.0       | 1                | 1/8        | -           | 1               | 1     | 6.4       | 38.6      | 1                    | 9.0  | 15.0        | 208  | 1               | 33     | 30 | 33 | 200                | A, B, C, E, F, H    |
| CU-2 | 18,000           | 90                    | 13.0       | 1                | 1/8        | 840         | 1               | 1     | 9.0       | 48.0      | 1                    | 12.1 | 20.0        | 208  | 1               | 36     | 15 | 25 | 170                | A, B, C, D, E, G, H |

REMARKS:  
 A: FACTORY PROVIDED DISCONNECT  
 B: FACTORY INSTALLED MOTOR CONTACTOR / STARTER  
 C: CONDENSER HAIL GUARDS  
 D: LOW-AMBIENT COOLING KIT  
 E: COMPRESSOR START ASSIST  
 F: ACCEPTABLE MANUFACTURERS: CARRIER, TRANE, YORK  
 G: ACCEPTABLE MANUFACTURERS: CARRIER, MITSUBISHI  
 H: REFRIGERANT: R-410A

# SPLIT SYSTEM DX INDOOR UNITS

23 81 00.01

| TAG   | SERVICE      | FAN DATA       |                 |                           |          | DX COOLING DATA          |                 |            |    | GAS TRAIN DATA       |             |               |                 | GAS FIRED HEATER DATA |              |               |            | UNIT ELECTRICAL DATA |            |            |        | UNIT DIMENSIONS |             |      | APPLICABLE REMARKS |    |        |    |               |                           |
|-------|--------------|----------------|-----------------|---------------------------|----------|--------------------------|-----------------|------------|----|----------------------|-------------|---------------|-----------------|-----------------------|--------------|---------------|------------|----------------------|------------|------------|--------|-----------------|-------------|------|--------------------|----|--------|----|---------------|---------------------------|
|       |              | SUPPLY AIR CFM | OUTSIDE AIR CFM | EXTERNAL STATIC P IN W.G. | MOTOR HP | NOMINAL CAPACITY BTU/HR. | NET SENS. BTU/H | EAT DEG. F |    | AMBIENT TEMP. DEG. F | FUEL SOURCE | GAS INPUT MBH | SUPPLY PRESSURE |                       | BURNER       |               | OUTPUT MBH | CFM                  | EAT DEG. F | LAT DEG. F | #CONN. | MCA             | MOCP (FUSE) | VOLT |                    | PH | INCHES |    |               | MAX WEIGHT LBS.           |
|       |              |                |                 |                           |          |                          |                 | DB         | WB |                      |             |               | MIN IN. W.G.    | MAX IN. W.G.          | CONTROL TYPE | IGNITION TYPE |            |                      |            |            |        |                 |             |      |                    |    | L      | W  | H             |                           |
| AHU-1 | OFFICE AREAS | 650            | 100             | 0.3                       | 1/5      | 18,000                   | 9,600           | 78         | 65 | 88                   | NG          | 40            | 4.5             | 13.6                  | THERMOSTAT   | HIS           | 37         | 650                  | 55         | 110        | 1      | 8.4             | 15          | 120  | 1                  | 26 | 18     | 40 | 200           | A, B, C, D, E, F, G, H, I |
| AHU-2 | ELECTRIC RM  | 525            | 0               | 0                         | 64 W     | 18,000                   | 12,600          | 85         | 57 | 88                   | -           | -             | -               | -                     | -            | -             | -          | -                    | -          | 1          | 0.48   | 25              | 208         | 1    | 43                 | 8  | 12     | 35 | A, B, D, G, J |                           |

REMARKS:  
 A: FACTORY PROVIDED DISCONNECT  
 B: FACTORY INSTALLED MOTOR CONTACTOR / STARTER  
 C: EQUIPMENT STAND FOR BOTTOM RETURN CONNECTION  
 D: PROGRAMMABLE ELECTRONIC THERMOSTAT  
 E: CONCENTRIC VENT TERMINATION KIT  
 F: 2-INCH PLEATED FILTERS, SIZED TO MATCH UNIT  
 G: REFRIGERANT: R-410A  
 H: PROVIDE EVAPORATOR COIL AS ACCESSORY TO UNIT, MINIMUM CAPACITY 18 MBH  
 I: ACCEPTABLE MANUFACTURERS: CARRIER, TRANE, YORK  
 J: ACCEPTABLE MANUFACTURERS: CARRIER, MITSUBISHI

# CONTROL DAMPERS

23 09 13.02

| TAG           | SPECIFICATION TYPE           | SERVES        | CONSTRUCTION MATERIALS |       |       |       | PERFORMANCE |                  | NOMINAL DIMENSIONS INCHES | ACTUATOR DATA                  |       |        |            | DAMPER MANUFACTURER | ACTUATOR MANUFACTURER | APPLICABLE REMARKS |        |   |
|---------------|------------------------------|---------------|------------------------|-------|-------|-------|-------------|------------------|---------------------------|--------------------------------|-------|--------|------------|---------------------|-----------------------|--------------------|--------|---|
|               |                              |               | AXLES                  | BLADE | FRAME | SEALS |             | MAX VELOCITY FPM |                           | PRESS. DROP @ 1500 FPM IN. WG. | FAILS | RANGE  | TYPE       |                     |                       |                    | VOLTS  |   |
|               |                              |               |                        |       |       | JAMB  | BLADE       |                  |                           |                                |       |        |            |                     |                       |                    |        |   |
| MD-1, 2, 3, 4 | STANDARD DUTY CONTROL DAMPER | EF-1, 2, 3, 4 | ALUM                   | ALUM  | ALUM  | METAL | METAL       | 750              | 0.01                      | 25                             | 25    | CLOSED | 2 POSITION | ELECTRIC            | 120                   | RUSKIN             | BELIMO | A |
| MD-5, 6       | STANDARD DUTY CONTROL DAMPER | INTAKE LOUVER | ALUM                   | ALUM  | ALUM  | METAL | METAL       | 500              | 0.01                      | -                              | -     | CLOSED | 2 POSITION | ELECTRIC            | 120                   | RUSKIN             | BELIMO | B |

REMARKS:  
 A: PROVIDED AS ACCESSORY WITH EQUIPMENT  
 B: SAME SIZE AS LOUVER

ABBREVIATIONS:  
 ALUM ALUMINUM  
 304 SST STAINLESS STEEL, TYPE 304

# UNIT HEATERS

23 82 00.01

| TAG            | QUANTITY | UNIT HEATER TYPE    | AIR SIDE DATA      |                  |           |          | ELEC. HEAT DATA  |             |           |      | GAS TRAIN DATA |           |               |                | UNIT ELECTRIC DATA |              |     |      | MOUNTING HEIGHT (MIN.) FEET | MAXIMUM DIMENSIONS |    |                      | MANUFACTURER | MODEL | APPLICABLE REMARKS |             |                     |   |
|----------------|----------|---------------------|--------------------|------------------|-----------|----------|------------------|-------------|-----------|------|----------------|-----------|---------------|----------------|--------------------|--------------|-----|------|-----------------------------|--------------------|----|----------------------|--------------|-------|--------------------|-------------|---------------------|---|
|                |          |                     | SUPPLY AIRFLOW CFM | HORIZ THROW FEET | MOTOR RPM | POWER HP | TEMP RISE DEG. F | CAPACITY KW | NO. STEPS | VOLT | PH             | FUEL TYPE | GAS INPUT MBH | GAS OUTPUT MBH | SUPPLY PRESSURE    |              | MCA | MOCP |                             | VOLT               | PH | PHYSICAL SIZE INCHES |              |       |                    | WEIGHT LBS. |                     |   |
|                |          |                     |                    |                  |           |          |                  |             |           |      |                |           |               |                | MIN IN. W.G.       | MAX IN. W.G. |     |      |                             |                    |    | L                    |              |       |                    |             | W                   | H |
| UH-1 THRU UH-6 | 6        | GAS, PROPELLER FAN  | 650                | 39               | 1550      | 1/35     | -                | -           | -         | -    | NG             | 50        | 40            | 5.0            | 14.0               | 1.3 FLA      | 15  | 120  | 1                           | 8                  | 28 | 14                   | 31           | 80    | REZTOR             | F 50        | D, F, G, H, I, J, K |   |
| UH-7           | 1        | ELECTRIC, SUSPENDED | 310                | 12               | 1000      | 1/50     | 27               | 2.6         | 1         | 208  | 1              | -         | -             | -              | -                  | 12.8         | 15  | 208  | 1                           | 8                  | 14 | 14                   | 16           | 35    | CHROMOLOX          | LUH 02      | A, B, C, E          |   |

REMARKS:  
 A: FACTORY INSTALLED MOTOR STARTER / HEATER CONTACTOR  
 B: DISCONNECT: FACTORY INSTALLED, NEMA TYPE 12  
 C: WALL MOUNTING BRACKET  
 D: WALL MOUNT THERMOSTAT KIT  
 E: FACTORY MOUNTED THERMOSTAT  
 F: POWER VENTING  
 G: INDOOR COMBUSTION AIR INLET  
 H: SPARK IGNITED INTERMITTENT SAFETY PILOT W/ ELECTRONIC FLAME SUPERVISION OR DIRECT SPARK IGNITION  
 I: ALUMINIZED STEEL HEAT EXCHANGER  
 J: DOWNTURN AIR NOZZLE  
 K: MANUAL SHUTOFF VALVE AND UNION  
 NG: NATURAL GAS  
 PG: PROPANE GAS  
 NG/PG: DUAL FUEL, NATURAL AND PROPANE GAS

# MAKE-UP AIR UNITS

23 77 00.02

| TAG   | LOCATION | TYPE       | FAN MODULE |         |                       |            |                |      |     |             | GAS FIRED HEATER MODULE |                 |                |            |         |                  |                 |            | FILTER MODULE            |                   | DIMENSIONS |     |                     |    | MANUFACTURER | MODEL | APPLICABLE REMARKS |               |  |
|-------|----------|------------|------------|---------|-----------------------|------------|----------------|------|-----|-------------|-------------------------|-----------------|----------------|------------|---------|------------------|-----------------|------------|--------------------------|-------------------|------------|-----|---------------------|----|--------------|-------|--------------------|---------------|--|
|       |          |            | AIRFLOW    |         | EXTERNAL STATIC IN WG | WHEEL TYPE | FAN MOTOR DATA |      |     | FUEL SOURCE | GAS INPUT MBH           | HEAT OUTPUT MBH | AIRFLOW DEG. F | EAT DEG. F | LAT MIN | GAS SUPPLY PRESS |                 | EFFICIENCY | RESISTANCE (FINAL) IN WG | MAX PHYSICAL SIZE |            |     | MAXIMUM WEIGHT LBS. |    |              |       |                    |               |  |
|       |          |            | CFM        | OSA CFM |                       |            | HP             | VOLT | PH  |             |                         |                 |                |            |         | NEMA CLASS       | MOTOR ENCLOSURE |            |                          | MIN IN WG         | MAX IN WG  | L   |                     | W  |              |       |                    | H             |  |
| MAU-1 | OUTDOORS | INDUSTRIAL | 13200      | 13200   | 0.5                   | BI         | 7.5            | 460  | 3.0 | 3R          | TEFC                    | NG              | 1500           | 1350       | 13200   | -15              | 80.0            | 5.0        | 14.0                     | ON/OFF            | DIRECT     | 30% | 0.25                | 82 | 52           | 156   | AEROVENT           | GACDW-630 BIA |  |

REMARKS:  
 A: MOTOR STARTER AND DISCONNECT: FACTORY PROVIDED AND INSTALLED ON UNIT  
 B: DISCONNECT: FACTORY INSTALLED, NEMA TYPE 3R  
 C: FACTORY SUPPLIED INTERNAL VIBRATION ISOLATORS  
 D: WELDED 14 GA, DOUBLE WALL, INSULATED CONSTRUCTION, MIN 1" THICK  
 E: SUPPORT LEGS  
 F: BIRDSCREEN  
 G: V-BANK FILTER CABINET  
 H: INDUSTRIAL ENAMEL PAINT FINISH

ABBREVIATIONS:  
 NG: NATURAL GAS  
 PG: PROPANE GAS  
 NG / PG: DUAL FUEL, NATURAL AND PROPANE GAS

**CH2MHILL**

RECORD DRAWINGS

03/2011

DATE

NO.

DR

C. ANDERSON

Y. FITZGERALD

R. YOLO

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REVISION

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M. JURY

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TYCO FIRE PRODUCTS LP  
GWCT SYSTEM  
PHASE II: TREATMENT BUILDING DESIGN  
MARINETTE, WISCONSIN

HVAC  
EQUIPMENT SCHEDULES

NOT TO SCALE  
VERIFY SCALE  
BAR IS ONE INCH ON ORIGINAL DRAWING.  
DATE: JUNE 2010  
PROJ: 388522  
DWG: H-3  
SHEET: 35

RECORD DRAWINGS