

3829 Hanson Road

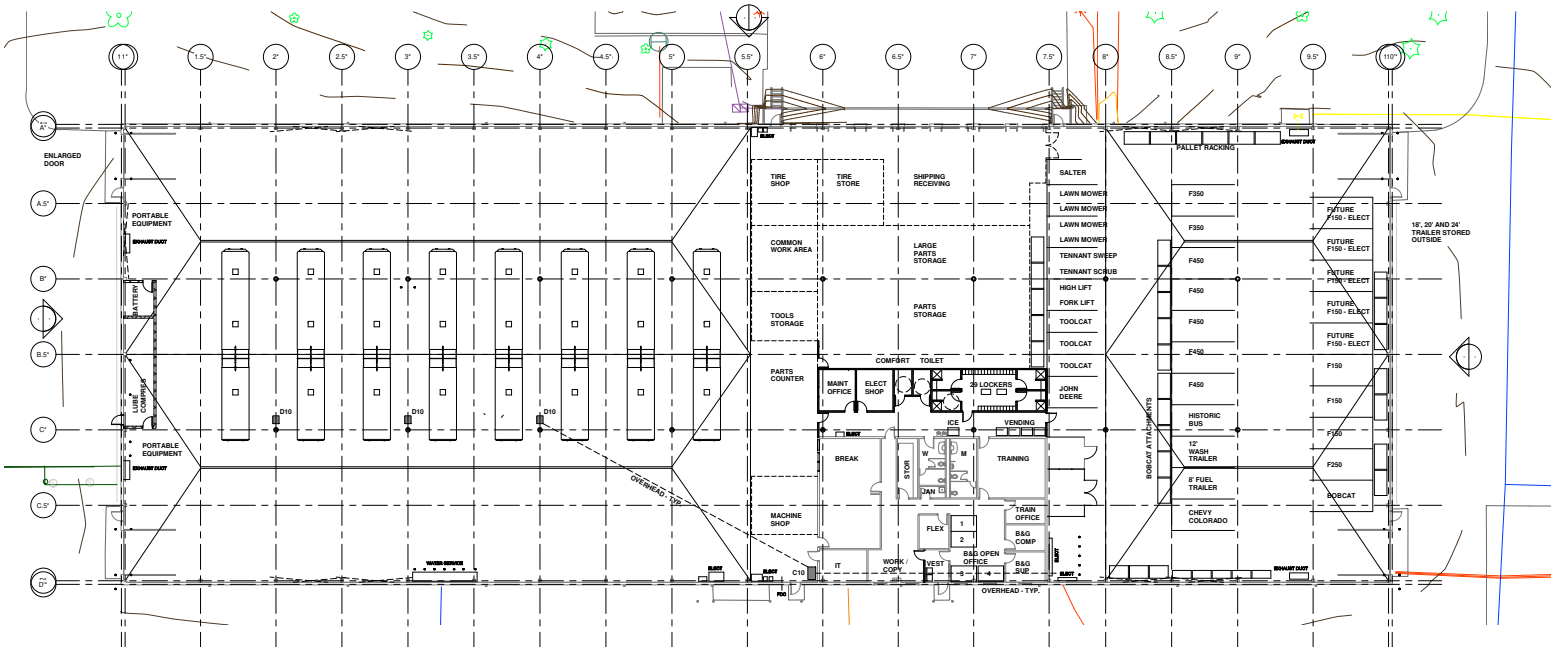


**METRO SATELLITE BUS
FACILITY**

3901 HANSON ROAD
MADISON, WI 53704
CITY OF MADISON
METRO TRANSIT
1245 E WASHINGTON AVE #201
MADISON, WI 53703

PROJECT NUMBER 213419.00

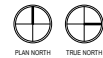
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1 FLOOR PLAN_3829
SCALE: 1/16" = 1'-0"

DRAWN BY	Author
CHECKED BY	Checker

FIRST FLOOR PLAN



SUSTAINABILITY

Sustainable design principles are to be included as part of the design process. Specifically, those principles that emphasize energy efficiency, long-term durability and maintenance, and long-term flexibility and adaptability should be used.

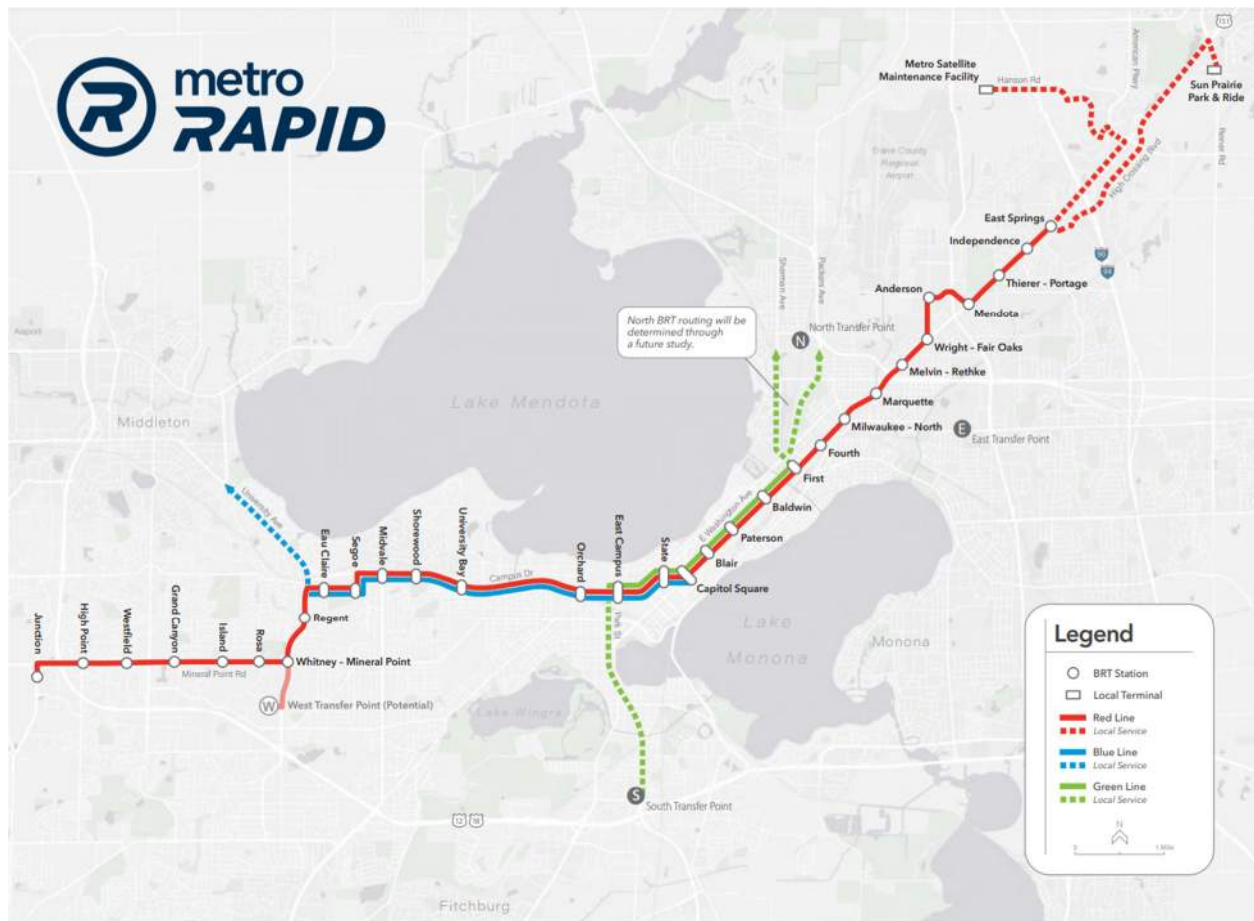
Energy Performance - The intent is to create a high performing, environmentally friendly project that has low operating costs, healthful indoor environments, and low environmental impact. These environmental goals will be integrated into the design strategies for form, function, schedule and budget.

LEED Certification - The project is required to pursue LEED Certification through the US Green Building Council’s (USGBC) Leadership in Energy and Environmental Design (LEED) program. The goal is to provide a LEED NC v4 Silver rating. See the attached LEED checklist that provides a look at the potential credit tally. At this time, the design team feels the LEED Silver Certification is achievable based on the current site, building, and systems planning.

Renewable Energy Systems

The facility will either a) be equipped with on-site renewable energy systems to supply building electric and thermal loads, or b) be equipped with the infrastructure for future on-site renewable energy systems to meet building electric and thermal loads wherever cost effective. On-site renewable energy systems include photovoltaic.

Consider roof mounted photo voltaic array (PV).



The planned east terminal routing will follow East Washington Avenue with a terminal station at East Springs Drive. From this BRT endpoint, local service may be extended via East Towne Blvd, High Crossing Blvd, and US 151 to access destinations beyond East Towne.

MECHANICAL SYSTEMS AND STRATEGIES

The following design describes the systems, components, conditions and methods to meet the goals of the project.

Existing Building Area:	131,817 SF
	125,733 SF Warehouse
	6,084 Office
Existing Eaves Height:	29' Warehouse; 18' Office
Existing Insulation Values:	Tilt-up Concrete Panels R9.6
	Roof R20
	Foundation R10

HVAC SYSTEMSDesign Criteria – 3901 Hanson Rd

Existing HVAC System Description:

- The Warehouse section is heated by eight(8) suspended, gas-fired unit heaters rated at 320 MBH output each at 80% efficiency.
 - Each unit heater is controlled by a local DDC sensor.
 - Unit heaters are vented vertically through the roof.
- The Warehouse section is ventilated by two(2) roof-curb mounted direct-fired makeup air units and ducted to the space.
 - The makeup air units MAU -1&2 are rated at 8,400 & 20,700 CFM each for a total of 29,100 CFM makeup air.
 - Exhaust air is ducted to 18" AFF from two(2) power roof ventilator fans rated at 8,400 CFM and 20,800 CFM(29,200 CFM total).
 - The Warehouse ventilation system is controlled by carbon monoxide sensors(35 PPM) and nitrous dioxide sensors(1 PPM) to automatically activate the Warehouse ventilation system upon detecting CO or NO2 above limits, in addition, to running a minimum of 5 hours/day.
 - A local exhaust fan is provided for table top contaminated work.
 - A small interior office enclosure is provided with a split-system furnace air-cooled condenser unit for heating and cooling.
- The Office section is heated, cooled and ventilated by two(2) roof-curb mounted gas-fired packaged rooftop units.
 - RT-1(2009 Addition): 96 MBH input @ 80% efficiency, 4-ton capacity with economizer.
 - RT-2: 250 MBH input @ 80% efficiency, 12-1/2-ton capacity with economizer.
 - Each RTU is provided with a zone bypass control system: RT-1 2-zones; RT-2 8-zones.
 - Toilet exhaust is provided by individual ceiling mounted exhaust fans.
- The HVAC equipment appear to be original and installed in 2003; 19 years old, except for the 2009 addition equipment. All original HVAC equipment appear to be at the end of their useful life.
- The facility controls have been upgraded to the City Honeywell network with DDC sensors and controls installed on all HVAC equipment in late 2021.

Proposed HVAC System Description:

- The proposed reuse of Bldg 3901 proposes to remodel the existing space into three(3) sections:
 - Bus Storage/Charging Section - 125,700 SF.
 - Bus Washing/Service Section - 34,400 SF.
 - Operations & Support Office Section - 18,300 SF.

- Bus Storage/Charging Section:
 - Add two(2) power roof ventilators on roof curbs for ceiling exhaust(smoke) rated at 23,600 CFM; and add two(2) wall exhaust fans with low returns rated for 23,600 CFM of exhaust air. Total exhaust rate of 94,400(0.75 CFM/SF)
 - Add two(2) new suspended direct-fired make-up air unit to serve the Bus Storage/Charging at 42,500 CFM each or 85,000 CFM total.
 - Add gas-fired radiant overhead heaters to heat Bus Storage/Charging space.
 - Decommission existing MAU, exhaust fans and gas-fired unit heaters.
 - Add new equipment to Honeywell DDC network.
- Bus Washing/Service Section:
 - Add two(2) power roof ventilators on roof curbs for ceiling exhaust(moisture) rated at 13,000 CFM; total exhaust rate of 26,000(0.75 CFM/SF).
 - Add two(2) new suspended direct-fired make-up air unit to serve the Bus Storage/Charging at 42,500 CFM each or 85,000 CFM total.
 - Add gas-fired radiant overhead heaters(corner mtd) to heat Bus Washing/Service space.
 - Add new equipment to Honeywell DDC network.
- Operations & Support Office Section:
 - Provide new floor-mounted VAV air handler unit with VAV terminals and hot water reheat to heat, cool and ventilate the Office section.
 - Provide 30-ton air cooled condenser with digital scroll compressors for variable capacity.
 - Air handling unit will be provided with fresh air intake and exhaust air outlet locations capable of providing 100% economizer with power exhaust fan.
 - Provide gas-fired modular boilers(96%) with hot water pumps to provide hot water reheat coils and perimeter radiation, if required.
 - Provide central inline fan for exhausting toilet rooms, janitor rooms and related.
 - Add new equipment to Honeywell DDC network.
 - Decommission existing rooftop units and exhaust fans.

Design Criteria – 3829 Hanson Rd

Existing HVAC System Description:

- The Warehouse section is heated by nine(9) suspended, gas-fired unit heaters rated at 207.5 MBH output each at 83% efficiency.
 - Each unit heater is controlled by a local DDC sensor.
 - Unit heaters are vented vertically through the roof.
- The Warehouse section is ventilated by an outdoor pad-mounted, direct-fired makeup air unit on the west side of the facility and ducted to the space.
 - The makeup air unit MAU -1 is rated at 38,000 CFM with 3,460 MBH gas input.
 - Exhaust air is ducted to 18" AFF from four(4) wall fans rated at 9000 CFM each(36,000 CFM total).
 - The Warehouse ventilation system is controlled by carbon monoxide sensors(35 PPM) and nitrous dioxide sensors(1 PPM) to automatically activate the Warehouse ventilation system upon detecting CO or NO2 above limits, in addition, to running a minimum of 5 hours/day.
- The Office section is heated, cooled and ventilated by two(2) suspended gas-fired furnaces with fresh air ducting.
 - Furnace F-1: 80 MBH input @ 92% efficiency with split system 3-ton condenser.
 - Furnace F-2: 100 MBH input @ 92% efficiency with split-system 4-ton condenser.
 - Each furnace is provided with a 3-zone bypass control system.
- The Computer Room within the Office section is provided with two(2) ductless fan coils and air-cooled condensers with low-ambient control.

- Three(3) 24 ft diameter HVLS(high velocity low speed) ceiling fans are provided at the Warehouse section for temperature destratification with local speed controls.
- The HVAC equipment appear to be original and installed in 2013; 9 years old. All HVAC equipment appear to be in good working condition.
- The facility controls have been upgraded to the City Honeywell network with DDC sensors and controls installed on all HVAC equipment in late 2021.

Proposed HVAC System Description:

- The proposed reuse of Bldg 3829 proposes to remodel the existing space into three(3) sections:
 - Bus Maintenance Section - 32,500 SF.
 - Administrative Office Section - 10,700 SF.
 - Building and Grounds Maintenance Section - 15,800 SF.
- Bus Maintenance Section:
 - Add VFD's to existing two(2) EF's on south side and balance to provide 16,300 CFM of exhaust air during occupied hours(0.50 CFM/SF - Repair Garage)
 - Add new suspended direct-fired make-up air unit to serve the Bus Maintenance at 15,000 CFM.
 - Add gas-fired radiant overhead heaters to heat Bus Maintenance space.
 - Decommission existing MAU and gas-fired unit heaters.
 - Add new equipment to Honeywell DDC network.
 - Reuse existing HVLS ceiling fan and controls
- Administrative Office Section:
 - Provide new floor-mounted VAV air handler unit with VAV terminals and hot water reheat to heat, cool and ventilate the Office section.
 - Provide 20-ton air cooled condenser with digital scroll compressors for variable capacity.
 - Air handling unit will be provided with fresh air intake and exhaust air outlet locations capable of providing 100% economizer with power exhaust fan.
 - Provide gas-fired modular boilers(96%) with hot water pumps to provide hot water reheat coils and perimeter radiation, if required.
 - Add new equipment to Honeywell DDC network.
 - Decommission existing furnace units and split-system air cooled condensers.
 - Reuse existing cooling units serving the computer room.
 - Decommission existing HVLS ceiling fan and controls for the center section and salvage.
- Building and Grounds Maintenance Section:
 - Add VFD's to existing two(2) EF's on north side and balance to provide 8,000 CFM of exhaust air during occupied hours(0.50 CFM/SF - Repair Garage)
 - Add new suspended direct-fired make-up air unit to serve the Bldg &Grnds Maintenance at 7,200 CFM.
 - Add gas-fired radiant overhead heaters to heat Bldg &Grnds Maintenance space.
 - Decommission existing gas-fired unit heaters.
 - Add new equipment to Honeywell DDC network.
 - Reuse existing HVLS ceiling fan and controls

ELECTRICAL SYSTEMSDesign Criteria for 3901 Hanson Rd

Existing Electrical System Description:

- The facility is serviced by a underground 2500-amp, 3-phase 277/480 volt electrical service to an exterior termination cabinet and interior main switchboard distribution panel.
- The main switchboard is provided with a 2500 main breaker, CT cabinet with remote meter and distribution section. The distribution section is provided with the follow breakers:

○		Panel LP-5	250/3		
○	Panel L3	100/3		Panel LP4	200/3
○	Panel LP3	200/3		Panel LP1	200/3
○	Panel L2100/3			Panel LP	200/3
○		XFMR	400/3		
○		MCC	800/3(no longer used)		
○	Panel LP5	200/3		Panel L1100/3	
○		MCP 8	250/3(no longer used)		
○		MCP 3	150/3(no longer used)		
- The electrical distribution is provided with a 300 KVA transformer at the to service to reduce voltage to 120/208 and service MPD-PP 120/208 volt main distribution panel. The distribution section is provided with the follow breakers

○	Panel PP1	200/3		Panel PP3	200/3
○	Panel PP5	200/3		Panel PP4	200/3
○	Panel PPF	125/3		Panel PP2	200/3
- The 480 volt and 208 volt distribution panels are clustered around three(3) locations in the warehouse section.
- Lighting in the warehouse section is provided with high-bay fluorescent fixtures(4 lamp) at 277 volt. Lighting appears inadequate.
- Emergency egress lighting is provided by a few battery pack lights mounted on the columns and at the exist lights with exterior remote heads feed from the exit lights. Emergency egress lighting appears inadequate through out the facility.
- Lighting in the office section is provided by fluorescent troffers with battery pack egress lights and exit lights.
- Exterior lighting is provided at egress doors and along the perimeter exterior of the building with HID wall packs.
- Parking lot lighting is provided by HID pole-mounted fixtures.
- Receptacles are provided at alternated columns and exit doors. Exterior receptacles are provided at the exterior at random locations.
- Fire alarm system provided to monitor fire protection and partial smoke detection.
- The electrical service and distribution are in fair condition and the size should meet future needs. The lighting and lighting controls need to be updated to LED with controls meeting IECC requirements. Exterior parking lights and building lights should be updated with LED lighting and new controls.

Proposed Electrical System Description:

- The proposed reuse of Bldg 3901 proposes to remodel the existing space into three(3) sections:
 - Bus Storage/Charging Section - 125,700 SF.
 - Bus Washing/Service Section - 34,400 SF.
 - Operations & Support Office Section - 18,300 SF.

- Bus Storage/Charging Section:
 - New high bay LED lighting with high-low occupancy dimming and shut-off controls.
 - Provide new receptacles and motor connections for new equipment.
 - Reuse existing distribution panels to service this area.
 - Provide central inverter for emergency egress lighting.

- Bus Washing/Service Section:
 - New high bay LED lighting for vapor tight wet locations with high-low occupancy dimming and shut-off controls.
 - Provide new receptacles and motor connections for washing and service equipment.
 - Provide new high and low voltage panelboards to service this area.
 - Provide central inverter for emergency egress lighting.

- Operations & Support Office Section
 - Provide new LED troffer lighting with dimming and occupancy controls.
 - Provide new receptacles office section.
 - Provide new motor connections for new HVAC equipment.
 - Provide new high and low voltage panelboards to service this area.
 - Provide central inverter for emergency egress lighting.

- Exterior:
 - Provide new exterior LED building-mounted lighting and parking pole lights with high-low occupancy dimming and photocell/time clock control from a programmable lighting control panel.
 - Consider permanent on-site gas-fired generator for critical loads or operations.

- Fire Alarm System:
 - Upgrade fire alarm system to meet NFPA 72 requirements for annunciation and add heat and smoke detectors at areas requiring supervision.

Design Criteria – 3829 Hanson Rd

Existing Electrical System Description:

- The facility is serviced by a underground 1600-amp, 3-phase 277/480 volt electrical service to switchboard distribution panel.

- The switchboard is provided with a 1600 main breaker, CT cabinet with remote meter and distribution section. The distribution section is provided with the follow breakers:

○ Panel SLP	100/3	XFMR	90/3
○ Panel PP3	150/3	Panel PP-2	150/3
○ Panel PP1	200/3	MCP-1	100/3(no longer used)

- A manual transfer switch is located outside for portable generator connection and is cabled to the main switchboard buss bars on the opposite side without disconnect.

- The electrical distribution is provided with transformers at three(3) locations to reduce voltage to 120/208 and provide 120/208 volt distribution panels:

○ SWBD	75 KVA	Panel LP-1(2 sections)
○ PP-2(west)	45 KVA	Panel LP-2
○ PP-3(east)	45 KVA	Panel LP-3

- Lighting in the warehouse section is provided with high-bay fluorescent fixtures(6 lamp) at 277 volt.
- Emergency egress lighting is provided by battery pack lights mounted on the columns and at the exist lights with exterior remote heads feed from the exit lights.
- Lighting in the office section is provided by fluorescent troffers with battery pack egress lights and exit lights.
- Exterior lighting is provided at egress doors and along the east exterior with HID wall packs.
- Parking lot lighting is provided by HID pole-mounted fixtures.
- Receptacles are provided at alternated columns and exit doors. Exterior receptacles are provided along the north exterior for block heaters.
- Fire alarm system provided to monitor fire protection and partial smoke detection.
- The electrical service and distribution are in good condition and should meet future needs. The lighting and lighting controls need to be updated to LED with controls meeting IECC requirements. Exterior parking lights and building lights should be updated with LED lighting and new controls.

Proposed Electrical System Description:

- The proposed reuse of Bldg 3829 proposes to remodel the existing space into three(3) sections:
 - Bus Maintenance Section - 32,500 SF.
 - Administrative Office Section - 10,700 SF.
 - Building and Grounds Maintenance Section - 15,800 SF.
- Bus Maintenance Section:
 - New high bay LED lighting with high-low occupancy dimming and shut-off controls.
 - Provide new receptacles and motor connections for bus repair and maintenance equipment.
 - Reuse Panels PP-3 and LP-3 to service this area.
 - Provide central inverter for emergency egress lighting.
- Administrative Office Section:
 - Provide new LED troffer lighting with dimming and occupancy controls.
 - Provide new receptacles office section.
 - Provide new motor connections for new HVAC equipment.
 - Reuse Panels PP-1 and LP-1 to service this area.
 - Provide new sub-panel from LP-1 to office area, if necessary
 - Provide central inverter for emergency egress lighting.
- Building and Grounds Maintenance Section:
 - New high bay LED lighting with high-low occupancy dimming and shut-off controls.
 - Provide new receptacles and motor connections for building and grounds repair and maintenance equipment.
 - Relocate and reuse Panels PP-2 and LP-2 to service this area.
 - Provide central inverter for emergency egress lighting.
- Exterior:
 - Provide new exterior LED building-mounted lighting and parking pole lights with high-low occupancy dimming and photocell/time clock control from a programmable lighting control panel.
 - Consider permanent on site gas-fired generator for critical loads or operations.

- Fire Alarm System:
 - Upgrade fire alarm system to meet NFPA 72 requirements for annunciation and add heat and smoke detectors at areas requiring supervision.

PLUMBING SYSTEMS

Governing Codes and Standards

Wisconsin Dept. of Safety and Professional Services Chapters 381, 382 and 384

City of Madison Wisconsin – Recommendations and Guidelines

Latest Addition of IBC

Sanitary Drain, Waste and Vent

A new sanitary drain waste and vent system will be provided for all new plumbing fixtures, floor drains, indirect waste receptors and equipment that require drainage. Plumbing fixtures and devices will be drained by gravity through conventional drain, waste and vent stacks to the municipal sewer via the existing below floor sanitary drainage piping system.

The above ground and below ground sanitary waste and vent piping will be type PVC-DWV Schedule 40 with solvent welded joints. Unless located in plenum ceiling area then the material shall meet the requirements of ASTM E-84/UL723 for flame spread of <25 and smoke development of <50.

In area where the waste discharge going into the sanitary piping is anticipated to be above 140 degree F. The waste piping shall be CPVC or cast iron.

Plumbing Fixtures

Plumbing fixtures will be commercial quality, match program requirements and comply with City of Madison guidelines. Sample fixtures requirements include: Toilets with 1.28 gpf manual flushometer valves; Urinals wall hung with .125 gpf hard wired electronic flush valves and public lavatories integral with counter top or wall hung with slow closing metered faucet with .5 gpm flow. General stainless-steel drop-in sink lay-in with manual faucets with 1.5 gpm flow. Exterior freeze proof wall hydrants with backflow preventer outlets. Electric water coolers to be high/low ADA accessible with bottle fillers.

Unique Design Criteria – 3829 Hanson Rd

The existing interior plumbing systems, sanitary waste and vent, and domestic water piping, water heaters within the building will be removed/revised as required to accommodate the new system layouts.

The existing 8” combined domestic water and fire protection service system may or may not be relocated to accommodate the new layout and overhead doors.

The existing underground building sanitary system will remain and be used for the existing trench drains and new/existing to remain plumbing fixtures. The underfloor water systems will be abandoned in place to minimize the removal of concrete floors. The abandon water systems will be removed in areas where it interferes with the new underfloor drainage systems.

The plumbing fixtures will be removed and replaced as required with new to accommodate the new room layouts. The existing trench drains and exterior oil interceptor and the related piping will remain .

New sanitary waste and vent, water and compressed air piping will be provided throughout the building to accommodate the new layout. Along with a new water meter, water heater, water softener system and compressed air pump system.

Domestic Water System

Potable water will be supplied from the municipal water system by means of the existing relocate combined domestic/fire protection water service. Domestic hot and cold-water piping will be provided to all existing and new plumbing fixtures and other devices and equipment that require a water supply. Water hammer arresters will be provided at all solenoid valves and at other potential sources of water hammer.

Domestic hot water will be softened, it will be generated by a single gas fired water heater. Hot water will be stored and distributed at nominal 125 deg. F, with no master thermostatic mixing valve. Hot water will be recirculated to ensure near instant hot water delivery.

Simplex water softener system will be installed to only be used for hot water system.

Non-potable water systems will provide where needed via a reduce pressure backflow preventer.

The water piping system will be Type L copper tube with wrought copper fittings and soldered joints for piping larger than 2" Solder will be lead-free, 95-5 type solder. PEXa crosslinked polyethylene with cold expansion fittings for piping 2" and less. Piping located in plenum ceiling areas shall have material that meets the requirements of ASTM E-84/UL723 for flame spread of <25 and smoke development of <50.

All water piping systems will be insulated

Isolation valves will be provided at all riser's connections, branch piping connections to fixture groups and connections to equipment.

Materials

All piping material will adhere to City of Madison guidelines.

Plumbing equipment to include:

Single gas fired water heater

Simplex water softeners to condition the cold water to the hot water system

Compressed air system

Chassis wash system

Plumbing fixtures to be ADA compliant.

Compressed air system

Compressed air system, install with Type L hard copper pipe with soldered joints or black steel, schedule 40, type F pipe.

Chassis Wash System

Chassis wash system will be specified as equipment and provided and installed by contractor.

Unique Design Criteria – 3901 Hanson Rd

The existing interior plumbing systems, sanitary waste and vent, and domestic water piping, water heaters within the building will be removed/revised as required to accommodate the new system layouts.

The existing 6" combined domestic water and fire protection service system to remain as is.

The existing storm drainage system to remain as is.

The existing underground building sanitary system will remain and be used for the existing trench drains and new/existing to remain plumbing fixtures. The underfloor water systems will be abandoned in place to minimize the removal of concrete floors. The abandon water systems will be removed in areas where it interferes with the new underfloor drainage systems.

The plumbing fixtures will be removed and replaced as required with new to accommodate the new room layouts.

The existing trench drains and garage catch basins and the related piping will remain. New trench drains will be added on the north side of the building. The new trench drains will discharge into the existing garage catch basins that serve the existing trench drain on the south side of the building.

New sanitary waste and vent, and water piping will be provided throughout the building to accommodate the new layout.

Storm and Clearwater Waste

A new storm drainage system will be provided to convey rainwater from the roof of the building additions through new roof drains to the site storm sewers. The roof will be drained by gravity through storm building drains to the site or municipal sewer. Overflow roof drainage will be accomplished through roof overflow drains and be discharged to grade.

Large volume clearwater waste from air handling units will be conveyed by gravity through a separate drain and vent piping system and will connect to the building storm drain system.

The above ground and below ground storm and clearwater waste and vent piping will be type PVC-DWV Schedule 40 with solvent welded joints. Unless located in plenum ceiling area then the material shall meet the requirements of ASTM E-84/UL723 for flame spread of <25 and smoke development of <50. Roof drain bodies and above ground horizontal storm and clearwater waste piping will be insulated.

Domestic Water System

Potable water will be supplied from the municipal water system by means of the existing combined domestic/fire protection water service. Domestic hot and cold-water piping will be provided to all existing and new plumbing fixtures and other devices and equipment that require a water supply. Water hammer arresters will be provided at all solenoid valves and at other potential sources of water hammer.

Domestic hot water will be provide to the new fixtures from the existing water heating system. Hot water will be stored and distributed at nominal 125 deg. F, with no master thermostatic mixing valve. Hot water will be recirculated to ensure near instant hot water delivery.

Non-potable water systems will provide where needed via a reduce pressure backflow preventer.

The water piping system will be Type L copper tube with wrought copper fittings and soldered joints for piping larger than 2" Solder will be lead-free, 95-5 type solder. PEXa crosslinked polyethylene with cold expansion fittings for piping 2" and less. Piping located in plenum ceiling areas shall have material that meets the requirements of ASTM E-84/UL723 for flame spread of <25 and smoke development of <50. All water piping systems will be insulated

Isolation valves will be provided at all riser's connections, branch piping connections to fixture groups and connections to equipment.

Materials

All piping material will adhere to City of Madison guidelines.
Plumbing fixtures to be ADA compliant.

Bus Wash System

Bus wash system will be specified as equipment and provided and installed by contractor.