

Exhibit 1

Charging Equipment Technical Specifications

1. SCOPE OF WORK

The City of Madison/Metro Transit is issuing this RFP for battery electric bus (BEB) charging equipment procurement. The City of Madison/Metro Transit requests that Proposers present installation-ready solutions to support electric bus charging in accordance with the City of Madison/Metro Transit requirements described herein.

The Proposer shall be responsible for work associated with sourcing, installation, and commissioning of depot and on-route charging systems.

The Proposer shall provide installation specifications needed for the general contractor to coordinate all civil and electrical work outside of this scope within 90 days after Contract Execution. This includes electrical requirements for switchgear, conduit to the switchgear, conduit to the overhead chargers, and any concrete ground work or civil engineering designs to support the on-route charger installation.

This RFP includes the installation and supply of conduit and cabling between the 10 depot chargers and the switchgear at Hanson road, cabling from the depot chargers to the dispensers, pantograph support arm for the overhead chargers, and cabling (but not conduit) from the switchgears to the chargers and pantograph for the overhead chargers. Details and locations are to be determined during the design process.

The Proposer shall not be responsible for any major civil or construction work, which shall be the responsibility of the General Contractor to be selected by the City of Madison/Metro Transit. The Proposer shall coordinate with the General Contractor to ensure that all major civil or construction work is made ready such that the Proposer can supply, install, and commission depot and on-route charging systems in a turn-key manner.

The Proposer shall be responsible for any necessary permitting, approvals, and coordination with project partners and stakeholders, including the City of Madison/Metro Transit's three separate electrical utilities, Madison Gas and Electric, Sun Prairie Gas and Electric, and Alliant Energy, that are directly associated with the installation and commissioning of the charging systems. This requirement includes ensuring that all parties on the Proposer's team are properly qualified and licensed in the necessary professions and jurisdictions.

The Proposer shall provide all material and equipment, supplies, labor, expertise, services, supervision, tools, plant, apparatus, conveyances, safety equipment, transportation, and incidental expenses for accomplishing the Work covered by this solicitation, except the materials and services specifically named elsewhere to be provided by the City of Madison/Metro Transit or the General Contractor.

The Proposer shall participate in on-site meetings with the City of Madison/Metro Transit to review site conditions, access requirements, construction progress, and confirmed or potential utility conflicts.

The Proposer will provide a written Commissioning Plan to the City according to the agreed schedule detailing the reports produced, tests planned, expected timeline, and staff and equipment requirements, both from the City of Madison, and the Proposer.

The Proposer shall develop and submit concept plans and charging system placement layouts for the City of Madison/Metro Transit's consideration and approval. Once conceptual plans are approved, the Proposer shall proceed with a detailed analysis and design. Designs must conform to all applicable standards.

The on-route charging electrical enclosure plans are shown in **Exhibit 2**, and the enclosure specifications are shown in **Exhibit 3**. The planned locations of the depot and on-route charging systems are shown in **Exhibit 4**. Hanson Rd Plans are shown in **Exhibit 5**. During the preliminary design phase, the Proposer shall coordinate with the City of Madison/Metro Transit for approval of the final location of the charging equipment.

The City of Madison/Metro Transit strongly encourages the Proposer to be familiar with all site conditions relevant to this project, preferably through participation in the site visit as a part of the pre-proposal conference. The Proposer will get the opportunity to walk each installation site and review requirements for pedestrian and vehicle access throughout the project. Drawings that indicate areas that must remain unimpeded throughout the project will be provided at the site visit and pre-proposal conference.

Proposer shall coordinate installation work with the City of Madison/Metro Transit to obtain access to site during construction.

All equipment of the charging system shall be protected against impact from vehicle and forklift traffic typical to the location of installation.

The City of Madison/Metro Transit Project Manager will perform continuous and ongoing reviews of the project status and progress. The Proposer shall assume that weekly progress review meetings will be conducted throughout the project with the Project Manager, where the Proposer shall provide updates on the project timeline (as a 3-week "Look Ahead" schedule), budget, completion of scope, and project risks. As mutually agreed, meetings can be held at a reduced frequency during periods of low activity. The Proposer shall provide web conferencing services for each meeting, and submit minutes to the Project Manager within one week of each meeting.

The Proposer shall make all necessary telecommunication connections for modem and Internet access necessary for the City of Madison/Metro Transit to remotely monitor and control operation of the charging systems. Owner-provided wired or wireless network access may be available, depending on Proposer's requirements.

The Proposer shall ensure that proper interoperability exists between the City of Madison/Metro Transit's IT systems and charger monitoring and control capabilities.

Following startup and authorization/initialization by the City of Madison/Metro Transit's IT system, operation of the charging systems shall be fully automatic with the exception of the bus connection.

The City of Madison/Metro Transit requires that cost and lead times for delivery of proposed solutions be included in the response and that costs be broken down by component (charger and electronic components, pantograph, structural assembly, software, warranty, etc.) where such components can be supplied separately. The City of Madison/Metro Transit requests that Proposers include certifications and specifications applicable to the products offered as solutions with their responses, including but not limited to Buy America compliance, UL listing status and/or NRTL certification.

1.1 Definitions and abbreviations

Agency: The Agency itself or a third-party representative or consultant that is authorized to operate on behalf of the Agency.

ASCE: American Society of Civil Engineers.

BEB: battery electric bus.

electric vehicle supply equipment (EVSE): Defined as “the conductors, including the ungrounded, grounded and equipment-grounding conductors; the electric vehicle connectors; the attachment plugs and all other fittings, devices, power outlets or apparatuses installed specifically for the purpose of delivering energy from the premises’ wiring to the electric vehicle” by NEC Article 625. For the purposes of this document, the chargers defined below are considered a subset of EVSE.

plug-in charger: An SAE J1772 CCS Type 1 (DC connection) or SAE J3068 (AC connection) plug-in charger, capable of delivering power to the bus up to 150 kW or higher, to support overnight charging, generally at a parking stall.

overhead conductive charger: An overhead pantograph charger conforming to the SAE J3105-1 standard capable of delivering up to 450 kW or higher to the bus to support automated, on-demand, conductive charging. Can be used for depot or on-route charging operations.

SAE: Society of Automotive Engineers.

vehicle to grid (V2G): The ability to provide power from a plug-in electric vehicle back to the electrical grid in addition to managing its power load when charging from the grid.

wireless inductive charger: A wireless charger with a demonstrated capability of delivering power from 25 kW to hundreds of kilowatts to the bus with a corresponding wireless receiver to support automated, on-demand, inductive charging. Can be used for depot or on-route charging operations. Standards for heavy-duty vehicles currently under development.

1.2 Agency operating conditions

1.2.1 Planned site description

The City of Madison/Metro Transit, in support of its battery electric bus deployment, is soliciting plug-in and overhead conductive charging equipment and the installation, testing, and commissioning of such equipment, to be located at three different locations:

- Metro’s Operations Facility at 3901 Hanson Rd, Madison WI 53704, herein referred to as “Hanson Rd Facility”. This facility is served by Madison Gas and Electric.
- Sun Prairie Park and Ride Facility at 2751 O’Keeffe Ave, Sun Prairie, WI 53590, herein referred to as “Sun Prairie PNR”. This facility is served by Sun Prairie Gas and Electric.
- A new Park and Ride Facility at 432 S Junction Rd, Madison WI 53593, herein referred to as “Junction Rd PNR”. This facility is served by Alliant Energy.

The exact location(s) for each charger will be determined during design in cooperation with the City of Madison/Metro Transit.

Proposers shall provide installation instructions including footprint drawings for proposed equipment. If possible, Proposers should provide recommended “best-fit configuration” for universal installation of chargers.

1.2.2 Electric bus operation strategy

Below is an overview of the City of Madison/Metro Transit's planned operating strategy for the battery electric buses and chargers:

- a. The Agency is seeking charging equipment capable of charging 46 New Flyer XE60 battery electric buses with 410 kWh XALT Energy, High Power, Gen 2 batteries.
- b. The Agency is seeking depot plug-in charging at the Hanson Rd Facility, with nine (10) charger units capable of approximately 150 kW charging rate each and 3 dispensers each, for a total of twenty-seven (30) dispensers.
- c. The Agency is seeking four (4) separate installations of overhead pantograph on-route opportunity charging units capable of approximately 450kW charging rate each, one each at the Hanson Rd Facility and the Sun Prairie PNR, and two units at the Junction Rd PNR.
- d. The agency is seeking two (2) plug-in mobile charging units capable of charging from a 480V 3-phase standard outlet.
- e. Buses will have two charge ports and receptacles to allow for the use of plug-in charging per SAE J1772 CCS 1 and/or SAE J3068. Charge receptacles are located on both sides of propulsion compartment.
- f. Buses will have dwell times available for on-route opportunity charging from 7 to 15 minutes.
- g. Buses will have charge bars installed to allow for the use of overhead infrastructure mounted pantograph charging per SAE J3105-1.
- h. In addition to the supplied systems, buses and charge stations are expected to integrate with third-party hardware and software systems for charge management and operational data collection and reporting if desired in the future.

1.2.3 Site operating conditions

The depot charger cabinets and dispensers and the on-route charger cabinets are planned to be kept within indoor enclosures constructed by the General Contractor. However, the City of Madison/Metro Transit expects Proposers to design charging solutions that will be able to operate in any reasonably anticipated weather conditions of the Madison, WI Metropolitan area, including below-freezing temperatures and blizzard conditions. Proposer will collaborate with the overall facility design contractor to adjust electrical rooms thermal load if needed.

2. STANDARDS AND REGULATIONS

Design Requirements:

- a. Charging equipment must comply with all applicable federal, state and local legislation, regulations, codes, standards, permits, approvals, authorizations and other requirements (collectively, "regulations") in effect at the date of acceptance.
- b. The charging equipment shall be UL classified or field certified for the intended purpose prior to acceptance.
- c. Communication shall be OCPP 1.6-J (or newer) compliant and can also be locally programmed.

The following specific standards and regulations shall apply to the charging equipment (latest version at time of acceptance):

STANDARDS FOR EV CHARGING EQUIPMENT SAFETY: Applicable to All		
Reference	Name	Notes
OSHA	Occupational Safety and Health Administration	All work must be accomplished compliant with OSHA regulations, as expressed in 29CFR1910 and 29CFR1926. Further, all contractors must identify their Designated Competent Person to the CAR.
NFPA	National Fire Protection Association	NFPA 70, Article 625 is relevant for EVSE and covered under UL 2202 and 2231-1 and -2. NFPA 70E is relevant for safe work practices to protect personnel exposure to major electrical hazards including arc flash.
NEC	National Electrical Code	NEC Article 625 is relevant for EVSE and covered under UL 2202 and 2231-1 and -2. There will be additional NEC requirements that will impact site design, cable sizes, etc.
EMC compliance	FCC Part 15 Class A	For plug-in applications FCC Part 15 Class A handles EMC. It may be worthwhile, for large projects, to coordinate a project specific EMC study.
IEEE/ANSI C95.1	Standard for Safety Levels with Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz	
STANDARDS FOR COMPLIANCE WITH BUILDING CODES: Applicable to All		
ASCE 7	Associated Criteria for Buildings and Other Structures	
COMMUNICATIONS STANDARDS: Applicable to All		
OCPP 1.6-J (or newer)	Open Charge Point Protocol 1.6-J	
OpenADR 2.0 (optional)	Open Automated Demand Response	Recommended for agencies interested in energy management and capable, or potentially capable, of automated demand response functionality.
ISO 15118 (optional)	Road vehicles: Vehicle-to-Grid Communication Interface	Applicable only for agencies requesting or requiring vehicle-to-grid capability for bidirectional charging. Not applicable for unidirectional charging only.
STANDARDS FOR DC PLUG-IN CHARGING		
SAE J1772	Electric Vehicle and Plug in Hybrid Electric Vehicle Conductive Charge Coupler	
UL 62	Flexible Cords and Cables	Applicable to the electric vehicle charging cable and not the charging system as a whole.
UL 1741SA or UL 9741 (optional)	Bidirectional EV Charging System Equipment	Applicable only for agencies requesting or requiring vehicle-to-grid capability for bidirectional charging. Not applicable for unidirectional charging only.
UL 2202	Electric Vehicle Charging System Equipment	

UL 2231	Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits	
UL 2251	Plugs, Receptacles and Couplers for Electric Vehicles	UL 2251 applies to charging up to 600V AC or DC. Some bus charging regularly exceeds 600V DC and therefore may not be applicable.
STANDARDS FOR AC PLUG-IN CHARGING		
SAE J3068	Electric Vehicle Power Transfer System Using a Three-Phase Capable Coupler (for AC charging)	CCS 2 generally not applicable for plug-in DC charging equipment.
UL 62	Flexible Cords and Cables	Applies to the electric vehicle charging cable and not the charging system as a whole.
UL 1741SA or UL 9741 (optional)	Bidirectional EV Charging System Equipment	Applicable only to agencies requesting or requiring vehicle-to-grid capability for bidirectional charging. Not applicable for unidirectional charging only.
UL 2202	Electric Vehicle Charging System Equipment	
UL 2231	Standard for Personnel Protection Systems for Electric Vehicle (EV) Supply Circuits	
UL 2251	Plugs, Receptacles and Couplers for Electric Vehicles	UL 2251 applies to charging up to 600V AC or DC. Some bus charging regularly exceeds 600V DC and therefore may not be applicable.
UL 2594	Electric Vehicle Supply Equipment	
STANDARDS FOR OVERHEAD CHARGING		
SAE J3105-1	Electric Vehicle Power Transfer System Using Conductive Automated Connection Devices	
UL 2202	Electric Vehicle Charging System Equipment	

Supporting Materials:

Proposer shall provide a detailed description of the charging infrastructure required to charge the bus and specify its compliance with SAE J1772 DC (for DC plug-in charging), SAE J3068 (for AC plug-in charging), SAE J3105-1 (for overhead charging), and any other standards that may be applicable.

Proposer shall provide a list of standards and regulations that the proposed equipment meets, including but not limited to those listed in the table above.

3. PLUG-IN CHARGER TECHNICAL SPECIFICATIONS

Design Requirements:

- a. The chargers shall be capable of connecting to single-phase, 60 Hz electrical supply at 480 VAC, or approved alternative.
- b. Charging system must be able to dispense a rated continuous output of at least 150kW for the depot chargers and 25 kW for the mobile chargers.
- c. While charging, power factor shall exceed 95% (or 0.95).
- d. Standby power consumption must be minimized.

- e. The charging equipment shall be capable of operating continuously in the manufacturer's designed operating profile without performance or safety degradations in the conditions defined in "Agency Operating Conditions," Section 1.2 of this appendix.
- f. The connectors shall not be energized except when mated with the bus mounted receptacle.
- g. Access doors shall be lockable (cabinets keyed the same) and use secure latching.
- h. Chargers shall be equipped with robust cable management hardware sufficient to safely and effectively store charging cables, for approximately 10-foot cable length, while providing operators ease of connection to the bus.
- i. Chargers shall be equipped with a pedestal-mounted cable management system capable of keeping the charger plugs out of the bus driving lane.
- j. Chargers shall allow the Agency to set operational power limits.
- k. New charging sessions shall be automatically restarted after power outage and restoration, to the extent safe and in accordance with applicable standards.
- l. Controls shall include features to prevent progressive charging system damage resulting from any one or more operating issues, or out-of-limit operating conditions.
- m. If electronics enclosures are located outdoors, they must be rated at NEMA 3R or above.
- n. Each charger shall be capable of communication to an external network (cellular, Ethernet, fiber, Wi-Fi, etc.) for purposes of charge management and control.
- o. The chargers shall be compatible with the City of Madison/Metro Transit's three (3) existing Proterra E2 Battery-Electric Buses.
- p. External emergency shutdown system shall be provided and meet electrical codes, standards and requirements.

Supporting Materials:

- a. Proposer shall provide complete charging equipment specifications for the equipment being proposed.
- b. Proposer shall provide information and options for power supply requirements for individual chargers.
- c. Proposer shall provide mounting and installation manuals and site design guides for all necessary components, including civil, electrical, mechanical and communications infrastructure requirements.
- d. Proposer shall provide a complete description of the vendor qualifications that may be required to perform work related to installation or maintenance of Proposer's equipment.
- e. The bid package shall contain a complete description of the charging equipment, including:
 - compliance with charge standards, electrical safety standards and UL classification;
 - charger efficiency;
 - charger dimensions;
 - connector type;
 - number of connectors;
 - connector cable length(s) offered;
 - electrical disconnect switch for each charger;
 - charge method (AC or DC);
 - rated power output;
 - standby power consumption;
 - enclosure IP and/or NEMA ratings;
 - country of origin;
 - Buy America compliance
 - ambient operating temperature ratings;
 - equipment thermal management;
 - a graph showing continuous current output versus voltage throughout the operating range; and

- details on:
 - charging instructions;
 - automatic and manual control capabilities;
 - dispenser control panel display features and operator functions, if equipped;
 - communication management options (cellular, Ethernet, fiber, Wi-Fi);
 - operations and maintenance manuals;
 - options for preventive maintenance (contract with OEM terms/cost, training to perform with own forces/contracted third party); and
 - maintenance requirements.
- f. Charger manufacturer shall describe all transit bus models that charger has been validated for if that validation included direct participation by the transit bus manufacturer and note any exceptions.
- g. Charger manufacturer shall provide list of all locations and contact information for installations of the proposed charger.
- h. If the chargers are capable of supporting multiple dispenser outputs, Proposer must clearly describe the total number of potential dispenser outputs, the power level for each dispenser, charge sequencing logic for multiple buses connected to the same charger, and any additional charging hardware cost for each dispenser. If separated charging stanchions or overhead reels are available or provided, Proposer shall describe their layout, installation and operation requirements.
- i. The Proposer shall propose a method for control of the charging cycle to manage the use of power from the utility grid for reduction of peak demand charges and general fleet charging management. If a charge management software solution is proposed, charging shall be able to be controlled by an Open Charge Point Protocol (OCPP)–compliant system. The charging management system must include a minimum of 5 years of service, and be compatible with a future OCPP vendor should the City select a new vendor after the 5 year term has completed.
- j. Proposer shall describe any automatic or “smart” charging features including programmable charging capability, networking multiple chargers, charge monitoring, remote charge management, vehicle-to-grid capability, and charge data collection and reporting. Describe whether these features are provided as a standard offering or as an option to the proposal submission. If certain features are provided as an option, clearly describe costs. Describe both up-front costs and any necessary subscription service costs.
- k. Proposer shall describe the cable management hardware being offered including functionality, specifications, dimensions, drawings, installation requirements and component replacement costs. If optional cable management systems are available, provide additional details on costs for those systems.

4. OVERHEAD CONDUCTIVE CHARGERS – TECHNICAL SPECIFICATIONS

Design Requirements:

- a. The overhead conductive charging stations must comply with all applicable local, state and federal codes.
- b. The chargers shall be capable of connection to 480 Volt three-phase, 60 Hz electrical supply.
- c. The overhead pantograph support structural element shall be included, and designed so it can attach to horizontal ground as a freestanding structural element. Each charging system must be able to dispense a rated continuous output of 450 kW or higher. Approximate locations are detailed on current planned drawings.
- d. The charging equipment shall be capable of operating continuously without performance or safety degradations in the conditions outlined in Section 1.2 of this appendix.
- e. The charging equipment shall be capable of safely and effectively making connection and operating in the Agency operating conditions defined above and up to 12 inches of snow or 1 inches of ice, without manual intervention.

- f. To ensure proper bus alignment, charger shall utilize communication links in accordance with SAE J3105 standards to determine bus identity and when bus is properly aligned for extension of pantograph. Charger must be able to safely and effectively operate in a multi-lane environment with other pantographs mounted 12 feet away and simultaneous approaching buses.
- g. Charging equipment shall be rated for wind and seismic loadings as determined by ASCE 7, with an importance factor of 1.0, while supporting a retracted or operationally extended pantograph.
- h. While charging, power factor shall exceed 95% (or 0.95).
- i. Standby power consumption must be minimized.
- j. The connectors shall not be energized except when mated with the bus charge rails.
- k. Access doors shall be lockable (cabinets keyed the same) and use secure latching.
- l. Chargers shall be capable of setting operational limitations on charging.
- m. New charging sessions shall be automatically restarted after power outage and restoration, to the extent safe and in accordance with applicable standards.
- n. Controls shall include features to prevent progressive charging system damage resulting from any one or more operating issues or out-of-limit operating conditions.
- o. If electronics enclosures are located outdoors, they must be rated at NEMA 3R or above.
- p. Each charger shall be capable of communication to an external network (cellular, Ethernet, fiber, Wi-Fi, etc.) for purposes of charge management and control.
- q. The overhead pantograph shall be capable of manually disconnecting and retracting the charging interface in the event of a system or power failure.
- r. All manual operations for the chargers must include detailed, explicit instructions for ensuring that power is removed and the system is safe prior to any work on the system.
- s. The charging system must be equipped with cloud-based system for manual operation, retrieving diagnostic codes, and resetting charging sessions for the set of chargers being offered.
- t. External emergency shutdown system shall be provided and meet electrical codes, standards and requirements

Supporting Materials:

- a. the City of Madison/Metro Transit requests Proposer to describe their proposals with sufficient detail for the City of Madison/Metro Transit to assess the structural adequacy of the overhead support structure solution by providing either structural substantiation or by providing sufficient detail for the City of Madison/Metro Transit to substantiate the structure to meet local codes and requirements.
- b. Proposer shall provide complete charging equipment specifications for the equipment being proposed.
- c. Proposer shall provide information and options for power supply requirements for individual chargers.
- d. Proposer shall provide mounting and installation manuals for all necessary components, including civil, electrical and mechanical infrastructure requirements.
- e. If Proposer has multiple options above the required power level, those options should be clearly described, including costs for each.
- f. Proposer shall provide a complete description of the vendor qualifications that may be required to perform work related to installation or maintenance of Proposer's equipment.
- g. The bid package shall contain a complete description of the charging equipment, including:
 - compliance with charge standards, electrical safety standards and UL classification;
 - charger efficiency;
 - charger dimensions;
 - connector type;
 - rated power output;
 - standby power consumption;

- a graph showing continuous current output versus voltage throughout the full operating range;
- IP and/or NEMA ratings;
- country of origin;
- Buy America compliance;
- ambient operating temperature ratings;
- equipment thermal management; and
- details on:
 - charging instructions;
 - automatic and manual control capabilities;
 - dispenser control panel display features and operator functions, if equipped;
 - communication management options (cellular, Ethernet, fiber, Wi-Fi);
 - operations and maintenance manuals;
 - options for preventive maintenance (contract with OEM terms/cost, training to perform with own forces/contracted third party);
 - electrical disconnect switch description; and
 - maintenance requirements.
- h. Charger manufacturer shall describe all transit bus models that charger has been validated for and note any exceptions.
- i. Charger manufacturer shall provide list of all locations and contact information for installations of the proposed charger.
- j. The Proposer must describe the methods for ensuring that charging equipment is capable of safely and effectively making connection and operating in snow and freezing environment.
- k. The Proposer must describe any bus-side connector requirements or recommendations.
- l. Proposer must describe software and connectivity options, web tools, APIs, etc. to facilitate data transmission to back offices and remote management of the charger.

5. INSTALLATION

Design Requirements:

- a. The owner, through a separate contractor will provide all wiring, equipment, and power up to the point of, and including, a switchgear at each location, as well as physical infrastructure such as concrete and conduits, per specifications provided by the Proposer.
- b. The Proposer shall supply any such specifications within three months of contract award, and shall coordinate with Owner's contractor, design firm, and construction inspector to ensure that work is being done in accordance with Proposer's specifications.
- c. The Proposer shall be responsible for the physical installation of the chargers, dispensers, wiring (from the point of the switchgear), and central systems in accordance with the Proposer's specifications.

6. CHARGE MANAGEMENT, DATA LOGGING AND TELEMATICS

Design Requirements:

- a. Proposer shall provide a central charge management system, with web-based access, with the following minimum capabilities:
 - Automatic adjustment of charging rates or sequencing of depot charging to limit peak demand.
 - The ability to for system users to see real-time charging system operational status and operating metrics, including, but not limited to charging rate, power output, charging vehicle SOC, and duration of active charge session.

- b. Proposer shall provide the City of Madison/Metro Transit the ability to access raw data generated by the chargers at no additional charge for the duration of the City of Madison/Metro Transit's ownership of the chargers. the City of Madison/Metro Transit recognizes that additional convenience functionality, wireless transmission, or processing capability or services may incur additional costs.
- c. Proposer shall provide the City of Madison/Metro Transit sufficient means to fully decode network traffic to engineering units including proprietary protocols or messages.
- d. Proposer shall provide the City of Madison/Metro Transit with the ability to physically connect to the monitoring system to view, retrieve and analyze charger data. Proposer shall provide connectors for the City of Madison/Metro Transit's use for the purpose of adding third-party data monitoring equipment. Proposer shall provide diagrams identify the location and pinouts of such connectors. The hardware for data collection and transmission shall be located behind a hinged and lockable panel with connection to the device(s) easily accessible.
- e. The system shall be capable of collecting and providing reports to the City of Madison/Metro Transit for the purpose of analyzing charger performance. Data collected and provided shall include but not be limited to energy consumption of the chargers and charge power output, as well as fault and diagnostic codes. the City of Madison/Metro Transit prefers that at least the following summary reports be readily available and accessible for analytics and diagnostics.
 - All charging session details in accordance with OCPP 1.6-J or newer, including but not limited to transaction ID, charger ID, bus ID, timestamp, duration of charge, DC output energy (kWh), AC input energy (kWh), max power output (kW), bus connection start time, bus disconnection time, charging start time, charging stop time, energy delivered by programmable utility rate time of use periods, session termination reason (fault/diagnostic codes), start vehicle SOC, and end vehicle SOC.
 - Idle energy consumption.
- f. The system shall have sufficient onboard storage to buffer data during brief loss of connection to the data network.
- g. The Proposer shall retain cloud-based storage data for at least one year's worth of collected information.
- h. Data shall also be made available to the City of Madison/Metro Transit via a web-based tool and/or APIs. The Proposer shall be capable of providing a management and analytic software platform or database repository to monitor, log, track and analyze charger data.

Preferences:

- a. High-resolution, high-frequency data is preferred. the City of Madison/Metro Transit favors systems that can provide second-by-second data over systems that provide only aggregated data.
- b. The chargers shall include instrumentation capable of metering and logging data and transmitting it to cloud storage, including but not limited to the following capabilities:
 - Measures and displays kilowatt-hours consumed and real-time load in kilowatt-hours within 1% accuracy.
 - Records energy (kilowatt-hours) for both the DC output and AC input.
 - Records fault codes and timestamp.
 - Maintains interval data storage in a first-in, first-out format.
 - Data is recorded and stored at 10-second intervals during charging sessions and 15-minute intervals during idle periods.

Supporting Materials:

- a. Provider shall describe the type, resolution and frequency of the available data.
- b. Provider shall provide information on management and analytic software platform or system used to log, track and analyze charger data.
- c. Provider shall provide an exemplar of the diagnostic software.

- d. Provider shall list information that can be readily accessible independently by the City of Madison/Metro Transit.
- e. Provider shall list items that are tracked for maintenance and preventive maintenance.

7. INSPECTION, ACCEPTANCE AND COMMISSIONING

Requirements:

- a. The purpose of the factory acceptance test is to confirm that any components, systems, subsystems, major assemblies, subassemblies, products, parts, apparatuses, articles and other materials comply with the Technical Specifications and other contract documents. Where required by the contract documents or requested by the Agency, Proposer shall cause Agency-witnessed factory acceptance testing to be conducted. Factory acceptance testing may include both a physical configuration inspection and a functional demonstration. Factory acceptance testing shall be conducted at Proposer or Subcontractor's facility. The Proposer shall furnish to the City of Madison/Metro Transit prior to factory acceptance testing a written inspection and demonstration plan for each item for review. The Agency's inspectors will attend factory acceptance testing unless the Agency provides a written waiver of its right to attend any such inspection. The results of factory acceptance testing shall be documented by Proposer in a format deemed acceptable by the Agency, and all documents relating to the testing shall be forwarded to the Agency.
- b. Upon delivery and installation, inspections will be carried out by the City of Madison/Metro Transit to ensure compliance with all requirements, standards and regulations herein. The Agency will prepare a punch list as a result of physical inspections, startup tests, and functional demonstrations. The punch list and completion schedule will be agreed upon by the City of Madison/Metro Transit and Proposer.
- c. Proposer shall provide, and the City of Madison/Metro Transit shall agree to, an Acceptance Testing and Commissioning Plan for all supplied equipment that shall include detailed instructions and requirements for verifying complete functionality of the full charging system (i.e., dispensers, power converters, mounting hardware and equipment, and all required wires, cables and connections). In addition, the plan must include instructions for demonstrating the successful operation of any data monitoring and charge management functionality or services. Acceptance testing and commissioning shall also ensure that the charging solution integrates with and charges with a pilot bus or the electric buses being used (both delivered and on order) in accordance with the Electric Bus Operation Strategy above and applicable interoperability standards. At the time of acceptance testing and commissioning, Proposer shall submit a written report to the City of Madison/Metro Transit listing all incidents and unusual system performance issues, as well as documenting correct function per the approved commissioning plan.
- d. Proposer's plans shall be completed in a manner that is in accordance with the City of Madison/Metro Transit's East-West BRT Project's System Integration Test Plan (SITP).

Supporting Material:

- a. Proposer shall provide an Acceptance Test and Commissioning Plan.

7.1 Charging system acceptance

Requirement:

- a. The charging systems will be considered complete and accepted for ownership by the City of Madison/Metro Transit upon the Agency's issue of notice of final acceptance to Proposer. The City of Madison/Metro Transit's final acceptance will be issued immediately upon Proposer's demonstration to the City of Madison/Metro Transit that the depot charging systems designed, delivered, assembled

and installed/constructed by Proposer are fully compliant with all requirements, and that all punch list items are complete. Minimum requirements for completion of the charging system are:

- the design, delivery, assembly and installation of complete and fully functional depot charging systems;
 - successful completion of all necessary inspections as required by authorities having jurisdiction (AHJs) and receipt of all necessary operating approvals as required by AHJs;
 - successful completion of UL field certification, if required; and
 - Proposer’s successful testing of charging system performance by completing the tests outlined below (Section 7.2).
- b. Preliminary acceptance will be granted when 7.1a is complete. A revenue service performance period will be conducted on each charger to confirm consistent and reliable operations. Chargers will be operated by the City of Madison/Metro Transit. The performance period is six months commencing on or about September 1, 2024. Final acceptance will be granted when 95% availability is achieved over the performance period duration.

Charger Availability %

$$= \frac{(\text{Days Charger Available for Service} + \text{Days Out of Service Outside of Equipment Provider's Control})}{(\text{Cumulative Days of Performance Period Completed})}$$

- c. All payments shall be made as provided herein, up to and including preliminary acceptance, less a retention of 10% plus any additional amount retained as provided below and less any amounts for liquidated damages. The Agency shall make a final payment for all retained funds within 30 calendar days of receipt of a final proper invoice and final acceptance.

7.2 Performance tests

7.2.1 For plug-in chargers only

Requirement:

- a. At a minimum, Proposer shall demonstrate three successful charge initiations and terminations and a minimum of one hour of continuous bulk charging with two separate buses on each of the plug-in chargers. Completely charging a bus to full SOC is required, along with verification that the charger successfully ramps down current when approaching full SOC and terminates the charge session, as applicable.
- b. The Proposer shall provide a commissioning certificate from the Agency-approved commissioning authority.
- c. The Proposer shall demonstrate charging at rated power or maximum power the bus will accept, whichever is lower, for 15 minutes.

7.2.2 For overhead conductive chargers only

Requirement:

- a. At a minimum, Proposer shall demonstrate 20 successful charge initiations with two separate buses on each of the overhead conductive chargers.
- b. The Proposer shall demonstrate charging at rated power or maximum power the bus will accept, whichever is lower, for 15 minutes. Completely charging a bus to full SOC, including successful charge termination, is required.
- c. If possible, Proposer shall also demonstrate that all combinations of any two concurrent charging operations in the same vicinity successfully initiate and maintain a charge event, as well as with a simultaneous approaching bus.

7.3 Functional tests

Requirement:

- a. Noise measurements:
 - Tests shall be conducted by Proposer in the presence of the City of Madison/Metro Transit representatives to ensure that airborne noise generated by the depot charging system while operating at full capacity does not exceed 60 dBA when measured 25 ft from charging system equipment in any direction. The Proposer shall also ensure compliance with the exterior noise requirements defined in local laws and ordinances.
- b. Normal stop conditions:
 - Tests of all available charger and bus side methods to stop a charge session shall be conducted to determine their effectiveness in accordance with the requirements of SAE J1772 or J3105, as applicable.
- c. Emergency shutdown system:
 - Tests of manual shutdown devices on the charging systems shall be conducted to determine their effectiveness in accordance with the emergency stop requirements of SAE J1772 or J3105, as applicable. To the extent possible without inflicting damage to charging or bus equipment, all automated emergency stop conditions shall also be simulated to determine their effectiveness in accordance with the emergency stop requirements of SAE J1772 or J3105, as applicable.
- d. Remote monitoring provisions:
 - All remote monitoring, control and data logging functionality shall be verified by Proposer.
- e. Design specification validation:
 - Design specifications may be tested upon indication of an overriding issue or fault. In this event, Proposer shall provide the necessary tests and equipment to verify the equipment specification. If Proposer cannot provide an in-situ test, the Agency may determine an appropriate test for verification in collaboration with Proposer. For example, thermal management systems designed to maintain acceptable operating temperatures may be tested to determine their effectiveness. Temperature readings may be recorded to verify that equipment is operating within designed range.
- f. Ancillary items:
 - The operation and function of ancillary items of the charging system shall be tested in the presence of the City of Madison/Metro Transit representatives. Deficiencies shall be recorded and corrected by Proposer to the satisfaction of the City of Madison/Metro Transit. Ancillary items shall include but not be limited to depot charging system lighting, doors, locks, control panels, switches and security systems.
 - Punch lists resulting from inspections of charging system carried out by the City of Madison/Metro Transit representatives are addressed and completed to the satisfaction of the Agency.
 - The Proposer has presented the City of Madison/Metro Transit all required deliverables per the contract terms, including but not limited to product information/verification forms, installation/start-up checklists, functional performance tests, final customer experience report, operator and maintenance manuals, system manuals and diagrams, and parts manuals.
 - The Proposer has completed all contract-specified operational training.
 - The Proposer and the City of Madison/Metro Transit have agreed to a schedule of operations training and maintenance training to be provided by Proposer.

Deficiencies for any of the above tests shall be recorded and corrected by Proposer to the satisfaction of the City of Madison/Metro Transit. Punch lists resulting from these tests shall be addressed and completed to the satisfaction of the Agency.

Final commissioning of the depot charging systems will be completed on the electric buses upon their arrival on the City of Madison/Metro Transit's property. The Proposer shall coordinate with the bus OEMs to ensure that each plug-in and overhead fast charger integrates with and charges each bus, as applicable.

8. MANUALS, DIAGRAMS, TRAINING AND RECOMMENDED SPARE PARTS

8.1 Operating manuals

Requirement:

- a. Proposer shall provide the City of Madison/Metro Transit with three identically bound sets of operating manuals for the plug-in and fast lane overhead charging systems. Operating manuals shall include step-by-step instructions to properly start, utilize, control and shut down charging system components. The operating manuals shall include instruction in the proper utilization of the charging systems and procedures to be observed. The target audience for the operating manuals shall be the City of Madison/Metro Transit fleet servicing personnel charged with opening, undertaking and closing the fleet refueling process.
- b. The Proposer shall also provide the City of Madison/Metro Transit with operating manuals in electronic (PDF) format. The operating manuals in electronic format shall be duplicate in content and organization to the bound sets of operating manuals for the charging systems.
- c. the City of Madison/Metro Transit shall have final approval for content of delivered operating manuals.

8.2 Diagrams

Requirement:

- a. Proposer shall provide single-line electrical diagrams for the installed charger bank in both PDF and CAD formats. Diagrams shall include, at a minimum, all the chargers, conductors and switches, and show the connection to primary electrical service.
- b. Proposer shall provide mechanical layout diagrams of equipment showing all equipment footprint dimensions, conduit entry points and wire termination locations in both PDF and CAD format.

8.3 Maintenance manuals

Requirement:

- a. Proposer shall provide the City of Madison/Metro Transit with three identically bound sets of maintenance manuals for the plug-in and fast lane charging systems. Maintenance manuals shall include step-by-step instructions to properly maintain all plug-in and fast lane charging systems and equipment/components. In addition to process and instrumentation drawings (P&IDs) and detailed descriptions of system function and operation, maintenance manuals shall, at a minimum, include information on proper troubleshooting steps, system logic, preventive maintenance procedures and checklists, and repair procedures for all major components and systems. Maintenance manuals shall include all applicable wiring and logic diagrams.
- b. The target audience for the maintenance manuals shall be the City of Madison/Metro Transit personnel or third-party contractors charged with maintenance of Agency facilities.
- c. The Proposer shall also provide the City of Madison/Metro Transit with maintenance manuals in electronic text-selectable (PDF) format. The maintenance manuals in electronic format shall be duplicate in content and organization to the bound sets of maintenance manuals for the on-route and depot charging systems.
- d. the City of Madison/Metro Transit shall have final approval for content of delivered maintenance manuals.

8.4 Parts manuals

Requirement:

- a. Proposer shall provide the City of Madison/Metro Transit with three identically bound sets of parts manuals for the depot charging systems. Parts manuals shall include the P&IDs; graphical parts breakdowns (parts diagrams); and associated parts lists for all major systems, assemblies, components and subcomponents of the charging systems. The parts diagrams shall be organized and clearly associated with parts lists using unique identifiers. Parts lists shall minimally define serviceable parts by system, assembly, noun name of part, the major component the part relates to, original equipment manufacturer, the OEM part number, life expectancy (in years or usage), unique part number, and quantity per associated assembly. The Proposer shall identify any parts or special tools needed for recurring preventive maintenance.
- b. The Proposer shall also provide the City of Madison/Metro Transit with parts manuals in electronic (PDF) format. The parts manuals in electronic format shall be duplicate in content and organization to the bound sets of parts manuals for the on-route and depot charging systems. Electronic manuals shall be compatible with the Agency's parts catalog documentation software. Manuals shall be text-selectable. Parts lists and associated parts graphics are preferred to be received in Excel format to facilitate seamless integration or parts lists with the Agency's system and its relational database.
- c. the City of Madison/Metro Transit shall have final approval for the content of delivered parts manuals.

8.5 Training

Requirement:

- a. Proposer shall provide 40 hours of training for the City of Madison/Metro Transit operating and maintenance personnel upon initial system installation and for future maintenance of the system. The training plan shall consist of the following details: description of the courses, suggested attendees, course length and suggested timing.
- b. the City of Madison/Metro Transit reserves the right to modify the proposed training plan to meet its needs.
- c. The instructor must be capable of training 10 City of Madison/Metro Transit personnel simultaneously in each course.
- d. Proposer must provide a one-hour quarter-annual webinar for new the City of Madison/Metro Transit employees and a refresher course within 60 days before expiration of the warranty.
- e. Proposer shall provide the training syllabus and all training material for review and approval by the Agency project manager prior to commencement of training. Proposer shall provide all necessary equipment to facilitate the training. the City of Madison/Metro Transit will specify the time and location for delivery for the on-site training courses at a later date after consulting with Proposer for availability.
- f. Proposer shall provide training in video format for future training of the City of Madison/Metro Transit personnel.

8.6 Recommended spare parts

Requirement:

- a. Proposer shall provide the City of Madison/Metro Transit with a list of recommended spare parts for the charging systems. Recommended spare parts lists shall, at a minimum, define serviceable parts by system, assembly, noun name of part, the major component the part relates to, original equipment manufacturer, the OEM part number, life expectancy (in years or usage), unit price, unique part number, and quantity per associated assembly.
- b. Proposer shall provide the City of Madison/Metro Transit with a list of recommended spare parts to have on hand for the first year of maintenance and repair after final commissioning.

- c. Proposer shall also provide the City of Madison/Metro Transit with a list of recommended spare parts for the charging systems in electronic (PDF and Excel) format. The list of recommended spare parts for the charging systems in electronic format shall be duplicate in content and organization to the hard copy of the recommended list of spare parts for the charging systems. The purpose of electronic spare parts list is to import into the City of Madison/Metro Transit's electronic parts catalog system.

9. UPDATES

Requirement:

- a. For a period of 15 years following the City of Madison/Metro Transit's final acceptance of the charging systems, or life of the equipment, whichever is longer, Proposer shall provide the City of Madison/Metro Transit with all updates to maintenance manuals, parts lists and procedures for all systems, equipment or components of the charging system as issued by Proposer and/or supplier to Proposer.
- b. Proposer shall provide, within reasonable periods of time, the spare parts, hardware, software, firmware and all equipment necessary to maintain and repair the chargers for a period of at least 15 years or the life of the equipment, whichever is longer, after the date of acceptance. Parts shall be interchangeable with the original equipment and shall be manufactured in accordance with the quality assurance provisions of this contract. Prices shall not exceed the Proposer's then-current published catalog prices.
- c. Changes to chargers, including hardware, software and firmware, must be coordinated with the City of Madison/Metro Transit to minimize disruptions to service. Remote updates must be scheduled with and approved by the Agency. Additionally, Proposer must provide evidence to the City of Madison/Metro Transit that the change has been successfully tested with the same model of buses provided by Proposer. If this is not possible, Proposer must submit a test plan to the City of Madison/Metro Transit, and the City of Madison/Metro Transit must approve the test plan before work to implement the change at the City of Madison/Metro Transit can commence. If initial validation or verification must be done on the City of Madison/Metro Transit equipment, then the upgrades may only be made to a single charging unit and verified for a period of 14 days in service before rolling upgrades out to the remainder of chargers in the fleet. If upgrades experience any issues during install or the 14-day period, then the chargers must be reverted back to the last working version until the issues are resolved at the factory.

10. WARRANTY

Requirement:

- a. The Proposer shall provide a minimum five-year parts and labor warranty, including preventive maintenance, on the charging systems, which shall commence upon the date of final acceptance of each charging system as issued by the City of Madison/Metro Transit. Proposer should clearly define all terms of the warranty in its response, and include the costs of the warranty in the cost proposal. The Proposer is also invited to list other available warranty options in the proposal narrative, clearly defining all terms.
- b. Voiding the warranty:
 - The warranty shall not apply to any depot charging system failure or damage resulting from accident, misuse or negligence for which Proposer is not responsible. Normal use shall include conditions prevalent in the normal (day-to-day) the City of Madison/Metro Transit operational and maintenance procedures. Normal use shall also include the environmental conditions specified in the Section 1.2 of this appendix.
- c. Warranty repairs:
 - A representative of the OEM of the malfunctioning equipment must be on-site at the City of Madison/Metro Transit's property within 24 hours of receiving notice of a charging system

issue from the City of Madison/Metro Transit. The malfunctioning system or component must be properly functioning within 48 hours of receiving notice of a charging system issue from the Agency.

- If during the warranty period, any replacement, repair or modification on a charging system component made necessary by defective design, materials or workmanship is not completed within two calendar days, then liquidated damages in the amount of \$500 will be assessed for each calendar day in excess of two.
- Any parts taken from the City of Madison/Metro Transit inventory to perform warranty work will be replaced under warranty.

11. TIMELINE

Requirement:

- a. One (1) 150 kW depot charger, three dispensers, and two (2) mobile chargers are to be delivered and installed at the Hanson Rd maintenance building on or before September 1, 2023
- b. Owner’s contractor preparation work is expected to be complete by May 1, 2024, at which time, an installation Notice to Proceed (NTP) will be issued and the Proposer is expected to begin installation on the remaining depot chargers, dispensers, and opportunity chargers.
- c. Proposer shall complete installation of all required equipment, other than mobile chargers, and systems within 90 calendar days of the Installation NTP.
 - A. The required deliverables are listed in Table A1.1. Proposers shall complete Table A1.1 with proposed dates to meet these deadlines. The Proposer shall provide a realistic, attainable schedule. If the Proposer believes that the required deadlines are not attainable, provide revised proposed dates for all tasks in Table A1.1, indicating any assumptions or dependencies that would prevent the substantial completion of the project by these deadlines.
 - B. The City of Madison/Metro Transit review and approval of the 30% Design Documents (Conceptual Design) is required. The City of Madison/Metro Transit will provide comments to the Proposer within five (5) business days of receipt of the package. The Proposer shall engage the City of Madison/Metro Transit in the review and approval of remaining deliverables as they see fit. The Proposer may request a design charrette with the City of Madison/Metro Transit at any time during the project.
 - C. The following deliverables are required:
 - i. A Project Schedule outlining all design and construction
 - ii. The 30% Design Documents (Conceptual Design) package
 - iii. The Recommendations to Accommodate Future Fleet Expansion package
 - iv. The 90% complete design documents package
 - v. The Proposer’s 100% design document package (Final Design) shall be submitted to Metro and the Authorities Having Jurisdiction for requirement permits
 - D. The City of Madison/Metro Transit reserves the right to issue a Stop Work Order at any time during contract execution.
 - E. Commissioning of charging equipment to the buses will occur after the arrival of the first article and will conclude after the arrival of the final article.

Table A1.1. Deliverable Milestone Schedule

Task/Deliverable	Completion Milestone
Detailed Project Schedule	Fourteen (14) calendar days after Contract Execution.
Civil and Electrical Engineering Design requirements for general engineering contractor	Ninety (90) calendar days after Contract Execution
30% Design Documents (Conceptual Design)	
60% Design Documents, Including Provisions for Fleet Expansion	
90% Design Documents	
Final Design Documents	
One (1) 150 kW depot charger, three dispensers, and two (2) mobile chargers are delivered to and installed at the Hanson Rd maintenance building	September 1, 2023
Commissioning Plan	May 1, 2024
Owner’s contractor preparation work is expected to be complete and EVSE installation NTP issued for remaining charging systems	May 1, 2024
Completion , All Charging Systems installed and commissioned to extent possible with buses	August 1, 2024

MADISON BRT COMFORT STATIONS

Exhibit 2

SHEET INDEX	
SHEET NUMBER	SHEET NAME
GENERAL	
G001	COMFORT STATIONS SHEET INDEX
G002	COMFORT STATIONS GENERAL NOTES AND CODE ANALYSIS
G003	ABBREVIATIONS
G004	ABBREVIATIONS
G005	ABBREVIATIONS
G006	ADA - BF MOUNTING HEIGHTS
G007	COMFORT STATIONS ADA - BF STANDARDS
G008	TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
G009	TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
G010	TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
G011	TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
G012	TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
G013	TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
G014	TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
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G016	FINISH MATERIAL ABBREVIATIONS
G020	MECHANICAL ABBREVIATIONS AND SYMBOLS
G025	ELECTRICAL LEGENDS
G026	ELECTRICAL LEGENDS AND ABBREVIATIONS
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STRUCTURAL	
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S002	STRUCTURAL NOTES
S003	STRUCTURAL NOTES
S004	STRUCTURAL NOTES
S100	FOUNDATION PLAN
S101	ROOF FRAMING PLAN
S400	STRUCTURAL DETAILS
S401	STRUCTURAL DETAILS
S900	STANDARD STRUCTURAL DETAILS
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A002	COMFORT STATION SITE PLAN - SUN PRAIRIE
A011	COMFORT STATION HANSON ROAD ELECTRICAL BUILDING
A020	COMFORT STATION FINISH FLOOR PLAN OVERALL COMBINED
A021	COMFORT STATION FINISH FLOOR PLAN OVERALL SEPARATED
A101A	COMFORT STATION ENLARGED JC/STO ROOM FLOOR PLAN
A101B	COMFORT STATION ENLARGED ELECTRICAL ROOM FLOOR PLAN
A102	COMFORT STATION ROOF PLAN
A201	COMFORT STATION EXTERIOR ELEVATIONS
A202	COMFORT STATION EXTERIOR ELEVATIONS
A210	COMFORT STATION TYPICAL INTERIOR ELEVATIONS
A301	COMFORT STATION BUILDING SECTIONS
A310	COMFORT STATION WALL SECTIONS
A311	COMFORT STATION WALL SECTIONS
A312	COMFORT STATION WALL SECTIONS
A401	COMFORT STATION PLAN DETAILS
A402	COMFORT STATION DOOR FRAME DETAILS
A403	COMFORT STATION DOOR SILL DETAIL
A405	COMFORT STATION ROOF DETAIL
A406	COMFORT STATION HVAC WALL DETAIL
A407	COMFORT STATION HALO DETAIL
A408	COMFORT STATION PARAPET COPING DETAIL
A601	COMFORT STATION EXTERIOR WALL SYSTEMS
A602	COMFORT STATION INTERIOR PARTITION TYPES
A603	COMFORT STATION INTERIOR PARTITION DETAILS
A610	COMFORT STATION DOOR SCHEDULE
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MECHANICAL	
M002	OVERALL MECHANICAL ROOF PLAN
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P901	PLUMBING ISOMETRICS
P902	PLUMBING STORM WATER ISOMETRIC
6	
SHEET COUNT: 73	

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CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

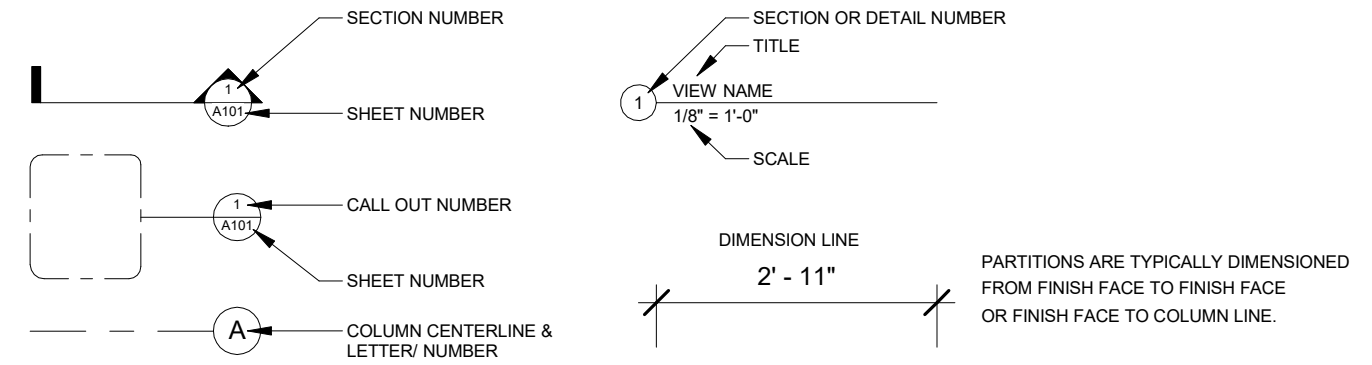
COMFORT STATIONS SHEET INDEX
BUS RAPID TRANSIT
CITY OF MADISON



GENERAL NOTES:

- DO NOT SCALE DRAWINGS TO DETERMINE SIZES AND DIMENSIONS. USE FIGURED DIMENSIONS ONLY. DIMENSIONS ARE TO FINISHED FACE OF WALLS UNLESS OTHERWISE NOTED. ALL PERIMETER DIMENSIONS ARE FROM FACE OF PERIMETER WALLS.
- ALL WALLS SHALL EXTEND TO FLOOR / ROOF DECK ABOVE UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS ARE NOMINAL UNLESS NOTED OTHERWISE.
- SEE STRUCTURAL AND ARCHITECTURAL DRAWINGS FOR RECESSED SLAB LOCATIONS.
- SLOPE CONCRETE SLABS TO DRAINS AT 1/8" PER FOOT (MINIMUM) TYPICAL.
- WHERE EXISTING WALLS ARE INDICATED AS RATED WALLS, EXTEND EXISTING WALLS UP TO DECK, SEAL ALL PENETRATIONS, OPENINGS, AND DECK FLUTES WITH A FIRE STOP ASSEMBLY TO MAINTAIN THE INDICATED RATING. DOCUMENTS ARE BASED UPON OWNER'S RECORD DRAWINGS. NOTIFY ARCHITECT OF DISCREPANCIES PRIOR TO CONTINUATION OF WORK.
- VERIFY ALL CONDITIONS AND DIMENSIONS IN FIELD PRIOR TO START OF WORK.
- REMOVE WALL ANCHORS, NAILS, SCREWS, ETC. AND PATCH AND FILL HOLES AT EXISTING SURFACES SCHEDULED TO RECEIVE NEW FINISHES.
- ALL SURFACES DISTURBED DUE TO DEMOLITION/ REMODELING, ARE TO BE PATCHED TO MATCH ADJACENT SURFACES AND PREPARED TO RECEIVE NEW FINISHES.
- WHERE FACE BRICK INFILL IS INDICATED, TOOTH-IN NEW FACE BRICK TO EXISTING FACE BRICK. NEW FACE BRICK TO MATCH THICKNESS OF EXISTING.
- ALWAYS REFER TO PROVIDED DIMENSIONS. PROJECT MEASUREMENTS NOT TAKEN DIRECTLY FROM PROVIDED DIMENSIONS SUBJECT CONTRACTOR TO LIABILITY FOR ANY RESULTANT ERRORS.
- IT IS THE INTENT OF THESE DOCUMENTS TO INCLUDE INFORMATION NECESSARY FOR THE COMPLETION OF THE PROJECT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INQUIRE AS TO THE INTENT OF THE DRAWINGS IN AREAS THAT ARE IN QUESTION FOR MEANING AND INTENT.
- CONTRACTOR IS RESPONSIBLE FOR ALL MEANS AND METHODS OF CONSTRUCTION AND SHALL CONSTRUCT WORK IN COMPLIANCE TO ALL APPLICABLE BUILDING CODES AND ORDINANCES.
- THE OWNER'S NORMAL OPERATIONS WILL BE CONTINUED DURING CONSTRUCTION. THE CONSTRUCTION SHALL NOT INTERFERE WITH THESE OPERATIONS IN ANY WAY WITHOUT THE OWNER'S EXPRESSED CONSENT.
- IT SHALL BE EACH TRADE CONTRACTORS RESPONSIBILITY TO VISIT THE SITE AND FAMILIARIZE HIMSELF/HERSELF WITH ALL EXISTING CONDITIONS. EACH CONTRACTOR SHALL TAKE ALL NECESSARY FIELD MEASUREMENTS AND OTHERWISE VERIFY ALL DIMENSIONS AND EXISTING CONSTRUCTION CONDITIONS INDICATED AND/OR SHOWN ON THE DRAWINGS. SHOULD ANY ERROR OR INCONSISTENCY EXIST, THE CONTRACTOR SHALL NOT PROCEED WITH THE WORK AFFECTED THEREBY UNTIL REPORTING THE SAME TO THE ARCHITECT AND THE OWNERS REPRESENTATIVE FOR CLARIFICATION AND/OR CORRECTION.
- DIMENSIONS FOLLOWED BY +/- SHALL BE REVIEWED AND ALL NECESSARY ADJUSTMENTS MADE PRIOR TO FABRICATION AND/OR INSTALLATION OF WORK. NOTIFY ARCHITECT /ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
- ALL EXISTING CONSTRUCTION AND SURFACES WHICH ARE TO REMAIN BUT ARE AFFECTED BY THE WORK UNDER THIS CONTRACT SHALL BE RESTORED AND REFINISHED TO MATCH THE CONSTRUCTION, FINISH AND ALIGNMENT OF THE EXISTING ADJACENT CONSTRUCTION AND FINISHES, UNLESS NOTED OTHERWISE.
- VERIFY QUANTITY, SIZE AND LOCATION OF ALL FLOOR, ROOF AND WALL OPENINGS FOR MECHANICAL AND ELECTRICAL WORK WITH THE APPROPRIATE TRADE. PROVIDE ALL OPENINGS SHOWN OR REQUIRED FOR COMPLETION OF WORK.
- COORDINATE SIZE AND LOCATION OF ALL HOUSE-KEEPING PADS AND/OR EQUIPMENT SUPPORTS WITH APPROPRIATE EQUIPMENT MANUFACTURER.
- PROVIDE FIRE WATCH DURING FIELD CUTTING AND WELDING OPERATIONS, MEETING OWNERS REQUIREMENTS.
- THE CONTRACTOR SHALL VERIFY THE EXISTENCE, LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES IN WORK AREAS PRIOR TO PROCEEDING WITH CONSTRUCTION. ALL DISCREPANCIES SHALL BE DOCUMENTED AND FORWARDED TO ARCHITECT AND OWNERS REPRESENTATIVE FOR ACTION.
- IT IS THE CONTRACTORS RESPONSIBILITY TO INVESTIGATE FIELD CONDITIONS AND PROVIDE AS NEEDED TEMPORARY SUPPORTS, SHORING AND / OR PROTECTION OF EXISTING STRUCTURES AND UNDERGROUND UTILITIES DURING EXECUTION OF WORK.
- ALL WORK TO COMFORM TO THE REQUIREMENTS OF FEDERAL, STATE, AND LOCAL CODES AND ORDINANCES. COORDINATE WITH SPECIFICATIONS, DIVISION 1.
- RELEVANT DIMENSIONS AND ELEVATIONS FOR EQUIPMENT INSTALLATIONS SHALL BE VERIFIED AND COORDINATED WITH MANUFACTURER'S CERTIFIED EQUIPMENT INSTALLATION DRAWINGS.
- CONTRACTOR SHALL PROVIDE TEMPORARY DUST PROOF PARTITIONS AS REQUIRED, OR WHERE REQUESTED BY OWNERS' REPRESENTATIVE. PARTITIONS SHALL BE FIRE RATED WHERE REQUIRED BY CODE HAVING JURISDICTION. ALL TEMPORARY PARTITIONS SHALL BE CONSTRUCTED IN A MANNER AND OF MATERIALS OFFERING ADEQUATE PROTECTION TO OWNER'S EQUIPMENT AND PERSONNEL.
- ALL PENETRATIONS TO FLOORS, CEILINGS AND WALLS SHALL BE SEALED AND FIRE STOPPED TO A FIRE RATING EQUAL TO THE CONSTRUCTION BEING PENETRATED.
- CONTRACTOR SHALL RESTORE FIRE RESISTIVE MATERIALS DISTURBED DURING CONSTRUCTION WITH NEW MATERIALS TO MATCH EXISTING FIRE RESISTIVE MATERIALS.
- ANY ITEM NEEDING TO BE HUNG FROM ABOVE NEEDS TO BE HUNG FROM MAIN STRUCTURE. NO ITEMS TO BE HUNG FROM ROOF/FLOOR DECK. ANY ADDITIONAL SUPPORT REQUIRED TO BE PROVIDED BY CONTRACTOR
- NOT ALL NOTES AND/ OR SYMBOLS SHOWN ON THE SHEET MAY BE APPLICABLE TO THIS PROJECT.

DRAWING SYMBOLS



MATERIALS LEGEND

- MASONRY
- CONCRETE
- WALL
- ACT
- CMU BLOCK
- INSULATION

PARTITION TYPE LEGEND

- CONCRETE MASONRY UNIT (CMU)
- SMOKE TIGHT ZERO HOUR PARTITION
- ONE HOUR SMOKE TIGHT BARRIER (UL U419 OR U905)
- ONE HOUR FIRE BARRIER (UL U419 OR U905)
- TWO HOUR FIRE/SMOKE BARRIER (UL U419 OR U905)

REVISION	DATE	BY

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CONTRACT NO: 60631225C

COMFORT STATIONS GENERAL NOTES AND CODE ANALYSIS
BUS RAPID TRANSIT
CITY OF MADISON



ABBREVIATIONS

A Air
 ABV Above
 A/C Air Conditioning
 ACIPC Architectural Cast In Place Concrete
 ACT Accoustical Ceiling Tile
 ADA Americans with Disabilities Act
 ADDNL Additional
 ADJ Adjustable
 ADO Automatic door opener
 AFF Above Finished Floor
 AGG Aggregate
 ALT Alternate
 ALUM Aluminum
 AP Access Panel
 APPROX Approximately
 ARCH Architectural
 AS Adjustable Shelf
 ASF Actual Square Footage
 AV Audio Visual
 A/V Audio Visual

BAS Building Automated System
 BC Bottom of Curb
 BCO Brick Course
 BD Board
 BDD Back Draft Damper
 BIT Bituminous
 BLDG Building
 BLK Block
 BLKG Blocking
 BLW Below Countertop at Knee Space
 BM Beam
 BO Bottom of
 BOC Bottom of Concrete
 BOL Bollard
 BOT Bottom
 BOW Bottom of Wall
 BR Bracket
 BRKT Bracket
 BSC Bio Safety Cabinet
 BUR Built Up Roofing

C Cold
 CAB Cabinet(s)
 CABO Council of American Building Officials
 CB Catch Basin
 CEM Cement
 CFCI Contractor Furnished & Contractor Installed
 CG Corner Guard
 CHB Chalkboard
 CHEM Chemical
 CI Cast Iron
 CIP Cast-in-Place
 CJ Control Joint
 CLG Ceiling
 CLM Centerline of Mullion
 CLR Clear(ance)
 CL Closet
 CMU Concrete Masonry Unit
 CO Convenience Outlet Receptacle
 COL Column
 COMM Command
 COMP Compressible
 COMPOUND Compounding
 CONC Concrete
 CONF Conference
 CONST Construction
 CONT Continuous
 CORR Corridor
 CR Card Reader
 CRP Card Reader Prep
 CS Cupsink
 CT Ceramic Tile
 CTR Center
 CUH Cabinet Unit Heater
 CW Cold Water

D Depth
 DB Drainboard (Interchangeable w/ DR)
 DET Detail
 DTL Detail
 DF Drinking Fountain

DIA Diameter
 DIF Diffuser
 DIM Dimension
 DN Down
 DP Dirty Power
 DS Downspout
 DR Door
 DW Dishwasher
 DWG Drawing
 E Emergency
 EJ Expansion Joint
 EL Elevation (Topographical)
 ELEC Electric(al)
 ELEV Elevator
 EMERG Emergency
 ENCL Enclosure
 EO Edge of
 EOS Edge of Slab
 EP Electrical Panel
 EQ Equal
 EQUIP Equipment
 ETR Existing to Remain
 ES Emergency Shower (or) Equipment Space
 ESV Emergency Shower Valve
 EW Emergency Eye Wash
 EWC Electric Water Cooler
 EXH Exhaust
 EXP Expansion
 EXPD Exposed
 EXT Exterior
 EX/EXIS Existing
 EXIST Existing

FBP Future Bid Pack
 FCO Floor Clean Out
 FD Floor Drain
 FDN Foundation
 FE Fire Extinguisher

60631225P

CITY OF MADISON, DANE COUNTY, WI

CONTRACT NO: 60631225C

ABBREVIATIONS
 BUS RAPID TRANSIT
 CITY OF MADISON



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ABRV. CONT.

FEC Fire Extinguisher Cabinet
 FEH Fire Extinguisher Hook
 FF Foil Faced
 FH Fume Hood
 FHC Fire Hose Cabinet
 FHCE Fume Hood Ceiling Enclosure
 FIN Finish
 FIXT Fixture
 FL Floor
 FLUOR Fluorescent
 FO Fiber Optic
 FOC Face of Concrete
 FOP Face of Precast
 FP Flat Panel NIC
 FRM Frame
 FRT Fire Retardant Treated
 FS Firestopping
 FT Feet
 FTG Footing
 FTR Fin Tube Radiation
 FV (Contractor to) Field Verify

G Gas (or) Ground
 GA Gauge
 GALV Galvanized
 GB Grab Bar
 GC General Contractor
 GFI Ground Fault Interrupting
 GFRG Glass Filer Reinforced Gypsum
 GL Glass
 GRN Granite
 GV Gas Valve
 GWB Gypsum Wall Board
 GYP Gypsum

H Hot (or) Height
 HB Hose Bib
 HC Handicapped
 HCR Hollow Core
 HCP Handicap
 HDW Hardware
 HE Helium

HeR Helium Return
 HGT Height
 HM Hollow Metal
 HOR Horizontal
 HP High Point
 HR Hour
 HTR Heater
 HVAC Heating, Ventilation
 and Air Conditioning
 HW Hot Water

ID Inside Diameter
 IN Inch or Inches
 INCAND Incandescent
 INCL Include (-ding)
 INSTRUM Instrument

JAN Janitor
 JT Joint
 JNT Joint

KS Knee Space

LAM Laminated
 LAV Lavatory
 LGMF Light Gage Metal Framing
 LL Lower Level
 LMF Light Gage Metal Framing (sim)
 LP Low Point
 LT Light
 LTG Lighting

MACH Machine
 MAX Maximum
 MB Markerboard
 MDF Medium Density Fiberboard
 MECH Mechanical
 MEMB Membrane

MET Metal
 MFR Manufacturer
 MIN Minimum
 MISC MISC.
 MO Masonry Opening
 MOS Mosaic
 MP Metal Panel
 MR Moisture Resistant
 MTD Mounted
 MTL Metal

N Nitrogen
 NA Not Applicable
 NER National Evaluation Report
 NIC Not in Contract
 NO Number
 NSF Net Square Feet
 NTS Not to Scale

OBL Oblique
 OC On Center
 OD Outside Diameter
 OF Owner Furnished
 OFO Owner Furnished & Owner Installed
 OFOI Owner Furnished & Owner Installed
 OFCI Owner Furnished & Contractor Installed
 O.H. Opposite Hand
 O.H. DR Overhead Door
 OHSG Overhead Service Grid
 OPNG Opening
 OPP Opposite
 OPPH Opposite Hand
 OVP Overhead Video Projector Support
 OVPS Overhead Video Projector

P Patch (or) Persons
 PB Pegboard
 PC Precast Concrete

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CITY OF MADISON, DANE COUNTY, WI

ABBREVIATIONS
 BUS RAPID TRANSIT
 CITY OF MADISON



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ABRV. CONT.

PCWS Process Chilled Water Supply
PCWR Process Chilled Water Return
PE Point Exhaust
PGL Plate Glass
PH Penthouse
PHR Penthouse Roof
(1)PH Single Phase
(3)PH Three Phase
PL Plate
PLAM Plastic Laminate
PLAS Plaster
PLWD Plywood
PNL Panel
PP Pumping Port
PRS Pressure Reducing Station
PS Projection Screen
PTD Paint(ed)
PT Point
PT Pressure Treated
PTN Partition
PTT Pedestrian Traffic Topping
PVC Poly Vinyl Chloride

QT Quarry Tile
QTY Quantity

R Radius (or) Riser
RA Return Air
RCP RCP -
RD Roof Drain
RECV Receiving
REF Refrigerator
REFRIG Refrigerator
REG Register
REINF Reinforcing
REQD Required
REV Revision/Reverse
R/F Ref. or Freezer (by owner)
RM Room
RMS Rooms
RO
RWL Rough Opening (or) Reverse Osmosis Rain Water Leader

S Sink
SC Solid Core
SD Shading Device
SECT Section
SEC Security
SH Shelf
SHT Sheet
SIM Similar
SMRF Seamless Mechanical Room Floor
SPEC Specifications
SQ Square
STD Standard (or) Stud
SS Stainless Steel
SSM Solid Surface Material
STL Steel
STN Stainless
STR Structural
STRUCT Structural
STOR Storage
SURG Surgical
SUSP Suspended
SV Special Vacuum

T Tread
TB Tackboard
TC Top of Curb
TD Trench Drain
TEL Telephone
TEMP Tempered (or) Temporary
TG Tempered Glass
THK Thick (or) Thickness
TMV Thermostatic Mixing Valve
TO Top of
TOC Top of Concrete
TOF Top of Footing
TOP Top of Parapet
TOR Top of Rail
TOS Top of Steel
TOT Top of Tunnel
TOW Top of Wall
TRANS Transformer
TS Tube Steel
TYP Typical

UC Under Counter
UL Underwriters Laboratory
U.O.N. Unless Otherwise Noted
U.N.O. Unless Noted Otherwise

V Vacuum
VAC Vacuum
VCT Vinyl Composition Tile
VERT Vertical
VIF Verify in Field
VIN Vinyl

W/ With
WC Water Closet
WD Wood
WF Steel Beam (Wide Flange)
WG Wall Guard
WMS Wire Mesh Screen
WMN Women
WP Working Point
WPR Waterproofing
W/O Without
WWF Welded Wire Fabric
WS(-#) Window Shade (and type)-
see "Shades and Blinds
Designations/Notes" legend

WT Weight
XPS Exposed

ABBREVIATIONS

BUS RAPID TRANSIT
CITY OF MADISON

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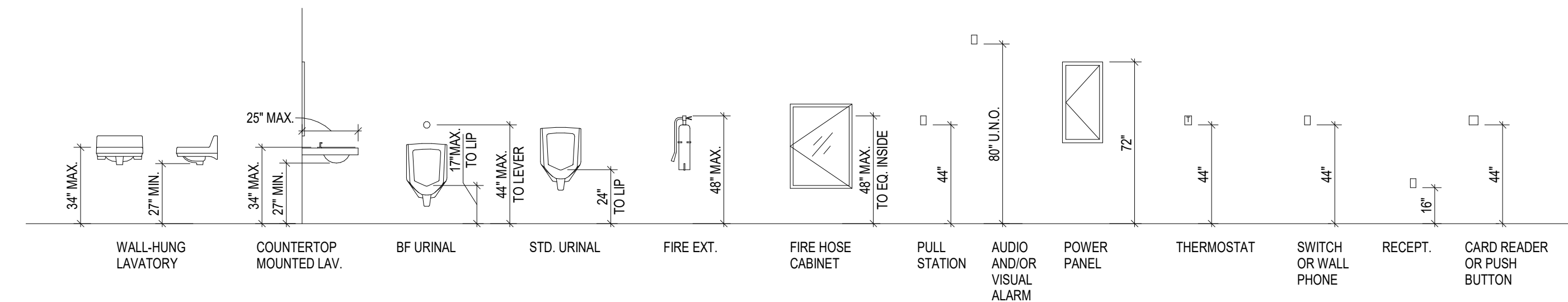
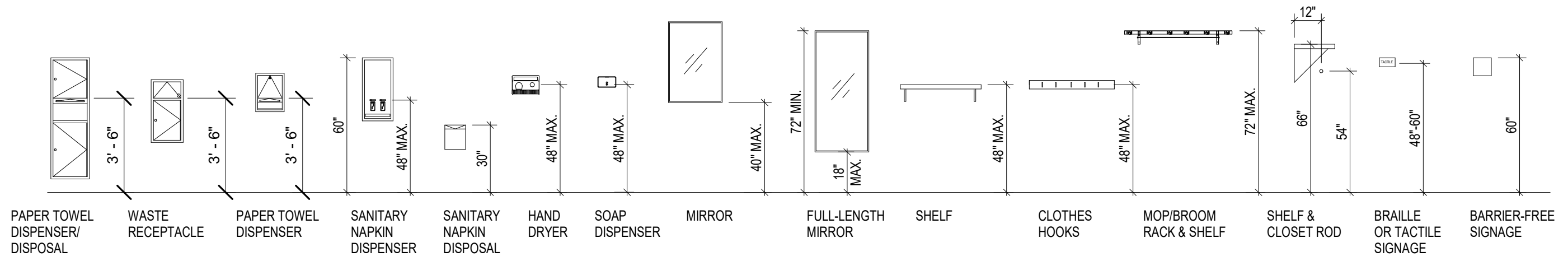


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NOTE:
 THE DIAGRAMS ON THIS SHEET ARE INTENDED TO CONVEY BARRIER FREE STANDARDS INCLUDING MINIMUM OR MAXIMUM MOUNTING HEIGHTS. FOR SPECIFIC MOUNTING HEIGHTS FOR VARIOUS ELEMENTS, REFER TO INTERIOR ELEVATIONS. DIMENSIONS ON INTERIOR ELEVATIONS TAKE PRECEDENCE OVER ADA TYPICAL DIAGRAMS. IF AN ELEVATION DIMENSION DOES NOT FALL WITHIN THE ADA GUIDELINES SHOWN ON THIS SHEET, REPORT THE DISCREPANCY TO THE ARCHITECT FOR CLARIFICATION.

BARRIER FREE & STANDARD MOUNTING HEIGHTS

NOT TO SCALE

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ADA - BF MOUNTING HEIGHTS
 BUS RAPID TRANSIT
 CITY OF MADISON



TOILET ROOM ACCESSORY LEGEND

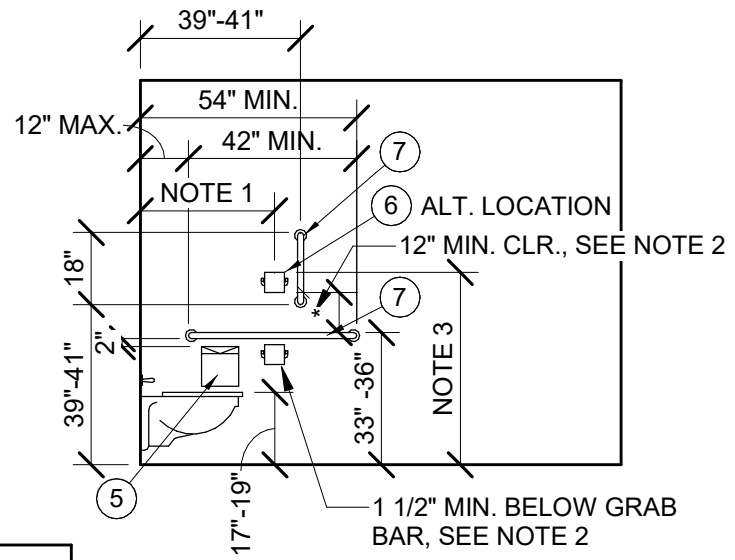
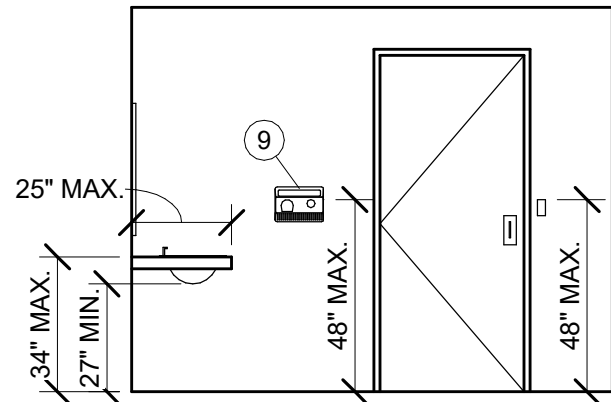
SYMBOL	DESCRIPTION	FURNISH/INSTALL
①	FRAMED MIRROR, SEE ELEVATIONS FOR SIZE	CFCI
②	SANITARY NAPKIN DISPENSER UNIT	CFCI
③	TOILET SEAT COVER DISPENSER	CFCI
④	WASTE CAN	CFCI
⑤	SANITARY NAPKIN DISPOSAL UNIT	CFCI
⑥	TOILET PAPER DISPENSER	CFCI
⑦	GRAB BARS	CFCI
⑧	SOAP DISPENSER	CFCI
⑨	HAND DRYER	CFCI
⑩	COAT HOOK	CFCI

NOTE:
 1. NOT ALL ITEMS IN LEGEND MAY BE USED.
 2. ALL TOILET ACCESSORIES ARE TO BE CFCI, UNO.

NOTES:

1. DISPENSER OUTLET ABOVE THE GRAB BAR SHALL BE 24" MIN. & 36" MAX. FROM REAR WALL. BELOW THE GRAB BAR, DISPENSER OUTLET SHALL BE 24" MIN. & 42" MAX. FROM REAR WALL.
2. NO PART OF ANY ACCESSORY SHALL BE WITHIN A ZONE 12" ABOVE AND 1 1/2" BELOW THE GRAB BAR. EXCEPTION: RECESSED DISPENSERS EXTENDING NO MORE THAN 1/4" BEYOND THE FACE OF WALL MAY CROSS THIS ZONE. NO PORTION OF A RECESSED DISPENSER SHALL BE BEHIND THE GRAB BAR ITSELF.
3. OUTLET OF DISPENSER SHALL BE 18" MIN. AND 48" MAX. ABOVE FLOOR.

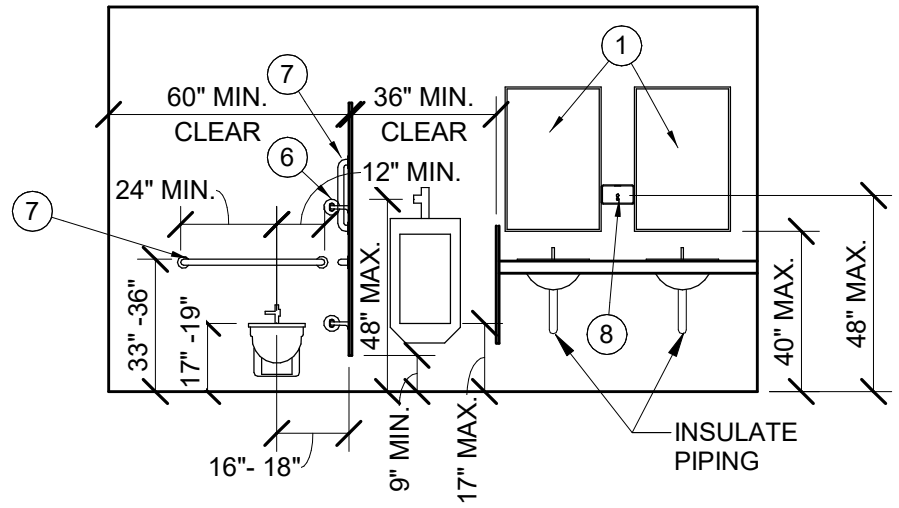
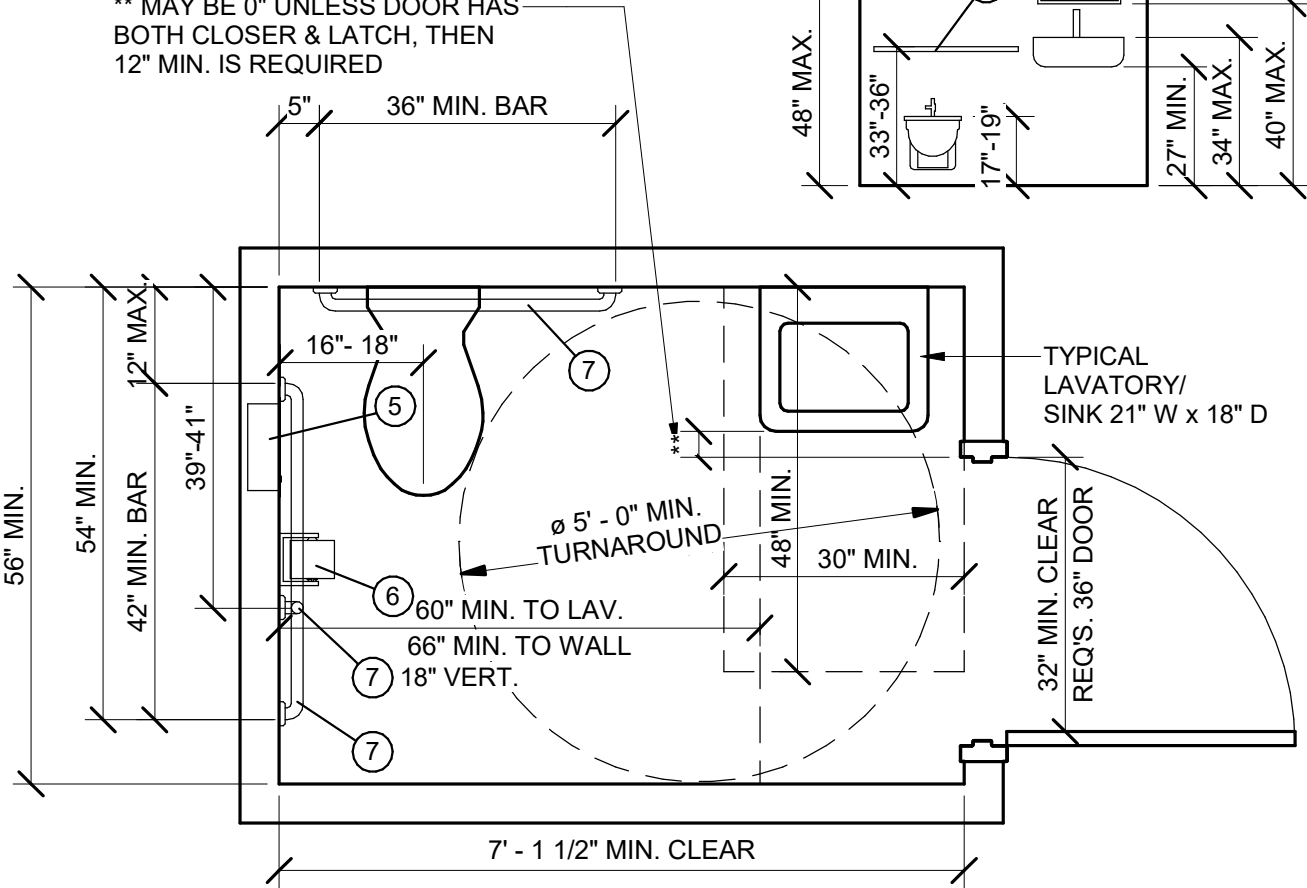
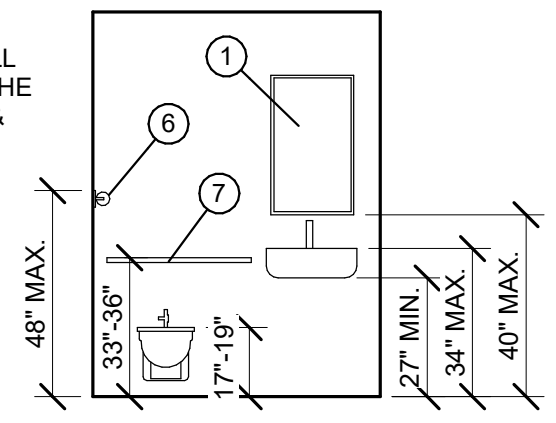
NOTE:
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NOTES:

1. DISPENSER OUTLET ABOVE THE GRAB BAR SHALL BE 24" MIN. & 36" MAX. FROM REAR WALL. BELOW THE GRAB BAR, DISPENSER OUTLET SHALL BE 24" MIN. & 42" MAX FROM REAR WALL.

** MAY BE 0" UNLESS DOOR HAS BOTH CLOSER & LATCH, THEN 12" MIN. IS REQUIRED



BARRIER FREE STANDARD ELEVATIONS

(REFER TO PLANS FOR ACTUAL LAYOUT)
 NOT TO SCALE

BARRIER FREE STANDARDS

(REFER TO PLANS FOR ACTUAL ROOM LAYOUT)
 NOT TO SCALE

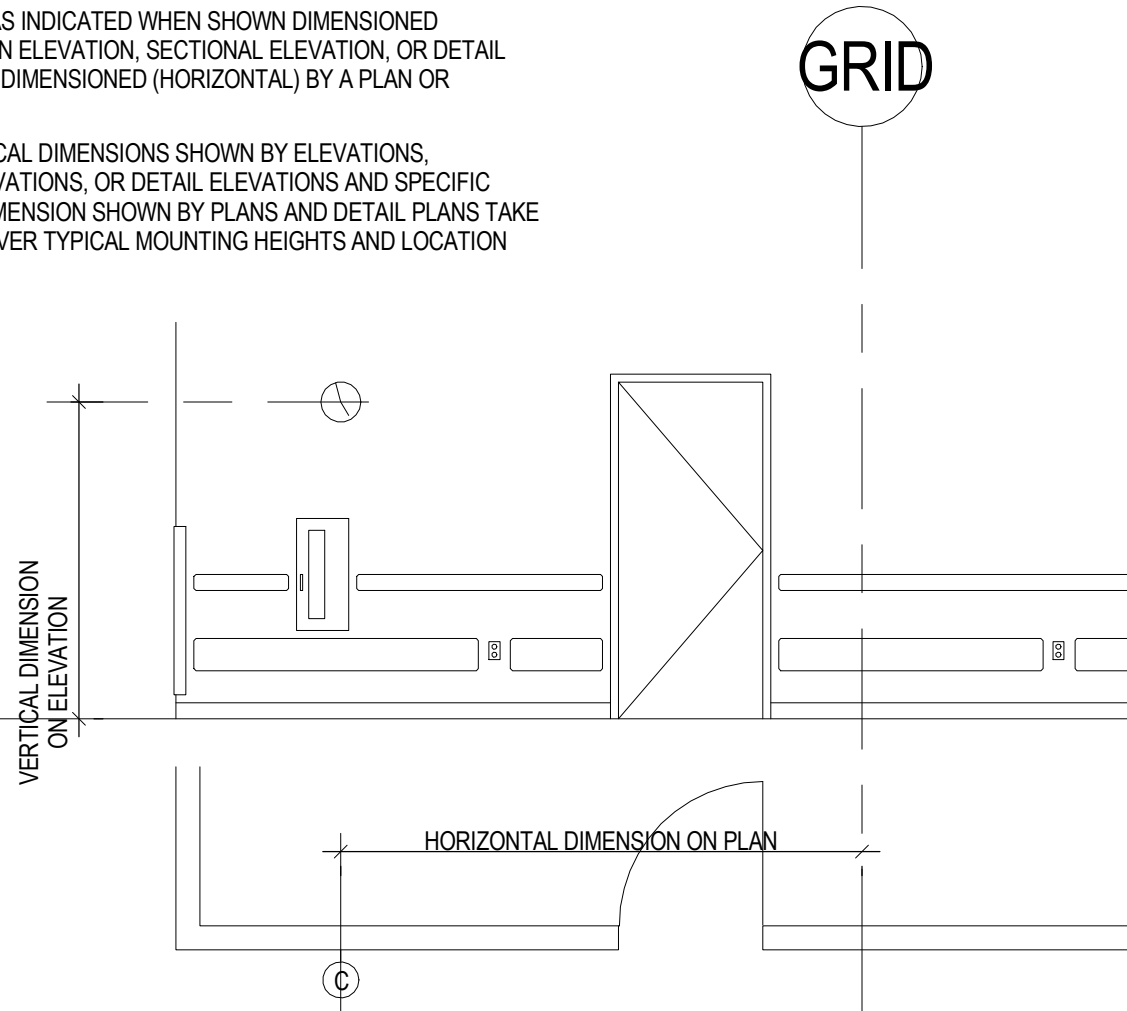
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COMFORT STATIONS ADA - BF STANDARDS
 BUS RAPID TRANSIT
 CITY OF MADISON



LOCATE ITEMS AS INDICATED WHEN SHOWN DIMENSIONED (VERTICAL) BY AN ELEVATION, SECTIONAL ELEVATION, OR DETAIL ELEVATION AND DIMENSIONED (HORIZONTAL) BY A PLAN OR DETAIL PLAN.

SPECIFIC VERTICAL DIMENSIONS SHOWN BY ELEVATIONS, SECTIONAL ELEVATIONS, OR DETAIL ELEVATIONS AND SPECIFIC HORIZONTAL DIMENSION SHOWN BY PLANS AND DETAIL PLANS TAKE PRECEDENCE OVER TYPICAL MOUNTING HEIGHTS AND LOCATION RULES.

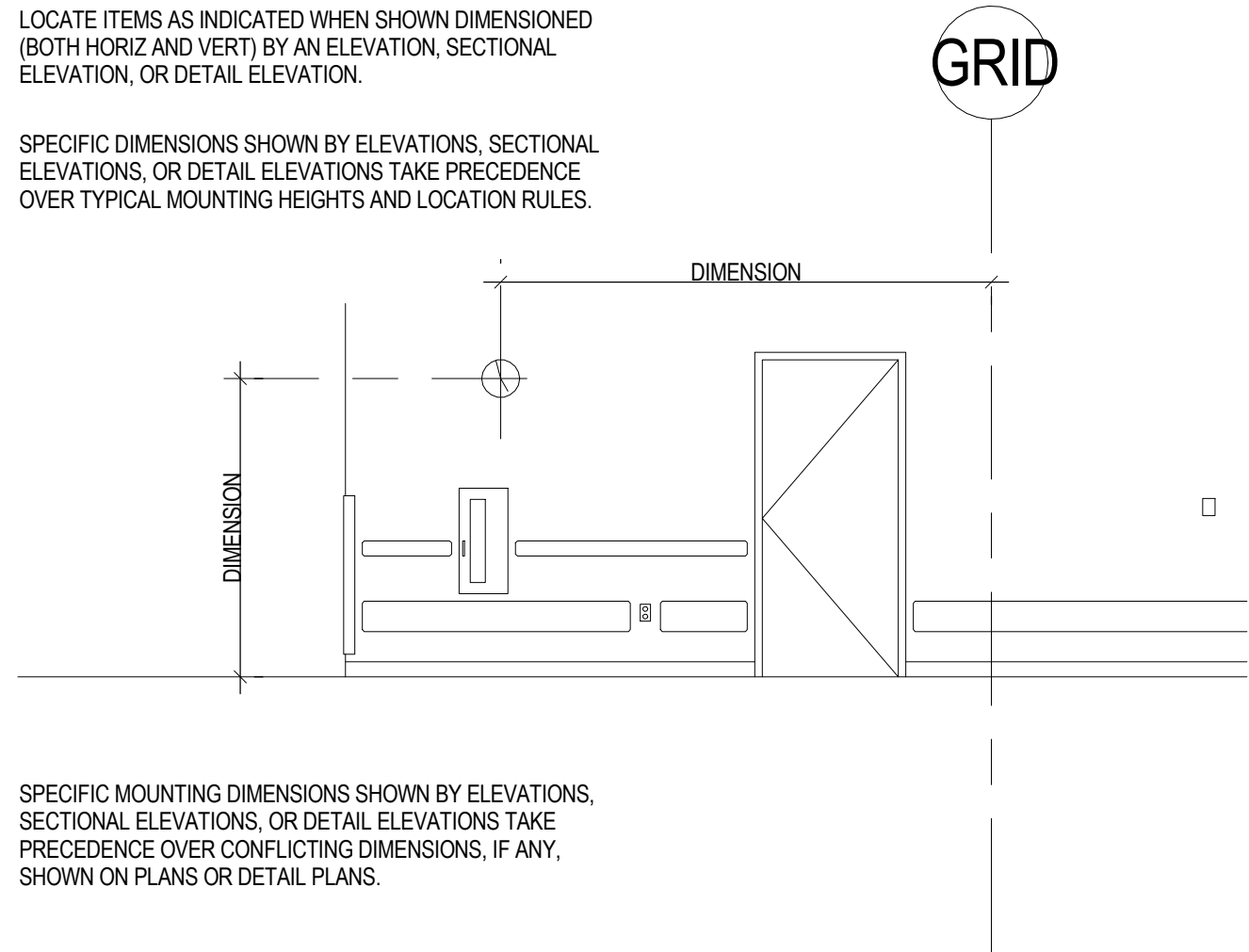


RULE 2

WHEN COMPLETELY DIMENSIONED BY COMBINATION OF PLAN AND ELEVATION

LOCATE ITEMS AS INDICATED WHEN SHOWN DIMENSIONED (BOTH HORIZ AND VERT) BY AN ELEVATION, SECTIONAL ELEVATION, OR DETAIL ELEVATION.

SPECIFIC DIMENSIONS SHOWN BY ELEVATIONS, SECTIONAL ELEVATIONS, OR DETAIL ELEVATIONS TAKE PRECEDENCE OVER TYPICAL MOUNTING HEIGHTS AND LOCATION RULES.



RULE 1

WHEN COMPLETELY DIMENSIONED IN ELEVATION



TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
 BUS RAPID TRANSIT
 CITY OF MADISON

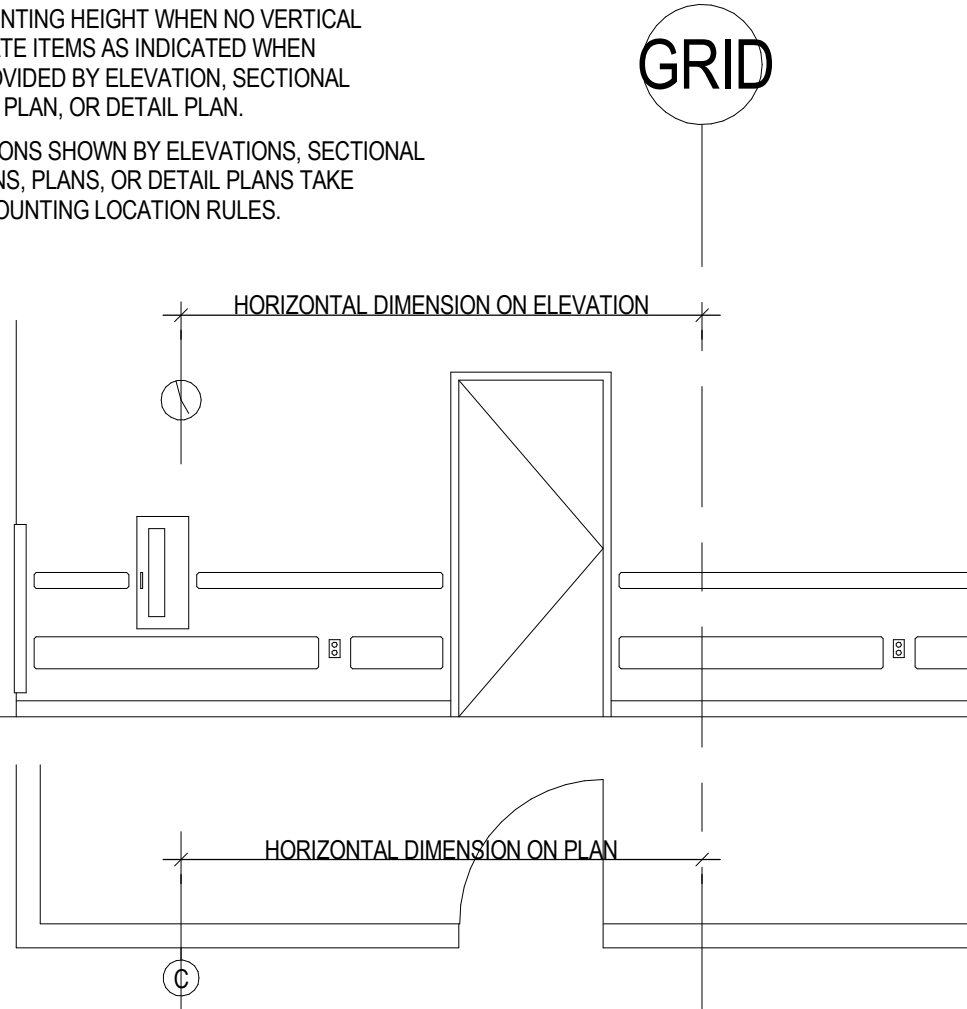
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LOCATE ITEMS AT TYPICAL MOUNTING HEIGHT WHEN NO VERTICAL DIMENSION IS PROVIDED. LOCATE ITEMS AS INDICATED WHEN HORIZONTAL DIMENSION IS PROVIDED BY ELEVATION, SECTIONAL ELEVATION, DETAIL ELEVATION, PLAN, OR DETAIL PLAN.

SPECIFIC HORIZONTAL DIMENSIONS SHOWN BY ELEVATIONS, SECTIONAL ELEVATIONS, DETAIL ELEVATIONS, PLANS, OR DETAIL PLANS TAKE PRECEDENCE OVER TYPICAL MOUNTING LOCATION RULES.

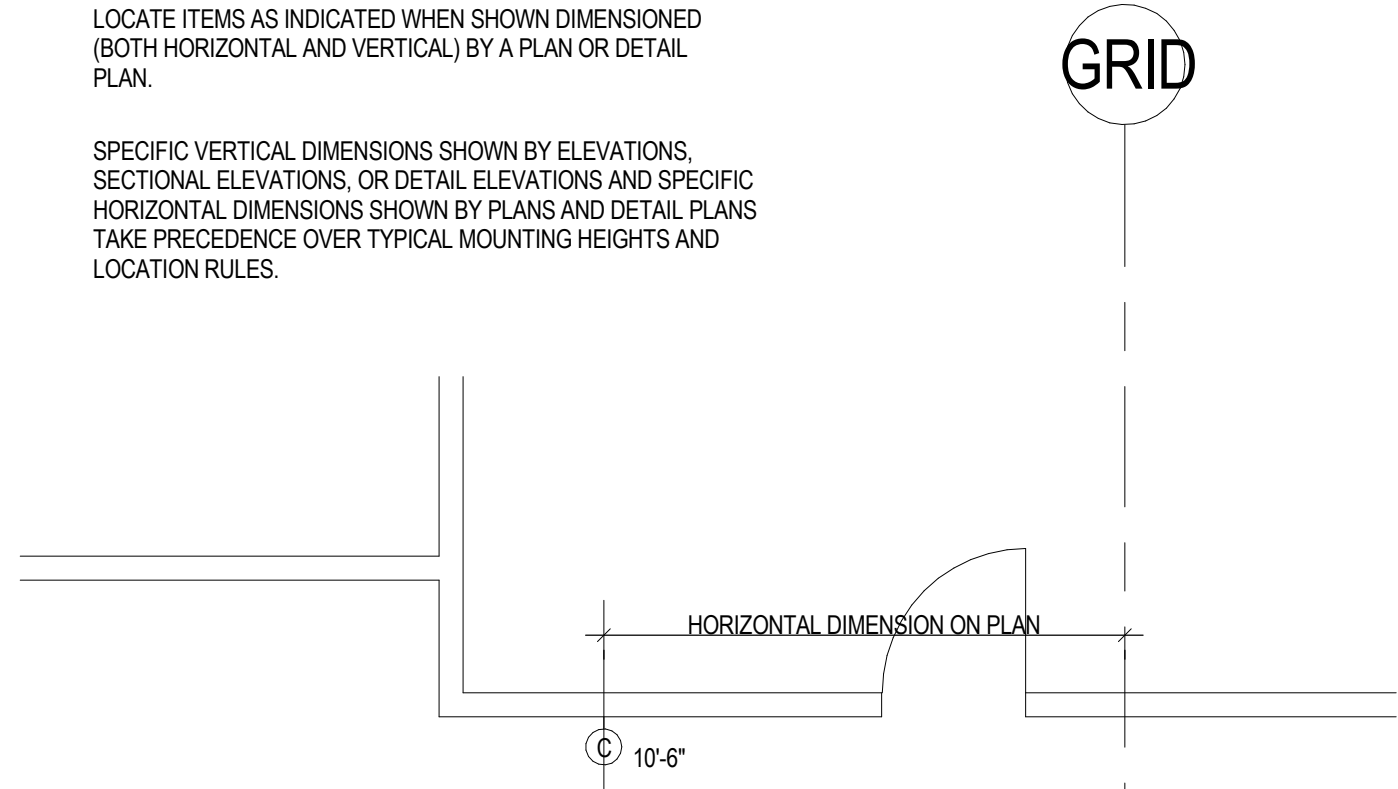


RULE 4

WHEN DIMENSIONED HORIZONTALLY IN PLAN OR ELEVATION, BUT NOT DIMENSIONED VERTICALLY

LOCATE ITEMS AS INDICATED WHEN SHOWN DIMENSIONED (BOTH HORIZONTAL AND VERTICAL) BY A PLAN OR DETAIL PLAN.

SPECIFIC VERTICAL DIMENSIONS SHOWN BY ELEVATIONS, SECTIONAL ELEVATIONS, OR DETAIL ELEVATIONS AND SPECIFIC HORIZONTAL DIMENSIONS SHOWN BY PLANS AND DETAIL PLANS TAKE PRECEDENCE OVER TYPICAL MOUNTING HEIGHTS AND LOCATION RULES.



RULE 3

WHEN COMPLETELY DIMENSIONED ON PLANS

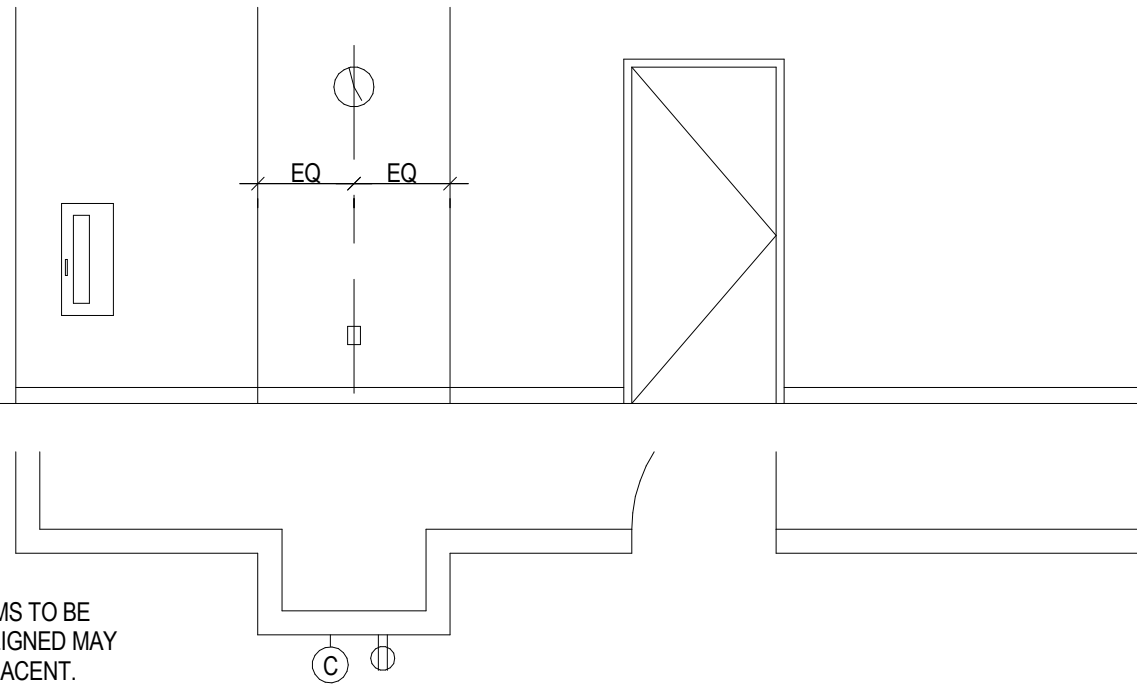
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WHEN NOT DIMENSIONED AND SHOWN LOCATED ON A COLUMN OR PILASTER, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: HORIZONTALLY CENTER ITEM ON FACE OF COLUMN OR PILASTER. ALIGN VERTICALLY CENTERS OF MULTIPLE ITEMS HAVING DIFFERING TYPICAL MOUNTING HEIGHTS.

WHEN MULTIPLE ITEMS HAVING THE SAME TYP MOUNTING HEIGHT ARE INDICATED, HORIZONTALLY CENTER GROUP OF ITEMS ON FACE OF COLUMN OR PILASTER (SEE RULE 7).



ON PLANS, ITEMS TO BE VERTICALLY ALIGNED MAY BE SHOWN ADJACENT.

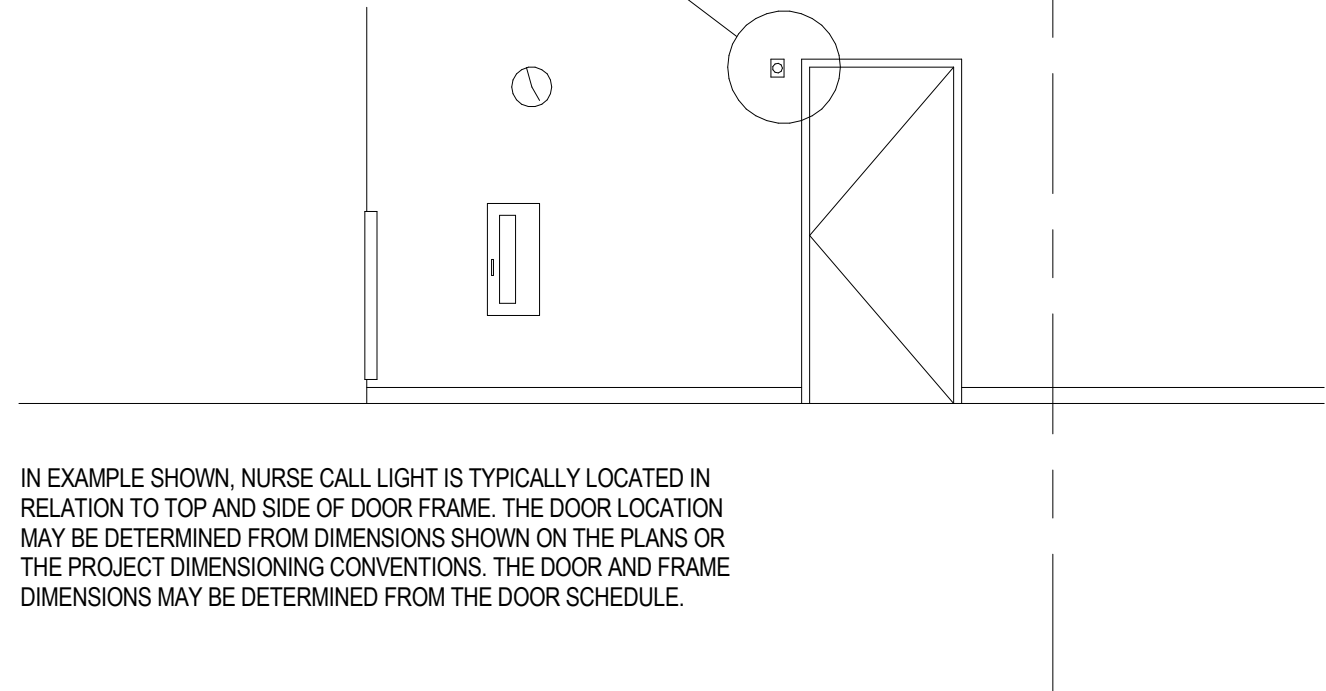
RULE 6

NOT DIMENSIONED AND LOCATED ON COLUMN OR PILASTER

UTILIZE TYPICAL MOUNTING CONFIGURATION DIAGRAMS PROVIDED TO DETERMINE HORIZONTAL AND VERTICAL LOCATION OF ITEM OR GROUP OF ITEMS IN RELATION TO OTHER, DIMENSIONED ITEMS.

SPECIFIC DIMENSIONS SHOWN BY TYPICAL MOUNTING CONFIGURATION DIAGRAMS TAKE PRECEDENCE OVER CONFIGURATIONS SHOWN WITHOUT DIMENSIONS ON ELEVATIONS.

SEE APPLICABLE TYPICAL CONFIGURATION DIAGRAM



IN EXAMPLE SHOWN, NURSE CALL LIGHT IS TYPICALLY LOCATED IN RELATION TO TOP AND SIDE OF DOOR FRAME. THE DOOR LOCATION MAY BE DETERMINED FROM DIMENSIONS SHOWN ON THE PLANS OR THE PROJECT DIMENSIONING CONVENTIONS. THE DOOR AND FRAME DIMENSIONS MAY BE DETERMINED FROM THE DOOR SCHEDULE.

RULE 5

WHEN NO DIMENSIONS ARE PROVIDED IN PLANS OR ELEVATIONS

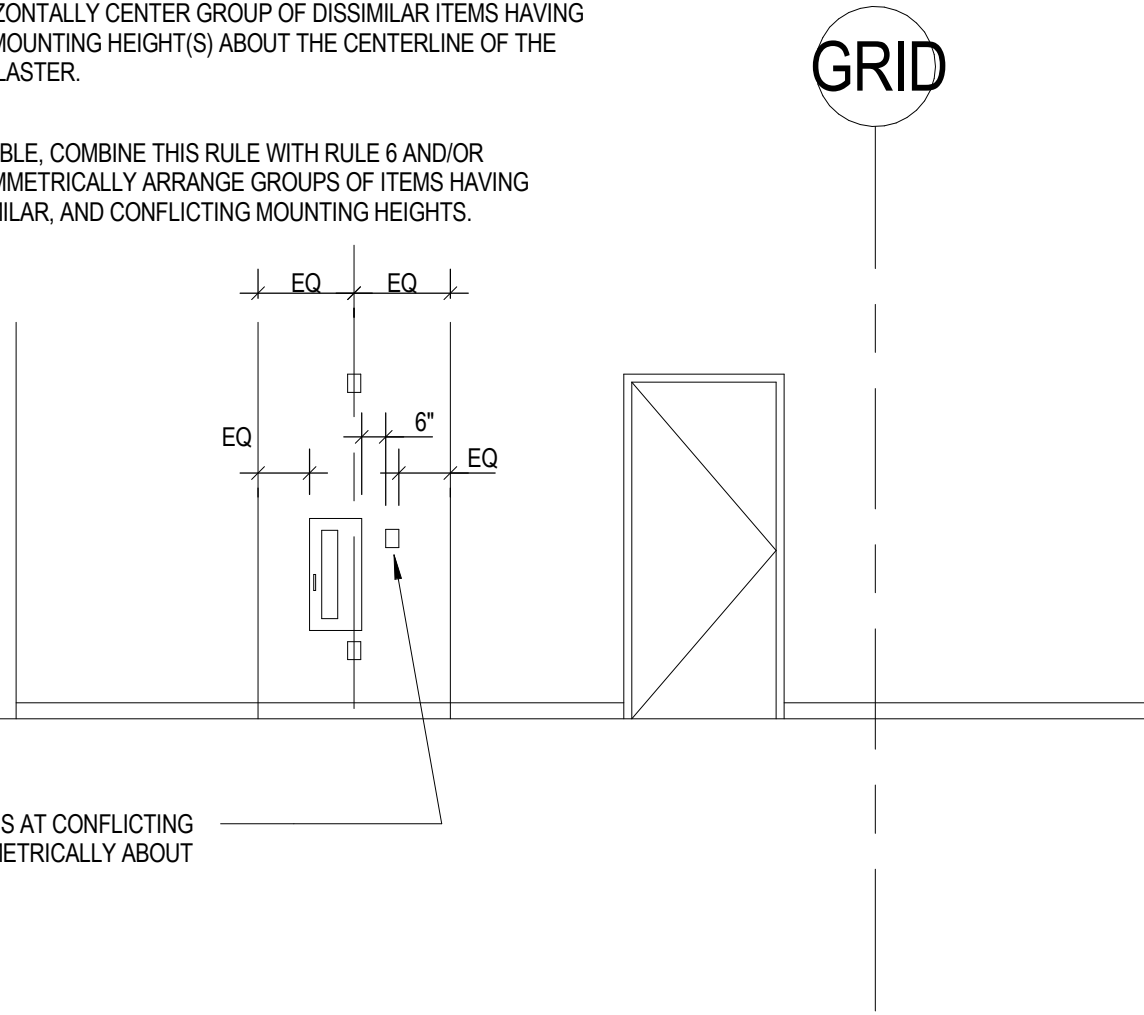
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 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C
 TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
 BUS RAPID TRANSIT
 CITY OF MADISON



WHEN NOT DIMENSIONED AND SHOWN LOCATED ON A COLUMN OR PILASTER, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: HORIZONTALLY CENTER GROUP OF DISSIMILAR ITEMS HAVING CONFLICTING MOUNTING HEIGHT(S) ABOUT THE CENTERLINE OF THE COLUMN OR PILASTER.

WHEN APPLICABLE, COMBINE THIS RULE WITH RULE 6 AND/OR RULE 7 TO SYMMETRICALLY ARRANGE GROUPS OF ITEMS HAVING DIFFERING, SIMILAR, AND CONFLICTING MOUNTING HEIGHTS.



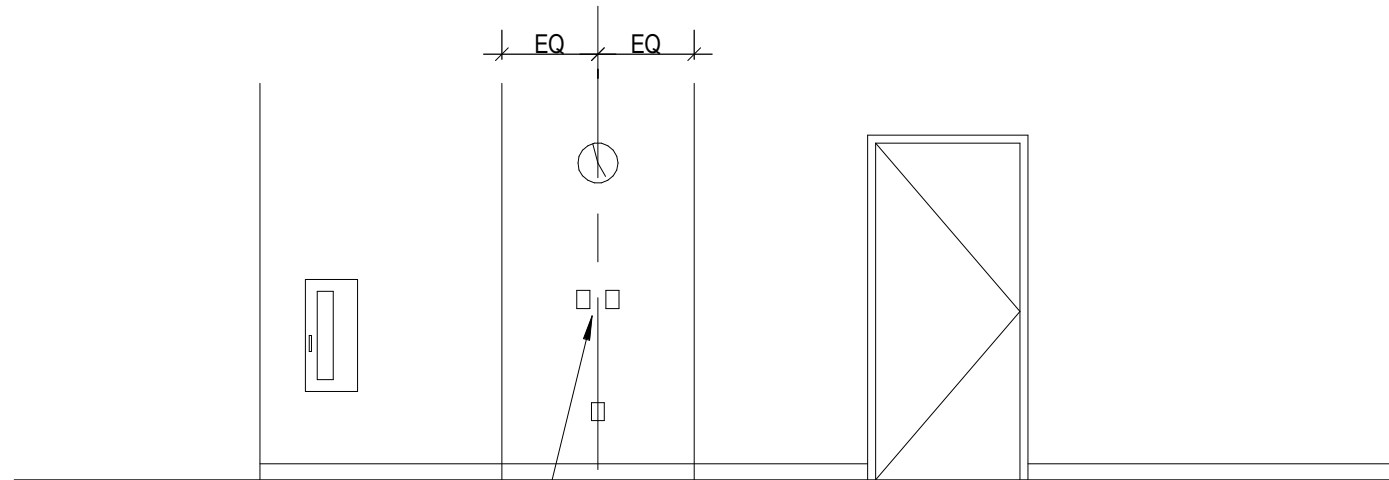
ARRANGE ITEMS AT CONFLICTING HEIGHTS SYMMETRICALLY ABOUT CENTERLINE

RULE 8

NOT DIMENSIONED AND LOCATED ON COLUMN OR PILASTER

WHEN NOT DIMENSIONED AND SHOWN LOCATED ON A COLUMN OR PILASTER, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: HORIZONTALLY CENTER GROUP OF SIMILAR ITEMS HAVING THE SAME MOUNTING HEIGHT(S) ABOUT THE CENTERLINE OF THE COLUMN OR PILASTER.

WHEN APPLICABLE, COMBINE THIS RULE WITH RULE 6 TO SYMMETRICALLY ARRANGE GROUPS OF ITEMS HAVING BOTH DIFFERING AND SIMILAR MOUNTING HEIGHTS.



ARRANGE ITEMS AT SAME HEIGHT SYMMETRICALLY ABOUT CENTERLINE

RULE 7

NOT DIMENSIONED AND LOCATED ON COLUMN OR PILASTER

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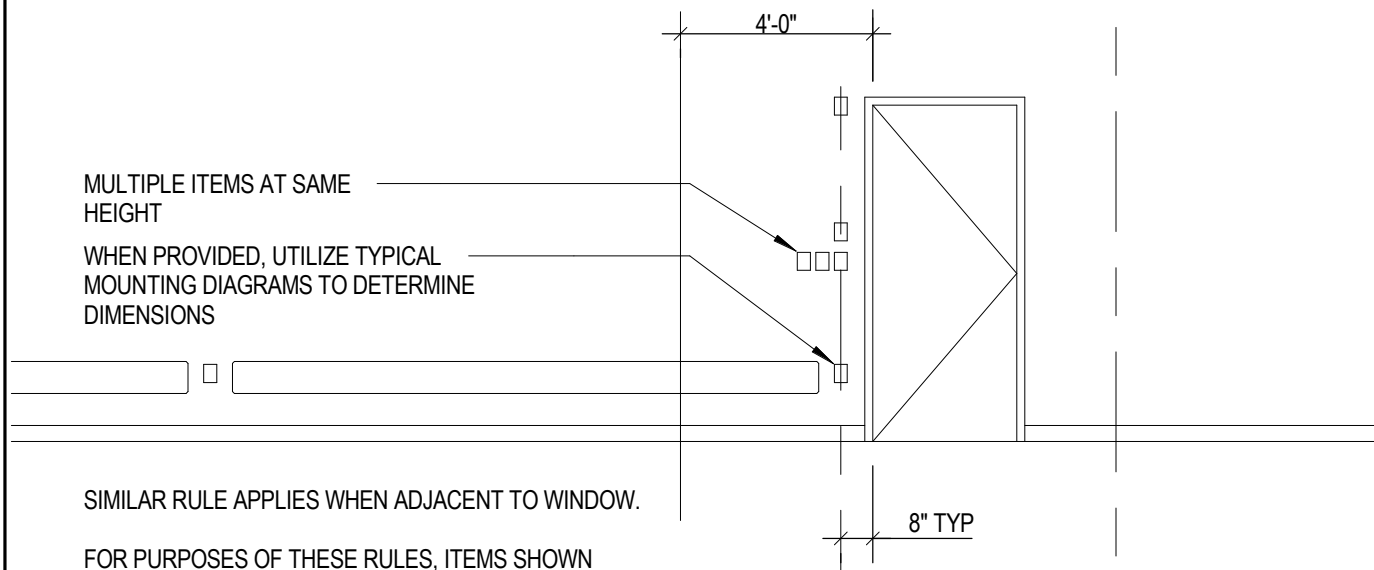
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TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
 BUS RAPID TRANSIT
 CITY OF MADISON



WHEN NOT DIMENSIONED AND SHOWN LOCATED ADJACENT TO DOOR, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: MOUNT ITEMS IN RELATION TO FRAME USING TYPICAL OFFSET DIMENSION. VERTICALLY ALIGN CENTERS OF ITEMS MOUNTED AT DIFFERENT HEIGHTS.

WHEN MULTIPLE ITEMS HAVING THE SAME TYPICAL MOUNTING HEIGHT ARE INDICATED, MOUNT FIRST ITEM IN RELATION TO FRAME USING TYPICAL OFFSET DIMENSION AND PLACE REMAINING ITEMS ADJACENT TO FIRST ON SIDE OPPOSITE FRAME AS ILLUSTRATED BY THIS DIAGRAM.



MULTIPLE ITEMS AT SAME HEIGHT
WHEN PROVIDED, UTILIZE TYPICAL MOUNTING DIAGRAMS TO DETERMINE DIMENSIONS

SIMILAR RULE APPLIES WHEN ADJACENT TO WINDOW.

FOR PURPOSES OF THESE RULES, ITEMS SHOWN LOCATED APPROXIMATELY WITHIN 4 FEET OF DOOR ARE CONSIDERED TO BE ADJACENT TO DOOR (OR WINDOW).

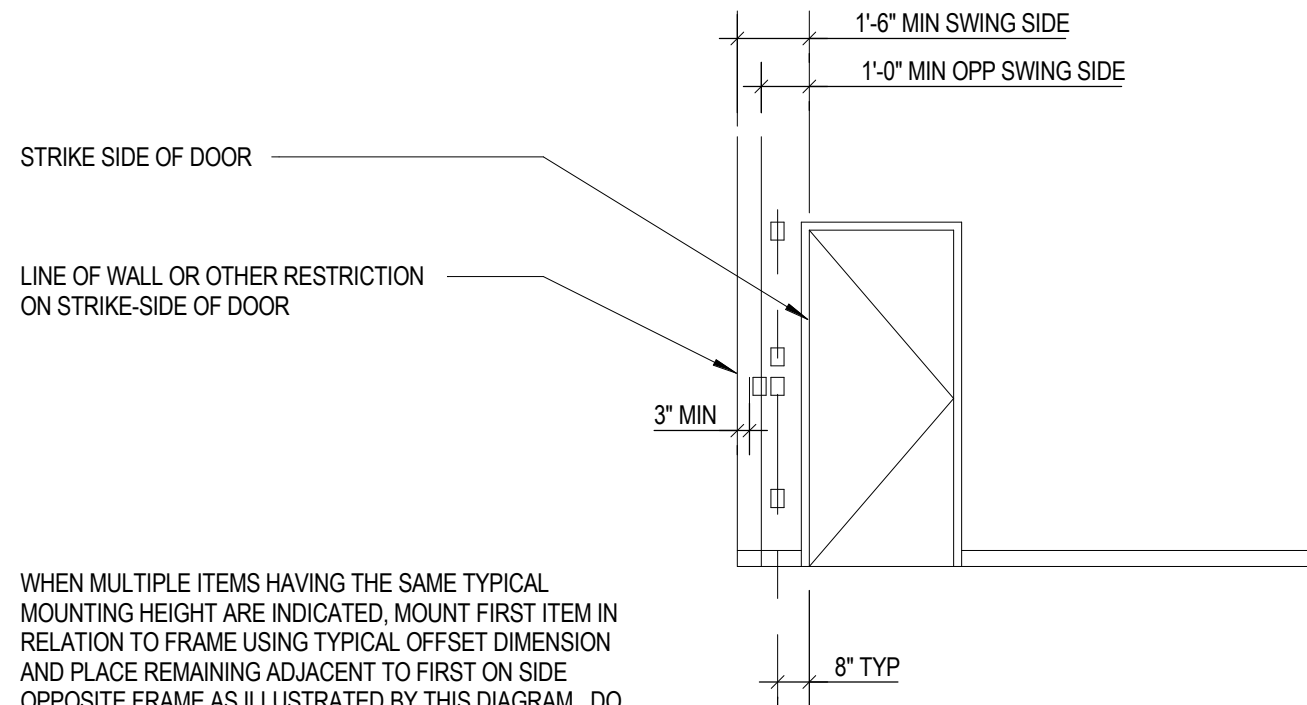
WHERE MULTIPLE DISSIMILAR ITEMS HAVING CONFLICTING MOUNTING HEIGHTS OCCUR, RULE 13 ALSO APPLIES.

RULE 10

NOT DIMENSIONED AND LOCATED ADJACENT TO DOOR OR WINDOW



WHEN NOT DIMENSIONED AND SHOWN LOCATED ADJACENT TO STRIKE SIDE OF DOOR, AND WHEN STRIKE-SIDE CLEARANCE IS BETWEEN 12 INCHES AND 18 INCHES, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: MOUNT ITEMS IN RELATION TO FRAME USING TYPICAL OFFSET DIMENSION. VERTICALLY ALIGN CENTERS OF ITEMS MOUNTED AT DIFFERENT HEIGHTS.



STRIKE SIDE OF DOOR

LINE OF WALL OR OTHER RESTRICTION ON STRIKE-SIDE OF DOOR

WHEN MULTIPLE ITEMS HAVING THE SAME TYPICAL MOUNTING HEIGHT ARE INDICATED, MOUNT FIRST ITEM IN RELATION TO FRAME USING TYPICAL OFFSET DIMENSION AND PLACE REMAINING ADJACENT TO FIRST ON SIDE OPPOSITE FRAME AS ILLUSTRATED BY THIS DIAGRAM. DO NOT CROWD MULTIPLE ITEMS AGAINST WALL OR RESTRICTION.

RULE 9

NOT DIMENSIONED AND LOCATED ADJACENT TO MINIMUM STRIKE-SIDE OF DOOR

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TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES

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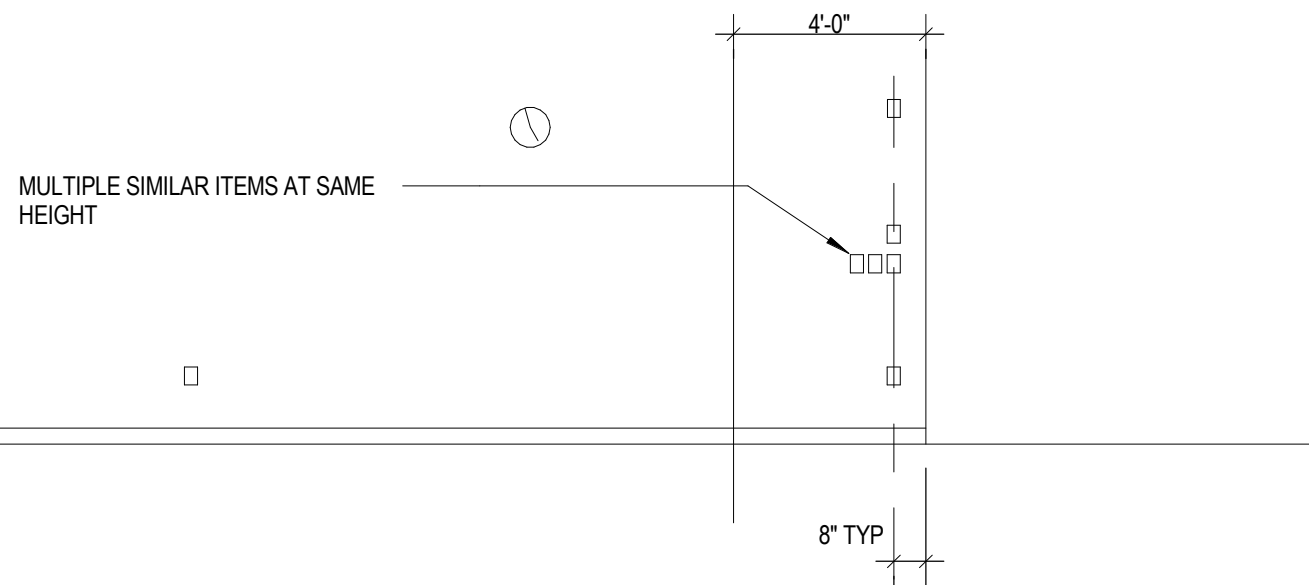
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WHEN NOT DIMENSIONED AND SHOWN LOCATED ADJACENT TO CHANGE IN PLANE OF WALL, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: MOUNT ITEMS IN RELATION TO PLANE CHANGE USING TYPICAL OFFSET DIMENSION. VERTICALLY ALIGN CENTERS OF ITEMS MOUNTED AT DIFFERENT HEIGHTS.

WHEN MULTIPLE SIMILAR ITEMS HAVING THE SAME TYPICAL MOUNTING HEIGHT ARE INDICATED, MOUNT FIRST ITEM IN RELATION TO PLANE CHANGE USING TYPICAL OFFSET DIMENSION AND PLACE REMAINING ITEMS ADJACENT TO FIRST ON SIDE OPPOSITE PLANE CHANGE AS ILLUSTRATED BY THIS DIAGRAM.



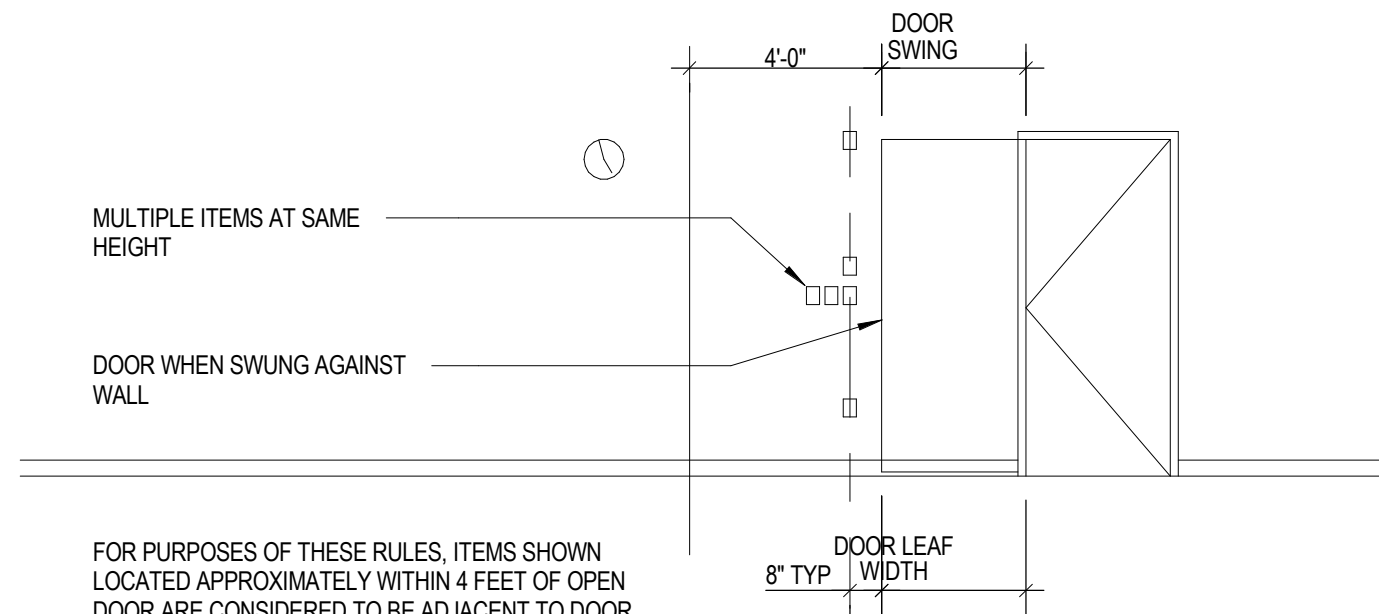
FOR PURPOSES OF THESE RULES, ITEMS SHOWN LOCATED APPROXIMATELY WITHIN 4 FEET OF PLANE CHANGE ARE CONSIDERED TO BE ADJACENT TO CHANGE IN PLANE.

RULE 12

WHEN NOT DIMENSIONED AND LOCATED ADJACENT TO CHANGE IN WALL DIRECTION

WHEN NOT DIMENSIONED AND SHOWN LOCATED ADJACENT TO DOOR, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: MOUNT ITEMS IN RELATION TO SWING USING TYP OFFSET DIMENSION. VERTICALLY ALIGN CENTERS OF ITEMS MOUNTED AT DIFFERENT HEIGHTS.

WHEN MULTIPLE ITEMS HAVING THE SAME TYPICAL MOUNTING HEIGHT ARE INDICATED, MOUNT FIRST ITEM IN RELATION TO SWING USING TYPICAL OFFSET DIMENSION AND PLACE REMAINING ITEMS ADJACENT TO FIRST ON SIDE OPPOSITE FRAME AS ILLUSTRATED BY THIS DIAGRAM.



FOR PURPOSES OF THESE RULES, ITEMS SHOWN LOCATED APPROXIMATELY WITHIN 4 FEET OF OPEN DOOR ARE CONSIDERED TO BE ADJACENT TO DOOR.

WHERE MULTIPLE DISSIMILAR ITEMS HAVING CONFLICTING MOUNTING HEIGHTS OCCUR, RULE 13 ALSO APPLIES.

RULE 11

NOT DIMENSIONED AND LOCATED ADJACENT TO DOOR AND ON WALL AGAINST WHICH DOOR SWINGS

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TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES

BUS RAPID TRANSIT



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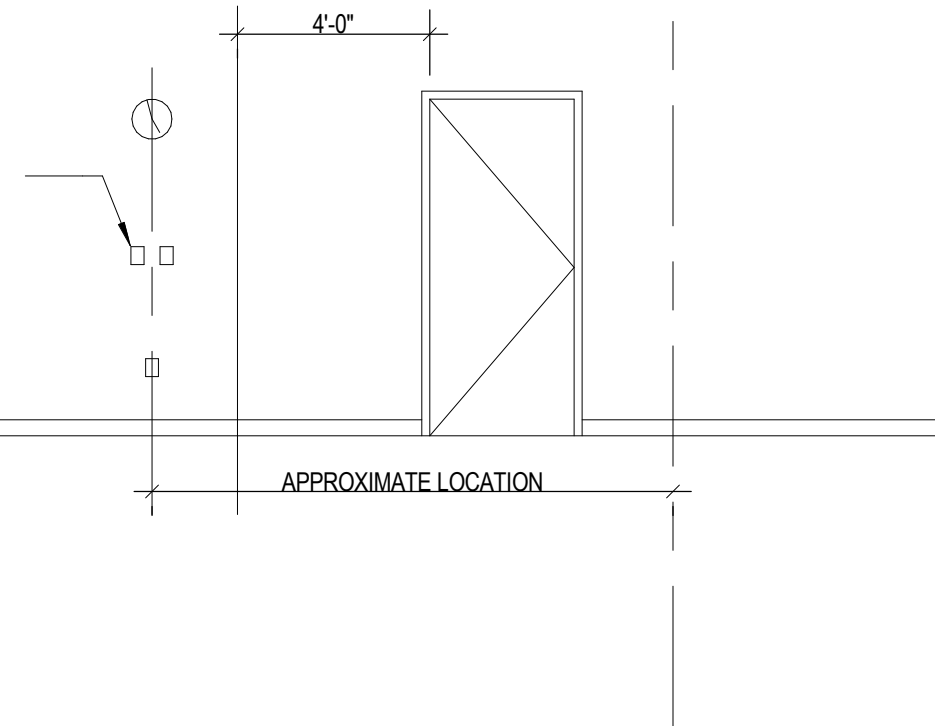


G013

WHEN NOT DIMENSIONED AND SHOWN ON A WALL NOT ADJACENT TO DOORS, WINDOWS, OR CHANGES IN WALL PLANE, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: LOCATE AT APPROXIMATE HORIZONTAL POSITION SHOWN ON PLANS OR ELEVATIONS. GROUP ITEMS HAVING DIFFERENT MOUNTING HEIGHTS INTO SINGLE, SYMMETRICAL ARRANGEMENT BY VERTICALLY ALIGNING CENTERS OF ITEMS. MAINTAIN MINIMUM 36" HORIZONTAL SEPARATION BETWEEN ITEMS OR GROUPS OF ITEMS WHICH CANNOT BE ALIGNED VERTICALLY (SEE RULE 15). WHEN APPLICABLE, SYMMETRICALLY ARRANGE GROUPS OF SIMILAR ITEMS HAVING THE SAME MOUNTING HEIGHT AROUND THE VERTICAL AXIS ESTABLISHED.

GRID

ARRANGE SIMILAR ITEMS AT SAME HEIGHT SYMMETRICALLY ABOUT CENTERLINE

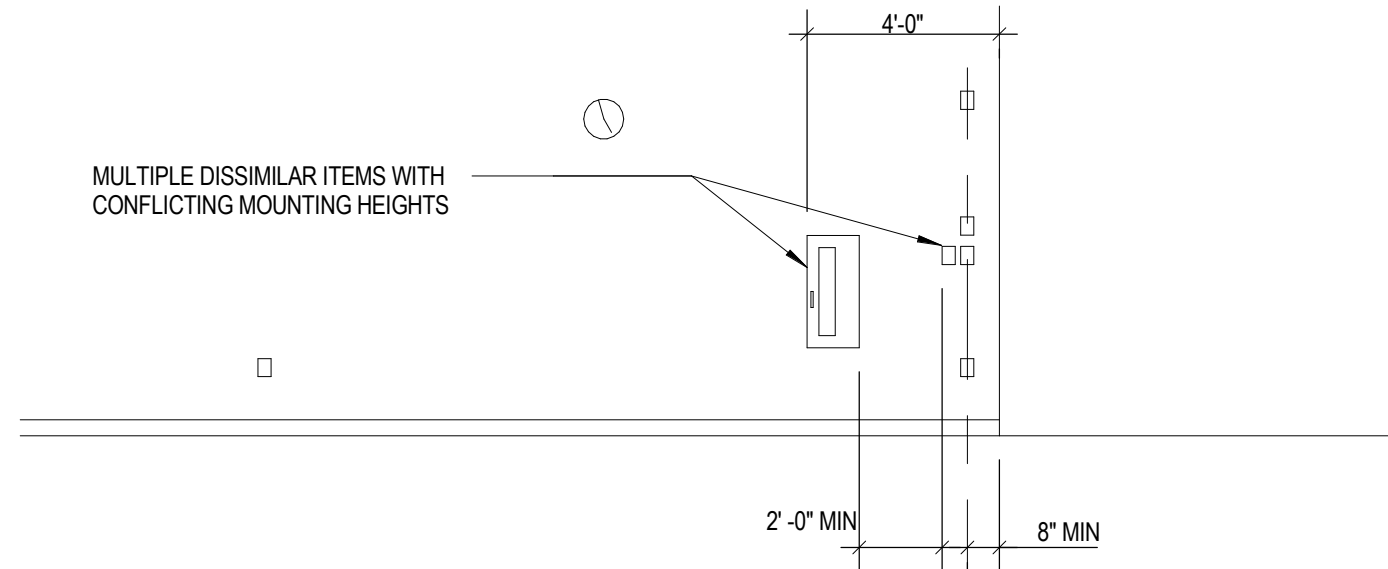


RULE 14

NOT DIMENSIONED AND LOCATED ON OPEN WALL

WHEN NOT DIMENSIONED AND SHOWN LOCATED ADJACENT TO CHANGE IN PLANE OF WALL, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: MOUNT ITEMS IN RELATION TO PLANE CHANGE USING TYPICAL OFFSET DIMENSION. VERTICALLY ALIGN CENTERS OF ITEMS MOUNTED AT DIFFERENT HEIGHTS.

WHEN MULTIPLE DISSIMILAR ITEMS HAVING CONFLICTING MOUNTING HEIGHTS ARE INDICATED, MOUNT FIRST ITEM IN RELATION TO PLANE CHANGE USING TYPICAL OFFSET DIMENSION. SEPARATE DISSIMILAR ITEM FROM GROUP OF SIMILAR ITEMS BY 24" MINIMUM AS ILLUSTRATED BY THIS DIAGRAM.



MULTIPLE DISSIMILAR ITEMS WITH CONFLICTING MOUNTING HEIGHTS

RULE 13

WHEN NOT DIMENSIONED AND LOCATED ADJACENT TO CHANGE IN WALL DIRECTION

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TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES

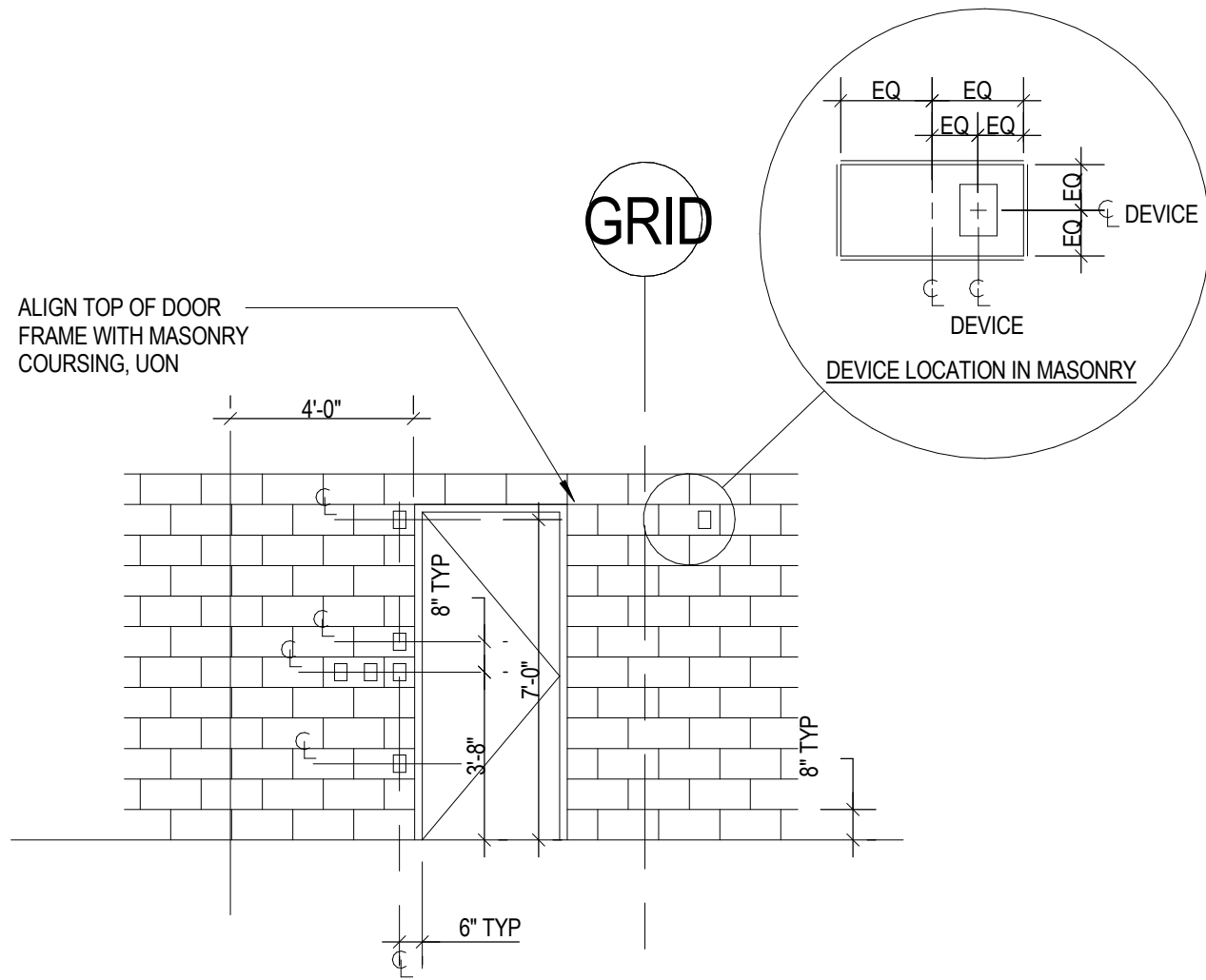
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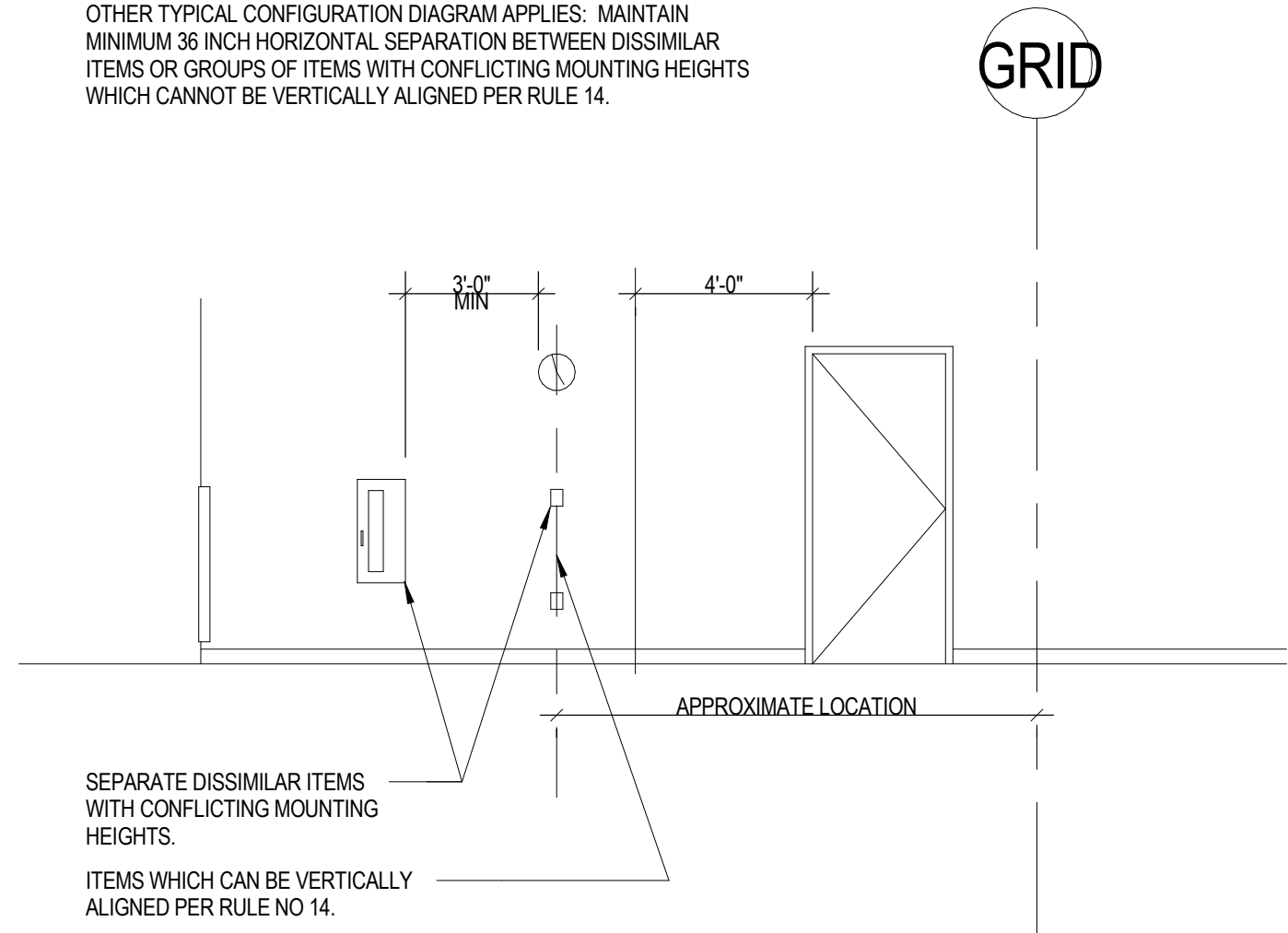


NOTE:
REFER TO RULE 10 FOR TYPICAL NOTES.

RULE 16

NOT DIMENSIONED AND LOCATED ADJACENT TO DOOR OR WINDOW IN MASONRY

WHEN NOT DIMENSIONED AND SHOWN ON A WALL NOT ADJACENT TO DOORS, WINDOWS, OR CHANGES IN WALL PLANE, AND WHEN NO OTHER TYPICAL CONFIGURATION DIAGRAM APPLIES: MAINTAIN MINIMUM 36 INCH HORIZONTAL SEPARATION BETWEEN DISSIMILAR ITEMS OR GROUPS OF ITEMS WITH CONFLICTING MOUNTING HEIGHTS WHICH CANNOT BE VERTICALLY ALIGNED PER RULE 14.



SEPARATE DISSIMILAR ITEMS
WITH CONFLICTING MOUNTING
HEIGHTS.

ITEMS WHICH CAN BE VERTICALLY
ALIGNED PER RULE NO 14.

RULE 15

NOT DIMENSIONED AND LOCATED ON OPEN WALL

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TYPICAL RULES FOR MOUNTING HEIGHTS & LOCATION RULES
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ABBREVIATIONS

Table listing abbreviations such as AIR, AIR COMPRESSOR, ABOVE FINISHED FLOOR, BACK DRAFT DAMPER, etc., up to WATER SUPPLY FIXTURE UNITS.

PIPE SYMBOLS

Table listing pipe symbols for various pipe types like ABOVE GRADE COLD WATER, BELOW GRADE COLD WATER, ABOVE GRADE HOT WATER, etc., up to CONNECTION POINT.

PIPE SYMBOLS (CONT.)

Table listing pipe symbols for specialties like BOILER BLOW DOWN, CONDENSATE PUMP DISCHARGE, HIGH PRESSURE STEAM, etc., up to LOW PRESSURE RETURN.

PIPE SPECIALTIES (GENERAL)

Table listing general pipe specialties like ELBOW, TEE, ELBOW UP, ELBOW DOWN, CONNECTION TOP, etc., up to PLUG.

PIPE SPECIALTIES (PLUMBING)

Table listing plumbing specialties like FIRE HYDRANT, FLOOR DRAIN, ROOF DRAIN, FLOOR CLEANOUT, SANITARY VENT, etc., up to SANITARY VENT (ACID).

TEMPERATURE CONTROL SYMBOLS

Table listing temperature control symbols like TEMPERATURE CONTROL PANEL, THERMOSTAT - ELECTRIC, THERMOSTAT - PNEUMATIC, etc., up to FAN-OFF-HEAT.

PIPE SPECIALTIES (HVAC)

Table listing HVAC pipe specialties like GUIDE, ANCHOR, FLOW MEASURING DEVICE, THERMOSTATIC TRAP, etc., up to PRESSURE GAUGE.

VALVE SYMBOLS

Table listing valve symbols like WATER MAIN VALVE, WALL HYDRANT (NON-FREEZE), HOSE BIBB, GAS COCK, etc., up to TRAP PRIMER VALVE.

DUCTWORK SYMBOLS

Table listing ductwork symbols like POSITIVE PRESSURE AIR DUCT RISE, POSITIVE PRESSURE AIR DUCT DROP, NEGATIVE PRESSURE AIR DUCT RISE, etc., up to CHANGE OF ELEVATION RISE (R), DROP (D).

NOTE: 1. THIS LIST OF ABBREVIATIONS SHOWN IS A STANDARD LIST. NOT ALL ABBREVIATIONS AND SYMBOLS ARE USED IN THESE CONTRACT DRAWINGS.

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CITY OF MADISON, DANE COUNTY, WI

MECHANICAL ABBREVIATIONS AND SYMBOLS

BUS RAPID TRANSIT
CITY OF MADISON



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ELECTRICAL SYMBOL LEGENDS

POWER	
	MOTOR
	NON-FUSED DISCONNECT
	FUSED DISCONNECT
	COMBINATION MAGNETIC STARTER
	MANUAL MOTOR STARTER
	JUNCTION BOX
	TRANSFORMER JUNCTION BOX
	PUSHBUTTON/CONTROL STATION
	ELECTRIC DOOR OPERATOR PUSHBUTTON
	TELEPHONE OUTLET
	DATA OUTLET
	COMBINATION, TELEPHONE/DATA OUTLET
	COMBINATION, TELEPHONE/DATA OUTLET CEILING MOUNT
	COMBINATION, TELEPHONE/DATA OUTLET FLOOR MOUNT
	AUTOMATIC AUDIBLE DOOR BELL
	CABLE \ TELEVISION OUTLET
	CABLE \ TELEVISION OUTLET, CEILING MOUNT
	FLAT PANEL DISPLAY
	FLAT PANEL DISPLAY, CEILING MOUNT
	CABLE TRAY
	FLOAT SWITCH
	120V, 20A, DUPLEX RECEPTACLE DG - DETENTION GRADE EWC - ELECTRIC WATER COOLER WITH GFI RECEPTACLE EXP - EXPLOSION PROOF GF - GROUND FAULT PROTECTION GFI - GROUND FAULT INTERRUPTER IG - ISOLATED GROUND R - RACK MOUNTED TR - TAMPER RESISTANT TW - TWIST LOCK U - UPS POWER WP - WEATHERPROOF +XX" - XX INCHES ABOVE FINISHED FLOOR

POWER	
	120V, 20A, DOUBLE DUPLEX RECEPTACLE AFCI - ARC FAULT CIRCUIT INTERRUPTER EXP - EXPLOSION PROOF GF - GROUND FAULT PROTECTION GFI - GROUND FAULT INTERRUPTER IG - ISOLATED GROUND R - RACK MOUNTED TR - TAMPER RESISTANT TW - TWIST LOCK U - UPS POWER WP - WEATHERPROOF +XX" - XX INCHES ABOVE FINISHED FLOOR
	120V, 20A, SINGLE RECEPTACLE
	120V, 20A, DUAL CONTROLLED DUPLEX RECEPTACLE CONTROLLED RECEPTACLES SHALL BE CONTROLLED BY THE LIGHTING CONTROL SYSTEM AND TURN OFF AFTER THE SPACE HAS BEEN UNOCCUPIED FOR 20 MINUTES.
	120V, 20A, DOUBLE DUPLEX RECEPTACLE WITH ONE DUAL-CONTROLLED DUPLEX RECEPTACLE AND ONE UNCONTROLLED DUPLEX RECEPTACLE CONTROLLED RECEPTACLES SHALL BE CONTROLLED BY THE LIGHTING CONTROL SYSTEM AND TURN OFF AFTER THE SPACE HAS BEEN UNOCCUPIED FOR 20 MINUTES.
	WALL FEED FOR POWER AND COMMUNICATIONS TO SYSTEM FURNITURE
	SPECIAL CONNECTION AFV - AUTOMATIC FLUSH VALVE
	RACEWAY COMPUTER RECEPTACLE
	RECEPTACLE IN 3 COMPARTMENTS RACEWAYS
	POWER POLE, "XX" INDICATES PANELBOARD AND CIRCUIT NUMBER
	COMBINATION, POWER/TELEPHONE/DATA OUTLET FLOOR BOX MOUNT. XX INDICATES TYPE. REFER TO FLOOR BOX DETAILS ON SHEET E-003.
	POWER OUTLET FLOOR BOX MOUNT. XX INDICATES TYPE. REFER TO FLOOR BOX DETAILS ON SHEET E-003.

GROUNDING AND LIGHTNING PROTECTION

	GROUND ROD, 10 ft, COPPER
	AIR TERMINAL
	DOWNLEAD CONDUCTOR
	GROUND TEST WELL

LIGHTING	
	TROFFER LUMINAIRE, TYPE Fx, FED FROM PANEL LPA, CIRCUIT 24
	SURFACE LINEAR LUMINAIRE, TYPE Fx
	WALL MOUNTED LUMINAIRE, TYPE Fx
	CHAIN HUNG STRIP LUMINAIRE, TYPE Fx
	DOWNLIGHT LUMINAIRE, TYPE Fx
	SUSPENDED DIRECT/INDIRECT LUMINAIRE, TYPE Fx
	LUMINAIRE ON EMERGENCY POWER, TYPE Fx
	CEILING MOUNTED LUMINAIRE, TYPE Fx
	WALL MOUNTED LUMINAIRE, TYPE Fx
	PHOTOCELL, EXTERIOR WALL MOUNTED
	277V, 15A, LIGHT SWITCH 3w = 3 WAY SWITCH D = DIMMER SWITCH MB = MOTORIZED BLINDS SWITCH F = FAN SWITCH FS = FUSED SWITCH K = KEY SWITCH LV = LOW VOLTAGE SWITCH OS = WALL-BOX OCCUPANCY SENSOR PS = PROJECTION SCREEN SWITCH T = TIMER SWITCH
	CEILING MOUNTED OCCUPANCY SENSOR WITH POWER PACK
	CEILING MOUNTED OCCUPANCY SENSOR AND PHOTOCELL WITH DIMMING POWER PACK
	EXIT SIGN, SINGLE FACE, WALL MOUNTED, C/W DIRECTIONAL ARROWS
	EXIT SIGN, SINGLE FACE, CEILING MOUNTED, C/W DIRECTIONAL ARROWS
	EXIT SIGN, DUAL FACE, CEILING OR WALL MOUNTED, C/W DIRECTIONAL ARROWS

60631225P

CITY OF MADISON, DANE COUNTY, WI

ELECTRICAL LEGENDS
 BUS RAPID TRANSIT
 CITY OF MADISON



G025

REVISION	DATE	BY
MARK	DESIGNED BY	SCALE
Date: 2022-03-08		

ELECTRICAL SYMBOL LEGENDS

POWER GENERAL NOTES:

- A. REFER TO CIVIL, ARCHITECTURAL, PLUMBING, AND MECHANICAL PLANS FOR WORK AFFECTING DIV. 26.
- B. REFER TO ARCHITECTURAL DRAWING ELEVATION DETAILS FOR ADDITIONAL WITH ELECTRICAL AND LIGHTING DEVICE LOCATIONS.
- C. DO NOT PLACE ANY CONDUITS IN NEW RAISED FLOOR SLABS UNO. DO NOT CROSS CONDUITS IN SLAB ON GRADE FLOORS.
- D. LOCATE AND INSTALL ALL SHIPPED LOOSE MOTOR STARTERS. REFER TO "MEP" DRAWINGS FOR SPECIFIC EQUIPMENT.
- E. PROVIDE ALL RACEWAYS, BOXES, SLEEVES, ETC. AS REQUIRED FOR A COMPLETE EMPTY RACEWAY SYSTEM FOR FUTURE EQUIPMENT AND SYSTEMS AS SHOWN ON THE PLANS. REFER TO "PS&E PLAN SET 3" FOR ADDITIONAL REQUIREMENTS.
- F. COORDINATE ALL SITE WORK WITH CIVIL UNDERGROUND UTILITIES.
- G. PROVIDE SELF-DRILLING CONCRETE ANCHORS OR SLEEVE ANCHORS FOR ALL SUPPORT APPLICATIONS IN CONCRETE.
- H. ROUTE ALL CONDUITS IN ROOMS WITH EXPOSED CEILINGS TIGHT TO DECK.
- I. REFER TO STRUCTURAL DRAWINGS FOR DETAILS AND REQUIREMENTS FOR MAKING CONDUIT PENETRATIONS THROUGH FLOORS, WALLS, AND FOUNDATION. COORDINATE PLACEMENT OF CONDUIT AND SLEEVES THROUGH FOUNDATION WALL WITH STRUCTURAL CONTRACTOR. SEAL PENETRATIONS PER DIV. 26 SPECIFICATIONS.

LIGHTING GENERAL NOTES:



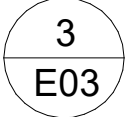


- A. REFER TO ARCHITECTURAL, PLUMBING, AND MECHANICAL PLANS FOR WORK AFFECTING DIV. 26.
- B. ALL EXIT SIGN LIGHTS TO BE CIRCUITED TO THE NEAREST CIRCUIT AND CONNECTED AHEAD OF ANY LOCAL SWITCHING CONTROLS, UNO.
- C. REFER TO ARCHITECTURAL ELEVATIONS FOR COORDINATION OF BUILDING MOUNTED LIGHT FIXTURES.
- D. LOCATE AND INSTALL OCCUPANCY SENSORS PER MANUFACTURER RECOMMENDATIONS TO ENSURE COMPLETE AREA COVERAGE, CIRCUIT LOADING, AND AVOIDANCE OF NUISANCE OPERATIONS.
- E. DO NOT ATTACH ANY FIXTURE, EQUIPMENT, OR SUPPORT FOR THE SAME DIRECTLY TO METAL ROOF DECK.

POWER KEYED NOTES:

- E1 LOCATE SIMPLEX RECEPTACLE OR HARDWIRED CONNECTION AS REQUIRED TO ELECTRONIC SENSOR FAUCET TRANSFORMER BENEATH SINK. COORDINATE EXACT REQUIREMENTS WITH PLUMBING CONTRACTOR. PROVIDE A 15A, 120V GFI CIRCUIT AND LABEL CONNECTION AS "GFI PROTECTED".
- E2 PROVIDE HARDWIRED CONNECTION TO TOILET ELECTRONIC FLUSH VALVE TRANSFORMER MOUNTED WITHIN WALL CAVITY. COORDINATE EXACT REQUIREMENTS WITH PLUMBING CONTRACTOR. PROVIDE A 15A, 120V GFI CIRCUIT AND LABEL CONNECTION AS "GFI PROTECTED".
- E3 PROVIDE 15A, 120V GFI CIRCUIT FOR HARDWIRED CONNECTION TO HAND DRYERS. COORDINATE EXACT REQUIREMENTS PRIOR TO CONNECTION.
- E4 CHARGER POWER CABINETS REQUIRE A MINIMUM FREE SPACE AROUND THEM FOR PROPER VENTILATION. PROVIDE NO LESS THAN 4" OF FREE SPACE BEHIND POWER CABINETS AND 6" OF FREE SPACE ON EVEN SIDE OF CABINET ROW. REFER TO MANUFACTURER'S INSTALLATION GUIDE FOR ADDITIONAL REQUIREMENTS.

LIGHTING KEYED NOTES:

- L1 CHAIN HANG LIGHT FIXTURES +10'-0" AFF. COORDINATE MOUNTING LOCATIONS WITH ANY MECHANICAL EQUIPMENT, DUCTWORK, ETC. BEFORE INSTALLING. PLACE FIXTURES FOR OPTIMAL ILLUMINATION.
- L2 PROVIDE WEATHERPROOF J-BOX FOR 120V DIRECT CONNECTION TO HALO LIGHTING SYSTEM. HALO LIGHTING SYSTEM PRE-FABRICATED AND INSTALLED ON SITE. COORDINATE J-BOX MOUNTING LOCATION AND SYSTEM CONNECTION REQUIREMENTS WITH HALO CONTRACTOR. AVOID ROOF PENETRATIONS.
- L3 PROVIDE OCCUPANCY SENSOR WITH AUXILIARY CONTACTS FOR CONTROL CONNECTION TO ROOM EXHAUST FAN. EXHAUST FAN TO BE INTERLOCKED WITH OCCUPANCY SENSOR.
- L4 TYPICAL MOUNTING DIMENSIONS FROM WALLS FOR ALL ROOM DOWNLIGHTS.

COMMON SYMBOLS	
	POWER KEYED NOTE
	LIGHTING KEYED NOTE
ABBREVIATIONS	
TYP	TYPICAL.
C	OUTLET MOUNTED OVER COUNTER TOP. MOUNT WITH BOTTOM OF BOX 6" ABOVE COUNTERTOP.
U.C.	OUTLET MOUNTED UNDER COUNTER TOP.
AFF	ABOVE FINISHED FLOOR.
WP	WEATHER PROOF, WATERTIGHT & CORROSION RESISTANT.
EXP	EXPLOSION PROOF
GFI	GROUND FAULT INTERRUPTING TYPE
IG	ISOLATED GROUND.
	DETAIL No.3 ON DRAWING E03
ELEC. ROOM 	ROOM TAG
	REVISION TRIANGLE
UNO	UNLESS NOTED OTHERWISE

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CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

ELECTRICAL LEGENDS AND ABBREVIATIONS
BUS RAPID TRANSIT
CITY OF MADISON



GENERAL

1. THE GENERAL STRUCTURAL NOTES AND STANDARD STRUCTURAL DETAILS APPLY TO THE ENTIRE PROJECT UNLESS SPECIFICALLY STATED OTHERWISE.

DESIGN CRITERIA

1. DESIGN AND CONSTRUCT IN CONFORMANCE WITH THE LATEST EDITION OF THE WISCONSIN BUILDING CODE AND 2015 IBC.
2. SUPERIMPOSED DESIGN LOADS:

A. LIVE LOAD:	100 PSF
B. ROOF LIVE LOAD (NON-REDUCIBLE):	20 PSF
C. ROOFING COLLATERAL LOAD	5 PSF
(ROOF SUPPORTED EQUIPMENT AND PIPING ADDITIONAL)	
D. MECHANICAL EQUIPMENT: VERIFY WITH EQUIPMENT SUPPLIER.	
(SEE EQUIPMENT SCHEDULES)	
E. OCCUPANCY CATEGORY OF BUILDINGS	II
F. ROOF SNOW LOAD:	
1. GROUND SNOW LOAD, P _g	30 PSF
2. FLAT ROOF SNOW LOAD	21 PSF+DRIFT
3. SNOW EXPOSURE FACTOR, C _e	1.0
4. IMPORTANCE FACTOR, I	1.0
5. THERMAL FACTOR, C _t	1.0
G. WIND LOAD:	
1. BASIC WIND SPEED, V	115 MPH
2. IMPORTANCE FACTOR, I	1.0
3. WIND EXPOSURE	C
4. INTERNAL PRESSURE COEFF, G _{Cpi}	+/- 0.18
2. DO NOT SCALE DRAWINGS TO OBTAIN DIMENSIONAL INFORMATION. MISSING OR CONFLICTING DIMENSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
3. REFER TO CIVIL, ARCHITECTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR LOCATIONS AND DIMENSIONS OF CHASES, SLOTS, INSERTS, CURBS, OPENINGS, SLEEVES, ANCHOR BOLTS, FLOOR PITCHES, ANGLE FRAMES, GATE FRAMES, AND OTHER PROJECT REQUIREMENTS NOT INDICATED ON STRUCTURAL DRAWINGS.
4. COORDINATE DIMENSIONS AND VERIFY LOCATION OF STRUCTURAL ELEMENTS WITH PURCHASED EQUIPMENT. SIZE AND FURNISH ANCHOR BOLTS AS REQUIRED BY THE EQUIPMENT SUPPLIER UNLESS OTHERWISE INDICATED. DESIGN ANCHOR BOLTS TO BE COMPLIANT WITH ACI 318 REQUIREMENTS.
5. PROVIDE OPENINGS REQUIRED FOR PURCHASED EQUIPMENT. PROVIDE ANCHOR BOLTS, NUTS, NON-SHRINK NON-METALLIC GROUT, CONCRETE PADS AND REINFORCING STEEL REQUIRED FOR THE INSTALLATION OF EQUIPMENT.
6. STANDARD DETAILS AS SHOWN ON THE STRUCTURAL STANDARD DETAIL SHEETS ARE APPLICABLE TO ALL STRUCTURAL WORK EXCEPT WHERE A SPECIFIC SECTION OR DETAIL IS SHOWN OTHERWISE.

FOUNDATION

1. FOUNDATION DESIGNS ARE BASED UPON ALLOWABLE SOIL BEARING CAPACITY OF 2000 PSF.
2. PERCENT COMPACTION IS DEFINED AS THE RATIO OF THE FIELD DRY DENSITY, DETERMINED BY ASTM D-1556, TO THE MAXIMUM DRY DENSITY, DETERMINED BY ASTM-D 1557 (MODIFIED PROCTOR).
3. COMPACT BACKFILL UNDER FOUNDATION MATS, BASE SLABS, FOOTINGS, AND SLABS ON GRADE TO A MINIMUM OF 95 PERCENT. COMPACT EMBANKMENTS AND BACKFILL NOT SUPPORTING STRUCTURES TO A MINIMUM OF 90 PERCENT. PLACE AND COMPACT ALL BACKFILL IN 8-INCH MAXIMUM LAYERS.
4. COMPACT THE BOTTOM SURFACE OF EXPOSED EXCAVATIONS WITH A VIBRATORY STEEL DRUM ROLLER OR VIBRATORY PLATE TO ACHIEVE A NEAR SURFACE DENSITY OF AT LEAST 95 PERCENT.
5. DO NOT PLACE FOUNDATION CONCRETE IN WATER OR ON FROZEN OR DISTURBED GROUND.
6. PLACE EXTERIOR SLABS, PLATFORMS AND WALKS ON 8-INCH LAYERS OF NON-FROST SUSCEPTIBLE MATERIAL (GRANULAR FILL, SCREENED GRAVEL OR CRUSHED STONE BACKFILL HAVING NOT MORE THAN 5 PERCENT BY WEIGHT PASSING A NO. 200 SIEVE). THE LIMITS OF BACKFILL ARE DEFINED BY AN OUTWARD SLOPE OF 1:1 FROM THE PERIMETER OF THE SLAB TO A DEPTH OF FOUR FEET BELOW FINISH GRADE UNLESS OTHERWISE INDICATED OR SPECIFIED. PLACE MATERIAL IN 8-INCH LIFTS. COMPACT SELECT BORROW TO 95 PERCENT. COMPACT SCREENED GRAVEL AND CRUSHED STONE USING A SELF-PROPELLED VIBRATORY STEEL DRUM ROLLER OR RUBBER TIRE ROLLERS WITH A MINIMUM OF FOUR PASSES IN DIRECTIONS PERPENDICULAR TO ONE ANOTHER IN OPEN AREAS. IN SMALL AREAS, USE MANUALLY OPERATED VIBRATORY PLATE COMPACTORS WITH A MINIMUM OF FOUR PASSES.

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CITY OF MADISON, DANE COUNTY, WI

STRUCTURAL NOTES
BUS RAPID TRANSIT
CITY OF MADISON



S001

CONTRACT NO: 60631225C

REVISION
Date: 2022-03-08

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REINFORCING STEEL

1. ALL REINFORCING STEEL INCLUDING STIRRUPS AND TIES, SHALL BE HIGH STRENGTH, NEW BILLET STEEL CONFORMING TO ASTM A615 GRADE 60 (FY=60,000 PSI). ALL REINFORCING TO BE WELDED SHALL CONFORM TO ASTM A706 GRADE 60.
2. ALL REINFORCING SHALL BE DETAILS, FABRICATED, AND PLACED IN ACCORDANCE WITH ACI-315 "MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES (LATEST EDITION).
3. REINFORCING BARS SHALL BE SPLICED AS SHOWN ON DRAWINGS. ANY ADDITIONAL SPLICING SHALL REQUIRE PRIOR APPROVAL FROM THE STRUCTURAL ENGINEER. WHERE SPICE LENGTHS ARE NOT EXPLICITLY CALLED OUT ON DETAILS, THE MINIMUM SPlice SHALL BE CLASS B PER ACI 318. EMBEDMENT AND HOOK LENGTHS SHALL BE PER ACI 318.
4. ALL BARS SHALL BE CLEAN OF RUST, GREASE AND OTHER MATERIAL LIKELY TO IMPAIR BOND. ALL BENDS SHALL BE MADE COLD.
5. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND OBTAIN APPROVAL PRIOR TO FABRICATION.
6. U.N.O. ON STRUCTURAL DRAWINGS, PROVIDE MINIMUM CONCRETE PROTECTION FOR REINFORCING AS FOLLOWS:

CAST AGAINST EARTH	3"
EXPOSED TO EARTH OR WEATHER:	
#5 AND SMALLER BARS AND W.W.F.	1-1/2" (U.N.O.)
#6 AND LARGER BARS	2"
NOT EXPOSED TO EARTH OR WEATHER:	
SLABS AND WALLS:	
#6 AND SMALLER BARS AND W.W.F.	3/4"
#7 AND #8 BARS	1"
#9 AND LARGER BARS	1-1/2"
BEAMS AND COLUMNS	1-1/2"
7. WHERE CONSTRUCTION JOINTS ARE PROVIDED, THE REINFORCEMENT SHALL PASS CONTINUOUSLY THROUGH THE JOINT.
8. ALL WELDING OF REINFORCING TO BE DONE WITH E90XX ELECTRODES IN ACCORDANCE WITH A.W.S. SPECIFICATIONS D1.4 (LATEST EDITION).

CONCRETE

1. CONCRETE WORK SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301) AND THE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318)
2. USE NORMAL WEIGHT CAST-IN-PLACE CONCRETE WITH ASTM C 150 TYPE I/II CEMENT FOR ALL CONCRETE WORK.
3. PROVIDE CONCRETE HAVING A 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI AND A MAXIMUM WATER-CEMENT RATIO OF 0.45 UNLESS OTHERWISE INDICATED OR SPECIFIED.
4. AIR-ENTRAIN ALL EXTERIOR CONCRETE (6%).
5. REINFORCING BARS SHALL CONFORM TO ASTM A 615, GRADE-60.
6. WELDING REINFORCING BARS IS PROHIBITED EXCEPT WHERE SPECIFICALLY INDICATED ON THE DRAWINGS. REINFORCING BARS INDICATED TO BE WELDED SHALL CONFORM TO ASTM A 706, GRADE-60.
7. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185. PROVIDE WELDED WIRE FABRIC IN FLAT SHEETS. STAGGER SPLICES AND LAP AT LEAST TWO FULL MESHES.
8. PROVIDE REINFORCING BAR SUPPORTS, SPACERS, AND ACCESSORIES AS RECOMMENDED IN THE ACI DETAILING MANUAL (ACI SP-66). PROVIDE PLASTIC BOOTED ACCESSORIES IN CONTACT WITH EXPOSED SURFACES. PROVIDE MINIMUM #5 SUPPORT BARS.
9. SET AND MAINTAIN REINFORCEMENT AT THE CLEAR DISTANCES FROM THE SURFACE OF CONCRETE AS SHOWN IN THE STANDARD DETAIL UNLESS OTHERWISE INDICATED.
10. PROVIDE EMBEDMENT AND SPLICES OF REINFORCEMENT AS SHOWN IN THE STANDARD DETAILS UNLESS OTHERWISE INDICATED.
11. PROVIDE CONSTRUCTION AND EXPANSION JOINTS IN SLABS AND WALLS AS SHOWN ON THE DRAWINGS. CONTRACTOR MAY SUBMIT ALTERNATIVE AND ADDITIONAL CONSTRUCTION JOINT LOCATIONS AND DETAILS FOR ENGINEER APPROVAL PRIOR TO CONSTRUCTION.
12. PROVIDE 3/4-INCH CHAMFER ON ALL EXPOSED CORNERS OF CONCRETE ELEMENTS.
13. FURNISH CONCRETE MASONRY UNIT (CMU) WALL REINFORCEMENT TO THE MASONRY SUBCONTRACTOR FOR INSTALLATION. PROVIDE REINFORCING BAR DOWELS TO BE EMBEDDED INTO CONCRETE ELEMENTS AT TOP AND BOTTOM OF CMU WALLS AS INDICATED.

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 CITY OF MADISON, DANE COUNTY, WI
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STRUCTURAL NOTES
 BUS RAPID TRANSIT
 CITY OF MADISON



MASONRY

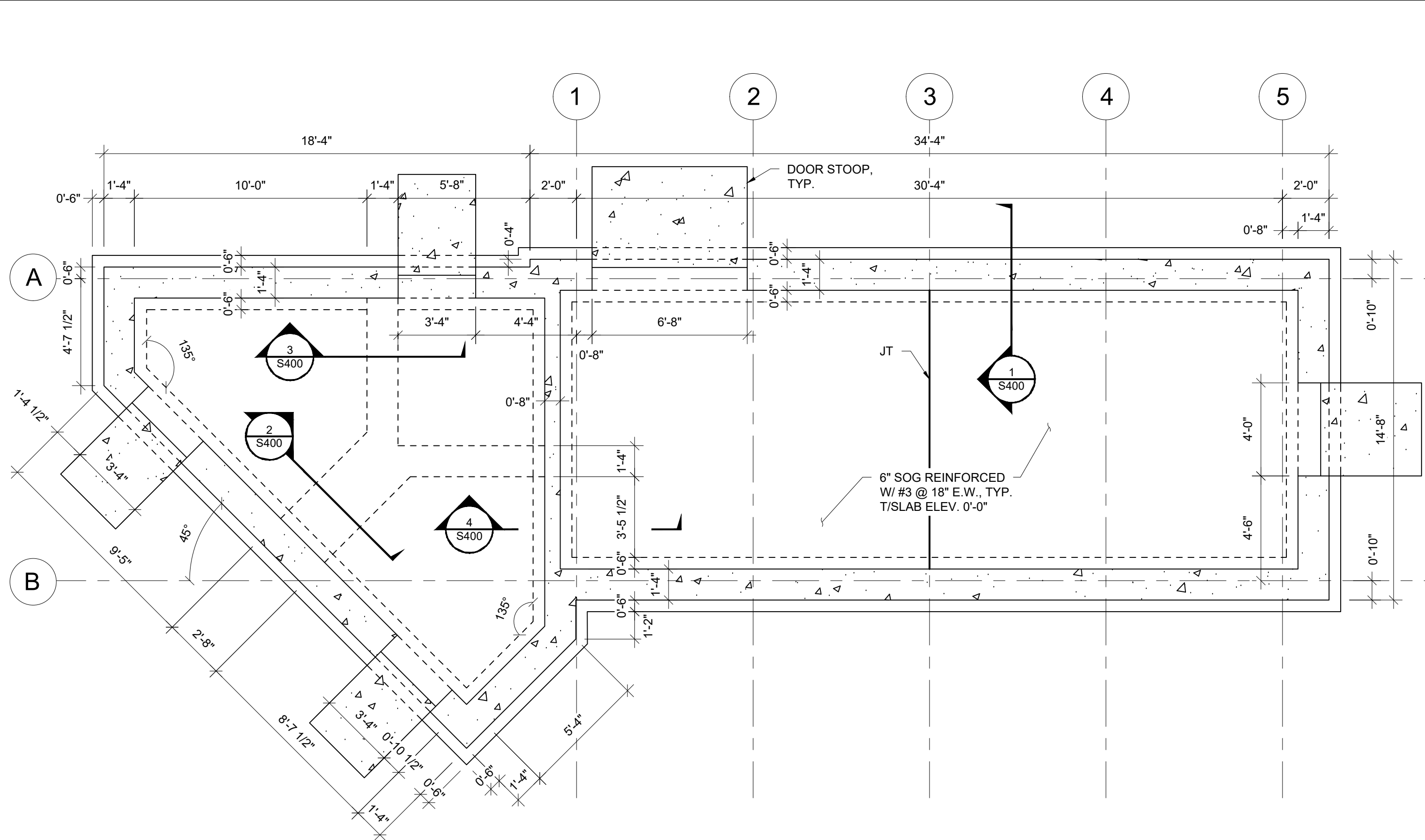
1. MASONRY WORK SHALL CONFORM TO THE REQUIREMENTS OF BUILDING CODE REQUIREMENTS AND SPECIFICATION FOR MASONRY STRUCTURES (ACI 530).
2. MASONRY DETAILS AND NOTES APPLY TO ALL INTERIOR AND EXTERIOR CMU WALLS. SEE STANDARD DETAILS AND ARCHITECTURAL UNITS FOR DETAILS OF WALL CONSTRUCTION.
3. CONCRETE MASONRY UNITS SHALL BE ASTM C 90, TYPE I HOLLOW LOAD BEARING UNITS. THE AVERAGE ASTM E 447 PRISM STRENGTH SHALL BE A MINIMUM OF 1,900 PSI WITH NO INDIVIDUAL PRISM LESS THAN 1,700 PSI. SPECIFIED COMPRESSIVE STRENGTH OF MASONRY ($f'm$) SHALL BE A MINIMUM OF 1,500 PSI.
4. JOINT REINFORCEMENT SHALL BE PREFABRICATED FROM 9 GAUGE DEFORMED WIRE CONFORMING TO ASTM A 82. REINFORCING SHALL BE OF TRUSS DESIGN CONSISTING OF TWO DEFORMED 9 GAUGE LONGITUDINAL WIRES WELDED AT NOT MORE THAN 16" ON CENTER TO 9 GAUGE CROSS WIRES. OUT-TO-OUT SPACING OF LONGITUDINAL WIRES SHALL BE APPROXIMATELY 2" LESS THAN NOMINAL THICKNESS OF THE BLOCK.
5. JOINT REINFORCEMENT SHALL BE HOT-DIP GALVANIZED IN CONFORMANCE WITH ASTM A 153, CLASS B-2, WITH A MINIMUM COATING OF 1.5 OUNCES PER SQUARE FOOT.
6. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60.
7. MORTAR SHALL BE ASTM C270, TYPE S HIGH STRENGTH PORTLAND CEMENT MORTAR.
8. MASONRY SHALL BE SET ON FULL MORTAR BED.
9. GROUT FILL FOR MASONRY CELLS, LINTELS AND BOND BEAMS SHALL BE COARSE GROUT CONFORMING TO ASTM C476 AND SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2,500 PSI.
10. FULLY GROUT ALL CELLS AND COURSES WITH VERTICAL OR HORIZONTAL REINFORCING. PROVIDE 2" MINIMUM CLEAR COVER TO THE REINFORCING.
11. GROUT SHALL BE PLACED IN FOUR FOOT MAXIMUM LIFTS.
12. ALL HORIZONTAL BAR REINFORCING, EXCEPT IN THE LINTELS, SHALL BE PLACED IN CMU BOND BEAM BLOCKS. PROVIDE GALVANIZED METAL LATH IN THE HORIZONTAL JOINT BELOW THE BOND BLOCKS TO RETAIN THE GROUT.
13. PROVIDE A CONTINUOUS BOND BEAM WITH 2-#5 CONTINUOUS HORIZONTAL BARS AT THE TOP OF ALL WALLS AND AT ALL FLOOR AND ROOF LEVELS. PROVIDE ADDITIONAL BOND BEAMS BELOW ALL OPENINGS AND AT 8'-0" MAXIMUM VERTICAL SPACING FOR WALLS GREATER THAN 16 FEET IN HEIGHT. BOND BEAM REINFORCING SHALL BE CONTINUOUS THROUGH CONTROL JOINTS.
14. PROVIDE HORIZONTAL JOINT REINFORCING AT 16" ON CENTER. PROVIDE CAVITY HOOKS AND EYES 16" ON CENTER EACH WAY. INTERRUPT ALL REINFORCING AT CONTROL JOINTS.
15. VERTICAL REINFORCING SHALL BE AS INDICATED, BUT IN NO CASE LESS THAN ONE #5 AT 24" ON CENTER.
16. PROVIDE TWO FULL HEIGHT VERTICAL BARS AT EACH SIDE OF WALL OPENINGS. BAR SIZE SHALL MATCH VERTICAL WALL REINFORCING.
17. PROVIDE ONE FULL HEIGHT VERTICAL BAR AT CORNERS AND ENDS OF WALLS. BAR SIZE SHALL MATCH VERTICAL WALL REINFORCING.
18. LINTEL REINFORCING OVER OPENINGS SHALL BE EXTENDED A MINIMUM OF 2'-0" OR 40 BAR DIAMETERS BEYOND EACH SIDE OF THE OPENING.
19. ALL REINFORCING BARS SHALL BE SECURELY HELD IN POSITION WITH 9 GAUGE WIRE SUPPORTS PRIOR TO GROUTING.
20. ALL REINFORCING BARS IN MASONRY SHALL HAVE MINIMUM LAPS OF 48 BAR DIAMETERS. JOINT REINFORCING SHALL BE LAPPED A MINIMUM OF 1'-0".

MARK	DESIGNED BY	REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

STRUCTURAL NOTES
BUS RAPID TRANSIT
CITY OF MADISON





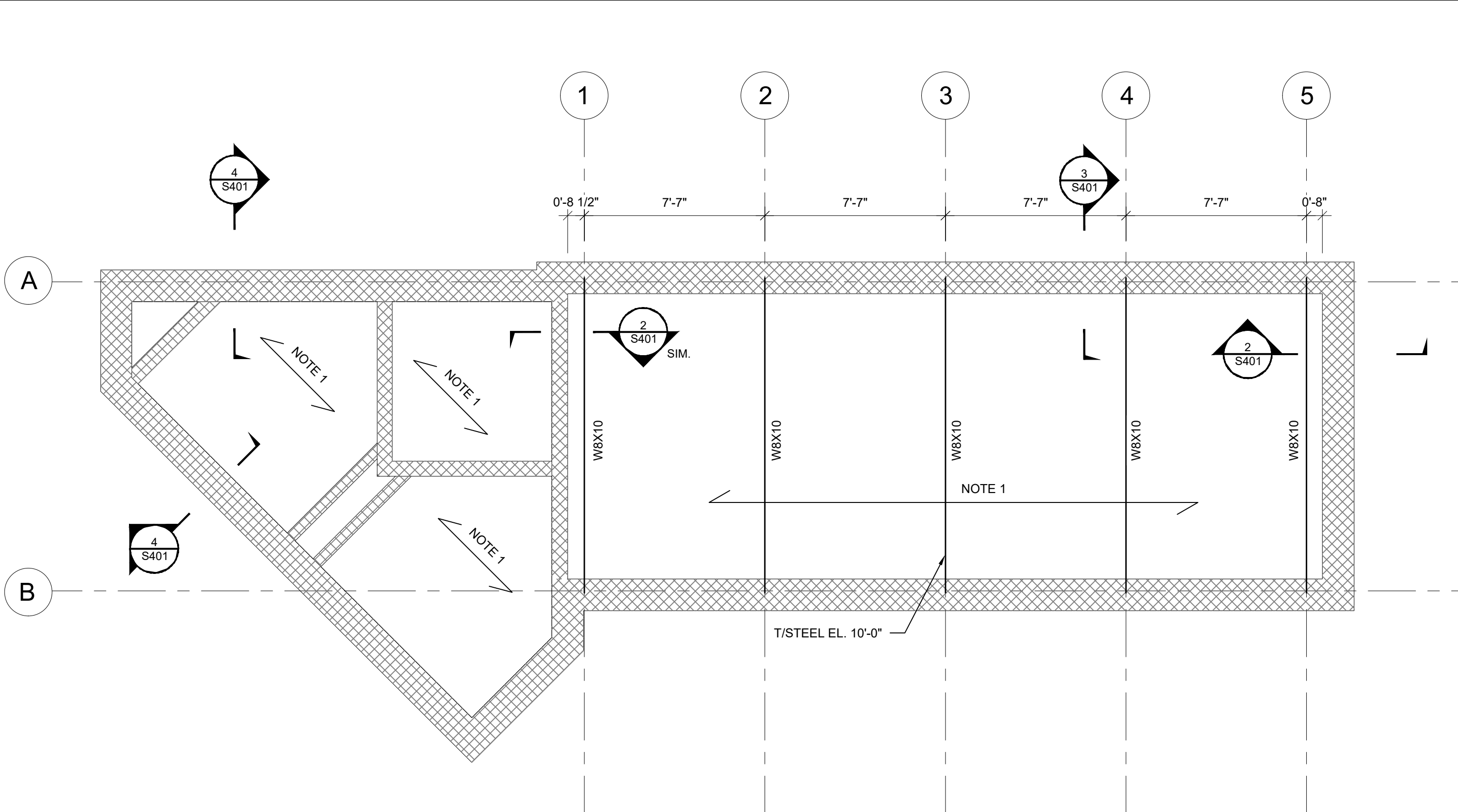
FOUNDATION AND FLOOR PLAN
 $\frac{1}{4}'' = 1'-0''$

REVISION	DATE	BY
MARK	DESIGNED BY	SCALE

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

FOUNDATION PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON





ROOF FRAMING PLAN

1/4" = 1'-0"

NOTES:

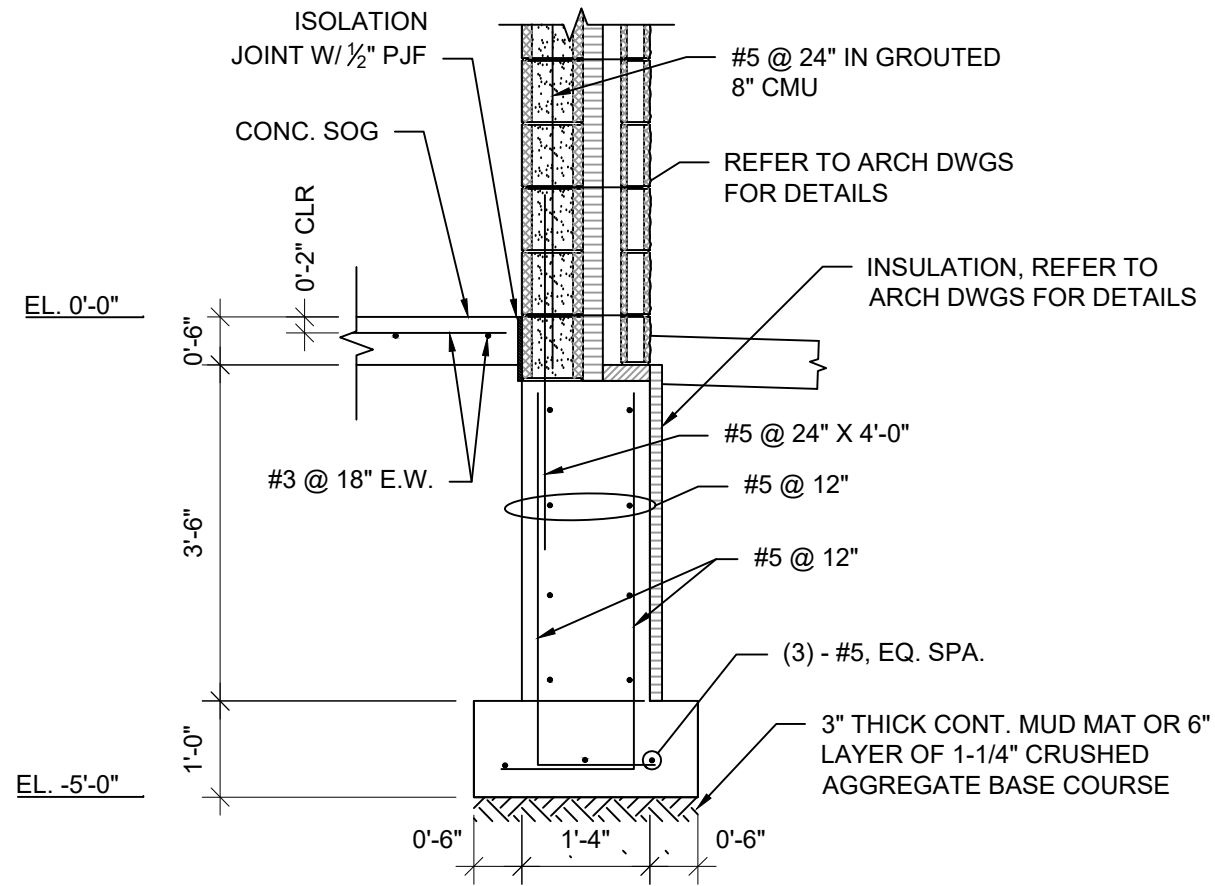
1. 1.5" X 16 GA TYPE B DECK FASTENED TO ALL SUPPORTS W/ #12 TEK SCREWS IN A 36/4 PATTERN. FASTEN SIDELAP W/ #10 TEK SCREWS @ 18" O.C.

MARK	REVISION	DATE	BY

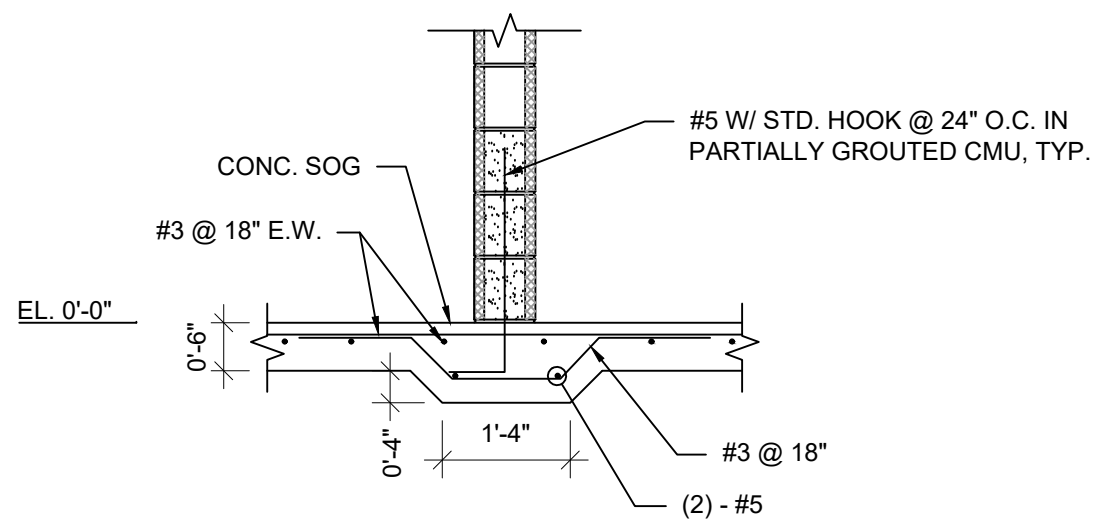
60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

ROOF FRAMING PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON

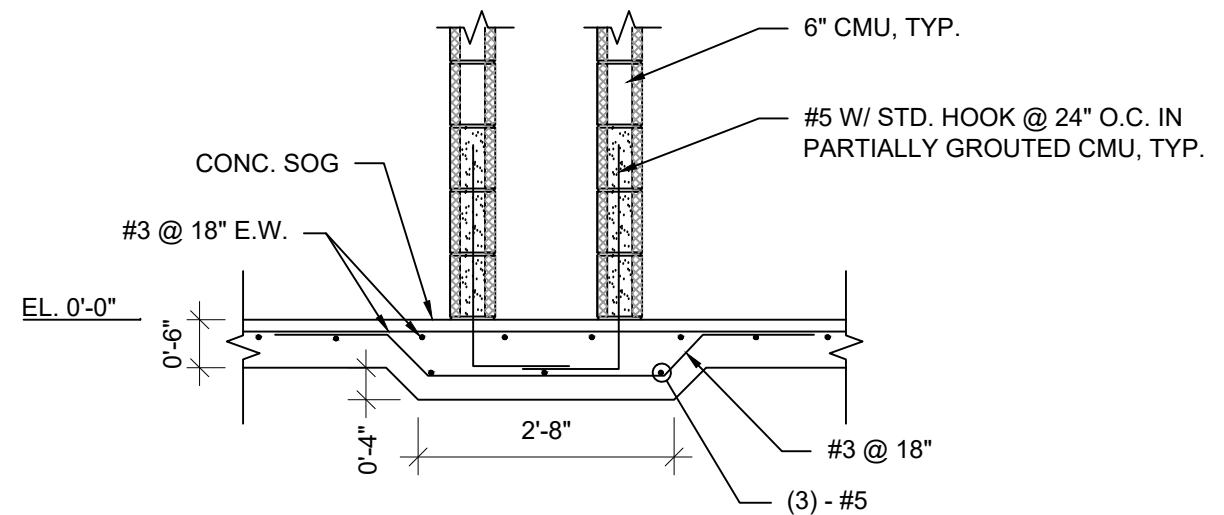




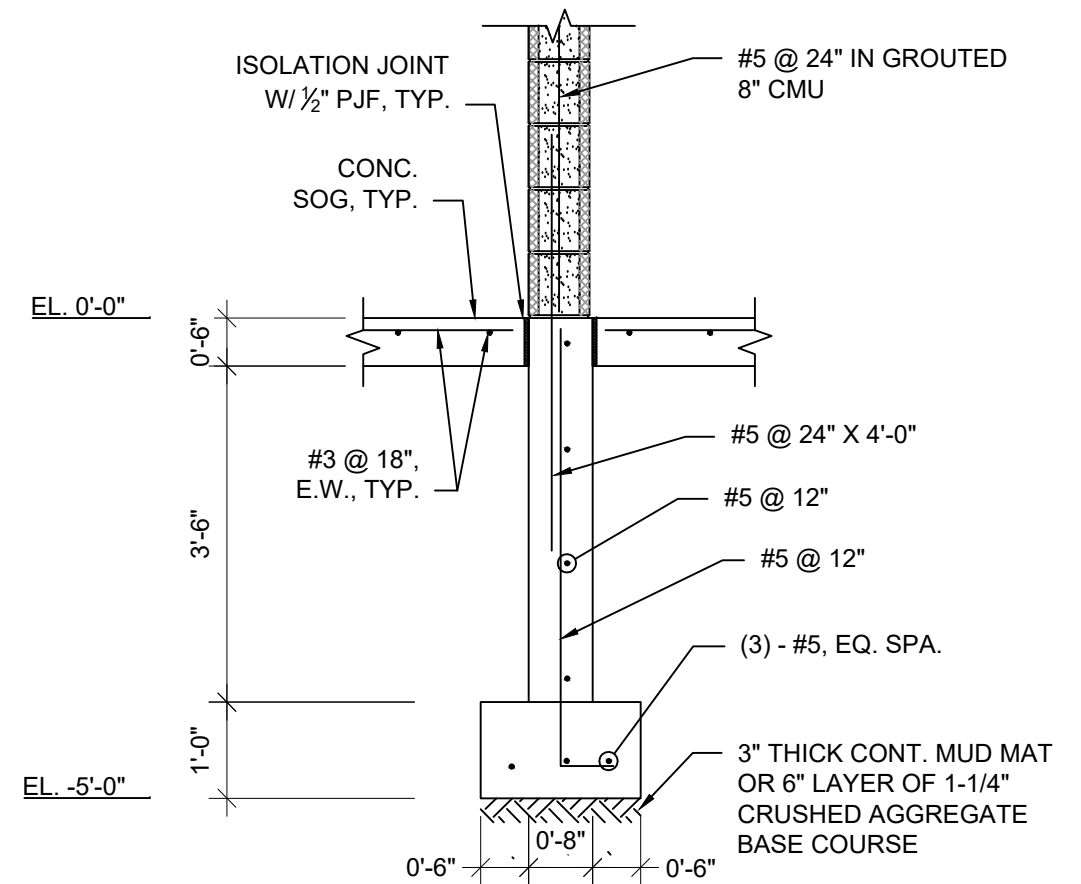
1 STRIP FOOTING AT EXTERIOR WALL DETAIL
 $\frac{1}{2}'' = 1'-0''$



3 THICKENED SLAB AT 8" CMU WALL DETAIL
 $\frac{1}{2}'' = 1'-0''$



2 THICKENED SLAB AT 8" CMU WALL DETAIL
 $\frac{1}{2}'' = 1'-0''$



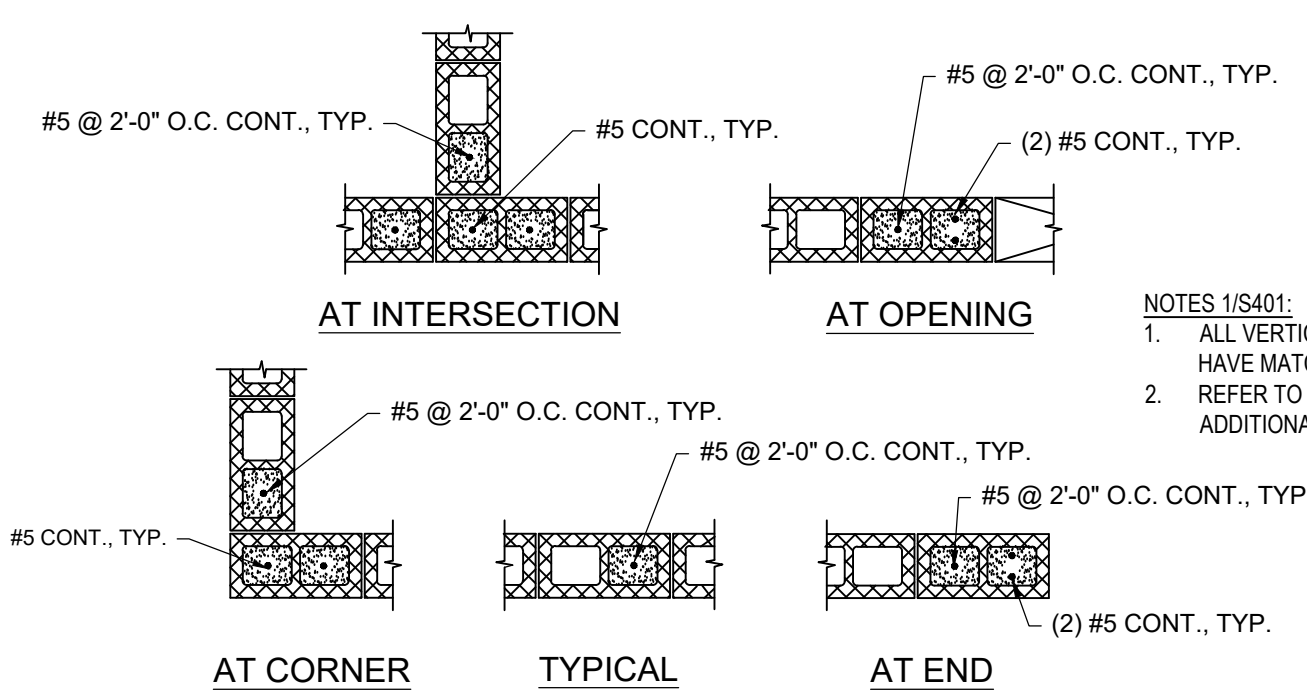
4 STRIP FOOTING AT INTERIOR WALL DETAIL
 $\frac{1}{2}'' = 1'-0''$

NO.	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

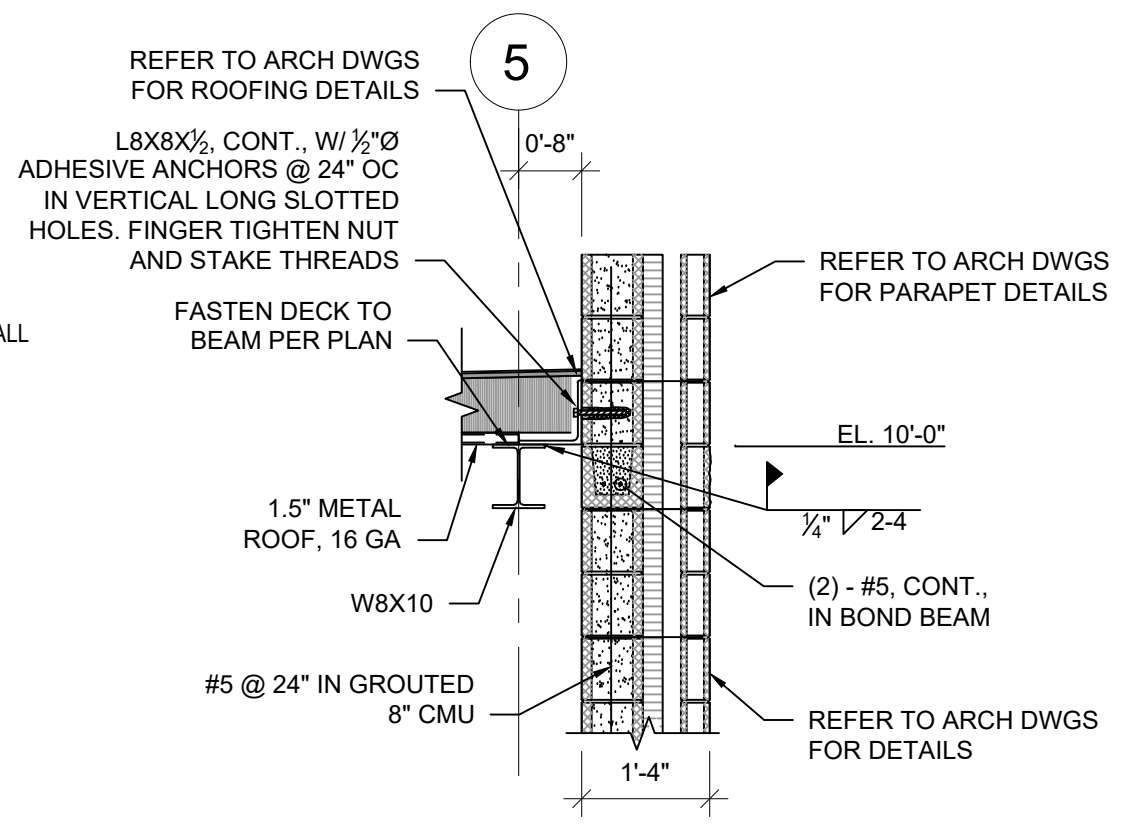
STRUCTURAL DETAILS
 BUS RAPID TRANSIT
 CITY OF MADISON



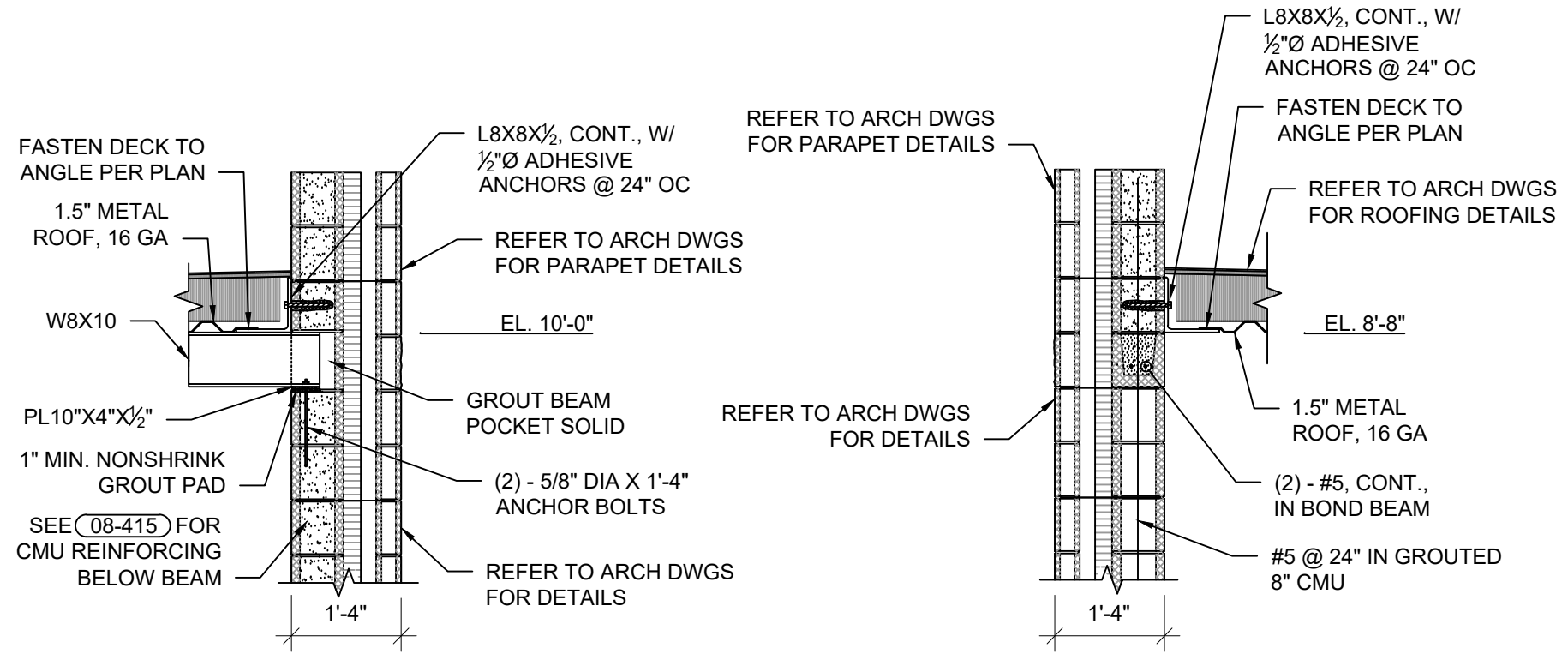


- NOTES 1/S401:
- ALL VERTICAL REINFORCING SHALL HAVE MATCHING DOWELS
 - REFER TO SHEET S003 FOR ADDITIONAL INFORMATION.

1 CMU WALL DETAILS
1/2" = 1'-0"



2 CMU WALL AT ROOF DETAIL
1/2" = 1'-0"



3 ROOF BEAM BEARING DETAIL
1/2" = 1'-0"

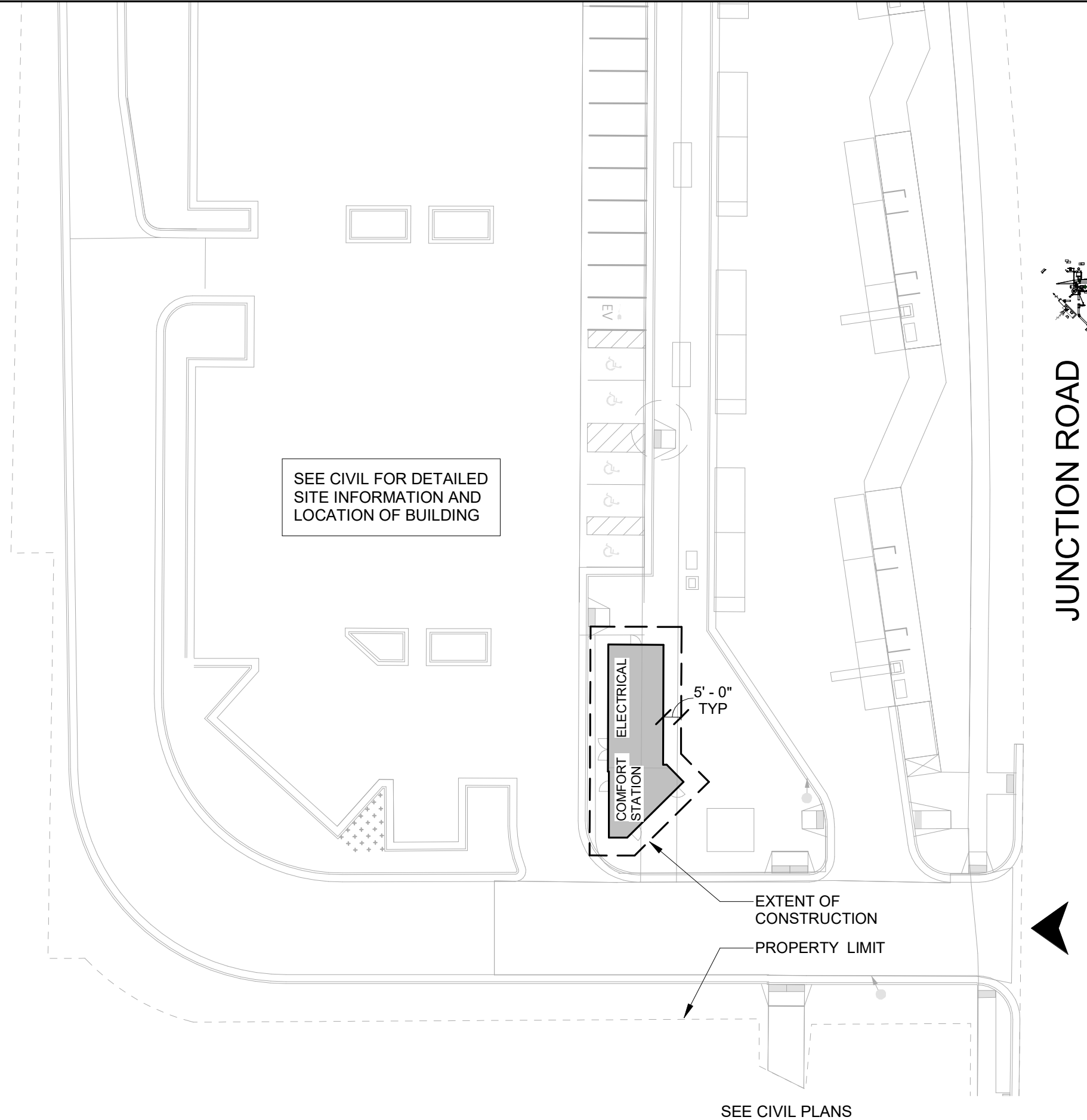
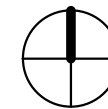
4 CMU WALL AT ROOF DETAIL
1/2" = 1'-0"

60631225P	60631225C
STRUCTURAL DETAILS	CONTRACT NO: 60631225C
BUS RAPID TRANSIT	CITY OF MADISON
CITY OF MADISON	CITY OF MADISON, DANE COUNTY, WI
DESIGNED BY: _____	DATE: _____
MARKED BY: _____	REVISION: _____
DATE: _____	DATE: _____
BY: _____	BY: _____
SCALE: _____	SCALE: _____
S401	

1
A201

SITE PLAN - JUNCTION ROAD

Scale: 1/32" = 1'-0"



A001

COMFORT STATION SITE PLAN - JUNCTION ROAD

BUS RAPID TRANSIT
CITY OF MADISON

JUNCTION ROAD

60631225P

CITY OF MADISON, DANE COUNTY, WI

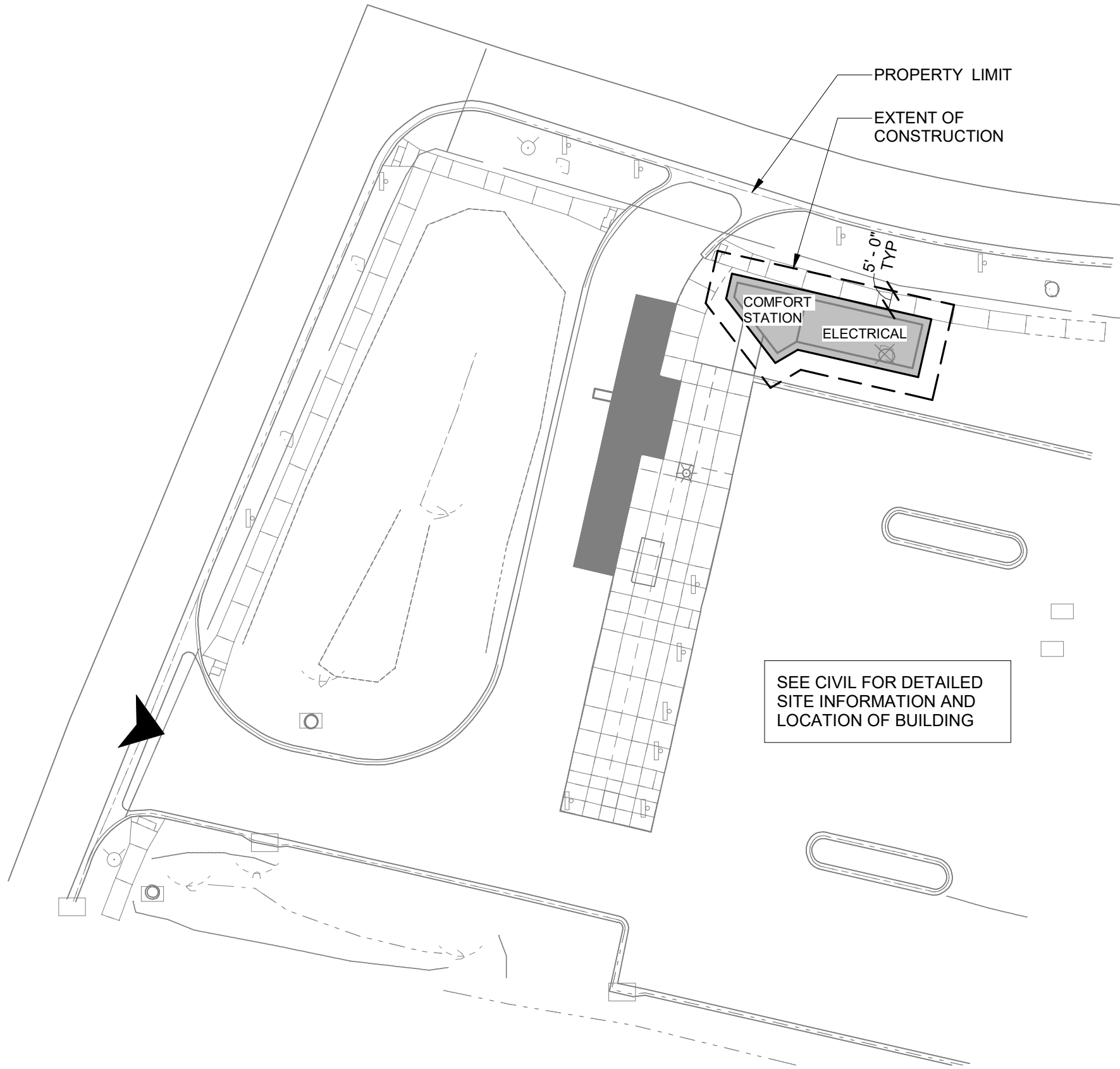
CONTRACT NO: 60631225C

MARK	REVISION	DATE	BY

Designed By:

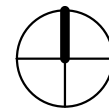
Date: 2022-03-08

Scale: ---



1
A201

SITE PLAN - SUN PRAIRIE
Scale: 1/32" = 1'-0"



MARK	REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

COMFORT STATION SITE PLAN - SUN PRAIRIE
BUS RAPID TRANSIT
CITY OF MADISON



A002

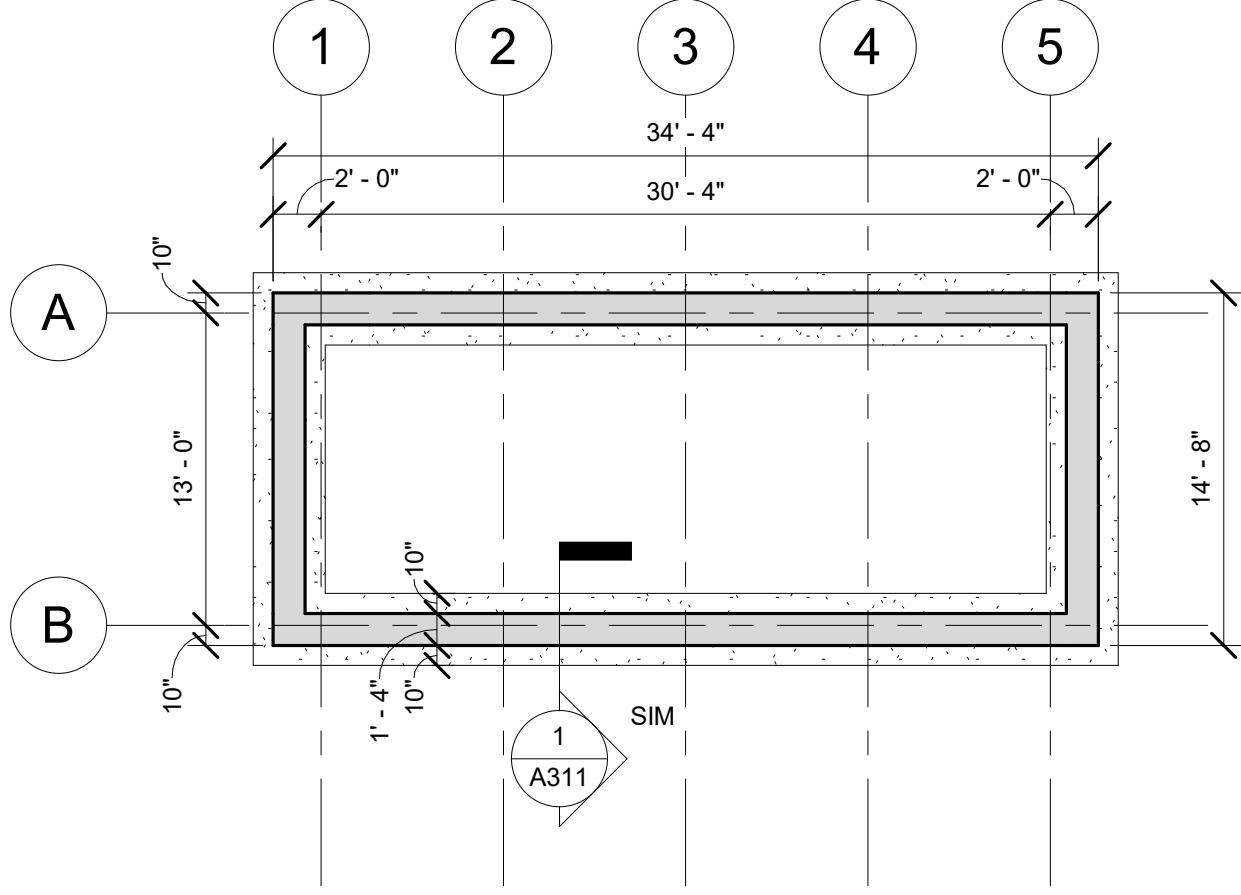
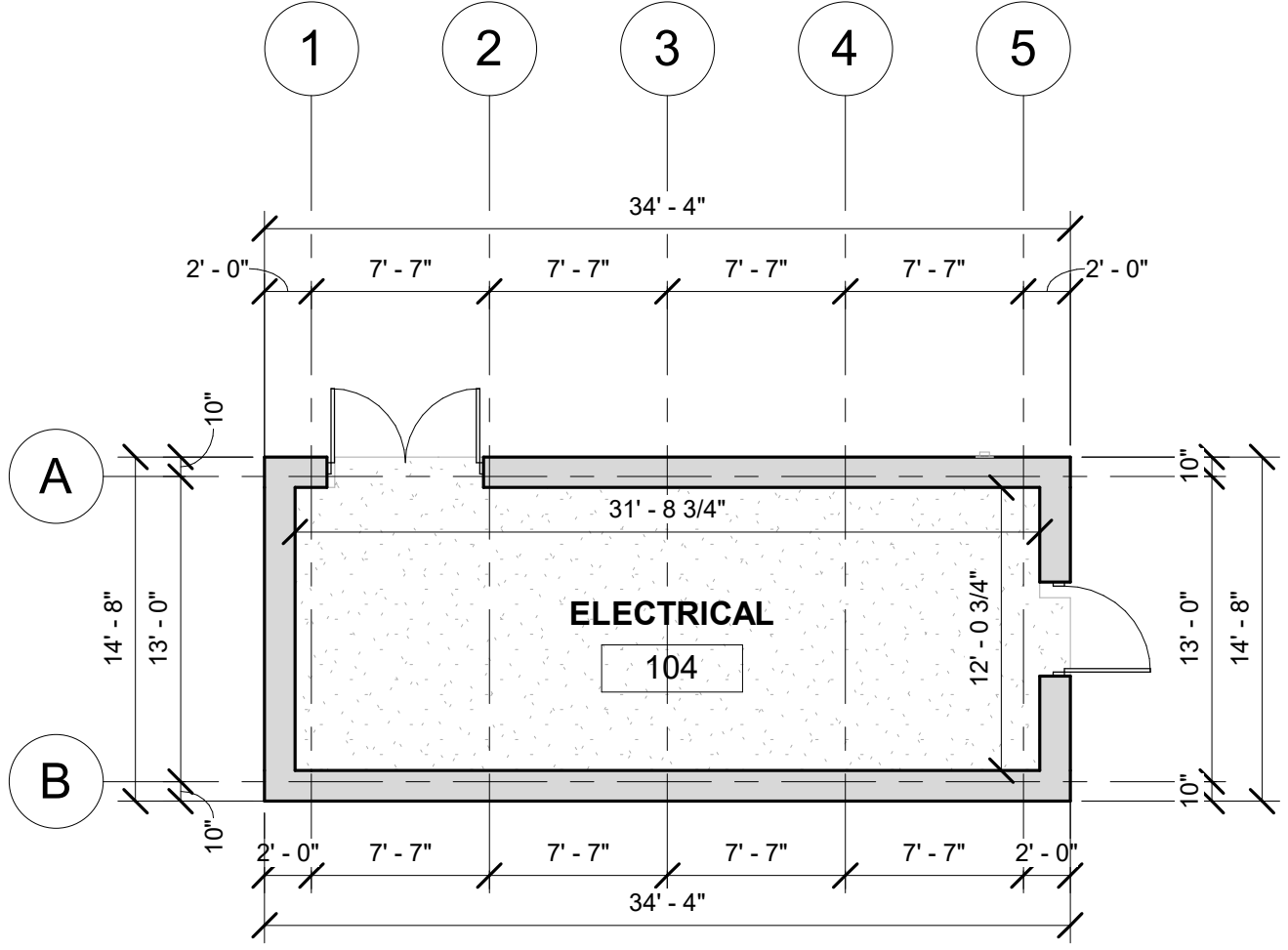
KEYNOTE LEGEND	
VALUE	DESCRIPTION

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

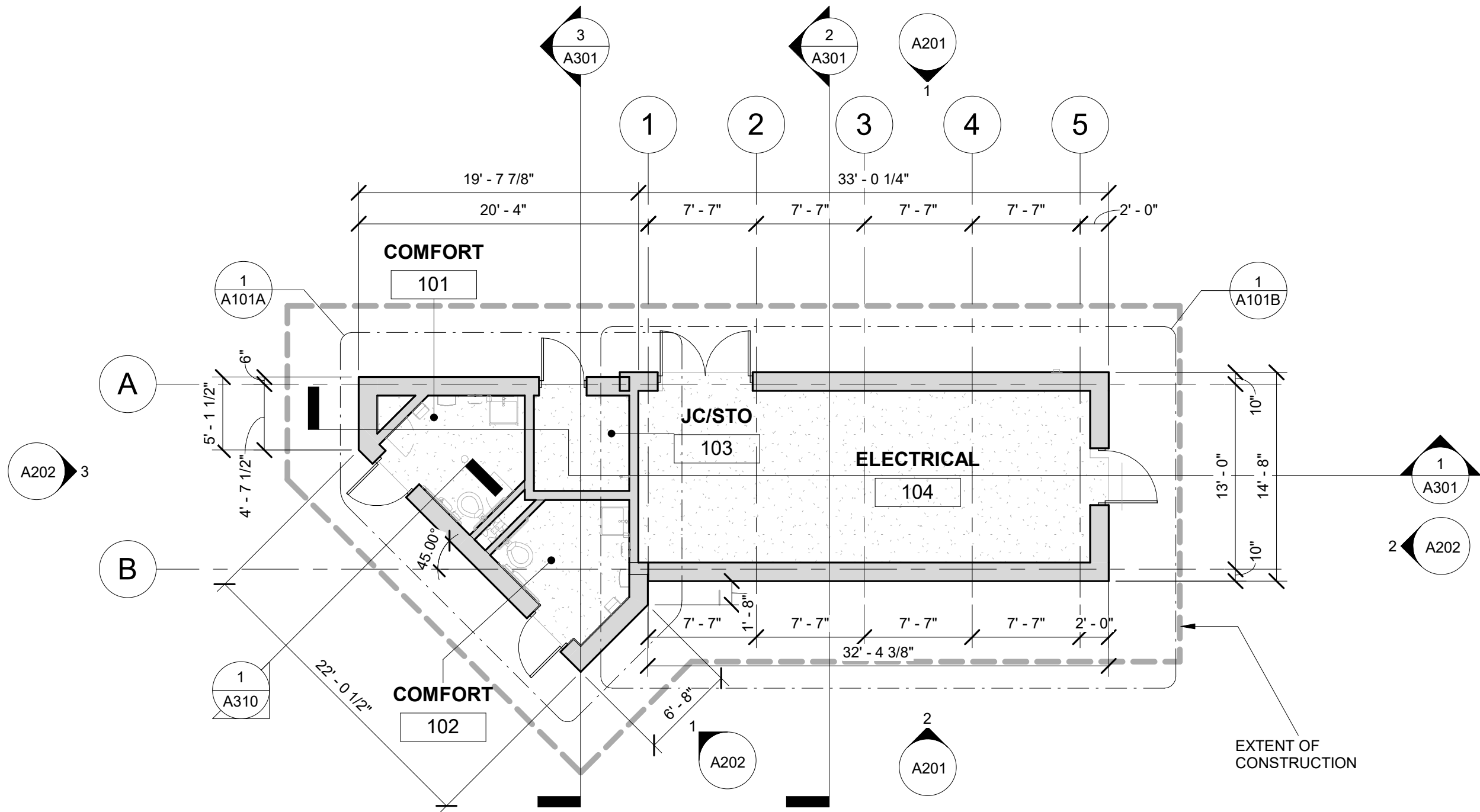


A011



2 | **ELECTRICAL ROOM PLAN HANSON ROAD**
 Scale: 1/8" = 1'-0"

1 | **HANSON ROAD ELECTRICAL ROOM FOUNDATION PLAN**
 A301 | Scale: 1/8" = 1'-0"



1
A201

FINISH FLOOR COMBINED

Scale: 1/8" = 1'-0"

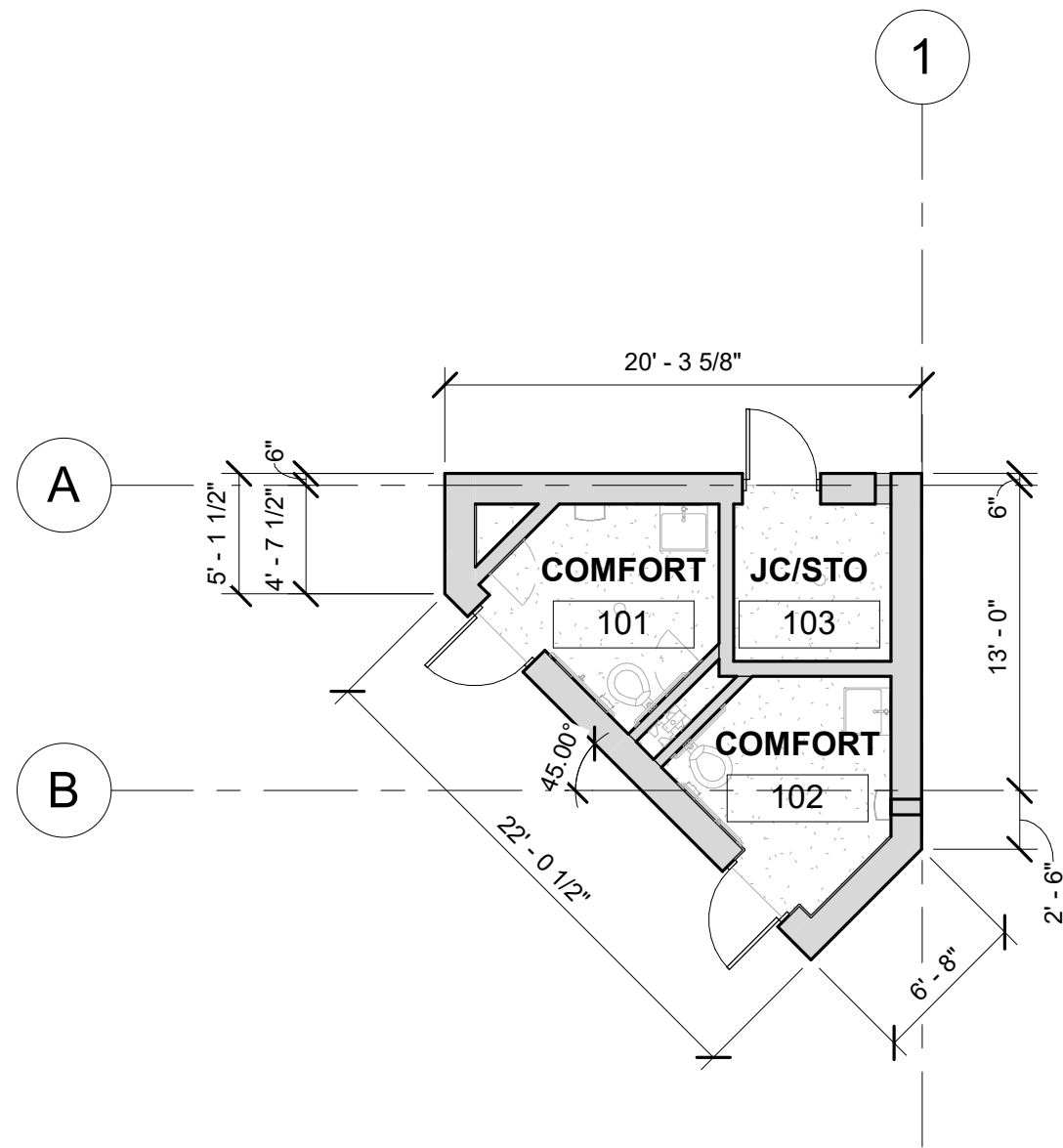
MARK	REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

COMFORT STATION FINISH FLOOR PLAN OVERALL COMBINED
BUS RAPID TRANSIT
CITY OF MADISON

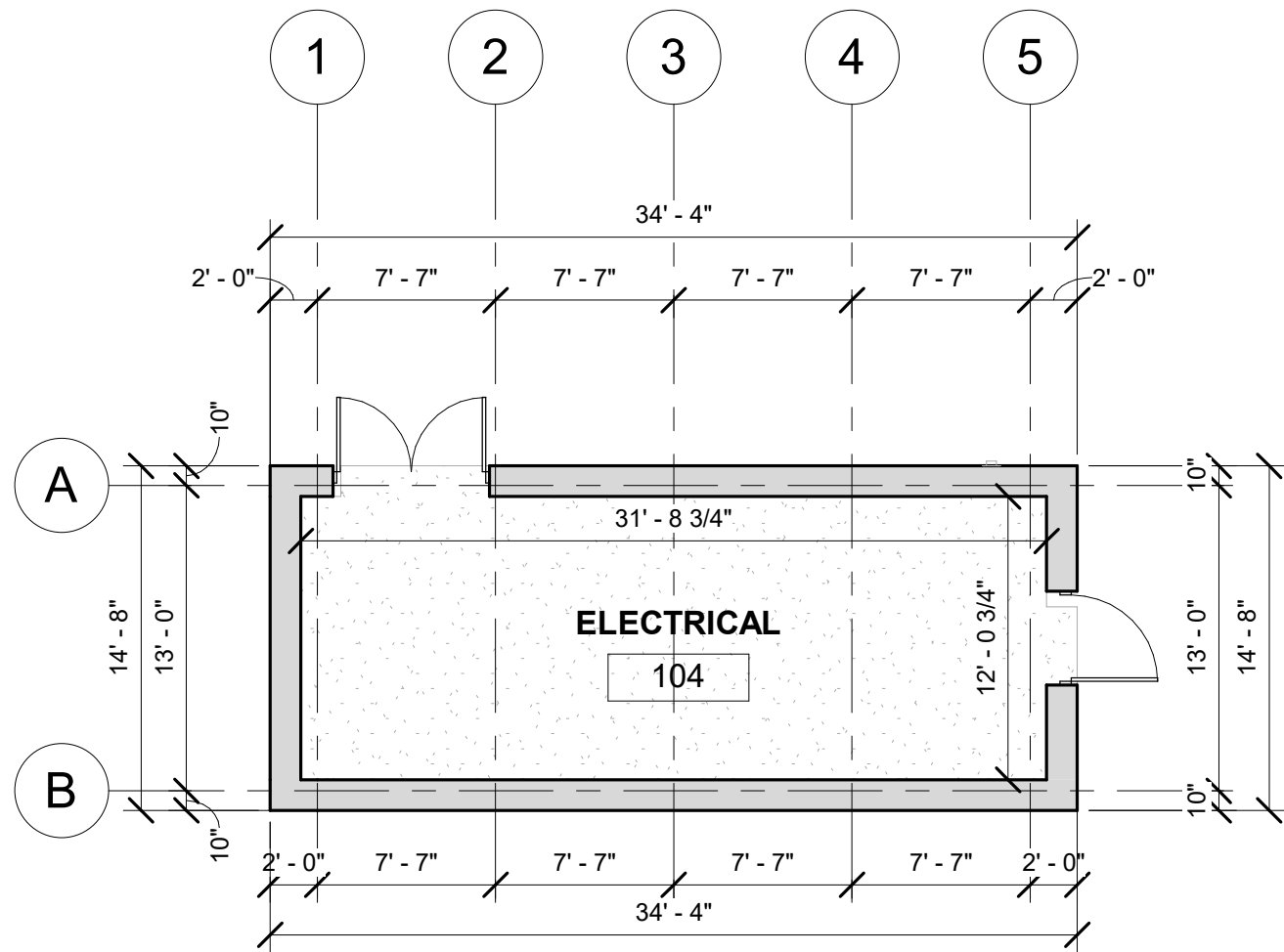


A020



COMFORT ROOMS PLAN

Scale: 1/8" = 1'-0"



ELECTRICAL ROOM PLAN

Scale: 1/8" = 1'-0"

1

A201

2

A201

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C



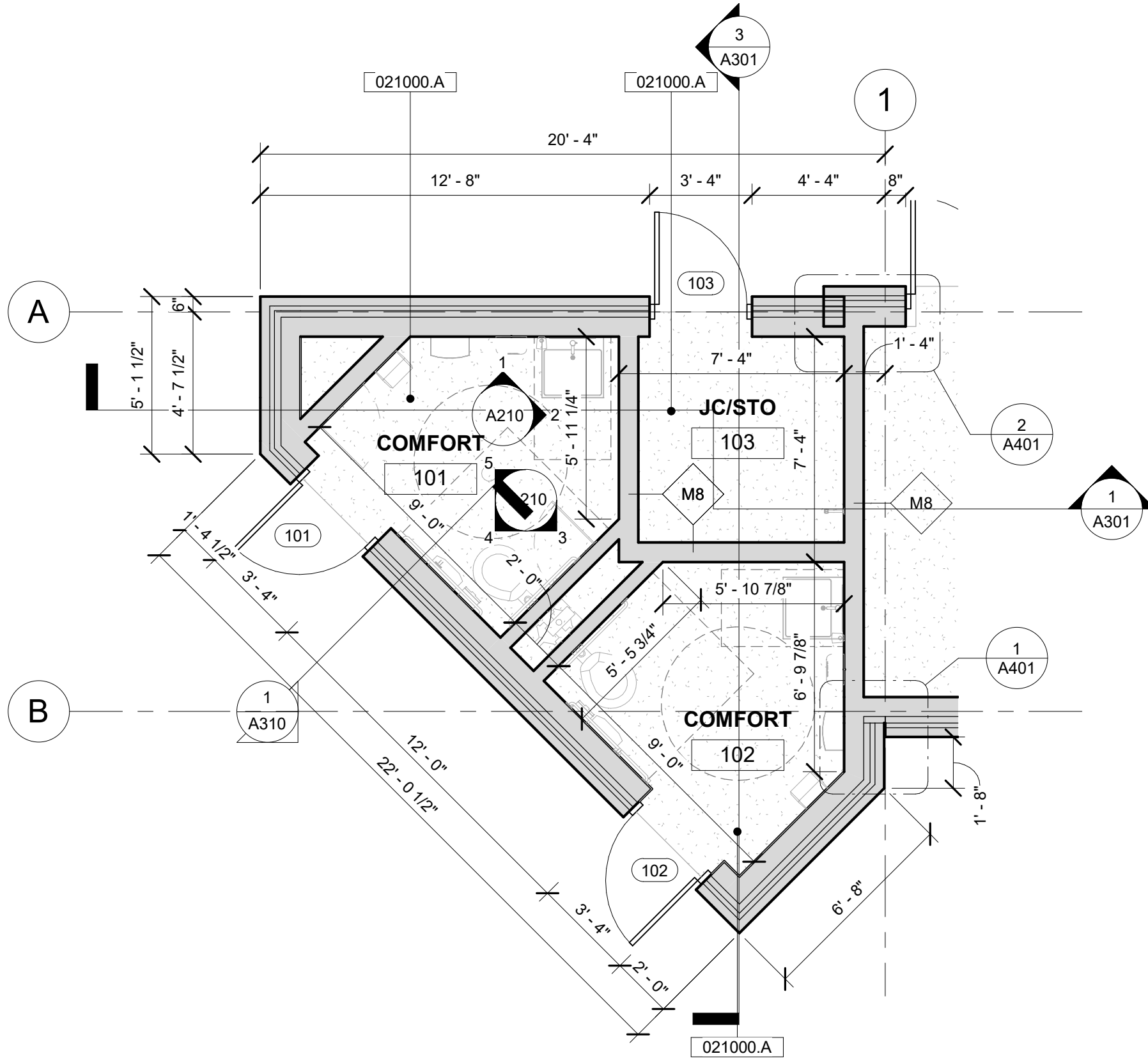
A021

COMFORT STATION FINISH FLOOR PLAN OVERALL SEPARATED

BUS RAPID TRANSIT
 CITY OF MADISON

Designed By: _____
 Date: 2022-03-08
 Scale: ---

KEYNOTE LEGEND	
VALUE	DESCRIPTION
021000.A	SEALED TROWELED CONCRETE FLOOR



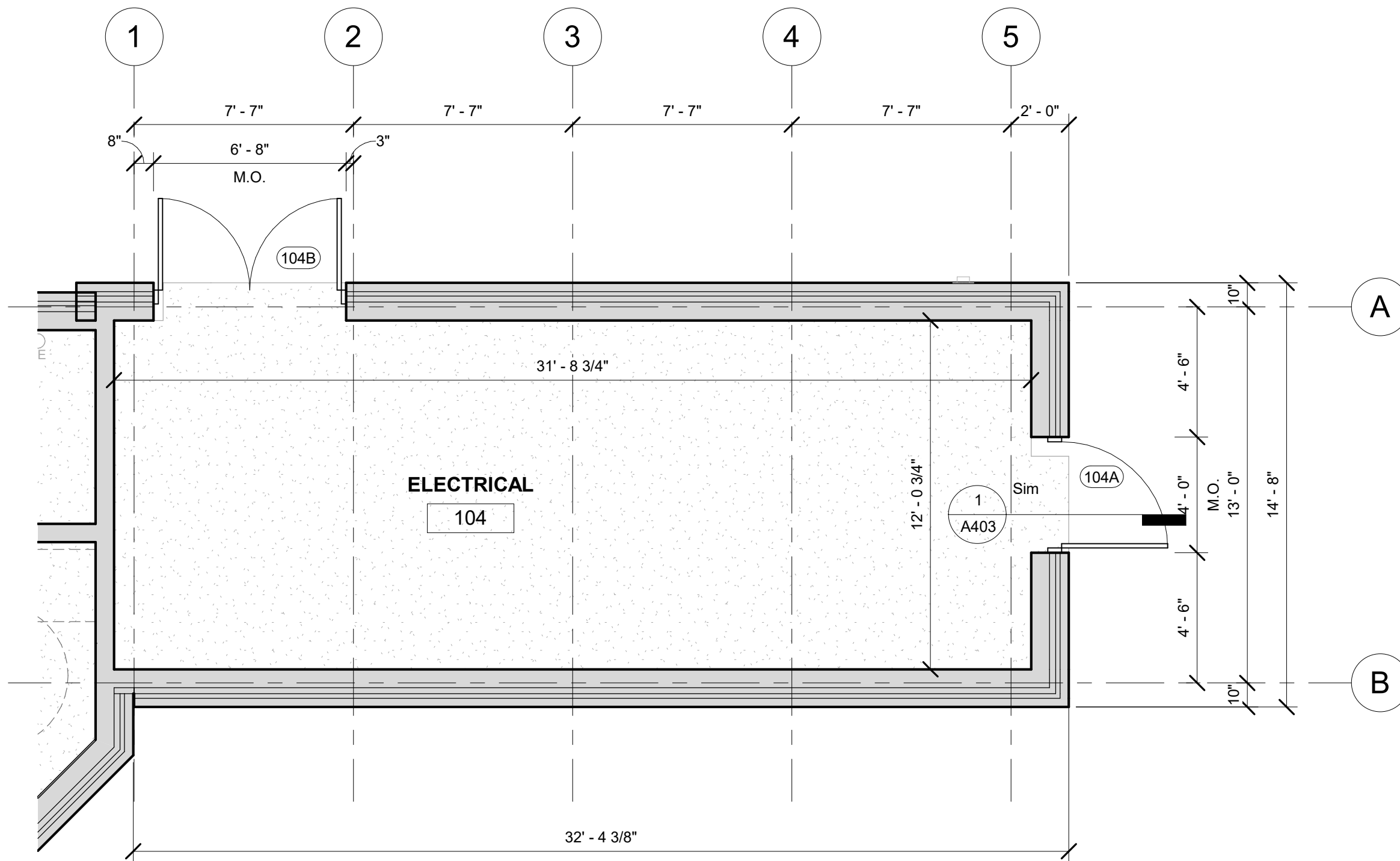
1 | **COMFORT AND JC / STORAGE ROOMS**
 A020 | Scale: 1/4" = 1'-0"

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C



COMFORT STATION ENLARGED JC/STO ROOM FLOOR PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON
 A101A



1
A020

ELECTRICAL ROOM

Scale: 1/4" = 1'-0"

MARK	REVISION	DATE	BY

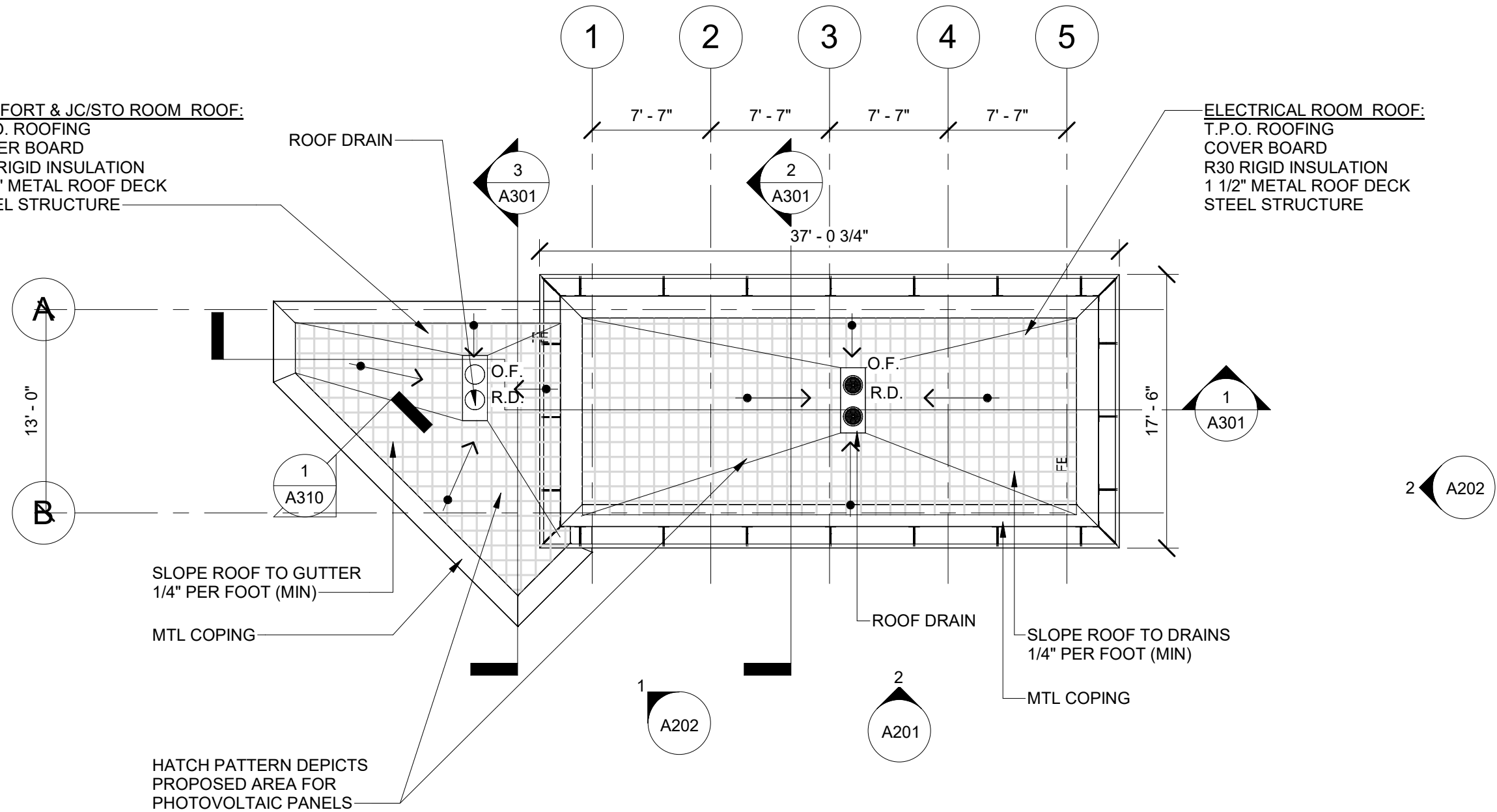
60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C



A101B

COMFORT & JC/STO ROOM ROOF:
 T.P.O. ROOFING
 COVER BOARD
 R30 RIGID INSULATION
 1 1/2" METAL ROOF DECK
 STEEL STRUCTURE

ELECTRICAL ROOM ROOF:
 T.P.O. ROOFING
 COVER BOARD
 R30 RIGID INSULATION
 1 1/2" METAL ROOF DECK
 STEEL STRUCTURE



SLOPE ROOF TO GUTTER
 1/4" PER FOOT (MIN)

MTL COPING

HATCH PATTERN DEPICTS
 PROPOSED AREA FOR
 PHOTOVOLTAIC PANELS

ROOF DRAIN

SLOPE ROOF TO DRAINS
 1/4" PER FOOT (MIN)

MTL COPING

1
 A201

ROOF PLAN

Scale: 1/8" = 1'-0"

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

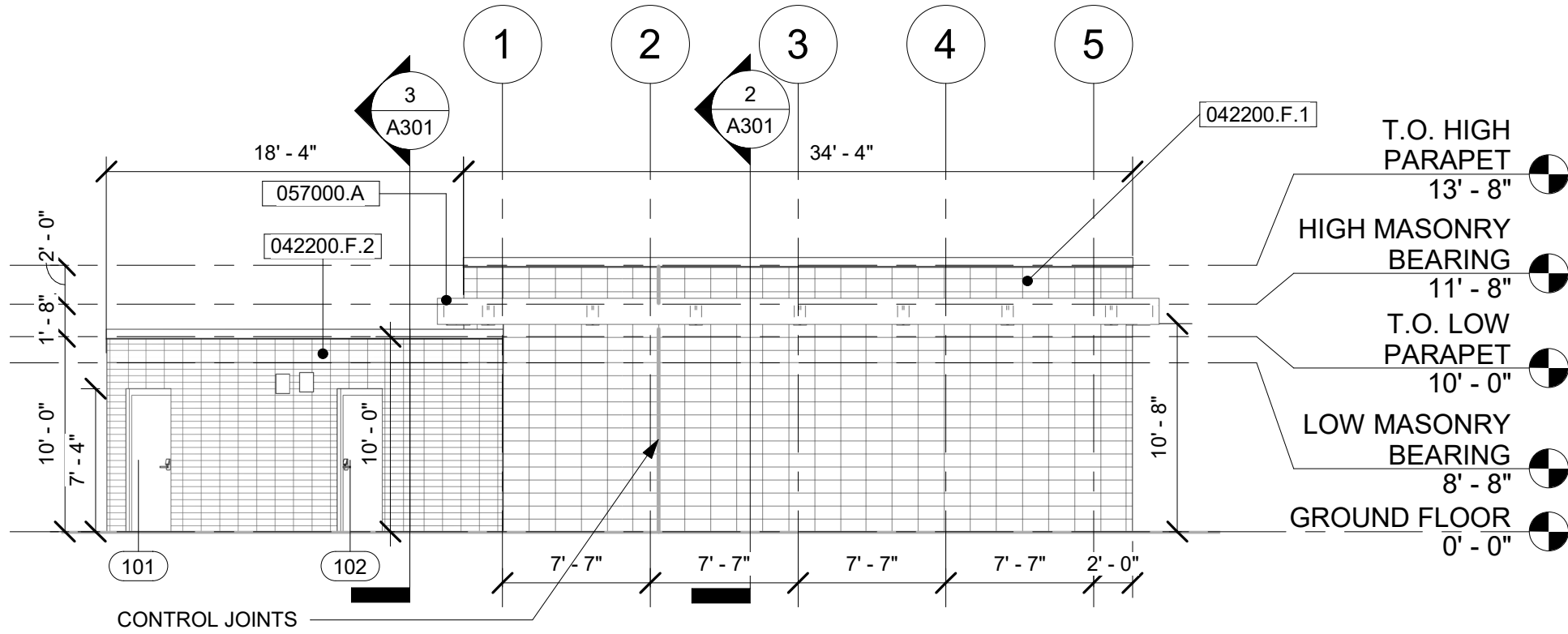
COMFORT STATION ROOF PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON



A102

MARK	REVISION	DATE	BY

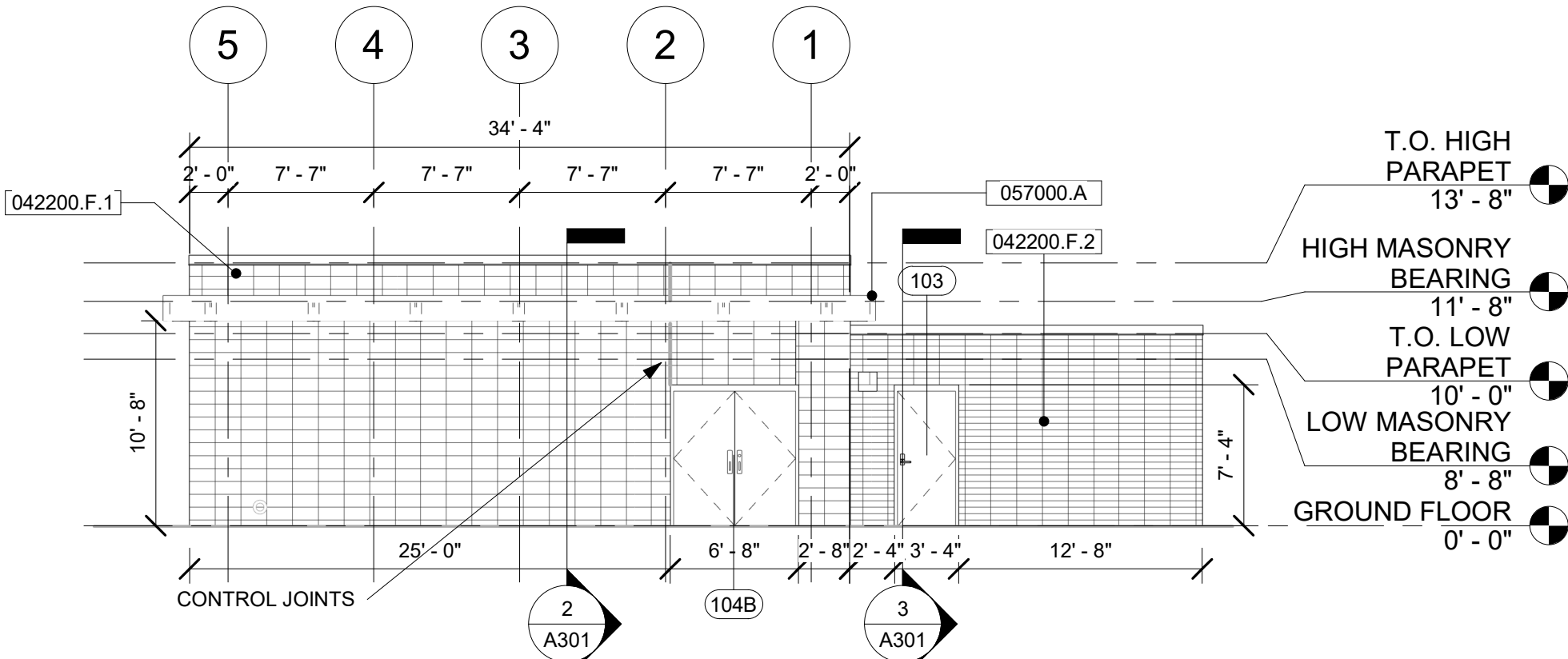
Designed By: _____ Date: 2022-03-08 Scale: ---



SOUTH ELEVATION

Scale: 1/8" = 1'-0"

2
A020



NORTH ELEVATION

Scale: 1/8" = 1'-0"

1
A020

KEYNOTE LEGEND	
VALUE	DESCRIPTION
042200.F.1	8"X16"X4" GROUND FACE CONCRETE MASONRY VENEER
042200.F.2	4"X16"X4" GROUND FACE CONCRETE MASONRY VENEER
057000.A	HALO WITH LIGHTING

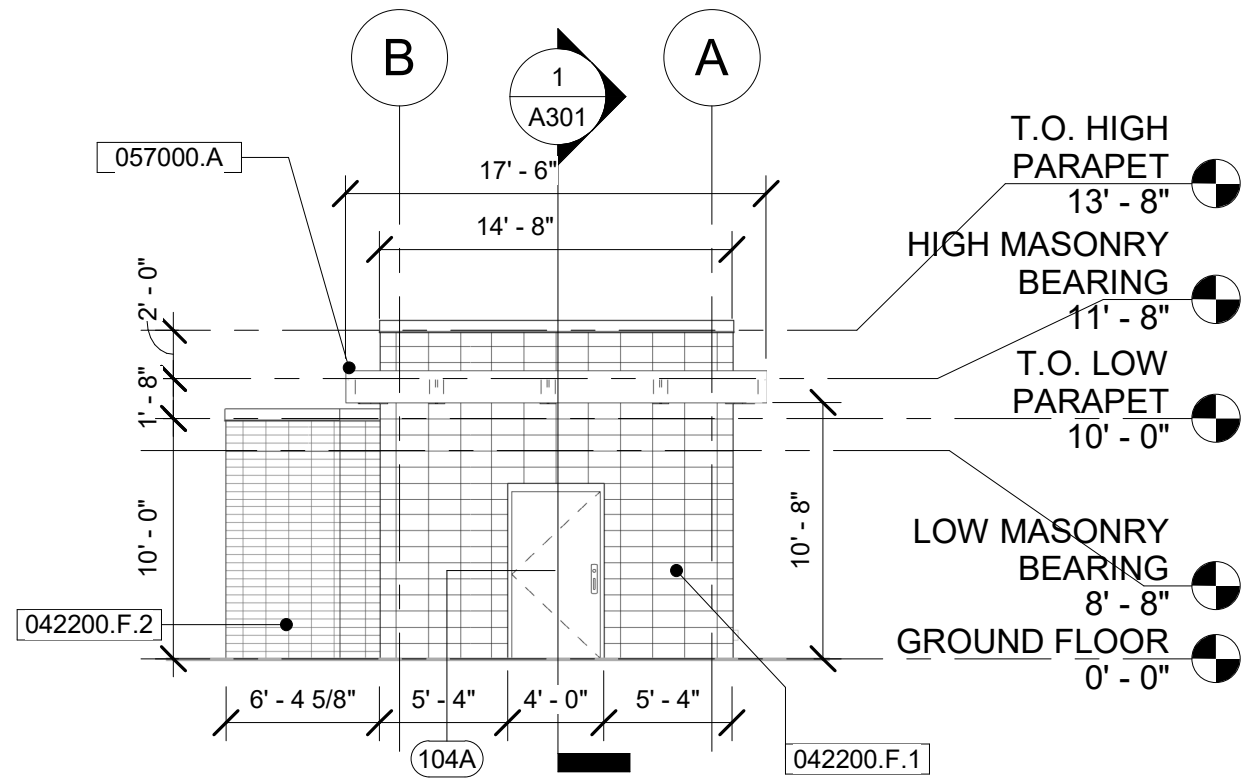
MARK	REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

COMFORT STATION EXTERIOR ELEVATIONS
BUS RAPID TRANSIT
CITY OF MADISON



A201

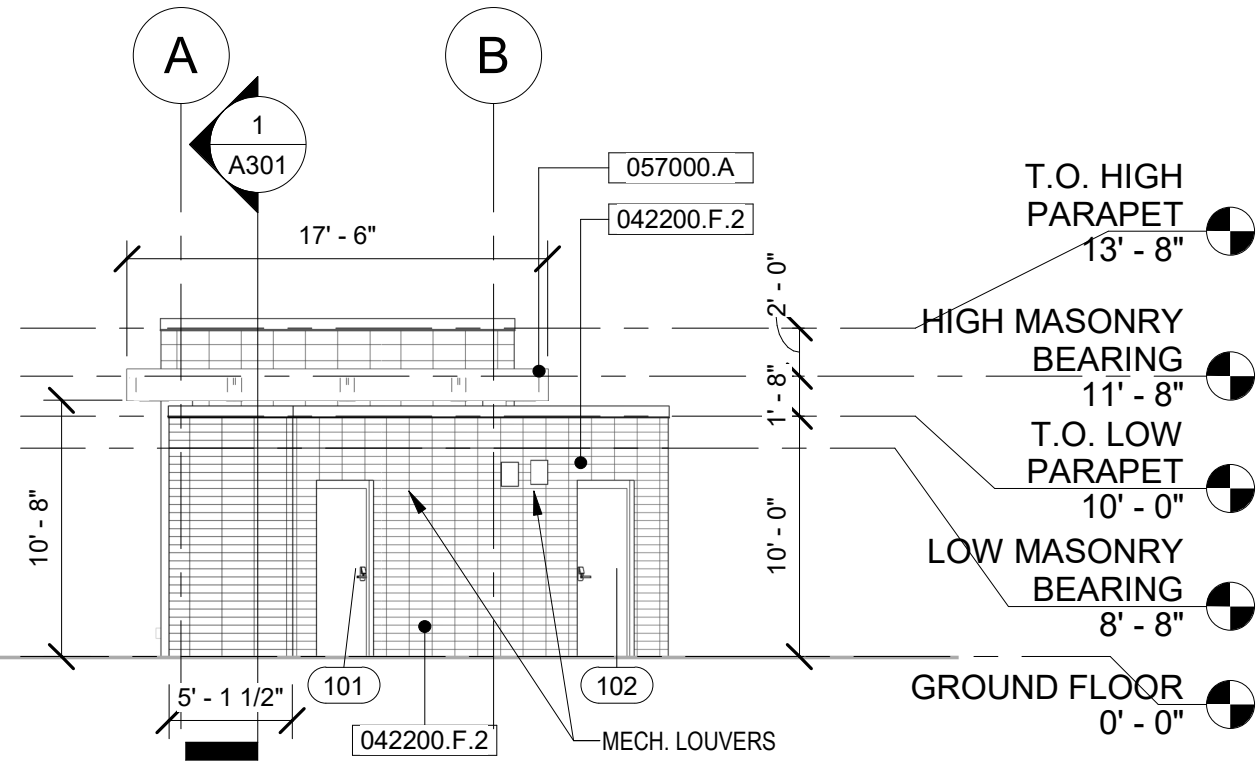


EAST ELEVATION

Scale: 1/8" = 1'-0"

2
A020

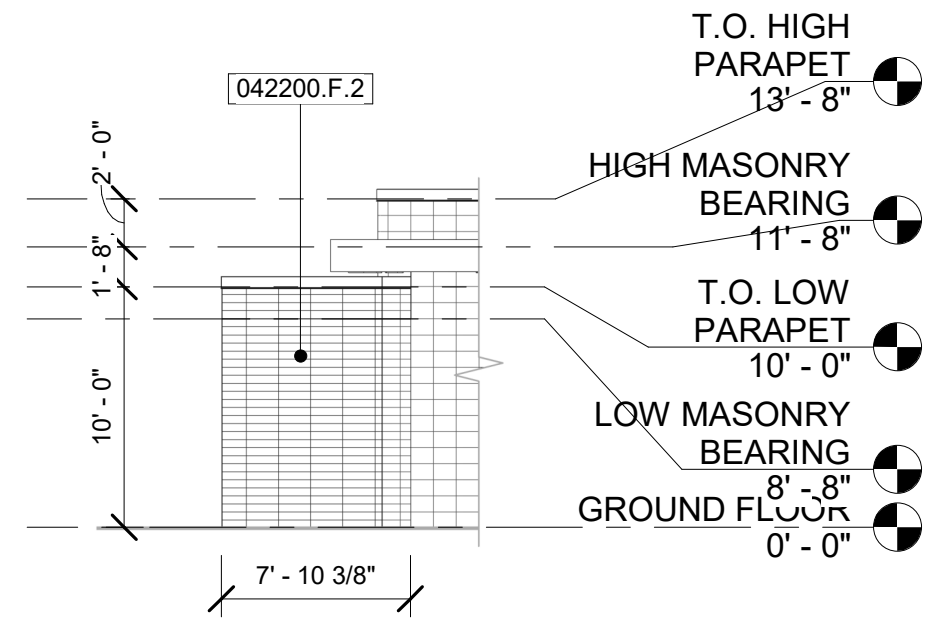
KEYNOTE LEGEND	
VALUE	DESCRIPTION
042200.F.1	8"X16"X4" GROUND FACE CONCRETE MASONRY VENEER
042200.F.2	4"X16"X4" GROUND FACE CONCRETE MASONRY VENEER
057000.A	HALO WITH LIGHTING



WEST ELEVATION

Scale: 1/8" = 1'-0"

3
A020



SOUTHEAST ELEVATION

Scale: 1/8" = 1'-0"

1
A020

MARK	REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

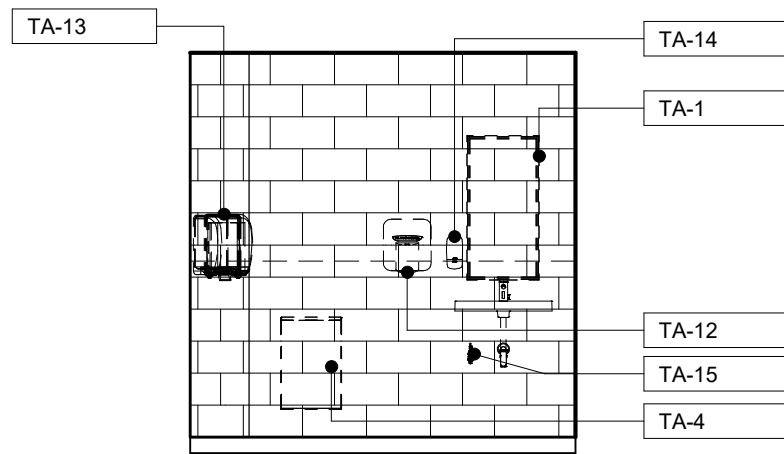
COMFORT STATION EXTERIOR ELEVATIONS
BUS RAPID TRANSIT
CITY OF MADISON



A202

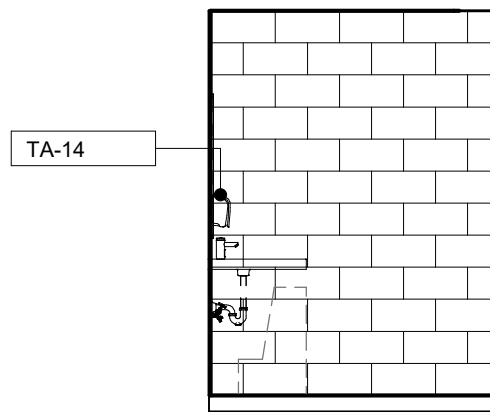
TOILET ACCESSORIES LEGEND

SYMBOL	DESCRIPTION	Comments
TA-1	Bobrick B-2908 1836 Tempered Glass Welded Frame Mirror	
TA-3	Bobrick B-221 Classic Series Surface Mounted Seat Cover Dispenser	
TA-4	Bobrick B-277 Contura Series Surface Mounted Waste Receptacle	
TA-5	TrimLineSeries™ Surface-Mounted Sanitary Napkin Disposal	
TA-7	Grab Bars	
TA-10	Bobrick B-6727 Surface Mounted Double Robe Hook	
TA-11	Tork 3-Roll Bath Tissue Dispenser for OptiCore, Black	
TA-12	XLERATOReco Hand Dryer	
TA-13	Tork Mechanical Hand Towel Roll Dispenser	
TA-14	Gojo 2740-12 - Soap Dispenser	
TA-15	1/2" Hose Union Bib Tap with Double Check Valve	



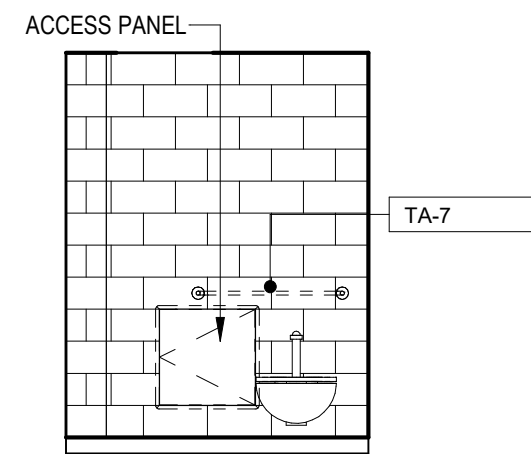
ELEVATION NORTH - COMFORT 101

1
A101A | Scale: 1/4" = 1'-0"



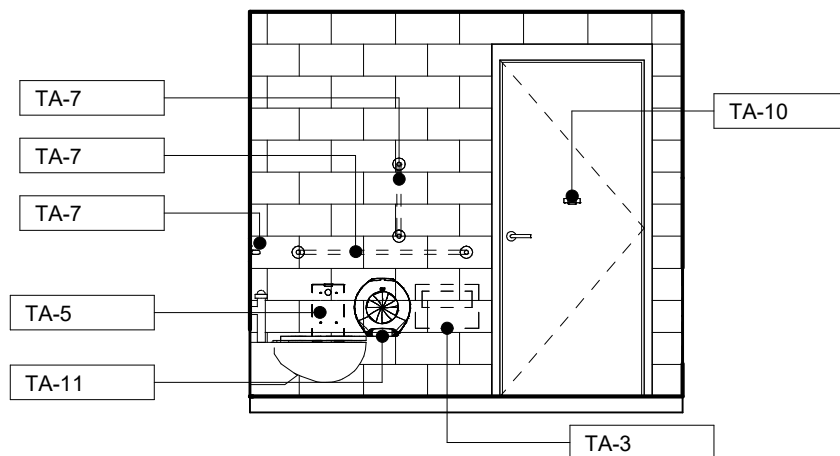
ELEVATION EAST - COMFORT 101

2
A101A | Scale: 1/4" = 1'-0"



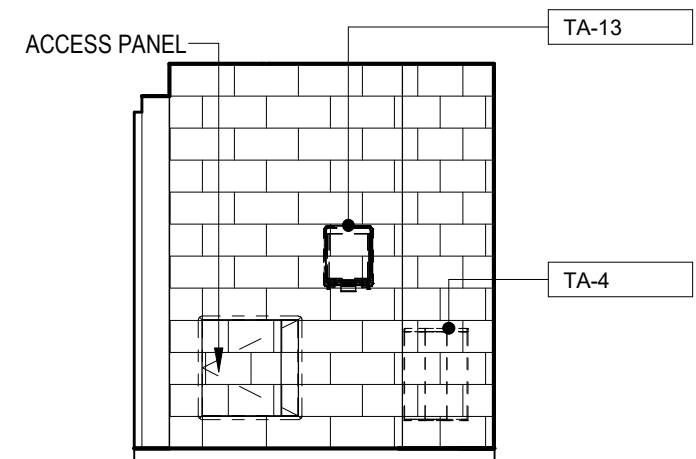
ELEVATION S/E - COMFORT 101

3
A101A | Scale: 1/4" = 1'-0"



ELEVATION S/W - COMFORT 101

4
A101A | Scale: 1/4" = 1'-0"



ELEVATION N/W - COMFORT 101

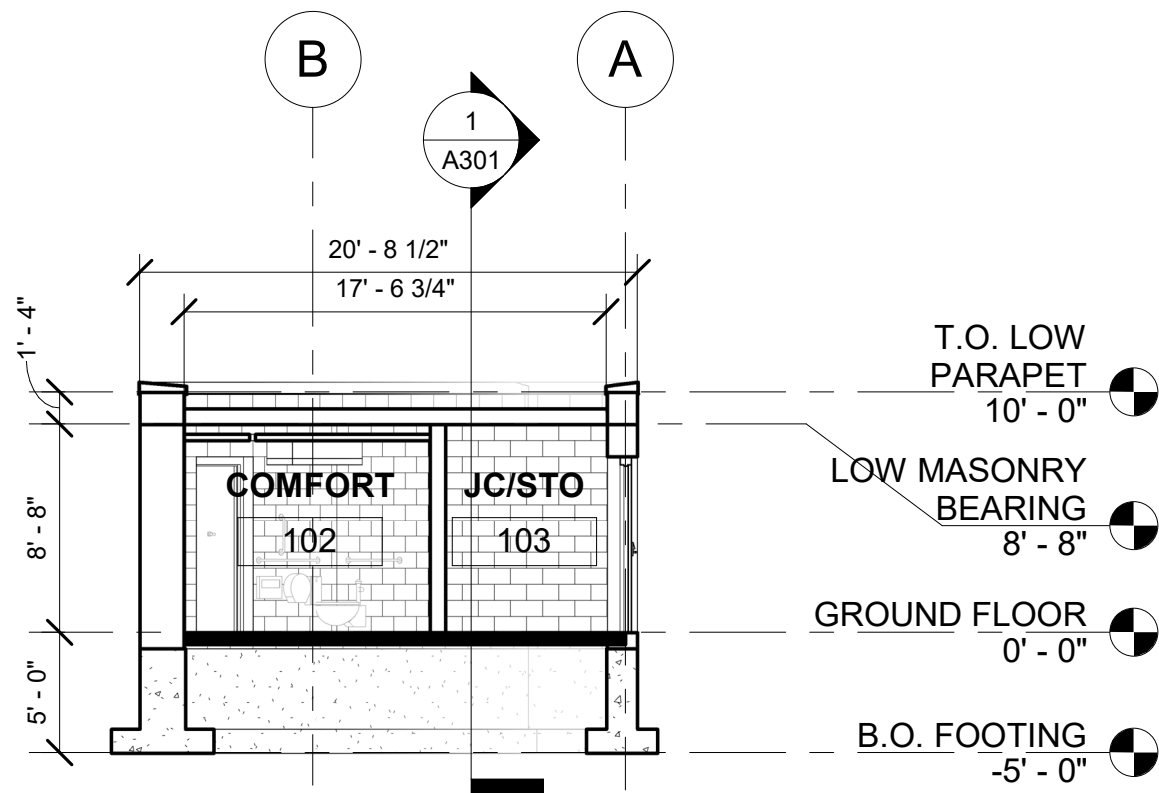
5
A101A | Scale: 1/4" = 1'-0"

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

COMFORT STATION TYPICAL INTERIOR ELEVATIONS
BUS RAPID TRANSIT
CITY OF MADISON



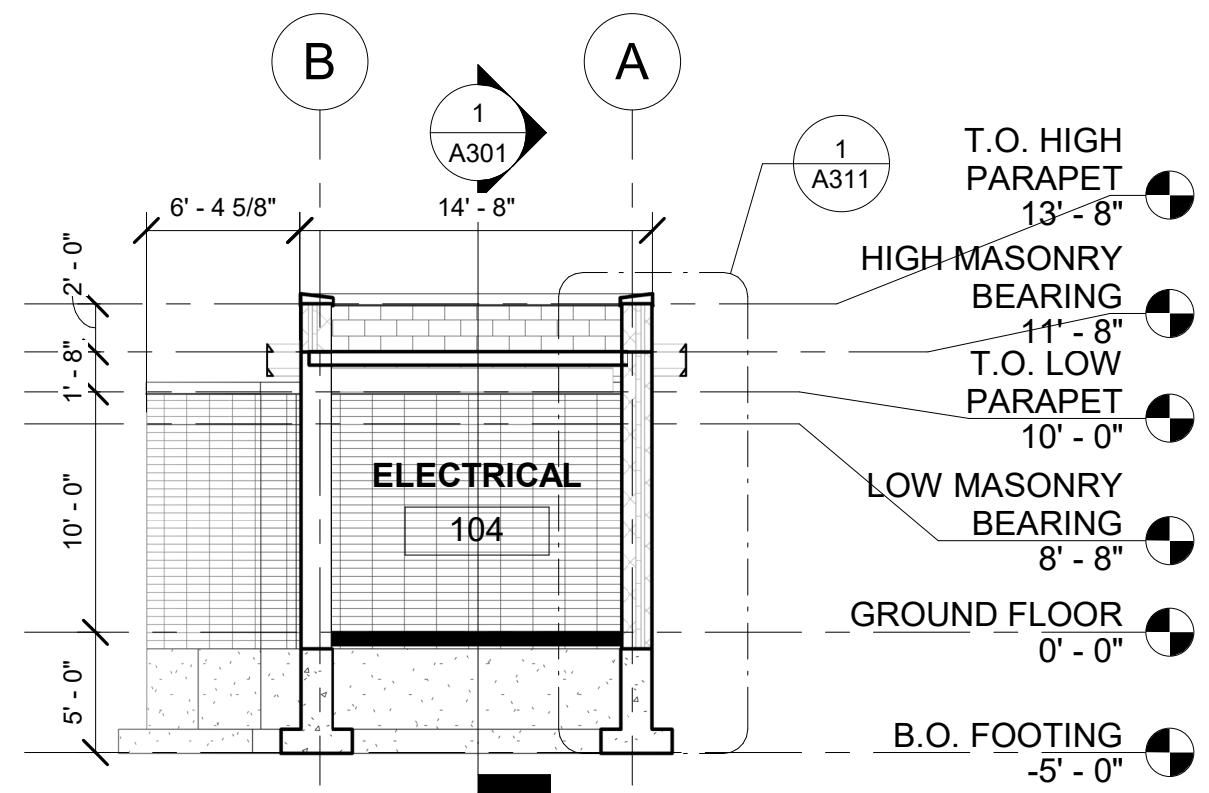
MARK	REVISION	DATE	BY



3 TRANSVERSE SECTION - COMFORT ROOMS

3
A010

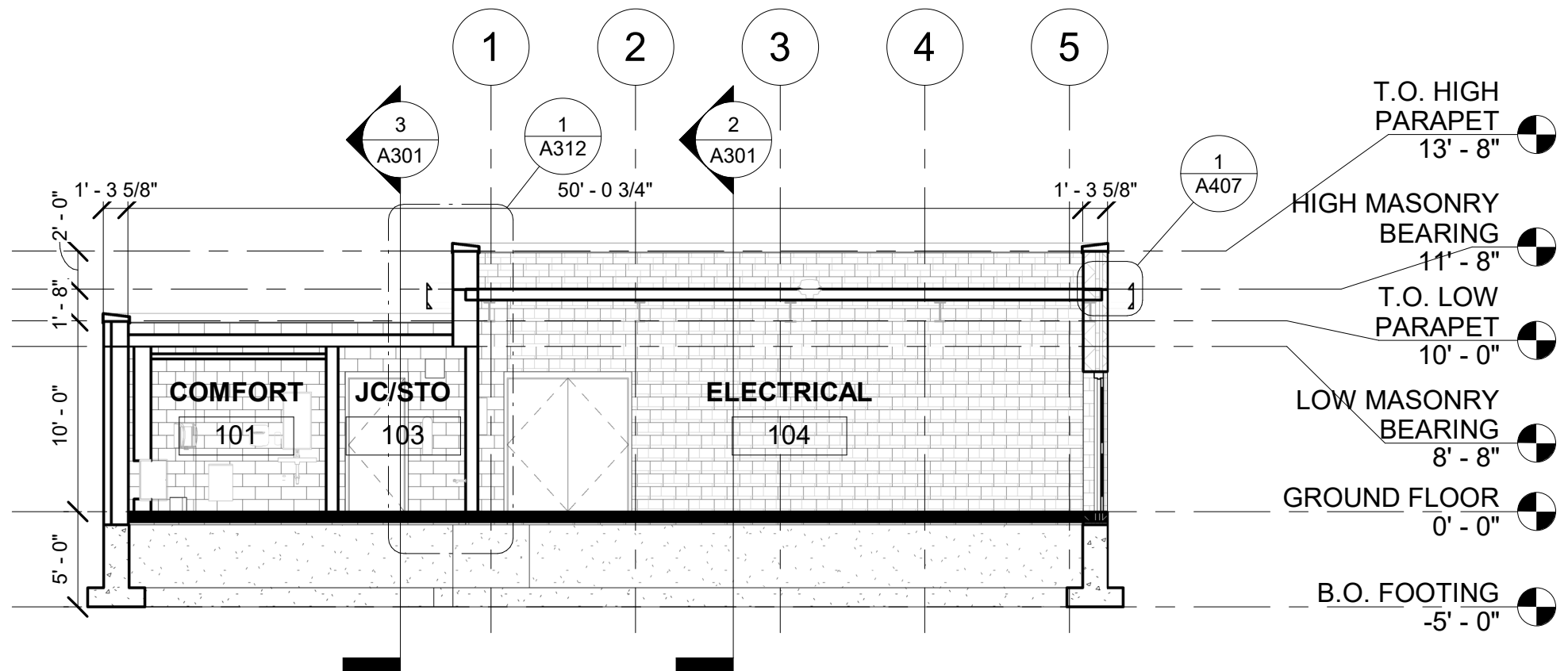
Scale: 1/8" = 1'-0"



2 TRANSVERSE SECTION - ELECTRICAL ROOM

2
A010

Scale: 1/8" = 1'-0"



1 LONGITUDINAL SECTION

1
A010

Scale: 1/8" = 1'-0"

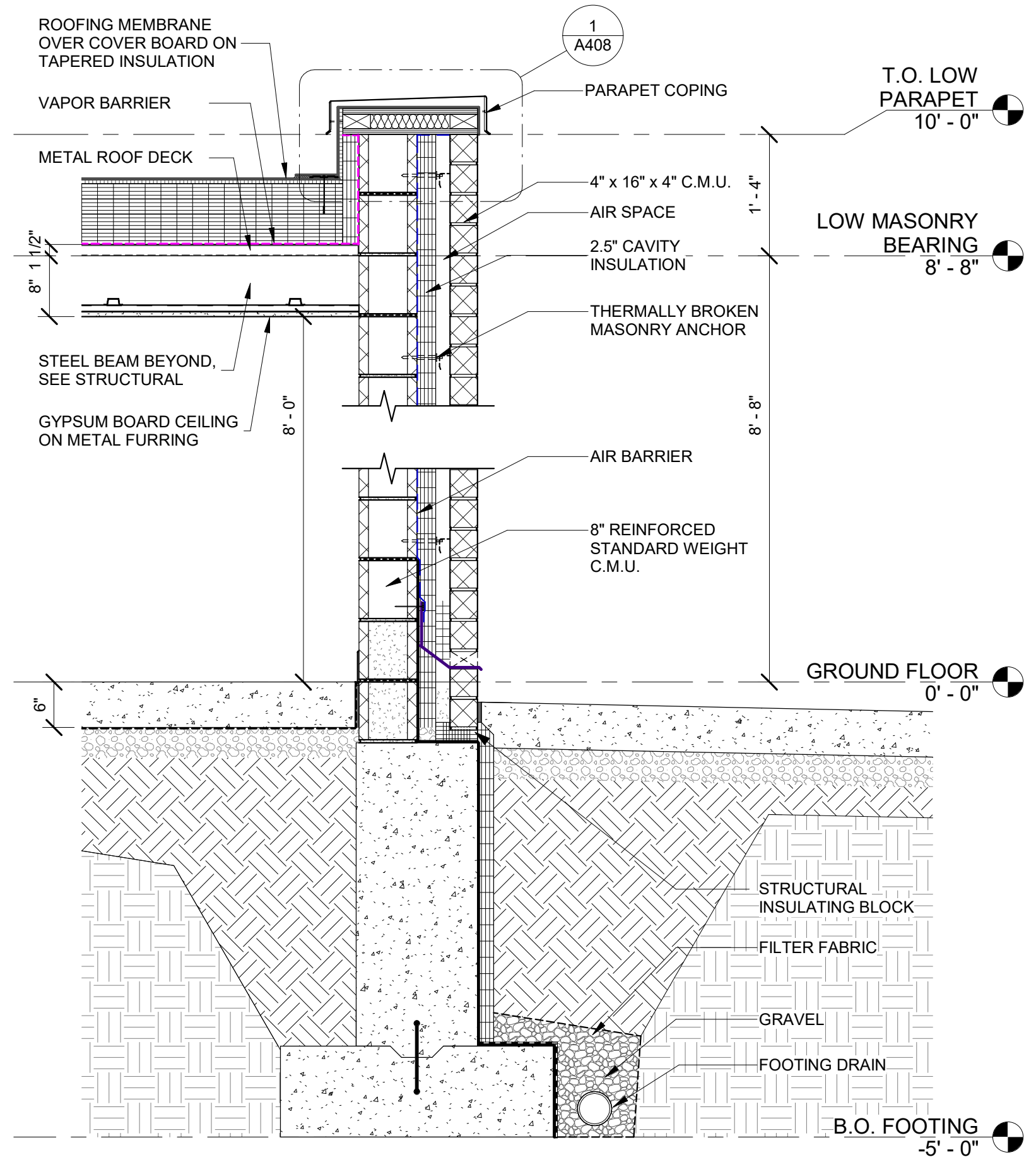
REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION BUILDING SECTIONS
 BUS RAPID TRANSIT
 CITY OF MADISON



A301



1
A010

COMFORT WALL SECTION

Scale: 3/4" = 1'-0"

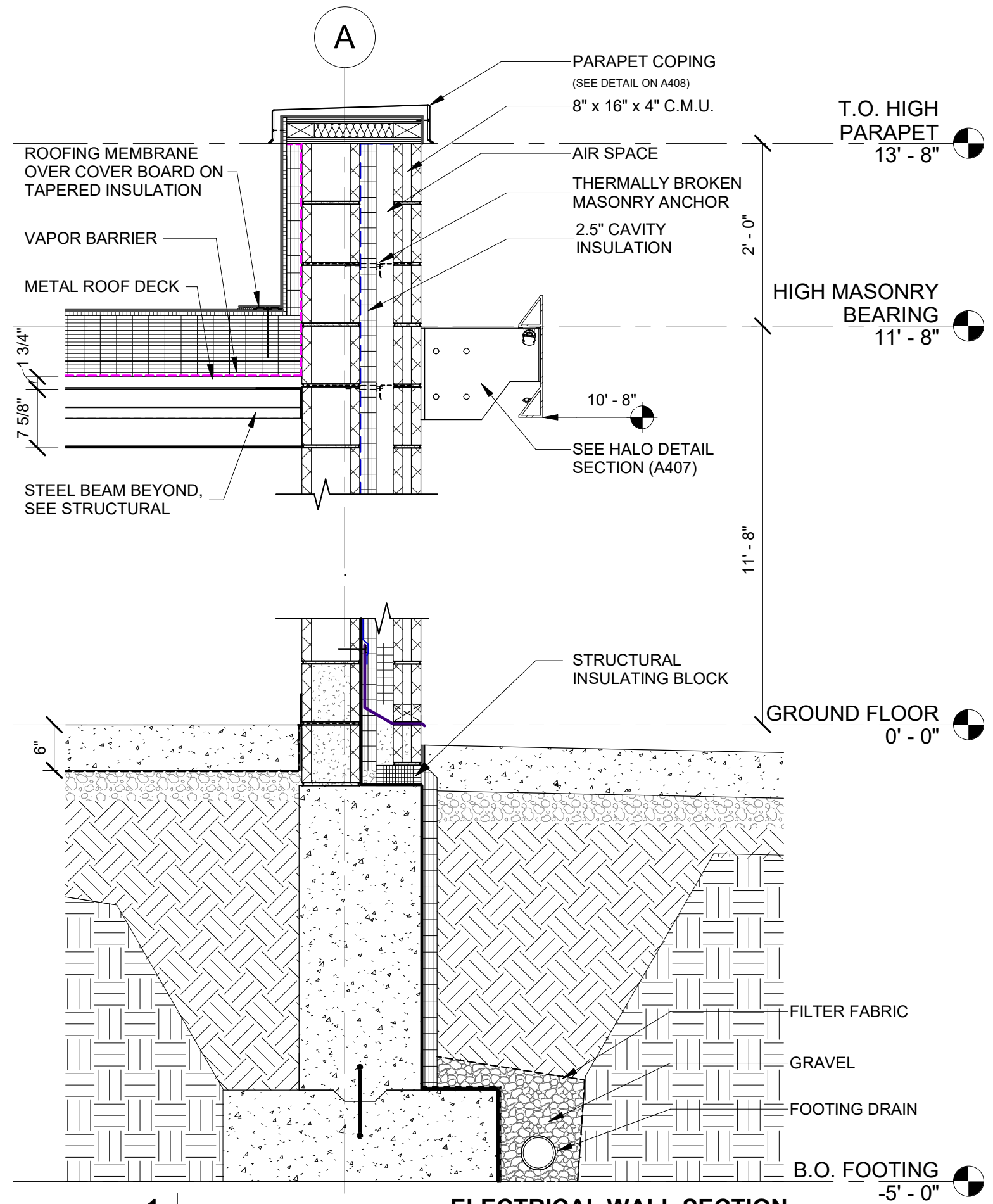
MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION WALL SECTIONS
 BUS RAPID TRANSIT
 CITY OF MADISON



A310



1
A011

ELECTRICAL WALL SECTION

Scale: 3/4" = 1'-0"

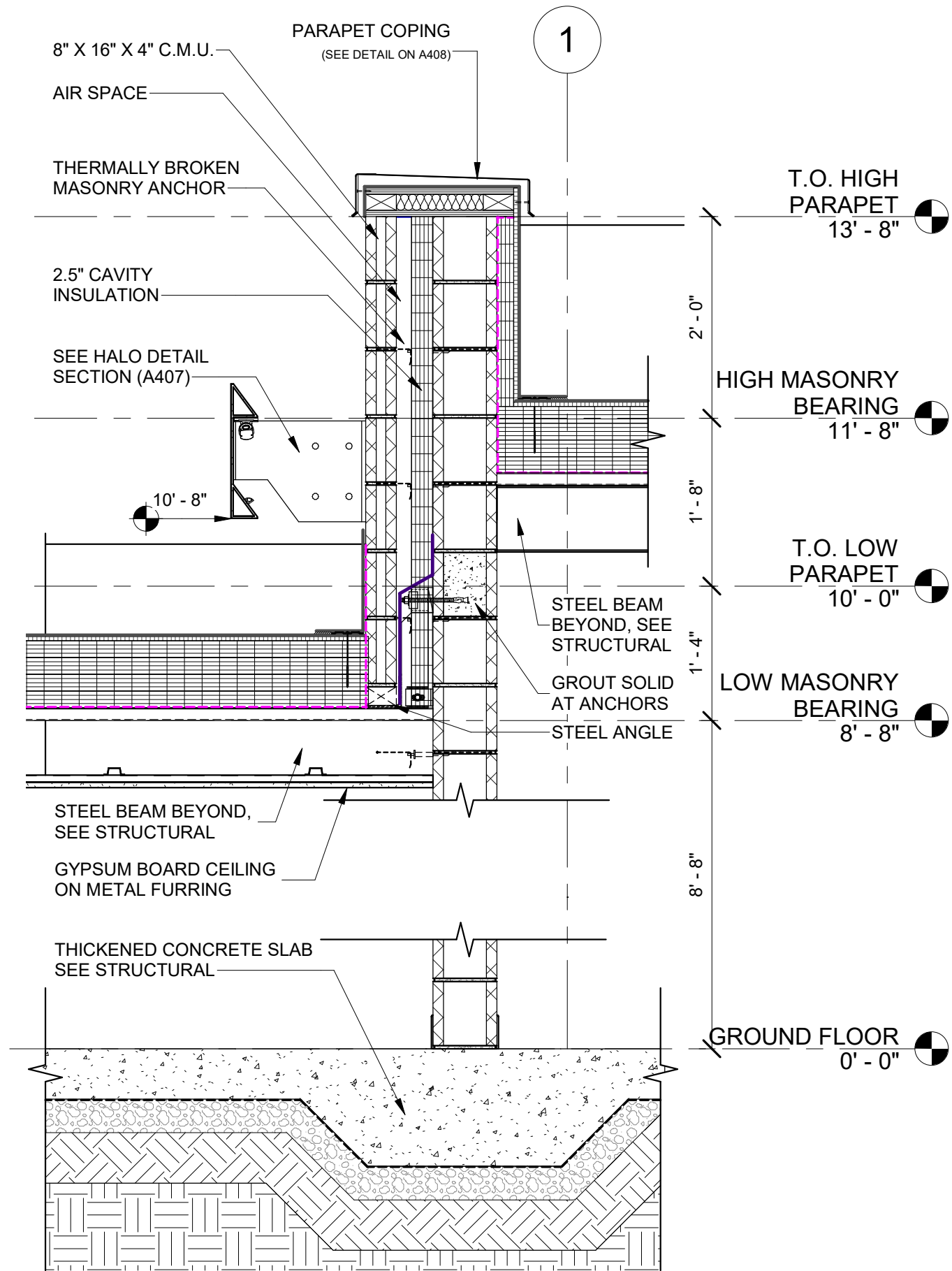
REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

COMFORT STATION WALL SECTIONS
BUS RAPID TRANSIT
CITY OF MADISON



A311



1
A301

WALL PARAPET SECTION

Scale: 3/4" = 1'-0"

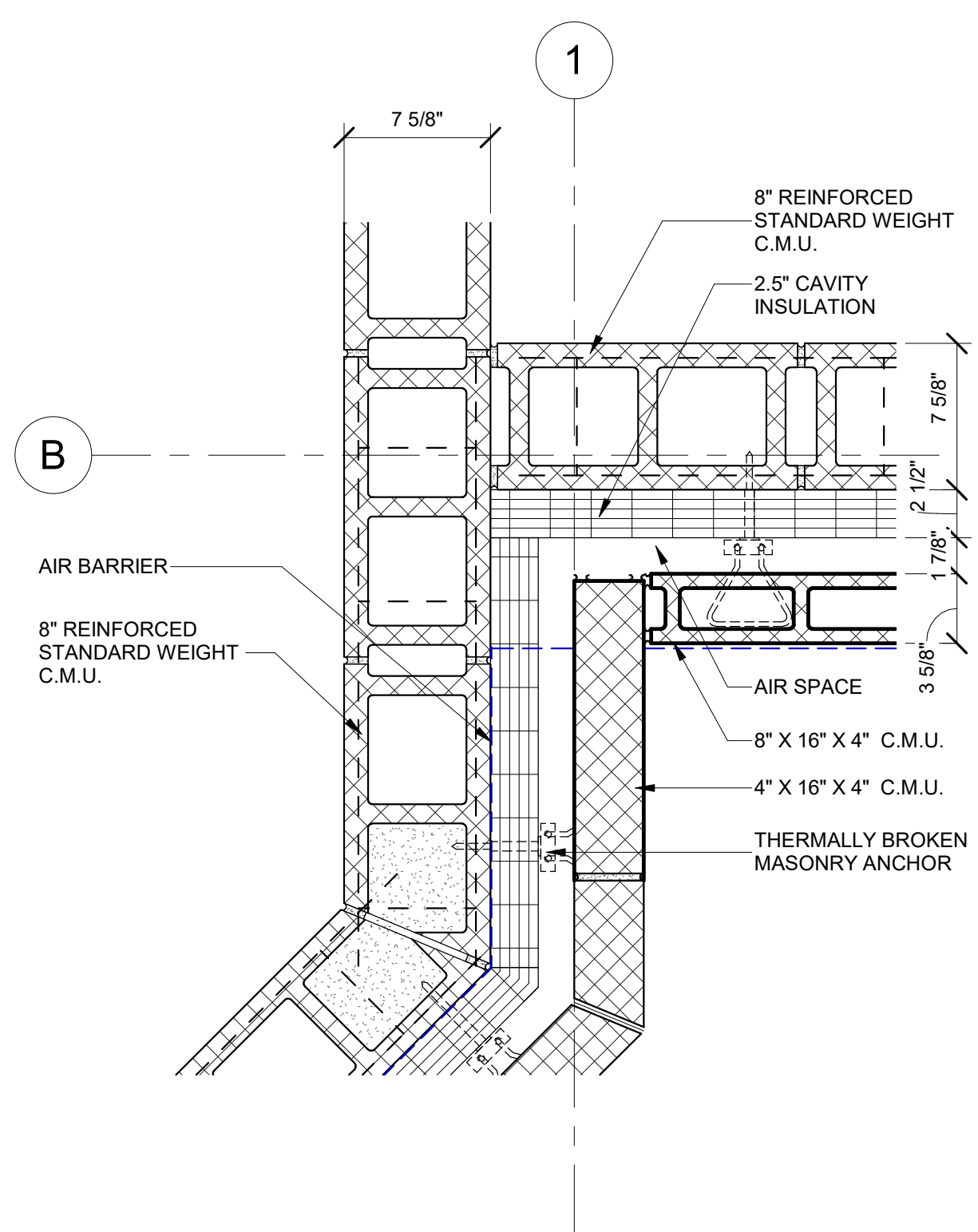
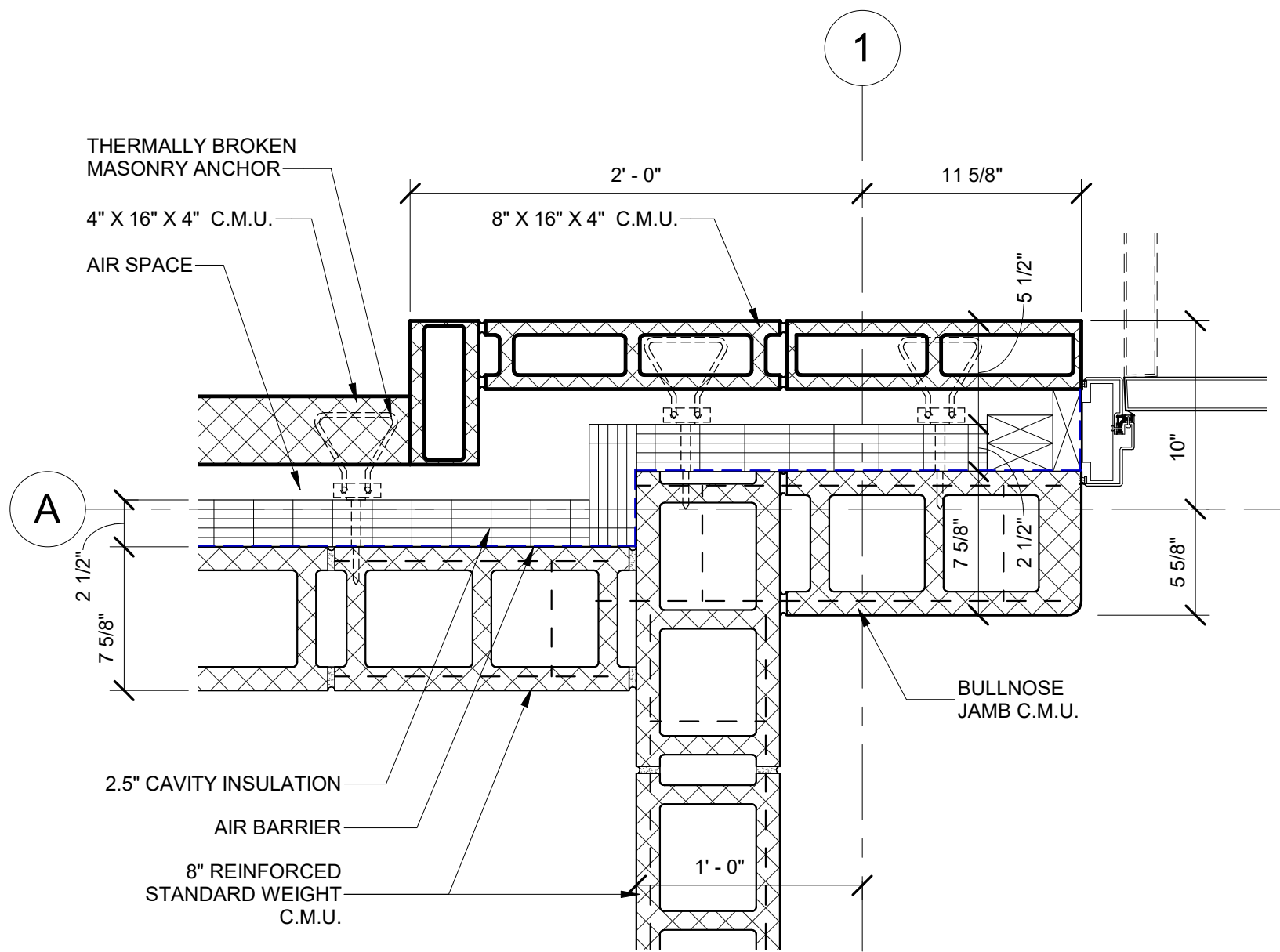
MARK	REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

COMFORT STATION WALL SECTIONS
BUS RAPID TRANSIT
CITY OF MADISON



A312



2

PLAN DETAIL - MASONRY JUNCTION

Scale: 1 1/2" = 1'-0"

A101A

1

PLAN DETAIL - MASONRY JUNCTION

Scale: 1 1/2" = 1'-0"

A101A

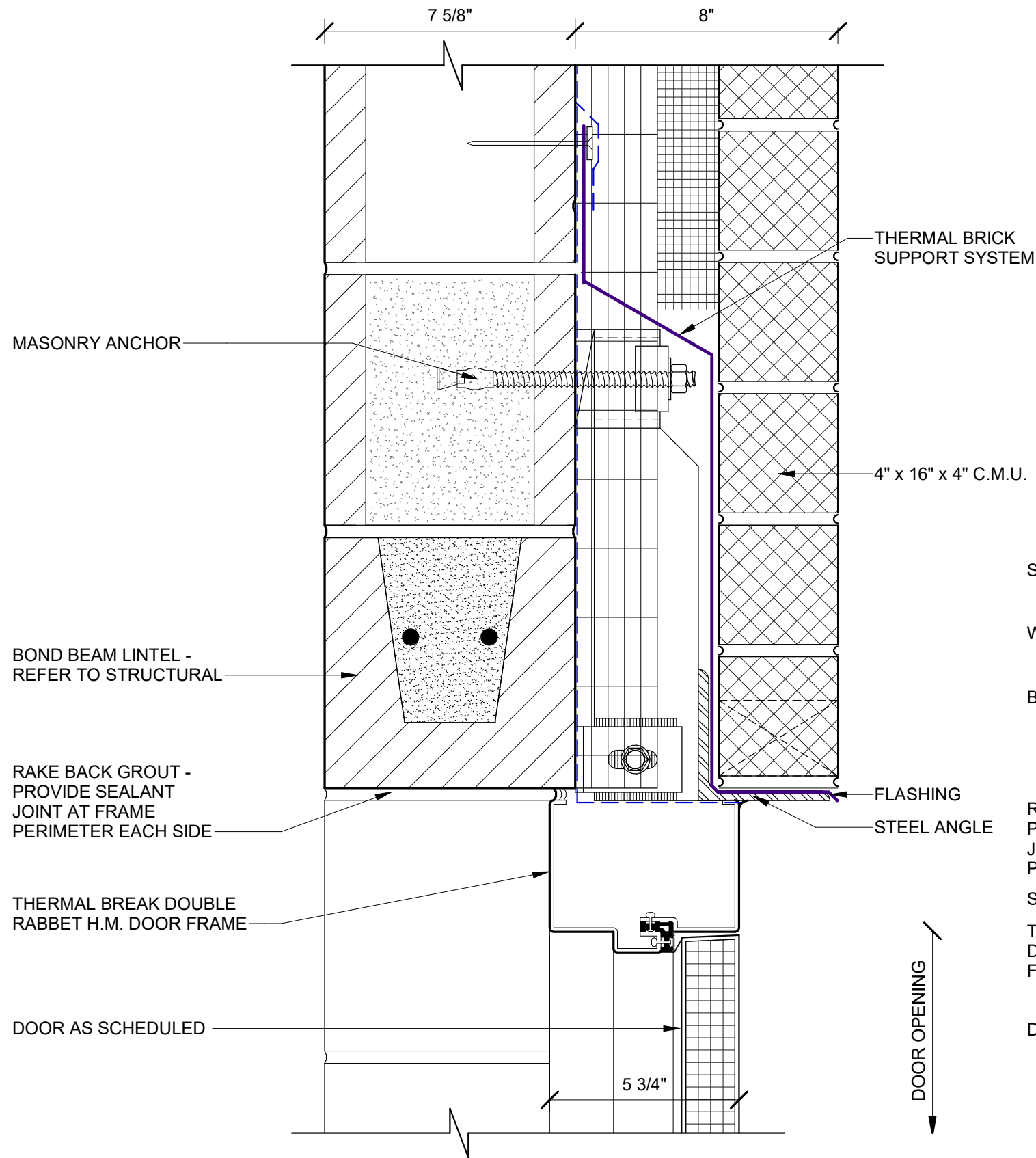
MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION PLAN DETAILS
 BUS RAPID TRANSIT
 CITY OF MADISON



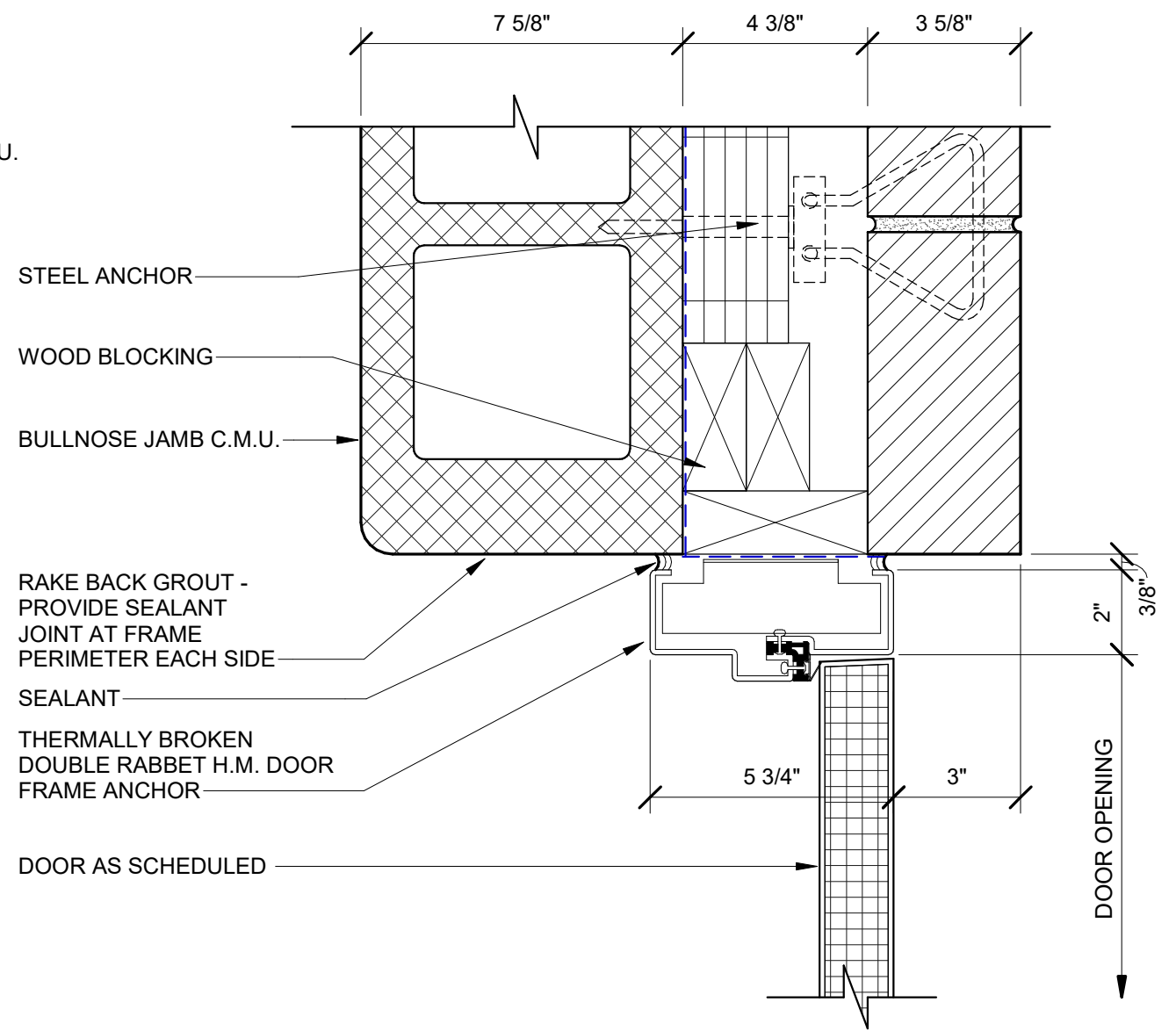
A401



DOOR HEAD DETAIL

Scale: 3" = 1'-0"

2



DOOR JAMB DETAIL

Scale: 3" = 1'-0"

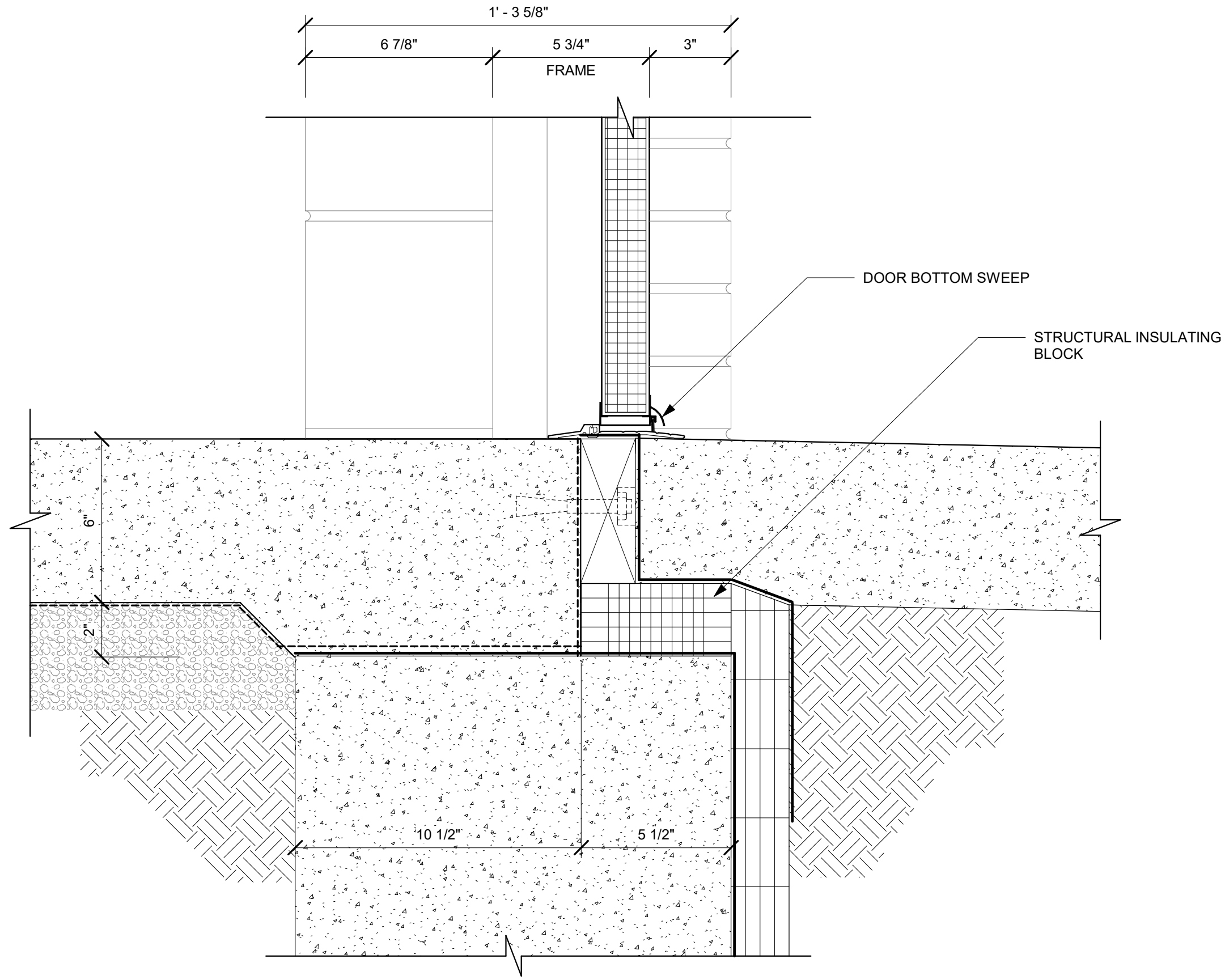
1

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION DOOR FRAME DETAILS
 BUS RAPID TRANSIT
 CITY OF MADISON





1
A101B

DOOR SILL DETAIL

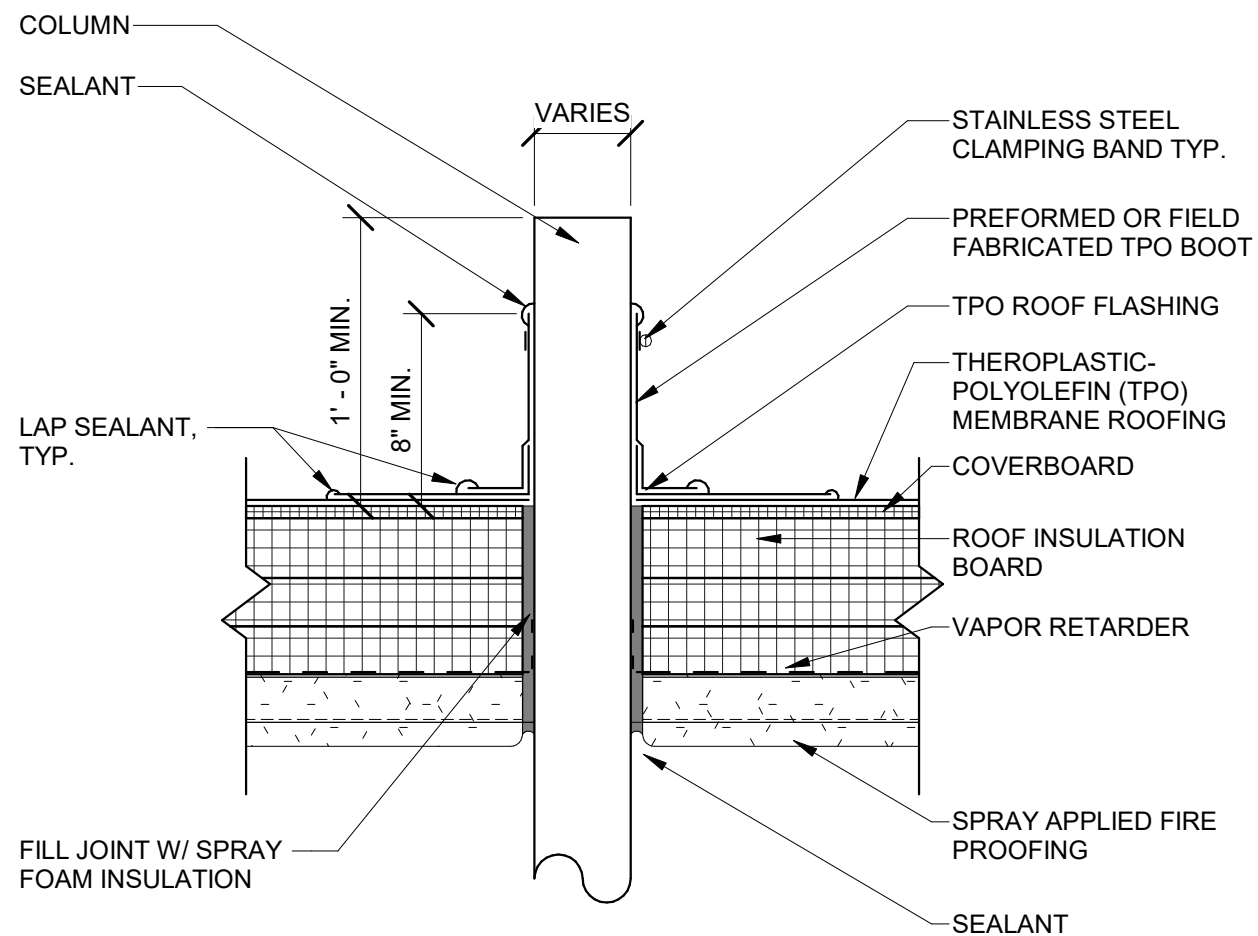
Scale: 3" = 1'-0"

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CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

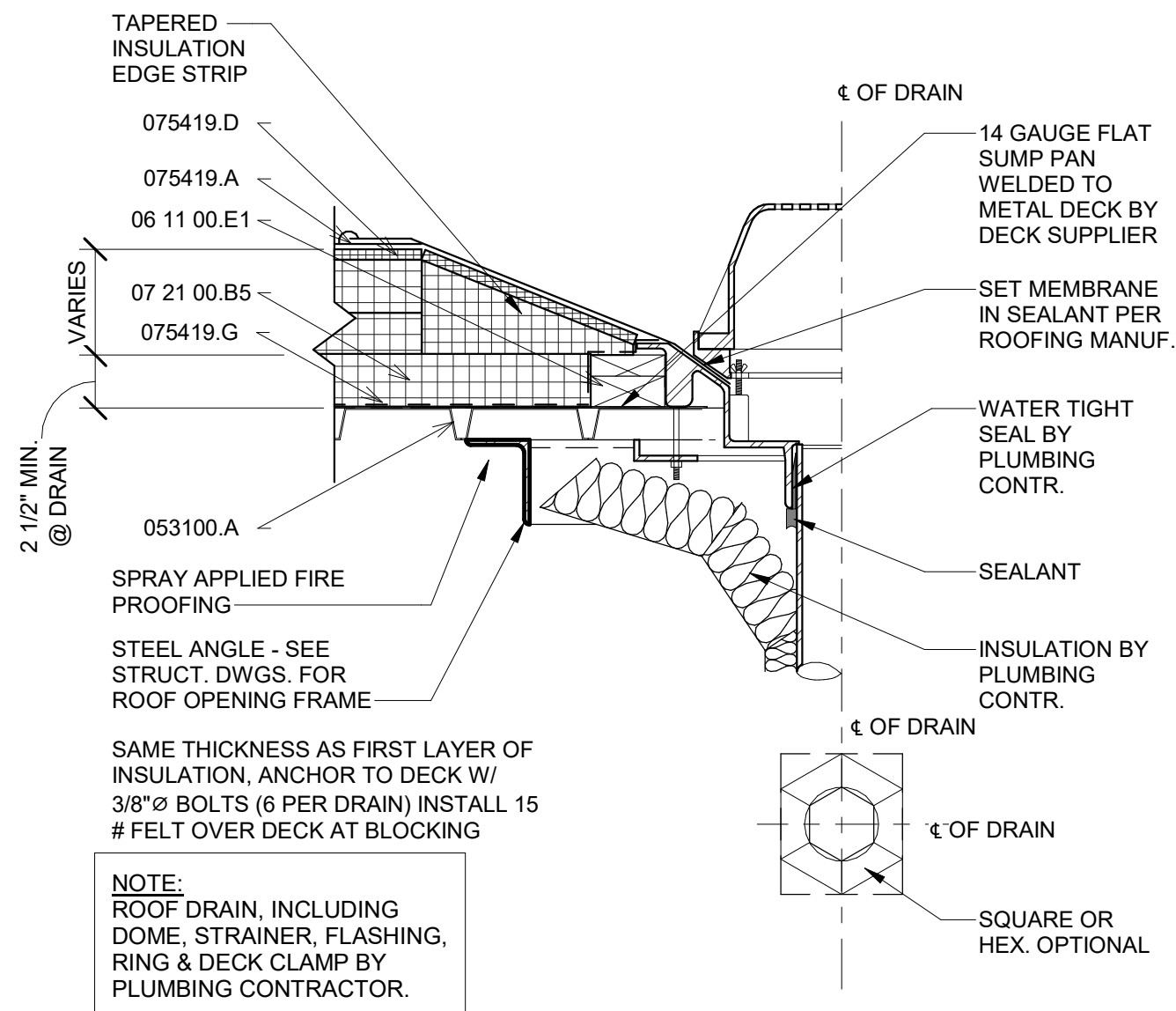
COMFORT STATION DOOR SILL DETAIL
BUS RAPID TRANSIT
CITY OF MADISON





TYPICAL PENETRATION THROUGH ROOF

1 1/2" = 1' 0"



TYPICAL ROOF DRAIN

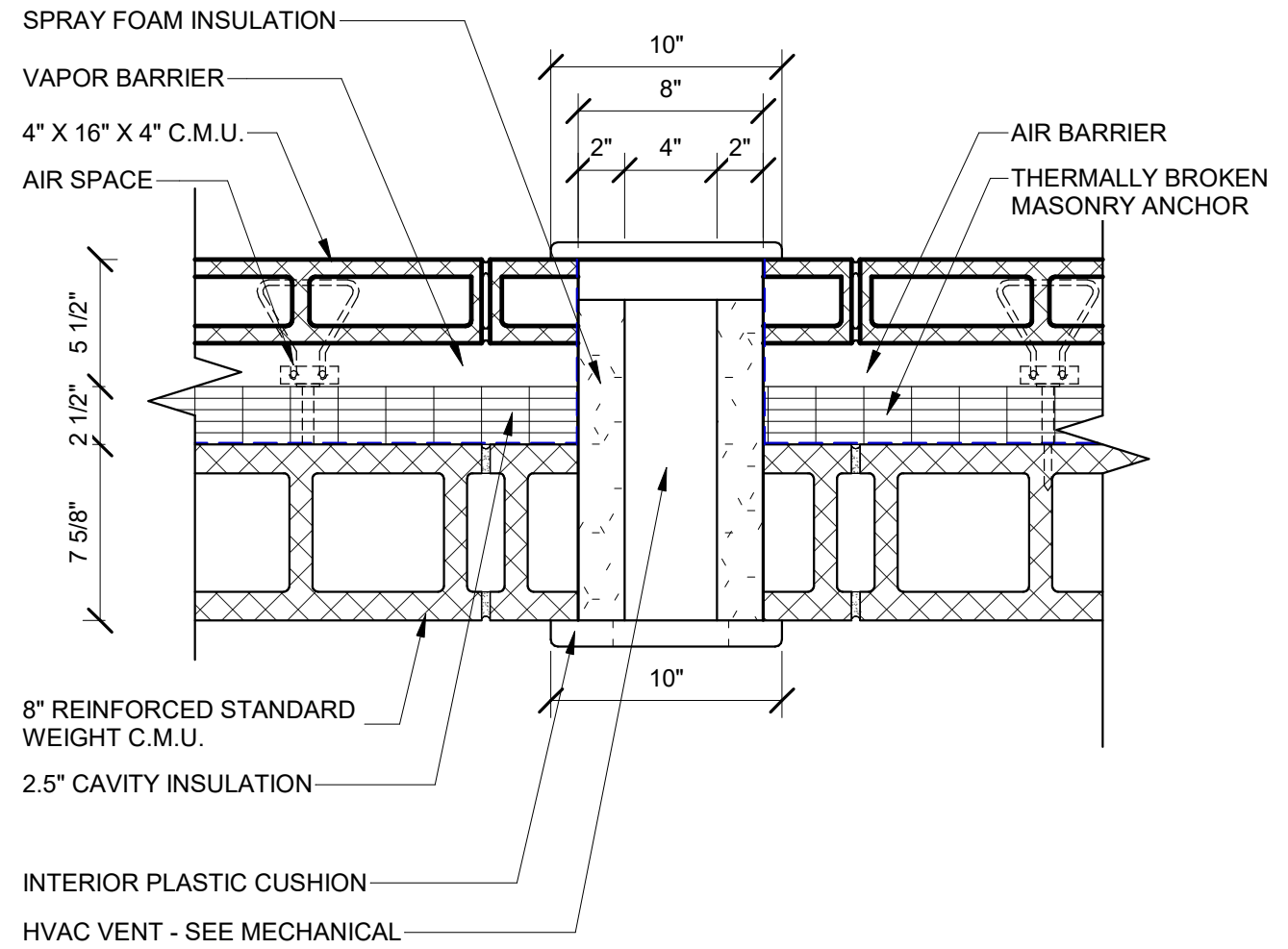
1 1/2" = 1' 0"

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 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION ROOF DETAIL
 BUS RAPID TRANSIT
 CITY OF MADISON





1

HVAC EXTERIOR WALL PENETRATION DETAIL

Scale: 1 1/2" = 1'-0"



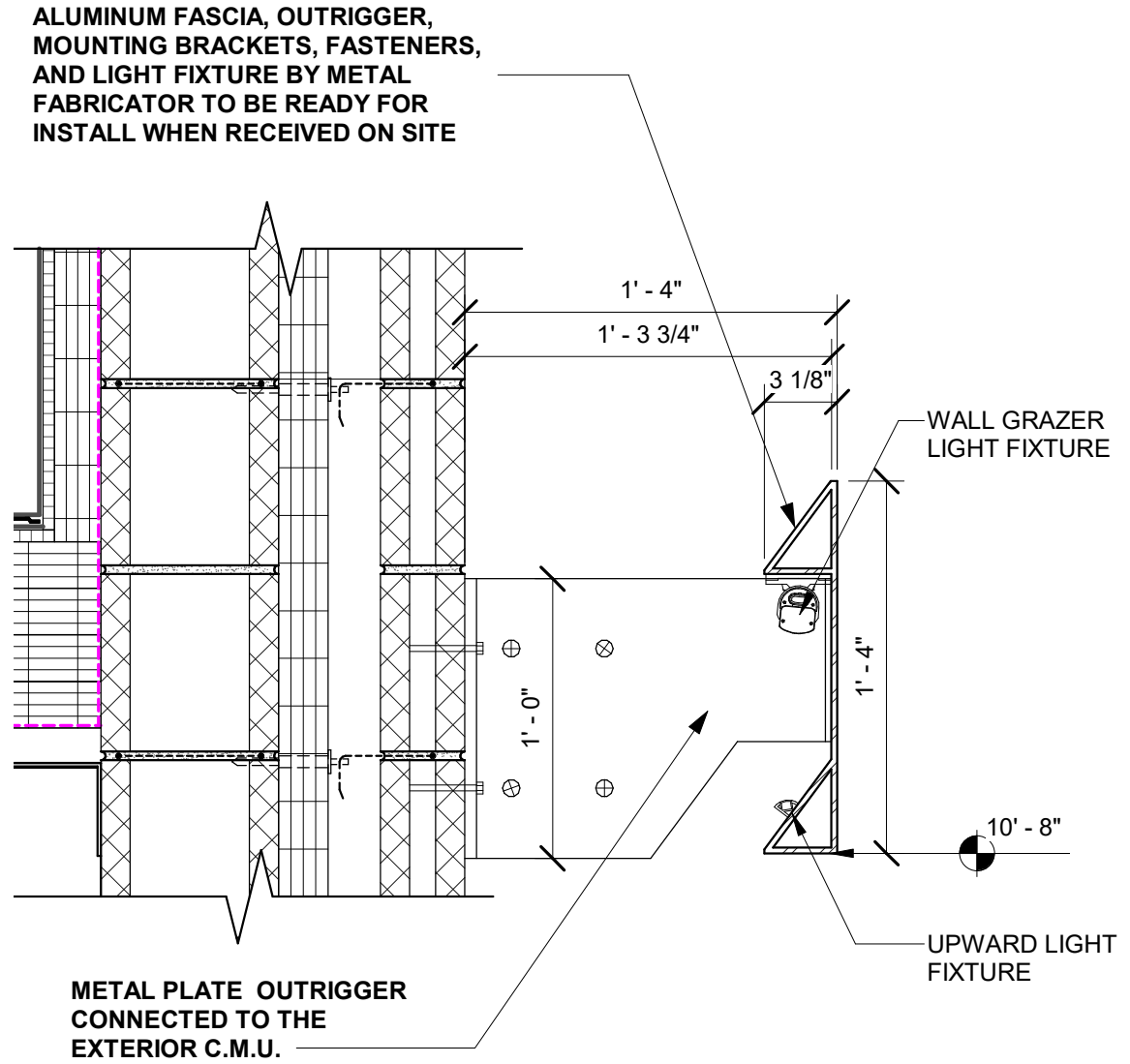
COMFORT STATION HVAC WALL DETAIL
 BUS RAPID TRANSIT
CITY OF MADISON

60631225P

CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

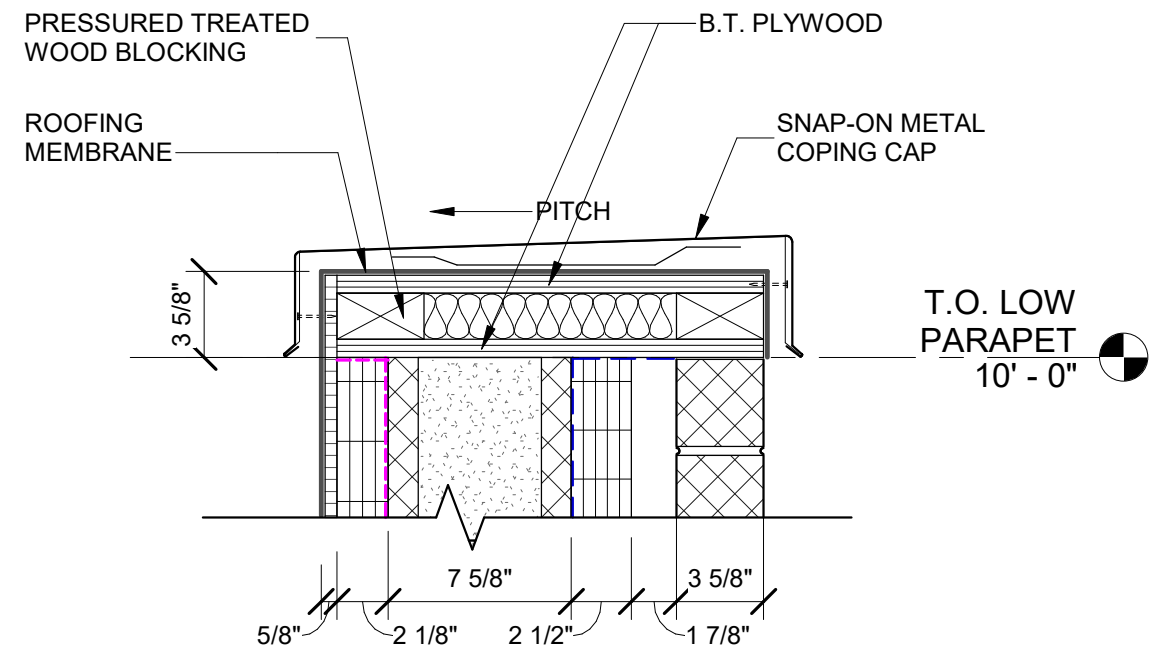
MARK	REVISION	DATE	BY

Designed By: _____ Date: 2022-03-08 Scale: ---



MARK	REVISION	DATE	BY

Designed By: _____ Date: 2022-03-08 Scale: ---



1
A310

PARAPET COPING DETAIL

Scale: 1 1/2" = 1'-0"

MARK	REVISION	DATE	BY

60631225P
CITY OF MADISON, DANE COUNTY, WI

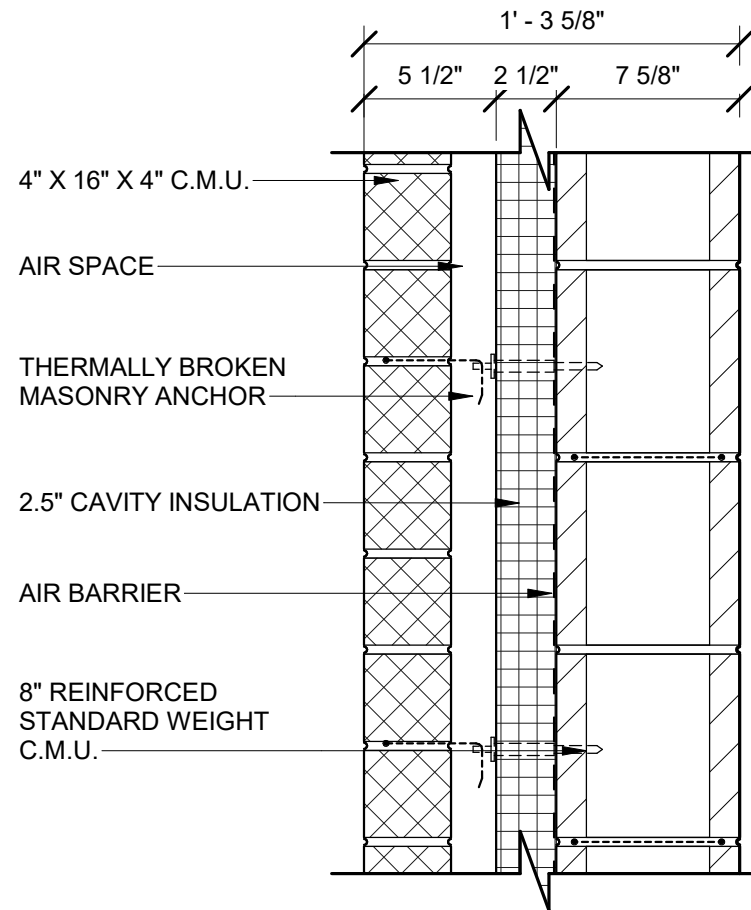
COMFORT STATION PARAPET COPING DETAIL
BUS RAPID TRANSIT
CITY OF MADISON



A408

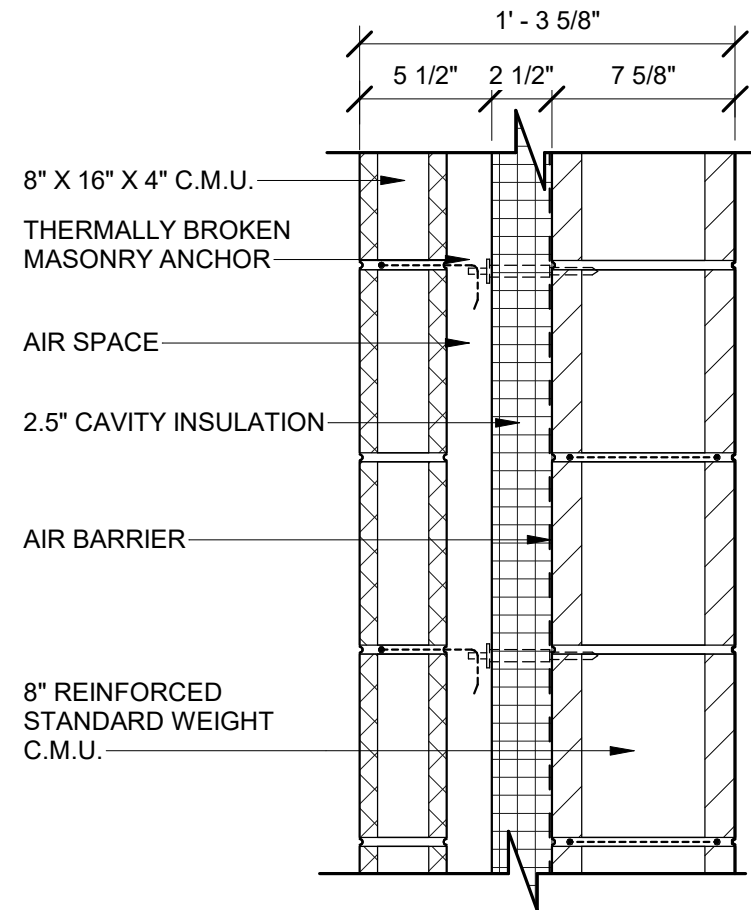
Designed By: _____
Date: 2022-03-08
Scale: ---

CONTRACT NO: 60631225C



WALL SYSTEM - WS-2 (COMFORT ROOMS)

MATERIAL	R-VALUE
OUTSIDE AIR LAYER	0.17
4" X 16" X 4" C.M.U.	0.80
AIR SPACE	1.00
3" CAVITY WALL INSULATION	12.50
AIR BARRIER	N/A
8" C.M.U.	1.10
INSIDE AIR LAYER	0.68
TOTAL R-VALUE	16.25
TOTAL U-VALUE	0.062



WALL SYSTEM - WS-1 (ELECTRICAL ROOM)

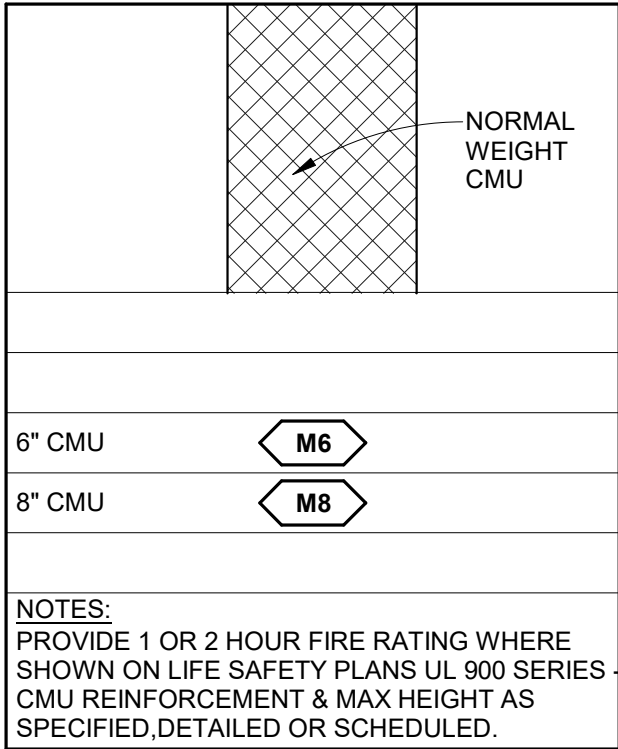
MATERIAL	R-VALUE
OUTSIDE AIR LAYER	0.17
8" X 16" X 4" STANDARD C.M.U.	0.80
AIR SPACE	1.00
3" CAVITY WALL INSULATION	12.50
AIR BARRIER	N/A
8" C.M.U.	1.10
INSIDE AIR LAYER	0.68
TOTAL R-VALUE	16.25
TOTAL U-VALUE	0.062

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION EXTERIOR WALL SYSTEMS
 BUS RAPID TRANSIT
 CITY OF MADISON





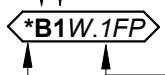
Partition Type Key:

PARTITION CONSTRUCTION / BASE PARTITION TYPES

FURRING/STUD/CMU SIZE
 NONEDIRECT APPLIED
 0 7/8"
 1 1 5/8"
 2 2 1/2"
 3 3 5/8"
 4 4"
 6 6"
 8 8"

REQUIRED WALL RATING OR SPECIAL FEATURE - WHEN INDICATED
 SEE LIFE SAFETY DRAWINGS FOR COMPLETE RATING DESIGNATIONS
 N NON-FULL HEIGHT WHEN SHOWN

*** = SPECIALTY FINISH (WHEN INDICATED)**
 SEE FINISH SCHEDULE ON SHEET AF050 FOR ADDITIONAL INFORMATION



WALL RATING DESIGNATION LIST:

Nxx	NON-FULL HEIGHT PARTITION - XX - HEIGHT OF WALL IN INCHES
AR	PROVIDE TYPE X ABUSE RESISTANT GYSUM BOARD IN LIEU OF STANDARD TYPE X ON ANTI-LIGATURE SIDE OF ROOM
1FB	1 HR RATED FIRE BARRIER
2FB	2 HR RATED FIRE BARRIER
1FP	1 HR RATED FIRE PARTITION

SEE LIFE SAFETY DRAWINGS FOR COMPLETE RATING DESIGNATIONS INFORMATION AS WELL AS SMOKE PARTITION LOCATIONS.

PARTITION TYPE NOTES:

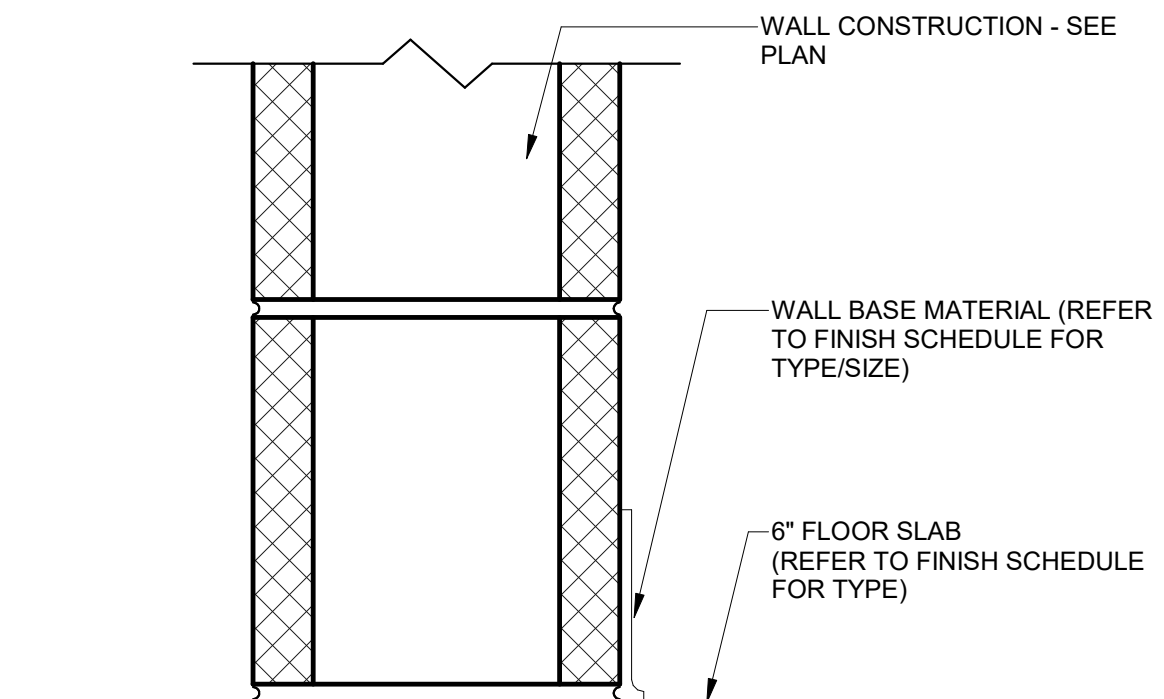
1. SEE PLAN FOR PARTITION TYPES.
2. SEE LIFE SAFETY PLANS FOR FIRE/SMOKE RATING AND/OR HEIGHTS OF PARTITIONS.
3. FULL HEIGHT PARTITIONS SHALL EXTEND FROM THE FLOOR TO THE UNDERSIDE OF THE STRUCTURE ABOVE. PROVIDE DEFLECTION CONNECTION PER DETAIL ON THIS SHEET.
4. MAINTAIN CONTINUITY OF HIGHER RATED PARTITIONS AT INTERSECTION WITH NON-RATED OR LESSER RATED PARTITIONS.
5. AT NON-RATED PARTITIONS MAINTAIN CONTINUITY OF HIGHER STC RATED PARTITIONS AT INTERSECTION WITH LESSER STC RATED PARTITIONS.
6. DIMENSIONING OF PARTITIONS ON THE FLOOR PLANS IS TO THE FACE OF PARTITION TYPE EXCLUSIVE OF ANY FINISH THICKNESS UNLESS INCLUDED IN PARTITION TYPE.

MARK	DESIGNED BY:	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION INTERIOR PARTITION TYPES
 BUS RAPID TRANSIT
 CITY OF MADISON

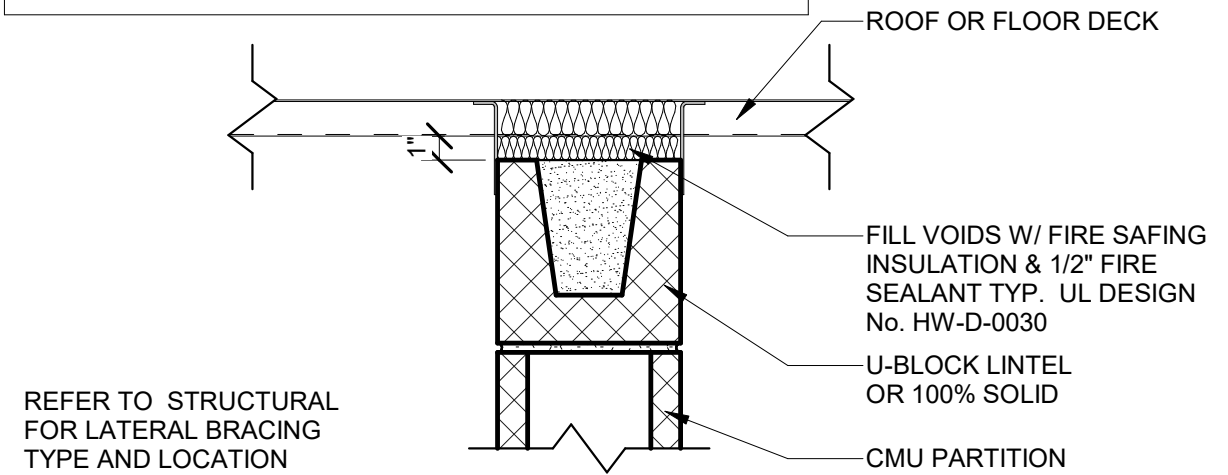




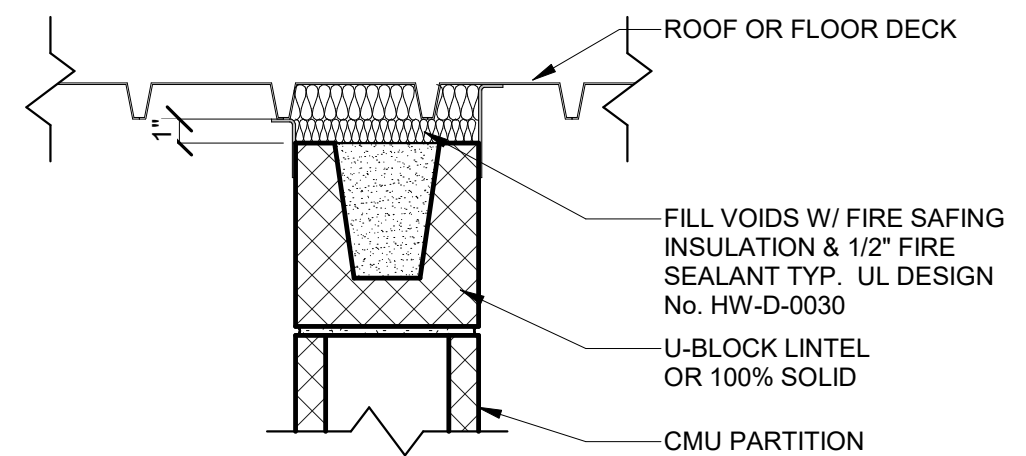
TYPICAL STUD PARTITION BASE

NOT TO SCALE

NOTE:
 FOR NON-FIRE RATED WALLS, SOUND ATTENUATION
 BATTS MAY BE SUBSTITUTED FOR FIRE SAFING
 INSULATION, AND NO FIRE SEALANT IS REQUIRED. SEE
 ARCH. PLANS FOR LOCATIONS OF RATED WALLS.



REFER TO STRUCTURAL
 FOR LATERAL BRACING
 TYPE AND LOCATION



**NON-BEARING MASONRY
 PARTITION AT DECK**

NOT TO SCALE

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

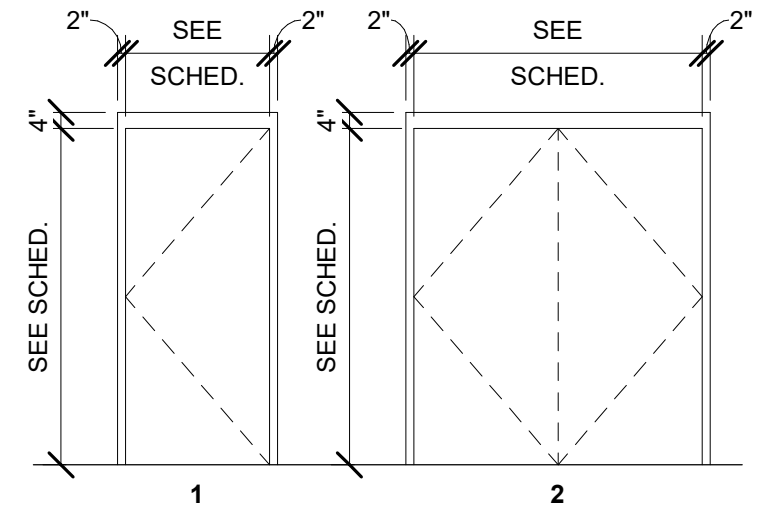
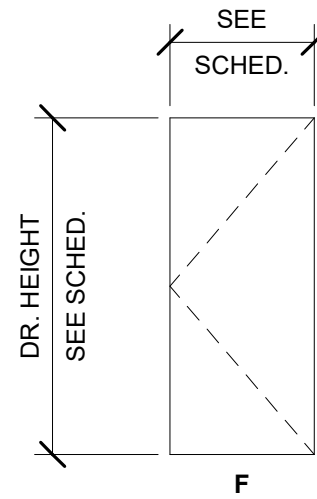
COMFORT STATION INTERIOR PARTITION DETAILS
 BUS RAPID TRANSIT
 CITY OF MADISON



DOOR SCHEDULE

MARK	ROOM NAME	DOOR					FRAME			RATING	HDW SET	DETAILS			COMMENTS
		TYPE	SIZE			MATERIAL	TYPE	MATERIAL	FINISH			HEAD	JAMB	SILL	
			WIDTH	HEIGHT	THICKNESS										
101	COMFORT	F	3' - 0"	7' - 0"	0' - 1 3/4"	HM	1	HM	PT-3	-	01	2/A402	1/A402	1/A403	INSULATED AND THERMALLY BROKEN DOORS
102	COMFORT	F	3' - 0"	7' - 0"	0' - 1 3/4"	HM	1	HM	PT-3	-	01	2/A402	1/A402	1/A403	INSULATED AND THERMALLY BROKEN DOORS
103	JC/STO	F	3' - 0"	7' - 0"	0' - 1 3/4"	HM	1	HM	PT-3	-	02	2/A402	1/A402	1/A403	INSULATED AND THERMALLY BROKEN DOORS
104A	ELECTRICAL	F	3' - 8"	7' - 0"	0' - 1 3/4"	HM	1	HM	PT-3		03	2/A402	1/A402	1/A403	INSULATED AND THERMALLY BROKEN DOORS
104B	ELECTRICAL	F	6' - 4"	7' - 0"	0' - 1 3/4"	HM	2	HM	PT-3		04	2/A402	1/A402	1/A403	INSULATED AND THERMALLY BROKEN DOORS

DOOR COUNT: 5



DOOR TYPES LEGEND

Scale: 1/4" = 1'-0"

FRAME TYPES LEGEND

Scale: 1/4" = 1'-0"

60631225P

CITY OF MADISON, DANE COUNTY, WI

COMFORT STATION DOOR SCHEDULE

BUS RAPID TRANSIT

CITY OF MADISON



A610

Designed By:	MARK
Date: 2022-03-08	REVISION
Scale: ---	DATE
BY	BY

ROOM FINISH SCHEDULE						
LOCATION			FLOOR	BASE	WALL	CEILING
REVISION	ROOM NUMBER	ROOM NAME				
	101	COMFORT	SC	CMB-1	CMU1	GYP
	102	COMFORT	SC	CMB-1	CMU1	GYP
	103	JC/STO	SC	-	CMU2	EC
	104	ELECTRICAL	SC	-	CMU2	EC

ROOM SCHEDULE		
NUMBER	NAME	AREA
GROUND FLOOR		
101	COMFORT	67 SF
102	COMFORT	67 SF
103	JC/STO	45 SF
104	ELECTRICAL	383 SF

FINISH SCHEDULE						
FINISH CODE	DESCRIPTION	MANUFACTURER	STYLE/PRODUCT NO.	COLOR	SIZE	REMARKS
CERAMIC WALL BASE						
CMB-1	CERAMIC WALL BASE			TBD		
PAINT						
PT-1	PAINT	SHERWIN WILLIAMS	SINGLE-COMPONENT PRECATALYZED WATERBOURNE ACRYLIC EPOXY	TBD	-	W/ FILLER OVER CMU
PT-2	PAINT	SHERWIN WILLIAMS	LATEX, NO VOC, SEE GENERAL NOTES FOR PAINT FINISHES	TBD	-	OVER GYP CLG
PT-3	PAINT	SHERWIN WILLIAMS	LATEX, NO VOC, SEE GENERAL NOTES FOR PAINT FINISHES	TBD	-	INTERIOR / EXTERIOR ON HM DOOR & FRAMES
SEALED CONCRETE						
SC	SEALED CONCRETE		TBD	TBD	-	

MARK	REVISION	DATE	BY

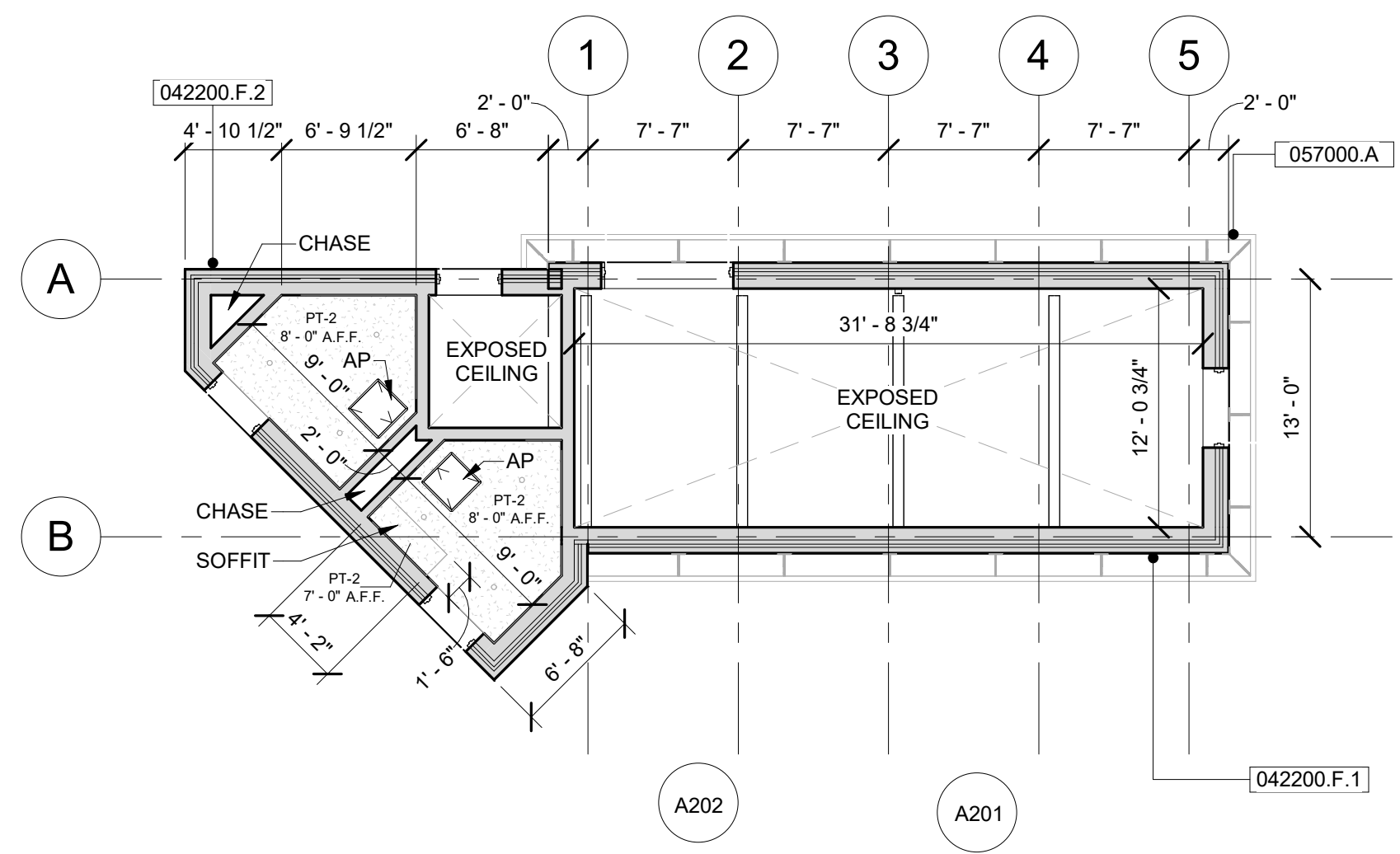
60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION ROOM FINISH SCHEDULE



KEYNOTE LEGEND

VALUE	DESCRIPTION
042200.F.1	8"X16"X4" GROUND FACE CONCRETE MASONRY VENEER
042200.F.2	4"X16"X4" GROUND FACE CONCRETE MASONRY VENEER
057000.A	HALO WITH LIGHTING

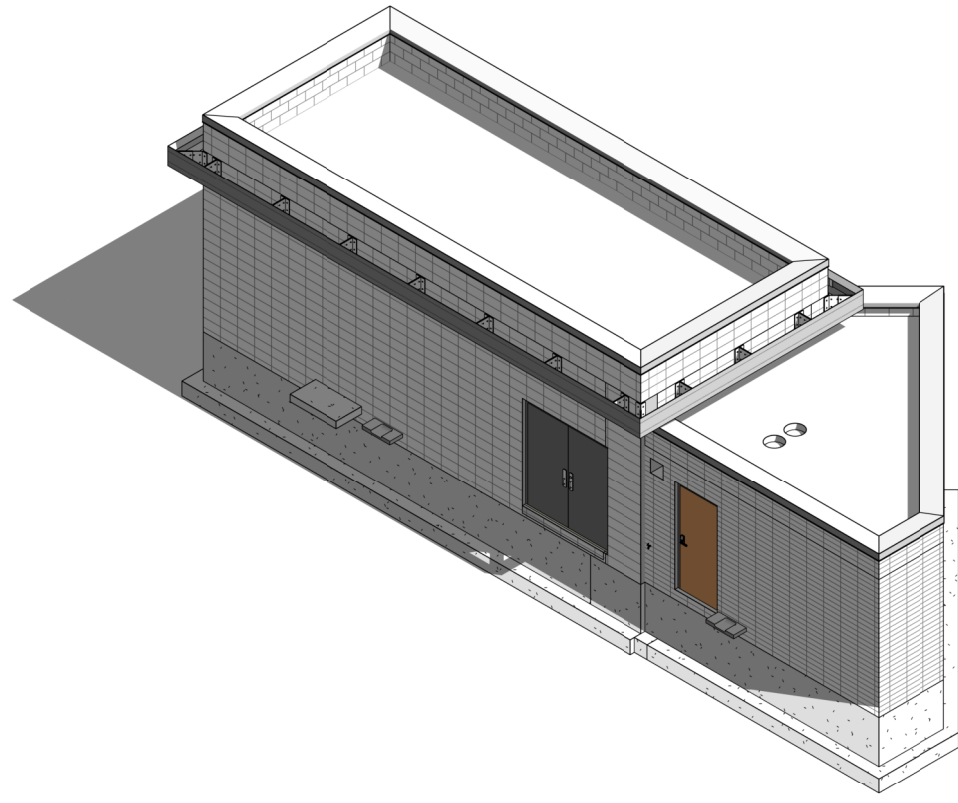


1
A201 | **REFLECTED CEILING PLAN**
Scale: 1/8" = 1'-0"

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

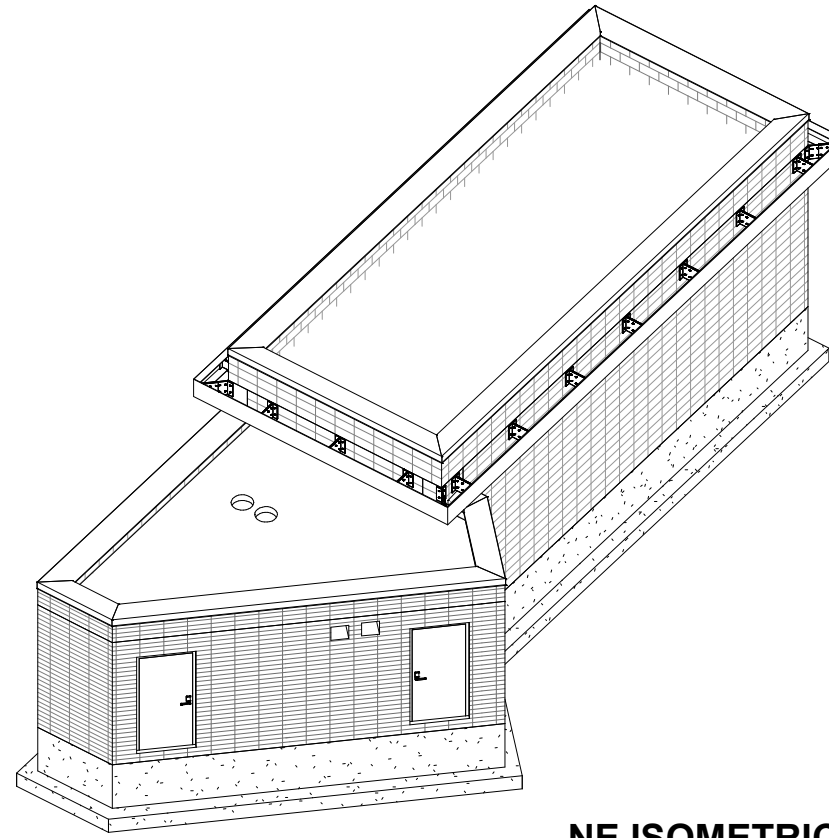




1

NW ISOMETRIC

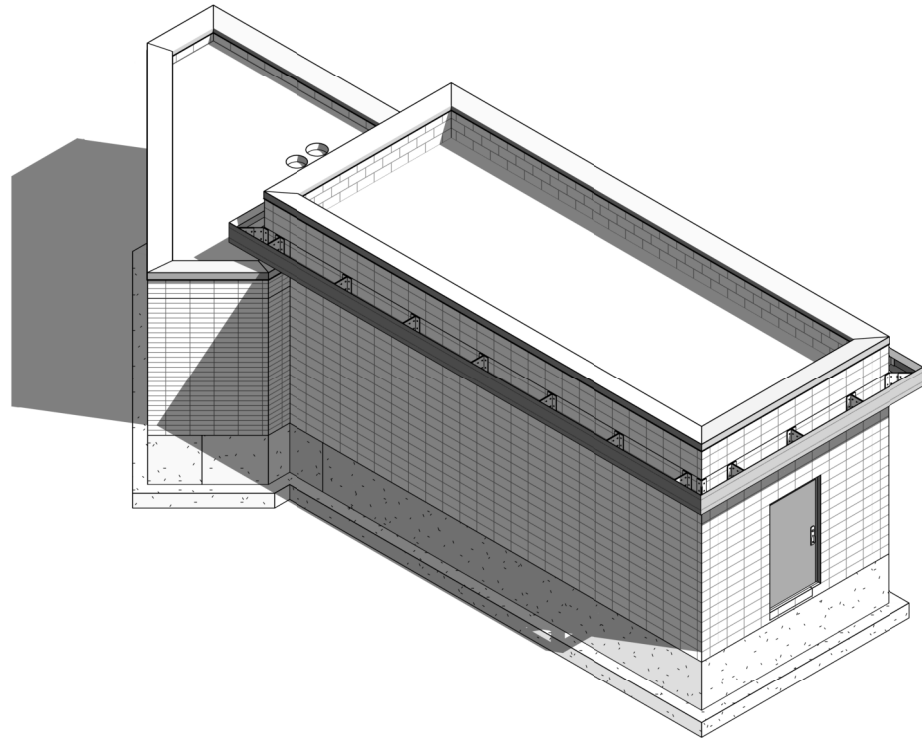
NTS



2

NE ISOMETRIC

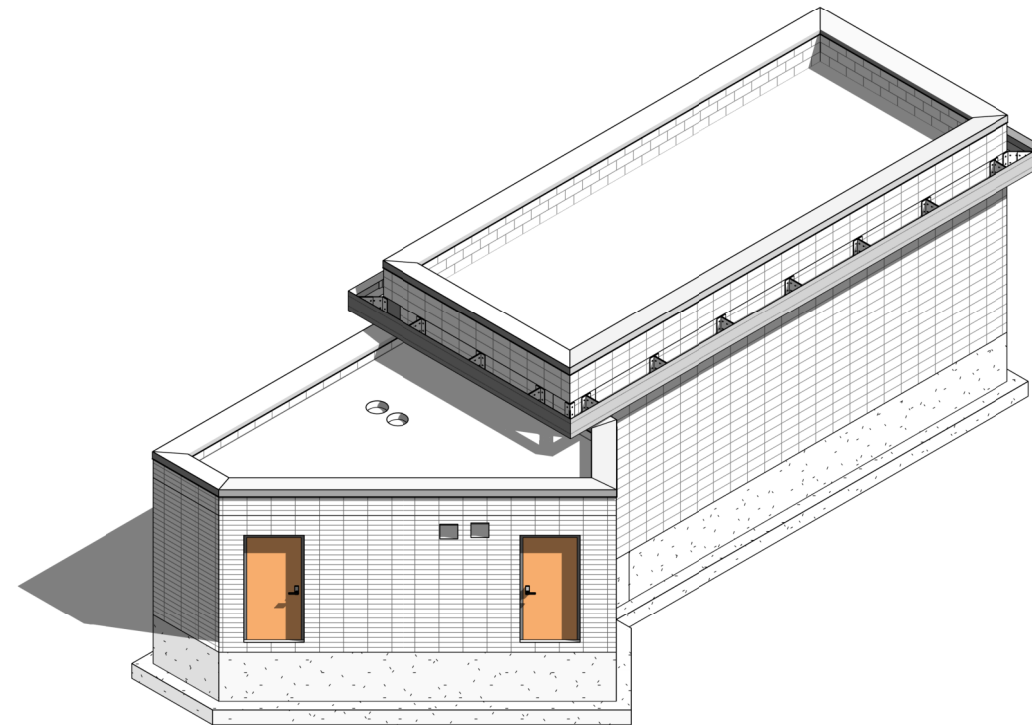
NTS



3

SE ISOMETRIC

NTS



4

SW ISOMETRIC

NTS

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

COMFORT STATION ISOMETRIC VIEWS COMBINED

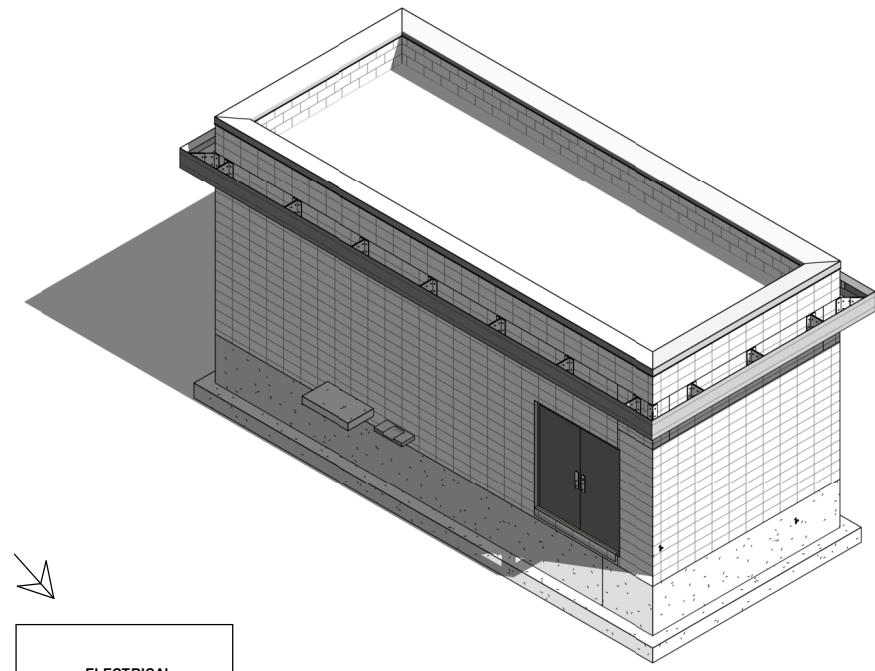
BUS RAPID TRANSIT
 CITY OF MADISON



A901

MARK	REVISION	DATE	BY

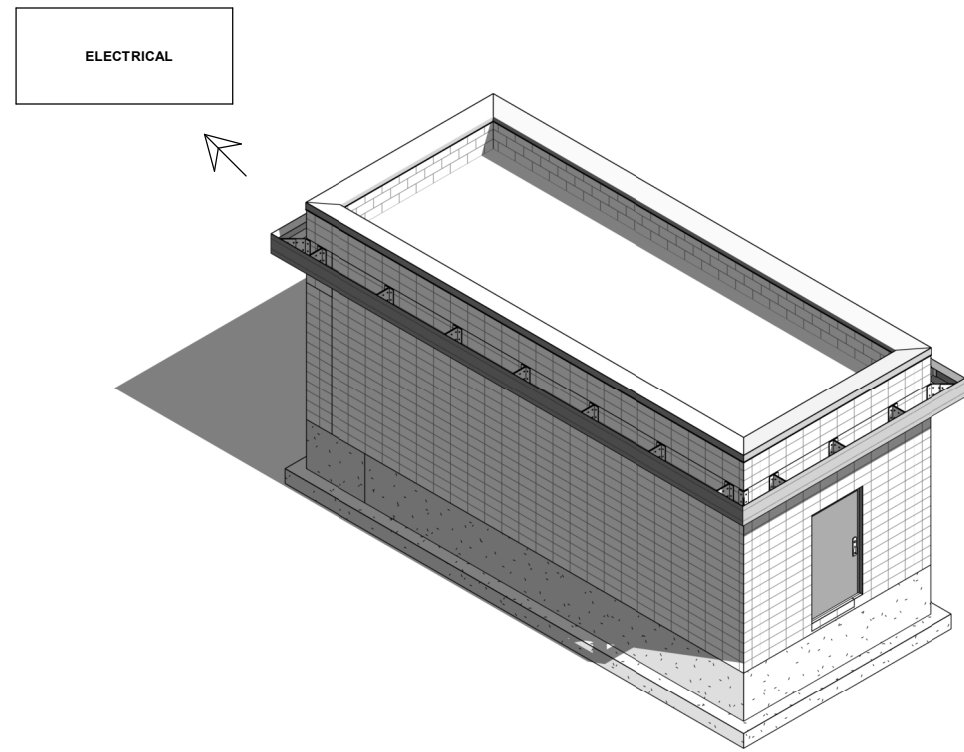
Designed By: _____ Date: 2022-03-08 Scale: ---



1

NW ISOMETRIC

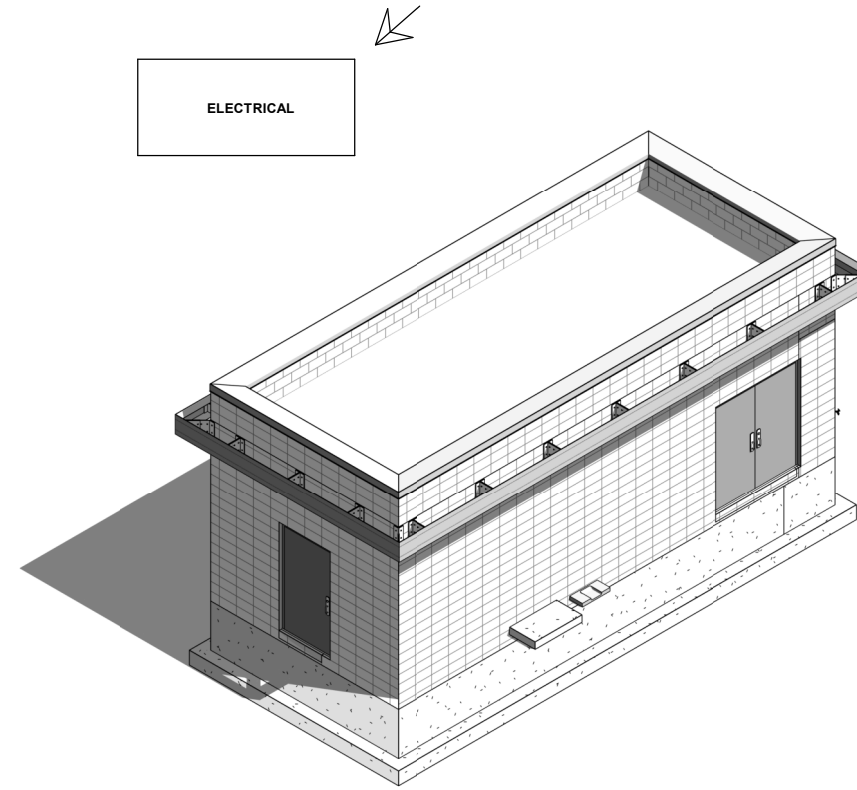
NTS



3

SE ISOMETRIC

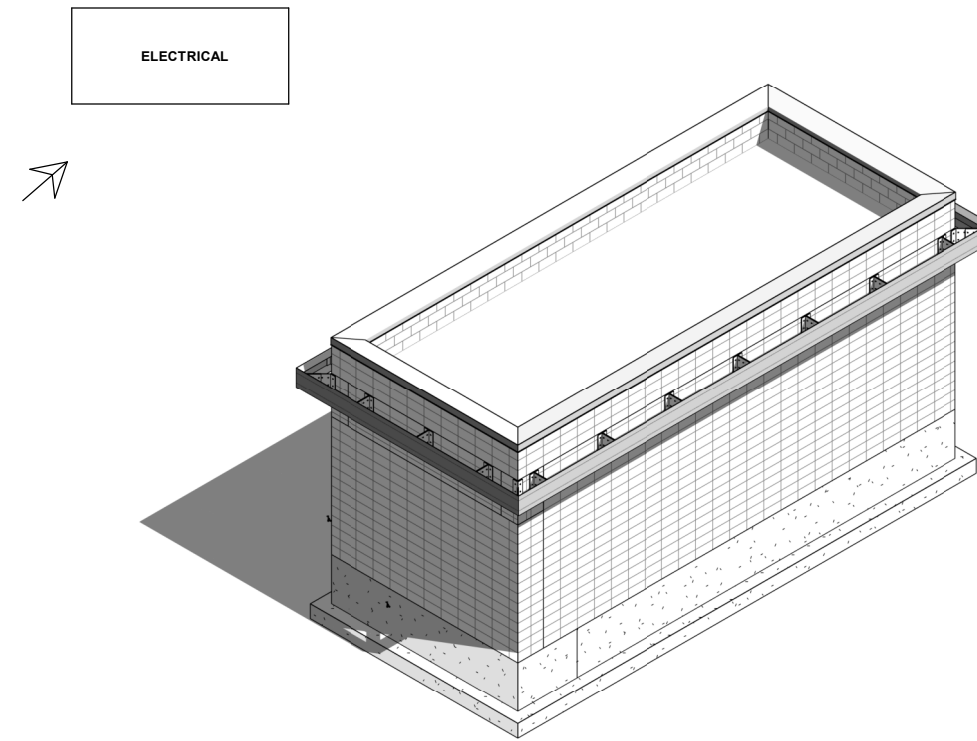
NTS



2

NE ISOMETRIC

NTS



4

SW ISOMETRIC

NTS

MARK	REVISION	DATE	BY

60631225P
 HANSON ROAD ELECTRICAL BUILDING ISOMETRIC VIEWS
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

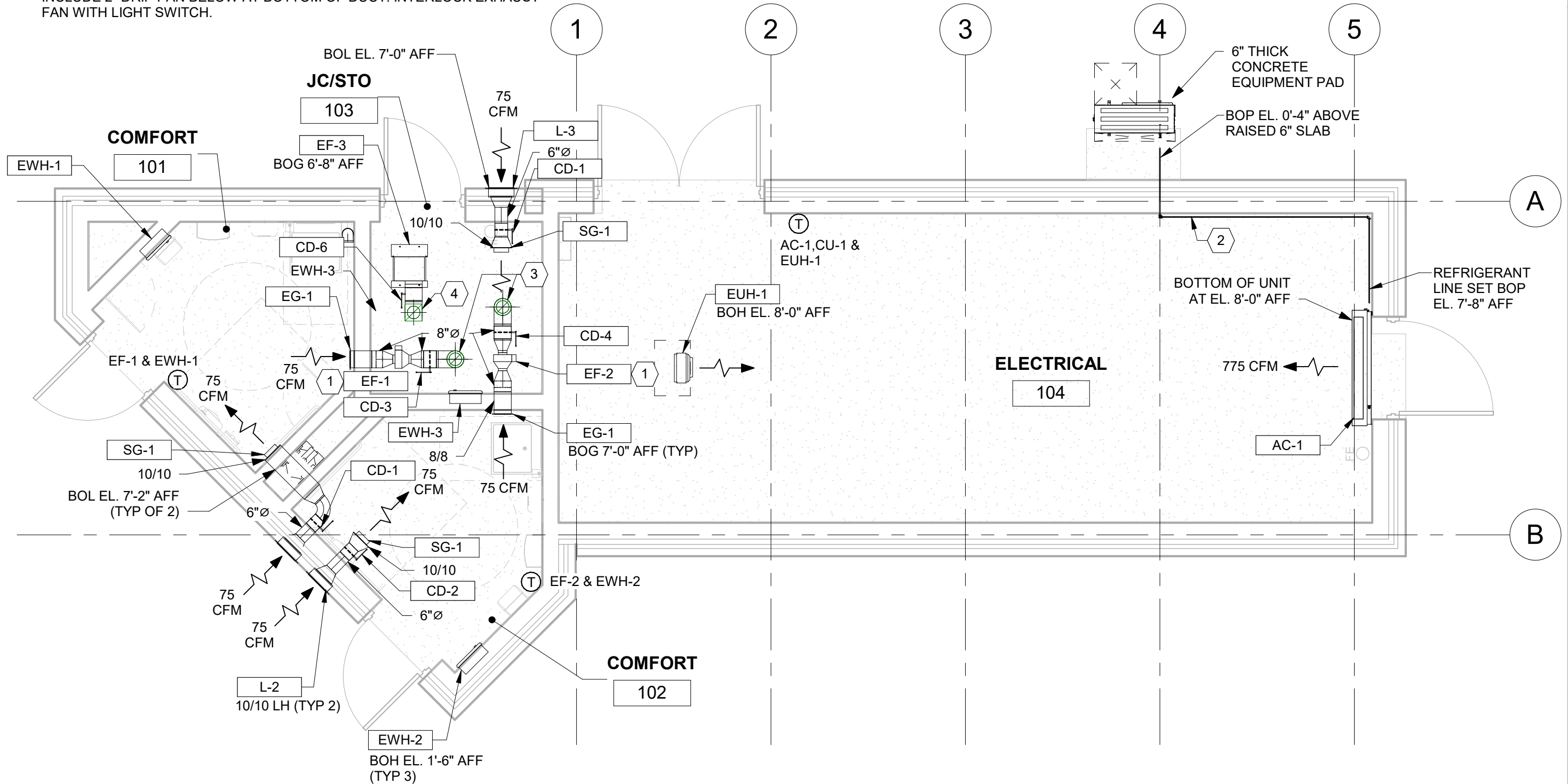


KEY NOTES

1. EXHAUST FAN TO BE INTERLOCKED WITH LIGHT SWITCH OF COMFORT ROOM EXHAUST FAN SERVES.
2. INSULATE LIQUID AND GAS PIPES SEPARATELY WITH INSULATION MATERIALS. DEFINED IN SPECIFICATION SECTION 23 00 00.
3. 8" ROUND EXHAUST DUCTWORK UP THROUGH CEILING, TERMINATING AT 6" ROUND ROOF JACK WITH INSTALLED FLASHING. INCLUDE 2" DRIP PAN BELOW AT BOTTOM OF DUCT.
4. GREENHECK SP-A200 CEILING EXHAUST FAN TO BE INSTALLED WITHIN CEILING SOFFIT. PROVIDE 8"X8" DUCT OUT OF FAN, UP THROUGH ROOF AND TERMINATING AT 6" ROUND ROOF JACK WITH INSTALLED FLASHING. INCLUDE 2" DRIP PAN BELOW AT BOTTOM OF DUCT. INTERLOCK EXHAUST FAN WITH LIGHT SWITCH.

GENERAL NOTES

1. WORK SHOWN IS FOR THE JUNCTION ROAD TERMINAL.



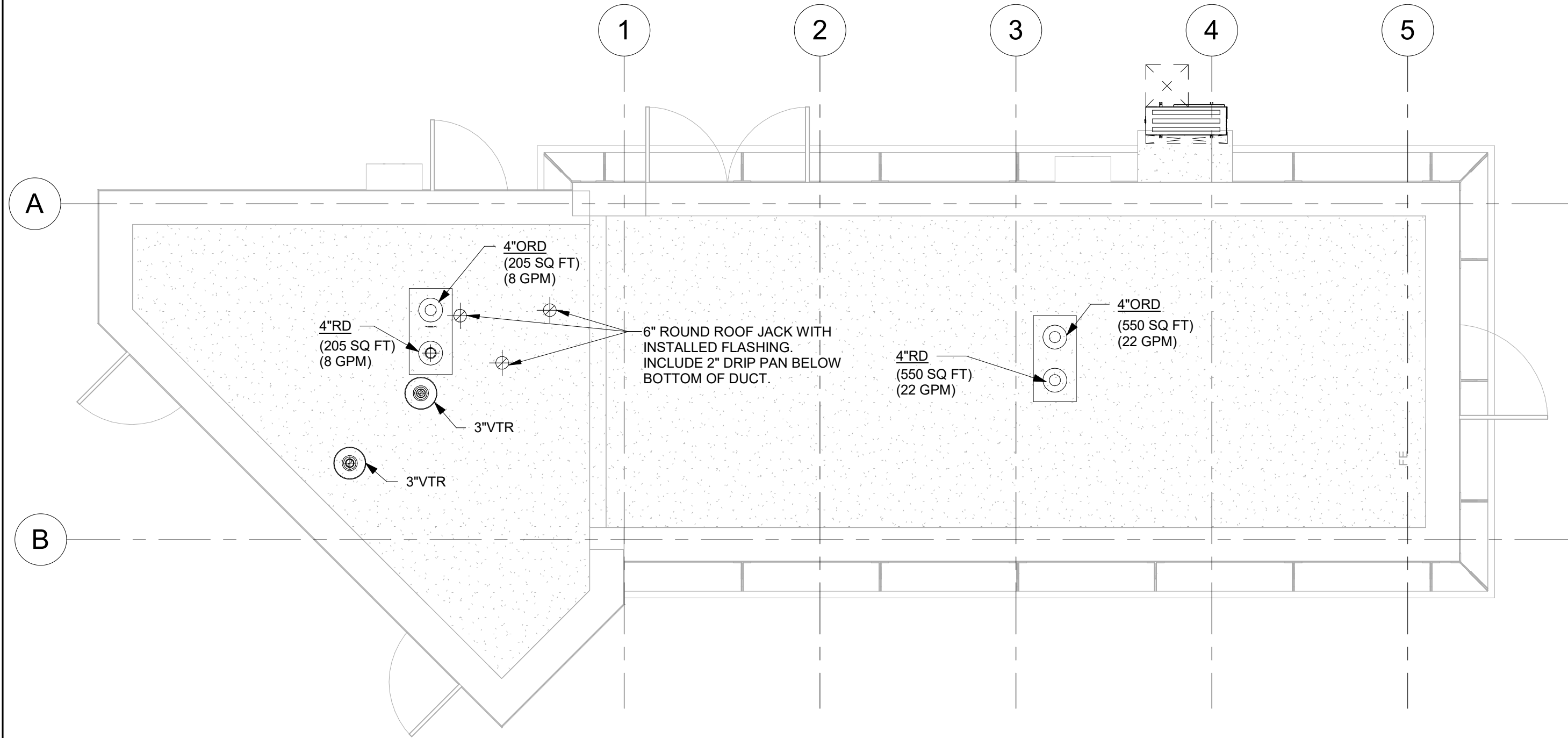
OVERALL HVAC FLOOR PLAN

Scale: 1/4" = 1'-0"

60631225P	60631225C
OVERALL HVAC FLOOR PLAN	CITY OF MADISON
BUS RAPID TRANSIT	CITY OF MADISON
CITY OF MADISON	CITY OF MADISON
WISCONSIN	WISCONSIN
M001	

GENERAL NOTES

1. ROOF DRAINS SHALL BE EQUIPPED WITH STRAINERS EXTENDING NOT LESS THAN 4 INCHES ABOVE THE SURFACE OF THE ROOF IMMEDIATELY ADJACENT TO THE ROOF DRAIN. STRAINERS SHALL HAVE AN AVAILABE INLET AREA ABOVE THE ROOF OF NOT LESS THAN 1.5 TIMES THE AREA OF THE CONDUCTOR TO WHICH THE DRAIN CONNECTS.
2. WORK SHOWN IS FOR JUNCTION ROAD TERMINAL. ROUTE HANSON ROAD AND SUN PRAIRIE SITE SANITARY SEWER AND STORM WATER PER LOCAL SITE CONDITIONS.



1

OVERALL MECHANICAL ROOF PLAN

Scale: 1/4" = 1'-0"

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

OVERALL MECHANICAL ROOF PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON



M002

FAN SCHEDULE															
TAG NO.	MANUFACTURER MODEL NO. OR EQUAL	TYPE	AIR DATA			FAN SPEED (RPM)	DRIVE TYPE	MOTOR DATA				SOUND (dBA)	WEIGHT (LBS)	REMARKS	
			CFM	ESP (IN. WG)	BHP			AIR FLOW (CFM)	HP	VOLTS	PHASE				FREQ. (HZ)
EF-1	FANTECH FG 6	INLINE CENTRIFUGAL	75	0.20	-	2,703	DIRECT	0.10	120	1	60	2,703	55	80	SSS, SSSC
EF-2	FANTECH FG 6	INLINE CENTRIFUGAL	75	0.20	-	2,703	DIRECT	0.10	120	1	60	2,703	55	80	SSS, SSSC
EF-3	GREENHECK SP-A200	CEILING EXHAUST	75	0.50	-	780	DIRECT	0.04	115	1	60	900	42	25	IG, SSSC

IG = INTEGRAL GRILLE, SSS = STAINLESS STEEL SHAFT, SSSC = SOLID STATE SPEED CONTROLLER

ELECTRIC HEATER SCHEDULE													
TAG NO.	MANUFACTURER MODEL NO. OR EQUAL	TYPE	HEAT OUTPUT (KW)	MOUNTING HEIGHT (FT)	AIR DATA			ELECTRICAL DATA				REMARKS	
					AIR FLOW (CFM)	THROW (FT)	TEMP. RISE (°F)	KW	VOLTS	PHASE	HZ		AMPS
EWH-1	QMARK CWH3408F	FORCED WALL HEATER	4	1.5	100	-	-	7.5	208	1	60	19.2	DS, SFS, RM
EWH-2	QMARK CWH3408F	FORCED WALL HEATER	4	1.5	100	-	-	7.5	208	1	60	19.2	DS, SFS, RM
EWH-3	QMARK CWH3408F	FORCED WALL HEATER	4	1.5	100	-	-	7.5	208	1	60	19.2	DS, SFS, RM
EUH-1	QMARK MUH05-81	HORIZONTAL UNIT HEATER	5	8.0	350	12.0	45	7.5	208	1	60	24.0	CM, DS, SFS

CM = CEILING MOUNTED, DS = INTEGRAL DISCONNECT SWITCH, SFS = SUMMER FAN SWITCH, RM = RECESSED MOUNTED

GRILLE/ DIFFUSER SCHEDULE												
TAG NO.	MANUFACTURER MODEL NO. OR EQUAL	SERVICE	CFM RANGE	NECK SIZE (IN)	MODULE SIZE (IN)	MAX. APD (IN WC)	MAX. NC	FINISH	MATERIAL	MOUNTING	REMARKS	
												EG-1
EG-1	TITUS 350R	RETURN	75	8x8	10x10	0.002	20	WHITE	ALUMINUM	SURFACE	SDFB	

DD = DOUBLE DEFLECTION, SDFB = SINGLE DEFLECTION FIXED BLADE

WALL LOUVER SCHEDULE												
TAG NO.	MANUFACTURER MODEL NO. OR EQUAL	SERVICE	AIR FLOW (CFM)	WIDTH (INCHES)	HEIGHT (INCHES)	BLADE DEPTH (IN WC)	MAX. APD (IN WC)	MAX. FACE VELOCITY (FFM)	FRAME TYPE	REMARKS		
											L-1	FANTECH COM6P
L-2	FANTECH COM6P	SUPPLY	75	10	10	4	-	216	CHANNEL			
L-3	FANTECH COM6P	SUPPLY	75	10	10	4	-	216	CHANNEL			

CONTROL DAMPER SCHEDULE												
TAG NO.	MANUFACTURER MODEL NO. OR EQUAL	DIAMETER (IN)	AREA (SQ IN)	AIR TYPE	BLADE TYPE	CONTROL TYPE	FAIL POSITION	RELATED LOUVER	RELATED SYSTEM	REMARKS		
											CD-1	RUSKIN ARD25
CD-2	RUSKIN ARD25	6	-	OUTDOOR	OPPOSED	2 POSITION	OPEN	L-2	-	GS		
CD-3	RUSKIN ARD25	8	-	EXHAUST	OPPOSED	2 POSITION	OPEN	-	EF-1	GS		
CD-4	RUSKIN ARD25	8	-	EXHAUST	OPPOSED	2 POSITION	OPEN	-	EF-2	GS		
CD-5	RUSKIN ARD25	6	-	OUTDOOR	OPPOSED	2 POSITION	OPEN	L-3	-	GS		
CD-6	RUSKIN ARD25	-	8x8	EXHAUST	OPPOSED	2 POSITION	OPEN	-	EF-3	GS		

GS = GALVANIZED STEEL

EXTERIOR DESIGN TEMPERATURE SCHEDULE						
DESCRIPTION	SEASON	TYPE	DRY BULB (°F)	WET BULB (°F)	REMARKS	
OUTDOOR AIR	WINTER	MINIMUM	-15	---	WI SAFETY AND PROFESSIONAL SERVICES, CHAPTER SPS 363 ENERGY CONSERVATION (2018)	
OUTDOOR AIR	SUMMER	MAXIMUM	87	75	WI SAFETY AND PROFESSIONAL SERVICES, CHAPTER SPS 363 ENERGY CONSERVATION (2018)	

INTERIOR DESIGN CRITERIA SCHEDULE					
AREA	SYSTEM(S)	TEMPERATURES		REMARKS	
		HEATING MINIMUM	COOLING MAXIMUM		
		DRY BULB (°F)	DRY BULB (°F)		
COMFORT 101	EF, EWH, UC	70	85		
COMFORT 102	EF, EWH, UC	70	85		
JCRSTO 103	EF, EWH, UC	70	85		
ELECTRICAL ROOM	EUH, MC	55	85		

EF = EXHAUST FAN, EUH = ELECTRIC UNIT HEATER, EWH = ELECTRIC WALL HEATER, MC = MECHANICAL COOLING, UC = UNTEMPERED COOLING

DUCTLESS SPLIT SYSTEM OUTDOOR UNIT SCHEDULE																					
TAG NO.	MANUFACTURER MODEL NO. OR EQUAL	TYPE	STYLE	HEATING DATA			COMPRESSOR DATA		REFRIGERANT			ELECTRICAL DATA			DIMENSIONS (IN)	WEIGHT (LBS)	REMARKS				
				RATED CAPACITY (MBH)	MIN (MBH)	MAX (MBH)	EFFICIENCY HSPF	TYPE	CAPACITY CONTROL	TYPE	CHARGE (OZ)	CONNECTIONS LIQUID SIZE (IN)	CONNECTIONS SUCTON SIZE (IN)	VOLTS				PH	HZ	MCA	MAX FUSE SIZE (AMPS)
CU-1	FRIEDRICH FSHSR9A3A	DX HEAT PUMP	AIR COOLED	34.6	14.9	36.0	9.0	TWIN ROTARY	MODULATING	R-410A	92	1/4	5/8	208-230	1	60	24	40	39 x 32 x 17	161	AST, IDC, RLS, SYC

AST = ANTI SHORT CYCLE TIMERS, IDC = INVERTER DRIVEN COMPRESSOR, MBH = 1,000 BTUs PER HOUR, MCA = MINIMUM CIRCUIT AMPACITY, RLS = REFRIGERANT LINE SET, SYC = SEVEN YEAR COMPRESSOR WARRANTY

- GENERAL NOTES:**
- OPERATING RANGE IN HEATING MODE IS BETWEEN 4°F AND 75°F.
 - HEAT PUMP CAPACITY RATED AT 47°F.
 - INDOOR UNIT POWERED FROM OUTDOOR UNIT.
 - INSTALL PER MANUFACTURER RECOMMENDATIONS.
 - FACTORY REFRIGERANT PRECHARGE IS 25 OUNCES.

DUCTLESS SPLIT SYSTEM INDOOR UNIT SCHEDULE																				
TAG NO.	MANUFACTURER MODEL NO. OR EQUAL	TYPE	STYLE	COOLING DATA					AIR DATA			ELECTRICAL			DIMENSIONS (IN)	WEIGHT (LBS)	REMARKS			
				NOMINAL (TONS)	TOTAL CAPACITY NET (MBH)	SENSIBLE (MBH)	HEAT RATIO	EFFICIENCY SEER	EFFICIENCY EER	TOTAL AIRFLOW (CFM)	OUTDOOR AIRFLOW (CFM)	SUPPLY AIR TEMP. (°F)	VOLTS	PH				HZ	POWER COOLING (WATTS)	
AC-1	FRIEDRICH FSHSW36A3A	DX HEAT PUMP	DUCTLESS WALL	3	36.0	7.4	36.0	0.75	18.0	8.2	883	0	53	208-230	1	60	4,100	54 x 13 x 10	42	AAS, CF, MSF, WCT

AAS = AUTOMATIC AIR SWEEP, CF = CLEANABLE FILTERS, MBH = 1,000 BTUs PER HOUR, MSF = MULTIPLE SPEED FAN, WCT = WIRED CONTROLLER/THERMOSTAT

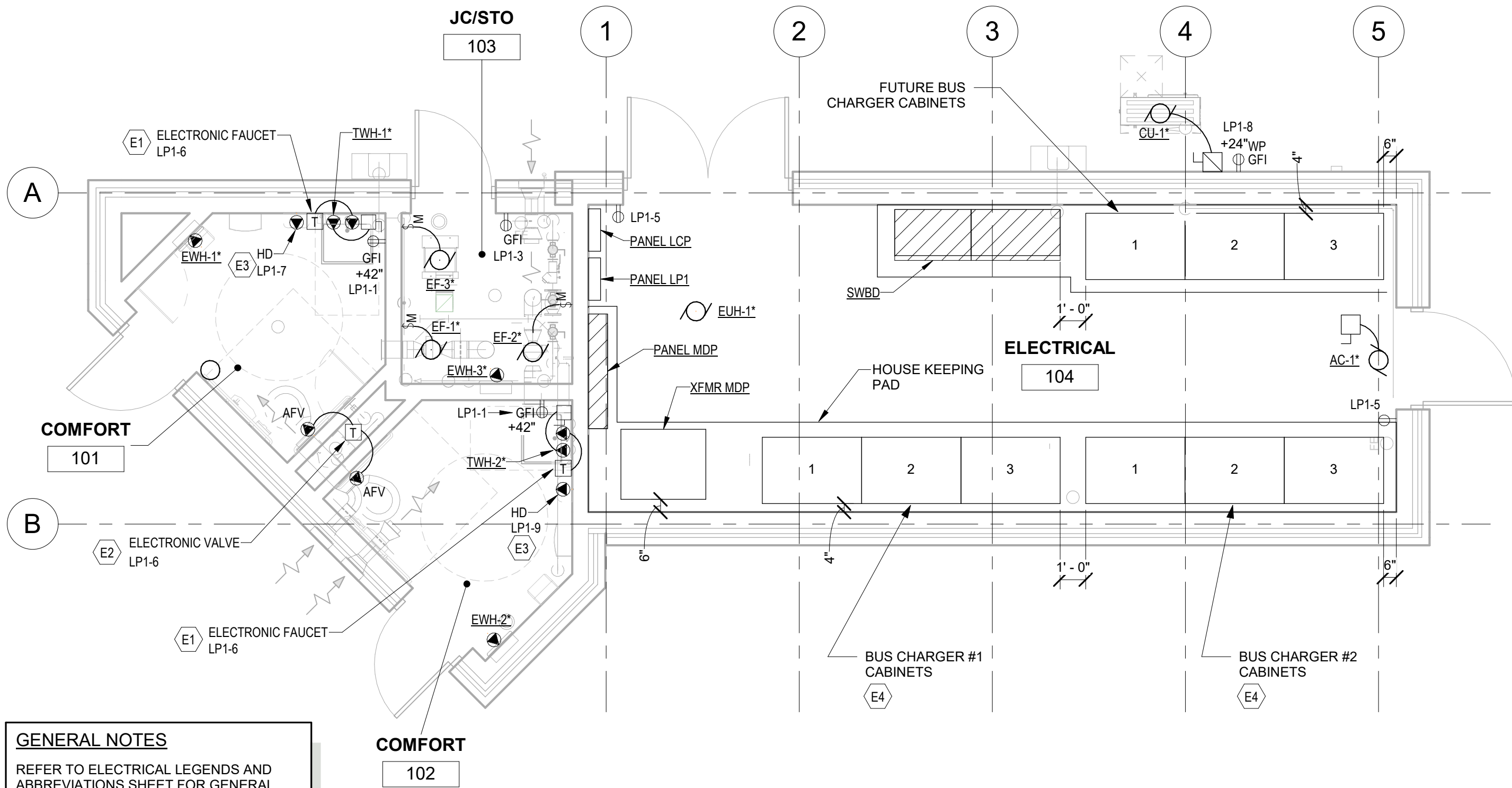
- GENERAL NOTES:**
- OPERATING RANGE IN COOLING MODE IS BETWEEN 0°F AND 115°F.
 - TOTAL AIRFLOW VALUE SHOWN IS FOR HIGH SPEED FAN OPERATION.
 - INDOOR UNIT POWERED FROM OUTDOOR UNIT.
 - ROUTE COIL CONDENSATE DRAIN TO OUTDOORS.
 - INSTALL PER MANUFACTURER RECOMMENDATIONS.

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MECHANICAL SCHEDULES
BUS RAPID TRANSIT
CITY OF MADISON





GENERAL NOTES

REFER TO ELECTRICAL LEGENDS AND ABBREVIATIONS SHEET FOR GENERAL AND KEYED NOTES.

* REFER TO ELECTRICAL "ME" SCHEDULE FOR ELECTRICAL REQUIREMENTS

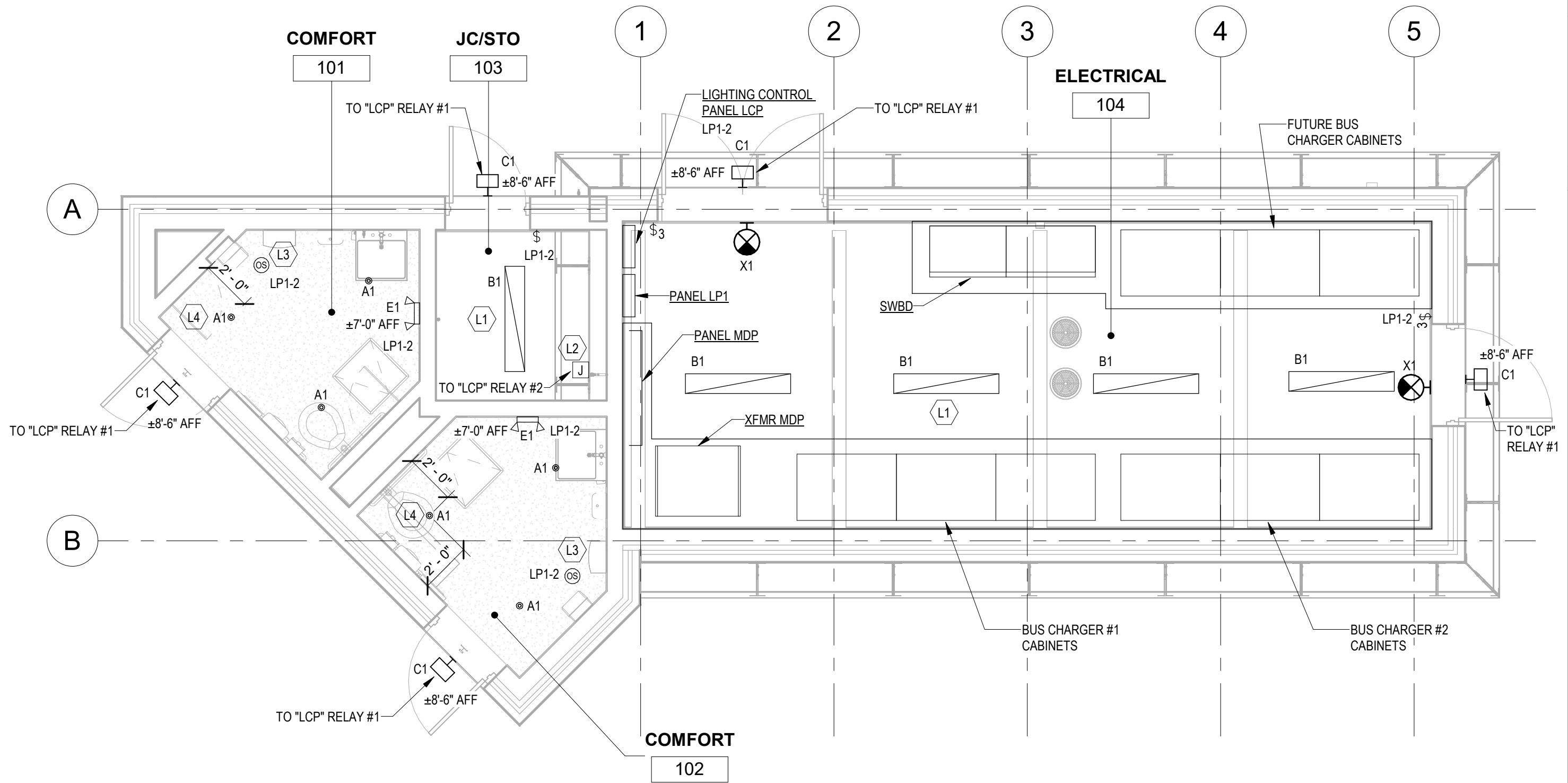
REFER TO "PS&E PLAN SET 4" FOR ELECTRICAL ONE-LINE DIAGRAMS & DISTRIBUTION EQUIPMENT SCHEDULES

1

JUNCTION PARK AND RIDE - ELECTRICAL POWER PLAN

Scale: 1/4" = 1'-0"

60631225P	CITY OF MADISON, DANE COUNTY, WI	CONTRACT NO: 60631225C													
JUNCTION PARK AND RIDE - ELECTRICAL POWER PLAN	BUS RAPID TRANSIT	CITY OF MADISON	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REVISION</th> <th>DATE</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISION	DATE	BY									
REVISION	DATE	BY													
			MARK: _____ Designed By: _____ Date: 2022-03-08 Scale: ---												
			E001												



GENERAL NOTES
 REFER TO ELECTRICAL LEGENDS AND ABBREVIATIONS SHEET FOR GENERAL AND KEYED NOTES.

JUNCTION PARK AND RIDE - ELECTRICAL LIGHTING PLAN

Scale: 1/4" = 1'-0"

MARK	REVISION	DATE	BY

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

JUNCTION PARK AND RIDE - ELECTRICAL LIGHTING PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON



LIGHTING FIXTURE SCHEDULE

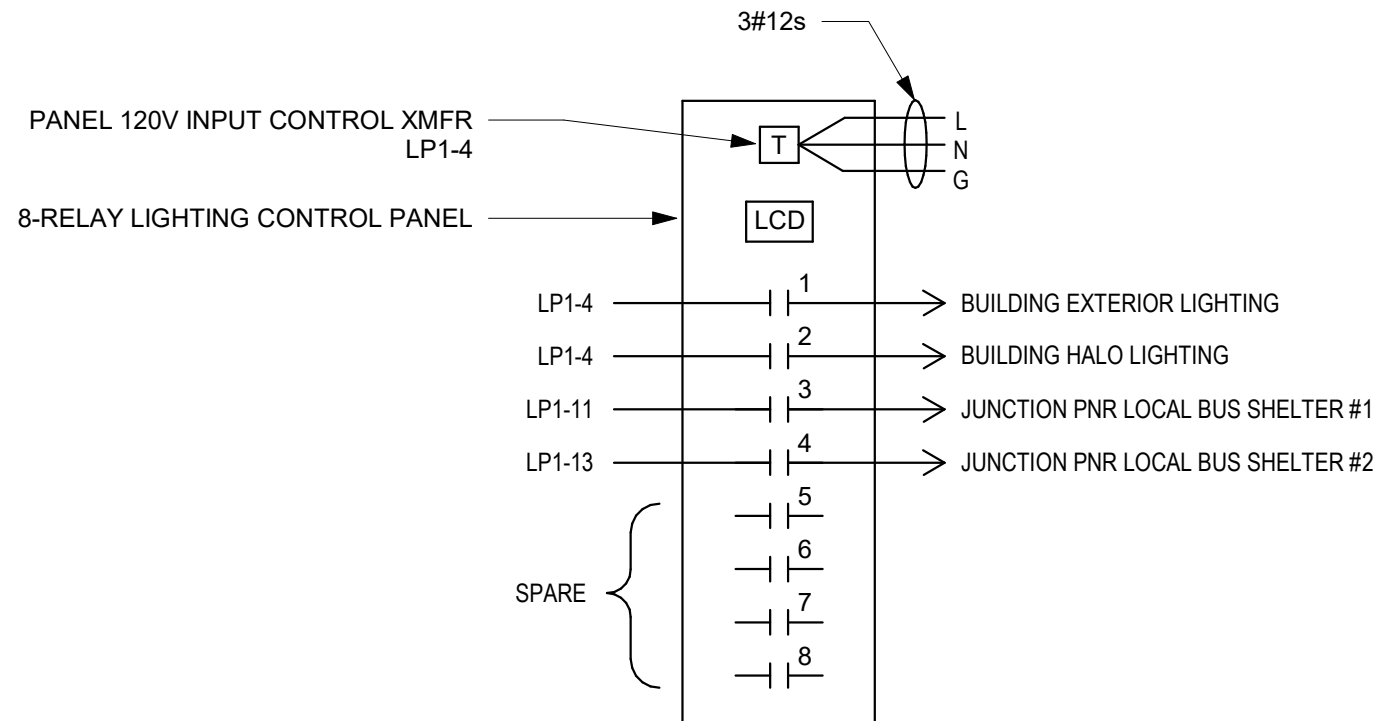
TYPE	DESCRIPTION	MOUNTING	LEDs	VOLTAGE	MANUFACTURE & CATALOG NO.	NOTE	VA
A1	ROUND LED DOWNLIGHT, 4" APERTURE, WET LOCATION, CLEAR SEMI-SPECULAR REFLECTOR, WIDE DISTRIBUTION	RECESSED CEILING	3500K, +80CRI, 1000 LUMENS	120V	GOTHAM #EVO4-35/10-AR-LSS-WD-(*)-UGZ OR APPROVED EQUAL	-	10
B1	4' INDUSTRIAL LED, STEEL HOUSING, DIFFUSE ACRYLIC LENS, WHITE FINISH	SUSPENDED CHAIN	3500K, +80CRI, 6000 LUMENS	120V	LITHONIA #UFIT-L46-6000LM-SEF-(*)-GZ10-35K-80CRI-WH OR APPROVED EQUAL	-	50
C1	DECORATIVE EXTERIOR CYLINDER SHAPE LED WALL-PAK WITH ACRYLIC LUMINOUS UPLIGHT & FULL-CUTOFF DOWNLIGHT, DIE-CAST ALUMINUM HOUSING, MED THROW DISTRIBUTION, WET LOCATION, BLACK FINISH	SURFACE WALL	3500K, +80CRI, 950 LUMENS	120V	VISA LIGHTING #OW2304-L35K-(*)-MED-JTBK OR APPROVED EQUAL	1	18
E1	3.6 VOLT EMERGENCY BATTERY LIGHTING UNIT, TWIN 1W LED LAMP HEADS, NICKEL-CADMIUM BATTERY, THERMOPLASTIC HOUSING, WHITE FINISH	SURFACE WALL	FURNISHED WITH FIXTURE	120V	LITHONIA #EU2L-M12 OR APPROVED EQUAL	-	2
X1	EMERGENCY EXIT SIGN, SINGLE FACE LED, GREEN LETTERS, NICKEL-CADMIUM BATTERY, THERMOPLASTIC HOUSING, WHITE FINISH, TWIN LED LAMP HEADS	SURFACE WALL	FURNISHED WITH FIXTURE	120V	LITHONIA #LHQM-LED-G-SD OR APPROVED EQUAL	2	5

GENERAL NOTES:

- A. FIXTURE CATALOG NUMBERS ARE FOR CONTRACTOR'S CONVENIENCE ONLY. VERIFY TYPE AND VOLTAGE FOR EACH INSTALLATION PRIOR TO PURCHASE.
- B. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS WHICH MAY NOT BE INCLUDED IN MANUFACTURER'S CATALOG NUMBER.
- C. ALL FIXTURES OF THE SAME LETTER TYPE, I.E.: A1, A2, ETC. ARE TO BE PRODUCTS OF THE SAME MANUFACTURER, UNLESS OTHERWISE NOTED.
- D. FIXTURES TO MEET BUY AMERICA(N) REQUIREMENTS.
- E. LUMENS LISTED ARE NOMINAL.
- F. (*) - SEE VOLTAGE COLUMN FOR DRIVER VOLTAGE.
- G. ALL EXTERIOR FIXTURES TO BE WET LABELED.
- H. FIXTURE MOUNTING HEIGHTS SHOWN ON THE PLANS ARE TO BOTTOM OF FIXTURE, UNO
- I. FIXTURES SUBMITTED AS AN APPROVED EQUAL TO MEET OR EXCEED DESIGN & PERFORMANCE SPECIFICATIONS OF THE LISTED FIXTURE TYPE.
- J. CIRCUIT ALL EXIT SIGNS AND EMERGENCY LIGHTING UNITS WITH SELF-CONTAINED BATTERY TO SAME BRANCH CIRCUIT SERVING THE NORMAL LIGHTING IN THE ROOM OR AREA IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

SPECIFIC NOTES:

- 1. MOUNTING HEIGHT SHOWN ON PLANS TO CENTER OF FIXTURE.
- 2. MOUNT EXIT SIGN TWO (2) INCHES ABOVE TOP OF DOOR FRAME.



BUILDING LIGHTING CONTROL DIAGRAM

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CITY OF MADISON, DANE COUNTY, WI

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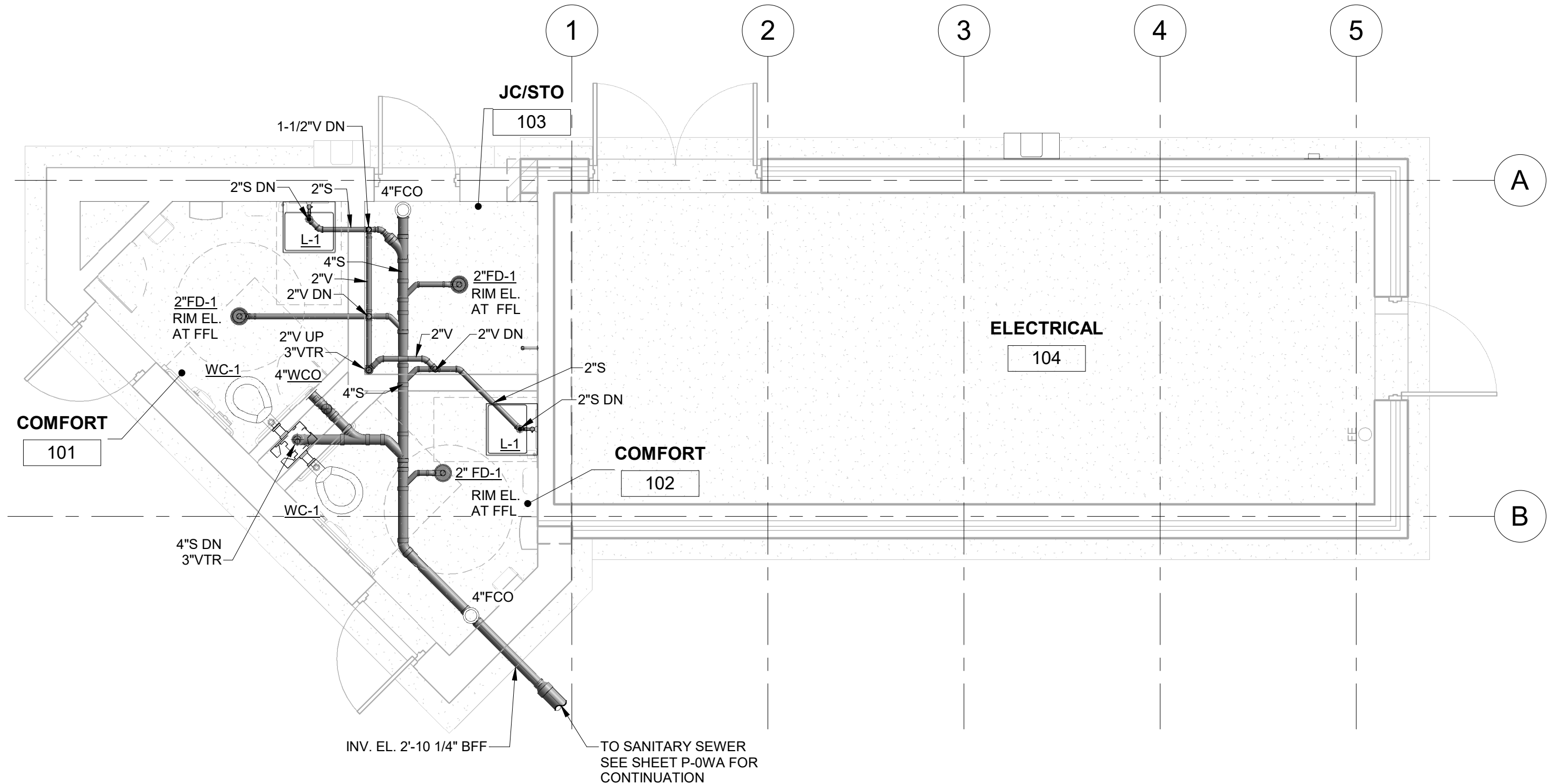
ELECTRICAL LIGHTING SCHEDULE

BUS RAPID TRANSIT
CITY OF MADISON



GENERAL NOTES

1. BURIED PIPING AND ON-SITE INTERIOR WORK BY THE CONTRACTOR AS NECESSARY TO COMPLETE THE UTILITY SERVICE CONNECTIONS AND PROVIDE A FULLY FUNCTIONAL INSTALLATION.
2. PIPING SHOWN IS BELOW THE SLAB AND NOT AT CEILING LEVEL COMFORT (101 & 102) ROOM AND JC/STORAGE (103) ROOM.
3. WORK SHOWN IS FOR THE JUNCTION ROAD TERMINAL, ROUTE HANSON ROAD AND SUN PRAIRIE SITE SANITARY SEWER AND STORM WATER PER LOCAL SITE CONDITIONS.
4. JUNCTION ROAD FLOOR ELEVATION IS SET AT 1076.75.



1

OVERALL SANITARY FLOOR PLAN

Scale: 1/4" = 1'-0"

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OVERALL SANITARY/VENT FLOOR PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON

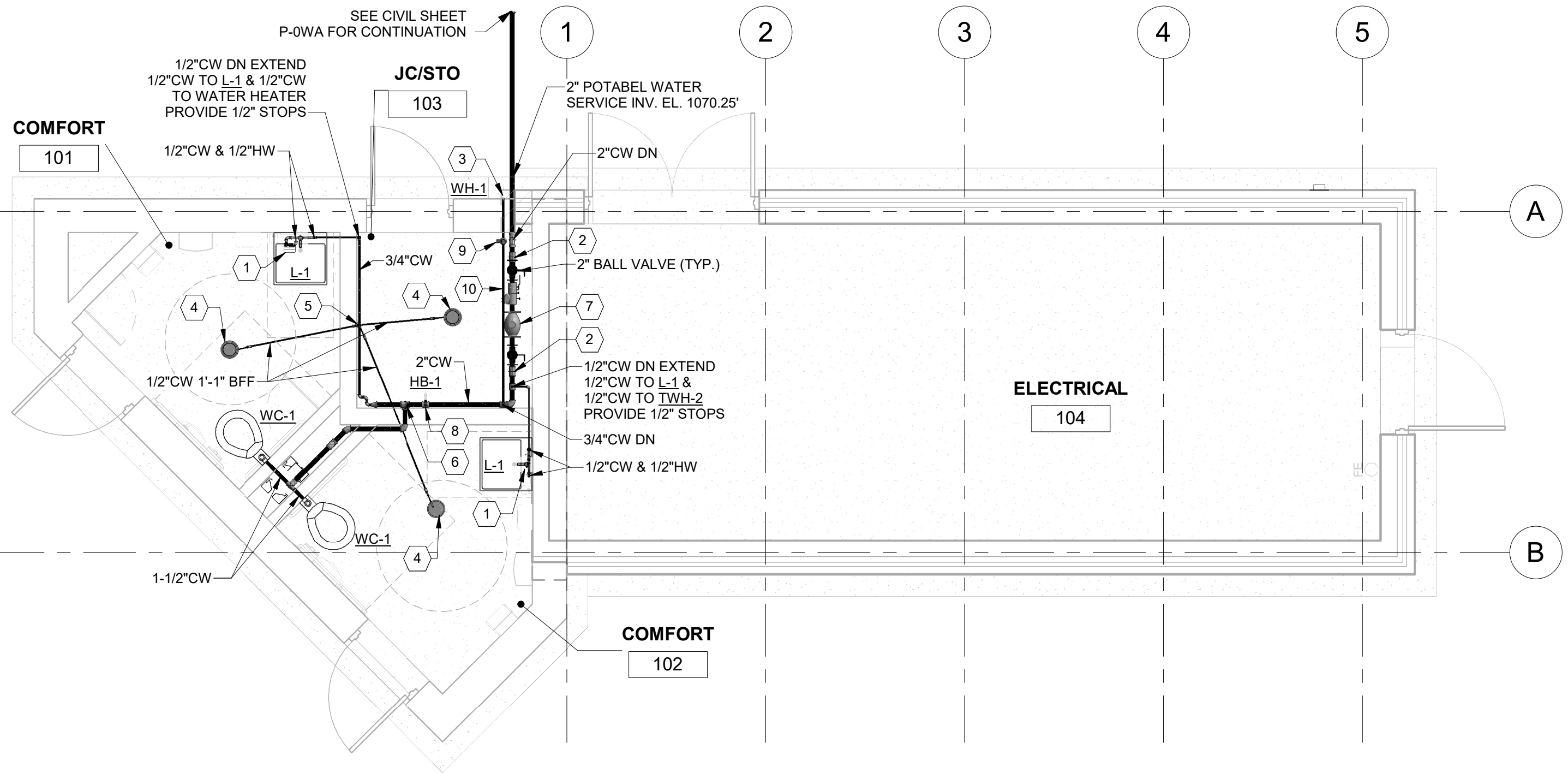


KEY NOTES

- EEMAX ACCUMIX II AM004120T ELECTRIC TANKLESS WATER HEATER TO BE INSTALLED UNDERNEATH LAVATORY.
- PROVIDE 2" CW BYPASS WITH 2" BALL VALVE.
- WOODFORD MODEL B67 BOX TYPE BACKFLOW PROTECTED FREEZELESS WALL HYDRANT TO BE INSTALLED ON EXTERIOR OF BUILDING. CONNECT WITH 3/4" FEMALE HOSE THREAD.
- FLOOR DRAINS TO BE INSTALLED WITH PRECISION PLUMBING PRODUCTS TRAP PRIMER TO ENSURE TRAP REMAINS SEALED.
- 1/2" CW DN TO ELECTRONIC TRAP SEAL PRIMER VALVE, MIFAB MODEL MI-300-500-DU-120VAC OR EQUAL, PROVIDE 120VAC 3-PRONG POWER PLUG, EXTEND 1/2" COPPER TUBING, TYPE K, TO EACH FLOOR DRAIN TRAP PRIMER CONNECTION.
- 2" CW DN WITH 2" BALL VALVE IN DROP, EXTEND 2" CW BFF OVER TO WATER CLOSETS.
- 2" WATER METER WITH STRAINER, \pm EL. 1080.75'.
- 3/4" CW DN TO HB-1, PROVIDE 3/4" BALL VALVE IN DROP.
- 3/4" CW DN TO WH-1, PROVIDE 3/4" BALL VALVE IN DROP.
- 3/4" CW AT CEILING EL.

GENERAL NOTES

- PLUMBING FIXTURES AND PIPING TO BE FURNISHED AND INSTALLED AS PART OF THE RESTROOM FACILITY.
- WORK SHOWN IS FOR THE JUNCTION ROAD TERMINAL. ROUTE HANSON ROAD AND SUN PRAIRIE SITE SANITARY SEWER AND STORM WATER PER LOCAL SITE CONDITIONS.
- JUNCTION ROAD FLOOR ELEVATION IS SET AT 1076.75.



OVERALL WATER FLOOR PLAN

Scale: 1/4" = 1'-0"

NO.	DATE	BY

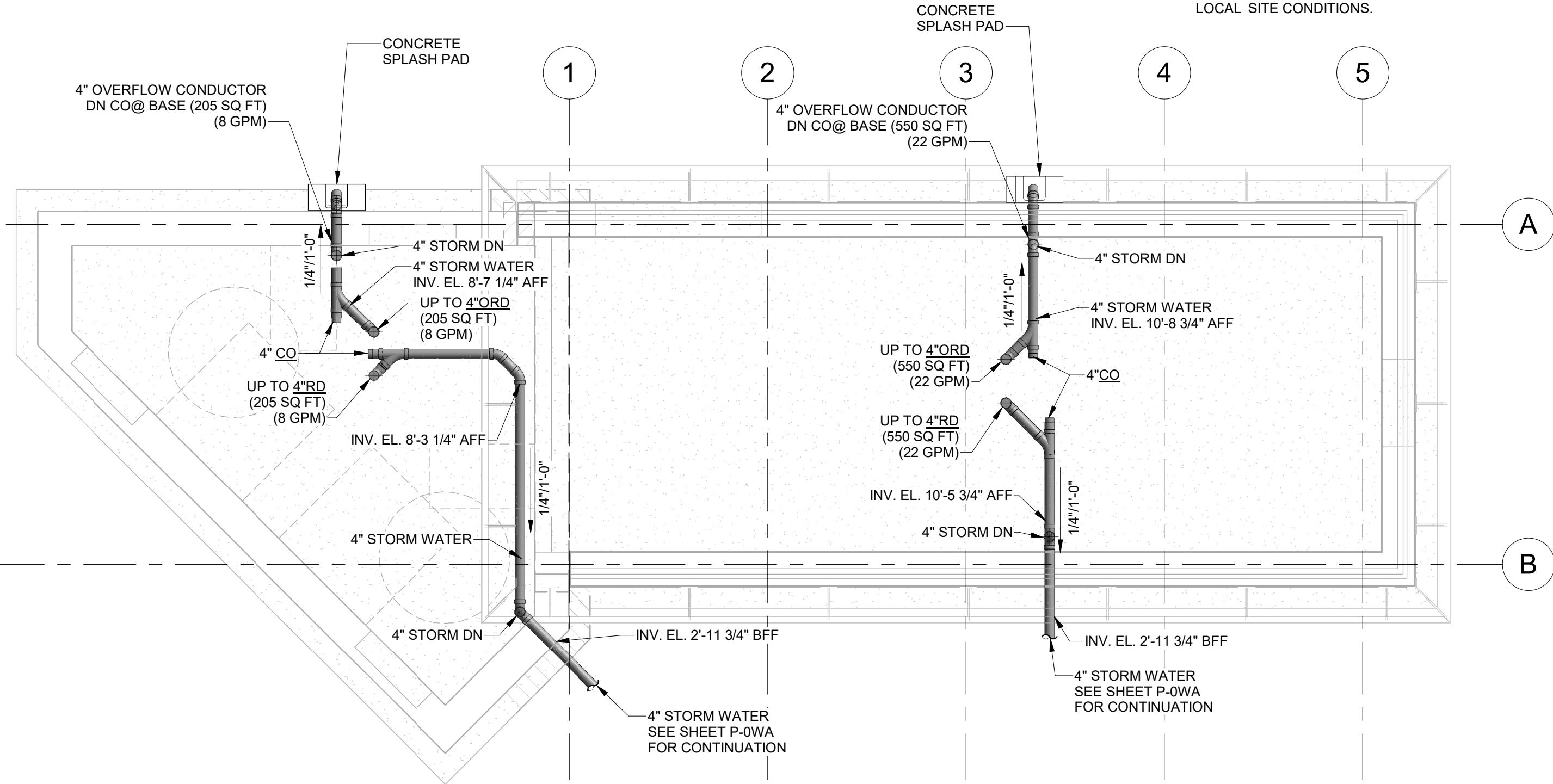
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 60631225C
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

OVERALL WATER FLOOR PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON



GENERAL NOTES

1. PIPING SHOWN IN ELECTRICAL 104 IS AT CEILING LEVEL OF FLOOR BELOW AND NOT ON ROOF.
2. WORK SHOWN IS FOR THE JUNCTION ROAD TERMINAL. ROUTE HANSON ROAD AND SUN PRAIRIE SITE SANITARY SEWER AND STORM WATER PER LOCAL SITE CONDITIONS.



1

OVERALL STORM WATER FLOOR PLAN

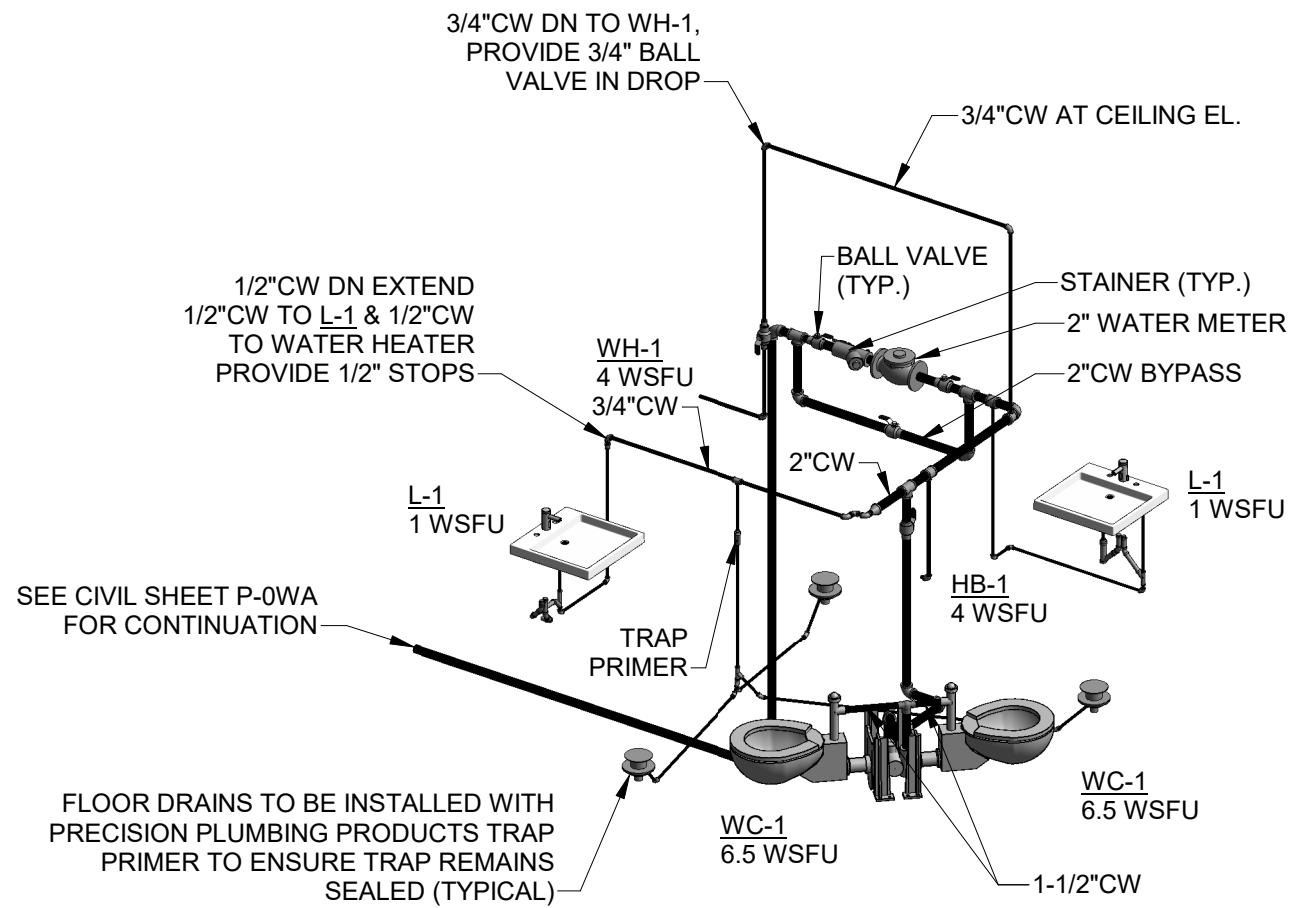
Scale: 1/4" = 1'-0"

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 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

OVERALL SANITARY ROOF PLAN
 BUS RAPID TRANSIT
 CITY OF MADISON

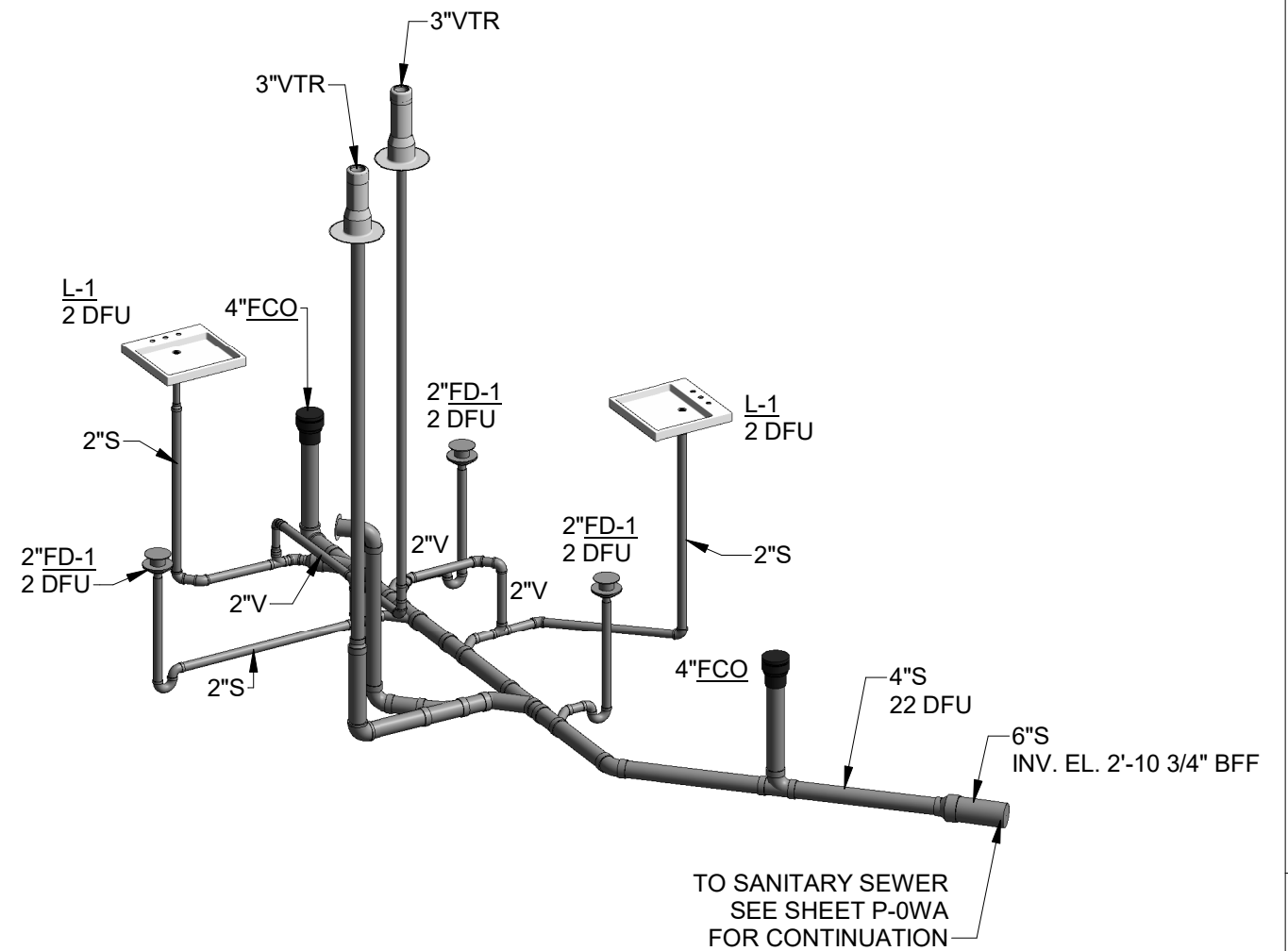




1

PLUMBING WATER ISOMETRIC

NTS



2

PLUMBING SANITARY ISOMETRIC

NTS

NO.	REVISION	DATE	BY

60631225P

CITY OF MADISON, DANE COUNTY, WI

CONTRACT NO: 60631225C

PLUMBING ISOMETRICS
BUS RAPID TRANSIT
CITY OF MADISON



SECTION 23 00 00 – MECHANICAL AND PLUMBING FOR COMFORT STATION

Exhibit 3

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:

1. Heating, ventilating, and air conditioning (HVAC) equipment.
2. Plumbing equipment.
3. Definitions for the manner and method by which controls function.
4. Ductwork and piping insulation.

1.02 REFERENCES

A. Wisconsin Administrative Code (2018):

1. Chapter 363 – Energy Conservation.
2. Chapter 364 – Heating, Ventilating, and Air Conditioning.
3. Chapter 382 – Design, Construction, Installation, Supervision, and Inspection of Plumbing.

B. Madison, Wisconsin – Code of Ordinances / Chapter 18 – Plumbing Code.

1.03 SUBMITTALS

A. Submit to the Engineer for review and approval complete construction drawings, shop details, installation drawings, catalog data, manufacturer's literature, etc. Complete submittals required include, but are not limited to, waste and vent piping, water piping, water closets, lavatories, tankless water heaters, hose bibbs, wall hydrants, floor drains, electric wall heaters, exhaust ventilators, miniature split systems, toilet accessories and other pertinent items.

1.04 DEFINITIONS

A. Control Sequences: Manner and method by which automatic temperature controls function. Requirements for each type of operation are described in this section.

B. Normal Mode: Mode or position-controlled device assumes without power.

C. Automatic Mode: Mode or position-controlled device assumed when under control of automatic system of controls.

D. Manual Mode: Mode or position-controlled device assumes when under manual control. Unless otherwise specified, manual mode implied and affects only device for which manual mode or position identified.

1.05 QUALITY ASSURANCE

A. Manufacturer's Quality System:

1. Registered to ISO 9001:2000 Quality Standard, including in-house engineering for product design activities.
1. The control must be UL tested and certified.
- B. Interpret specific reference in these specifications to any article, device, product, material, fixture, form or type of construction, etc., by name, make or catalog number as establishing a standard of quality. Do not construe specific references as limiting competition. Use any article, device, product or material, fixtures, form, or type of construction, which in the judgment of the architect is equal to that named in the special provisions or shown on the plans.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 GENERAL

- A. Provide all plumbing fixtures, piping and accessories as outlined in this section meeting ASME A112.119.3.
- B. Provide all heating and ventilation equipment, wiring, and accessories as outlined within this section.
- C. Provide all products and workmanship of the highest commercial or industrial quality available. Lesser quality products, such as “economy grade”, will not be acceptable. The engineer will reject any product or work that is inferior in his/her judgment.

2.02 WASTE AND VENT PIPING

- A. Waste and vent piping shall be ABS or PVC plastic.

2.03 WATER PIPING

- A. Copper tubing Type L, hard drawn. Provide a gate or ball valve at the inlet end of the water line. Size water lines to provide proper flushing action based on a nominal water pressure of 40 psi.
- B. Provide a main shut-off valve and water meter at the water service entrance.
- C. Provide a water hammer arrestor, to be installed on water line.
- D. Buried water piping to be type K soft copper.

2.04 WATER CLOSETS (WC-1)

- A. Ceramic, ADA compliant, wall hung, elongated bowl, with siphon or blowout jet action. Provide back spud for concealed 1.6 gpf flush valve connection. Kohler Kingston K-4323, or approved equal.
- 2.05 LAVATORIES (L-1)
- A. Ceramic, wall mount, ADA compliant, with backsplash and carrier. Kohler Chesapeake K-1728, or approved equal.
 - B. Lavatory valves to be pneumatically operated pushbutton valve. Valve to be non-hold open type with a vandal resistant pushbutton requiring less than 5 lbs pressure to activate.
- 2.06 TANKLESS WATER HEATER (TWH-1-2)
- A. Electric, 3500 Watts, 120 V. single phase, with high temperature limit switch. Mounting location must be located within 2 feet of fixture. Eemax AccuMix II AM004120T, or approved equal.
- 2.07 HOSE BIBB (HB-1)
- A. Hose bibb to be provided in janitor's closet/storage room.
- 2.08 WALL HYDRANT (WH-1)
- A. Wall hydrant shall be a box type Woodford Model B67, automatic draining with ASSE 1052 approved NIDEL Model 50HA high flow double check backflow preventer. 3/4" male inlet and outlet. Hardened stainless steel operating stem and one-piece valve plunger to control both flow and drain functions. Exterior finish to be chrome plated. Loose tee key to be furnished with each hydrant. Wall thickness to be 16 inches.
- 2.09 FLOOR DRAINS (FD-1)
- A. PVC or ABS body with height adjustment, 4" outlet and polished nickel-bronze grate. Zurn Model EZ1, or approved equal.
- 2.10 ELECTRIC WALL HEATER (EWH-1-6)
- A. Janitor's closet and toilet space: Fan forced 13 MBH, 208 V., single phase with surface-mount trim and integral thermostat. QMark CWH3408F, or approved equal.
 - B. Electrical room: Three fan forced electric wall heaters, 13 MBH each, 208 V., single phase with surface-mount trim and integral thermostat. QMark CWH3408F, or approved equal.
- 2.11 EXHAUST VENTILATOR (EF-1-2)
- A. Toilet space: In-line centrifugal, 75 cfm, 115 V., single phase with speed controller, 6" dia. duct connections. Interlock with light switch and reverse-acting thermostat. Fantech Model FG 6, or approved equal. Terminate duct at 8"x8" wall cap.
- 2.12 AIR INTAKE OPENING (L-1-2, SG-1)

- A. Toilet space: 6" dia. PVC with motorized damper interlocked with fan, and exterior louvered PVC intake with insect screen. Fantech Model COM-6P, or approved equal. Interior grille: Fantech Model DG-6, or approved equal.

2.13 MECHANICAL COOLING (AC-1/CU-1)

- A. Electrical room: 30 MBH mini split system with outdoor condensing unit. 208 V., single phase for the condensing unit. 15.5 SEER. 775 CFM. Refrigerant R-410A. Mitsubishi Model PKA-A30KA4, or approved equal.

2.14 CONCRETE SPLASH PAD

- A. Concrete splash pads to be installed on exterior of building to accommodate roof drain overflow lines. 22GPM for the electrical room. 8 GPM for the toilet space and janitor's closet.

2.15 INSULATION ACCESSORIES

- A. Ductwork Insulation Accessories: Provide staples, wires, bands, wire netting, stud pins, and metal cover tape, anchors, corner angles, and similar accessories as recommended by insulation manufacturer for application indicated.

2.16 VAPOR BARRIER AND JACKETING MATERIALS

- A. JK1, Kraft Paper Faced Vapor Barrier Material: FS HH B 100B, Type I, all service type aluminum foil and fiberglass yarn reinforced kraft paper. Manville Type AP, or equal.
 - a. Maximum water vapor permeability, ASTM E96/E96M, 0.02 perms.
 - b. Minimum tensile strength, ASTM D828, 40 lbs/in. width.
 - c. Minimum Mullen burst pressure, ASTM D774/D774M, 70 psi.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Install all equipment in strict compliance with applicable laws and the latest rules and regulations of all municipal and other public agencies having jurisdiction over this work.
- C. Complete the utility service connections to provide a fully functional restroom facility.
- D. Install water hammer arrester on water line.
- E. Install heating and ventilating equipment, wiring and accessories to comply with manufacturer's written instructions.
- F. Install electrical components to comply with manufacturer's written instructions.

3.02 CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces.

3.03 WARRANTY

- A. For all items of work to be performed under this article, guarantee each item against defects in material and workmanship for a period equal to the standard warranty period of the manufacturer or the industry, whichever is longer. Commencement of the warranty period begins after final acceptance of the work. In the event of a legitimate claim, replace or repair the defective item, in whole or in part, as necessary, to restore the item to its original intended state.

3.04 PIPING

- A. Exposed Piping: Locate insulation and cover seams in least visible locations.
- B. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, up to 3' from the pump seal water connection.
 - a. Provide standard jackets with or without vapor barrier, factory applied or field applied.
 - b. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe.
 - c. Finish with glass cloth and vapor barrier adhesive.
 - d. PVC fitting covers may be used.
 - e. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations.
 - f. Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
 - g. Provide formed insulation segments capable of being removed for service and reinstalled without damage to the segments or vapor barrier sealing tapes for valves, pipe flanges, unions, and valve flanges.
- C. Continue insulation through penetrations of building assemblies or portions of assemblies having fire resistance rating of one hour or less. Provide intumescent firestopping when continuing insulation through assembly. Finish at supports, protrusions, and interruptions. Refer to Section 07840 for penetrations of assemblies with fire resistance rating greater than one hour.
- D. Buried Piping: Insulate only where insulation manufacturer recommends insulation product may be installed in trench, tunnel or direct buried. Install factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with 1 mil thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with polyester film.

- E. Insulate piping and equipment less than 8 foot above finished floors in locations accessible to personnel contact so that temperatures of exposed surfaces do not exceed 180 degrees F.

3.05 AIR CONDITIONING UNITS

A. Units Served:

- a. AC-1/CU-1

B. General

- a. Two way control valve shall fail open upon loss of power.

C. Normal Mode: Off

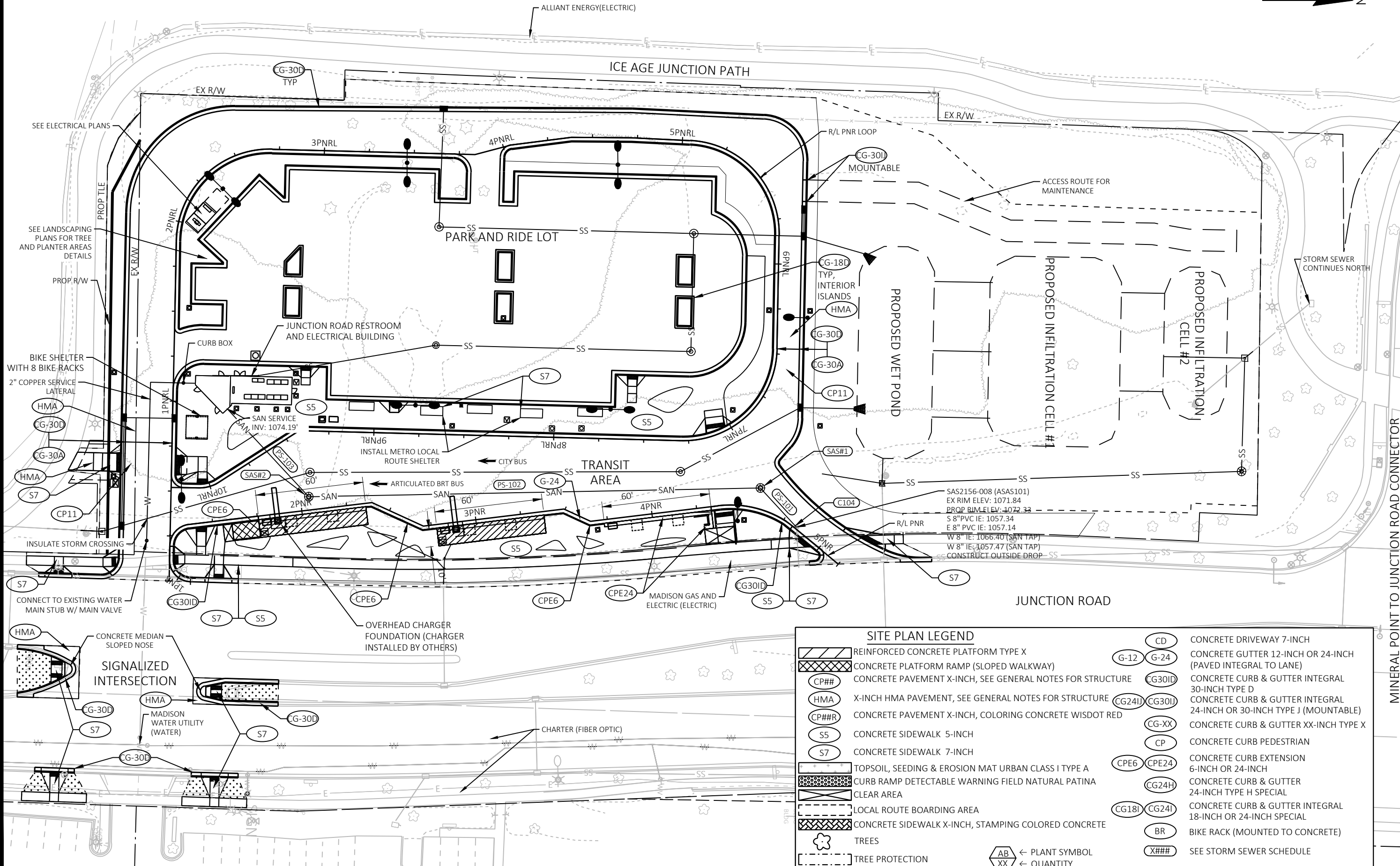
- a. Fan: Off
- b. Control Valve: Closed

D. Automatic Mode: On.

- a. Units shall be controlled by space thermostat set at 65°F (field adjustable). On call for heat, thermostat shall engage with electric wall heaters within space. When space heating requirements are satisfied, thermostat shall disengage with electric wall heaters within space.

END OF SECTION

Exhibit 4



SITE PLAN LEGEND	
	REINFORCED CONCRETE PLATFORM TYPE X
	CONCRETE PLATFORM RAMP (SLOPED WALKWAY)
	CONCRETE PAVEMENT X-INCH, SEE GENERAL NOTES FOR STRUCTURE
	X-INCH HMA PAVEMENT, SEE GENERAL NOTES FOR STRUCTURE
	CONCRETE PAVEMENT X-INCH, COLORING CONCRETE WISDOT RED
	CONCRETE SIDEWALK 5-INCH
	CONCRETE SIDEWALK 7-INCH
	TOPSOIL, SEEDING & EROSION MAT URBAN CLASS I TYPE A
	CURB RAMP DETECTABLE WARNING FIELD NATURAL PATINA
	CLEAR AREA
	LOCAL ROUTE BOARDING AREA
	CONCRETE SIDEWALK X-INCH, STAMPING COLORED CONCRETE
	TREES
	TREE PROTECTION
	← PLANT SYMBOL ← QUANTITY
	CONCRETE DRIVEWAY 7-INCH
	CONCRETE GUTTER 12-INCH OR 24-INCH (PAVED INTEGRAL TO LANE)
	CONCRETE CURB & GUTTER INTEGRAL 30-INCH TYPE D
	CONCRETE CURB & GUTTER INTEGRAL 24-INCH OR 30-INCH TYPE J (MOUNTABLE)
	CONCRETE CURB & GUTTER XX-INCH TYPE X
	CONCRETE CURB PEDESTRIAN
	CONCRETE CURB EXTENSION 6-INCH OR 24-INCH
	CONCRETE CURB & GUTTER 24-INCH TYPE H SPECIAL
	CONCRETE CURB & GUTTER INTEGRAL 18-INCH OR 24-INCH SPECIAL
	CONCRETE CURB & GUTTER INTEGRAL 18-INCH OR 24-INCH SPECIAL
	CONCRETE CURB & GUTTER INTEGRAL 18-INCH OR 24-INCH SPECIAL
	BIKE RACK (MOUNTED TO CONCRETE)
	SEE STORM SEWER SCHEDULE

MARK: 60631225P
DESIGNED BY: AECOM
DATE: 2022-10-20
REVISION: 60631225P
DATE: 1 IN: 50 FT

60631225P
CITY OF MADISON, DANE COUNTY, WI
CONTRACT NO: 60631225C

SITE PLAN: WESTERN TERMINAL
BUS RAPID TRANSIT
CITY OF MADISON

MINERAL POINT TO JUNCTION ROAD CONNECTOR
WESTERN TERMINAL

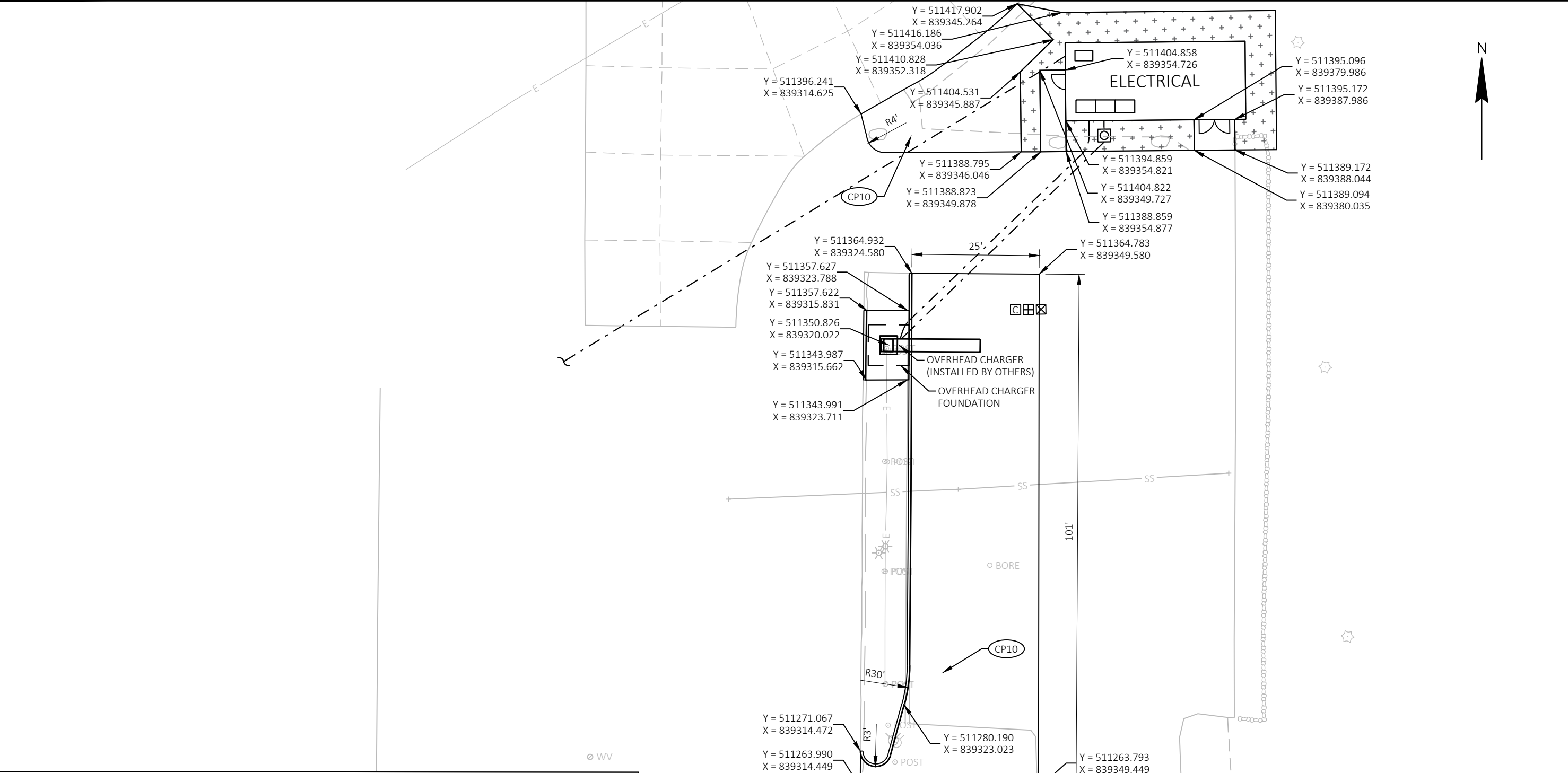
60631225P
P-0W

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LAYOUT NAME - Plan 1 IN 50 FT
LAST PLOT DATE: 2022-10-20

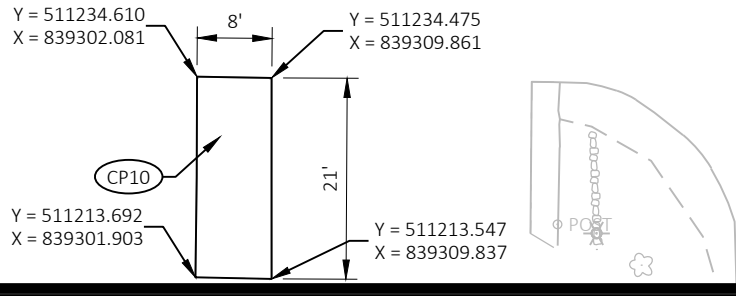
MARK	REVISION	DATE	BY

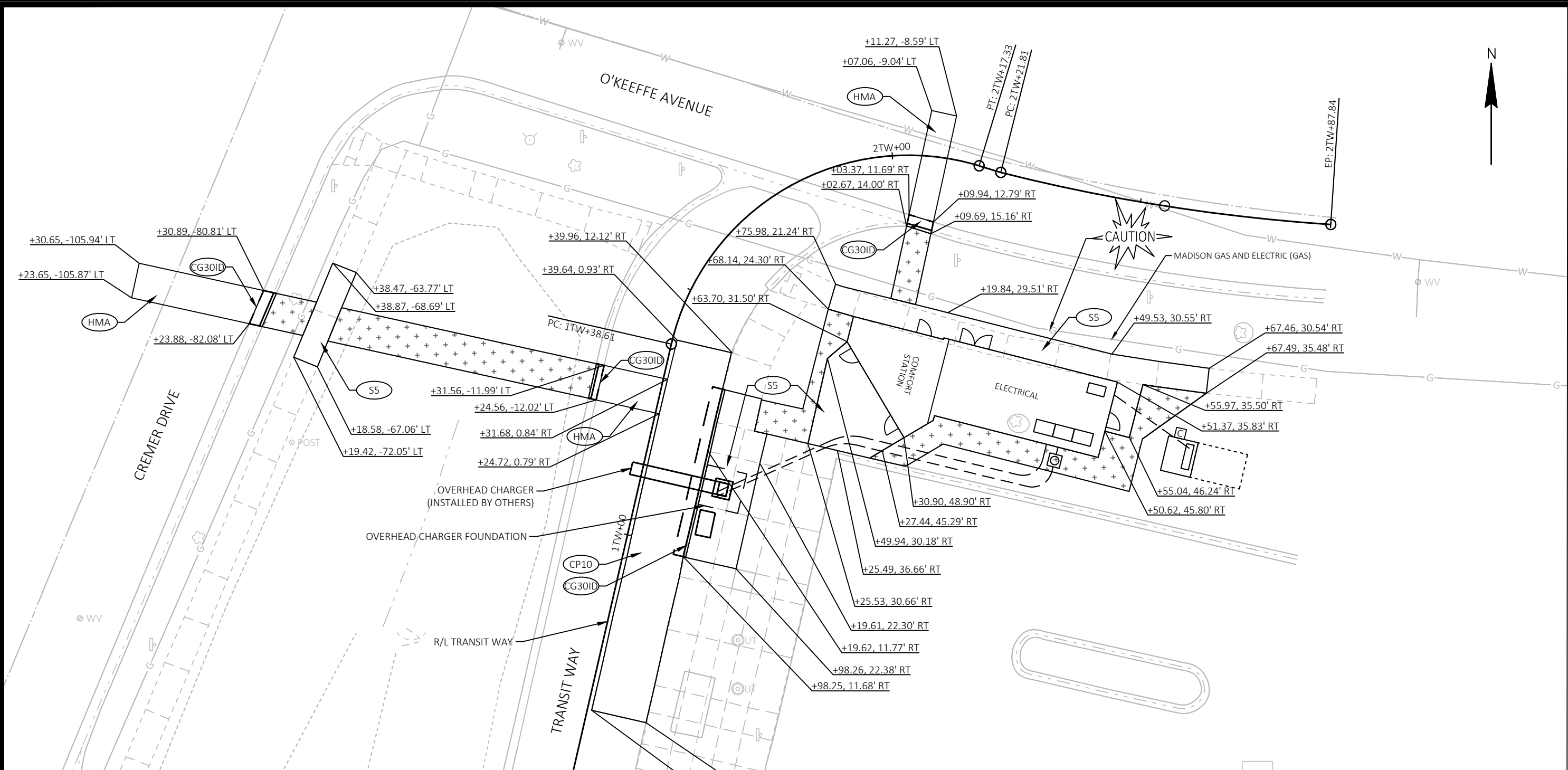
60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

SITE PLAN: HANSON ROAD
 BUS RAPID TRANSIT
 CITY OF MADISON
 60631225P
 P34-E



SITE PLAN LEGEND	
	REINFORCED CONCRETE PLATFORM TYPE X
	CONCRETE PLATFORM RAMP (SLOPED WALKWAY)
	CONCRETE PAVEMENT, SEE GENERAL NOTES FOR STRUCTURE
	X-INCH HMA PAVEMENT, SEE GENERAL NOTES FOR STRUCTURE
	X-INCH CONCRETE PAVEMENT, COLORED RED
	CONCRETE SIDEWALK 5-INCH
	CONCRETE SIDEWALK 7-INCH
	SEEDING
	CURB RAMP DETECTABLE WARNING FIELD NATURAL PATINA
	CLEAR AREA
	LOCAL ROUTE BOARDING AREA
	X-INCH CONCRETE, COLORED AND STAMPED
	TREES
	TREE PROTECTION
	CONCRETE DRIVEWAY 7-INCH
	CONCRETE GUTTER 24-INCH (PAVED INTEGRAL TO LANE, SEE DETAIL)
	CONCRETE CURB & GUTTER INTEGRAL 30-INCH TYPE D
	CONCRETE CURB & GUTTER INTEGRAL 30-INCH TYPE J (MOUNTABLE)
	CONCRETE CURB & GUTTER XX-INCH TYPE X
	CONCRETE CURB PEDESTRIAN
	CONCRETE CURB EXTENSION 6-INCH OR 24-INCH
	CONCRETE CURB & GUTTER 24-INCH TYPE H SPECIAL
	CONCRETE CURB & GUTTER INTEGRAL 24-INCH SPECIAL
	BIKE RACK (MOUNTED TO CONCRETE)
	← PLANT SYMBOL
	← QUANTITY





MARK	REVISION	DATE	BY
60631225P	Designed By: AECOM	Date: 2022-10-23	Scale: 1"=20 FT

60631225P
 CITY OF MADISON, DANE COUNTY, WI
 CONTRACT NO: 60631225C

SITE PLAN: SUN PRAIRIE PARK AND RIDE
 BUS RAPID TRANSIT
 CITY OF MADISON

60631225P
 P36-E

FILE NAME: C:\P\WORKING\AECOM_DS20_NA_2019\MICHAEL.SCHNEIDERZ@AECOM.COM\DM586348\050304B-PN.DWG
 LAYOUT NAME - Plan 1 IN 20 FT
 LAST PLOT DATE - 2022-10-23

SITE PLAN LEGEND	
	REINFORCED CONCRETE PLATFORM TYPE X
	CONCRETE PLATFORM RAMP (SLOPED WALKWAY)
	CONCRETE PAVEMENT X-INCH, SEE GENERAL NOTES FOR STRUCTURE
	X-INCH HMA PAVEMENT, SEE GENERAL NOTES FOR STRUCTURE
	CONCRETE PAVEMENT X-INCH, COLORING CONCRETE WISDOT RED
	CONCRETE SIDEWALK 5-INCH
	CONCRETE SIDEWALK 7-INCH
	TOPSOIL, SEEDING & EROSION MAT URBAN CLASS I TYPE A
	CURB RAMP DETECTABLE WARNING FIELD NATURAL PATINA
	CLEAR AREA
	LOCAL ROUTE BOARDING AREA
	CONCRETE SIDEWALK X-INCH, STAMPING COLORED CONCRETE
	TREES
	TREE PROTECTION
	← PLANT SYMBOL
	← QUANTITY
	CONCRETE DRIVEWAY 7-INCH
	CONCRETE GUTTER 12-INCH OR 24-INCH (PAVED INTEGRAL TO LANE)
	CONCRETE CURB & GUTTER INTEGRAL 30-INCH TYPE D
	CONCRETE CURB & GUTTER INTEGRAL 24-INCH OR 30-INCH TYPE J (MOUNTABLE)
	CONCRETE CURB & GUTTER XX-INCH TYPE X
	CONCRETE CURB PEDESTRIAN
	CONCRETE CURB EXTENSION 6-INCH OR 24-INCH
	CONCRETE CURB & GUTTER 24-INCH TYPE H SPECIAL
	CONCRETE CURB & GUTTER INTEGRAL 18-INCH OR 24-INCH SPECIAL
	BIKE RACK (MOUNTED TO CONCRETE)
	SEE STORM SEWER SCHEDULE

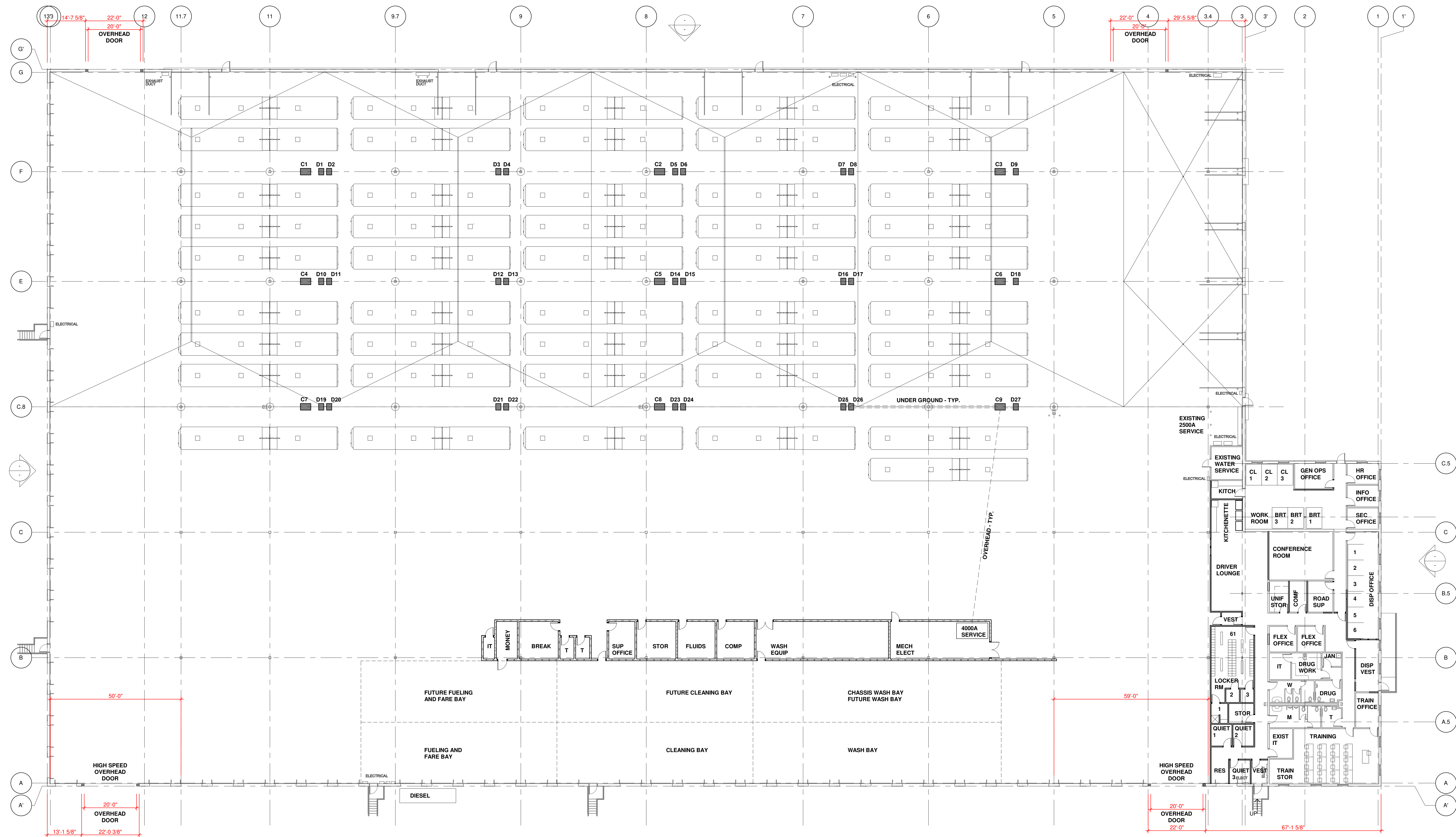
Exhibit 5

**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

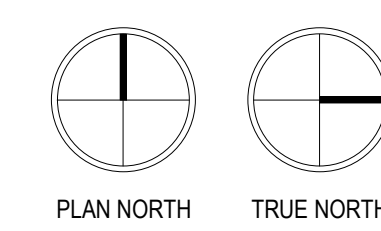
ISSUED FOR:		
DESCRIPTION	Issue Date	
REVISION FOR:		
NO.	DESCRIPTION	DATE



DRAWN BY _____ Author
CHECKED BY _____ Checker

First Floor Plan

1 FLOOR PLAN - 3901
SCALE: 1/16" = 1'-0"



A101sb

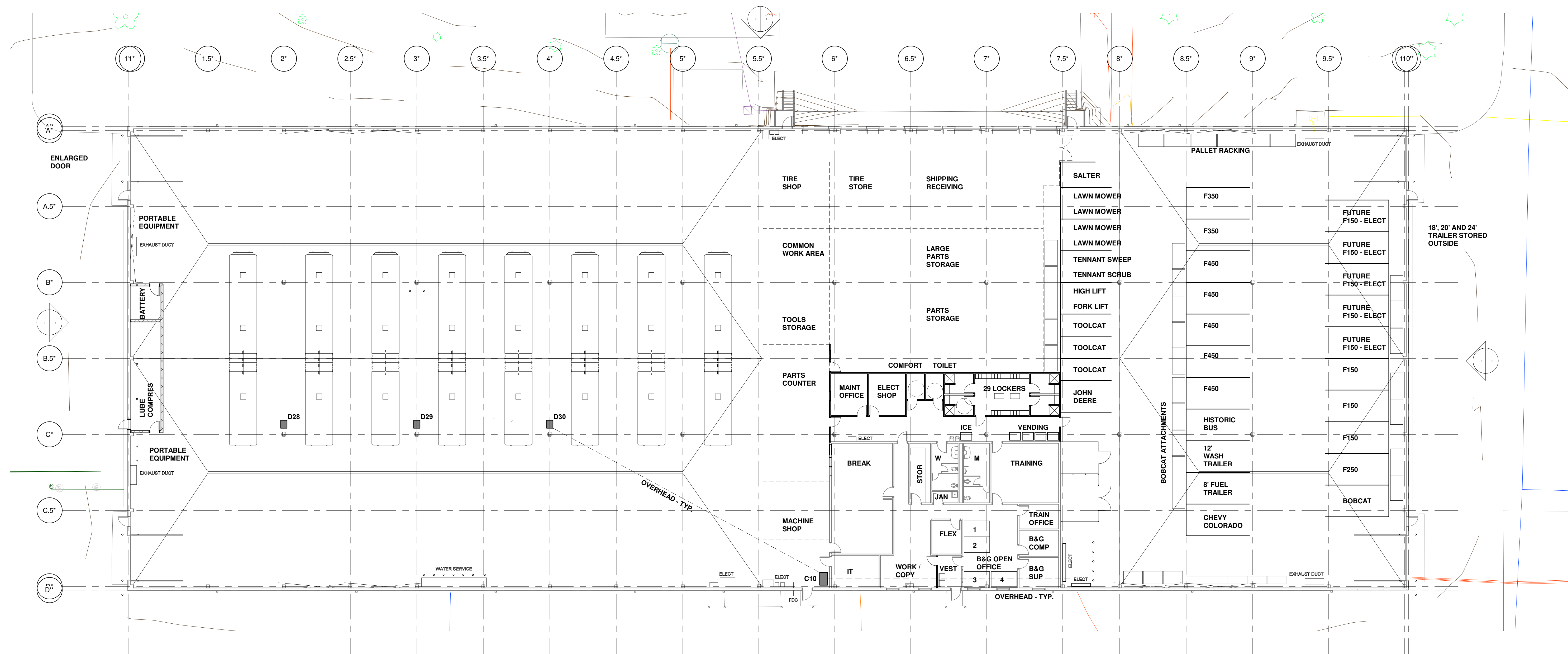
**METRO SATELLITE BUS
FACILITY**

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

PROJECT NUMBER 213419.00

ISSUED FOR:	
DESCRIPTION	Issue Date

REVISION FOR:		
NO.	DESCRIPTION	DATE



1 FLOOR PLAN - 3829
SCALE: 1/16" = 1'-0"

DRAWN BY	Author
CHECKED BY	Checker

FIRST FLOOR PLAN

