

PROJECT OVERVIEW

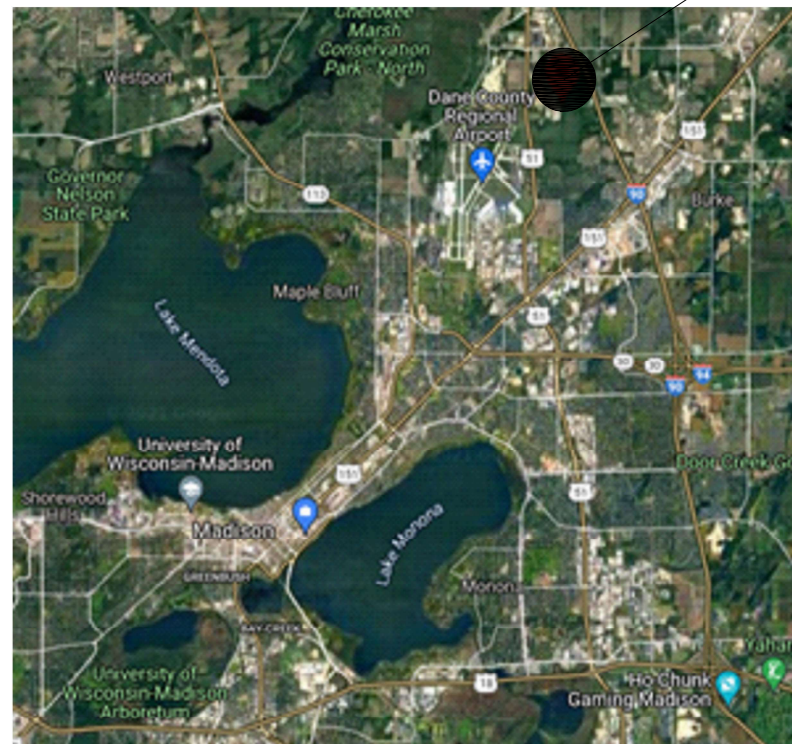
City of Madison Metro Transit recently purchased several buildings on Hanson Rd. that were formally Fed Ex facilities. These buildings will house articulated buses (60') and some 40' buses and in the future maintenance bays and a service lane similar to what is at 1101 E Washington Ave.

3901 Hanson Rd is a 135,071 SF building originally built in 2005 with a small addition in 2009. 3829 Hanson Rd is a ~58,000 SF building built in 2014. Both buildings have Make Up Air Units, Exhaust fans, unit heaters wall heaters and/or rooftop units, furnaces and minisplit systems. This equipment currently runs stand alone, but it is desired to add these buildings to the City of Madison Honeywell WEBS building automation network. The selected contractor will be required to install the conduit, wiring, hardware and software to facilitate adding these buildings and this equipment to the BAS network.

ABBREVIATIONS

- ADJ – ADJUSTABLE
- BAS – BUILDING AUTOMATION SYSTEM
- BPD – BYPASS DAMPER
- CO – CARBON MONOXIDE
- DA-T – DISCHARGE AIR TEMPERATURE SENSOR
- DDC – DIRECT DIGITAL CONTROL
- EWB – ELECTRIC WALL HEATER
- EF – EXHAUST FAN
- F – FURNACE
- JACE – JAVA APPLICATION CONTROL ENGINE
- MAU – MAKE UP AIR UNIT
- N4 – HTML5 VERSION OF WEBS
- NO2 – NITROGEN DIOXIDE
- OA – OUTSIDE AIR
- OC – OCCUPANCY SENSOR
- RTU – ROOFTOP UNIT
- SP – SETPOINT
- T – THERMOSTAT or TEMPERATURE
- TR-21 – SPACE TEMPERATURE SENSOR
- TR-71 – SPACE TEMPERATURE SENSOR
- UH – UNIT HEATER
- VAV – VARIABLE AIR VOLUME
- WEBS – CONTROL WEB BROWSER INTERFACE
- ZD – ZONE DAMPER

REGIONAL VICINITY



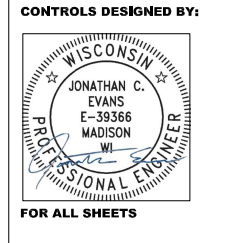
SITE PLAN



<u>DRAWING INDEX</u>	
M000	PROJECT OVERVIEW
M100	3901 HANSON ROAD
M101	3829 HANSON ROAD

PUBLIC WORKS IMPROVEMENT PROJECT
APPROVED BY THE COMMON COUNCIL OF MADISON WISCONSIN
RESOLUTION: RES-21-00735
FILE ID: 67797
DATE: NOVEMBER 2, 2021

PUBLIC WORKS IMPROVEMENT DESIGN
APPROVED BY
W. Greg Fries
CITY ENGINEER
 Jan 6, 2022
DATE



CITY OF MADISON
 DEPT. OF PUBLIC WORKS
 ENGINEERING DIVISION
 CITY COUNTY BLDG. RM. 115
 MADISON, WI 53703
 PHONE: 608-266-4751

MADISON METRO TRANSIT SATELLITE FACILITY –
 CONTROLS UPGRADE
 3901 and 3829 HANSON ROAD
 MADISON, WI 53704

PROJECT OVERVIEW

CONTRACT	9136
MUNIS	10950
DRWN BY:	JON EVANS
DATE	01/06/2022
REV:	BID SET

SHEET
 M000



CITY OF MADISON
DEPT OF PUBLIC WORKS
ENGINEERING DIVISION
CITY COUNTY BLDG RM 115
210 MARTIN LUTHER KING JR BLVD
MADISON, WI 53703
PHONE: 608-266-4751

MADISON METRO TRANSIT SATELLITE FACILITY –
CONTROLS UPGRADE
3901 and 3829 HANSON ROAD
MADISON, WI 53704

3901
HANSON ROAD

EQUIP AND
CONTROLS
PLAN

CONTRACT
9136
MUNIS
10950

DRWN BY: JON EVANS
DATE 01/06/2022
REV: BID SET

SHEET
M100

GENERAL NOTES:

- CONTROL WIRING TO BE RUN IN CONDUIT (EMT). CONDUIT TO BE LABELED 'CONTROLS'
- UTILIZE AIRPORT OUTSIDE AIR TEMP SENSOR
- BUILDINGS ARE CONNECTED TO THE CITY FIBER NETWORK
- NEW JACES (TITAN) V4.10 WITH STATIC IP ADDRESSES FOR EACH BUILDING
- JACES TO CONNECT TO EXISTING CITY HONEYWELL WEBS SERVER RUNNING V4.10 ON THE NIAGARA N4 PLATFORM.
- BUILDING FLOORPLAN GRAPHICS TO BE PROVIDED TO CONTRACTOR FROM OWNER IN AUTOCAD FORMAT. GRAPHICS TO BE LOCATED UNDER THE METRO TRANSIT .NAV FILE IN WEBS. A NEW .NAV FILE FOR METRO TRANSIT WILL BE REQUIRED TO SEPARATE 1101 FROM HANSON RD FACILITY.
- SEQUENCES TO GENERALLY MIRROR 1101 E WASHINGTON AVE TO THE MAXIMUM EXTENT POSSIBLE.

PLAN NOTES:

- Locate Jace and Panel 1 Here
- Locate Panel 2 Here

EQUIPMENT INFORMATION							
EQUIP TAG	MODEL #	FUNCTION	ASSOCIATIONS	SCHEDULE	T-STAT TYPE	POINTS	NOTE
MAU-1	Captive Air CAH-25	Make Up Air and Exhaust for Bus Parking Area (West)	Interlocked. CO/NO2 Sensor Sets 1-6	SCHEDULE 1	DA-T	DA-T, DAMPER, BURNER, FAN, FILTER, DUCT SMOKE DETECTOR CO/NO2	(3)
EF-1	CookHSE10B	Make Up Air and Exhaust for Bus Parking Area (West)	Interlocked. CO/NO2 Sensor Sets 1-6	SCHEDULE 1	DA-T	DA-T, DAMPER, BURNER, FAN, FILTER, DUCT SMOKE DETECTOR CO/NO2	(3)
MAU-2	Captive Air A4-D	Make Up Air and Exhaust for Bus Parking Area (SW)	Interlocked. CO/NO2 Sensor Sets 7-8	SCHEDULE 1	DA-T	DA-T, DAMPER, BURNER, FAN, FILTER, DUCT SMOKE DETECTOR CO/NO2	(3)
EF-2	Carnes VUBK30-V1	General Parking Heat	---	---	TR-21	TR-21, CURRENT SWITCH, FAN, GAS VALVE	(3)
UH-1 through UH-8	Reznor UDAP-400	Remote Office Heat/Cool/Vent	Interlocked. Occupancy Sensors	SCHEDULE 2	TR-21	TR-71, DAMPER, HEAT/COOL, FAN, FILTER, OCC SENSORS OCC SENSORS (bathroom for after hours - just EFs)	(1)
F-1	Trane TU	Remote Off Bathroom Exhaust	---	---	TR-21	TR-21	(2)
EF-8 and EF-9	Broan 684/L-250	Remote Off Bathroom Exhaust	---	---	TR-21	TR-21	(2)
EW-3 and EW-4	QMARK CWH-1101-DS	Remote Off Bathroom Heat	---	---	TR-21	TR-21	(2)
RTU-1	Trane YCD15CB3HAA	Office Heat/Cool/Vent	Interlocked EFs. 2-hr Override (8) Zone Dampers	SCHEDULE 3	TR-71	TR-71, ZONE DAMPERS, DA-T, OA DAMPER, HEAT/COOL, FAN, FILTER, DUCT SMOKE DETECTOR, EF STATUS	(1)
EF-4 through EF-7	Broan L250/L300/684	Bathroom Exhaust	---	---	TR-71	TR-71, ZONE DAMPERS, DA-T, OA DAMPER, HEAT/COOL, FAN, FILTER, DUCT SMOKE DETECTOR, EF STATUS	(1)
RTU-2	Trane YSC048A	Office Heat/Cool/Vent	2-hr Override (3) VAV Dampers	SCHEDULE 3	TR-71	TR-71, ZONE DAMPERS, DA-T, OA DAMPER, HEAT/COOL, FAN, FILTER, DUCT SMOKE DETECTOR, EF STATUS	(1)
EF-3	Broan L250	Janitor Closet Exhaust	---	24/7	---	EF STATUS	(2)
EW-1 and EW-2	Berko FRA	Vestibule Heat	---	---	TR-21	TR-21 (ALARM IF < 40 F)	(2)
IT ROOM TEMP	---	Space High Temp Monitor	Keep Existing T-stat	---	TR-21	TR-21 (ALARM IF > 80 F)	
IT ROOM TEMP	---	Space High Temp Monitor	Keep Existing T-stat	---	TR-21	TR-21 (ALARM IF > 80 F)	
WATER ROOM TEMP	---	Space Low Temp Monitor	Keep Existing T-stat	---	TR-21	TR-21 (ALARM IF < 40 F)	

- Trane Furnace and Rooftop Unit Controllers to integrate with Honeywell WEBS n4 Building Jace via BACnet protocol.
- If not possible to install TR-21 with EWHs then install the TR-21 to monitor space temp only
- Maintain Bus Parking at 60 F (adj) - DA-T from MAU and UH space setpoints.

SCOPE OF WORK AND SEQUENCE OF OPERATION DETAILS

MAU-1 MAU-2 and Associated EFs (1-2)

- Replace Remote Control Panel
- Interlock EF-1 through EF-2
 - Add EF Status and Alarm
- Occupied and Unoccupied Schedule
 - Unoccupied: Dampers closed, Burner off, Fan Off
 - Occupied: Dampers open, Burner enabled, Fan On
- Fan on/off status
- Filter status
 - SP=0.8" (adj)
- Modulating burner status - heat on/off and % command
 - Lockout burner if > 50 F (adj)
- OA Damper status - open/closed and alarm
- Duct smoke detector to shutdown unit and alarm
- Replace CO/NO2 Sensors and DA-T sensor
 - DA-T Setpoint: 60 F (adj)
 - DA-T used for software freeze stat
 - SP = 35 F (adj)
 - Delay = 600 s (adj)
 - Software reset (adj)
 - Alarm
- CO/NO2 Setpoints
 - CO SP = 35 ppm (adj)
 - NO2 SP = 1 ppm (adj)
 - MAU to operate occupied if threshold exceeded.
 - Allow MAU to sequence occupied if threshold is exceeded.
 - MAU to operate for 30 min after setpoint threshold clears.
 - MAU to send alarm during CO/NO2 activation.

Unit Heaters (UH-1 through UH-8)

- Replace Existing thermostats with TR-21
- Maintain a space temperature SP = 60 F (adj)
- Add current switch for BAS monitoring and alarm
- Alarm if space temp falls below 40 F (adj)

Other Exhaust Fans (EF-3 through EF-9)

- EF-3 through EF-6 (bathroom exhaust)
 - Fans interlocked with RTU-1 and RTU-2 Schedule
 - Add occupancy sensor in each bathroom
 - Occupancy sensor to turn on fan after hours
 - Add Fan status and alarm
- EF-7 (janitors closet)
 - Fan runs 24/7
 - Add Fan status and alarm
- EF-8 and EF-9 (bathroom exhaust)
 - Fans interlocked with F-1 Schedule
 - Add occupancy sensor in each bathroom
 - Occupancy sensor to turn on fan after hours
 - Add Fan status and alarm

Office Rooftop Units (RTU-1 and RTU-2)

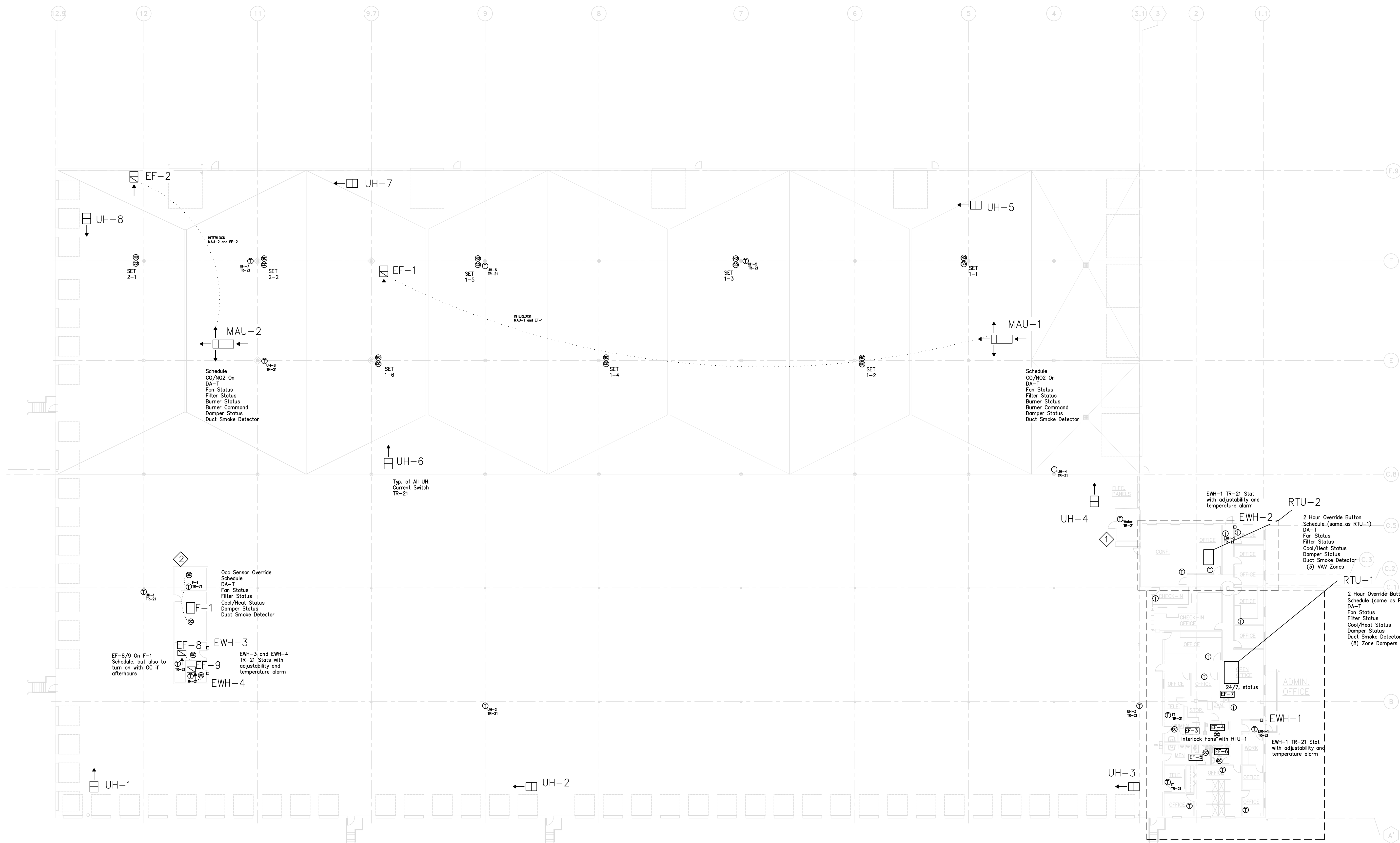
- Occupied/Unoccupied Schedule
- 2 hr override for after hours occupancy
- Interlock Bathroom Fans EF-3 through EF-6
- Replace Existing thermostats with Honeywell TR-71
- Bacnet Integrate Zone Dampers and Bypass Dampers
 - 8 Zone Dampers for RTU-1
 - 3 VAV Dampers for RTU-2
- Add:
 - DA-T
 - DA-T reset
 - Fan on/off and alarm
 - cooling and heating status and alarm
 - filter status and alarm
 - SP = 0.8"

Remote Office Furnace (F-1)

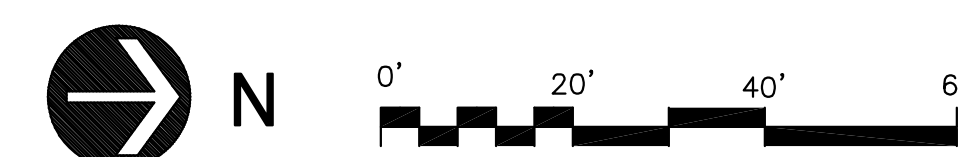
- Occupied/Unoccupied Schedule
- Occupancy sensors (2) for after hours or sporadic occupancy
- Interlock Bathroom Fans (EF-8 and EF-9)
- Replace Existing thermostat with Honeywell TR-71
- Add:
 - DA-T
 - DA-T reset
 - Fan on/off and alarm
 - cooling and heating status and alarm
 - filter status and alarm
 - SP = 0.8"

Other

- IT Rooms (2)
 - Add TR-21 for space temp monitoring
 - Alarm if space temp > 80 F (adj)
- Water Room
 - Add TR-21 for space temp monitoring
 - Alarm if space temp < 40 F (adj)
- Electric Wall Heaters
 - Add TR-21 for space temp control and monitoring
 - Alarm if space temp < 40 F (adj)



1 BUILDING 3901 EQUIPMENT LAYOUT
M100 SCALE: 1" = 20'





CITY OF MADISON
DEPT. OF PUBLIC WORKS
ENGINEERING DIVISION
CITY COUNTY BLDG. RM. 115
210 MARTIN LUTHER KING JR. BLVD
MADISON, WI 53704
PHONE: 608-262-4751

GENERAL NOTES:

- CONTROL WIRING TO BE RUN IN CONDUIT (EMT). CONDUIT TO BE LABELED 'CONTROLS'
- UTILIZE AIRPORT OUTSIDE AIR TEMP SENSOR
- BUILDINGS ARE CONNECTED TO THE CITY FIBER NETWORK
- NEW JACES (TITAN) V4.10 WITH STATIC IP ADDRESSES FOR EACH BUILDING
- JACES TO CONNECT TO EXISTING CITY HONEYWELL WEBS SERVER RUNNING V4.10 ON THE NIAGARA N4 PLATFORM.
- BUILDING FLOORPLAN GRAPHICS TO BE PROVIDED TO CONTRACTOR FROM OWNER IN AUTOCAD FORMAT. GRAPHICS TO BE LOCATED UNDER THE METRO TRANSIT .NAV FILE IN WEBS. A NEW .NAV FILE FOR METRO TRANSIT WILL BE REQUIRED TO SEPARATE 1101 FROM HANSON RD FACILITY.
- SEQUENCES TO GENERALLY MIRROR 1101 E WASHINGTON AVE TO THE MAXIMUM EXTENT POSSIBLE.

PLAN NOTES:

- ① Locate Jace and Panel 1 Here
- ② Existing Destratification Fan Control Panels to Remain

EQUIPMENT INFORMATION							
EQUIP TAG	MODEL #	FUNCTION	ASSOCIATIONS	SCHEDULE	T-STAT TYPE	POINTS	NOTE
MAU-1	Captive Air CAH-33	Make Up Air and Exhaust for Bus Maint. Area	Interlocked. CO/NO2 Sensor Sets 1-4	SCHEDULE 1	DA-T	DA-T, DAMPER, BURNER, FAN, FILTER, DUCT SMOKE DETECTOR CO/NO2	(3)
EF-1 through EF-4	Twin City WPD 30E4	General Maint. Area Heat	---	---	TR-21 (9)	TR-21, CURRENT SWITCH, FAN, GAS VALVE	(3)
UH-1 through UH-9	STERLING TF-250	Attic Vent/Temp Control	---	---	TR-21	EF STATUS	(4)
EF-5	Carnes LWBK24-p1	Office Heat/Cool/Vent	Interlocked. (3) ZD and (1) BPD	SCHEDULE 2	TR-71 (3)	TR-71, DAMPER, ZDs, BPD, HEAT/COOL, FAN, FILTER	(1)
F-1	Trane TU	Office Heat/Cool/Vent	Interlocked. (3) ZD and (1) BPD	---	TR-71 (3)	TR-71, DAMPER, ZDs, PBD, HEAT/COOL, FAN, FILTER	(1)
F-2	Trane TU	Office Bathroom Exhaust	Occupancy Sensors	---	---	OC C SENSORS (bathroom for after hours - just EFs)	
EF-8 and EF-9	Broan L-250	Office Bathroom Heat	---	---	TR-21 (2)	TR-21	(2)
EWB-2 and EWB-3	QMARK CWH-1101-DS	Transfer Air to IT Room	Interlock with F-1 and F-2	SCHEDULE 2	---	EF STATUS	
EF-7	Broan L250	Janitor Closet Exhaust	---	24/7	---	EF STATUS	
EF-6	Broan QTXE80	Vestibule Heat	---	---	TR-21	TR-21 (ALARM IF < 40 F)	(2)
EWB-1	QMARK CWH1101-DS	Space High Temp Monitor	Keep Existing T-stats	---	TR-21	TR-21 (ALARM IF > 80 F)	
IT ROOM TEMP	---	---	---	---	---	---	

- (1) Trane Furnace Unit Controllers to integrate with Honeywell WEBS n4 Building Jace via BACnet protocol.
- (2) If not possible to install TR-21 with EWBs then install the TR-21 to monitor space temp only
- (3) Maintain Bus Maint Area at 60 F (adj) - DA-T from MAU and UH space setpoints.
- (4) EF-5 to turn on if TR-21 in attic >85 F (adj)

SCOPE OF WORK AND SEQUENCE OF OPERATION DETAILS

- MAU-1 and Associated Efs (1-4)**
1. Replace Remote Control Panel
 2. Interlock EF-1 through EF-4
 - 2.1. Add EF Status and Alarm
 3. Occupied and Unoccupied Schedule
 - 3.1. Unoccupied: Dampers closed, Burner off, Fan Off
 - 3.2. Occupied: Dampers open, Burner enabled, Fan On
 4. Fan on/off status
 5. Filter status
 - 5.1. SP=0.8" (adj)
 6. Modulating burner status - heat on/off and % command
 - 6.1. Lockout burner if > 50 F (adj)
 7. OA Damper status - open/closed and alarm
 8. Duct smoke detector to shutdown unit and alarm
 9. Replace CO/NO2 Sensors and DA-T sensor
 - 9.1. DA-T Setpoint: 60 F (adj)
 - 9.2. DA-T used for software freeze stat
 - 9.2.1. SP = 35 F (adj)
 - 9.2.2. Delay = 600 s (adj)
 - 9.2.3. Software reset (adj)
 - 9.2.4. Alarm
 - 9.3. CO/NO2 Setpoints
 - 9.3.1. CO SP = 35 ppm (adj)
 - 9.3.2. NO2 SP = 1 ppm (adj)
 - 9.3.3. MAU to operate occupied if threshold exceeded.
 - 9.3.4. Allow MAU to sequence occupied if threshold is exceeded.
 - 9.3.5. MAU to operate for 30 min after setpoint threshold clears.
 - 9.3.6. MAU to send alarm during CO/NO2 activation.

Unit Heaters (UH-1 through UH-9)

1. Replace Existing thermostats with TR-21
2. Maintain a space temperature SP = 60 F (adj)
3. Add current switch for BAS monitoring and alarm
4. Alarm if space temp falls below 40 F (adj)

Other Exhaust Fans (EF-5 through EF-9)

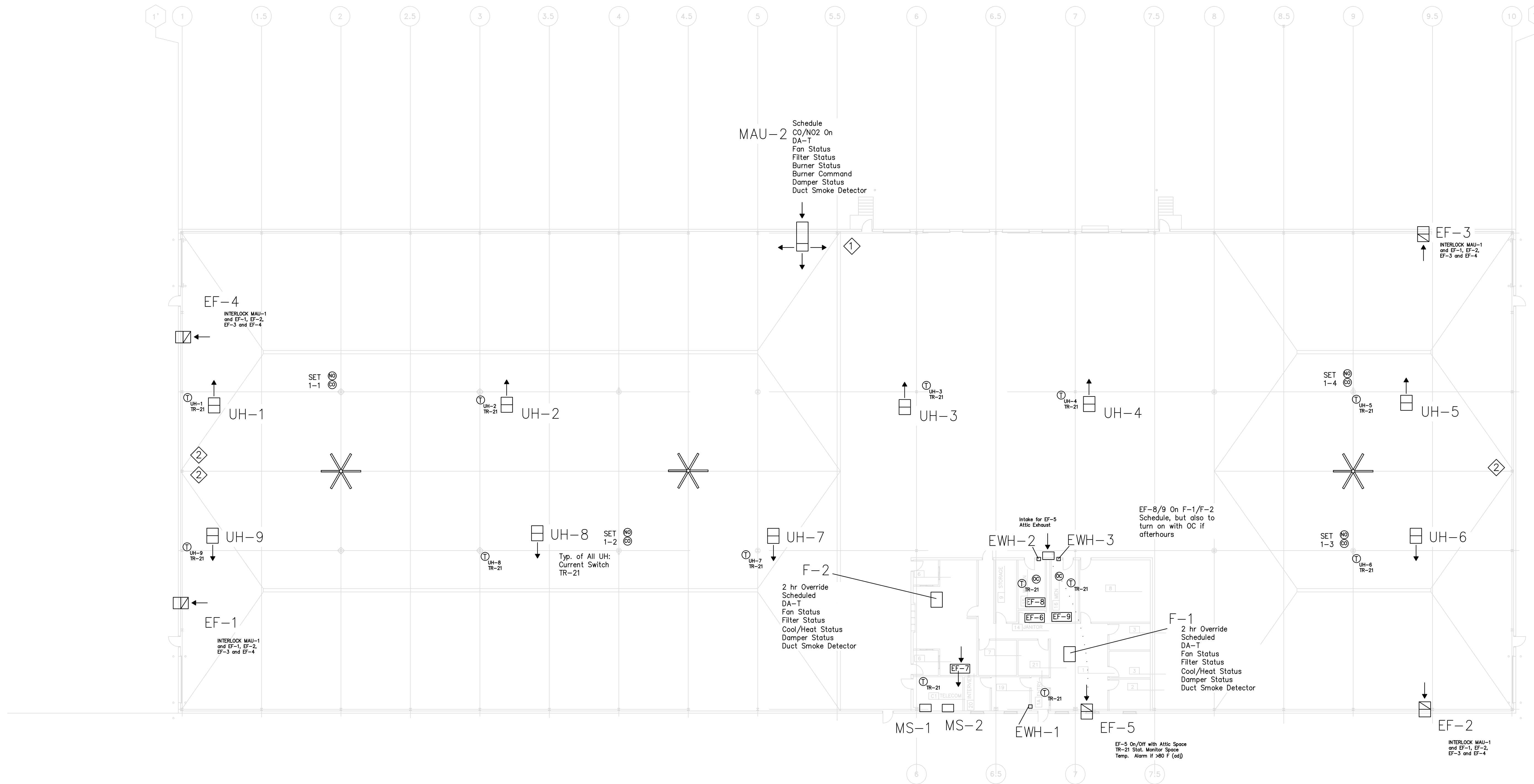
1. EF-5 (attic ventilation and temp control)
 - 1.1. Replace temp sensor in attic with TR-21
 - 1.2. Cycle fan if temp sensor > 85 F (adj)
 - 1.3. Add Fan status and alarm
 - 1.4. Alarm if attic temp exceeds 90 F (adj)
2. EF-6 (janitors closet)
 - 2.1. Fan runs 24/7
 - 2.2. Add Fan status and alarm
3. EF-7 (transfer fan)
 - 3.1. Fan interlocked with F-1 and F-2 Schedule
 - 3.2. Add Fan status and alarm
4. EF-8 and EF-9 (bathroom exhaust)
 - 4.1. Fans interlocked with F-1 and F-2 Schedule
 - 4.2. Add occupancy sensor in each bathroom
 - 4.2.1. Occupancy sensor to turn on fan after hours
 - 4.3. Add Fan status and alarm

Office Space Furnaces (F-1 and F-2)

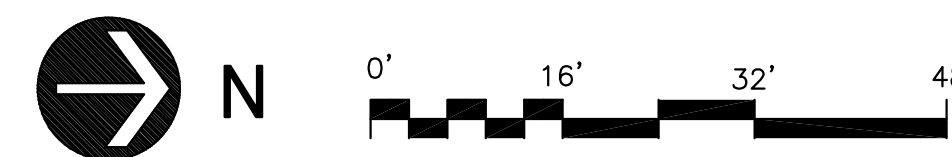
1. Occupied/Unoccupied Schedule
2. 2 hr override for after hours occupancy
3. Interlock Bathroom Fans
4. Replace Existing thermostats with Honeywell TR-71
 - 5.1. 3 Zone Dampers and 1 By Pass Damper per Furnace
 6. Add
 - 6.1. DA-T
 - 6.2. DA-T reset
 - 6.3. Fan on/off and alarm
 - 6.4. cooling and heating status and alarm
 - 6.5. filter status and alarm
 - 6.5.1. SP = 0.8"

Other

1. IT Room
 - 1.1. Add TR-21 for space temp monitoring
 - 1.2. Alarm if space temp > 80 F (adj)
2. Electric Wall Heaters
 - 2.1. Add TR-21 for space temp control and monitoring
 - 2.2. Alarm if space temp < 40 F (adj)



1 BUILDING 3829 EQUIPMENT LAYOUT
M101 SCALE: 1" = 16'



MADISON METRO TRANSIT SATELLITE FACILITY -
CONTROLS UPGRADE
3901 and 3829 HANSON ROAD
MADISON, WI 53704

3829
HANSON ROAD

EQUIP AND
CONTROLS
PLAN

CONTRACT
9136
MUNIS
10950
DRWN BY: JON EVANS
DATE 01/06/2022
REV: BID SET

SHEET
M101