



**PROPOSED AGENDA
REGULAR MEETING OF
THE CHARLOTTE PLANNING COMMISSION**

111 E. Lawrence Ave, Charlotte, MI 48813 (517) 543-2750
7:00 P.M. Monday, June 16th, 2025

1. Call to Order
2. Roll Call
3. Pledge of Allegiance
4. Approval of Minutes – April 1st, 2025
5. Early Public Comment – Limit presentation to 5 minutes
6. Approval of Agenda
7. Zoning Ordinance review committee update
8. Public Hearing: Temporary Use Permit – 116 Lansing St
9. Action: 116 Lansing St – Temporary Use
10. Public Hearing: Site Plan– Building Addition- 400 Parkland Dr.
11. Action: Site Plan - 400 Parkland Rd.
12. Late Public Comment – Limit presentation to 5 minutes
13. Commissioner Comments
14. Adjourn

CITY OF CHARLOTTE
PLANNING COMMISSION MEETING MINUTES
111 E. Lawrence Ave. Charlotte, MI 48813 (517) 543-2750
April 01, 2025 7:00 p.m.

CALL TO ORDER:

The meeting was called to order by Chairperson Brummette at 7:00 P.M.

ROLL CALL:

Present: Chairperson Brummette, Vice Chairperson McRae, Commissioners N. Christensen, Bliven, Packowski, Bearup and Snyder. Council member representative J. Christensen

Also in attendance: Assistant Fire Chief Fullerton, Deputy City Clerk Middaugh, and City Manager Hillard

Absent: Garrett, Lester

PLEDGE OF ALLEGIANCE:

Led by Chairperson Brummette

APPROVAL OF MINUTES:

Motion by Snyder supported by Packowski, to approve the minutes of February 4, 2025, noting to clarify the May 6th meeting date was changed to May 7th to accommodate for the Special election. Carried. Yea 7; Nay 0; Absent 2

EARLY PUBLIC COMMENT:

No comments

APPROVAL OF AGENDA:

Motion by Bliven, supported by Christensen to approve the agenda. Carried. Yea 7; Nay 0; Absent 2

INTRODUCTION OF COMMUNITY DEVELOPMENT DIRECTOR – SALENA BENAVIDEZ:

INTRODUCTION OF ERIC ENSEY – MCKENNA PLANNING SERVICES:

ZONING ORDINANCE REVIEW COMMITTEE UPDATE:

A written report was received and included in the packet. Projects include a review of the table of contents for the Zoning Code; proposed revisions to Master plan zoning; discussions on the cannabis overlay district, creation of a resident-appointed Zoning Board of Appeals, special land uses and signs.

PUBLIC HEARING: REZONING REQUEST – NE CORNER OF W. LAWRENCE AVE./WHEATON RD:

Opened at 7:11 p.m. and closed at 7:26 p.m. with the following comments and discussion:

Several residents voiced opposition to advancing the approval to the Council, expressing concerns about potential declines in property values, the loss of wildlife habitat, and the impacts of business-related activities. Those speaking in opposition included Eric Baker, Curtis Rebel, and an additional resident who did not provide their name.

Eric Crandall, a real estate agent involved in the transaction, argued that the proposed request aligns with the area's future planning objectives. He emphasized that the development would likely result in an increase in property values rather than a decrease, and that the property is better suited for business development than for residential use.

Commissioners deliberated on the potential loss of habitat, weighing the benefits of commercial versus residential development, particularly considering the potential impacts on future residential growth vs business growth in that area. The discussion also sought to gain a better understanding of the distinctions between B2 and B3 business zoning. B2 zoning is designed for general business areas with specific restrictions on commercial activities, while B3 zoning allows for more intensive commercial operations, such as larger retail establishments, offices, and a broader range of business uses.

ACTION: REZONING REQUEST - RECOMMENDATION
CITY COUNCIL:

CITY OF CHARLOTTE
PLANNING COMMISSION
RESOLUTION 2025-01

**A RESOLUTION TO APPROVE A CONDITIONAL
REZONE REQUEST FOR PARCELS #200-013-100-
036-00 AND 200-013-100-033-00 AT THE
NORTHEAST CORNER OF LAWRENCE AVE. AND
WHEATON RD. FROM R-1 (RESIDENTIAL) TO B-3
(BUSINESS)**

WHEREAS, the City of Charlotte has received a request from Mr. Kirchen to rezone two parcels of undeveloped land located at the northeast corner of Lawrence Avenue and Wheaton Road, identified as Parcel #200-013-100-036-00 and Parcel #200-013-100-033-00, from their current zoning designation of R-1 (Residential) to B-3 (Business); and

WHEREAS, the properties in question are currently undeveloped, and Mr. Kirchen has an accepted offer to purchase the property, contingent upon the approval of the rezoning; and

WHEREAS, historical zoning patterns and past Commission visions for the area indicate an intent to maintain business zoning along the frontage of the state truckline corridor of M-79 (W. Lawrence), particularly entering the city from the west; and

WHEREAS, the requested rezoning is consistent with the City's recently adopted master plan, which prioritizes the

development of strategic corridors to support business and commercial growth; and

WHEREAS, the rezoning of this property aligns with the goal of enhancing the visual and economic landscape of the city, especially as travelers approach Charlotte from the west; and

WHEREAS, future development of the property will be subject to a more detailed site plan review in accordance with the city's zoning standards, ensuring compatibility with the surrounding area; and

WHEREAS, the Planning Commission has reviewed all relevant materials and has determined that the proposed rezoning is in the best interest of the City of Charlotte;

NOW, THEREFORE, BE IT RESOLVED, that the Charlotte Planning Commission hereby recommends approval of the conditional rezoning request for Parcel #200-013-100-036-00 and Parcel #200-013-100-033-00 from R-1 (Residential) to B-3 (Business), and forwards this recommendation to the City Council for further consideration.

BE IT FURTHER RESOLVED, that this recommendation is contingent upon the submission of a detailed site plan in accordance with the City of Charlotte's zoning regulations, as part of the future development process.

Motion by McRae supported by Bearup to approve the conditional rezoning request and forward this recommendation to the City Council for further consideration. Carried via roll call vote: Yea (4) Snyder, Bearup, Bliven, Packowski; Nay (3) N. Christensen, McRae, Brummette; Absent (2) Snyder, Garrett

April 01, 2025

PLANNING COMMISSION MEETING MINUTES

PUBLIC HEARING: CONDITIONAL USE PERMIT – 122 S. LINCOLN ST:

Opened at 7:46 p.m. and closed at 7:50 p.m. with the following comments and discussion:

Chris Jones, the owner of Jones Trailer Company, introduced himself to the Commission and made himself available to answer any questions.

The Commissioners acknowledged that this item serves as a correction of a previous administrative oversight and should not impede the approval process. They noted that, to date, there have been no violations or complaints against the applicant, who remains fully in compliance with the conditional use requirements.

ACTION: 122 S. LINCOLN ST. CONDITIONAL USE:

**CITY OF CHARLOTTE
PLANNING COMMISSION
RESOLUTION 2025-02**

**A RESOLUTION APPROVING A CONDITIONAL
USE PERMIT FOR JONES TRAILER COMPANY
(122 S. LINCOLN ST.) TO OPERATE AS A CLASS
"B" USED VEHICLE DEALER**

WHEREAS, in July of 2024, the Charlotte Planning Commission granted a Conditional Use Permit for a nearby property for the sale of used vehicles; and

WHEREAS, as part of a larger review of all conditional use permits, it was identified that a previous request from March 2019, from the owner of Jones Trailer Company (122 S.

Lincoln St.), sought to license the property as a Class "B" used vehicle dealer; and

WHEREAS, under City of Charlotte Code 82-269(1), which governs outdoor sales spaces for the sale of new or secondhand automobiles, house trailers, or rental trailers, a Conditional Use Permit is required for such operations in the B-3 district; and

WHEREAS, this process was not followed at the time of the original approval, and city staff mistakenly approved the request without the necessary Conditional Use Permit; and

WHEREAS, after consultation with the City Attorney, it has been advised that this oversight be corrected by following the proper procedure and issuing a Conditional Use Permit for Jones Trailer Company in compliance with the City of Charlotte's regulations; and

WHEREAS, the following conditions have been established for the issuance of the Conditional Use Permit for Jones Trailer Company:

1. The lot or area shall be provided with a permanent, durable, and dustless surface, and shall be graded and drained to dispose of all surface water accumulated within the area.
2. Access to the outdoor sales area shall be at least 60 feet from the intersection of any two streets.
3. No major repair or major refinishing shall be done on the lot.

4. All lighting shall be shielded from adjacent residential districts.

WHEREAS, city staff has conducted an inspection of the property and confirmed that all conditions have been met; and

WHEREAS, the owner of Jones Trailer Company has indicated that he will be present at the upcoming meeting to address any questions from the Planning Commission; and

WHEREAS, this request is a procedural matter to ensure that the City of Charlotte follows the proper process and maintains fairness and transparency in the issuance of Conditional Use Permits, as outlined in the City's ordinances; and

WHEREAS, the property will be subject to annual inspections by city staff to ensure continued compliance with the City's regulations;

NOW, THEREFORE, BE IT RESOLVED, that the Charlotte Planning Commission hereby approves the Conditional Use Permit for Jones Trailer Company (122 S. Lincoln St.) to operate as a Class "B" used vehicle dealer, subject to the conditions listed above; and

BE IT FURTHER RESOLVED, that this approval is granted with the understanding that the business shall remain in compliance with all applicable city regulations, and that annual inspections will continue to ensure compliance.

Motion by McRae supported by Christensen to approve the Conditional Use Permit for Jones Trailer Company to operate as a Class B used vehicle dealer located at 122 S. Lincoln St. Carried; Yea 7; Nay 0; Absent 2

PUBLIC HEARING: TEMPORARY USE PERMIT – 1167 E. CLINTON TRAIL:

Opened at 7:53 p.m. and closed at 7:55 p.m. with the following comments and discussion:

Chuck Friese, the Michigan Area Manager for TNT Fireworks, introduced himself to the Commission and offered to address any questions they had.

The Commission sought clarification on several points, including whether there was a history of past issues, whether the permit was within the 30-day limit, and the application fees. With all questions answered satisfactorily, they were comfortable moving forward with the motion to approve.

ACTION: TEMPORARY USE PERMIT – 1167 E. CLINTON TRAIL:

**CITY OF CHARLOTTE
PLANNING COMMISSION
RESOLUTION 2025-03**

**A RESOLUTION APPROVING A TEMPORARY USE
PERMIT FOR A FIREWORKS TENT AT MEIJER
PARKING LOT (1167 E CLINTON TRL)**

WHEREAS, the City of Charlotte has received a request for a Temporary Use Permit for the operation of a fireworks sales tent to be located in the Meijer parking lot at 1167 E Clinton Trl, from June 20, 2025, to July 6, 2025; and

WHEREAS, this location has hosted fireworks sales for multiple years without any reported issues, and no concerns have been raised regarding the operation during that time; and

WHEREAS, the Charlotte Police Department has reviewed the proposed permit and expressed no concerns regarding public safety or security; and

WHEREAS, the Charlotte Fire Department will conduct a fire safety inspection, contingent upon the approval of this permit, to ensure the safety of the operation; and

WHEREAS, all signage associated with the fireworks sales tent will comply with the City's zoning code regulations; and

WHEREAS, the application ensures that adequate parking will remain available for customers, and that the proposed use will not impair the health, safety, or welfare of the public; and

WHEREAS, based on the review of the proposal and the history of successful operation of fireworks sales at this location, City staff recommends approval of the Temporary Use Permit; and

WHEREAS, a representative from TNT Fireworks is expected to be present at the upcoming Planning Commission meeting to answer any questions or provide additional information as needed;

NOW, THEREFORE, BE IT RESOLVED, that the Charlotte Planning Commission hereby approves the Temporary Use Permit for a fireworks tent to be located in

the Meijer parking lot at 1167 E Clinton Trl from June 20, 2025, to July 6, 2025, contingent upon the Fire department's fire safety inspection and compliance with all applicable zoning regulations.

Motion by McRae supported by Christensen to approve the temporary use permit for a fireworks tent to be located in the Meijer parking lot at 1167 E. Clinton Trl from June 20, 2025 to July 6, 2025. Carried. Yea 7; Nay 0; Absent 2

MAY 7TH MEETING CONFLICT – DATE DISCUSSION:

To clarify the meeting was moved from its original date on Tuesday May 6th to Wednesday May 7th to accommodate the May 6th Special election.

LATE PUBLIC COMMENT:

No comments

COMMISSIONER COMMENTS:

McRae; welcomed Ms. Benavidez and recognized and thanked Mr. Fullerton for his work with the Commission

Bearup; welcome to Mr. Ensey from McKenna Planning Services

Snyder; Wondered about Mr. Fullerton's continued service and received the reply he will continue to provide zoning support

Brummette; welcome to Ms. Benavidez and noted the great audience turnout. Mentioned he will be meeting with the new DPW Director.

No further Commissioner comments were received

ADJOURNMENT:

Motion by Bliven, supported by McRae, to adjourn the meeting at 8:02 p.m. Carried. Yea 7; Nay 0; Absent 2

Respectfully submitted,
Mary LaRocque, City Clerk



CHARLOTTE FIRE DEPARTMENT & RURAL FIRE ASSOCIATION

Fire Chief – Kevin Christiansen

111 E. Lawrence Ave., Charlotte MI 48813

Ph. 517-543-0241



To: City of Charlotte – Planning Commission

From: Assistant Fire Chief Tyger Fullerton

Date: May 12, 2025

Subject: Temporary Use Permit – The Wizards Fireworks Sales Tent, 116 Lansing St. (The Eagles)

Dear Planning Commission,

We have received an application for a Temporary Use Permit submitted by The Wizards Fireworks for the operation of a fireworks sales tent located in the parking lot of The Eagles at 116 Lansing Street. The proposed structure is a 20' x 40' flame-resistant tent, to be situated in the southwest corner of the lot.

Upon review of the site drawing, we have found no zoning-related concerns. The proposed operation dates are from June 6th through July 6th. This is the same vendor and location utilized last year, during which there were no reported issues or violations.

While fireworks retail sites are primarily regulated and inspected by the State Fire Marshal's Office, the Charlotte Fire Department also conducts fire safety inspections. Should any concerns arise, they will be addressed promptly by the fire department.

Based on our review, we recommend approval of the Temporary Use Permit.

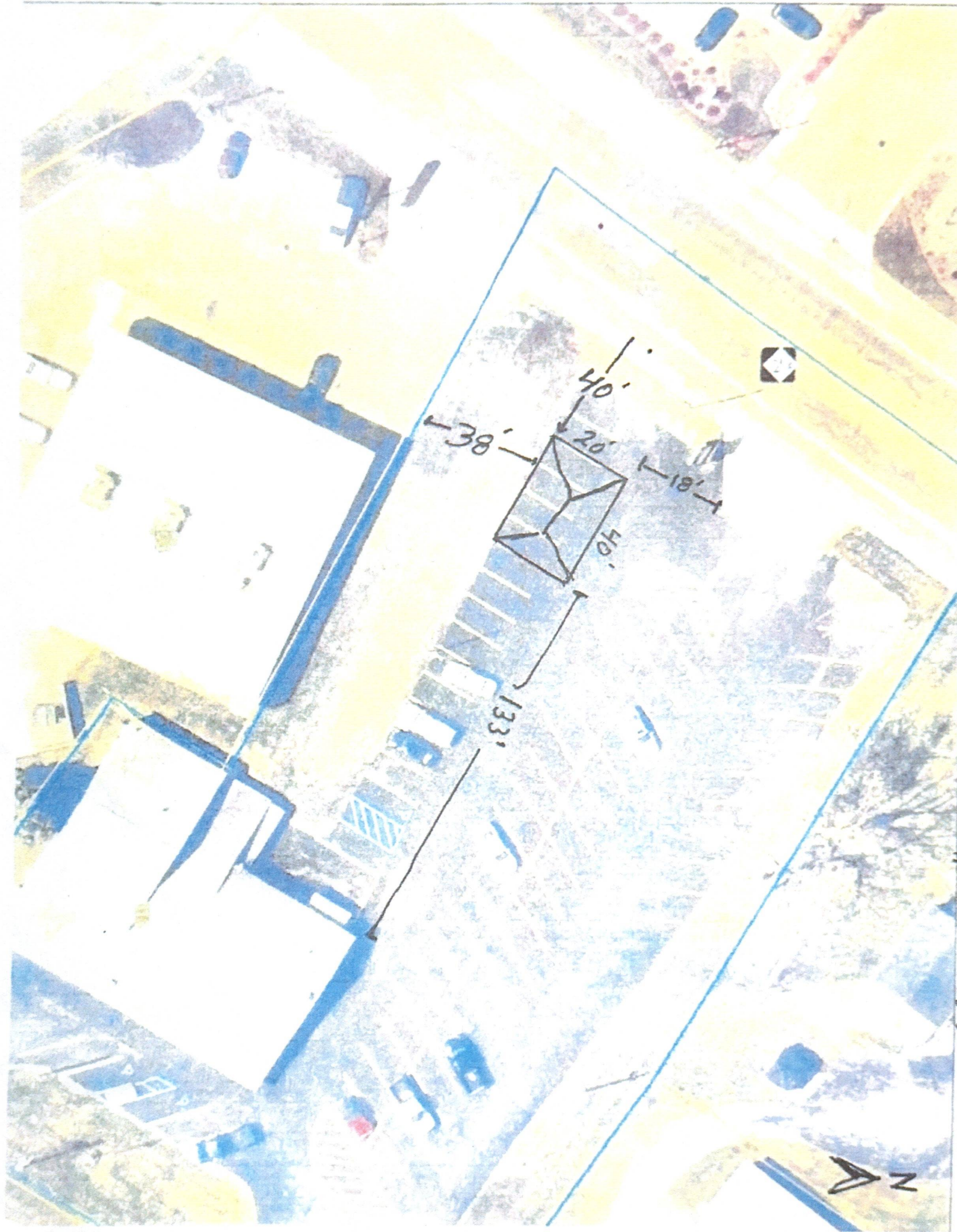
Please feel free to contact me if you have any questions or require further information.

Respectfully,

Tyger Fullerton

Assistant Fire Chief

Charlotte Fire Department





CHARLOTTE FIRE DEPARTMENT & RURAL FIRE ASSOCIATION

Fire Chief – Kevin Christiansen

111 E. Lawrence Ave., Charlotte MI 48813

Ph. 517-543-0241



To: City of Charlotte – Planning Commission
From: Assistant Fire Chief Tyger Fullerton
Date: May 20, 2025
Subject: Site Plan Review – 400 Parkland Dr. (Combs Industrial Park)

Members of the Planning Commission,

The City of Charlotte has received a zoning approval request submitted by Anderson Construction LLC on behalf of Markdom International Inc, for a proposed project located at 400 Parkland Drive, within the Combs Industrial Park. As you may be aware, this property was acquired in 2024 by an associated property company of Markdom, a Canadian-based plastic molding manufacturer now initiating production operations here in Charlotte. The applicant has submitted plans for an approximately 8,000 square foot building addition, and an estimated total investment of 19 million into the property. The intended primary use of this new space is for office facilities, as well as bathroom and break areas, to support the operations within the existing 98,000 square foot manufacturing building.

Upon review of the submitted site drawings, we find that the proposed development complies with all zoning requirements, including setback and height restrictions. Furthermore, the site provides parking capacity that well exceeds the minimum requirement for projected shift staffing levels. The plan also reflects an increase in barrier-free parking spaces, ensuring full compliance with ADA and local accessibility standards.

Should the Planning Commission approve the site plan, it is important to note that subsequent approvals will still be required. A stormwater management plan must be reviewed and approved by the Eaton County Drain Commission & Department of Public Works. Additionally, any modifications or additions to water and sewer infrastructure must be permitted through the City of Charlotte Department of Public Works prior to the commencement of construction.

The Charlotte Fire Department has conducted a preliminary review and has no objection to the proposal at this stage. They will coordinate with the Eaton County Building Department to finalize requirements related to fire suppression and detection systems, and will be involved throughout the inspection process during construction.

Based on our review and coordination with applicable departments, we recommend approval of the proposed site plan.

Please feel free to contact me if you have any questions or require further information.

Respectfully, Tyger Fullerton -Assistant Fire Chief / Zoning Admin.

Addition & Renovation:

Markdom Renovation

Sheet Index

Sheet Number	Sheet Name
CIVIL	
C-101	EXISTING CONDITIONS & REMOVALS PLAN
C-102	SITE LAYOUT GRADING & SESC PLAN
C-500	DETAILS
STRUCTURAL	
F0.1	GENERAL STRUCTURAL NOTES
F1.0	FOUNDATION PLAN
F2.1	FOUNDATION DETAILS
ARCHITECTURE	
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A0.2	SPECIFICATIONS
A0.3	ASSEMBLIES
D1.0	DEMOLITION SHEET
A1.0	OVERALL FLOOR PLAN
A1.1	ADDITION LAYOUT AND OFFICES
A3.1	EXTERIOR ELEVATIONS
A3.2	EXTERIOR ELEVATIONS
A4.1	BUILDING SECTIONS
A5.1	WALL SECTIONS & DETAILS
A6.1	ENLARGED BATHROOM PLAN
A6.2	INTERIOR ELEVATIONS
A7.1	REFLECTED CEILING PLAN
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P-1.0	ENLARGED OFFICE ADDITION UNDERGROUND PLUMBING PLAN
P-1.1	ENLARGED OFFICE ADDITION ABOVE GROUND PLUMBING PLAN
P-2.1	MANUFACTURING AREA PLUMBING PLAN
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E0.1	ELECTRICAL SITE PLAN
E0.2	SITE LIGHTING CALCULATIONS
E1.1	LIGHTING AND POWER PLANS
E2.1	POWER PLAN
E5.1	ELECTRICAL ONE-LINE & DETAILS
E5.2	ELECTRICAL SCHEDULES
E5.3	ELECTRICAL PANEL SCHEDULES
E6.1	ELECTRICAL SPECIFICATIONS
E6.2	ELECTRICAL SPECIFICATIONS
E6.3	ELECTRICAL SPECIFICATIONS
E6.4	ELECTRICAL SPECIFICATIONS
MECHANICAL	
M-0.1	MECHANICAL GENERAL INFORMATION
M-1.2	MECHANICAL PLAN
M-2.1	MECHANICAL PLAN
M-4.1	MECHANICAL PLAN

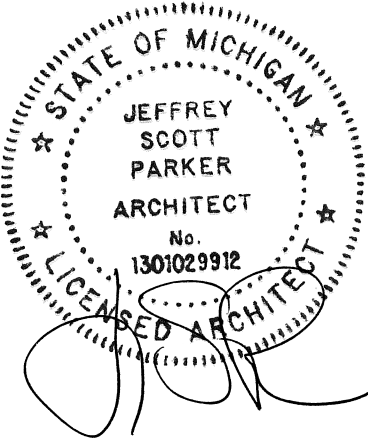
Architect
Jeffrey Parker Architects
855 28th Street SE
Grand Rapids, MI 49508
616-241-0080
Project Architect: JOHN PICK

CIVIL
ROOSIEN & ASSOCIATES
5055 PLANFIEL AVE. NE
Grand Rapids, MI 49525
616-361-7220
ENGINEER: PAUL HENDERSON

STRUCTURAL
HOFFMAN CONSULTANTS
4180 44TH ST. SE - SUITE G
KENTWOOD, MI 49512
616-827-1586
ENGINEER: BRAD GEERS

ELECTRICAL
WPF ENGINEERING LLC
8200 PEACHTREE AVE.
ROCKFORD, MI 49341
616-340-9627
ENGINEER: LYNN SURDOCK

MECHANICAL & PLUMBING
ABILITY ENGINEERING
931 W RIVER CENTER, SUITE A
COMSTOCK PARK, MI 49321
616-232-5817
ENGINEER: CHRIS NOLAN



Mark	Description	Date
	BID AND PERMITS	04/22/2025

Building Design & Documentation 02/03-2025 Jeffrey Parker Architects, Inc.



ARCHITECTURE PLANNING ENGINEERING

855 28th Street SE
Grand Rapids, MI 49508
Phone: 616-241-0090
Fax: 616-241-0098

Addition & Renovation
Markdom Renovation

400 Parkland Dr.
Charlotte, MI 48813

COVER SHEET

Issued	Drawing No.
Project No. 22067	T1.0



Know what's below.
Call before you dig.

W 1/4 COR.
SEC. 6, T2N, R4W

589°36'35"E
400.80'

736.92'
500°54'09"E

1252 N COCHRAN RD
200-006-300-070-02
LARCYN DEVELOPMENT LLC

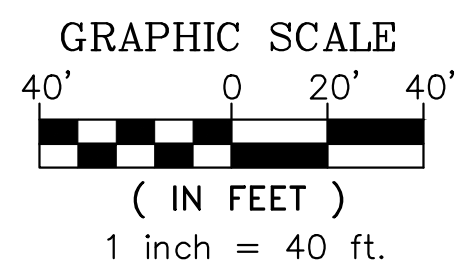
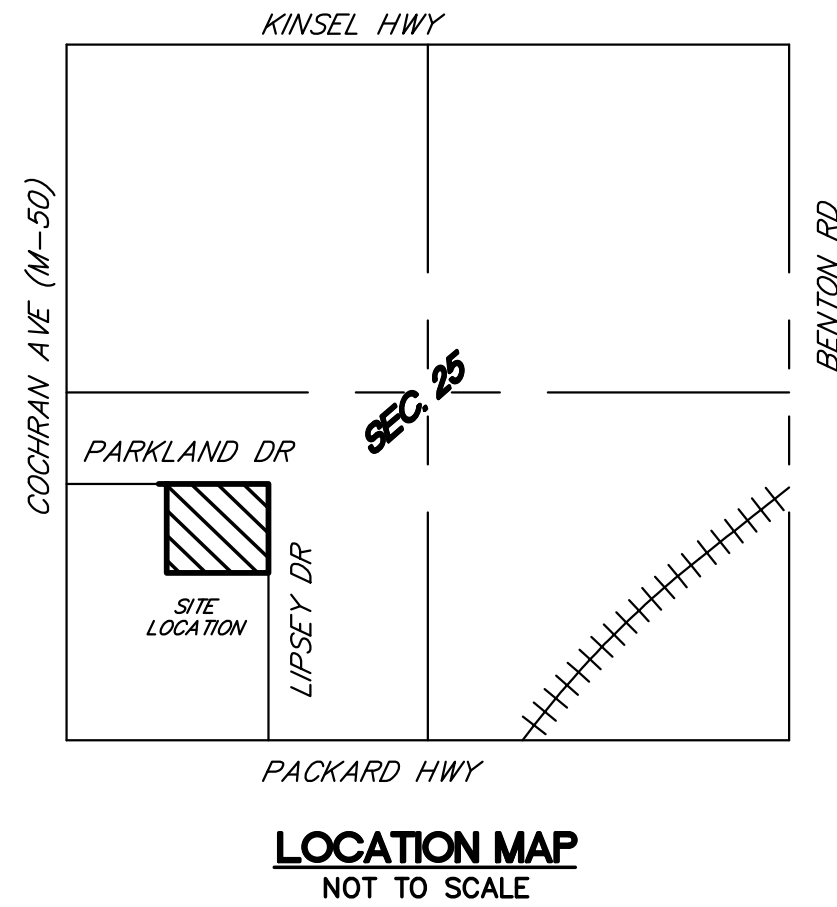
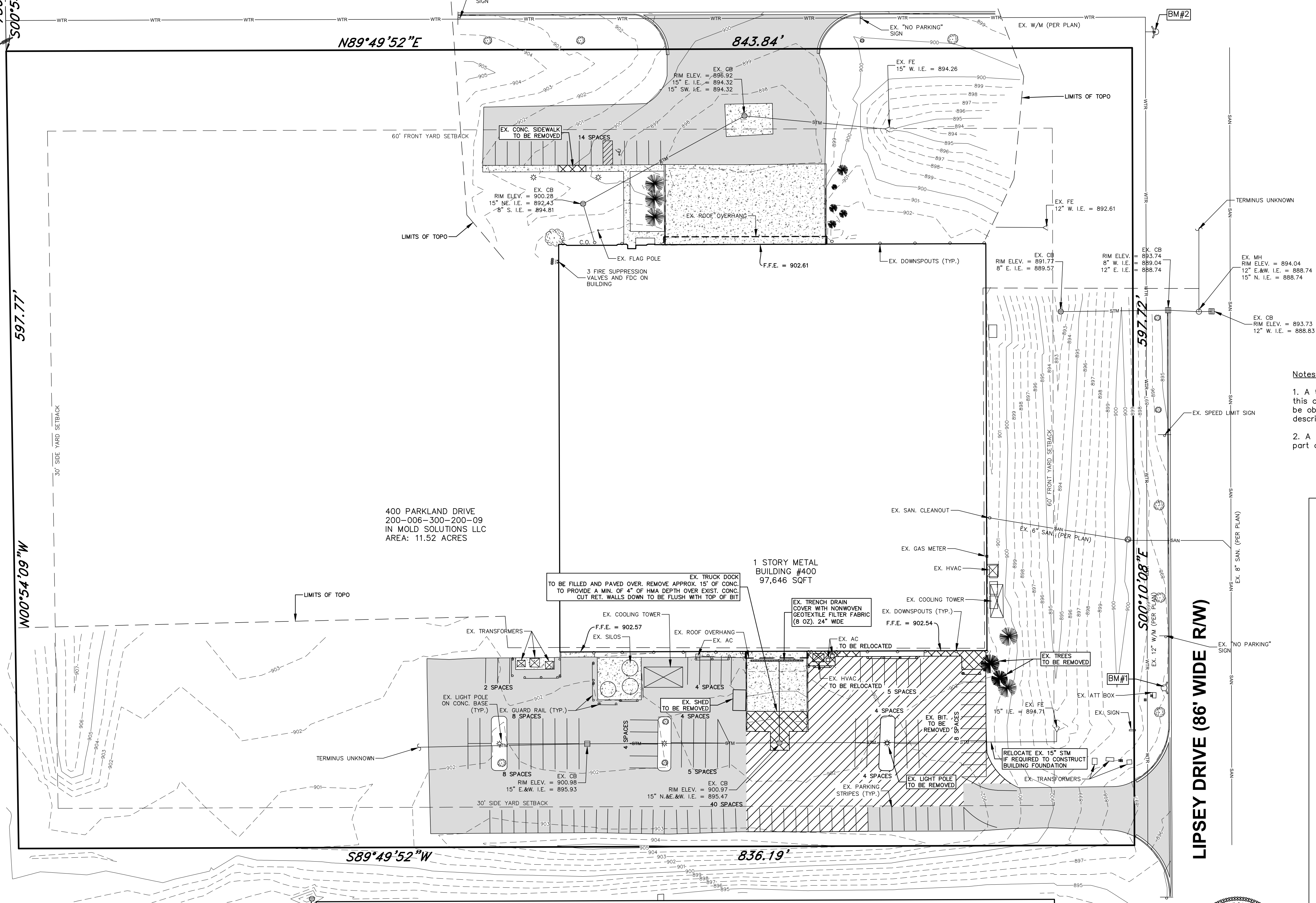
BENCHMARK NO. 1 ELEV. = 899.65'
SOUTHEAST FLANGE BOLT UNDER "N" IN "JORDAN" ON THE
HYDRANT LOCATED 523'± SOUTH OF THE CENTERLINE OF
PARKLAND DR. AND 20'± WEST OF THE CENTERLINE OF LIPSEY DR.
(N.A.V.D. 88)

BENCHMARK NO. 2 ELEV. = 899.01'
NORTHEAST FLANGE BOLT UNDER "N" IN "JORDAN" ON THE
HYDRANT LOCATED 31'± SOUTH OF THE CENTERLINE OF PARKLAND
DR. AND 20'± WEST OF THE CENTERLINE OF LIPSEY DR.
(N.A.V.D. 88)

LEGAL DESCRIPTION FROM TAX RECORDS:
Commencing West 1/4 Corner of Section 6, S89°36'35"E 400.80 Feet, S00°54'09"E
736.92 feet to Point of Beginning, N89°49'52"E 843.84 feet, S00°10'08"E 597.72
feet, S89°49'52"W 836.19 feet, N00°54'09"W 597.77 feet to the Point of Beginning.
Section 6, T2N, R4W, CITY OF CHARLOTTE 4-6-98 (L.D.F.A EXPIRED)

UTILITIES SHOWN ARE FROM FIELD MEASUREMENTS OF VISIBLE
EVIDENCE OR AVAILABLE RECORDS. THIS INFORMATION SHOULD NOT
BE CONSTRUED TO BE A GUARANTEE OF COMPLETENESS OR
ACCURACY. ROOSTEN AND ASSOCIATES TAKE NO RESPONSIBILITY FOR
INACCURACIES IN UTILITY MARKINGS OR IN THE INTERPRETATION OF
PLANS PROVIDED. THE CONTRACTOR SHALL VERIFY THE LOCATION OF
EXISTING UTILITY LINES WHERE THE GRADE IS TO BE LOWERED OR
THE EXISTING UTILITIES CROSS PROPOSED UTILITY LINES. NOTIFY THE
DESIGN PROFESSIONAL OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

PARKLAND DRIVE (86' WIDE R/W)



- Notes:
1. A title insurance policy was not provided to this office at the time of the survey. One should be obtained to compare for accuracy of legal description and easements of record.
 2. A full boundary survey was not performed as part of this project.

EXISTING LEGEND

SURVEY	TREES
SECTION CORNER	CONIFEROUS TREE
PROPERTY IRON FOUND	DECIDUOUS TREE
PROPERTY IRON SET	
WOOD STAKE SET	
BENCHMARK	
MEASURED DIMENSION	ELECTRICAL
RECORDED DIMENSION	UTILITY POLE
DEEDED DIMENSION	GUY WIRE
PLATTED DIMENSION	LIGHT POLE
	UTILITY RISER/METER
WATER	STORM SEWER
MANHOLE	CURB CATCH BASIN
VALVE	ROUND CATCH BASIN
HYDRANT	FLARED END SECTION
SANITARY SEWER	MISC
MANHOLE	MAILBOX
CLEANOUT	UTILITY FLAG
	SIGN
	GRAVEL
	CONCRETE
	BITUMINOUS
	DEMO CONCRETE
	DEMO BITUMINOUS
	CURB & GUTTER
	BITUMINOUS VALLEY GUTTER
	LANDSCAPE CURB
	CENTER LINE
	PROPERTY LINE
	CONTOUR LINE (MAJOR)
	CONTOUR LINE (MINOR)
	FENCE
	TREE LINE
	WATER MAIN
	SANITARY SEWER
	STORM SEWER
	NATURAL GAS
	FIBER OPTIC
	OVERHEAD ELECTRIC
	UNDERGROUND TELEPHONE
	UNDERGROUND CABLE
	UNDERGROUND ELECTRIC



EXISTING CONDITIONS & REMOVALS PLAN
400 PARKLAND DR
PART OF SECTION 6, T2N, R4W
CITY OF CHARLOTTE, EATON COUNTY, MI

CLIENT:
JOHN FICK
855 28TH STREET SE
GRAND RAPIDS, MI 49508
616-309-1303

PROJECT NO.
250128

C-101



Know what's below.
Call before you dig.

UTILITIES SHOWN ARE FROM FIELD MEASUREMENTS OF VISIBLE EVIDENCE OR AVAILABLE RECORDS. THIS INFORMATION SHOULD NOT BE CONSTRUED TO BE A GUARANTEE OF COMPLETENESS OR ACCURACY. ROOSSEN AND ASSOCIATES TAKE NO RESPONSIBILITY FOR INACCURACIES IN UTILITY MARKINGS OR IN THE INTERPRETATION OF PLANS PROVIDED. THE CONTRACTOR SHALL VERIFY THE LOCATION OF EXISTING UTILITY LINES WHERE THE GRADE IS TO BE LOWERED OR THE EXISTING UTILITIES CROSS PROPOSED UTILITY LINES. NOTIFY THE DESIGN PROFESSIONAL OF ANY CONFLICTS PRIOR TO CONSTRUCTION.

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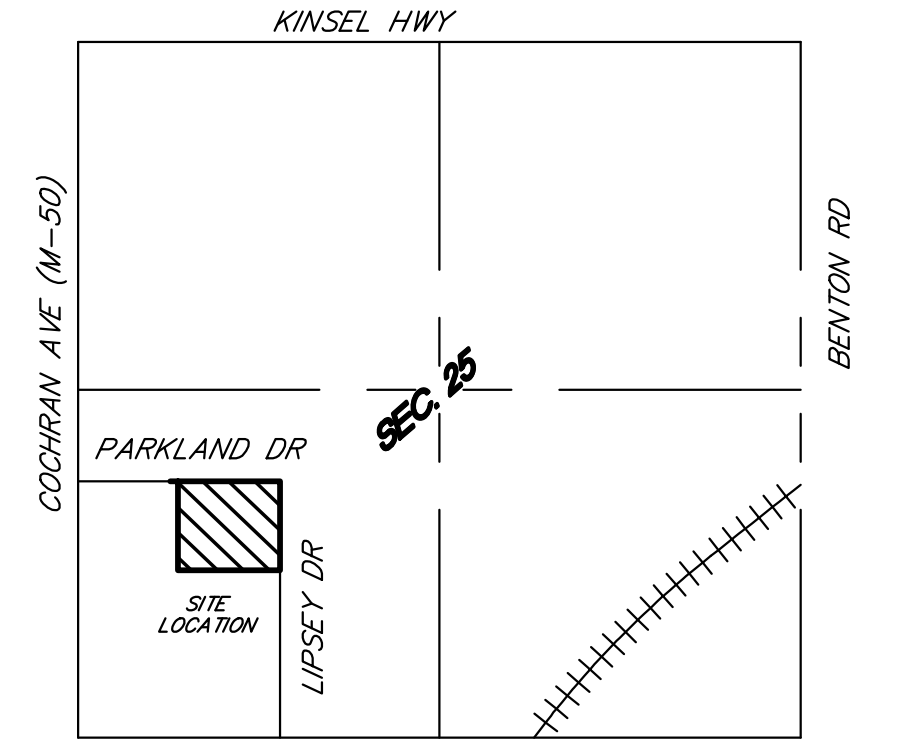
SESC PLAN

SOIL EROSION CONTROL KEY

- ③ PERMANENT/TEMPORARY SEEDING
- ②6 GEOTEXTILE SILT FENCE
- ③98 INLET PROTECTION WITH GEOTEXTILE AND STONE
- ④5 SOIL EROSION CONTROL BLANKET (N.A.G. S-150 OR EQUAL)
- ⑦ RIP RAP

LEGEND

- EXISTING CONTOUR LINE
- PROPOSED CONTOUR LINE
- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- TRUCK DOCK RET. WALL
- SURFACE DRAINAGE
- EXISTING BIT. PAVEMENT
- PROPOSED STANDARD DUTY BIT PAVEMENT
- PROPOSED HEAVY DUTY BIT PAVEMENT
- EXISTING CONCRETE
- PROPOSED CONCRETE
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION

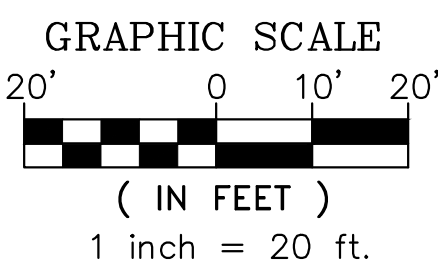
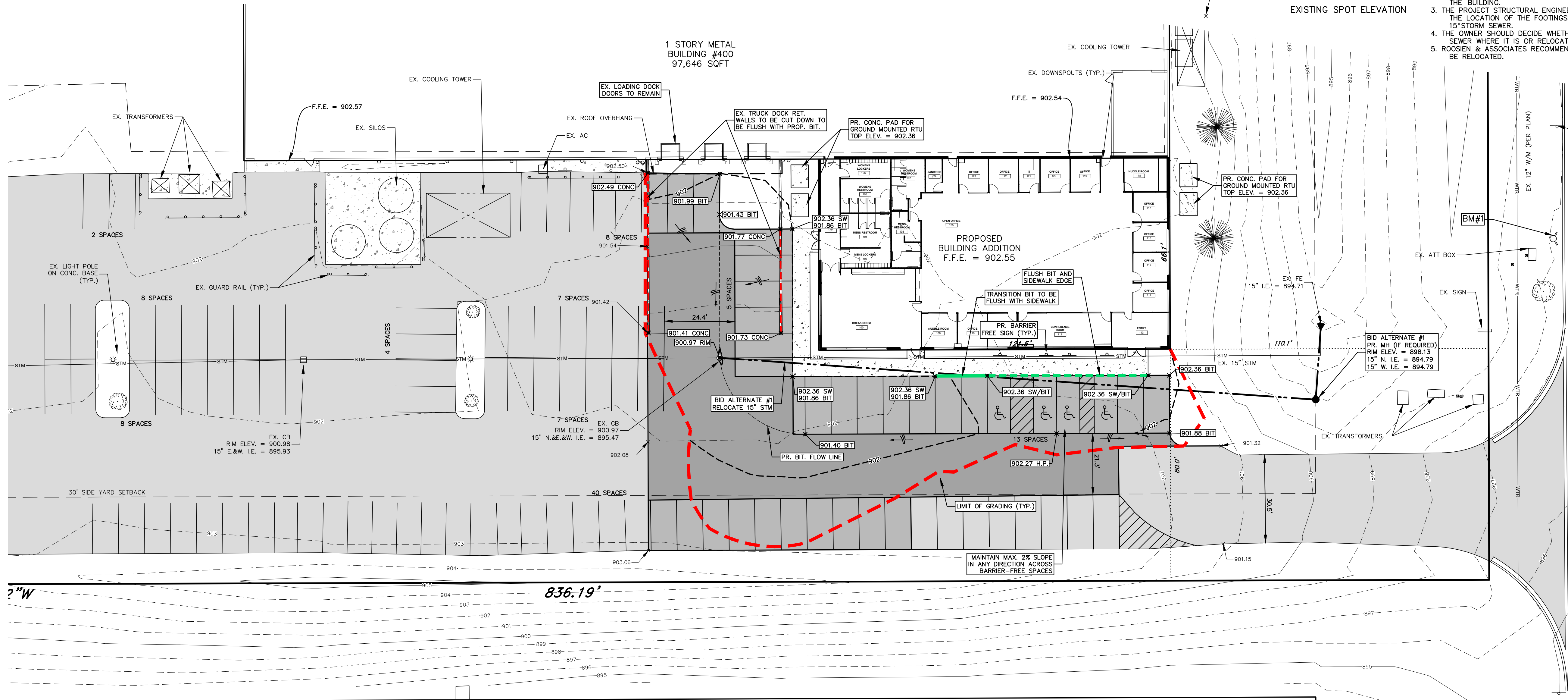
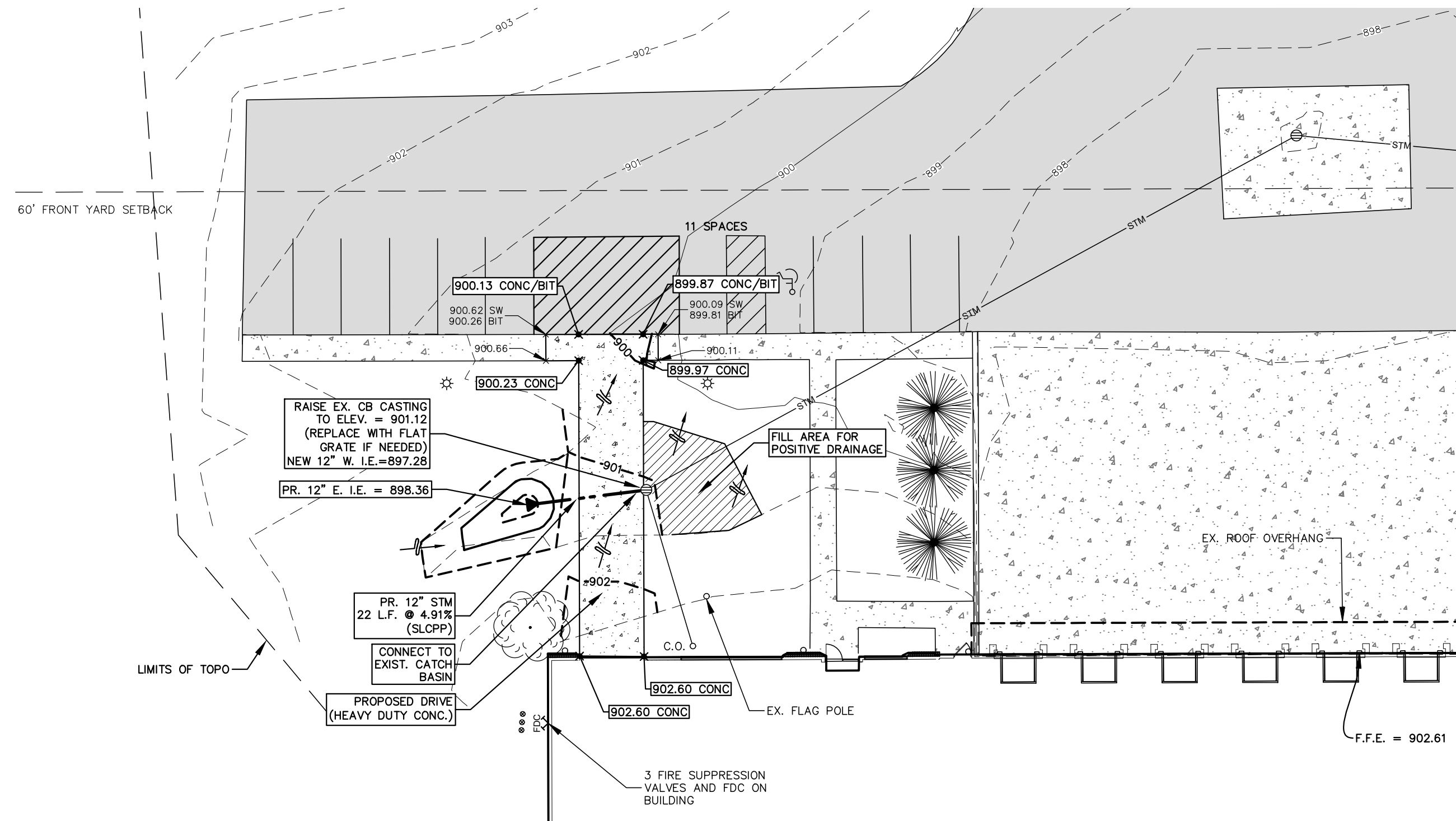


LOCATION MAP NOT TO SCALE

SITE PLAN NOTES:

1. APPLICANT: JEFFREY PARKER ARCHITECTS 855 - 28TH ST. SE GRAND RAPIDS, MI 49508
2. PROPERTY INFORMATION: 400 PARKLAND DR - 200-006-300-200-09 OWNER: IN MOLD SOLUTIONS LLC
3. PARCEL SIZE: 11.52 ACRES
4. ZONING: I-2 - GENERAL INDUSTRIAL DISTRICT MINIMUM FRONT YARD SETBACK - 60 FEET MINIMUM SIDE YARD SETBACK - 30 FEET MAXIMUM BUILDING HEIGHT - 60 FEET
5. PARKING: EXISTING PARKING: 110 TOTAL SPACES (INCLUDING 1 BARRIER FREE) POST DEVELOPMENT PARKING: 113 TOTAL SPACES (INCLUDING 5 BARRIER FREE)

- IMPORTANT STRUCTURAL FOOTING/FOUNDATION NOTE:**
1. EXISTING STORM SEWER IS IN CLOSE PROXIMITY TO THE FOOTINGS /FOUNDATION OF THE PROPOSED BUILDING.
 2. THE LOCATION OF THE 15" STORM SEWER IS APPROXIMATELY 1 FOOT FROM THE FOOTING OF THE ADDITION. IT IS APPROXIMATELY 7.5' BELOW THE FIRST FLOOR ELEVATION OF THE BUILDING.
 3. THE PROJECT STRUCTURAL ENGINEER MUST REVIEW AND APPROVE THE LOCATION OF THE FOOTINGS IN RELATION TO THE EXISTING 15" STORM SEWER.
 4. THE OWNER SHOULD DECIDE WHETHER OR NOT TO LEAVE THE STORM SEWER WHERE IT IS OR RELOCATE IT.
 5. ROOSSEN & ASSOCIATES RECOMMENDS THAT THE STORM SEWER BE RELOCATED.



EXIST. BUILDING

1215 LIPSEY DRIVE
200-006-300-120-00
VICOTRINOX LLC

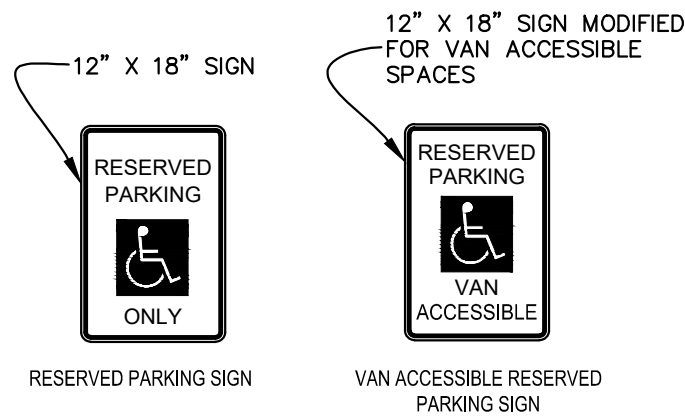
LIPSEY DRIVE (86' WIDE RW)

SITE LAYOUT, GRADING, AND SESC PLAN
400 PARKLAND DR
PART OF SECTION 6, T2N, R4W
CITY OF CHARLOTTE, EATON COUNTY, MI

CLIENT:
JOHN FICK
855 28TH STREET SE
GRAND RAPIDS, MI 49508
616-309-1303

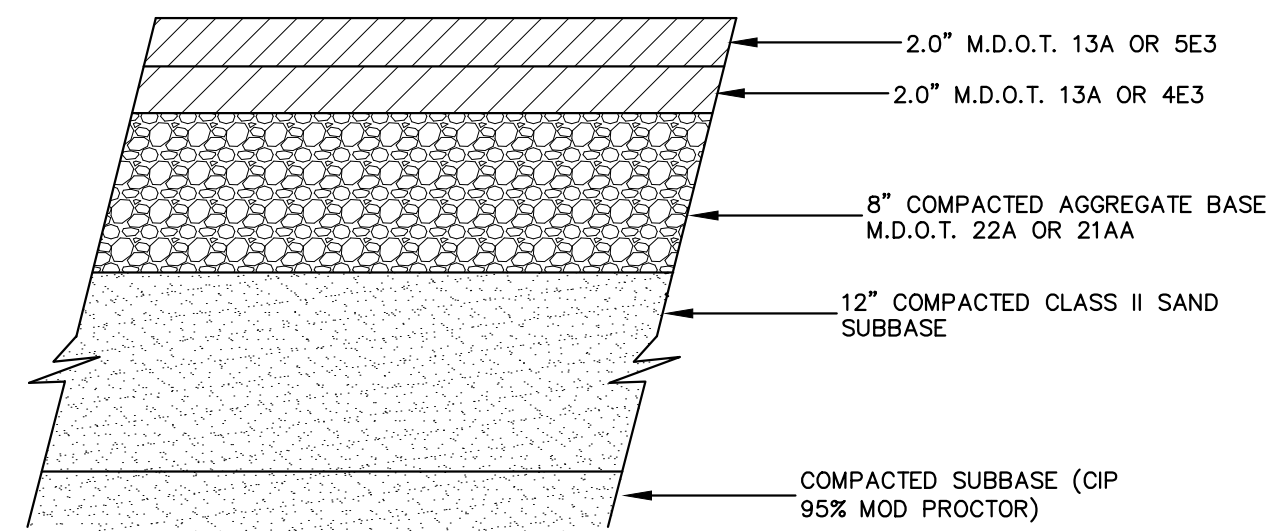
PROJECT NO.
250128

C-102



SIGN MATERIALS:
GENERAL SIGNS SHALL CONFORM WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
MOUNTING HARDWARE: STAINLESS STEEL.
PANEL MATERIAL: ALUMINUM SHEET.
SIGN FACE: REFLECTORIZED BACKGROUND, REFLECTORIZED LEGEND.

BARRIER FREE SIGNS
NOT TO SCALE



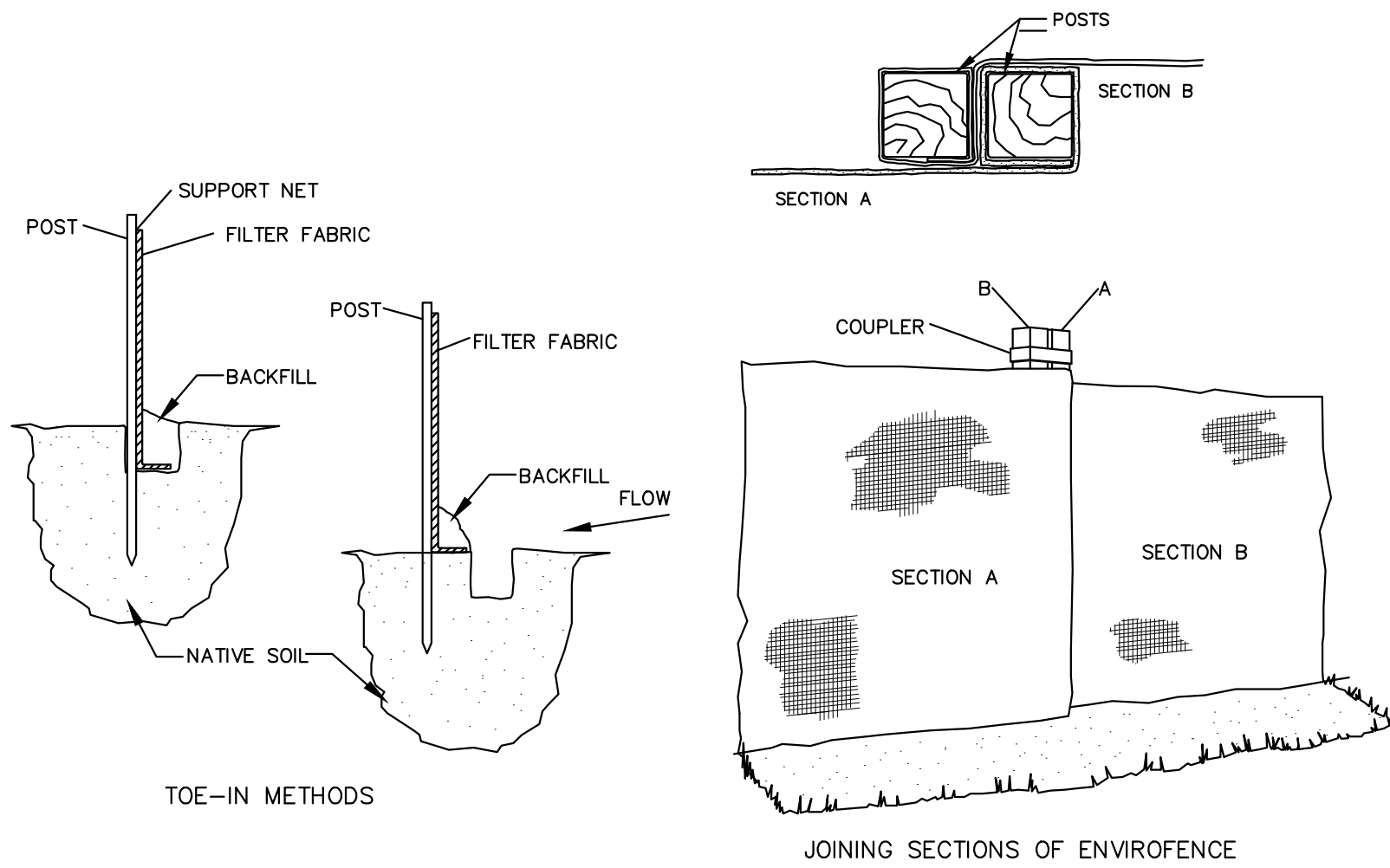
HEAVY DUTY BIT PAVEMENT-SECTION
NOT TO SCALE

NOTE:
- REFER TO MDOT SOIL EROSION & SEDIMENTATION CONTROL MANUAL.
- CONTRACTOR SHALL PLACE NA-GREEN SC-150 (OR APPROVED EQUAL) EROSION CONTROL BLANKET ON ALL SLOPES 1 ON 3 OR STEEPER AND IN THE BOTTOM ONE FOOT OF THE DRAINAGE SWALES.
- TOTAL DISTURBED AREA IS 0.63 ACRES.
- CONTRACTOR SHALL SWEEP THE STREET OF ANY DIRT TRACKED ONTO IT BY THE CONSTRUCTION OPERATION AS NEEDED AND AS DIRECTED BY LOCAL SESC AGENT.
- THESE MEASURES ARE MINIMUM REQUIRED. CONTRACTOR MAY NEED ADDITIONAL MEASURES DEPENDING ON WEATHER, TIMING, ETC.

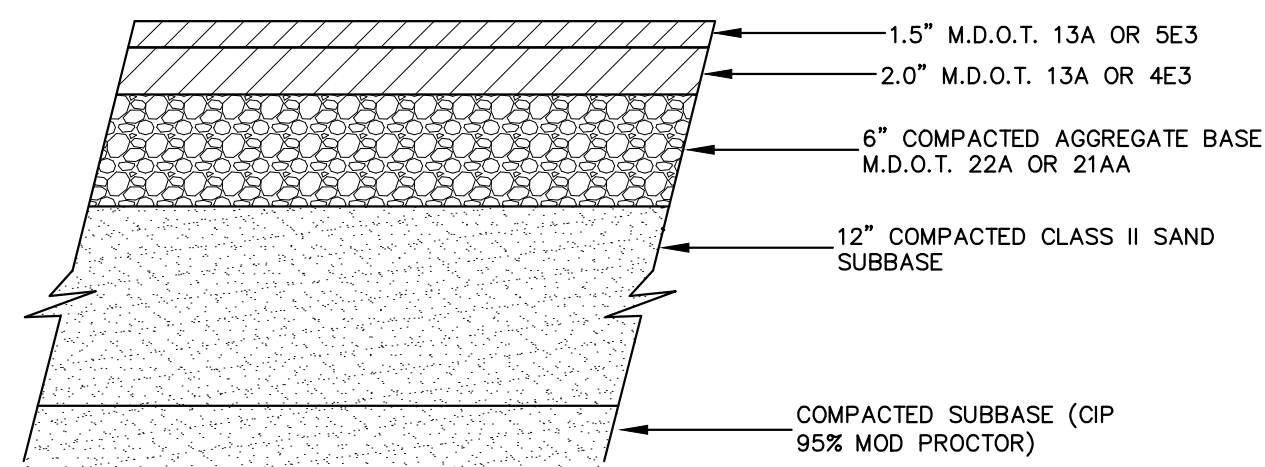
CONSTRUCTION SEQUENCE	2025												REMARKS
	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	
INSTALL SILT FENCING AND INLET PROTECTION													REQUIRED
CLEAR VEGETATION AND STRIP AND STOCKPILE TOPSOIL													
ROUGH GRADE SITE													
INSTALL BUILDING													
INSTALL UTILITIES													
INSTALL PAVEMENT													
FINISH GRADE, PLACE PLANTINGS, TOPSOIL AND SEED, AND MULCH BLANKETS													
CLEAN PAVEMENTS AND STORM SEWER													
REMOVE TEMPORARY EROSION CONTROL													

STORM WATER MANAGEMENT SYSTEM MAINTENANCE
THE STORM SEWER AND DETENTION SYSTEMS MUST BE INSPECTED AND MAINTAINED ON A REGULAR BASIS FOR OPTIMAL PERFORMANCE. SEE CHART BELOW FOR SUGGESTED INTERVALS.

TASKS	COMPONENTS				SCHEDULE
	SWALE	CULVERT INLETS	STORM WATER BASIN	OUTLET STRUCTURE	
INSPECT FOR ACCUMULATION	●	●	●	●	ANNUALLY
REMOVE SEDIMENT ACCUMULATION	●	●	●	●	EVERY 2-5 YEARS AS NEEDED
INSPECT FOR DEBRIS (DEAD VEGETATION AND TRASH)	●	●	●	●	EARLY SPRING, FALL AND AFTER MAJOR STORMS
CLEAN DEBRIS	●	●	●	●	AS NEEDED
INSPECT FOR EROSION ON BANKS AND BOTTOM	●		●		EARLY SPRING, FALL AND AFTER MAJOR STORMS
REESTABLISH PERMANENT VEGETATION ON ERODED SLOPES	●		●		AS NEEDED
MOWING	●		●		AS NEEDED (MIN. ANNUALLY)



FABRIC SILTATION FENCING
NOT TO SCALE



STANDARD DUTY BIT PAVEMENT-SECTION
NOT TO SCALE

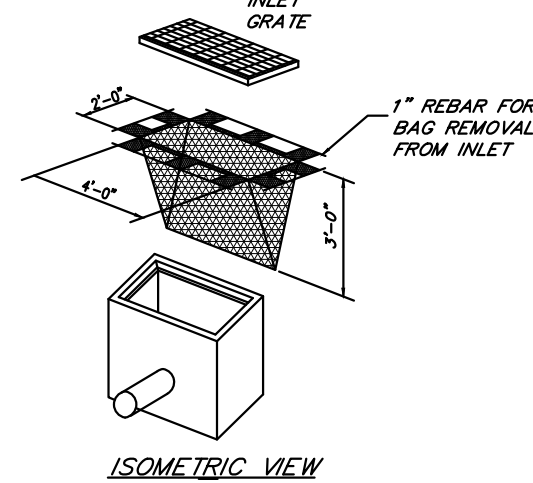
INLET PROTECTION - FABRIC DROP SPECIFICATIONS

S58 S58 INLET PROTECTION - FABRIC DROP

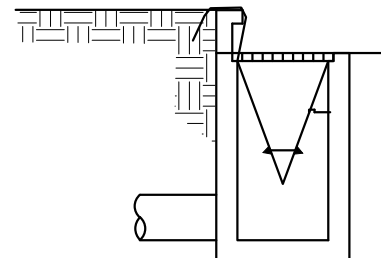
- When • When sediment laden stormwater requires treatment before entering a stormwater drainage system.
- Why • To prevent sediment from entering stormwater systems.
- Where • Use in or at stormwater inlets, especially at construction sites or in streets.
- How 1. A filter fabric bag is hung inside the inlet, beneath the grate.
2. Replace grate, which will hold bag in place.
3. Anchor filter bag with 1" rebar for removal from inlet.
4. Flaps of bag that extend beyond the bag can be buried in soil in earth areas.
- Maintenance • Drop inlet filters should be inspected routinely and after each major rain event.
• Damaged filter bags should be replaced.
• Clean and/or replace filter bag when 1/2 full.
• Replace clogged fabric immediately.
• If needed, initiate repairs immediately upon inspection.
• Remove entire protective mechanism when upgradient areas are stabilized and streets have been swept.
- Limitations • Can only accommodate small flow quantities.
• Requires frequent maintenance.
• Ponding may occur around storm drains if filter is clogged.



MICHIGAN
DEPARTMENT OF
MANAGEMENT AND BUDGET



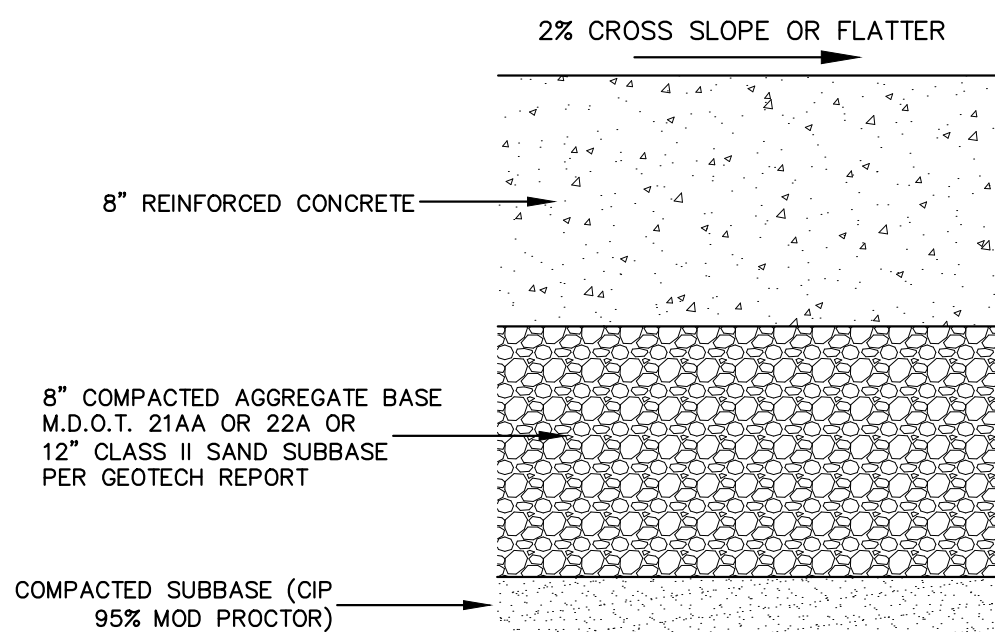
ISOMETRIC VIEW



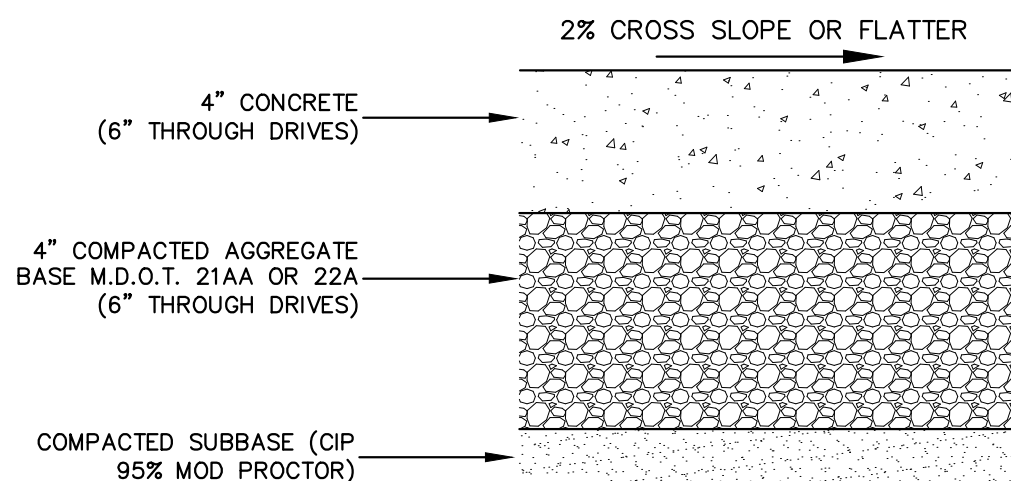
INSTALLATION DETAIL



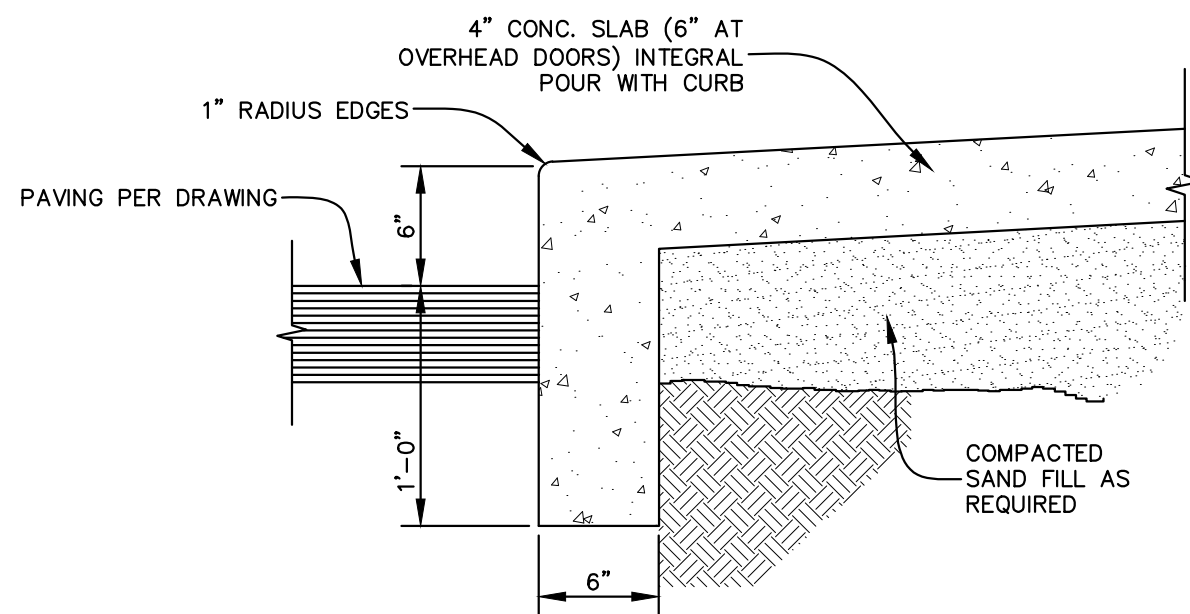
MICHIGAN
DEPARTMENT OF
MANAGEMENT AND BUDGET



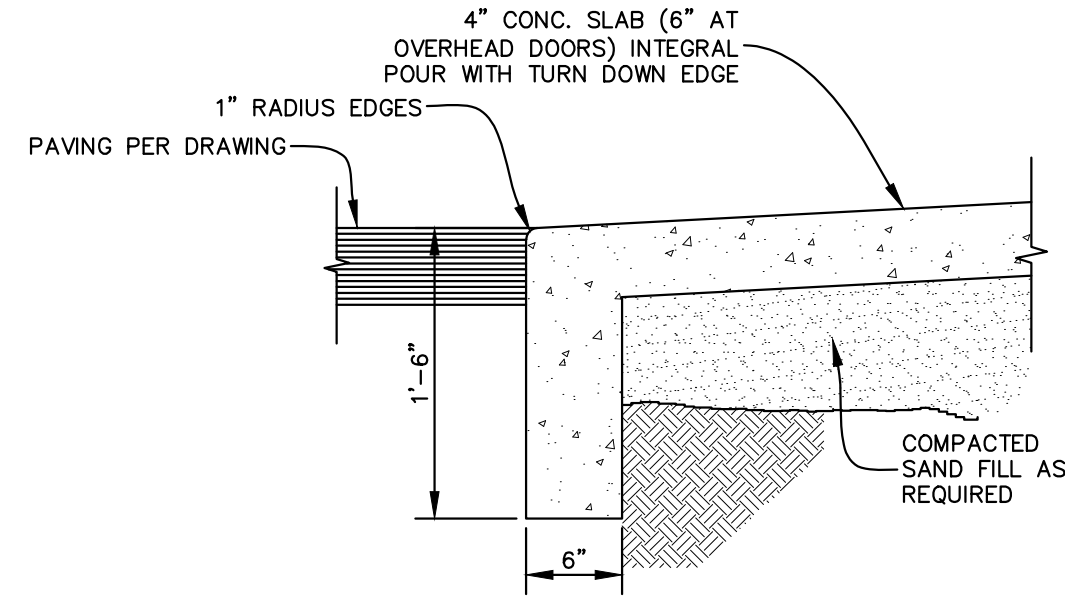
HEAVY DUTY CONCRETE SIDEWALK
NOT TO SCALE



CONCRETE SIDEWALK
NOT TO SCALE



RAISED SIDEWALK EDGE
NOT TO SCALE



FLUSH SIDEWALK EDGE
NOT TO SCALE

REVISIONS:

DRAWN BY: CSN
APPROVED BY: RGH
DATE: APRIL 11, 2025
REVISIONS:

Rooston & Associates
SURVEYING AND ENGINEERING

2025 PLANNED AVE. SE. WALKER, MI 49508-2525
GRAND RAPIDS, MI 49505 TELE: (616) 351-7220

DETAILS
400 PARKLAND DR
PART OF SECTION 6, T2N, R4W
CITY OF CHARLOTTE, EATON COUNTY, MI

CLIENT:
JOHN FICK
855 28TH STREET SE
GRAND RAPIDS, MI 49508
616-309-1303

PROJECT NO.
250128

C-500

SPECIAL INSPECTION SCHEDULE (IBC - Chapter 17)				
ITEM	CONT. ²	PERIODIC ²	REFERENCE STANDARD	NOTES
PRE-FABRICATED CONSTRUCTION (1704.2)				
STEEL CONSTRUCTION (1705.2)				
PRIOR TO WELDING			TABLE N5.4-1, ASCE360-10	
Verify welding procedures (WPS) and consumable certificates	X			
Material identification		X		
Welder identification		X		
Fit-up groove welds		X		
Access holes		X		
Fit-up of fillet welds		X		
DURING WELDING			TABLE N5.4-2, ASCE360-10	
Use of qualified welders		X		
Control and handling of welding consumables		X		
Cracked tack welds		X		
Environmental conditions		X		
WPS followed		X		
AFTER WELDING			TABLE N5.4-3, ASCE360-10	
Welds cleaned		X		
Size, length, and location of welds	X			
Welds meet visual acceptance criteria	X			
Arc strikes	X			
k-area	X			
Backing & weld tabs removed	X			
Repair activities	X			
Document acceptance or rejection of welded joint/member	X			
NON DESTRUCTIVE TESTING				
CJP welds (Risk Cat. II)		X		
CJP welds (Risk Cat. III or IV)	X			
Access holes (flange > 2")	X			
Welded joints subject to fatigue	X			
PRIOR TO BOLTING			TABLE N5.6-1, ASCE360-10	15
Certifications of fasteners	X			
Fasteners marked		X		
Proper fasteners for joint		X		
Proper bolting procedure		X		
Connecting elements		X		
Pre-installation verification testing		X		
Proper storage		X		
DURING BOLTING			TABLE N5.6-2, ASCE360-10	15 & 16
Fastener assemblies		X		
Snug-tight prior to pretensioning		X		
Fastener component		X		
Pretensioned fasteners		X		
Document acceptance or rejection of bolted connections	X			
OTHER STEEL INSPECTIONS			SECTION N5.7, AISC 360-10; Tables J8-1 & J10-1, AISC 341-10	
Structural steel details		X		
Anchor rods and other embeddings supporting structural steel		X		
Reduced beam sections (RBS)		X		
Protected zones		X		
H-piles		X		
STEEL ELEMENTS OF COMPOSITE CONSTRUCTION				
Placement and installation of steel deck	X		TABLE N6.1, AISC 360-10; TABLES J9-1 thru J9-3, AISC 341-11	
Placement and installation of steel headed stud anchors	X			
Document acceptance or rejection of steel elements	X			
Reinforcing steel		X		
Composite member size		X		
STEEL CONSTRUCTION OTHER THAN STRUCTURAL STEEL (IBC 1705.2.2)				
STEEL ROOF AND FLOOR DECKS			IBC TABLE 1705.2.2	
Material verification of coldformed steel deck		X		
Floor and roof deck welds		X		
WELDING OF REINFORCING STEEL			IBC TABLE 1705.2.2	
Verification of weldability		X		
Reinforcing steel in intermediate or special moment frames, and boundary elements of special structural walls	X			
Shear reinforcement	X			
Other reinforcing steel		X		

SPECIAL INSPECTION SCHEDULE (IBC - Chapter 17)				
ITEM	CONT. ²	PERIODIC ²	REFERENCE STANDARD	NOTES
CONCRETE CONSTRUCTION (1705.3)				
Reinforcing Steel Placement		X	ACI 318: 3.5, 7.1-7.7	7
Welding of Reinforcing Steel			AWS D.14/ACI 318 - 3.5.2	6
Embedded Bolts & Plates	X			
Verify Required Mix Design		X	ACI 318: Ch 4, 5.2-5.4	
Concrete Sampling	X		ASTM C 172/ASTM C 31/ACI 318: 5.6, 5.8	
Concrete / Shotcrete Placement	X		ACI 318: 5.9, 5.10	
Curing Temperature & Techniques		X	ACI 318: 5.11-5.13	
Application of Prestressing Forces	X		ACI 318: 18.20	
Grouting Bonded Prestressing Tendons	X		ACI 318: 18.18.4	
Erection of Precast Members		X	ACI 318: Ch 16	
Verify In-Situ Strength		X	ACI 318: 6.2	8
Formwork Shape, Location & Dimensions		X	ACI 318: 6.1.1	
Epoxy / Expansion Anchor Placement	X			9
SOILS (1705.6)				
Site Preparation		X		
Classification & Testing of Fill Material		X		
Placement of Fill Material	X			
In-Place Density		X		
Final Foundation Preparation		X		
WIND RESISTANCE (1705.10)				
Structural wood fasteners		X		14
Wind resisting componets		X		
Roof/Wall Cladding		X		
SEISMIC RESISTANCE (1705.11)				
Exterior Cladding		X		
Interior/Exterior Non Bearing Walls		X		
Interior/Exterior Veneer		X		
Interior/Exterior Veneer		X		
NON STRUCTURAL ELEMENTS				
Anchorage		X	Section 13.2 of ASCE 7-10	12 & 13

NOTES:

- Items marked with an 'X' shall be inspected in accordance with chapter 17 of the building code by a certified special inspector from an established testing agency. For material sampling and testing requirements, refer to the project specifications and the specific general notes sections. The testing agency shall send copies of all structural testing and inspection reports directly to the architect, engineer, contractor, and building official. Any items which fail to comply with the approved construction documents shall immediately be brought to the attention of the contractor for correction. If discrepancies are not corrected, they shall be brought to the attention of the building official, architect, and engineer prior to completion of that phase of work. Special inspection testing requirements apply equally to all bidder designed components.
- Continuous special inspection means the full-time observation of work requiring special inspection by an approved special inspector who is present in the area where the work is being performed. Periodic special inspection means the part-time or intermittent observation of work requiring special inspection by an approved special inspector who is present in the area where the work has been or is being performed and at the completion of the work. (sect 1702)
- Slip-critical connections may have periodic special inspection provided that direct tension indicators, twist-off bolts, or turn-of-the-nut method with match marking techniques are used.
- All welds shall be visibly inspected. (sect 1704.3)
- All complete penetration welds shall be tested ultrasonically or by using another approved method.
- Periodic special inspection is allowed for verification of the weldability of reinforcing steel other than ASTM A 706 in accordance with building code section 1903.5.2. Continuous special inspection is required for reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, boundary elements of special reinforced concrete shear walls, and shear reinforcement. Periodic special inspection is allowed for welding of other ASTM A 706 reinforcing steel not included in the continuous special inspection requirements noted above.
- Special inspection is not required for isolated spread footings (≤ 3 stories), non-structural slabs, foundation walls, patios, driveways and sidewalks provided the requirements of section 1704.4 are met.
- Periodic special inspection is required for verification of in-situ concrete strength for post-tensioned concrete prior to tensioning tendons and for beams and structural slabs before removing shoring or forms.
- Epoxy and expansion anchors into masonry of concrete may be used only when approved by architect and/or engineer using an approved product with current published ICBO research report numbers.
- Special inspection of soils shall reference the approved soils report to determine compliance.
- Any construction or material that has failed inspection shall be subject to removal and replacement.
- Exempt: Furniture, temporary/movable equipment, and M&E components outlined in Section 13.1.4
- Structural anchorage of non structural components must comply with 1705.12.3. Anchorage specification certified by analysis, testing, or experience data must be submitted for approval. Architectural components include but are not limited to: objects 6 feet tall or greater (e.g. storage cabinets, book shelves, or office partitions), ceiling mounted acoustical panels, light fixtures, ornamental figures, fans, other objects of significant mass, and components whose collapse could result in the blocking of egress.
- Structural wood fasteners include Titan HD fasteners to foundation as well as all hold downs for shearwalls.
- Not required if only snug-tight joints are specified [per Section N5.6(1) of AISC 360-10].
- Not required for pretensioned joints using turn-of-the-nut method with match-marking, direct-tension-indicators, or twist-off type tension control method [per Section N5.6(2) of AISC 360-10].

STRUCTURAL NOTES

GENERAL:

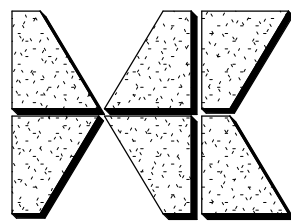
- IF ANY NOTE CONFLICTS WITH ANY DETAIL OR NOTE ON THE PLANS OR IN THE SPECIFICATIONS, THE STRICTEST PROVISION SHALL GOVERN.
- THE STRUCTURAL DRAWINGS ARE FOR THE PLACEMENT AND SIZE OF STRUCTURAL COMPONENTS ONLY. OSHA, DNR AND SAFETY CODE REQUIREMENTS ARE DETERMINED AND PROVIDED BY OTHERS. HOFFMAN CONSULTANTS IS NOT RESPONSIBLE FOR JOBSITE SAFETY.
- THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE AFTER IT IS FULLY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF TEMPORARY BRACING, GUYS OR TIE DOWNS IF NECESSARY AND BRACING EXCAVATIONS TO PREVENT CAVE IN. SUCH MATERIAL SHALL REMAIN THE CONTRACTORS PROPERTY AFTER COMPLETION OF THE PROJECT.
- USE OF ENGINEERING DRAWINGS AS ERECTION DRAWINGS BY THE CONTRACTOR IS STRICTLY PROHIBITED.

FOUNDATIONS:

- FOOTINGS ARE DESIGNED TO BEAR ON SOIL OR ENGINEERED FILL WITH THE FOLLOWING ALLOWABLE BEARING CAPACITY:
SPREAD FOOTINGS: 3000PSF
WALL FOOTING: 3000PSF
(VERIFIED BY QUALIFIED TESTING AGENCY IN FIELD)
IF MATERIAL OF THIS CAPACITY IS NOT CONFIRMED AT THE ELEVATIONS INDICATED, THE FOOTINGS SHALL BE LOWERED, OR ENLARGED. NOTIFY AND CONSULT ENGINEER FOR ADJUSTMENTS.
- ALL FOUNDATIONS AND SLAB ON GRADE TO BE PREPARED PER ASSUMED 3,000PSF SOIL BEARING CAPACITY, IF 3,000PSF CANNOT BE ACHIEVED, CONTACT ENGINEER FOR FURTHER INSTRUCTION.
- ALL FILL UNDER SLABS AND ADJACENT TO WALLS SHALL BE CLEAN GRANULAR SOIL COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR.
- EXERCISE CARE WHEN BACKFILLING WALLS. EXCEPT FOR WALLS WITH EQUAL FILL ON BOTH SIDES, NO BACKFILLING OF WALLS SHALL BE DONE UNTIL THE WALL HAS ATTAINED ITS FULL STRENGTH AND HAS BEEN PROPERLY SUPPORTED BY BRACING OR BY COMPLETED FLOOR OR ROOF STRUCTURE. ALTERNATE FILL WHEN BACKFILLING WALLS WITH FILL ON BOTH SIDES.
- COORDINATE FOUNDATION WORK WITH UNDERGROUND WORK BY MECHANICAL AND ELECTRICAL CONTRACTORS, IF ANY.
- UNLESS OTHERWISE INDICATED ON DRAWINGS, PROVIDE FOUNDATION DRAINS WITH APPROPRIATE FILTER MATERIAL, AS RECOMMENDED BY SOIL REPORTS OR IF WET SOIL CONDITIONS FROM GROUND WATER ARE ENCOUNTERED.

CONCRETE:

- ALL CONCRETE SHALL ATTAIN THE FOLLOWING 28 DAY COMPRESSIVE STRENGTHS:
FOOTINGS: 3000PSI
SLAB ON GRADE: 4000PSI
ALL OTHER CONCRETE: 4000PSI
- ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615. MAIN BARS TO BE GRADE 60, TIES & STIRRUPS TO BE GRADE 40. WELDED WIRE MESH SHALL CONFORM TO ASTM A185.
- ALL ANCHOR BOLTS SHALL BE ASTM F1554 GRADE 36.
- MATERIAL AND WORKMANSHIP FOR ALL CONCRETE AND REINFORCING SHALL BE IN ACCORDANCE WITH THE ACI MANUAL OF STANDARD PRACTICE AND THE ACI BUILDING CODE REQUIREMENTS.
- PROVIDE ENTRAINED AIR IN ALL EXPOSED EXTERIOR CONCRETE.
- OTHER CONCRETE ADMIXTURES MAY BE USED AS NECESSARY, INCLUDING THE USE OF A PLASTICIZER TO IMPROVE WORKABILITY. HOWEVER, EXTRA WATER SHALL NOT BA ADDED BEYOND THAT WHICH IS REQUIRED FOR PROPER HYDRATION OF THE MIX DESIGN BEING USED. CHLORINE IS NOT AN ACCEPTABLE ADMIXTURE AND SHALL NOT BE USED.
- FOR REINFORCING SPLICES, UNLESS OTHERWISE INDICATED, MAINTAIN A MINIMUM BAR LAP OF 30 BAR DIAMETERS, AND A MINIMUM LAP OF 8" FOR WIRE MESH. SPLICES FOR REINFORCING MAY BE MECHANICAL OR WELDED IF DESIRED, BUT SUBJECT TO ENGINEER APPROVAL.
- PROVIDE CORNER BARS TO MATCH ALL HORIZONTAL REINFORCING IN WALLS AND FOOTINGS. PROVIDE DOWELS AS REQUIRED TO MATCH VERTICAL REINFORCING. MAINTAIN MINIMUM LAP REQUIREMENT.
- APPROPRIATE CURING MEASURES SHALL BE TAKEN FOR NEW CONCRETE. A MOIST CURE MEATHOD OR A CURING COMPOUND SHALL BE USED. COMMENCEMENT OF CURING OR APPLICATION OR A COMPOUND SHALL BE DONE IMMEDIATELY AFTER FINISHING OR REMOVING FORMWORK. THE CURING COMPOUND SHALL BE COMPATIBLE WITH FLOOR COVERINGS OR COATINGS AND IT SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- APPROPRIATE PROCEDURES FOR COLD OR WARM WEATHER CONCRETE WORK SHALL BE FOLLOWED, AS NECESSARY, IN ACCORDANCE WITH ACI SPECIFICATION.
- VERIFY AND COORDINATE ALL SLEEVES, OPENINGS, EMBEDDED ITEMS, ETC., AS NECESSARY WITH THE APPLICABLE TRADES THAT REQUIRE THEM.
- THE CONTRACTOR SHALL ALLOW IN THE BID AN ADDITIONAL ONE (1) TON OF REINFORCING STEEL TO BE PLACED IN THE FIELD AT THE DIRECTION OF THE ENGINEER. ANY UNUSED PORTION OF THIS ALLOWANCE SHALL BE CREDITED TO THE OWNER.
- PROVIDE CONCRETE COVER OVER REINFORCING BARS AS FOLLOWS, UNLESS NOTED OTHERWISE:
A. CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH = 3"
B. PERMANENTLY EXPOSED TO EARTH OR WEATHER:
#5 AND SMALLER = 1 1/2"
#6 AND LARGER = 2"
C. NOT EXPOSED TO EARTH OR WEATHER:
WALLS, SLABS AND JOISTS = 3/4"
BEAMS, AND COLUMNS = 1 1/2"



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HC PROJ. # 25336

Mark	Description	Date
	Bids & Permits	04/16/2025

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**Jeffrey
Parker**
architects

ARCHITECTURE PLANNING ENGINEERING

855 28th Street SE
Grand Rapids MI 49508

Phone: 616-241-0090
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Addition & Renovation

Markdom Renovation

400 Parkland Dr.
Charlotte, MI 48813

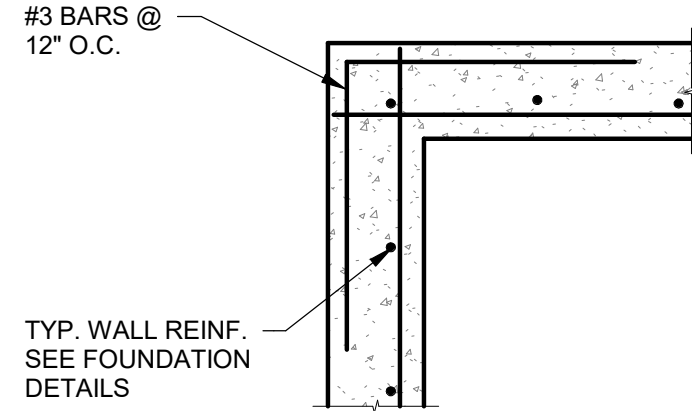
General Structural Notes

Issued
4/16/2025 11:05:17 AM

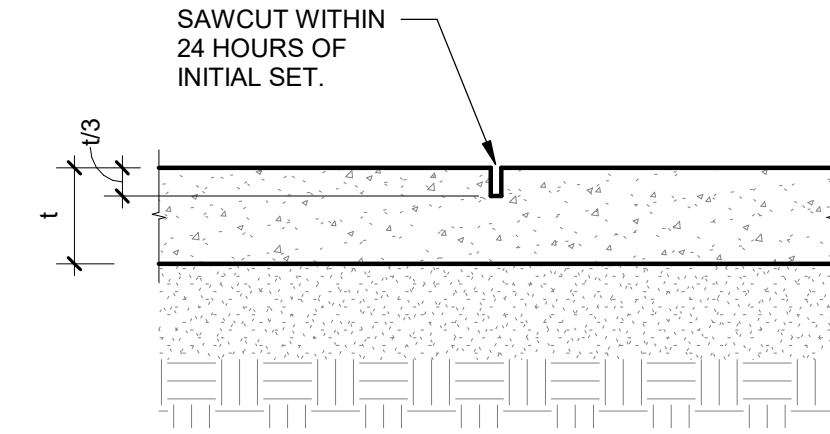
Project No.
22067

Drawing No.

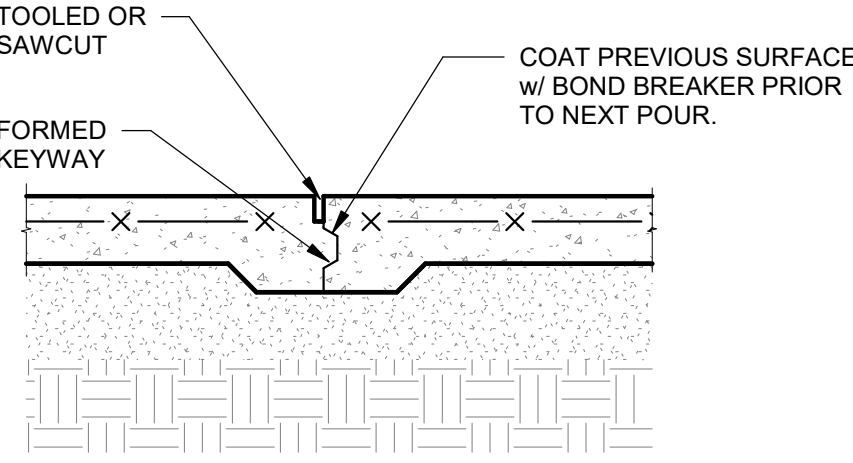
F0.1



Outside Corner Reinforcement
SCALE: N.T.S.



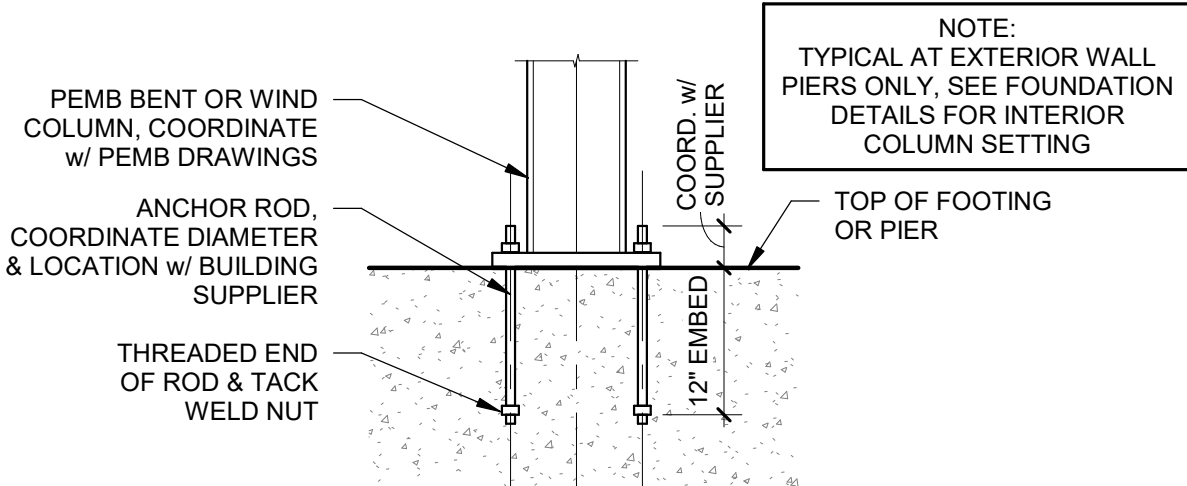
Typical Control/Contraction Joint
SCALE: N.T.S.



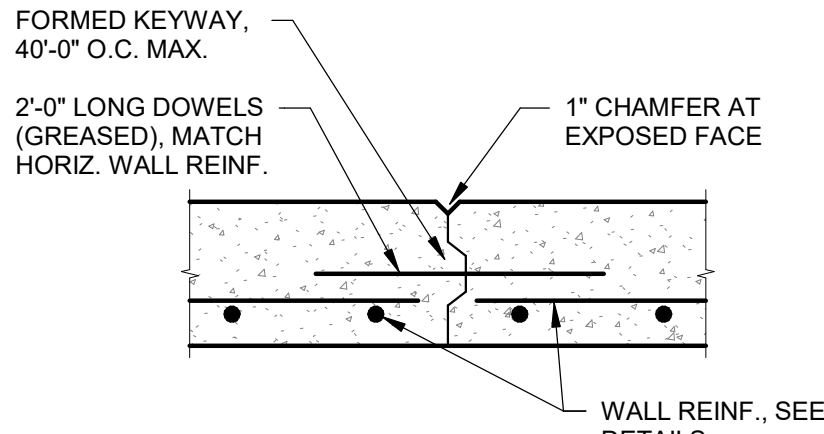
Typical Construction Joint
SCALE: N.T.S.

FOOTING SCHEDULE								
MARK	WIDTH	LENGTH	THICKNESS	REINFORCING	CAPACITY	SOIL CAPACITY	QTY.	REMARKS
F2x5	5' - 0"	2' - 0"	1' - 0"		29 kip	3000 psf	4	
F3.0	3' - 0"	3' - 0"	1' - 0"	4-#4 E.W.	26 kip	3000 psf	4	
F3.5	3' - 6"	3' - 6"	1' - 0"	5-#4 E.W.	47 kip	4000 psf	4	
F5.0	5' - 0"	5' - 0"	1' - 0"	7-#4 E.W.	71 kip	3000 psf	4	

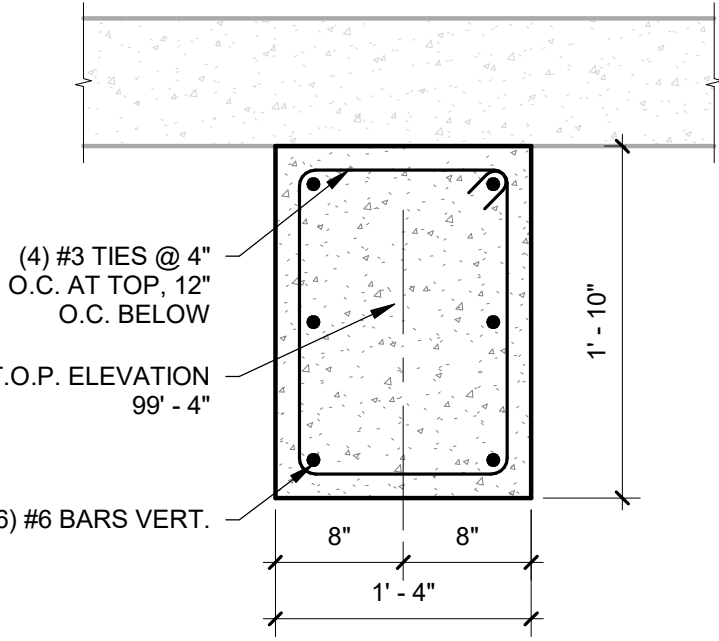
- GENERAL FOUNDATION PLAN NOTES:
- SEE GENERAL STRUCTURAL NOTES, SHEET F0.1 & TYPICAL DETAILS, SHEET F1.0.
 - T.O.W. = TOP OF CONC. WALL
T.O.W. = 100'-8" TYP. U.N.O.
 - T.O.F. = TOP OF FOOTING
T.O.F. = 97'-4" TYP. U.N.O.
 - FIELD LOCATE CONTROL JOINTS AS REQUIRED BELOW:
4" CONC. SLAB = 12'-0" O.C., MAX.
 - VERIFY ALL DIMENSIONS AND ELEVATIONS WITH ARCHITECT.



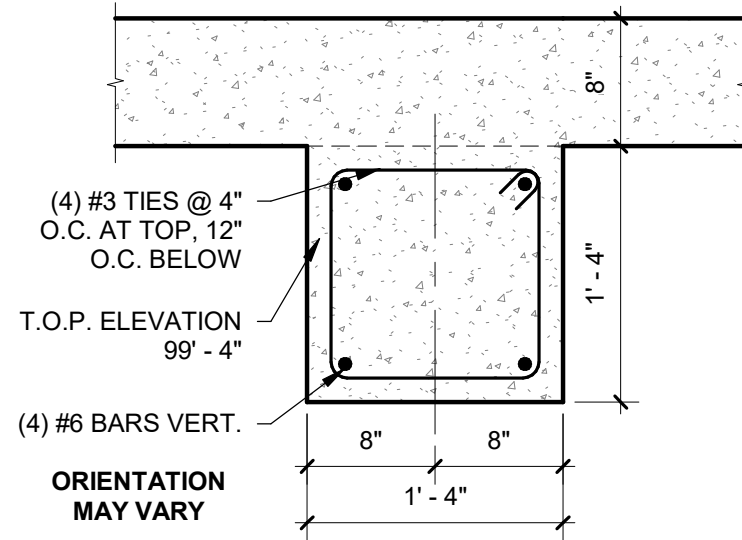
Pre-Engin Col Setting
SCALE: N.T.S.



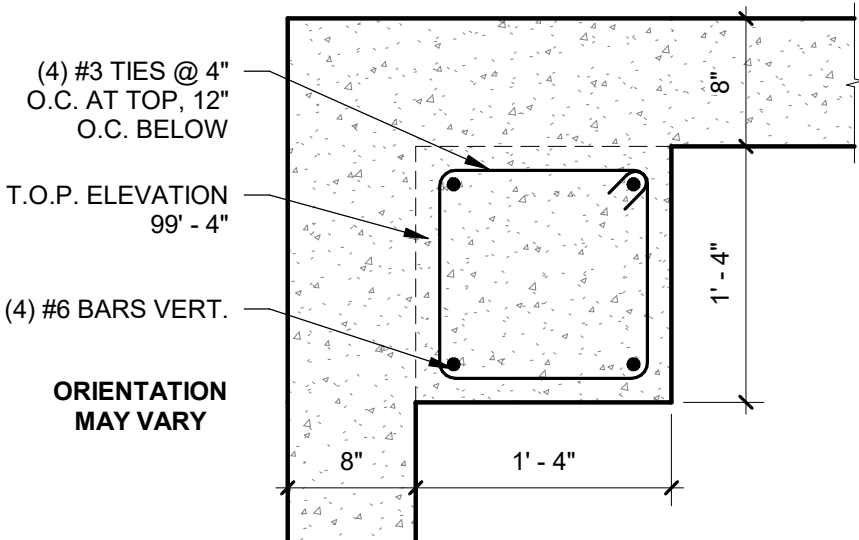
Vertical Construction Joint
SCALE: N.T.S.



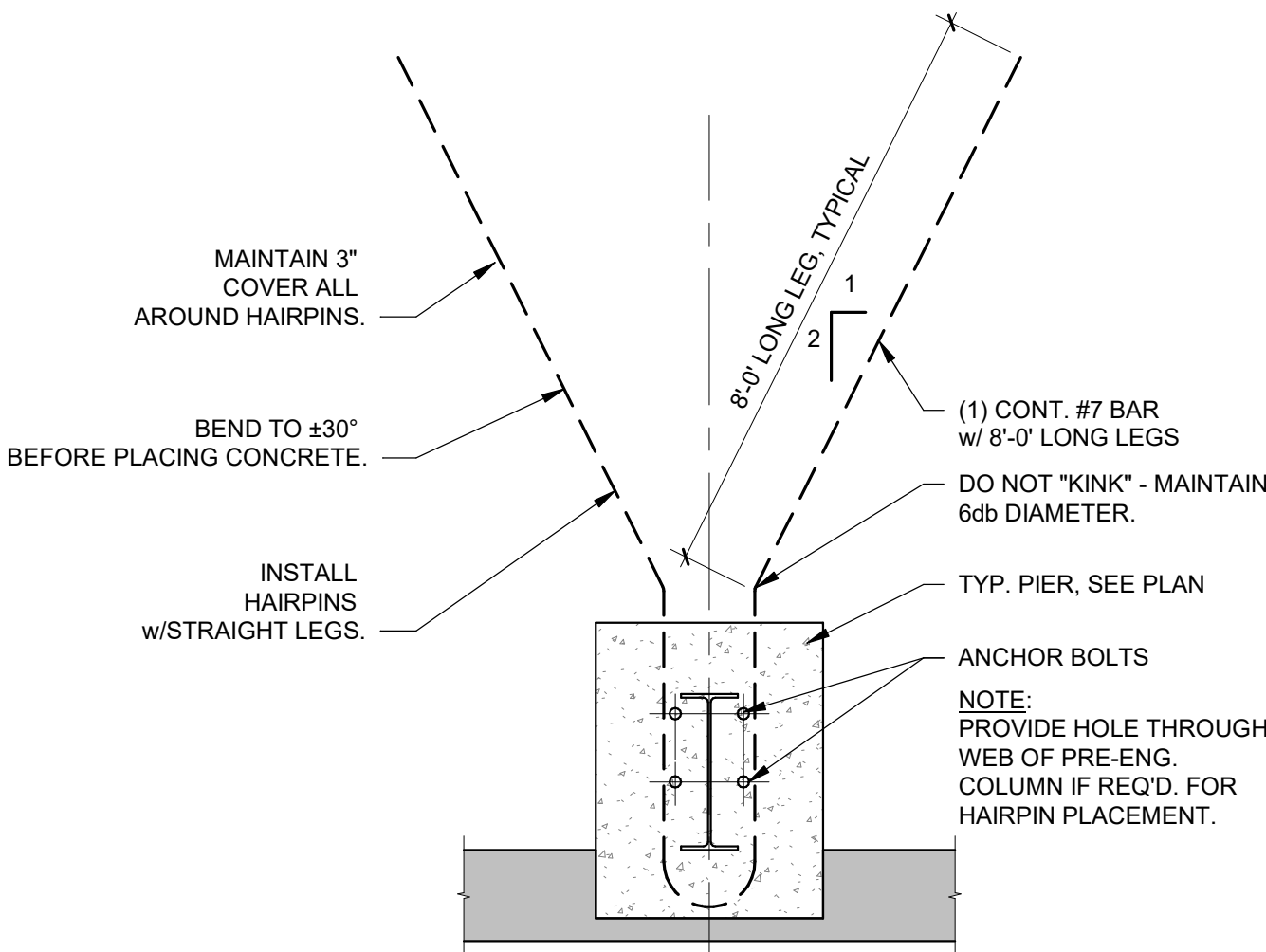
P3
SCALE: 1" = 1'-0"



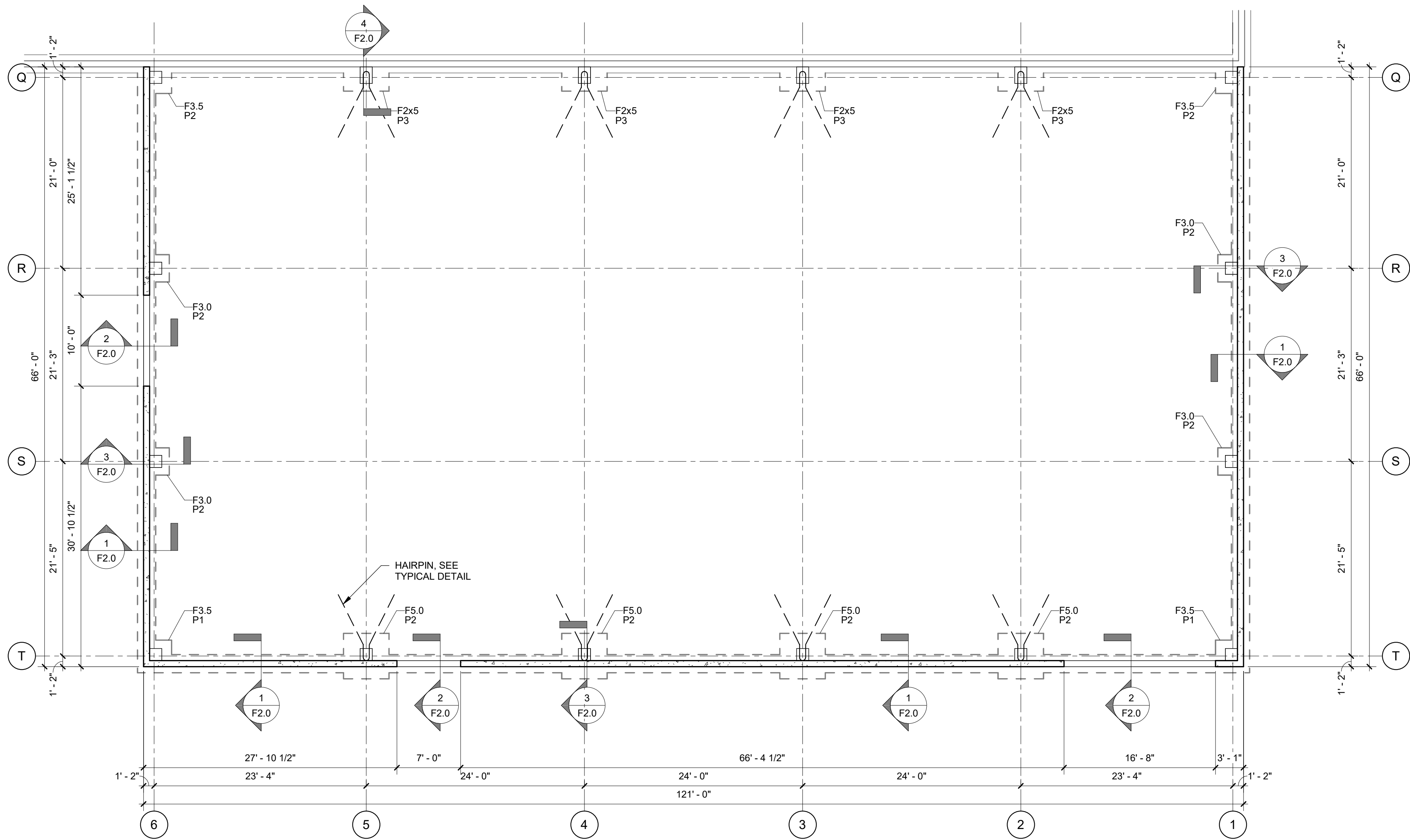
P2
SCALE: 1" = 1'-0"



P1
SCALE: 1" = 1'-0"



Typical Hairpin Detail
SCALE: N.T.S.



Foundation Plan
SCALE: 1/8" = 1'-0"



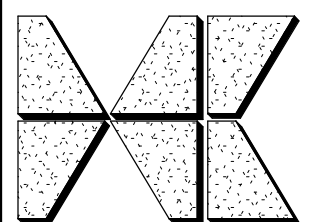
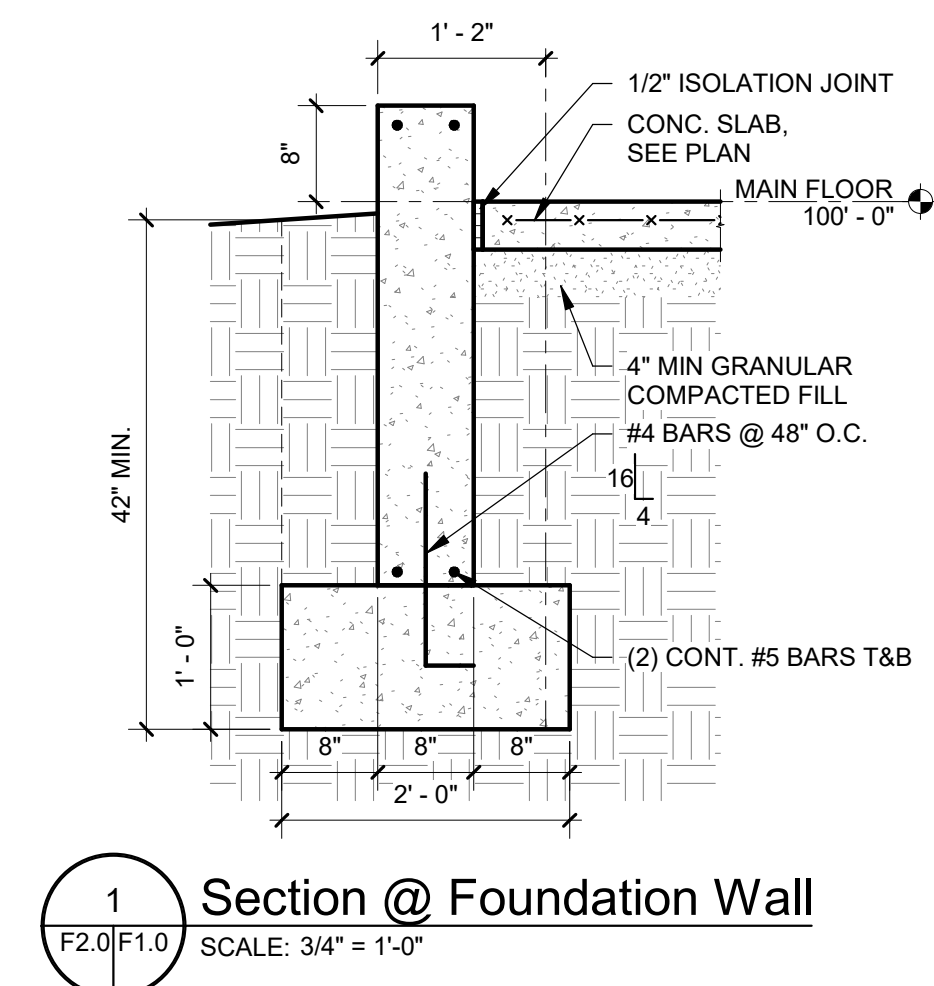
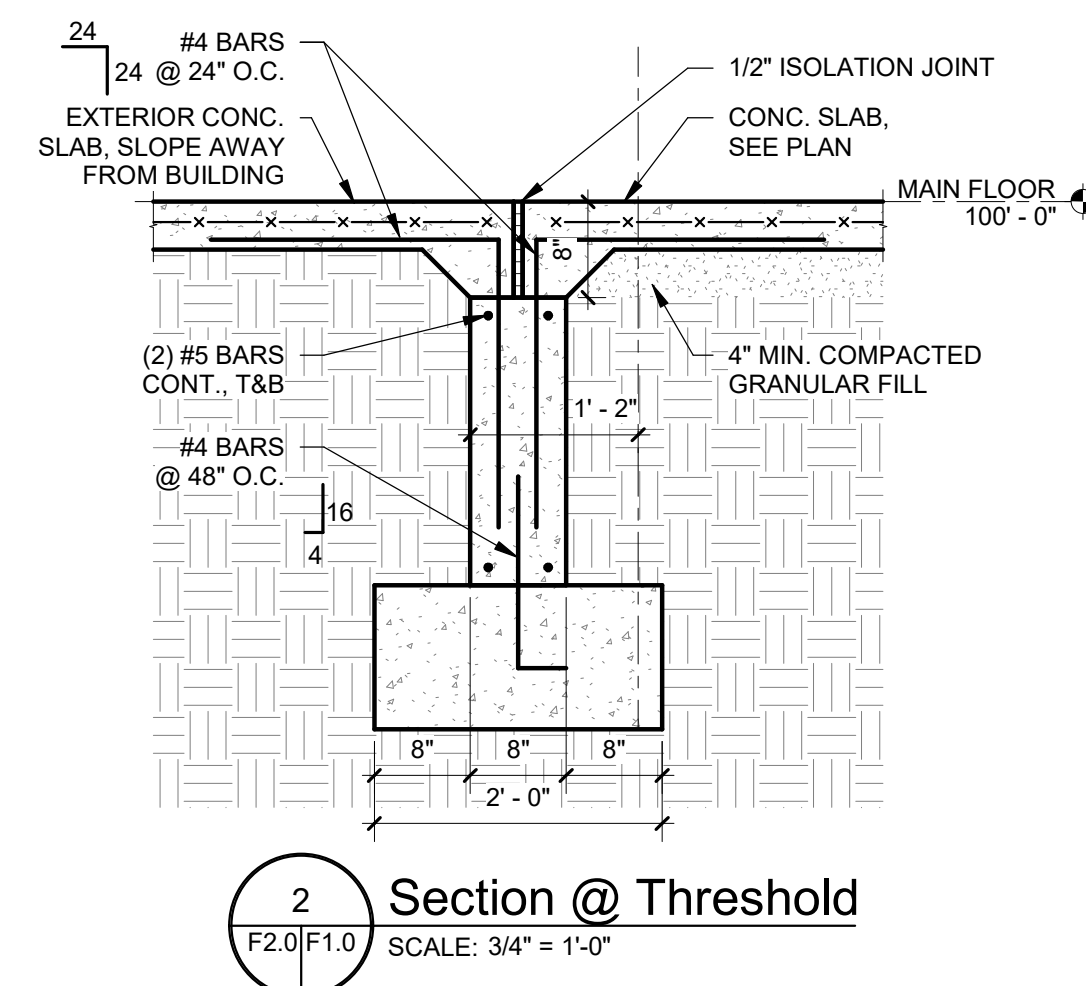
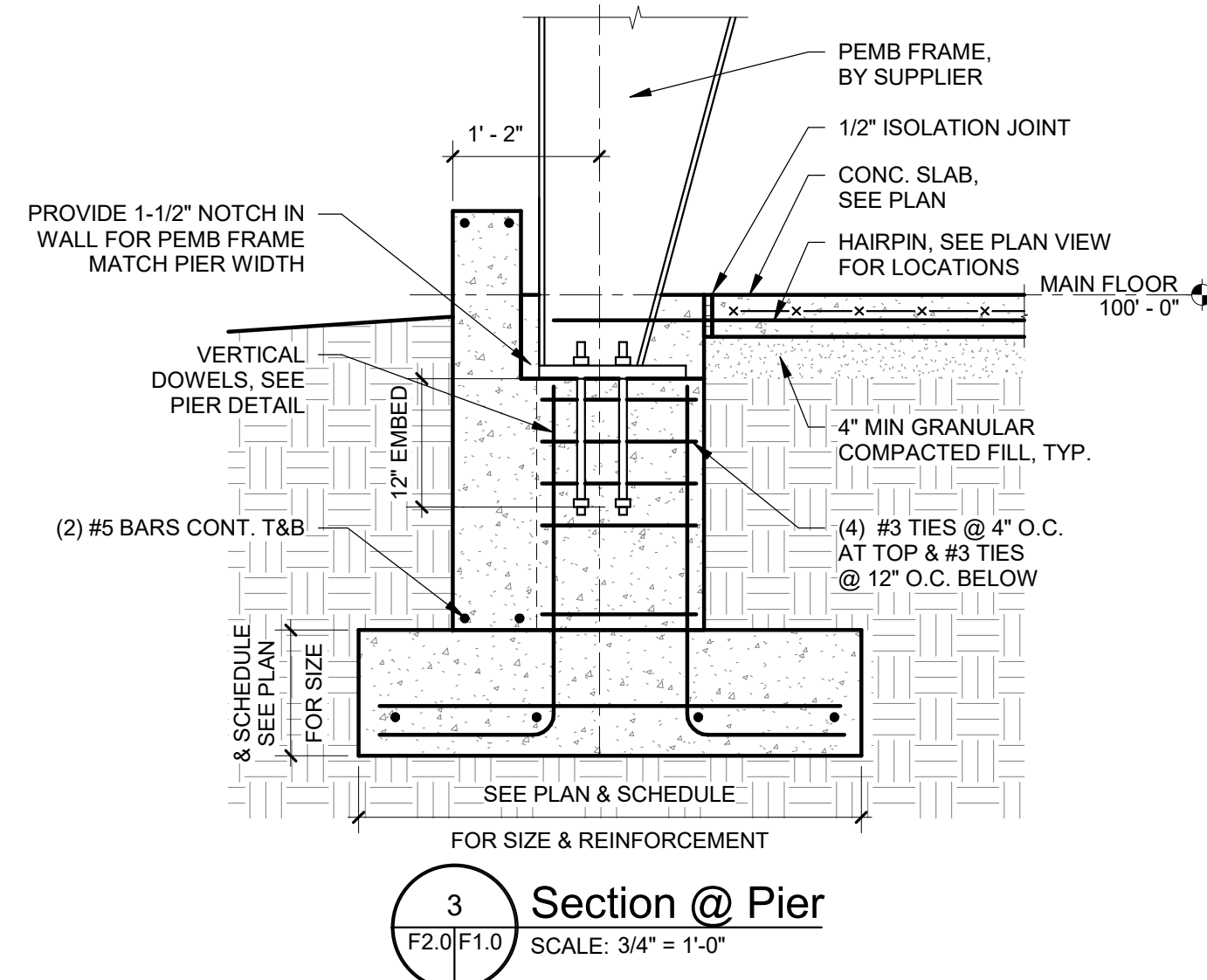
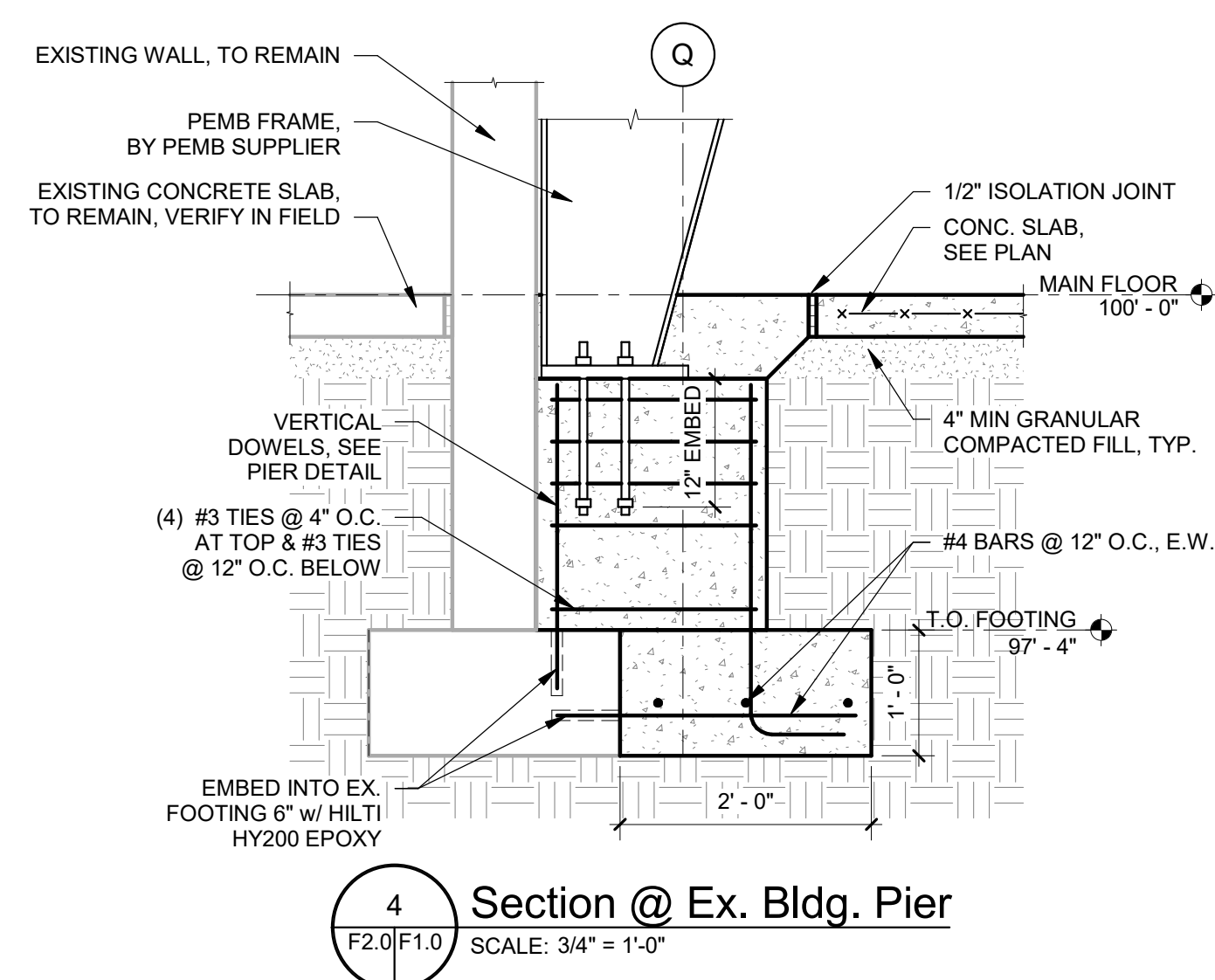
Mark	Description	Date
	Bids & Permits	04/16/2025

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Addition & Renovation
Markdom Renovation
400 Parkland Dr.
Charlotte, MI 48813

Foundation Plan	
Issued 4/16/2025 11:05:17 AM	Drawing No. F1.0
Project No. 22067	



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ARCHITECTURE PLANNING ENGINEERING

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Addition & Renovation
Markdom Renovation

400 Parkland Dr.
Charlotte, MI 48813

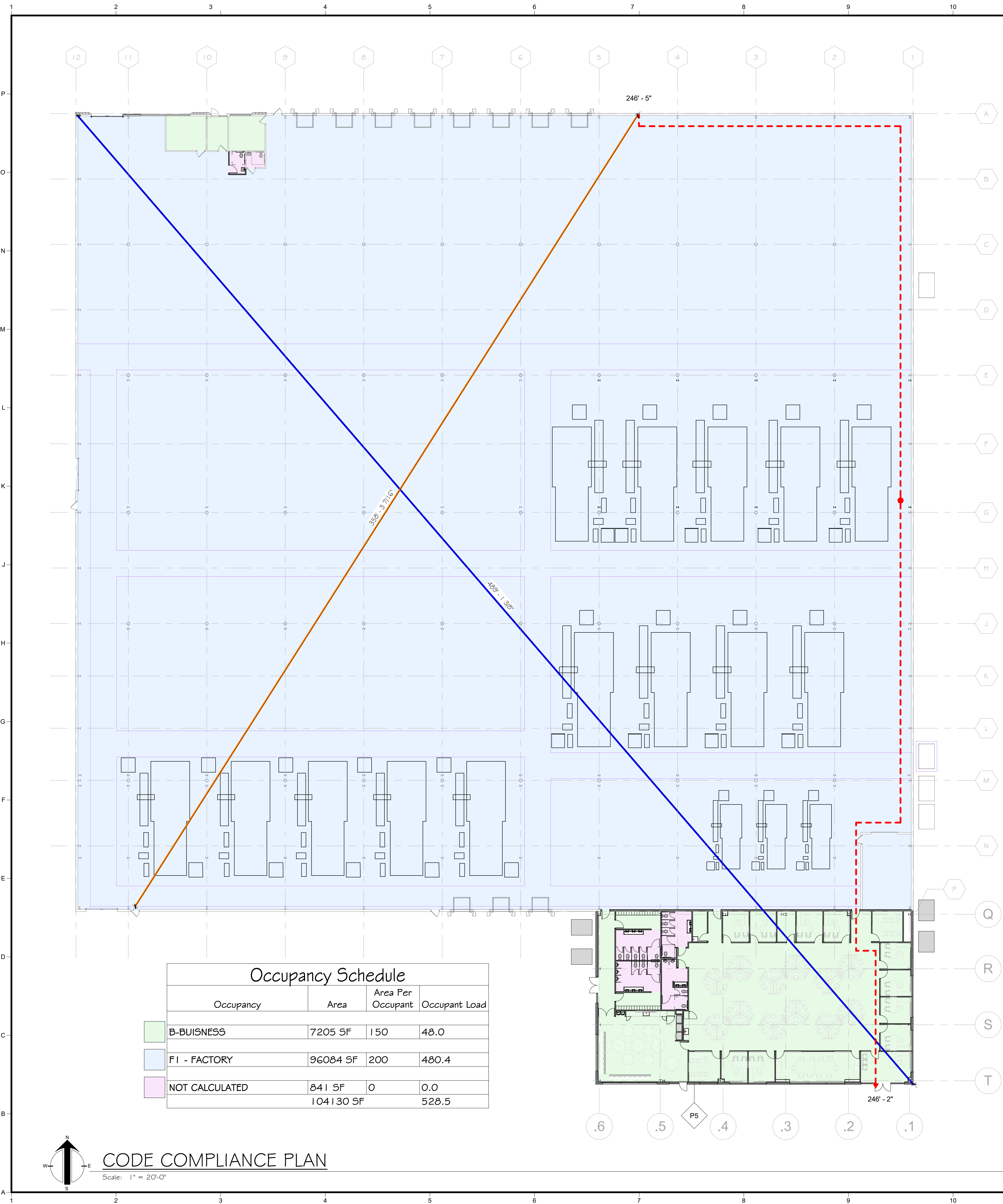
Foundation Details

Issued 16/2025 11:05:17 AM	Drawing No. E20
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Project No. 22067	F2.0
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Drawing No.

F2.0



Occupancy Schedule			
Occupancy	Area	Area Per Occupant	Occupant Load
B-BUISNESS	7205 SF	150	48.0
F1 - FACTORY	96084 SF	200	480.4
NOT CALCULATED	841 SF	0	0.0
	104130 SF		528.5

BUILDING CODE & ZONING

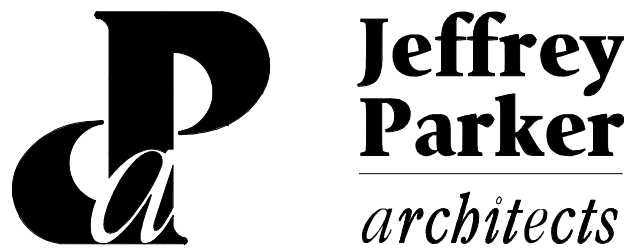
CATEGORY:	PROJECT INFORMATION:
PROJECT INFORMATION	
LOCATION:	400 Parkland Dr, Charlotte, MI 48813
COUNTY:	EATON
MUNICIPALITY:	EATON COUNTY
ZONING REQUIREMENTS:	PER CIVIL DRAWINGS
GENERAL INFORMATION	
BUILDING CODE:	MICHIGAN BUILDING CODE 2021 (MBC) MICHIGAN ENERGY CODE MEC-2015 (ASHRAE 90.1-2013) ACCESSIBILITY CODE ANSI/ICC 117.1-2009
CHAPTER 3	
USE GROUP OCCUPANCY:	F-1 FACTOR GROUP - MBC SECTION 306.1 B - BUSINESS - MBC SECTION 304.1 MBC SECTION 306.2
CHAPTER 4	
HAZARDOUS MATERIAL:	NONE WITHIN THE SPACE
CHAPTER 5	
ALLOWABLE BUILDING HEIGHT:	75'-0"
PROPOSED ADDITION HEIGHT:	22'-0"
ALLOWABLE NUMBER OF STORIES:	3 STORIES
PROPOSED BUILDING STORIES:	1 STORY
ALLOWABLE FLOOR AREA:	UNLIMITED MBC TABLE 507.4 / SINGLE STORY SPRINKLED (F1) F-1 FACTOR GROUP # B- BUISNESS
EXISTING BUILDING AREA	98,000 SF
ADDITION	8000 SF
FINAL BUILDING AREA:	106,000 SF
CHAPTER 6	
CONSTRUCTION TYPE: TABLE 601	TYPE II-B MBC TABLE 601
CHAPTER 7	
DRAFTSTOPPING:	NO ENCLOSED ATTIC LOCATIONS MBC SECTION 718
CHAPTER 8	
INTERIOR WALL/CEILING FINISHES:	ALL INTERIOR WALL AND CEILING FINISHES SHALL MAINTAIN THE FOLLOWING: MBC SECTION 803.1.1 / TABLE 803.9 AT EXIT ENCLOSURES, EXIT PASSAGEWAYS, AND CORRIDORS: FLAME SPREAD INDEX: 26-75 SMOKE DEVELOPED INDEX: 0-450 AT ROOMS AND ENCLOSED SPACES: FLAME SPREAD INDEX: 76-200 SMOKE DEVELOPED INDEX: 0-450

BUILDING CODE & ZONING

CATEGORY:	PROJECT INFORMATION:
CHAPTER 9	
AUTOMATIC SPRINKLER SYSTEM:	GROUP F-1 REQUIRED SECTION 903.2.4
ALARM SYSTEM:	REQUIRED MBC SECTION 903.4
MONITORING SYSTEM:	REQUIRED MBC SECTION 903.4.1
FDC STANDPIPE CONNECTION:	NOT REQUIRED MBC SECTION 905
FIRE EXTINGUISHERS:	MUST BE LOCATED WITHIN 75' OF EVERY LOCATION WITHIN THE BUILDING MBC SECTION 906.3(1)
FIRE ALARM SYSTEM:	MANUAL FIRE ALARMS ARE NOT REQUIRED MBC SECTION 907.2.4 EXEMPTION
SMOKE AND HEAT VENTS:	NOT REQUIRED MBC SECTION 910
CHAPTER 10	
BUILDING OCCUPANT LOAD:	SEE SCHEDULE MBC TABLE 1004.1.2
EGRESS SIZING:	.2" PER OCCUPANT MBC SECTION 1005.3.2
REQUIRED BUILDING EGRESS SIZING:	528 * .2 = 106"
EXITS REQUIRED:	3 EXITS REQUIRED PER OCCUPANT LOAD MBC SECTION 1006.6.2.1.1
MAXIMUM COMMON PATH OF EGRESS:	75'-0"
SEPARATION OF EXITS:	1/3 OF DIAGONAL DISTANCE MBC SECTION 1007.1.2
ACCESSIBLE EXITS:	2 REQUIRED MBC SECTION 1009.1
EXIT DOOR SIZING:	PER OCCUPANT LOAD MBC SECTION 1010.1.1
PANIC & FIRE EXIT HARDWARE:	OCCUPANT LOADS OF 50 OR GREATER MBC SECTION 1010.1.10
EXIT SIGNS REQUIRED:	PER MBC SECTION 1013.1 EXEMPTION 2
MAXIMUM EXIT ACCESS TRAVEL DISTANCE:	250'-0"
PLUMBING CODE	
MICHIGAN PLUMBING CODE	SECTION 403.1
PLUMBING FIXTURE COUNT REQUIRED:	PER MPC TABLE 403.1
B - BUISNESS / F1 - FACTORY	49 OCCUPANTS / 481 OCCUPANTS
WATER CLOSETS REQUIRED:	3.9 / 4.8 = 9 REQUIRED
WATER CLOSETS (URINALS) PROVIDED:	6 (2) / 10 (3) = 16 (5) PROVIDED
LAVATORIES REQUIRED:	2 / 4.8 = 7 REQUIRED
LAVATORIES PROVIDED:	4 / 8 = 12 PROVIDED
DRINKING FOUNTAINS:	1 REQUIRED / 1 PROVIDED
SERVICE SINKS:	1 REQUIRED / 1 PROVIDED

Mark	Description	Date
	BID AND PERMITS	04/22/2025

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Charlotte, MI 48813

CODE COMPLIANCE PLAN

Issued	Drawing No.
Project No. 22067	A0.1

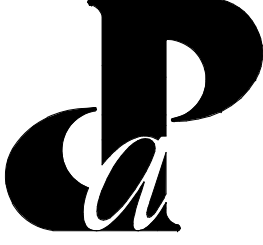
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SPECIFICATIONS AND NOTES

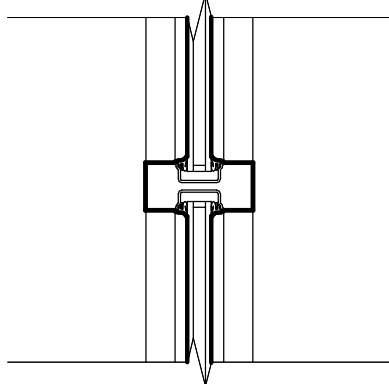
03 - CONCRETE	
03 30 00 - CAST-IN-PLACE CONCRETE	
SPECIFICATIONS:	REFER TO STRUCTURAL DRAWINGS FOR ADDITIONAL SPECIFICATIONS
EXPOSED CONCRETE:	ARCHITECTURAL FINISH, CARE TO BE TAKEN IN LAYOUT OF FORMWORK TO MATCH PANEL WIDTHS.
STEEL BOLLARDS:	SEE SPECIFICATION SECTION 05 59 00
03 35 00 - CONCRETE FINISHING	
MATERIAL SELECTION:	SEE ARCHITECTURAL FOR LOCATIONS OF CONCRETE FINISHING
	LEVEL 2: SALT & PEPPER GRIND
	SHEEN LEVEL A: GLOSSY AS DETERMINED BY A GLOSS READING OF 45-60
	LOW REFLECTIVITY FINISH
	FINISH: MEDIUM GLOSS, 800 GRIT
HARDENED CONCRETE PROPERTIES:	MIN. CONCRETE COMPRESSIVE STRENGTH: 3,500 PSI
	NORMAL WEIGHT CONCRETE: NO LIGHTWEIGHT CONCRETE
	NON-AIR ENTRAINED
MOCK UP:	PROVIDE MOCK UP ON SITE IN AREA THAT WILL LATER BE COVERED BY ALTERNATE FLOOR COVERING
	PLEASE ALLOW INSPECTION OF MOCK UP PRIOR TO PROCEEDING WITH WORK
05 - METALS	
05 10 00 - STRUCTURAL STEEL FRAMING	
SPECIFICATIONS:	REFER TO PEMB DRAWINGS FOR ADDITIONAL SPECIFICATIONS
05 40 00 - COLD-FORMED METAL FRAMING	
SPECIFICATIONS:	REFER TO STRUCTURAL ENGINEERING DRAWINGS FOR ADDITIONAL SPECIFICATIONS
	FRAMING SUB-CONTRACTOR TO PROVIDE ENGINEERED SHOP DRAWINGS TO SHOW COMPLIANCE WITH REQUIRED FRAMING LOADS
TOLERANCE:	ALL FRAMING SHOULD HAVE A MINIMUM TOLERANCE OF 1/8" PER 10'-0"
05 59 00 - METAL SPECIALTIES	
STEEL BOLLARDS:	6" DIA., SCHEDULE 40, GALVANIZED STEEL PIPE, INSTALLED 42" ABOVE FINISH GRADE/FLOOR, SEE TYPICAL DETAIL
	ALL GRADE LEVEL DOORS: (1) BOLLARD EACH SIDE OF DOOR, INTERIOR AND EXTERIOR / ALL TRUCK DOCK DOORS: (1) BOLLARD EACH SIDE OF DOOR, INTERIOR ONLY
	INSTALL EXTERIOR BOLLARDS IN 18" DIA CONCRETE ENCASING @ 42" BELOW GRADE, W/ 1" TAPERED MOUND ABOVE GRADE
	INSTALL INTERIOR BOLLARDS 24" BELOW GRADE, PRIOR TO POURING INTERIOR FLOOR SLAB
	BOLLARDS TO BE FILLED WITH CONCRETE, MOUND TOP OF POST 1/2" ABOVE TOP OF STEEL
	ALL BOLLARDS TO BE PAINTED
05 75 00 - METAL FLASHINGS AND TRIM	
	24 GA. PRE-FINISHED METAL FLASHING AND TRIM PER DETAILS AT ALL REQUIRED EDGES AND TRANSITIONS
	CONCEALED FASTENING, SPLICE PLATES AS REQUIRED
	COLOR: MATCH EXISTING RED ON BUILDING
	PROVIDE ARCHITECT SAMPLES
07 - THERMAL AND MOISTURE	
07 21 00 - THERMAL PROTECTION	
	ALL INSULATION STRATEGIES ARE REQUIRED TO COMPLY WITH THE 2015 INTERNATIONAL ENERGY CONSERVATION CODE / IE5 STANDARD 90.1-2013
07 21 13.2 - XPS FOAM BOARD INSULATION	
XPS FOAM BOARD INSULATION:	2015 IECC MINIMUM, R10 (BELOW GRADE) R7.5 (ABOVE GRADE)
	EXTRUDED POLYSTYRENE BOARD INSULATION (XPS), R5.0 PER INCH MINIMUM
	INSTALLED ON THE INTERIOR SIDE OF THE FOUNDATION WALL, INSTALLED VERTICALLY 24" BELOW GRADE
	INSTALLED PER WALL DETAILS FOR EXTERIOR, ABOVE GRADE WALLS
	GIVE CAREFUL ATTENTION TO SEAMS AND JOINTS TO ESTABLISH CONTINUOUS INSULATION
07 25 00 - WEATHER BARRIERS	
WEATHER BARRIER:	DUPONT TYVEK COMMERCIAL WRAP, SINGLE LAYER WEATHER BARRIER, INCLUDING FLASHING AND SEALING OF ALL PENETRATIONS AND SEAMS
	INSTALLED WEATHER BARRIER AND ACCESSORIES SHALL WITHSTAND SPECIFIED WIND PRESSURES, LIQUID WATER PENETRATION, AND WATER VAPORS PRESSURES, WITHOUT FAILURE DUE TO DEFECTIVE MANUFACTURE OF PRODUCTS
FLASHING:	DUPONT FLEX WRAP NF OR COMPATABLE FLASHINGS REQUIRED
	ALL FLASHING AND SEAMLESS SILL FANS SHOULD EXTEND UP THE JAMBS WITHOUT CUTS, PATCHES OR FASTENERS
BUILDING WRAP TAPE:	DUPONT TYVEK TAPE OR COMPATABLE FLASHING REQUIRED
	TAPE FLASHING FOR JOINT OR PENETRATION SEALING WITH TYVEK COMMERCIAL WRAP TO ACHIEVE WEATHER TIGHT ASSEMBLY
07 26 16 - BELOW-GRADE VAPOR RETARDERS	
	UNDER-SLAB VAPOR BARRIER MUST MEET THE MINIMUM STANDARDS OUTLINED IN ASTM E-1745
	MINIMUM THICKNESS OF 10 MILS
	INSTALLED WITH NO TEARS OR PUNCTURES TO ENSURE FULL COVERAGE UNDER THE SLAB, MIN OVERLAP OF 6" BETWEEN SHEETS AND SEALED WITH MANUFACTURER APPROVED TAPE AT ALL SEAMS AND EDGES.
08 - OPENINGS	
08 00 00 - OPENINGS	
MATERIAL SELECTION:	REFER TO ARCHITECTURAL FOR PLANS FOR DOOR & WINDOW SELECTIONS AND SCHEDULES
	NO UNIVERSAL DOORS ARE TO BE USED. ALL DOORS ARE TO BE PREPPED FOR THE PROPER SWING
	PER ARCHITECTURAL PLANS, ALL DOORS WITH FIRE RATINGS ARE TO BE STAMPED AND LEGIBLE AT DATE OF OCCUPANCY
08 11 13 - METAL DOORS AND FRAMES	
EXTERIOR DOORS:	ALL EXTERIOR DOORS AND FRAMES ARE TO BE GALVANIZED
INTERIOR DOORS:	INSTALLED AND PREPARED FOR A PAINTED FINISH
08 36 13 - SECTIONAL DOORS	
	REFER TO ARCHITECTURAL FLOOR PLANS FOR DOOR SELECTION LOCATIONS & SIZES
	DOOR COLOR: MATCH EXISTING
	DOOR WINDOWS: NEW DOORS TO HAVE WINDOWS IN SAME LOCATION AS EXISTING DOORS
	ALL SECTIONAL DOORS TO BE 2" THICK, 24 GA. GALVANIZED STEEL SANDWICHED INSULATED DOOR
	ALL SECTIONAL DOORS TO HAVE INDUSTRIAL DUTY COMMERCIAL OPERATOR W/ 3-BUTTON WALL CONTROL
	ALL SECTIONAL DOORS TO HAVE FULL VERTICAL WHEN CLEARANCE IS PROVIDED. ALL OTHERS HIGH LIFT TRACKS
08 42 13 - ALUMINUM FRAMED ENTRANCES	
	ALL ALUMINUM FRAMED DOORS TO BE INSTALLED, FLASHED AND CAULK PER MANUFACTURES REQUIREMENTS
	ALL ALUMINUM FRAMED EXTERIOR DOORS TO COMPLY WITH ADA REQUIREMENTS
	HARDWARE REQUIREMENTS PER MANUFACTURERS REQUIREMENTS
	SEE ARCHITECTURAL FOR INSTALLATION DIMENSIONS & DETAILS
08 51 13 - ALUMINUM WINDOWS	
	ALL ALUMINUM FRAMED WINDOWS TO BE INSTALLED, FLASHED AND CAULK PER MANUFACTURES REQUIREMENTS
	SEE ARCHITECTURAL FOR INSTALLATION DIMENSIONS & DETAILS
08 70 00 - DOOR HARDWARE	
MATERIAL SELECTION:	SEE DOOR SCHEDULE MATCH EXISTING EXTERIOR DOOR HARDWARE AND KEYWAYS
	FINISH: MATCH EXISTING

SPECIFICATIONS AND NOTES

09 - FINISHES	
09 90 00 - PAINTING AND COATING	
MATERIAL SELECTION:	SEE FINISH SCHEDULE FOR SELECTIONS
09 91 13 - EXTERIOR PAINTING	
	HOLLOW METAL DOORS & FRAMES, TRUCK DOCK 2-LINE RAILS, STEEL BOLLARDS
	PAINTER TO PREP AND PREPARE ALL SURFACES TO RECEIVE MANUFACTURER RECOMMENDED PRIMER AND PAINT
	PAINTER TO PROTECT AND CARE FOR SURROUNDING FINISHES
09 91 23 - INTERIOR PAINTING	
	REFER TO INTERIOR MATERIAL SPECIFICATIONS AND ROOM FINISH SCHEDULE FOR OFFICE SPACE
	PAINTING ALSO TO INCLUDE: HOLLOW METAL DOORS & FRAMES, 2-LINE RAILING AROUND TRUCK DOCK, STEEL BOLLARDS
	PAINTER TO PREP AND PREPARE ALL SURFACES TO RECEIVE MANUFACTURER RECOMMENDED PRIMER AND PAINT
	PAINTER TO PROTECT AND CARE FOR SURROUNDING FINISHES
10 - SPECIALTIES	
10 73 16 - CANOPIES	
SPECIFICATIONS:	MAPES ARCHITECTURAL CANOPIES, CANTILEVER CANOPY
	FLAT SOFFIT DECK, 8" J FASCIA PROFILE, SUPER LUMIDECK WALL MOUNT
	SEE ARCHITECTURAL DETAILS FOR CONNECTIONS AND FLASHING, SEE EXTERIOR MATERIAL SCHEDULE FOR COLOR SELECTION
31 - EARTHWORK	
31 20 00 - COMPACTED GRAVEL & STRUCTURAL FILL	
SPECIFICATIONS:	REFER TO STRUCTURAL AND CIVIL FOR ADDITIONAL SPECIFICATIONS
No	
06 - WOODS, PLASTICS, COMPOSITES	
06 16 36.1 - SHEATHING	
SHEATHING PLYWOOD:	ALL EXTERIOR SHEATHING USED SHALL BE 3/4" CDX PLYWOOD, APA RATED
	SIZE: 1/2" X 4 X 8'
	SPACING OF 1/8" BETWEEN PANELS IS RECOMMENDED
	NAIL AND FASTENING PATTERN REQUIREMENTS PER MANUFACTURERS SPECIFICATIONS
06 41 00 - ARCHITECTURAL WOOD CASEWORK	
CASEWORK / CABINETS:	SEE INTERIOR MATERIAL SPECIFICATION FOR SELECTIONS
	CASEWORK / CABINETS MUST PROVIDE SHOP DRAWINGS. CONSTRUCTION OF CASEWORK / CABINETS SHALL NOT BEGIN UNTIL THE APPROVED SHOP DRAWING PROCESS IS COMPLETE
	COORDINATION OF APPLIANCES IS THE RESPONSIBILITY OF THE SUB-CONTRACTOR
	FIELD VERIFICATION OF CABINET LOCATIONS AFTER FRAMING AND WALLBOARD IS HUNG IS THE RESPONSIBILITY OF THE SUB-CONTRACTOR
	PLASTIC LAMINATE FACED CABINETS, TYPE A / FRAMELESS CONSTRUCTION
	ALL CONSTRUCTION SHALL BE WITH 3/4" SUBSTRATE
	FULL OVERLAY DOORS & DRAWERS
	COUNTERTOPS: PLASTIC LAMINATE
07 - THERMAL AND MOISTURE	
07 21 16.1 - BLANKET INSULATION	
SIMPLE SAVER INSULATION SYSTEM:	2015 IECC MINIMUM, WALLS R25 (U-VALUE: .059), ROOF R36 (U-VALUE: .028)
	ALL BLANKET INSULATION SYSTEMS TO MEET MINIMUM OSHA COMPLIANT FALL PROTECTION STANDARDS
	ALL BLANKET INSULATION SYSTEMS TO MEET THE MANUFACTURERS RECOMMENDED SPECIFICATIONS
	ALL BLANKET INSULATION SYSTEMS SHALL MEET ASTM C991 TYPE I, ASTM E136 AND ASTM E64 - OR SIMILAR TESTS WITH ARCHITECT APPROVAL
07 42 13.19 - INSULATED METAL WALL PANELS	
SPECIFICATIONS:	BASIS OF DESIGN: MBCI, CF MESA, CONCEALED FASTENER, INSULATED METAL PANEL
	3" PANEL, 26GA METAL, EACH SIDE WITH STUCCO EMBOSSED SURFACE.
	SEE ARCHITECTURAL DETAILS, ASSEMBLIES AND EXTERIOR FINISH SCHEDULE
08 - OPENINGS	
08 12 00 - METAL FRAMES	
INTERIOR FRAMES:	ALL INTERIOR HOLLOW METAL FRAMES INSTALLED IN STUD WALLS ARE AN WALL THICKNESS TO ALL FOR INSTALLATION OF FRAME
08 14 16 - WOOD DOORS	
INTERIOR DOORS:	PREFINISHED, CLEAR MAPLE FLUSH DOORS
08 81 26 - GLASS PARTITIONS	
MATERIAL SELECTION:	1/2" CLEAR TEMPERED GLASS
	FLUSH, BUTT JOINTS BETWEEN PANELS
	3" CLEAR ANODIZED ALUMINUM BOTTOM CHANNEL, RECESSED TOP CHANNEL
09 - FINISHES	
09 29 82 - GYPSUM WALL BOARD	
SPECIFICATIONS:	5/8" TYPE X
	MOLD & MOISTURE RESISTANT BOARD IN WET AREAS AS REQUIRED
	LEVEL 4 FINISH, INSTALLED, TAPED, JOINT COMPOUND AND FINISH PER MANUFACTURER SPECIFICATIONS
09 51 23 - ACT CEILINGS	
MATERIAL SELECTION:	SEE FINISH SCHEDULE FOR SELECTIONS
09 65 19.19 - LUXURY VINYL COMPOSITE TILE	
MATERIAL SELECTION:	SEE FINISH SCHEDULE FOR SELECTIONS
09 68 13 - CARPET AND ADHESIVES	
MATERIAL SELECTION:	SEE FINISH SCHEDULE FOR SELECTIONS
10 - SPECIALTIES	
10 21 13 - TOILET COMPARTMENTS	
SPECIFICATIONS:	HADRIAN MANUFACTURING INC., OR APPROVED EQUAL
	COMPARTMENTS - HEADRAIL BRACED, POWDER COATED, SEE INTERIOR MATERIAL SPECIFICATIONS FOR COLOR SELECTION
	URINAL SCREENS - WALL MOUNTED, POWDER COATED, SEE INTERIOR MATERIAL SPECIFICATIONS FOR COLOR SELECTIONS
10 28 13 - TOILET ACCESSORIES	
SPECIFICATIONS:	SOAP DISPENSER: GAMCO G-950FA OR EQUAL, STAINLESS SATIN FINISH
	PAPER TOWEL / DISPOSAL COMBO: BOBRICK B-369 OR EQUAL, STAINLESS SATIN FINISH
	MIRRORS: FRAMELESS MIRRORS
	HOOKS: CONCEALED FASTENING, SATIN STAINLESS FINISH, COORDINATE WITH TOILET PARTITIONS
	GRAB BARS: SURFACE MOUNT, SATIN STAINLESS FINISH
	TOILET TISSUE DISPENSERS: SURFACE MOUNT, DOUBLE ROLL DISPENSER, SATIN STAINLESS FINISH
	BABY CHANGING STATION: HORIZONTAL, SURFACE MOUNT, KOALA KARE KB200 OR EQUAL
	SEE DETAIL PLANS FOR LOCATIONS AND QUANTITIES
13 - SPECIAL CONSTRUCTION	
13 34 19 - PRE-ENGINEERED METAL BUILDING SYSTEMS:	
	REFER TO PRE-ENGINEERING METAL BUILDING DRAWINGS FOR PLANS, DETAILS AND SPECIFICATIONS

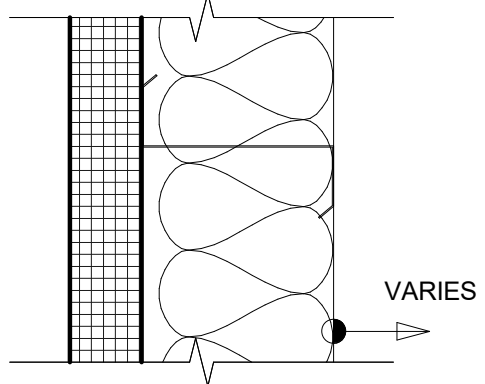
Mark	Description	Date
	BID AND PERMITS	04/22/2025
Building Design & Documentation 6/2023-2025 Jeffrey Parker Architects, Inc.		
 Jeffrey Parker architects		
ARCHITECTURE PLANNING ENGINEERING		
855 28th Street SE Grand Rapids, MI 49508		
Phone: 616-241-0090 Fax: 616-241-0098		
Addition & Renovation		
Markdom Renovation		
400 Parkland Dr, Charlotte, MI 48813		
SPECIFICATIONS		
Issued	Drawing No.	
Project No. 22067	A0.2	

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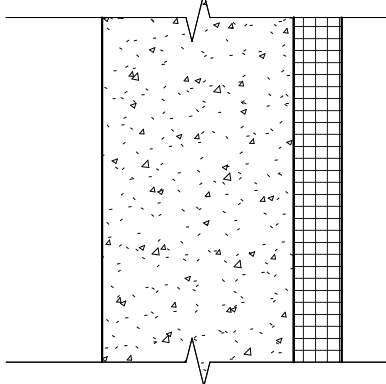
SF1

ALUMINUM STOREFRONT WINDOW SYSTEM
EXTERIOR
07 42 13 METAL PANEL
07 25 00 AIR & WEATHER BARRIER
06 16 10 PLYWOOD SHEATING
13 34 19 GIRT PER PEMB SUPPLIER
07 21 16.1 SIMPLE SAVER
INTERIOR



P5

METAL PANEL WALL
EXTERIOR
07 42 13 3" FALK PANEL
07 25 00 AIR & WEATHER BARRIER
13 34 19 GIRT PER PEMB SUPPLIER
INTERIOR



P1

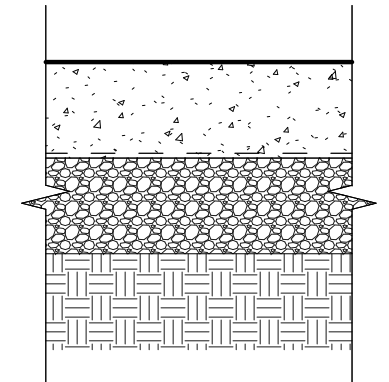
BELOW GRADE CONC WALL
EXTERIOR
03 30 00 CIP CONC WALL PER PLAN
07 21 13 RIGID INSULATION (R10 MIN)
INTERIOR

* TOTAL ASSEMBLY U VALUE = ???

* TOTAL ASSEMBLY U VALUE = ???

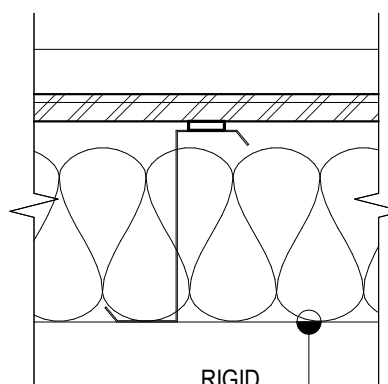
* TOTAL ASSEMBLY UVALUE =

EXTERIOR WALLS



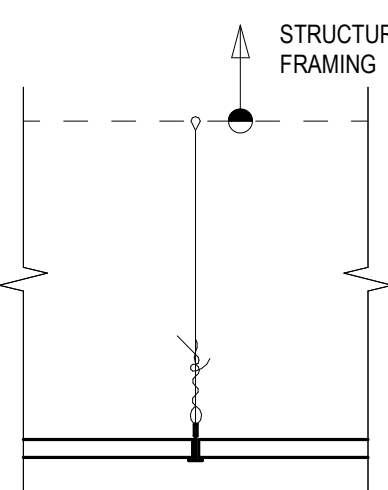
F1

CIP CONC SLAB
03 30 00 CIP CONC SLAB - FINISH PER SCHEDULE
03 30 00 VAPOR BARRIER
31 20 00 COMPACT GRAVEL
31 20 00 STRUCT FILL
F1.1: 4" INTERIOR CONCRETE
4" EXTERIOR CONCRETE



R1

METAL ROOF
EXTERIOR
13 34 19 DBLK STANDING SEAM MTL ROOF
PANEL - CLIPPED TO PURLINS PER MFG REQ
13 34 19 THERMAL BLOCK
13 34 19 PURLIN PER PEMB SUPPLIER
07 21 16.1 SIMPLE SAVER INSULATION
13 34 19 RIGID FRAME PER PEMB SUPPLIER
INTERIOR



C1

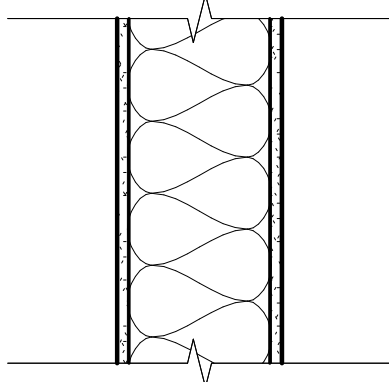
ACT CEILING
05 10 00 STRUCTURAL FRAMING PER PLAN
09 51 23 WIRE HANGER
09 51 23 METAL GRID
09 51 23 ACOUSTIC CEILING TILE PER SCHED

* TOTAL ASSEMBLY UVALUE =

ASSEMBLIES - FLOORS

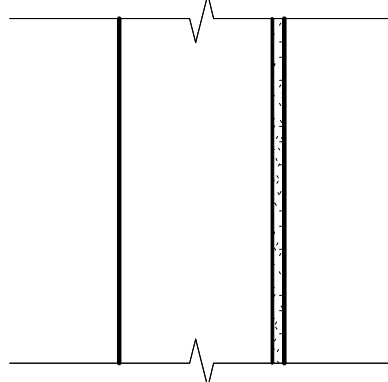
ASSEMBLIES - ROOFS

ASSEMBLIES - CEILINGS



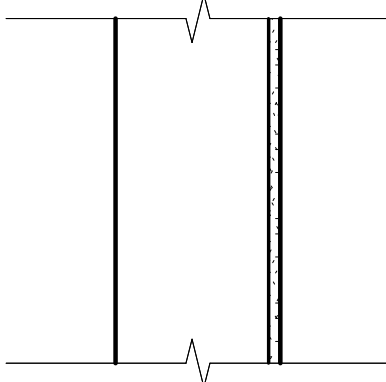
A

GYP BD PARTITION
5/8" PAINTED GYP PER FINISH SCHEDULE
METAL STUD (SIZE VARIES)
A1: 3 5/8" METAL STUD
A2: 6" METAL STUD
A3: 8" METAL STUD
BATT INSULATION TO FILL CAVITY
5/8" PAINTED GYP PER FINISH SCHEDULE



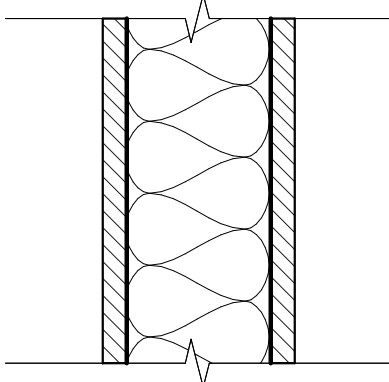
B

GYP BD PARTITION
5/8" PAINTED GYP PER FINISH SCHEDULE
METAL STUD (SIZE VARIES)
B1: 2 1/2" METAL STUD
B2: 3 5/8" METAL STUD
B3: 6" METAL STUD



C

TILE PARTITION
3/8" TILE (PER FINSHI SCHDULE)
1/2" TILE BACKER BOARD
METAL STUD (SIZE VARIES)
C1: 3 5/8" METAL STUD
C2: 6" METAL STUD
C3: 3 5/8" METAL STUD
1/2" TILE BACKER BOARD
3/8" TILE (PER FINSHI SCHDULE)



L

LINER PANEL PARTITION

ASSEMBLIES - INTERIOR WALLS

Mark	Description	Date
	BID AND PERMITS	04/22/2025



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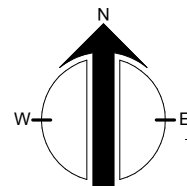
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ASSEMBLIES

Issued

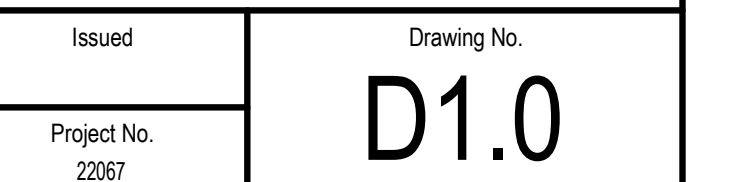
Project No.
22067

Drawing No.
A0.3



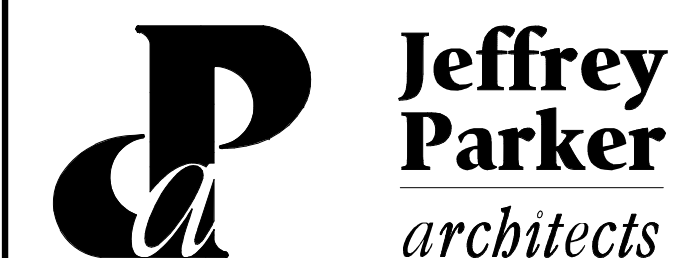
Scale: 1/16" = 1'-0"

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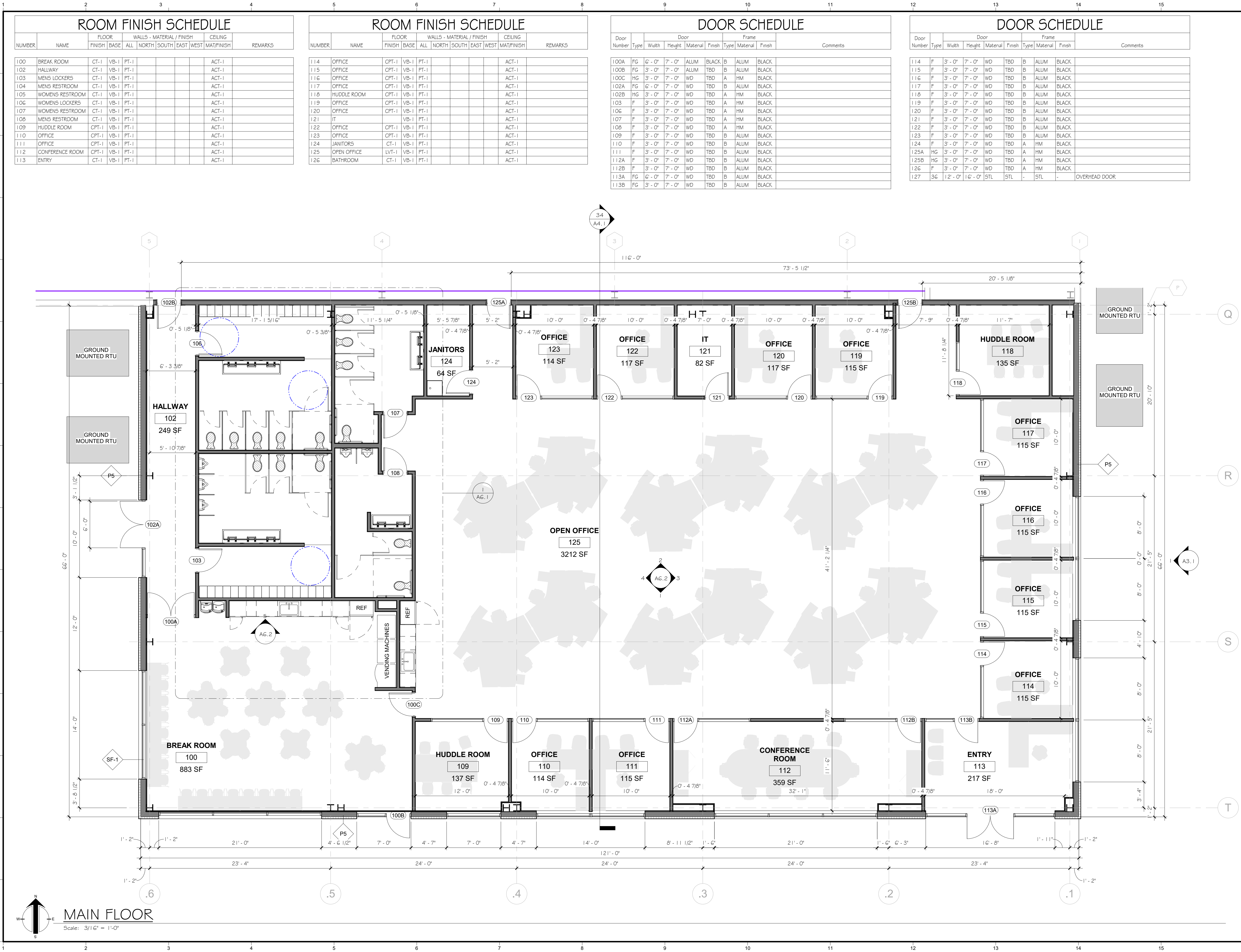
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OVERALL FLOOR PLAN

Issued	Drawing No. A1.0
Project No. 22067	



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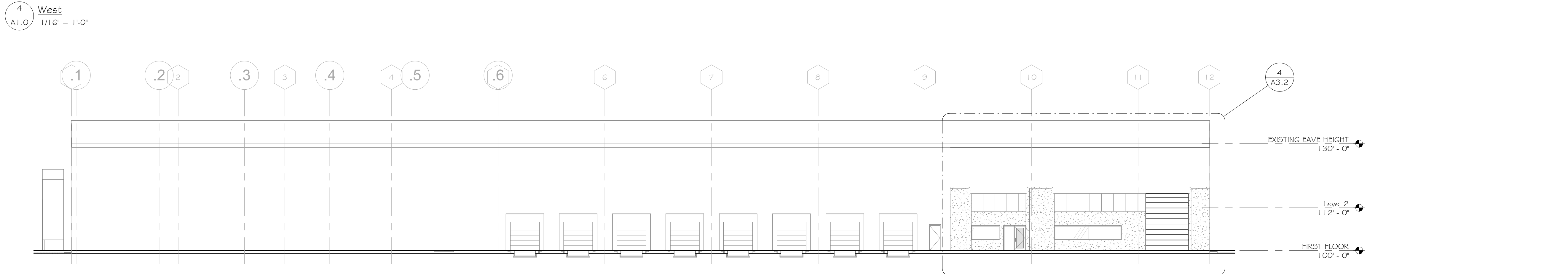
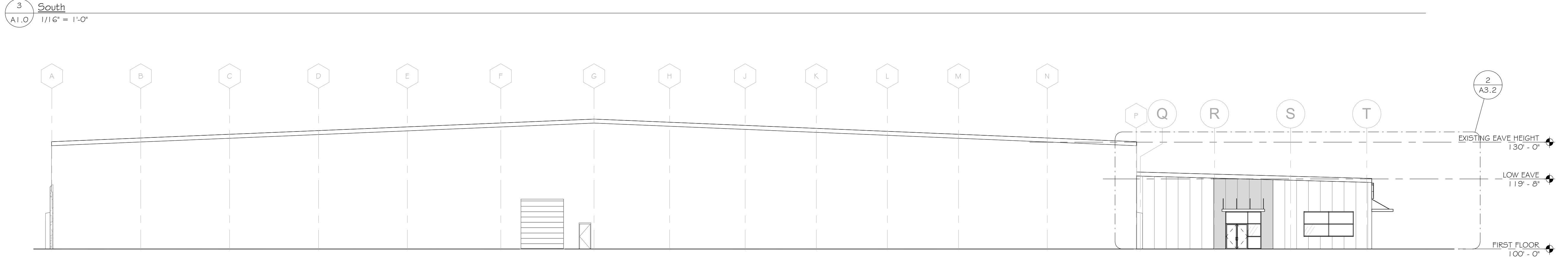
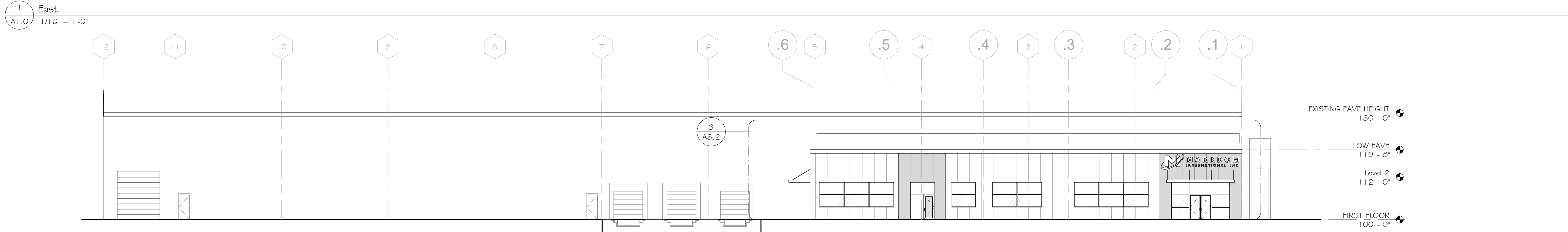
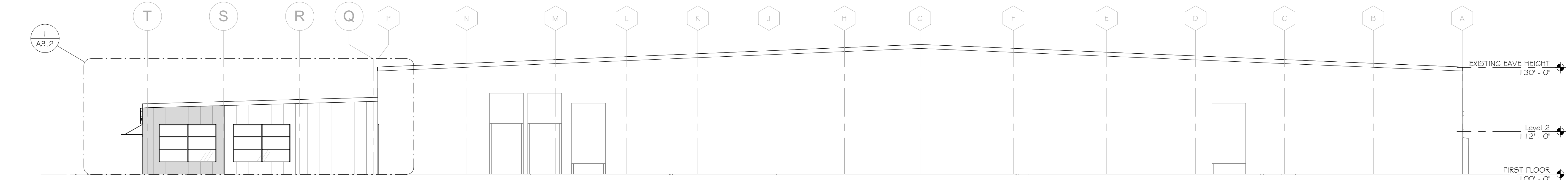
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Issued	Drawing No.
Project No. 22067	A1.1

EXTERIOR FINISH SCHEDULE

TAG	DESCRIPTION	SPEC SECTION	FINISH / COLOR
CANOPY			
CC-1	MAPES CANOPY	13 34 19	TBD
METAL SIDING			
MS-1	FALK 3" METAL PANEL	07 14 13.19	SMP GALLERY BLUE
MS-2	FALK 3" METAL PANEL	07 14 13.19	SMP CHARCOAL
STORE FRONT			
SF-1	ALUMINUM STORE FRONT WINDOWS	08 51 13	TBD



Mark	Description	Date
BID AND PERMITS		04/22/2025

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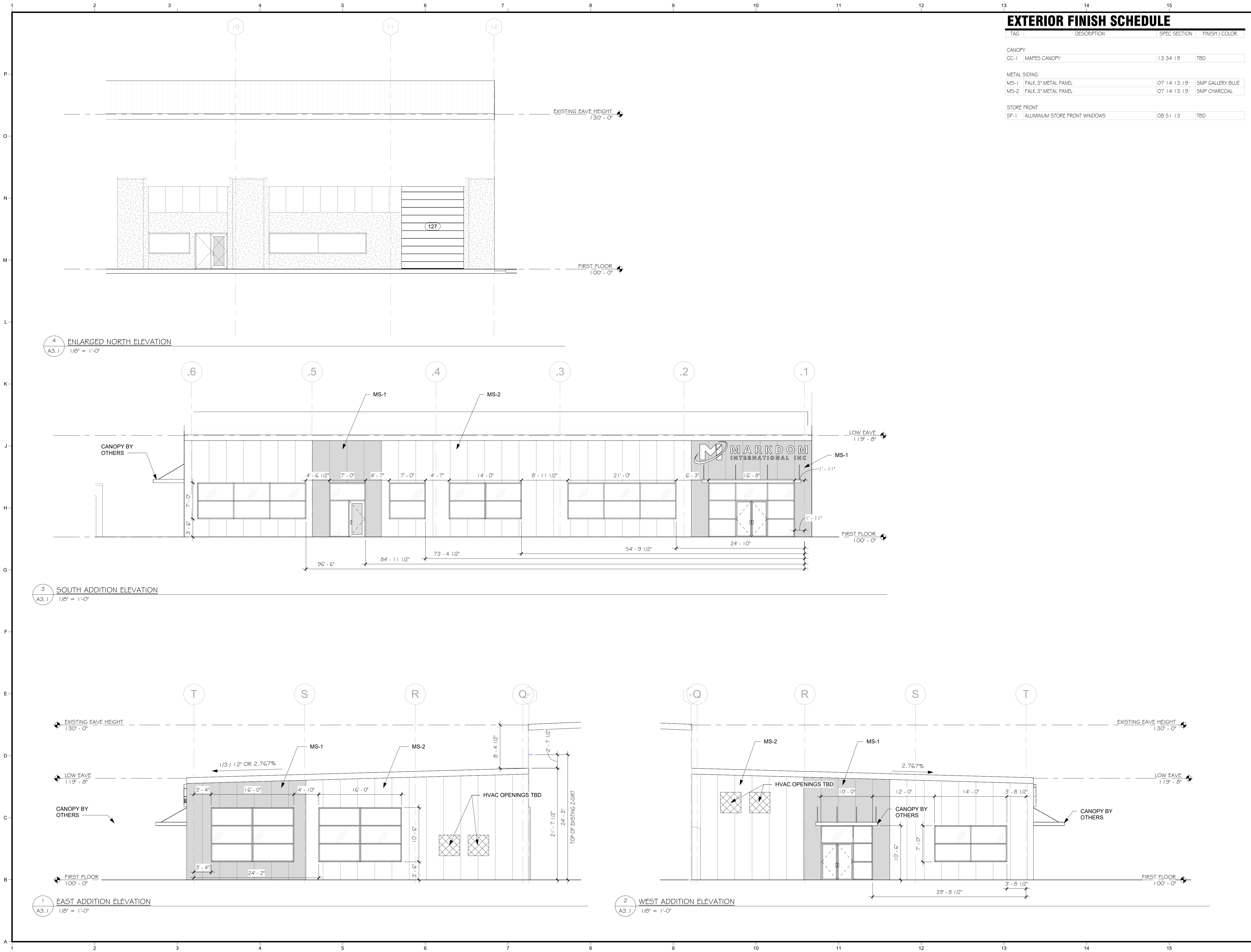
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EXTERIOR ELEVATIONS

Issued	Drawing No.
Project No. 22067	A3.1



EXTERIOR FINISH SCHEDULE

TAG	DESCRIPTION	SPEC SECTION	FINISH / COLOR
CANOPY			
CC-1	MAPES CANOPY	13 34 19	TBD
METAL SIDING			
MS-1	FALK 3" METAL PANEL	07 14 13.19	SMP GALLERY BLUE
MS-2	FALK 3" METAL PANEL	07 14 13.19	SMP CHARCOAL
STORE FRONT			
SF-1	ALUMINUM STORE FRONT WINDOWS	08 51 13	TBD

Mark	Description	Date
BID AND PERMITS		04/22/2025

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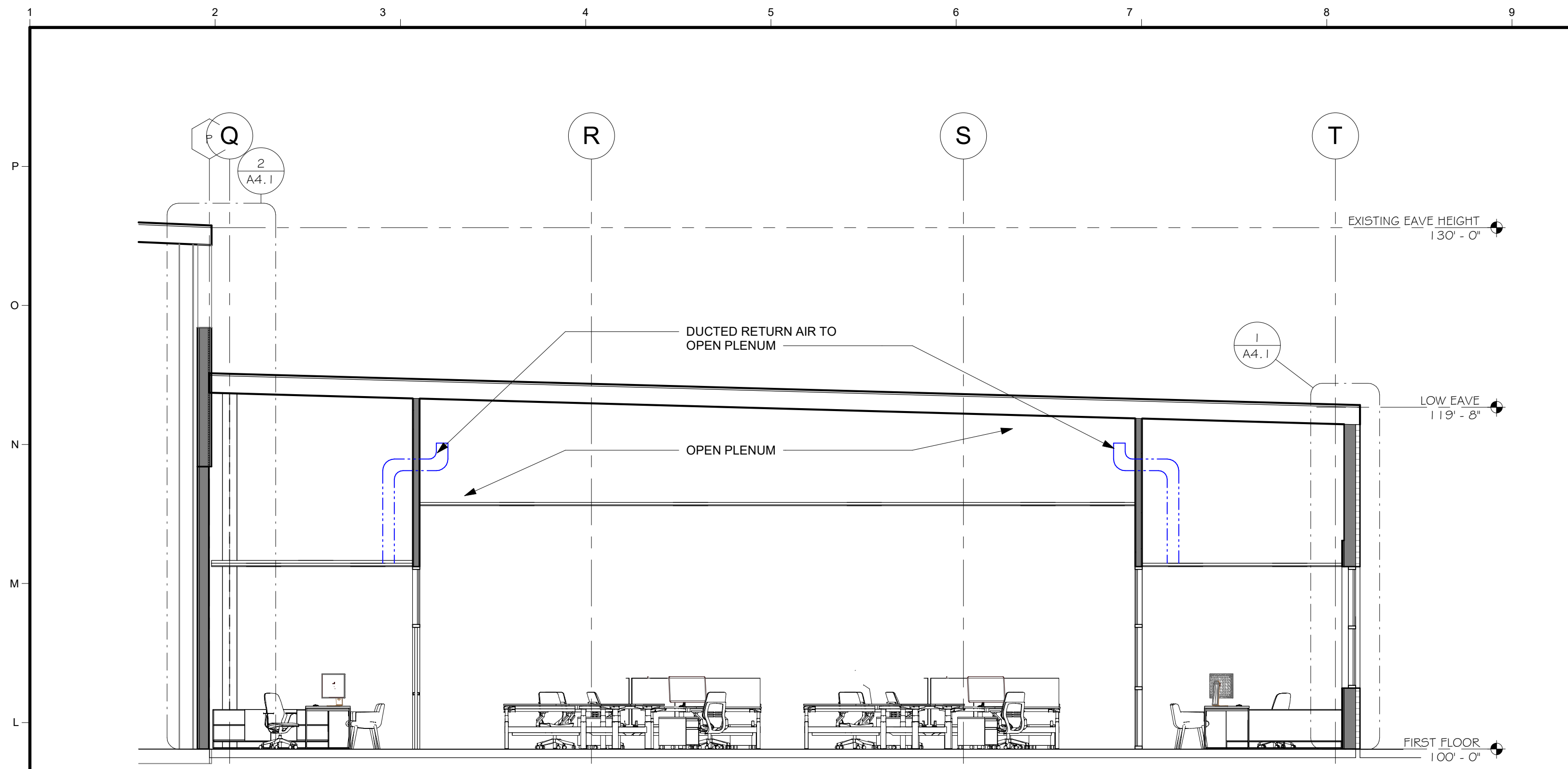
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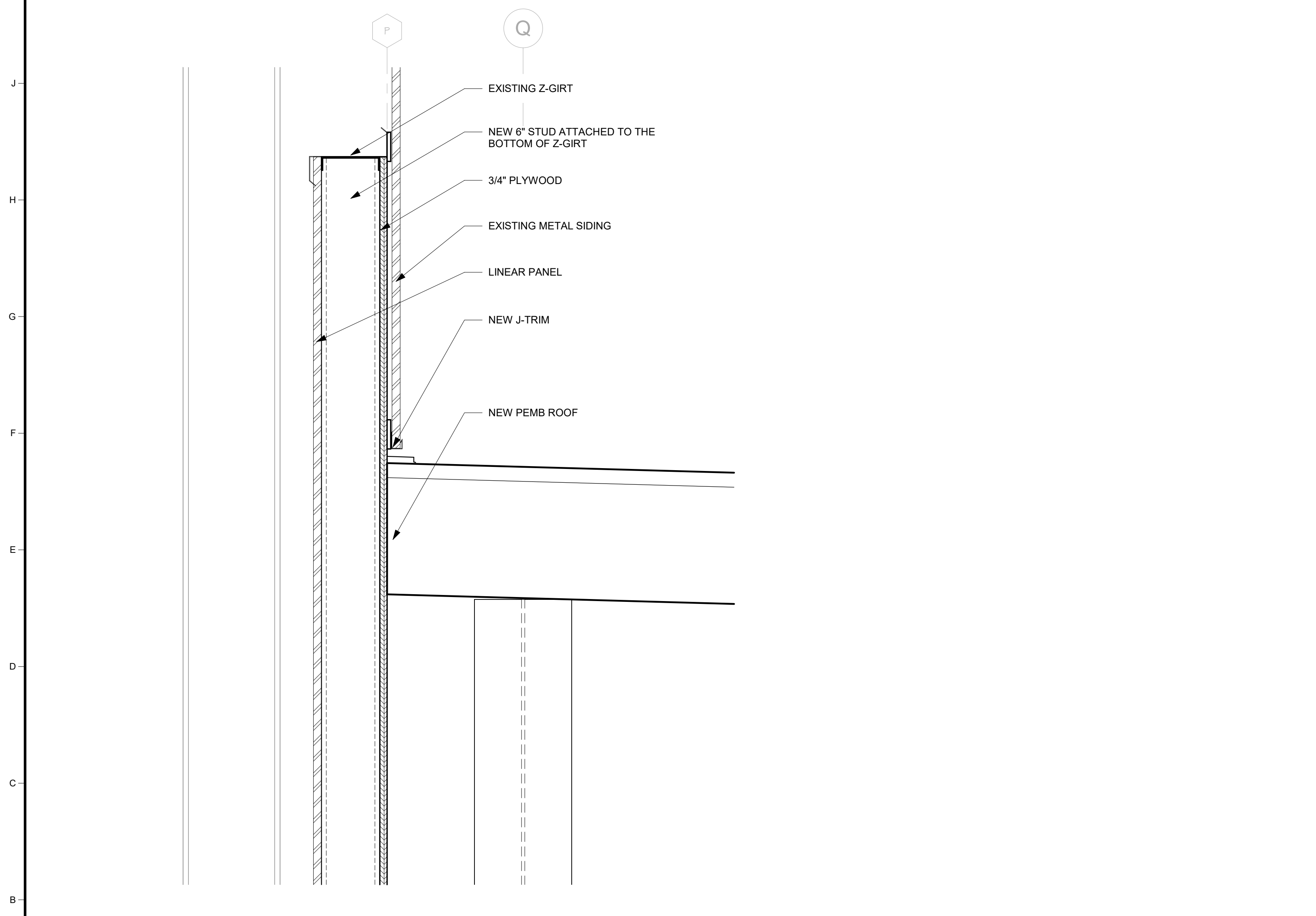
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EXTERIOR ELEVATIONS

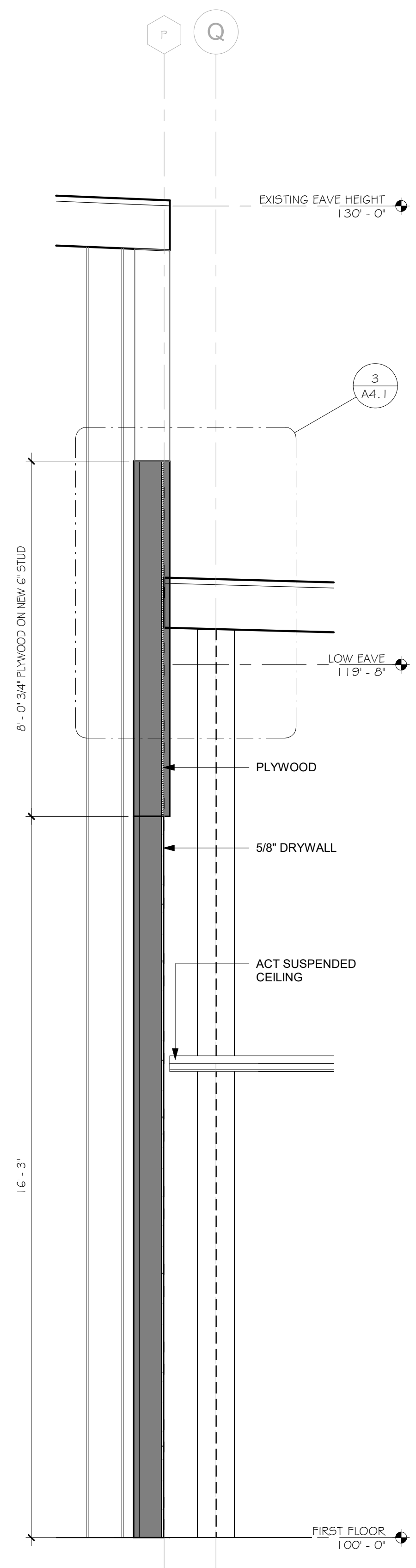
Issued	Drawing No.
Project No. 22067	A3.2



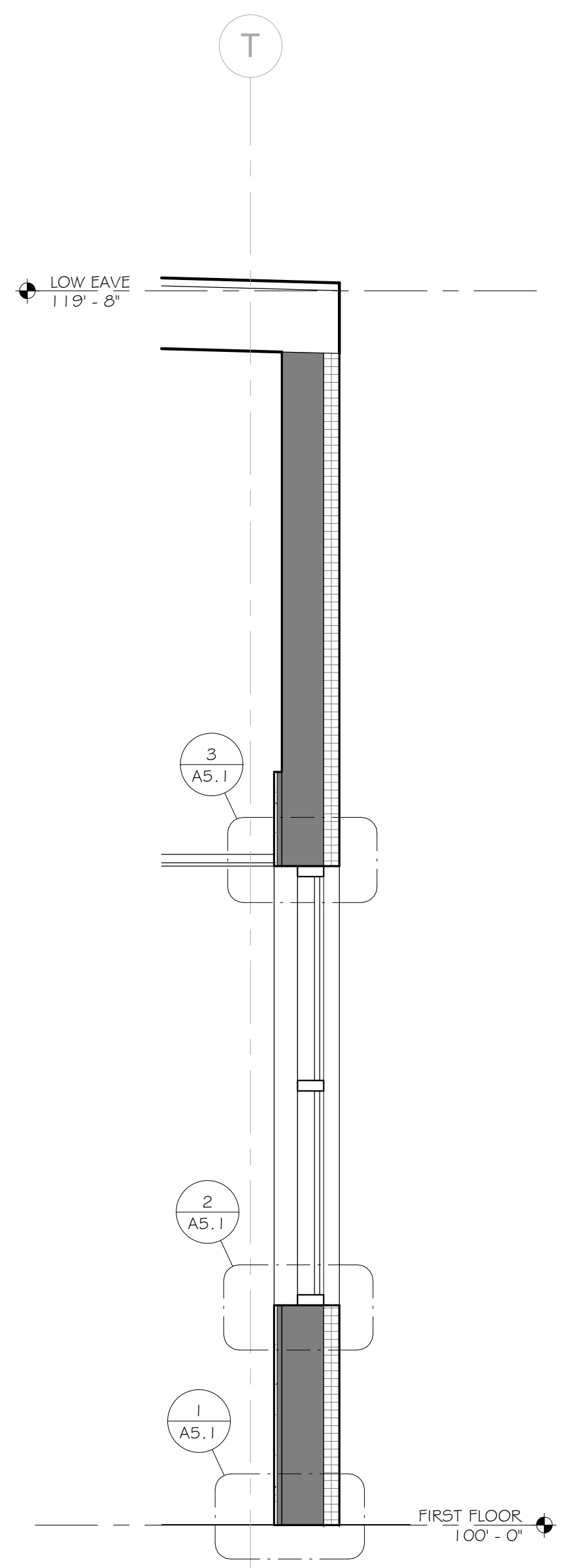
34 BUILDING SECTION
3/16" = 1'-0"



3 Section 1 - Callout 1 - Callout 1
1/2" = 1'-0"



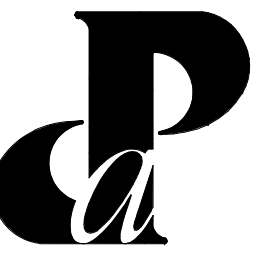
2 Section 1 - Callout 1
1/2" = 1'-0"



1 Section 1 - Callout 2
1/2" = 1'-0"

Mark	Description	Date
BID AND PERMITS		04/22/2025

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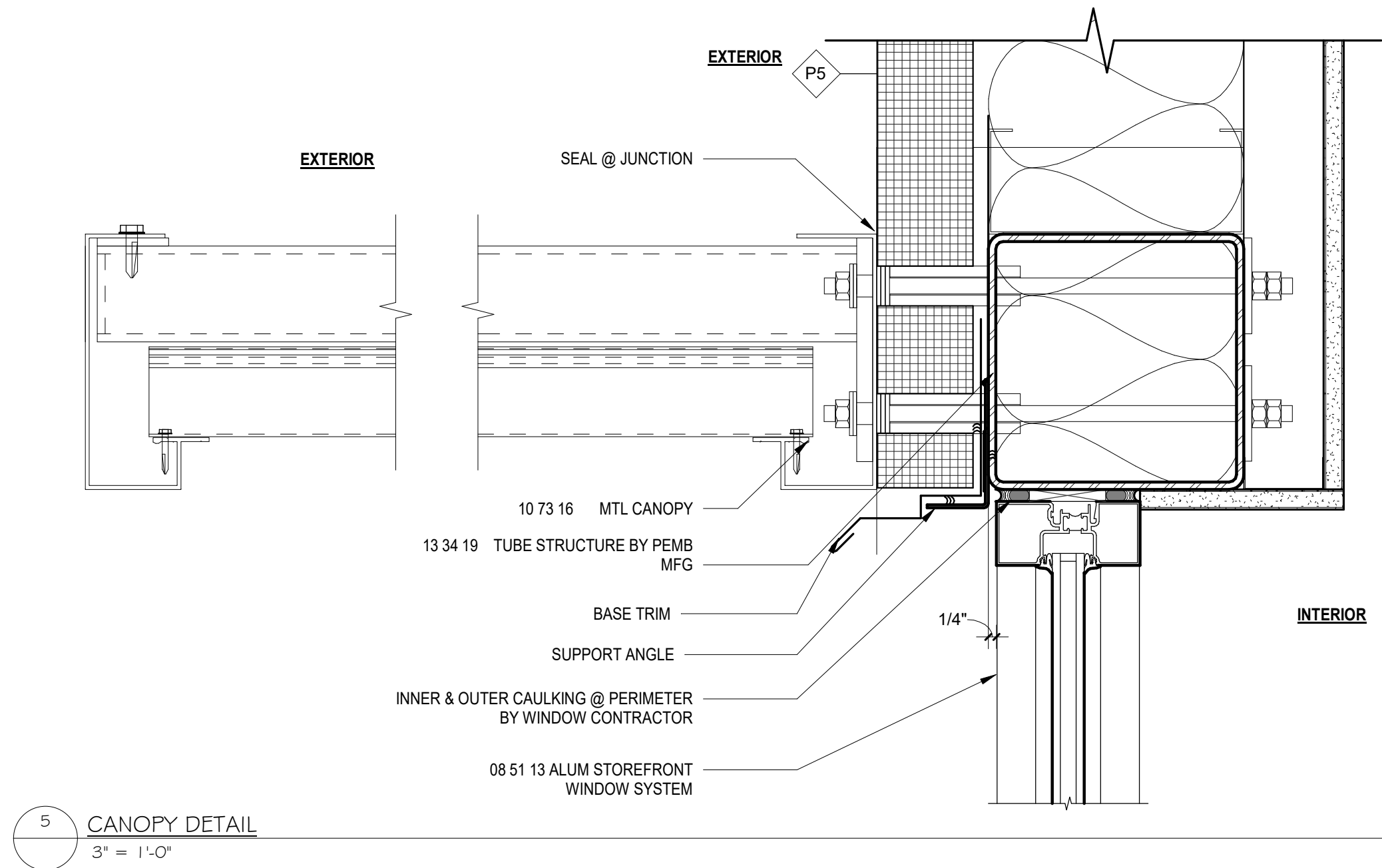
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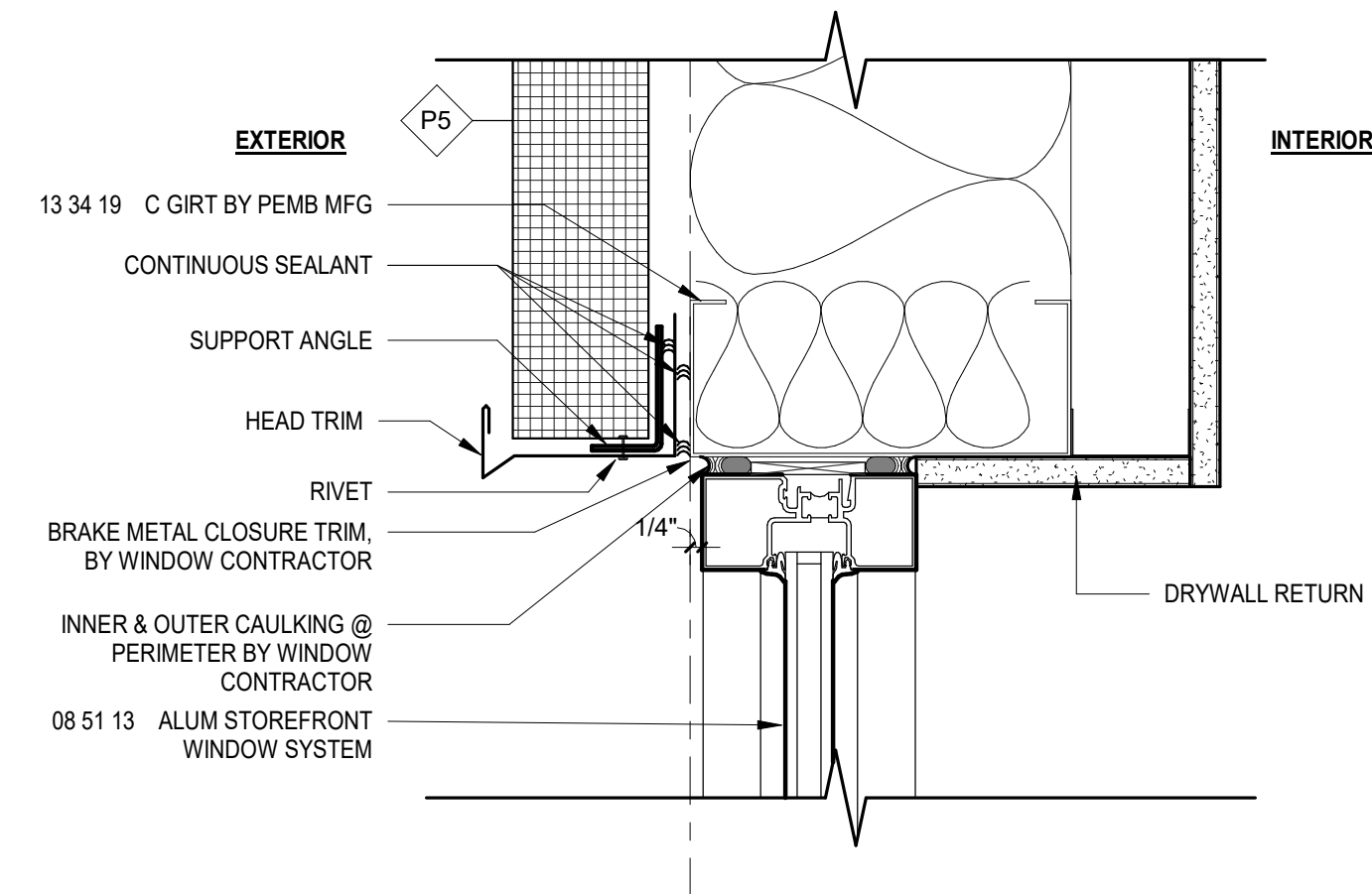
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BUILDING SECTIONS

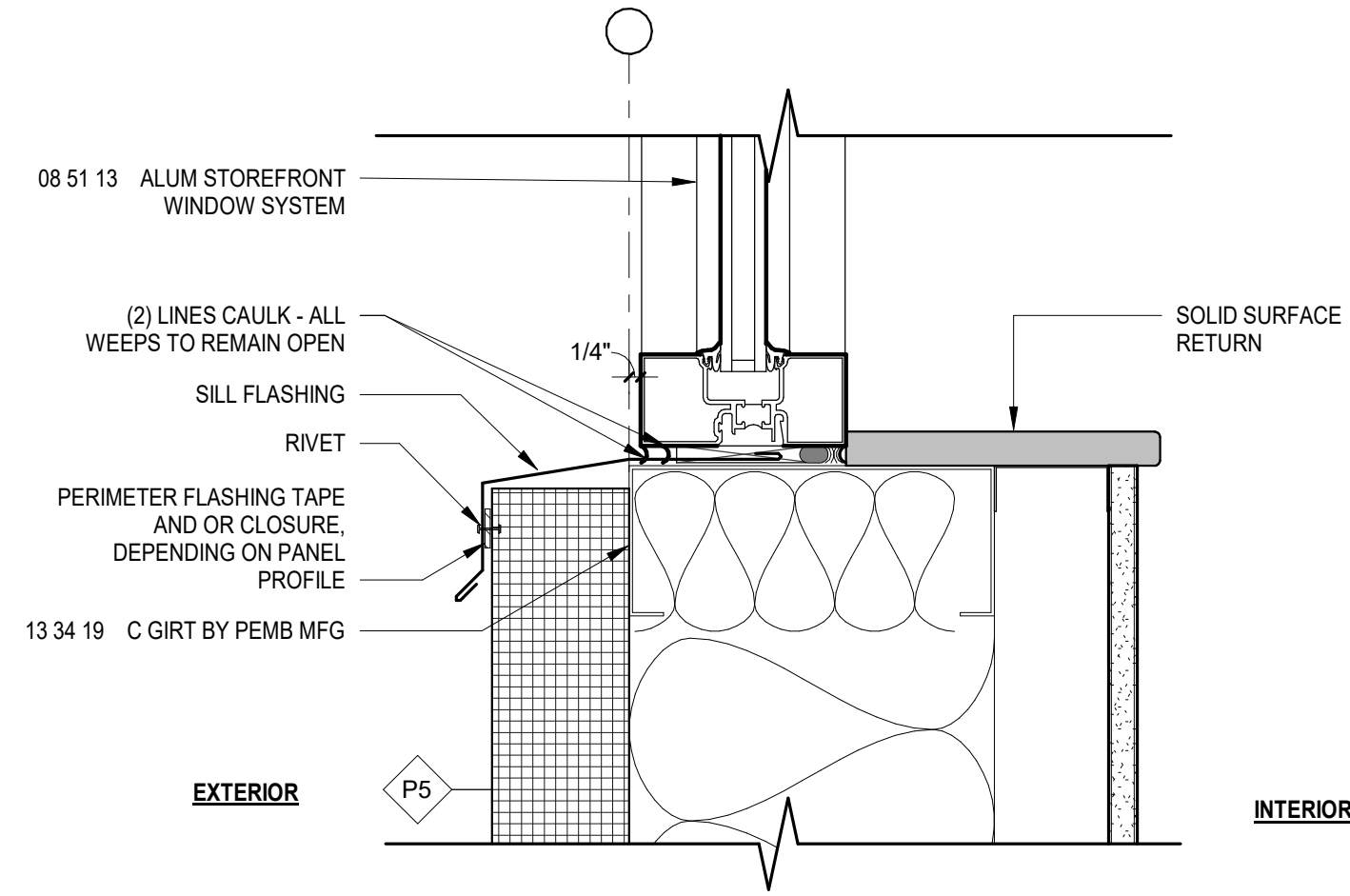
Issued	Drawing No.
Project No. 22067	A4.1



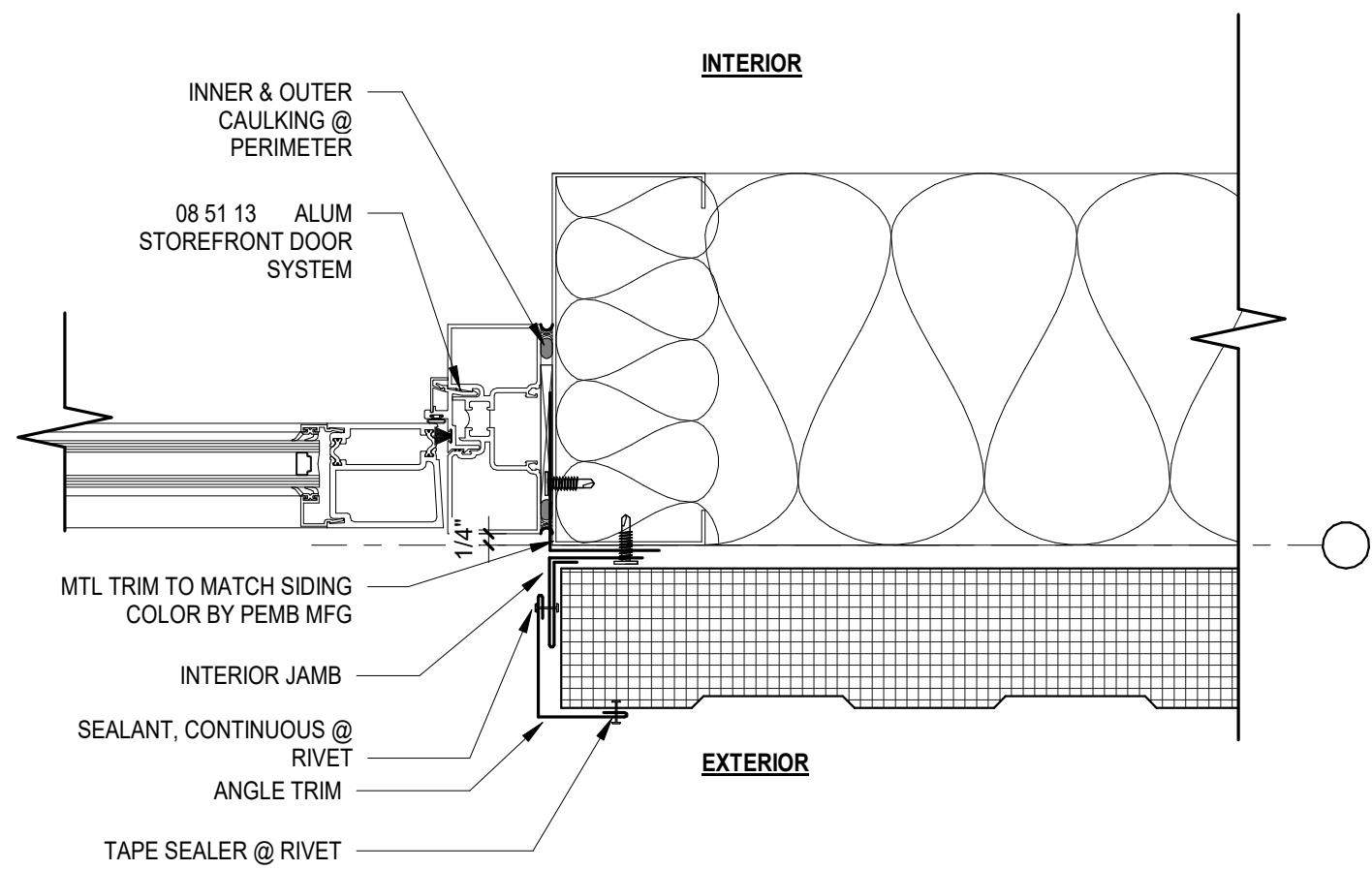
5 CANOPY DETAIL
3" = 1'-0"



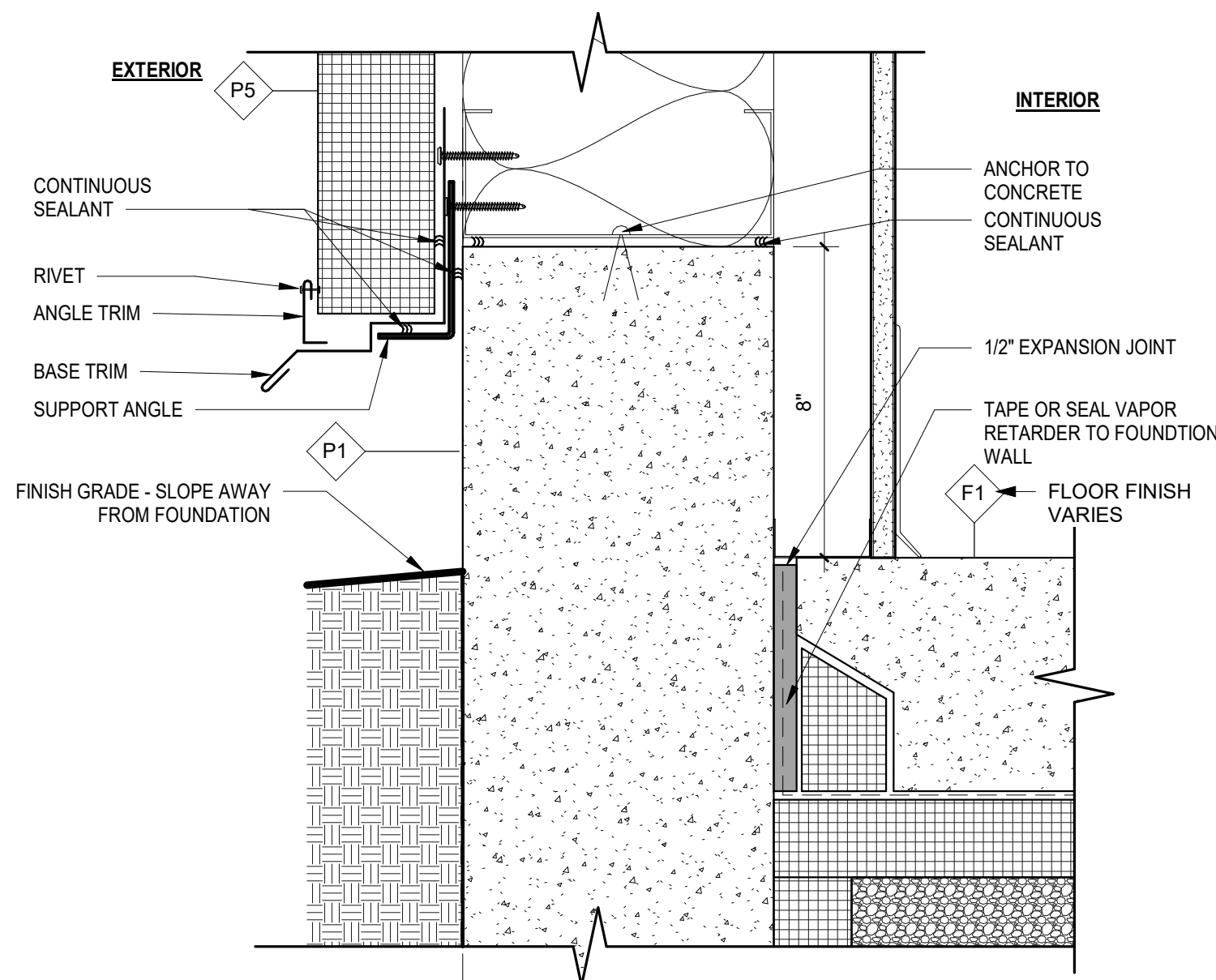
3 HEAD DETAIL
3" = 1'-0"



2 SILL DETAIL
3" = 1'-0"



4 JAMB DETAIL
3" = 1'-0"



1 FOUNDATION DETAIL
3" = 1'-0"

Mark	Description	Date
BID AND PERMITS		04/22/2025

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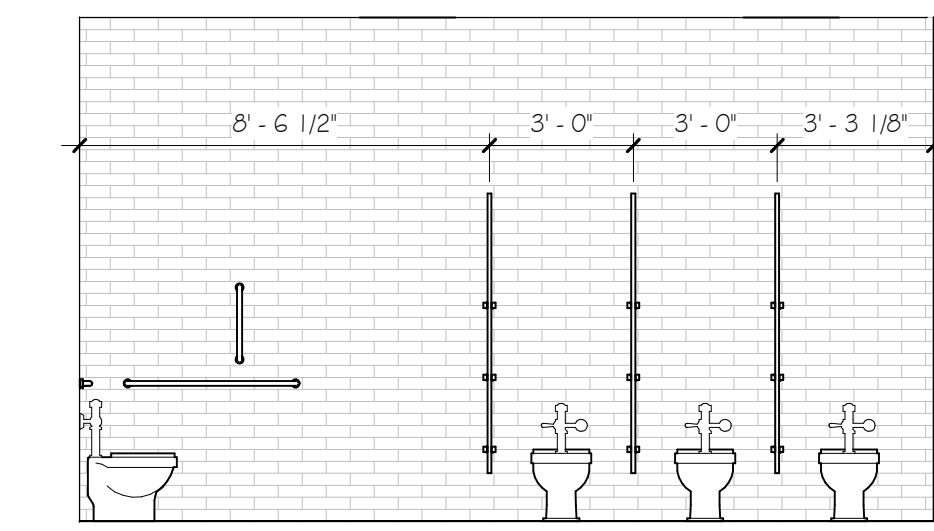
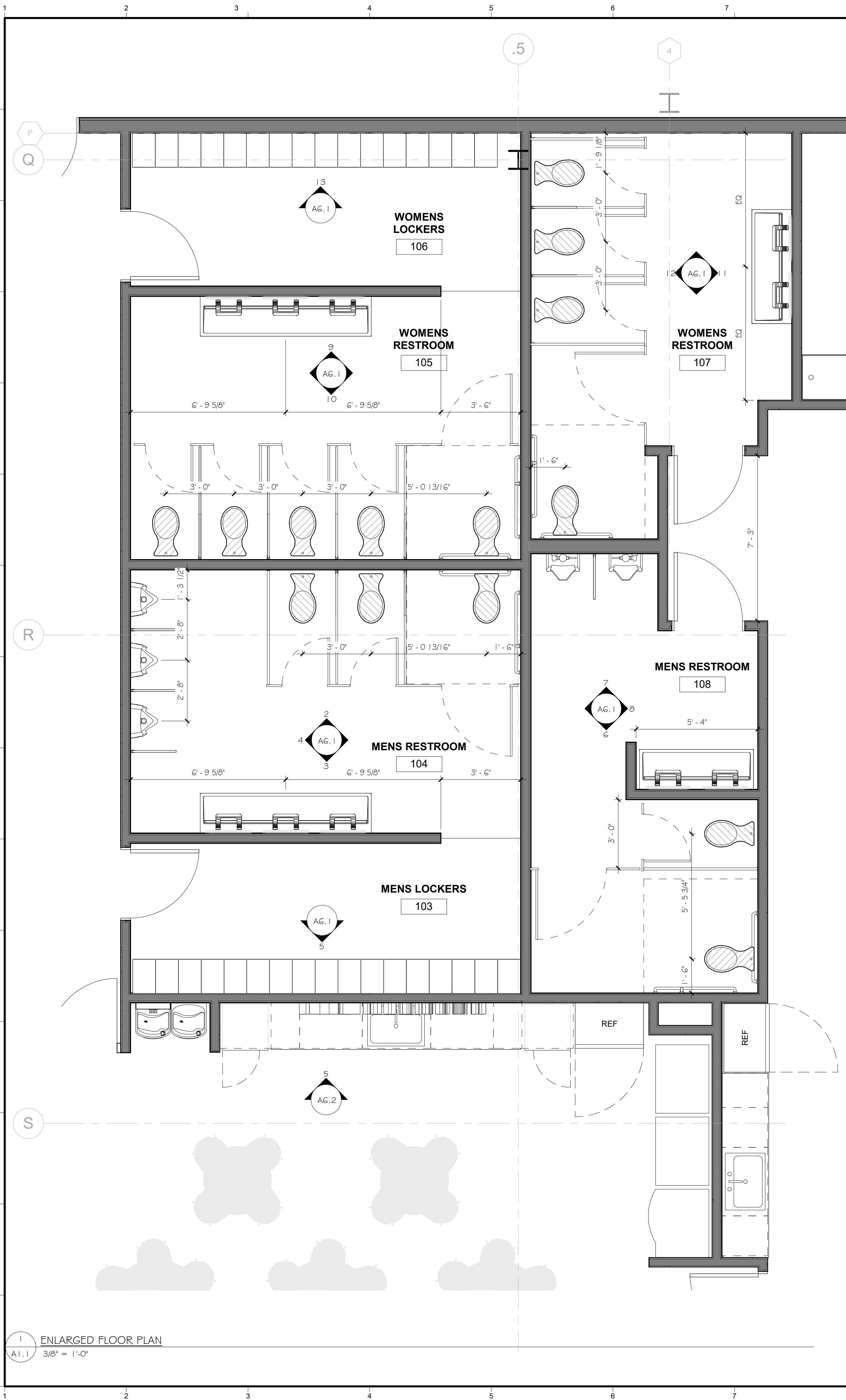
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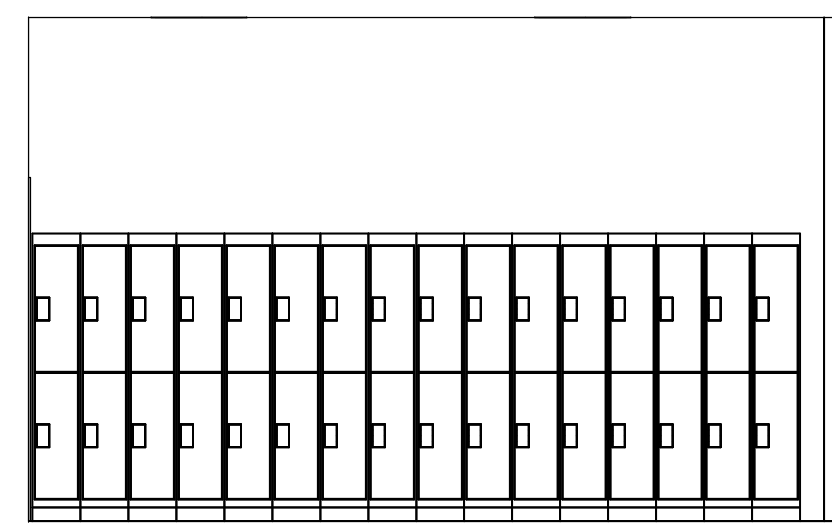
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WALL SECTIONS & DETAILS

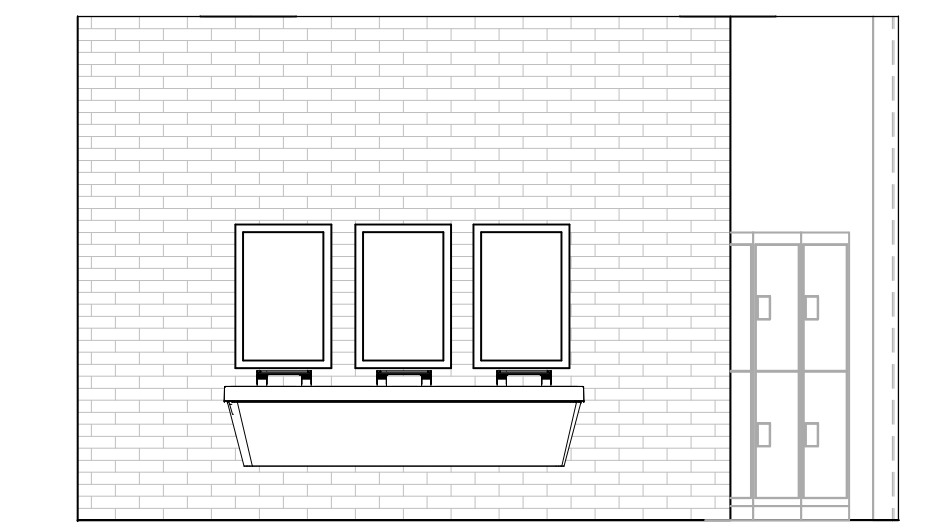
Issued	Drawing No.
Project No. 22067	A5.1



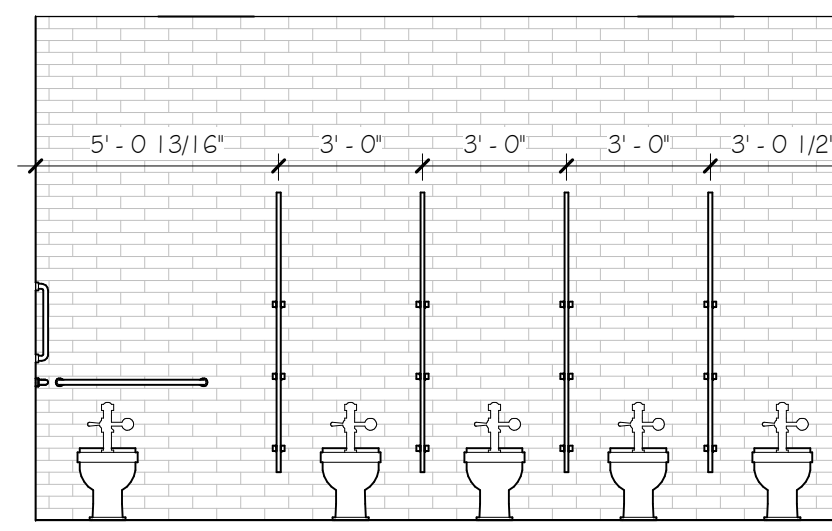
12 TOILET ELEVATION RM 107
AG.1 1/4" = 1'-0"



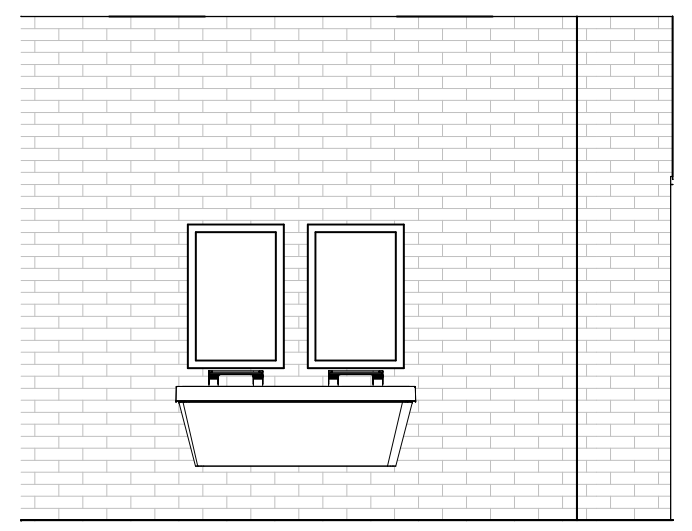
13 WOMENS LOCKER ROOM
AG.1 1/4" = 1'-0"



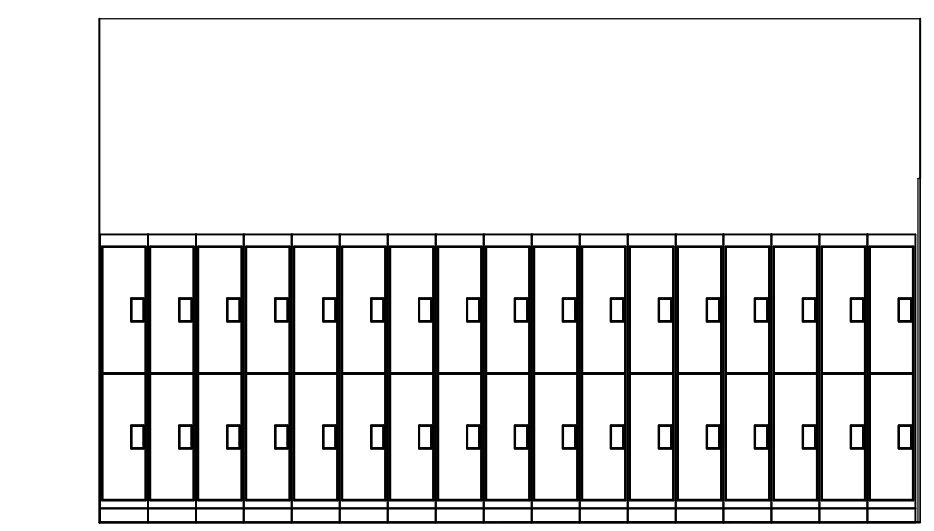
9 WOMENS SINK ELEVATION
AG.1 1/4" = 1'-0"



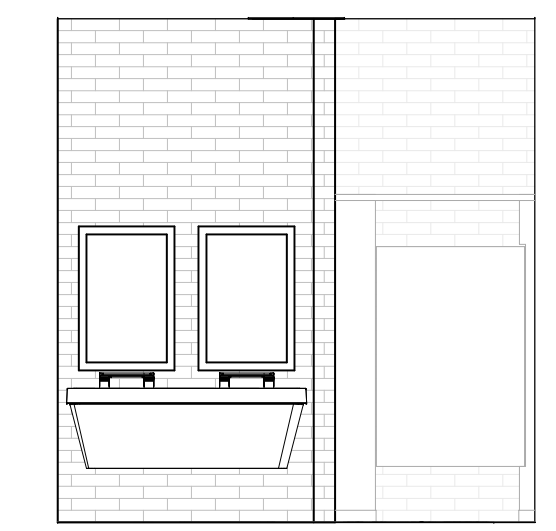
10 WOMENS RESTROOM
AG.1 1/4" = 1'-0"



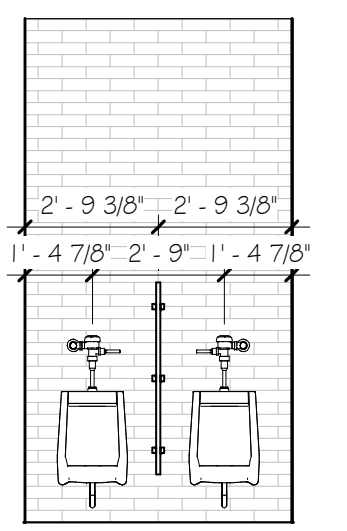
11 SINK ELEVATION RM 107
AG.1 1/4" = 1'-0"



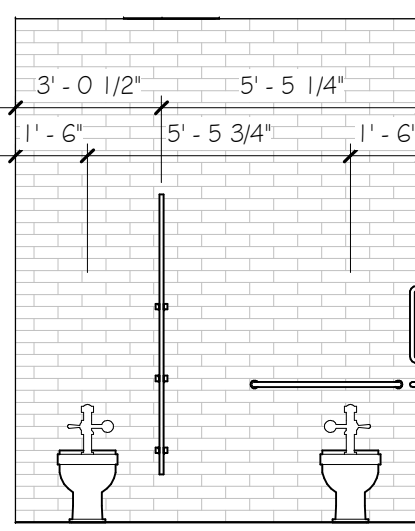
5 MENS LOCKER ROOM
AG.1 1/4" = 1'-0"



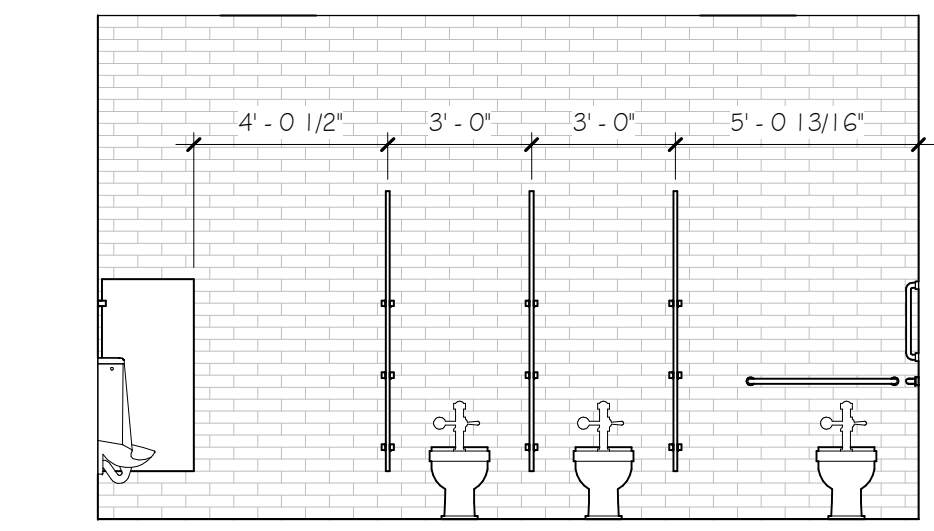
6 SINK ELEVATION
AG.1 1/4" = 1'-0"



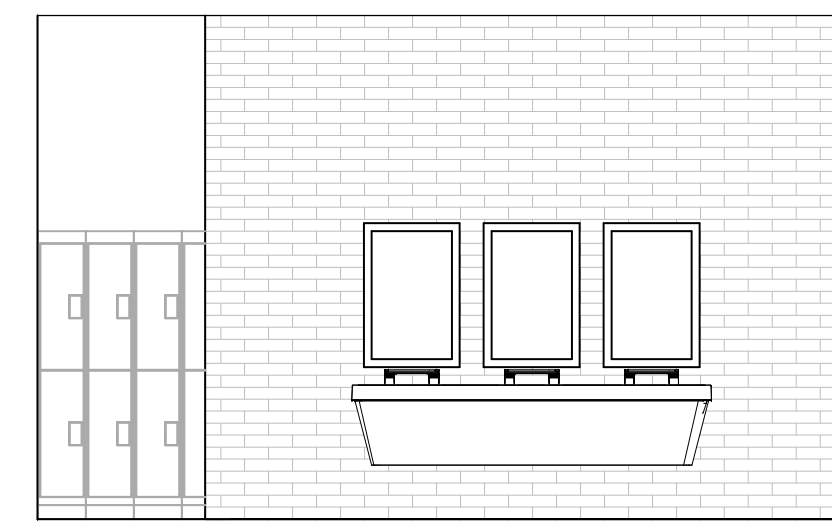
7 URINAL ELEVATION RM 108
AG.1 1/4" = 1'-0"



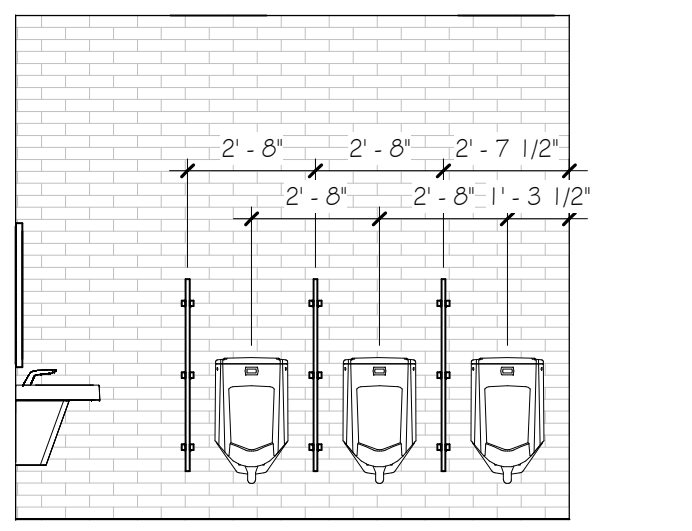
8 TOILET ELEVATION RM 108
AG.1 1/4" = 1'-0"



2 MENS RESTROOM ELEVATION
AG.1 1/4" = 1'-0"



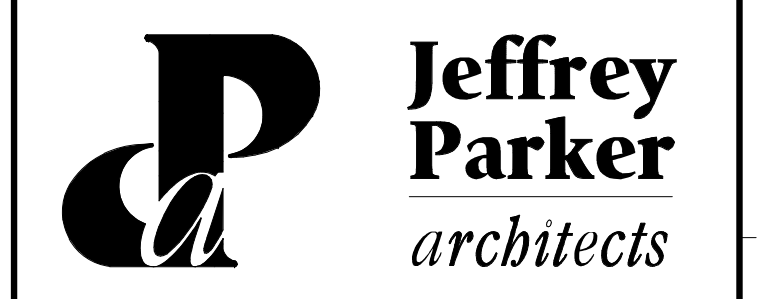
3 MENS SINK ELEVATION
AG.1 1/4" = 1'-0"



4 URINAL ELEVATION
AG.1 1/4" = 1'-0"

Mark	Description	Date
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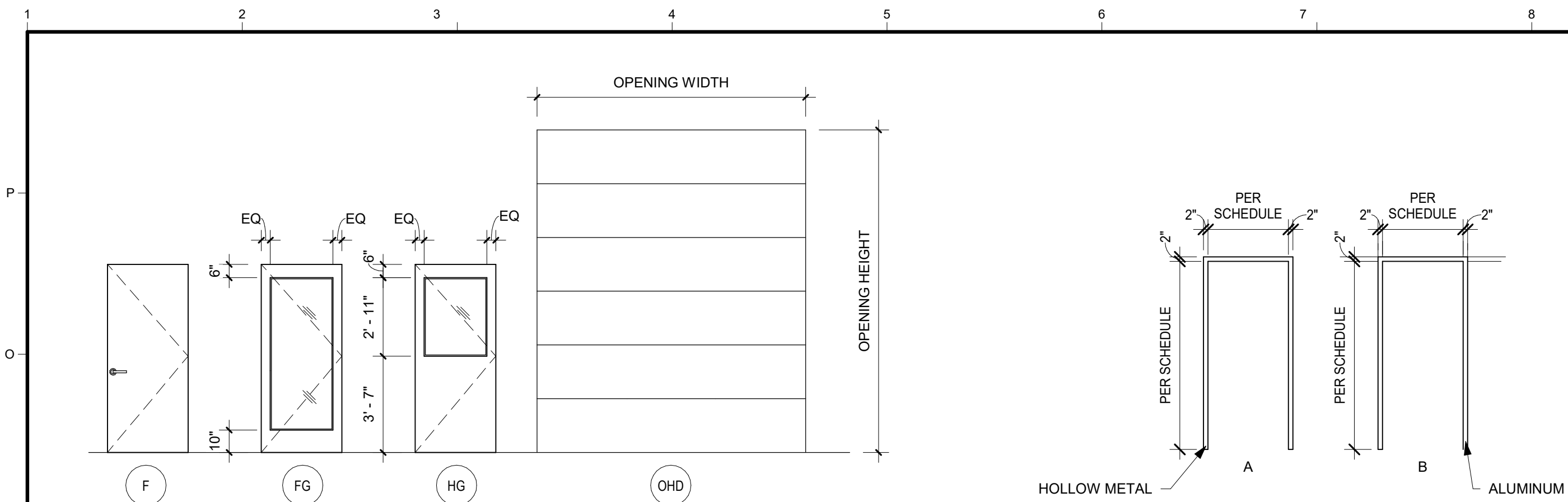


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ENLARGED BATHROOM PLAN

Issued	Drawing No.
Project No. 22067	A6.1

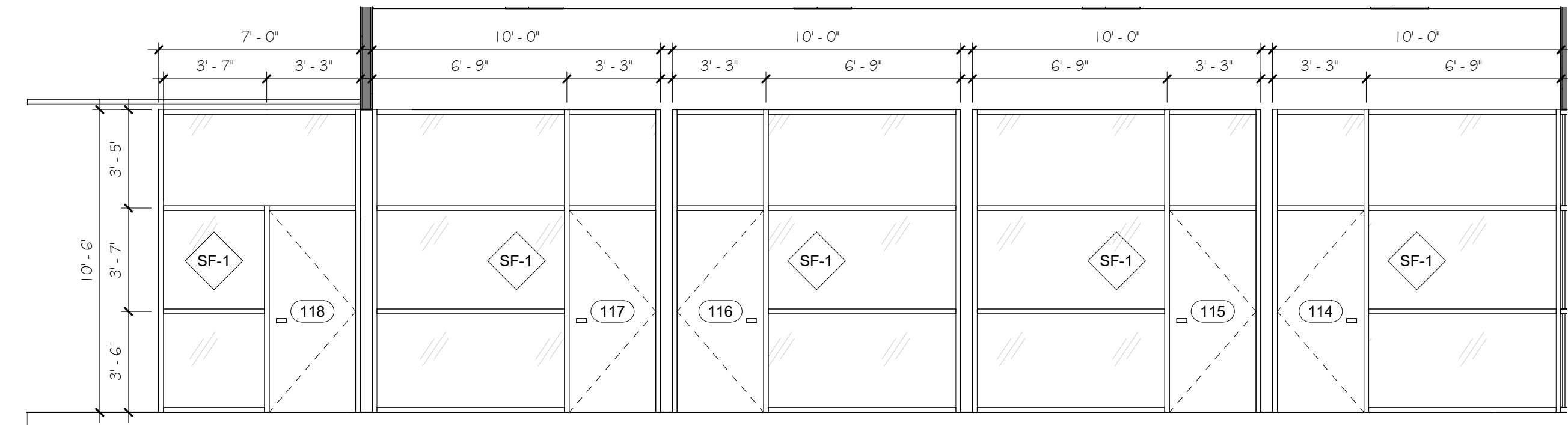


DOOR TYPES

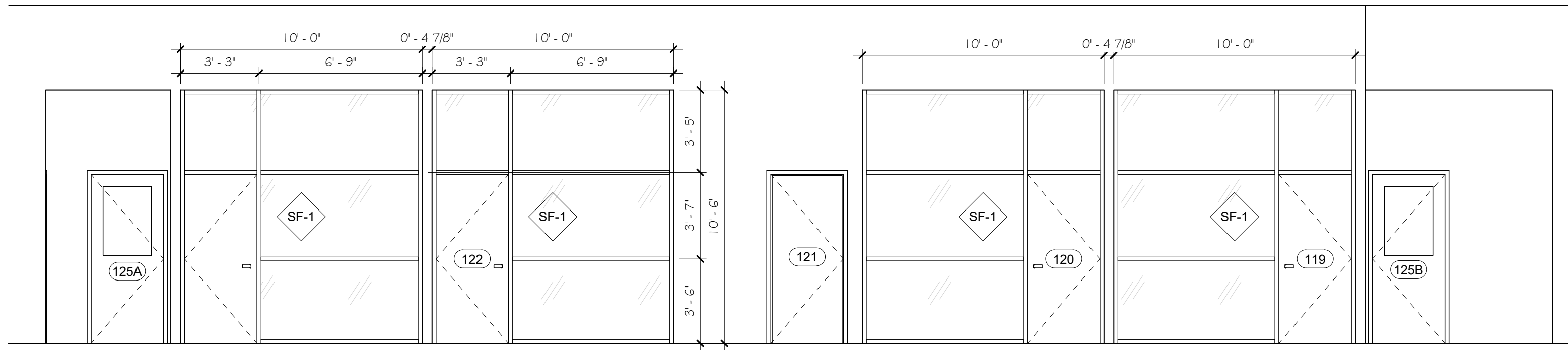
FRAME TYPES

INTERIOR MATERIAL SPECIFICATIONS

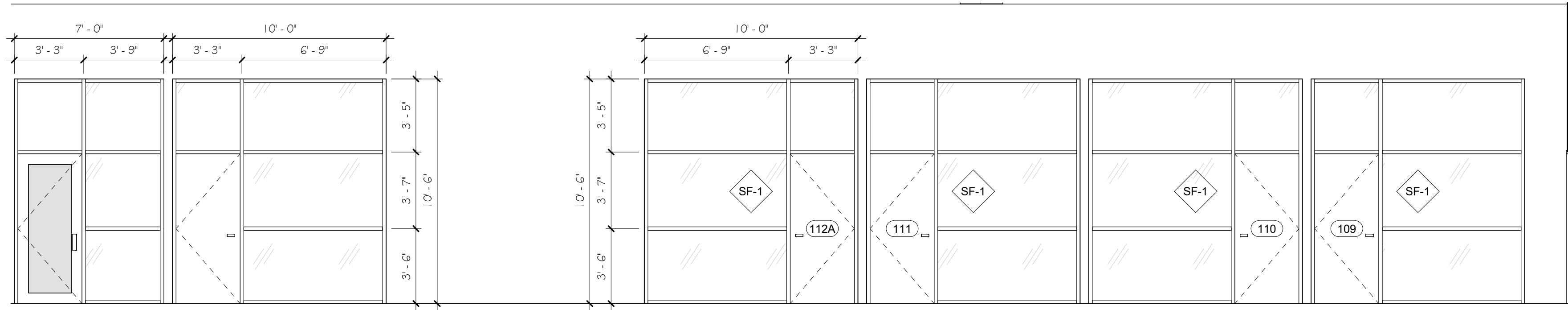
MATERIAL SELECTION SCHEDULE					
ABBREV	MANUFACTURER	PATTERN	COLOR	PRODUCT NO.	SIZE
ACOUSTICAL CEILING TILES					
ACT-1	ARMSTRONG	ULTIMA	WHITE		24x24
CARPET					
CPT-1	J+J FLOORING	INTRINSIC ACCENT 7311	3563 ESSENTIAL ACCENT		24x24
CPT-1	J+J FLOORING	INTRINSIC ACCENT 7311	3563 ESSENTIAL ACCENT		24x24 WALK OFF CARPET
CERAMIC TILE					
CT-1	TBD	12X24			
CT-2	TBD	SUBWAY	TBD		
LUXURY VINYL TILE					
LVT-1	TBD				
METAL LOCKERS					
ML-1	TBD				
PAINT					
PT-1	TBD				
PLASTIC LAMINATE					
PL-1	WILSONART	TRACELESS	ACORN VELVET ELM	15602-31	
POLISHED CONCRETE					
PC-1	TBD				
SOLID SURFACE					
SS-1	CORIAN	SOLID SURFACE	NATURAL GRAY		
TOILET PARTITIONS					
TP-1	HADRIAN		GRAY		
VINYL BASE					
VB-1	TARKETT	TRADITIONAL WALL BASE	DOCKSIDE WG	199	4"



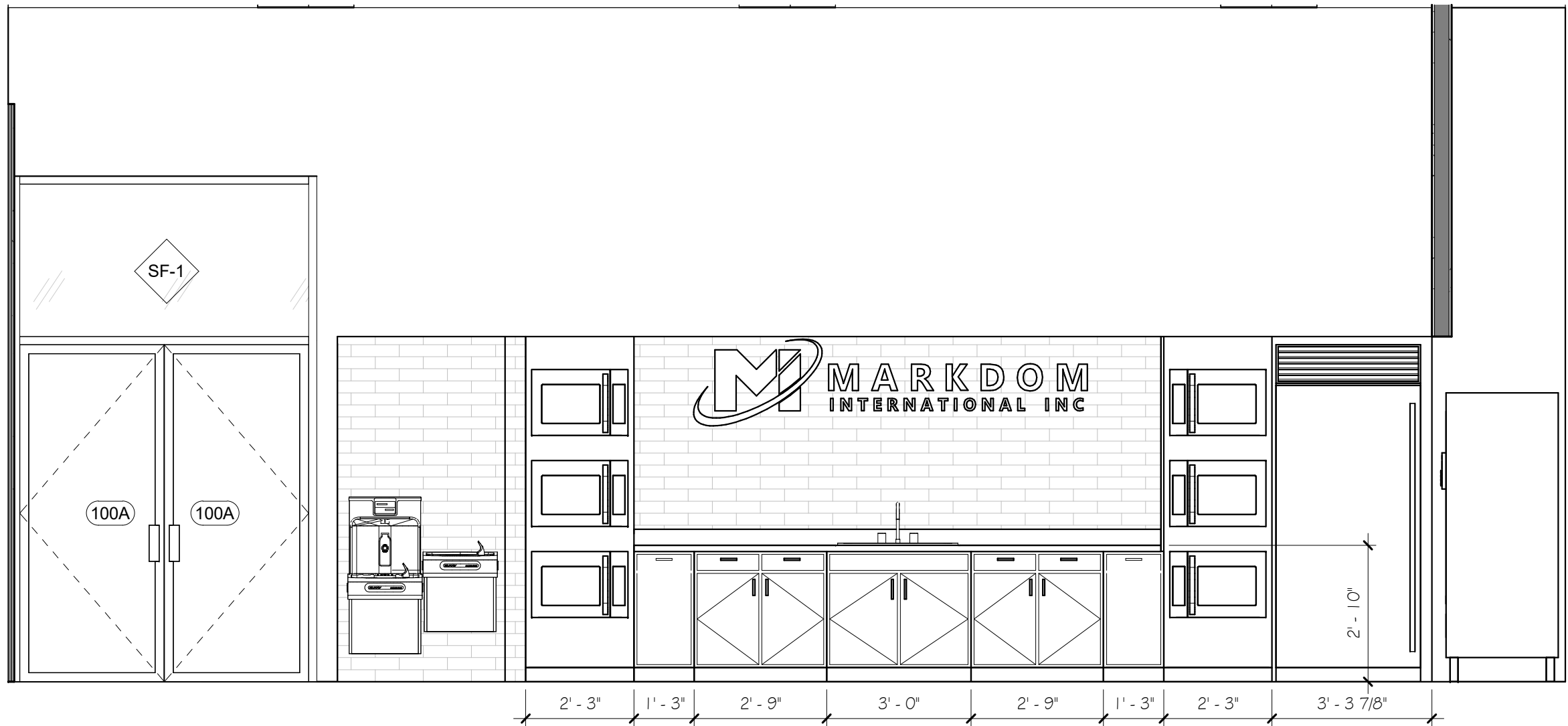
3 EAST INTERIOR ELEVATION
A1.1 1/4" = 1'-0"



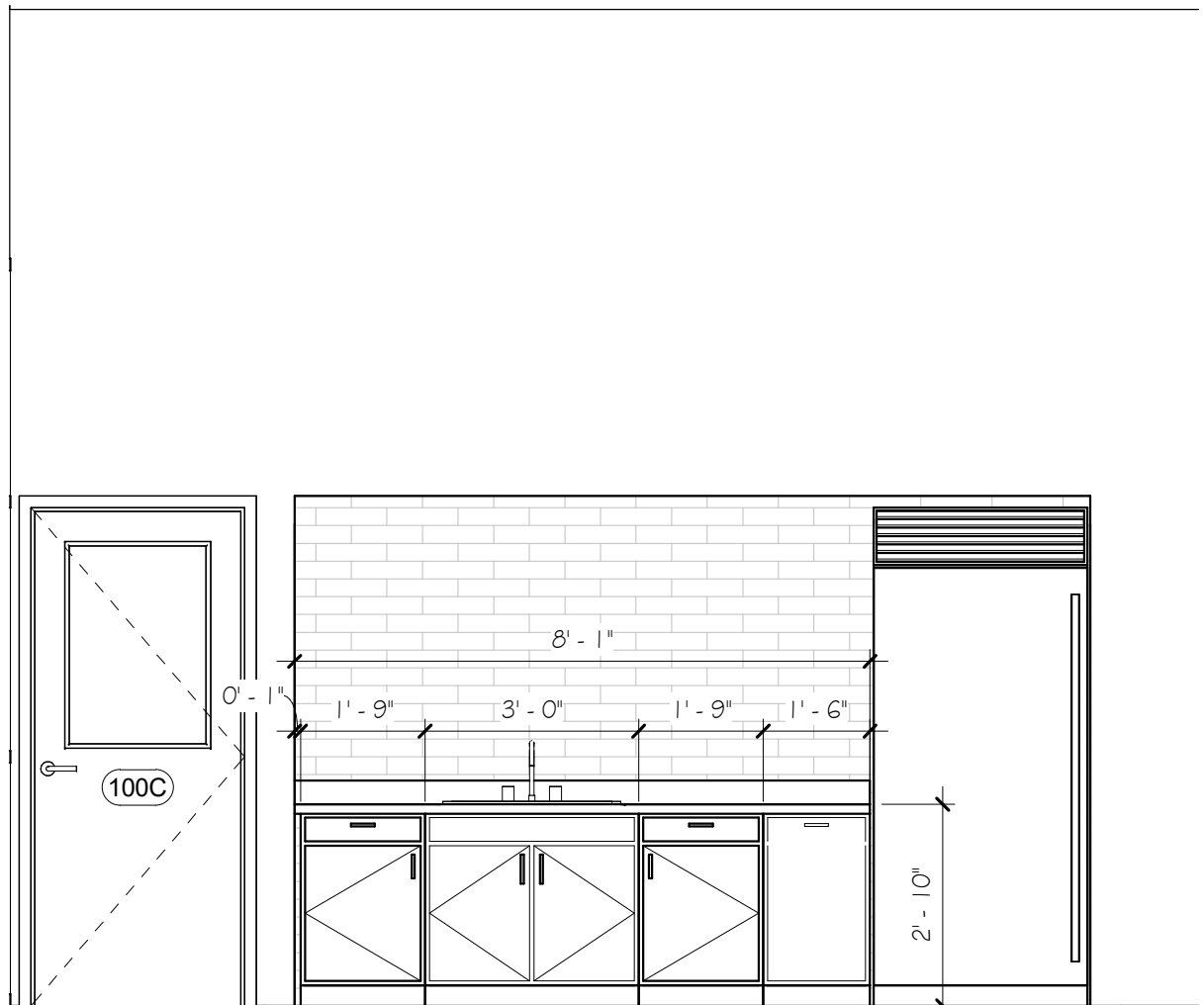
2 NORTH INTERIOR ELEVATION
A1.1 1/4" = 1'-0"



1 SOUTH INTERIOR ELEVATION
A1.1 1/4" = 1'-0"



5 BREAK ROOM ELEVATION
A1.1 3/8" = 1'-0"



4 KITCHENETTE
A1.1 3/8" = 1'-0"

Mark	Description	Date
	BID AND PERMITS	04/22/2025

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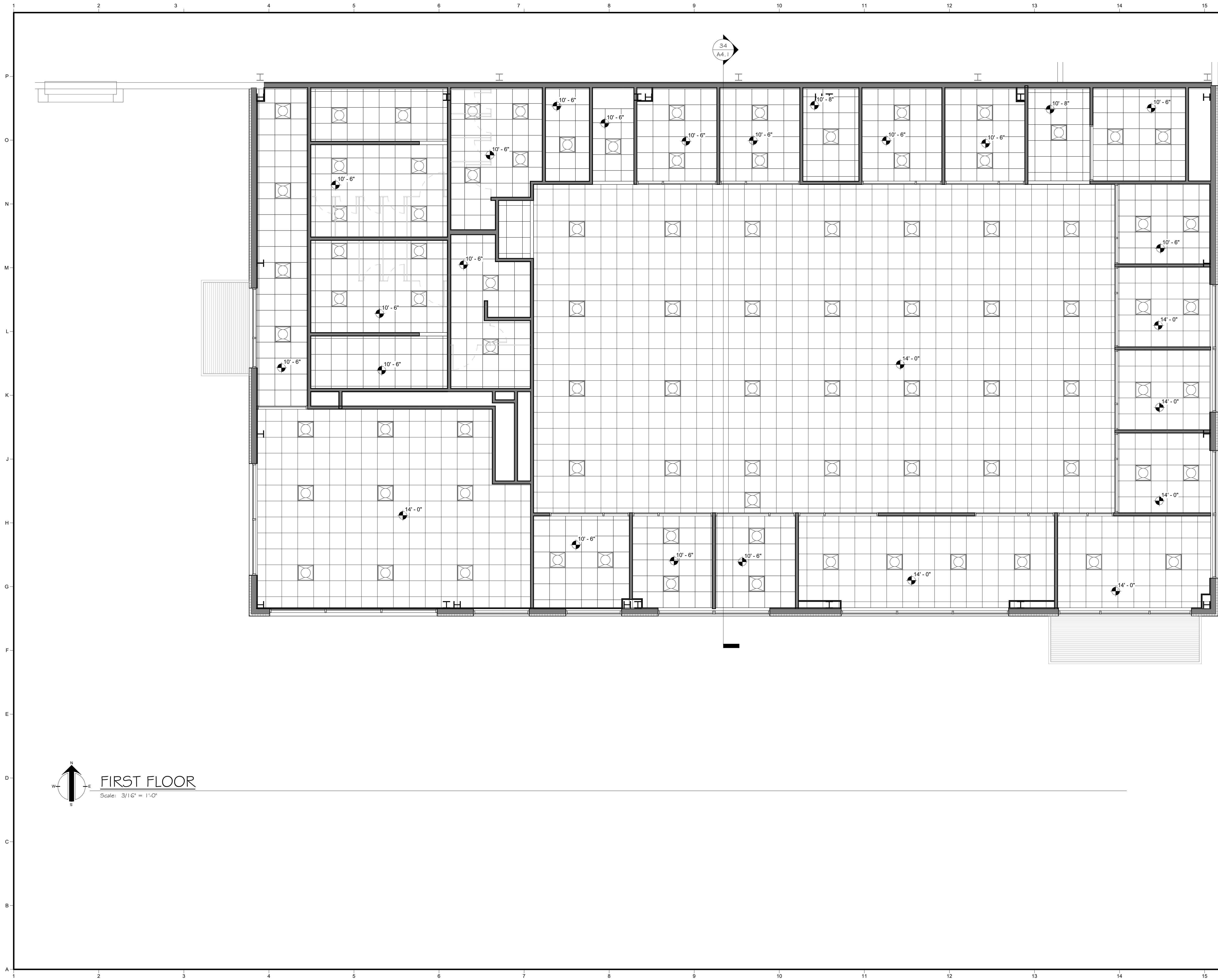
INTERIOR ELEVATIONS

Issued

Project No.
22067

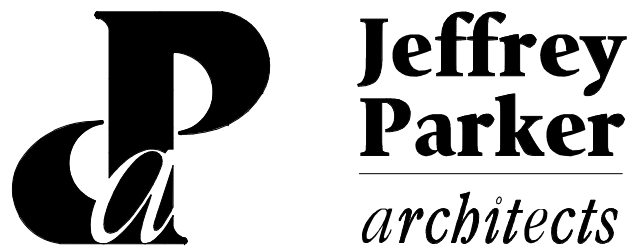
Drawing No.

A6.2



Mark	Description	Date
	BID AND PERMITS	04/22/2025

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REFLECTED CEILING PLAN

Issued	Drawing No.
Project No. 22067	A7.1

PLUMBING ABBREVIATIONS			
AFB	ABOVE FINISH FLOOR	HRW	DOMESTIC HOT WATER RETURN
BFP	BACKFLOW PREVENTER	HRWP	HOT WATER RECIRCULATION PUMP
CBV	CALIBRATED BALANCING VALVE	INER	INVERT ELEVATION
CLV	CEILING	LAV	LAVATORY
CLN	CONDUCTOR NOZZLE	MFR	MANUFACTURER
CO	CLEANOUT	MSB	MOP SERVICE BASIN
CONN	CONNECTION	OD	OVERFLOW ROOF DRAIN
CONT	CONTINUATION	PSF	POUNDS PER SQUARE INCH
COORD	COORDINATE	RD	ROOF DRAIN
CW	COLD DOMESTIC COLD WATER	RH	ROOF HYDRANT
CWFU	COLD WATER FIXTURE UNITS	RPZBFP	REDUCED PRESSURE ZONE BACKFLOW PREVENTER
DFU	DRAINAGE FIXTURE UNITS	SAN	SANITARY DRAIN
DN	DOWN	ST	STORM DRAIN
DWG	DRAWING	TYP	TYPICAL
DWH	DOMESTIC WATER HEATER	UR	URINAL
ECO	EXTERIOR CLEANOUT	VNT	VENT
ET	EXPANSION TANK	VTR	VENT THROUGH ROOF
EWIC	ELECTRIC WATER COOLER	W	WASTE
EXIST	EXISTING	WC	WATER CLOSET
FCO	FLOOR CLEAN OUT	WCO	WALL CLEAN OUT
FF	FLOOR DRAIN	WH	WALL HYDRANT
FD	FINISH FLOOR	WMB	WASHING MACHINE BOX
FLR	FLOOR	WMP	WASHING MACHINE PAN
G	NATURAL GAS	WOB	WALL OUTLET BOX
HW	DOMESTIC HOT WATER	WSFU	WATER SUPPLY FIXTURE UNITS
HWFU	HOT WATER FIXTURE UNITS		

PLUMBING LEGEND

	CALIBRATED RISING VALVE		CAP
	CHECK VALVE		STRAINER
	SHUT OFF VALVE		SANITARY DRAIN
	PRESSURE REDUCING VALVE		SAN(UG) UNDERGROUND SANITARY DRAIN
	HOSE BIBB/WALL HYDRANT		CW DOMESTIC COLD WATER
	PIPE ELBOW		HW DOMESTIC HOT WATER
	RISER UP		HWR DOMESTIC HOT WATER RETURN
	RISER DOWN		PV PLUMBING VENT
	BRANCH UP		→ DIRECTION OF FLOW
	UNION		G NATURAL GAS

WC-1 WATER CLOSET (ADA)-AMERICAN STANDARD MADERA MODEL 3043.102, FLUSH VALVE WATER CLOSET, FLOOR MOUNTED, VITREOUS CHINA, ELONGATED FRONT, STD WHITE COLOR, W/ FV-1 FLUSH VALVE & OPEN FRONT TOILET SEAT

UR-1 URINAL (ADA)-AMERICAN STANDARD WASHBROOK MODEL 6590.005, WALL HUNG FLUSH VALVE SIPHON JET URINAL, VITREOUS CHINA, ADA ACCESSIBLE, STANDARD WHITE COLOR W/ FV-1 FLUSH VALVE AND STEEL WALL HANGER

FV-1 WATER CLOSET -SLOAN 111-1.28, MANUAL FLUSH, 1.28 GPF, TOP SPUD.

FV-2 URINAL SLOAN 186-0.5 MANUAL 0.5 GPF, TOP SPUD.

L-1 LAVATORY (ADA) - SLOAN DESIGNER SERIES DSG-82000, 2-STATION SOLID SURFACE COUNTERTOP WITH INTEGRAL SINK, ADA ACCESSIBLE, FRONT OVERFLOW, FOUR HOLE, (2) SENSOR OPERATED SOAP DISPENSERS, (2) FAUCETS (LF-1) ASSE 1070 MIXING VALVE, UNDERSINK PIPE COVERS, AND CHROME DRAIN ASSEMBLY.

L-2 LAVATORY (ADA) - SLOAN DESIGNER SERIES DSG-83000, 3-STATION SOLID SURFACE COUNTERTOP WITH INTEGRAL SINK, ADA ACCESSIBLE, FRONT OVERFLOW, SIX HOLE, (3) SENSOR OPERATED SOAP DISPENSERS, (3) FAUCETS (LF-1) ASSE 1070 MIXING VALVE, UNDERSINK PIPE COVERS, AND CHROME DRAIN ASSEMBLY.

L-3 LAVATORY (ADA)-AMERICAN STANDARD LUCERNE MODEL 0355.012, WALL HUNG LAVATORY VITREOUS CHINA, STANDARD WHITE COLOR, 3-HOLE W/ 4" CENTERS, FAUCET, ASSE 107 MIXING VALVE, UNDERSINK PIPE COVERS, AND CHROME DRAIN ASSEMBLY (LF-1)

LF-1 LAVATORY FAUCET-MOEN DECK MOUNTED FAUCET, 4" CENTERS, STANDARD 0.5 GPM PEAK FLOW W/ ASSE 1016 TEMPERATURE AND PRESSURE REGULATING DEVICE

S-1 SINK (ADA) ELKAY LUSTERTONE MODEL #RAD2022, SINGLE BOWL DROP-IN STAINLESS STEEL SINK, 18 GA TYPE 304 SS, 22"x19.5" OVERALL, 16"x19" BOWL, 5-1/2" DEPTH, SELF-RIMMING BOWL, UNDERCOUNTER UNDERSIZE, 3-1/2" DRAIN OPENING W/ DRAIN HARDWARE, STOPPER AND TAILPIECE, 1-1/2" PRE-DRILLED FAUCET HOLES FOR GOOSENECK FAUCET (SF-1).

SF-1 SINK FAUCET-KOHLER RIVAL MODEL #K-30469, DECK MOUNTED SINK FAUCET, POLISHED CHROME PLATED FINISH, SINGLE HANDLE, PULL DOWN SPOUT WITH INTEGRAL SPRAY, 1.5 SWING GOOSENECK SPOUT W/ TRIM PLATE AND MOUNTING HARDWARE.

MSB-1 MOP SERVICE BASIN-FIAT MODEL #MSB 2424, 24x24x10 HIGH, SS DRAIN W/ COMBINATION DOME STRAINER AND LINT BASKET, HOSE, HOSE BRACKET AND MOP HANG PAIRED W/ WALL MOUNTED FAUCET MSF-1.

MSF-1 MOP SINK FAUCET-KOHLER MODEL #K-837760-4A WALL MOUNTED 8" WIDESPREAD FAUCET, SOLID BRASS BODY, 3/4" HOSE THREAD OUTLET, VACUUM BREAKER SPOUT WITH PAIL HOOK AND WALL BRACE, 2 3/8" LEVEL HANDLES W/ MOUNTING HARDWARE.

EWC-1 ELECTRIC WATER COOLER-ELKAY MODEL #ELZSTL8WSPL BI-LEVEL BARRIER FREE SELF-CONTAINED COOLER W/ SATIN FINISH AND BOTTLE FILLING STATION.

AAV-1 AIR-ADMITTANCE VALVE - ASSE 1051 MECHANICAL SEALING DIAPHRAGM (BASED ON STUOD, INC.)

FD-1 FLOOR DRAIN -SIQUX CHIEF 5" ROUND, LIGHT DUTY, NICKEL BRONZE FINISH. PROVIDE WITH SURESEAL TRAP SEALER.

1. COMPLETED INSTALLATIONS SHALL CONFORM TO ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND ORDINANCES INCLUDING, BUT NOT LIMITED TO THE LATEST EDITIONS OF THE FOLLOWING: 2021 MICHIGAN PLUMBING CODE.
2. PROTECT ALL PUBLIC LAVATORY SINK FAUCETS WITH ASSE 1070 WATER TEMPERATURE LIMITING DEVICE PER 2021 MPC 607.1
3. VENT ALL DRAIN FIXTURES IN ONE OF THE METHODS ALLOWED BY 2021 MPC CHAPTER 9. EXTEND EVERY VENT, VENT STACK OR WASTE STACK VENT THROUGH ROOF WITH 3" MINIMUM SIZE.
4. CONTRACTOR SHALL PERFORM ALL REQUIRED TESTS OF SANITARY WASTE AND VENT SYSTEM AND DOMESTIC WATER SYSTEM AS IDENTIFIED IN SECTION 312 OF 2021 MPC.
5. ALL STORM, WASTE, AND VENT PIPING IN PLENUM SPACES TO BE PLENUM RATED: PVC PIPING WITH FIBERGLASS INSULATION AND ASJ JACKET OR CAST IRON PIPING.

1. CONTRACTOR RESPONSIBLE FOR ALL REQUIRED PERMITS AND FEES RELATIVE TO THEIR WORK SCOPE.
2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH ALL OTHER TRADES AND WITH INSTALLATION OF ALL PLUMBING SYSTEMS IN COMPLIANCE WITH THE 2021 MICHIGAN PLUMBING CODE AND ALL OTHER APPLICABLE STATE AND LOCAL CODES.
3. ROUTE ALL SANITARY & WASTE PIPING 3" AND LARGER AT 1/8" FALL PER FOOT UNLESS OTHERWISE NOTED; ROUTE ALL SANITARY & WASTE PIPING 2-1/2" AND SMALLER AT 1/4" FALL PER FOOT UNLESS OTHERWISE NOTED.
4. DRAIN AND VENT SIZES IDENTIFIED ON PLANS SUPERCEDE SIZES IDENTIFIED ON MINIMUM SIZE CONNECTION TABLE.
5. MAINTAIN AS-BUILT DRAWINGS IN THE FIELD; AS-BUILTS SHALL BE PROVIDED TO THE OWNER AS RECORD DRAWINGS WITH PROJECT CLOSE-OUT DOCUMENTS.
6. CONTRACTOR SHALL GUARANTEE WORK INSTALLED UNDER THEIR CONTRACT TO BE FREE FROM DEFECTIVE WORKMANSHIP OR MATERIALS FOR A PERIOD OF ONE (1) YEAR AFTER SUBSTANTIAL COMPLETION, AND SHALL REPAIR AND/OR REPLACE DEFECTIVE ITEMS AND DAMAGE RESULTING FROM FAILURE OF THESE ITEMS AT NO EXPENSE TO THE OWNER.
7. INSTALL WATER HAMMER ARRESTOR AT LOCATIONS SHOWN ON PLANS AND AT ALL QUICK CLOSING FIXTURES.

PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

DEFINITIONS: FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION. INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE. PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.

COORDINATION: COORDINATE WITH THE WORK OF OTHER TRADES, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.

ALL PUBLIC LAVATORIES SHALL BE PROVIDED WITH APPROVED WATER TEMPERATURE LIMITING DEVICE THAT CONFORMS TO ASSE 1070.

ALL FLOOR DRAIN SHALL BE EQUIPPED WITH ASSE 1072 BARRIER STYLE TRAP SEAL; RECTORSEAL SURESEAL OR EQUAL.

DOMESTIC HOT AND COLD WATER PIPE TO BE TYPE L HARD COPPER TUBE WITH LEAD FREE SOLDERED OR PRESS-FIT JOINTS AND FITTINGS, OR SHALL BE PEX-A PLASTIC TUBE WITH BARB STYLE FITTINGS

DOMESTIC HOT WATER PIPE AND HOT WATER RETURN PIPE SHALL BE INSULATED WITH 1" THICKNESS OF PRE-FORMED FIBERGLASS PIPE INSULATION WITH FACTORY ASJL PVC ELBOW JACKETS. PIPE SUPPORTS WILL BE ALLOWED TO CONNECT DIRECTLY TO THE PIPE AND PIPE INSULATION IS NOT REQUIRED TO BE CONTINUOUS AT SUPPORTS. FLEXIBLE ELASTOMERIC INSULATION (AP ARMAFLEX BLACK LAPSEAL OR EQUAL) SHALL BE APPROVED ALTERNATE TO FIBERGLASS PIPE INSULATION

PROVIDE STOP VALVES AT ALL WATER FIXTURE CONNECTIONS. PROVIDE BRONZE BODY BALL STOP&WASTE SHUT-OFF VALVES ON SUPPLY LINE TO ALL HOSE BIBBS AND WALL HYDRANTS. PROVIDE BRONZE BODY BALL SHUT-OFF VALVES ON COLD AND HOT CONNECTIONS TO WATER HEATER.

HOT WATER RECIRCULATION BALANCING VALVE BASED ON CIRCUITSOLVER SELF-ACTING THERMOSTATIC RECIRCULATION VALVE.

PURGE AND DISINFECT ALL NEW POTABLE WATER PIPING PER REQUIREMENTS OF AWWA C651 OR C652, OR AS REQUIRED BY LOCAL HEALTH DEPARTMENT.

PROVIDE APPROVED ANTISIPHON DEVICE FOR SIDE CONNECTION WATER HEATERS TO PREVENT BACK-SIPHONING; LOCATE ANTISIPHON DEVICE ABOVE TOP OF WATER HEATER TANK.

SANITARY WASTE AND VENT PIPING SYSTEMS: SCH 40 SOLID CORE PVC WITH SOLVENT WELDED JOINTS & FITTINGS FOR BOTH BELOW GROUND AND ABOVE GROUND. SUPPORT ALL ABOVE GROUND WASTE AND VENT PIPING FROM STRUCTURE AT NOT MORE THAN CODE MAXIMUM SPACING FOR PIPE MATERIAL AND SIZE. INSTALL WITH NO SAGS OR DIPS IN HORIZONTAL PIPE. GROUP VENTS TO COMMON POINT FOR VENT THROUGH ROOF. ALL HORIZONTAL INDOOR PRIMARY STORM PIPE OR ALL PVC PIPE IN A PLENUM SHALL BE INSULATED WITH 1" THICKNESS, OF PRE-FORMED FIBERGLASS PIPE INSULATION WITH FACTORY ASJ JACKETS.

PROVIDE CLEANOUTS FOR WASTE LINES AS SHOWN ON DRAWINGS, AND OF TYPE APPROVED BY LOCAL CODES

VENT PIPE(S) THRU THE ROOF SHALL BE 3" MINIMUM AND EXTEND AT LEAST 3 FT. ABOVE THE ROOF; PROVIDE ROOF JACK VENT PIPE FLASHING EACH PENETRATION WITH ALUMINUM BASE AND RUBBERIZED BOOT. CAULK JOINT BETWEEN VENT PIPE AND BOOT TO MAKE WEATHER TIGHT.

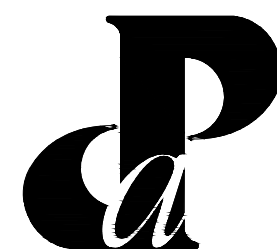


STATE OF MICHIGAN
 CHRISTOPHER
 NOLAN
 ENGINEER
 No.
 48663
 LICENSED PROFESSIONAL ENGINEER
 418-2025

CHRISTOPHER J. NOLAN, P.E.
MI - REGISTRATION# 6201043863
EXP. DATE# 4/14/2027

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**Jeffrey
Parker**
architects

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Charlotte, MI 48813

GENERAL PLUMBING INFORMATION

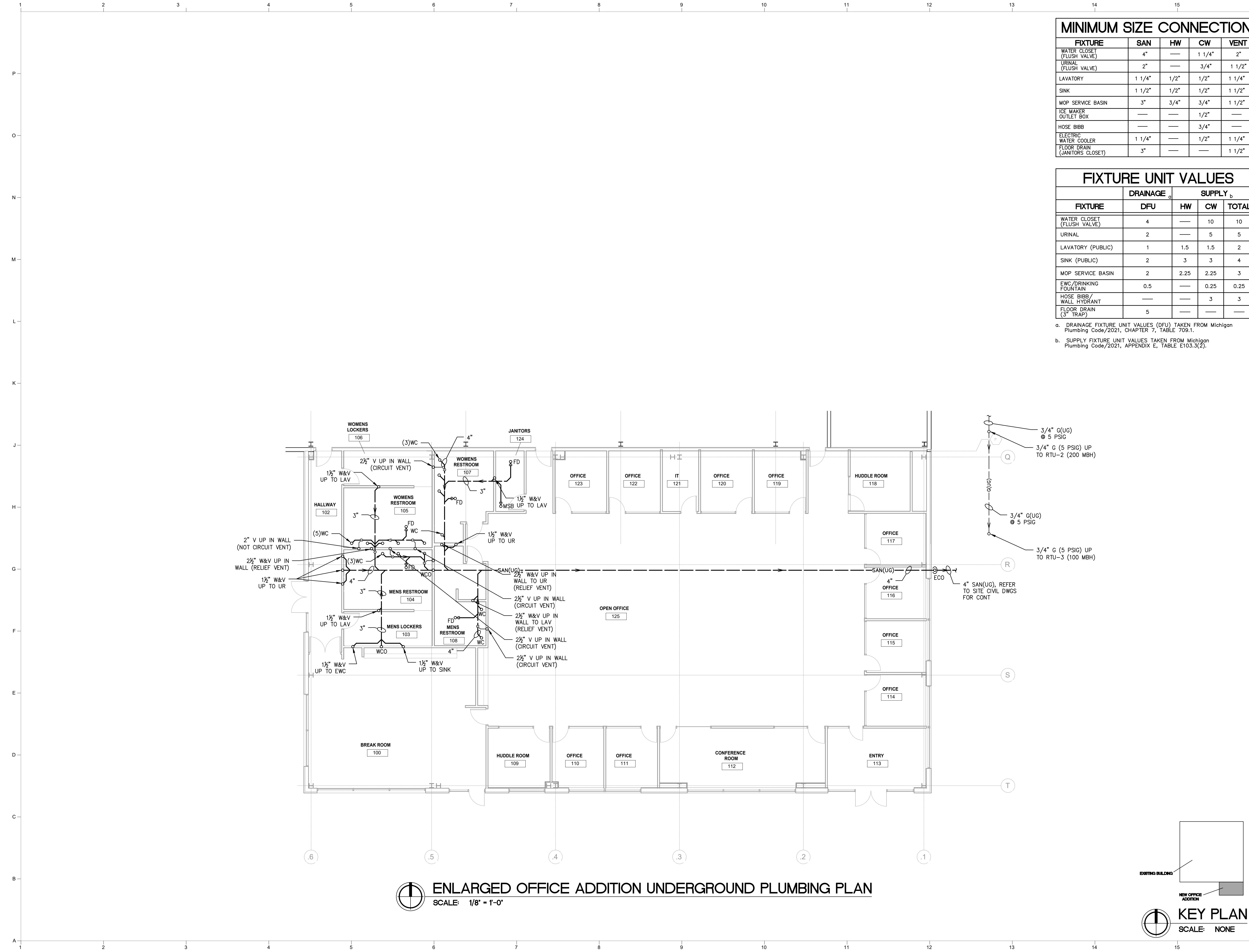
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Project No.
12067

P.O.

P-0.1



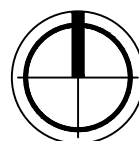
MINIMUM SIZE CONNECTION

FIXTURE	SAN	HW	CW	VENT
WATER CLOSET (FLUSH VALVE)	4"	—	1 1/4"	2"
URINAL (FLUSH VALVE)	2"	—	3/4"	1 1/2"
LAVATORY	1 1/4"	1/2"	1/2"	1 1/4"
SINK	1 1/2"	1/2"	1/2"	1 1/2"
MOP SERVICE BASIN	3"	3/4"	3/4"	1 1/2"
ICE MAKER OUTLET BOX	—	—	1/2"	—
HOSE BIBB	—	—	3/4"	—
ELECTRIC WATER COOLER	1 1/4"	—	1/2"	1 1/4"
FLOOR DRAIN (JANITORS CLOSET)	3"	—	—	1 1/2"

FIXTURE UNIT VALUES

FIXTURE	DRAINAGE ^a		SUPPLY ^b	
	DFU	HW	CW	TOTAL
WATER CLOSET (FLUSH VALVE)	4	—	10	10
URINAL	2	—	5	5
LAVATORY (PUBLIC)	1	1.5	1.5	2
SINK (PUBLIC)	2	3	3	4
MOP SERVICE BASIN	2	2.25	2.25	3
EW/C/DRINKING FOUNTAIN	0.5	—	0.25	0.25
HOSE BIBB/WALL HYDRANT	—	—	3	3
FLOOR DRAIN (3" TRAP)	5	—	—	—

a. DRAINAGE FIXTURE UNIT VALUES (DFU) TAKEN FROM Michigan Plumbing Code/2021, CHAPTER 7, TABLE 709.1.
b. SUPPLY FIXTURE UNIT VALUES TAKEN FROM Michigan Plumbing Code/2021, APPENDIX E, TABLE E103.3(2).



ENLARGED OFFICE ADDITION UNDERGROUND PLUMBING PLAN
SCALE: 1/8" = 1'-0"

EXISTING BUILDING
NEW OFFICE ADDITION

KEY PLAN
SCALE: NONE

931 W River Center, Suite A
Comstock Park, MI, 49321
www.ability-engineer.com

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CHRISTOPHER J. NOLAN, P.E.
MI - REGISTRATION # 43863
EXP. DATE 01/14/2027

Mark	Description	Date
	BIDDING & PERMIT SET	04/18/2025

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Project No. 22087	P-1.0

MINIMUM SIZE CONNECTION

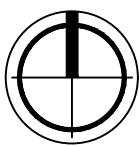
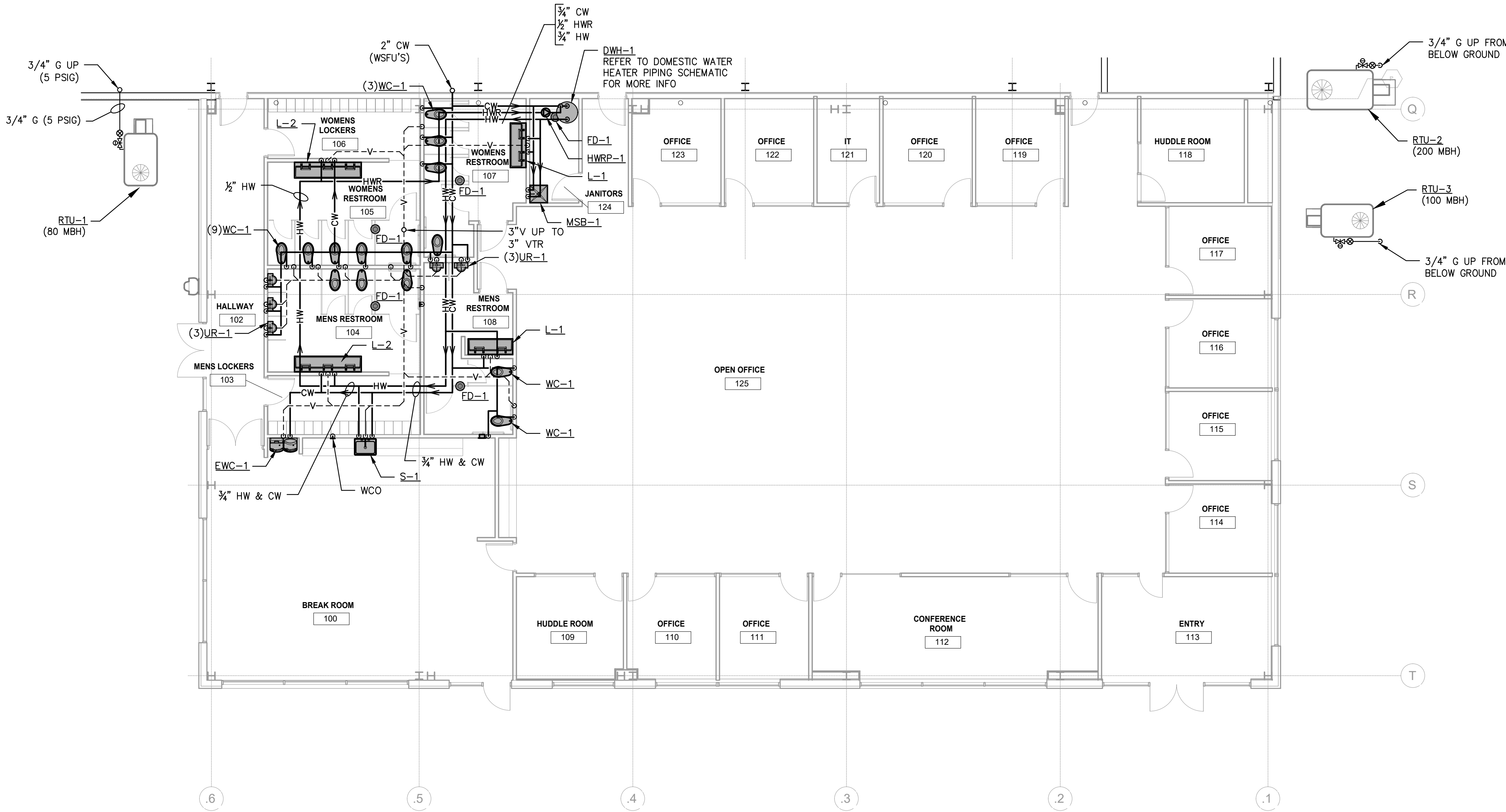
FIXTURE	SAN	HW	CW	VENT
WATER CLOSET (FLUSH VALVE)	4"	—	1 1/4"	2"
URINAL (FLUSH VALVE)	2"	—	3/4"	1 1/2"
LAVATORY	1 1/4"	1/2"	1/2"	1 1/4"
SINK	1 1/2"	1/2"	1/2"	1 1/2"
MOP SERVICE BASIN	3"	3/4"	3/4"	1 1/2"
ICE MAKER OUTLET BOX	—	—	1/2"	—
HOSE BIBB	—	—	3/4"	—
ELECTRIC WATER COOLER	1 1/4"	—	1/2"	1 1/4"
FLOOR DRAIN (JANITORS CLOSET)	3"	—	—	1 1/2"

FIXTURE UNIT VALUES

FIXTURE	DRAINAGE ^a		SUPPLY ^b	
	DFU	HW	CW	TOTAL
WATER CLOSET (FLUSH VALVE)	4	—	10	10
URINAL	2	—	5	5
LAVATORY (PUBLIC)	1	1.5	1.5	2
SINK (PUBLIC)	2	3	3	4
MOP SERVICE BASIN	2	2.25	2.25	3
EWC/DRINKING FOUNTAIN	0.5	—	0.25	0.25
HOSE BIBB/WALL HYDRANT	—	—	3	3
FLOOR DRAIN (3" TRAP)	5	—	—	—

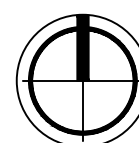
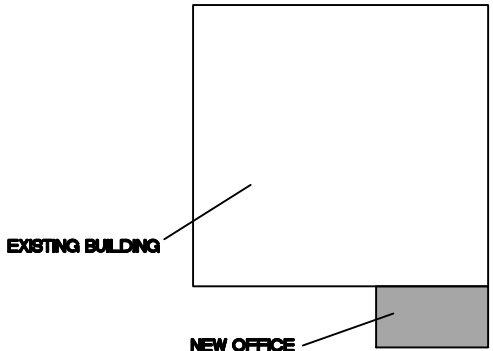
a. DRAINAGE FIXTURE UNIT VALUES (DFU) TAKEN FROM Michigan Plumbing Code/2021, CHAPTER 7, TABLE 709.1.

b. SUPPLY FIXTURE UNIT VALUES TAKEN FROM Michigan Plumbing Code/2021, APPENDIX E, TABLE E103.3(2).



ENLARGED OFFICE ADDITION PLUMBING PLAN

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

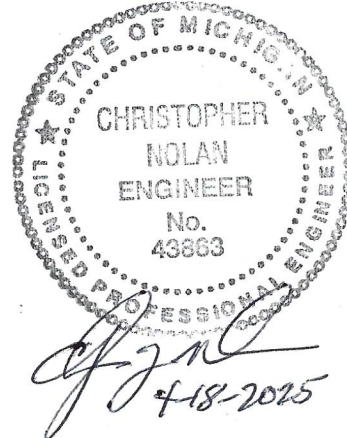


KEY PLAN

SCALE: NONE

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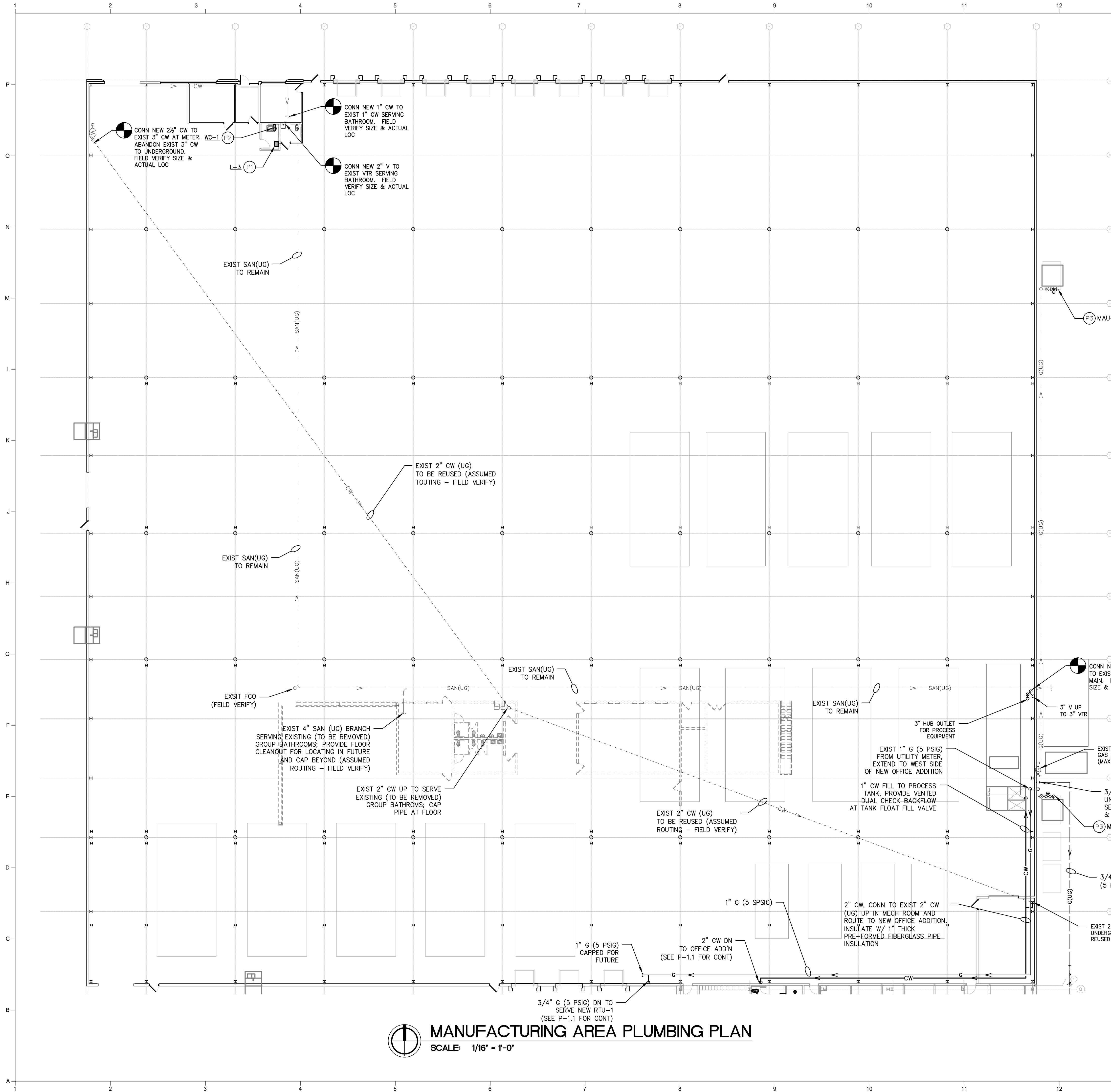
ENLARGED OFFICE
ADDITION ABOVE
GROUND PLUMBING PLAN

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Project No.
22087

Drawing No.

P-1.1



- KEYED PLUMBING NOTES:**
- P1 PROVIDE NEW LAV & ROUTE 1/2" CW, 1/2" HW, AND 2" W&V TO EXIST PIPING. ROUTE 2" V UP & CONNECT TO EXIST 3" VTR. FIELD VERIFY SIZE AND ACTUAL LOC OF EXIST PIPING.
 - P2 PROVIDE NEW WC & ROUTE NEW 1" CW AND 4" W TO EXIST PIPING. FIELD VERIFY SIZE AND ACTUAL LOC OF EXIST PIPING.
 - P3 DISCONNECT GAS PIPING FROM EXISTING MAKE-UP AIR UNIT TO BE REMOVED; RE-CONNECT EXISTING GAS PIPE TO NEW LIKE-FOR-LIKE MAKE-UP AIR UNIT REPLACEMENT

- KEYED PLUMBING DEMOLITION NOTES:**
- 1 REMOVE EXISTING WATER CLOSET AND TRIM. CAP WASTE BELOW FLOOR. REMOVE VENT AND COLD WATER PIPING BACK TO NEAREST MAIN OR TEE AND CAP.
 - 2 REMOVE EXISTING LAVATORY AND TRIM. CAP WASTE BELOW FLOOR. REMOVE VENT, HOT AND COLD WATER PIPING BACK TO NEAREST MAIN OR TEE AND CAP.
 - 3 REMOVE EXISTING SINK AND TRIM. CAP WASTE BELOW FLOOR. REMOVE VENT, HOT AND COLD WATER PIPING BACK TO NEAREST MAIN OR TEE AND CAP.
 - 4 REMOVE EXISTING DRINKING FOUNTAIN OR ELECTRIC WATER COOLER AND TRIM. CAP WASTE BELOW FLOOR. REMOVE VENT AND COLD WATER PIPING BACK TO NEAREST MAIN OR TEE AND CAP.

MINIMUM SIZE CONNECTION

FIXTURE	SAN	HW	CW	VENT
WATER CLOSET (FLUSH VALVE)	4"	—	1 1/4"	2"
URINAL (FLUSH VALVE)	2"	—	3/4"	1 1/2"
LAVATORY	1 1/4"	1/2"	1/2"	1 1/4"
SINK	1 1/2"	1/2"	1/2"	1 1/2"
MOP SERVICE BASIN	3"	3/4"	3/4"	1 1/2"
ICE MAKER OUTLET BOX	—	—	1/2"	—
HOSE BIBB	—	—	3/4"	—
ELECTRIC WATER COOLER FLOOR DRAIN (JANITORS CLOSET)	1 1/4"	—	1/2"	1 1/4"
	3"	—	—	1 1/2"

FIXTURE UNIT VALUES

FIXTURE	DRAINAGE ^a		SUPPLY ^b	
	DFU	HW	CW	TOTAL
WATER CLOSET (FLUSH VALVE)	4	—	10	10
URINAL	2	—	5	5
LAVATORY (PUBLIC)	1	1.5	1.5	2
SINK (PUBLIC)	2	3	3	4
MOP SERVICE BASIN	2	2.25	2.25	3
EWV/DRINKING FOUNTAIN	0.5	—	0.25	0.25
HOSE BIBB/WALL HYDRANT	—	—	3	3
FLOOR DRAIN (3" TRAP)	5	—	—	—

a. DRAINAGE FIXTURE UNIT VALUES (DFU) TAKEN FROM Michigan Plumbing Code/2021, CHAPTER 7, TABLE 709.4

b. SUPPLY FIXTURE UNIT VALUES TAKEN FROM Michigan Plumbing Code/2021, APPENDIX E, TABLE E103.3(2).

MANUFACTURING AREA PLUMBING PLAN
SCALE: 1/16" = 1'-0"

KEY PLAN
SCALE: NONE

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ABILITY ENGINEERING
ENGINEERING - DESIGN - CONSULTING

STATE OF MICHIGAN
CHRISTOPHER J. NOLAN
ENGINEER
No. 43863
4-18-2025

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MI - REGISTRATION# 4301043863
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MANUFACTURING AREA PLUMBING PLAN

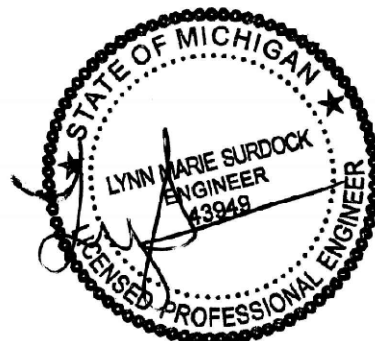
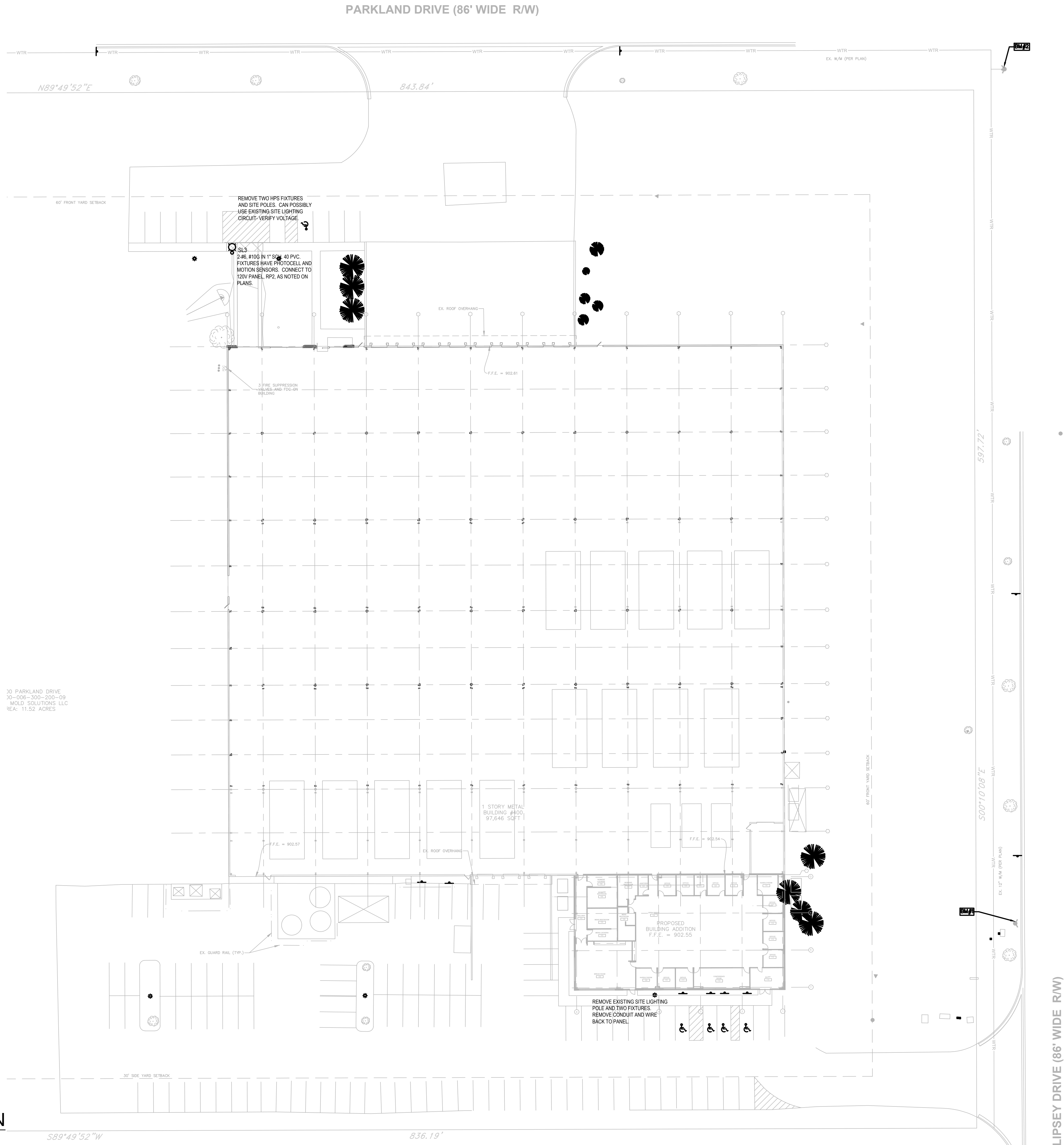
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Project No. 22087

P-2.1

APR 18, 2025
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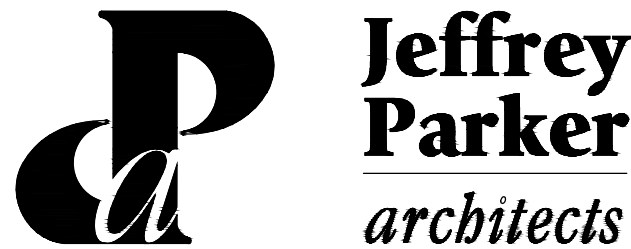
1
E0.1
ELECTRICAL SITE PLAN
SCALE: 1/8"=1'-0"



4/18/2025

Mark	Description	Date
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Charlotte, MI 48813

ELECTRICAL SITE PLAN

Issued	Drawing No.
Project No. 22067	E0.1

April 18, 2025
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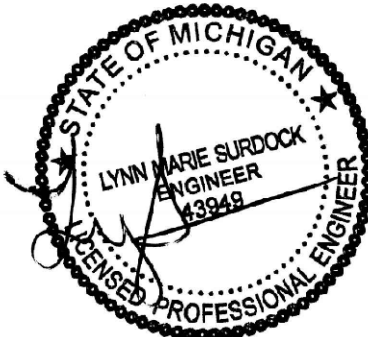
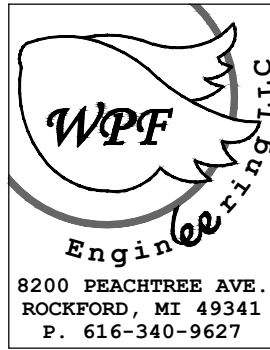
Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
FRONT LOADING DOCK	+	1.2 fc	2.7 fc	0.3 fc	9.0:1	4.0:1
FRONT PARKING LOT	+	1.3 fc	3.3 fc	0.3 fc	11.0:1	4.3:1
OFFICE PARKING	+	1.4 fc	3.5 fc	0.4 fc	8.8:1	3.5:1
SIDE DRIVE	+	1.0 fc	2.6 fc	0.3 fc	8.7:1	3.3:1

Schedule										
Symbol	Label	Image	QTY	Manufacturer	Catalog	Description	Number Lamps	Lamp Output	LLF	Input Power
	XW4		7	Lithonia Lighting	DSXW1 P7 40K TFTM	10000 4000K 70CRI Forward Throw Medium	1	10355	0.95	72.52
	SL3		1	Lithonia Lighting	DSX1 LED P4 35K 80CRI T3M	D-Series Size 1 Area Luminaire P4 Performance Package 3500K CCT 80 CRI Type 3 Medium	1	14422	0.95	123.94



Plan View

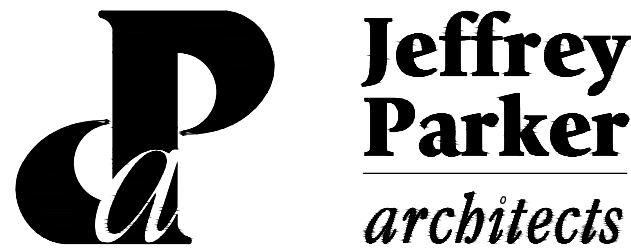
Scale - 1" = 30ft



4/18/2025

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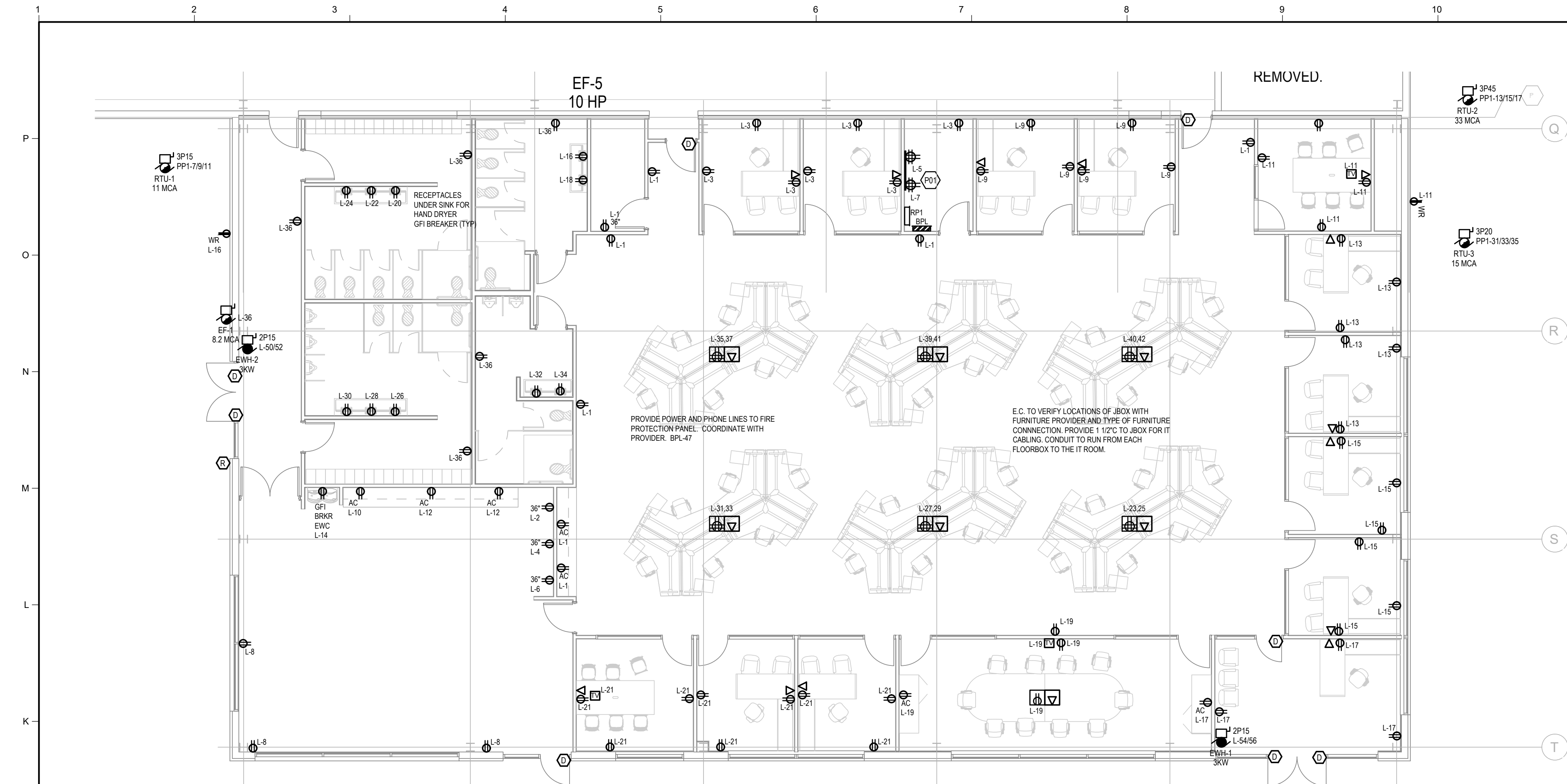
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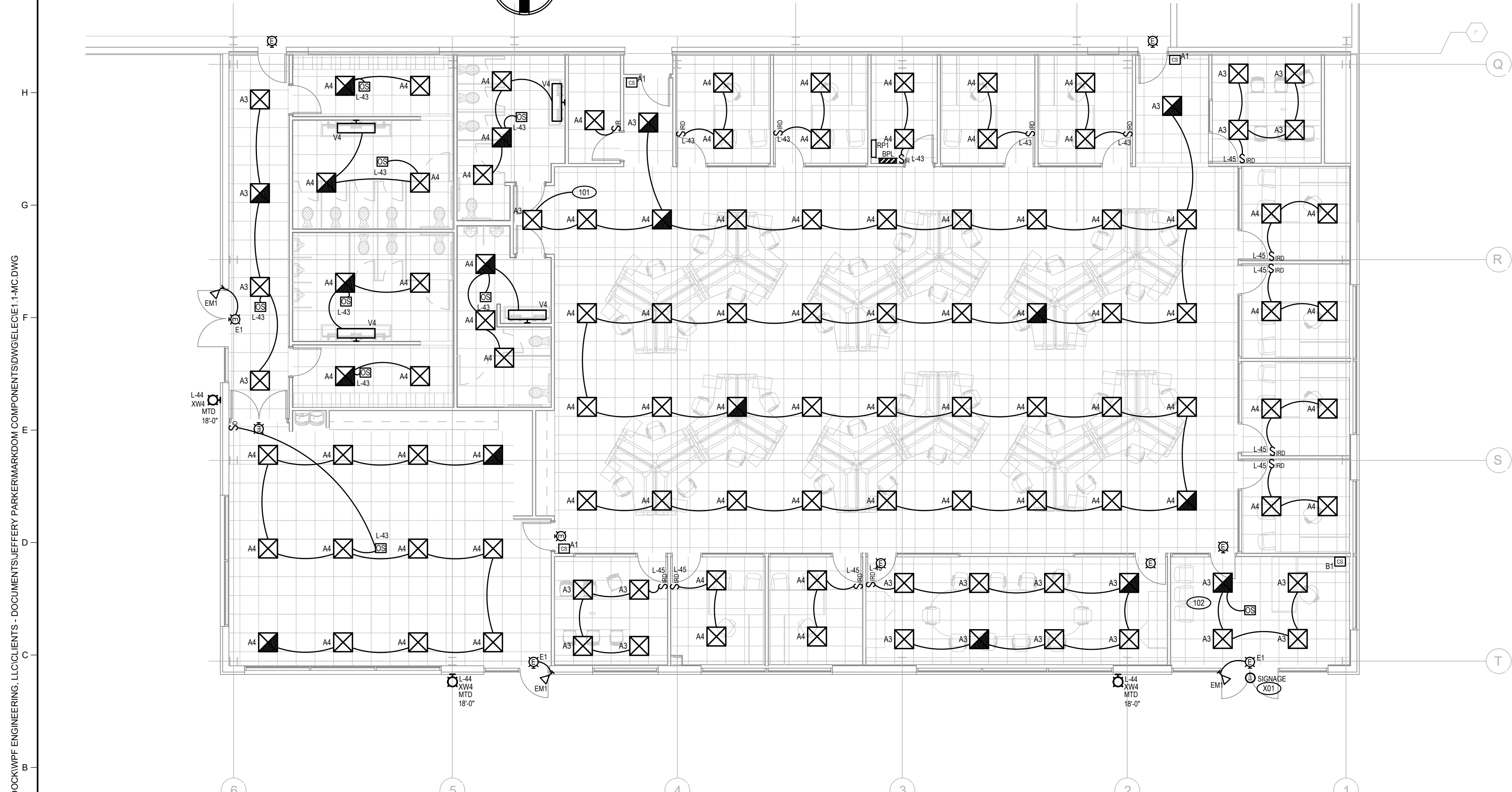
SITE LIGHTING CALCULATIONS

Issued	Drawing No.
Project No. 22067	E0.2

April 18, 2025
C:\USERS\LYNSURDOCK\WPF\ENGINEERING\LOCCLIENTS - DOCUMENTS\JEFFERY PARKER\MARKDOM COMPONENTS\DWG\E1.1.MCDWG



1 POWER PLAN - OFFICE
E1.1
SCALE: 1/8" = 1'-0"



2 LIGHTING PLAN - OFFICE
E1.1
SCALE: 1/8" = 1'-0"

GENERAL LIGHTING NOTES

- REFER TO ARCHITECTURAL AND ELECTRICAL PLANS, ELEVATIONS AND DETAILS FOR LIGHT FIXTURE MOUNTING HEIGHTS AND LOCATIONS.
- E.C. SHALL CONNECT EXIT SIGNS AND EMERGENCY BALLAST/BATTERIES TO UN-SWITCHED LOCAL LIGHTING CIRCUIT.
- E.C. SHALL BE RESPONSIBLE FOR PROVIDING FUNCTIONAL TESTING OF LIGHTING CONTROL SYSTEM PER ASHRAE 90.1-2013 SECTION 9.4.3

LIGHTING PLAN LEGEND

LEGEND SYMBOL INDICATOR

- L01 LOCAL SWITCHES TO OVERRIDE OCCUPANCY SENSOR OFF FOR AV USAGE.

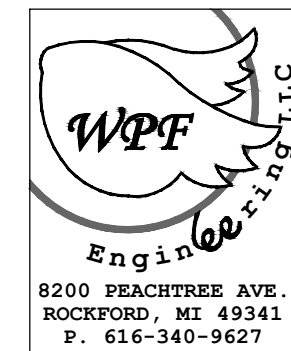
GENERAL POWER NOTES

- COORDINATE EXACT LOCATION AND MOUNTING HEIGHT OF TV AND MONITORS PRIOR TO INSTALLATION.
- PROVIDE TAMPER RESISTANT RECEPTACLES PER NEC 2023. THIS INCLUDES ALL COMMON USE AREAS (CORRIDORS, COMMUNITY ROOMS, ETC.).
- MOUNT PANELS, TRANSFORMERS, DISCONNECT SWITCHES, AND COMBINATION MOTOR STARTERS WITH ADEQUATE CLEARANCES IN ACCORDANCE WITH NEC 110.
- VERIFY ALL KITCHEN EQUIPMENT REQUIREMENTS, CONNECTION TYPES, AND LOCATIONS WITH KITCHEN EQUIPMENT SUPPLIER AND NAMEPLATES PRIOR TO ROUGH-IN.

POWER PLAN LEGEND

LEGEND SYMBOL INDICATOR

- P01 PROVIDE 4x8 PLYWOOD BOARD TREATED WITH FIRE RETARDANT PAINT. PROVIDE #8 GROUND BAR.
- P02 EXHAUST FAN AND LIGHT FIXTURE(S) IN ROOM SHALL BE CONTROLLED TOGETHER. PROVIDE SENSOR RATED FOR MOTOR AND LIGHTING LOAD. REFER TO LIGHTING PLAN FOR CIRCUIT INFORMATION.
- P03 GANG TOILET EXHAUST FANS TO OPERATE WITH LIGHTING. PROVIDE 120V AUXILIARY RELAY WATSTOPPER S12027T C-P OR EQUAL.
- P04 WEATHERPROOF HORN STROBE. TO BE LOCATED ON EXTERIOR OF BUILDING AT 8'-0" AT FIRE SUPPRESSION CONNECTION. STROBE TO ACTIVATED BY FIRE PROTECTION FLOW SWITCHES.



4/18/2025

Mark	Description	Date
	BIDDING & PERMIT SET	04/18/2025

Building Design & Documentation ©2023-2025 Jeffrey Parker Architects, Inc.



ARCHITECTURE PLANNING ENGINEERING

855 28th Street SE
Grand Rapids, MI 49508

Phone: 616-241-0090
Fax: 616-241-0098

Renovation
Markdom Renovation

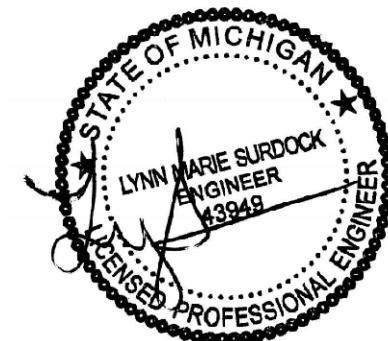
400 Parkland Dr.
Charlotte, MI 48813

LIGHTING & POWER PLANS - OFFICE

Issued	Drawing No.
	E1.1
Project No. 22067	

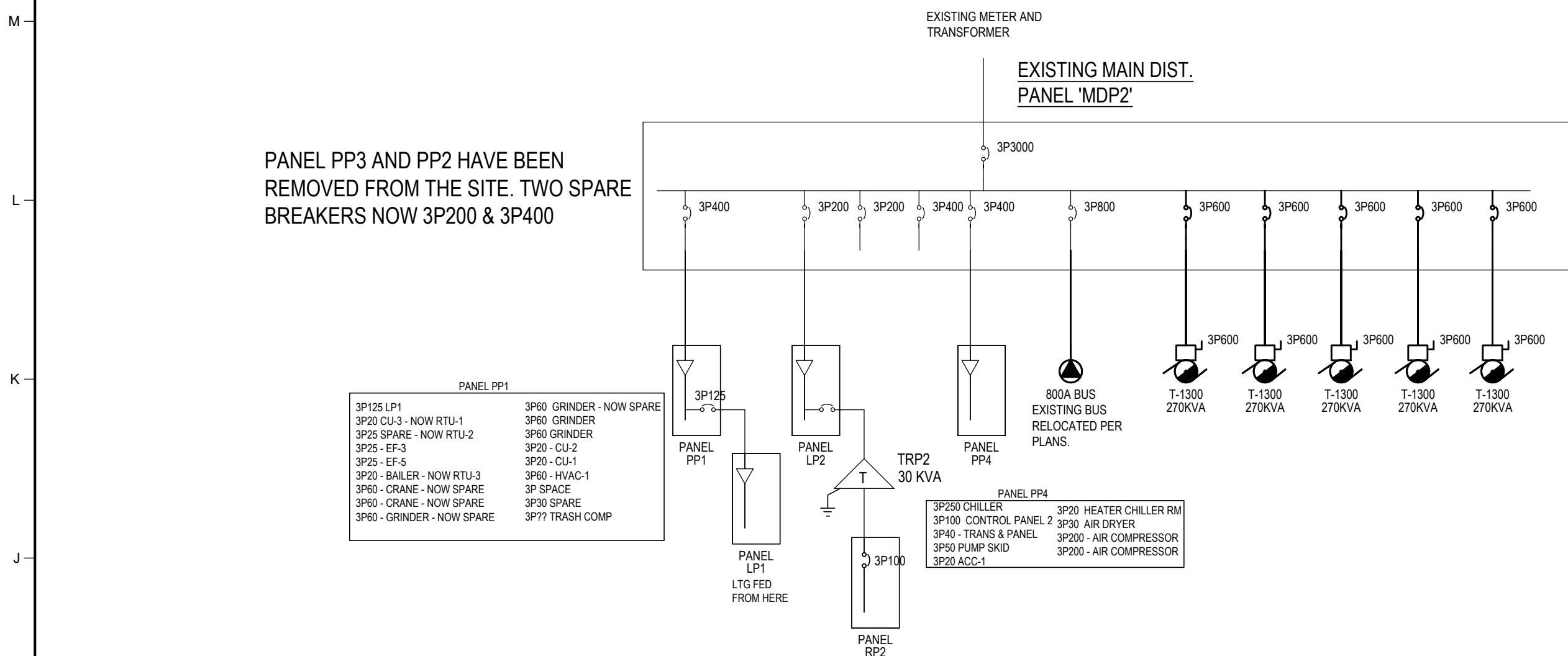
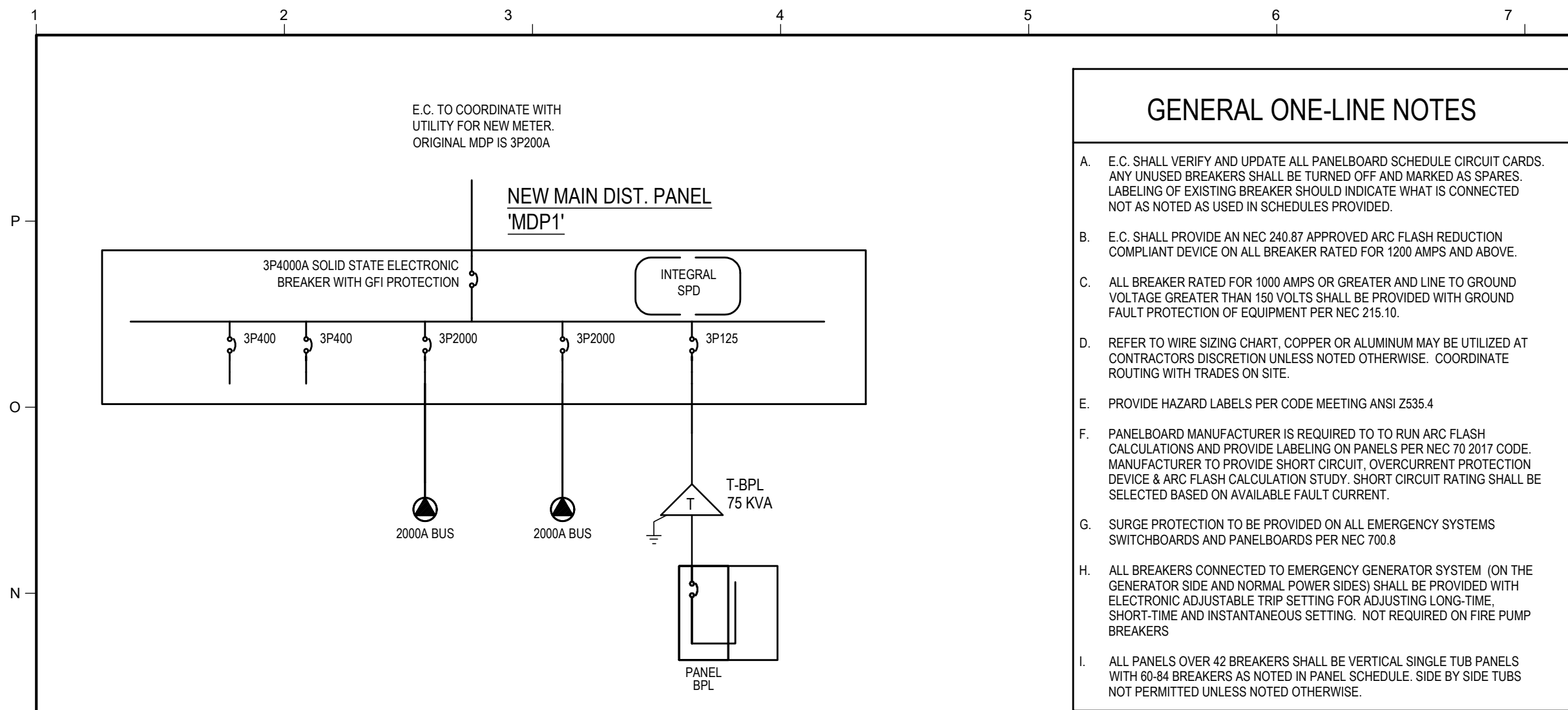


P01	PROVIDE 4x8 PLYWOOD BOARD TREATED WITH FIRE RETARDANT PAINT. PROVIDE #5 GROUND BAR.
P02	EXHAUST FAN AND LIGHT FIXTURE(S) IN ROOM SHALL BE CONTROLLED TOGETHER. PROVIDE SENSOR RATED FOR MOTOR AND LIGHTING LOAD. REFER TO LIGHTING PLAN FOR CIRCUIT INFORMATION.
P03	GANG TOILET EXHAUST FANS TO OPERATE WITH LIGHTING. PROVIDE 120V AUXILIARY RELAY WATTSOFFER S120/277 C-P OR EQUAL.
P04	WEATHERPROOF HORN STROBE TO BE LOCATED ON EXTERIOR OF BUILDING AT 8'-0" AT FIRE SUPPRESSION CONNECTION. STROBE TO ACTIVATED BY FIRE PROTECTION FLOW SWITCHES.

[illegible]

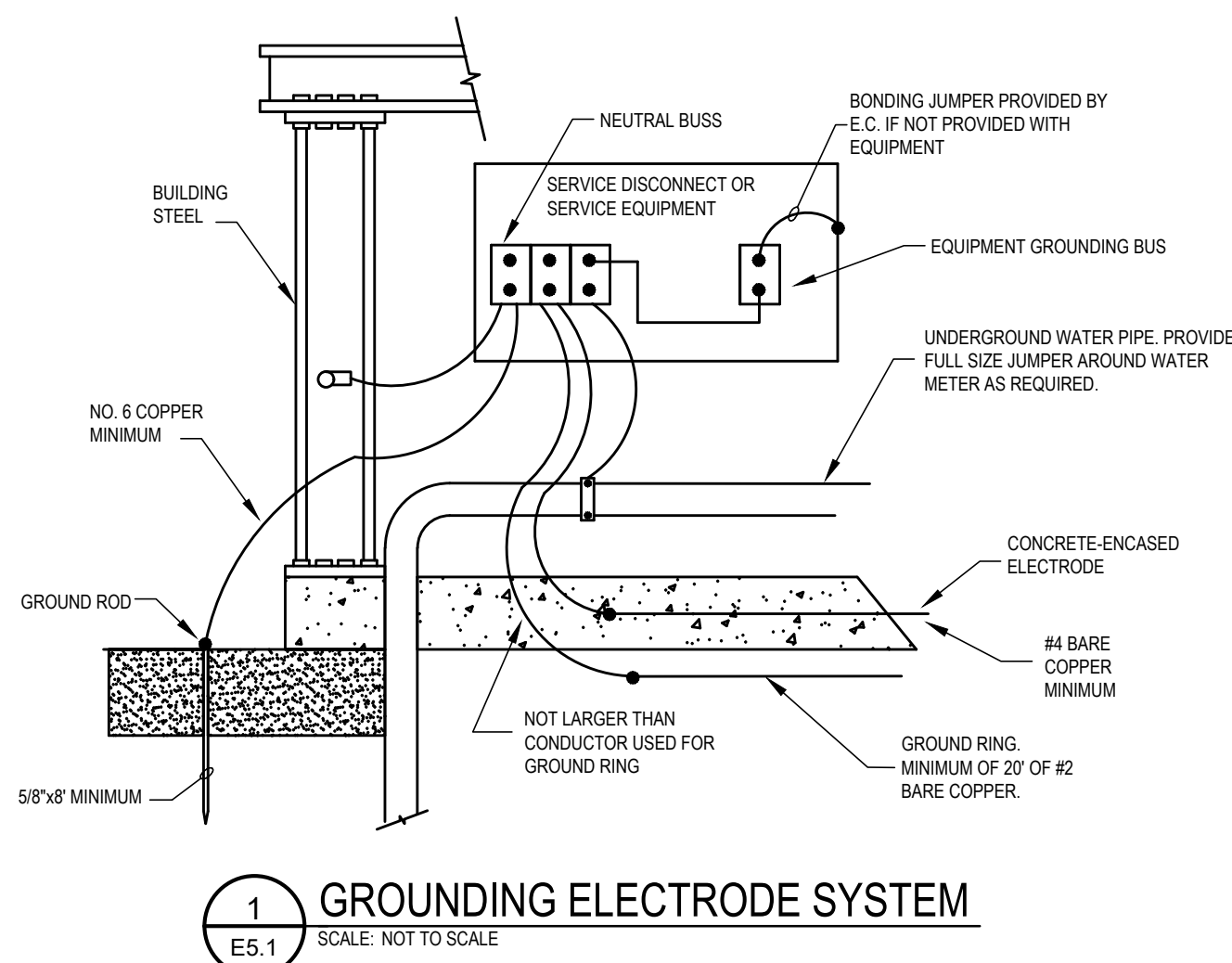
JP
**Jeffrey
Parker**
architects

Project No. 22067	E2.1
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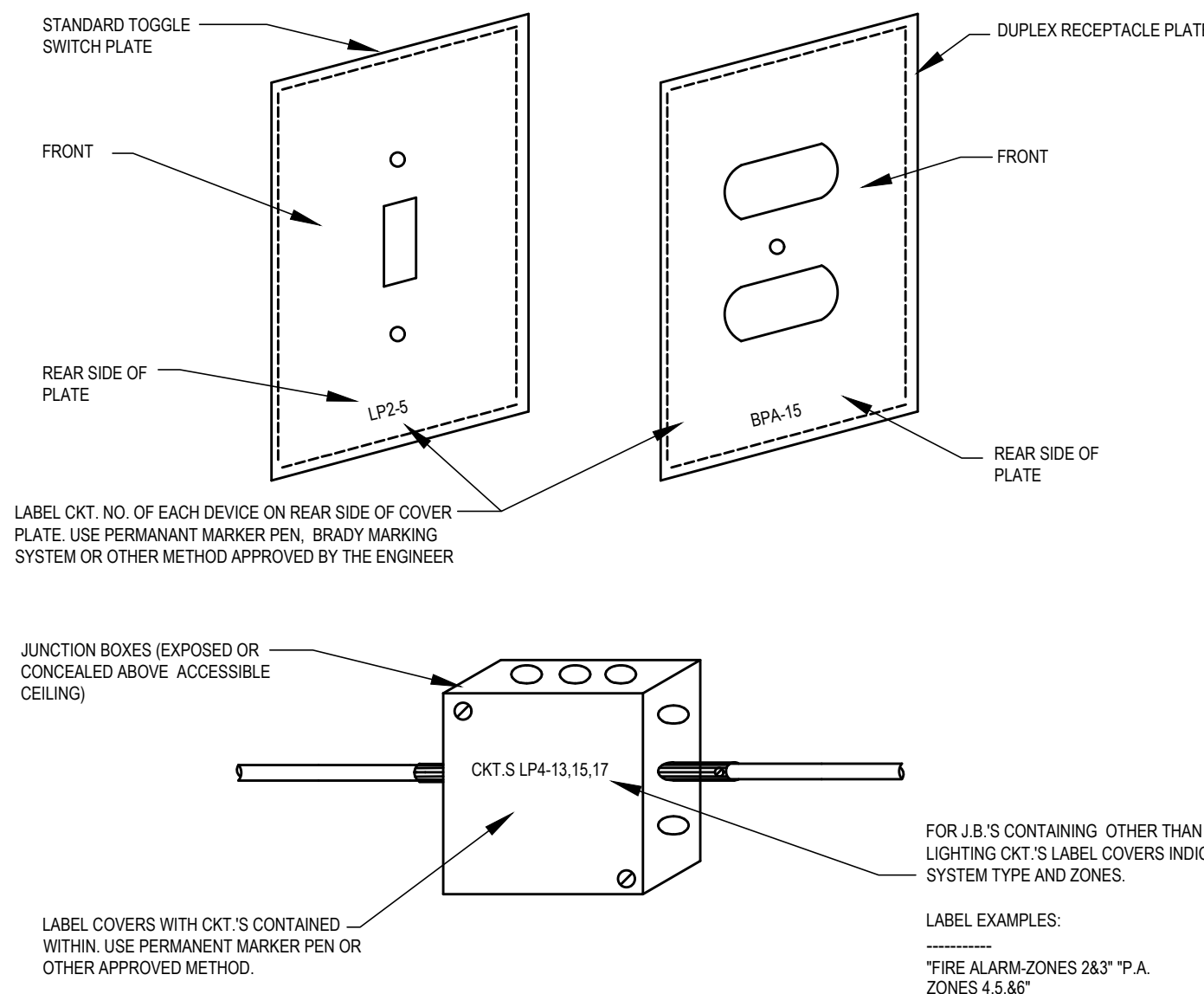


ONE-LINE 277/480V, 3-PHASE, 4W

SCALE: NTS



- NOTES:**
1. REFER TO NATIONAL ELECTRIC CODE FOR ALL REQUIREMENTS FOR A PROPERLY GROUNDED SYSTEM.
 2. ALL GROUND CONDUCTORS TO BE SIZED ACCORDING TO ART. 250 OF THE NATIONAL ELECTRIC CODE.



ELECTRICAL IDENTIFICATION

SCALE: NOT TO SCALE

ALUMINUM CONDUCTOR AND CONDUIT SIZING

MAX. OCCUP.	ALUMINUM WIRE (4) COND + G	MAX. OCCUP.	ALUMINUM WIRE (4) COND + G	MAX. OCCUP.	ALUMINUM WIRE (4) COND + G* (NON-Linear Loads)
100AG	3#1, #6G, 1 1/4"	100ANG	4#1, #6G, 1 1/2"	100AALG	4#0, #6G, 2 1/2"
110AG	3#1/0, #4G, 1 1/4"	110ANG	4#1/0, #4G, 1 1/2"	110AALG	4#0, #4G, 2 1/2"
125AG	3#1/0, #4G, 1 1/2"	125ANG	4#1/0, #4G, 1 1/2"	125AALG	4#0, #4G, 2 1/2"
150AG	3#0, #4G, 2"	150ANG	4#0, #4G, 2"	150AALG	4#0, #4G, 2 1/2"
175AG	4#0, #4G, 2"	175ANG	4#0, #4G, 2 5/8"	175AALG	4#300KCMIL, #4G, 3"
200AG	3250KCMIL, #2G, 2 1/2"	200ANG	4250KCMIL, #2G, 2 1/2"	200AALG	4350KCMIL, #4G, 3"
225AG	3500KCMIL, #2G, 3"	225ANG	4300KCMIL, #2G, 3"	225AALG	4500KCMIL, #2G, 3 1/2"
250AG	3500KCMIL, #2G, 3"	250ANG	4350KCMIL, #2G, 3"	250AALG	4500KCMIL, #2G, 3"
300AG	3500KCMIL, #3G, 3 1/2"	300ANG	4500KCMIL, #3G, 3 1/2"	300AALG	4700KCMIL, #1G, 4"
350AG	3700KCMIL, #1G, 4"	350ANG	4700KCMIL, #1G, 4"	350AALG	(2) 4300KCMIL, #1G, 3"
400AG	(2) 2500KCMIL, #1G, 2 1/2"	400ANG	(2) 4250KCMIL, #1G, 2 1/2"	400AALG	(2) 4500KCMIL, #1G, 3"
500AG	(2) 3500KCMIL, 10G, 3"	500ANG	(2) 4350KCMIL, 10G, 3"	500AALG	(2) 4500KCMIL, 10G, 3 1/2"
600AG	(2) 4500KCMIL, 20G, 3"	600ANG	(2) 4500KCMIL, 20G, 3"	600AALG	(2) 4700KCMIL, 20G, 4"
700AG	(2) 3700KCMIL, 30G, 4"	700ANG	(2) 4700KCMIL, 30G, 4"	700AALG	(3) 4500KCMIL, 30G, 3 1/2"
800AG	(3) 4000KCMIL, 30G, 3"	800ANG	(3) 4000KCMIL, 30G, 3"	800AALG	(3) 4600KCMIL, 30G, 4"
1000AG	(3) 4600KCMIL, 40G, 3 1/2"	1000ANG	(3) 4600KCMIL, 40G, 3 1/2"	1000AALG	(4) 4500KCMIL, 40G, 4"
1200AG	(4) 5500KCMIL, 250KCMIL, G, 3 1/2"	1200ANG	(4) 4500KCMIL, 250KCMIL, G, 3 1/2"	1200AALG	(4) 4750KCMIL, 250KCMIL, G, 4"
1400AG	(5) 5500KCMIL, 350KCMIL, G, 3 1/2"	1400ANG	(5) 4500KCMIL, 350KCMIL, G, 3 1/2"	1400AALG	(5) 4700KCMIL, 350KCMIL, G, 3 1/2"
1600AG	(6) 4500KCMIL, 350KCMIL, G, 3 1/2"	1600ANG	(6) 4800KCMIL, 350KCMIL, G, 3 1/2"	1600AALG	(6) 4600KCMIL, 350KCMIL, G, 3 1/2"
2000AG	(8) 4500KCMIL, 400KCMIL, G, 3 1/2"	2000ANG	(8) 4600KCMIL, 400KCMIL, G, 3 1/2"	2000AALG	(7) 4500KCMIL, 400KCMIL, G, 3 1/2"
2500AG	(8) 4600KCMIL, 600KCMIL, G, 3 1/2"	2500ANG	(8) 4600KCMIL, 600KCMIL, G, 3 1/2"	2500AALG	(9) 4700KCMIL, 600KCMIL, G, 4"
3000AG	(8) 4600KCMIL, 600KCMIL, G, 3 1/2"	3000ANG	(8) 4500KCMIL, 600KCMIL, G, 3 1/2"	3000AALG	(10) 7700KCMIL, 600KCMIL, G, 4"
3500AG	(9) 7500KCMIL, 750KCMIL, G, 4"	3500ANG	(9) 4750KCMIL, 750KCMIL, G, 4"	3500AALG	(12) 4700KCMIL, 750KCMIL, G, 4"
4000AG	(11) 3750KCMIL, 750KCMIL, G, 4"	4000ANG	(11) 4750KCMIL, 750KCMIL, G, 4"	4000AALG	(13) 4750KCMIL, 750KCMIL, G, 4"

NOTES

1. AMPACITY: THHN/THWN, 75 DEG. RATING NEC: 2023
2. BASED ON EMT. E.C. RESPONSIBLE FOR SIZE CHANGES WHEN DIFFERENT TYPE OF CONDUIT IS USED.
3. LIGHTING LOADS ARE CONSIDERED NON-LINEAR. THEREFORE MOST PANELS ARE NON-LINEAR.

** CONDUCTOR AMPACITY REDUCED TO 80% PER NEC AMPACITY TABLE 310.15(B)(3)(a). ASSUMING NONLINEAR LOADS, THE NEUTRAL SHALL BE CONSIDERED TO BE A CURRENT-CARRYING CONDUCTOR.

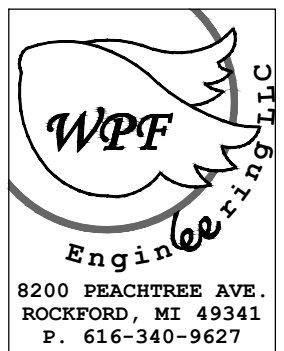
COPPER CONDUCTOR AND CONDUIT SIZING

MAX OCCUP	COPPER WIRE (3) COND - G	MAX OCCUP	COPPER WIRE (4) COND - G (LINEAR LOADS)	MAX OCCUP	COPPER WIRE (4) COND - G** (NON-LINEAR LOADS)
20G	3#12, #12G, 1/2"	20NG	4#12, #12G, 1/2"	20NG	4#12, #12G, 1/2"
30G	3#10, #10G, 3/4"	30NG	4#10, #10G, 1/2"	30NG	4#8, #10G, 3/4"
40G	3#8, #10G, 3/4"	40NG	4#8, #10G, 3/4"	40NG	4#8, #10G, 3/4"
50G	3#8, #10G, 3/4"	50NG	4#8, #10G, 3/4"	50NG	4#6, #10G, 1"
60G	3#6, #10G, 1"	60NG	4#6, #10G, 1"	60NG	4#4, #10G, 1 1/4"
70G	3#4, #8G, 1"	70NG	4#4, #8G, 1"	70NG	4#3, #8G, 1 1/4"
80G	3#4, #8G, 1"	80NG	4#4, #8G, 1 1/4"	80NG	4#3, #8G, 1 1/4"
90G	3#3, #8G, 1 1/4"	90NG	4#3, #8G, 1 1/4"	90NG	4#2, #8G, 1 1/4"
100G	3#3, #8G, 1 1/4"	100NG	4#1, #8G, 1 1/4"	100NG	4#1, #8G, 1 1/2"
110G	3#2, #8G, 1 1/4"	110NG	4#2, #6G, 1 1/4"	110NG	4/10, #6G, 1 1/2"
125G	3#1, #8G, 1 1/2"	125NG	4#1, #6G, 1 1/2"	125NG	4/10, #6G, 2"
150G	3/4, #6G, 1 1/2"	150NG	4/10, #6G, 1 1/2"	150NG	4/30, #6G, 2 1/2"
175G	3/20, #6G, 2"	175NG	4/20, #6G, 2"	175NG	4/40, #6G, 2 1/2"
200G	3/40, #4G, 2"	200NG	4/40, #4G, 2 1/2"	200NG	4/250KCML, #4G, 2 1/2"
225G	3/40, #4G, 2"	225NG	4/40, #4G, 2 1/2"	225NG	4/300KCML, #4G, 3"
250G	3/250KCML, #4G, 2 1/2"	250NG	4/250KCML, #4G, 2 1/2"	250NG	4/350KCML, #4G, 3"
300G	3/350KCML, #4G, 3"	300NG	4/350KCML, #4G, 3"	300NG	4/500KCML, #4G, 3 1/2"
350G	3/500KCML, #3G, 3"	350NG	4/350KCML, #3G, 3 1/2"	350NG	(2) 4/40, #3G, 2 1/2"
400G	4/600KCML, #3G, 3"	400NG	4/600KCML, #3G, 3 1/2"	400NG	(2) 4/250KCML, #3G, 2 1/2"
450G	(2) 3/250KCML, #2G, 2 1/2"	500NG	(2) 4/250, #2G, 2 1/2"	500NG	(2) 4/350KCML, #2G, 2 1/2"
600G	(2) 3/350KCML, #1G, 3"	600NG	(2) 4/350KCML, #1G, 3"	600NG	(2) 4/500KCML, #1G, 3"
700G	(2) 3/500KCML, 1/0G, 3"	700NG	(2) 4/500KCML, 1/0G, 3"	700NG	(3) 4/350KCML, 1/0G, 3"
800G	(2) 3/600KCML, 1/0G, 4"	800NG	(2) 4/600KCML, 1/0G, 4"	800NG	(3) 4/400KCML, 1/0G, 3"
1000G	(3) 3/500KCML, 2/0G, 3"	1000NG	(3) 4/500KCML, 2/0G, 3"	1000NG	(4) 4/350KCML, 2/0G, 3"
1200G	(4) 3/350KCML, 3/0G, 3"	1200NG	(4) 4/500KCML, 3/0G, 3"	1200NG	(4) 4/500KCML, 3/0G, 3 1/2"
1400NG	(4) 3/500KCML, 4/0G, 3"	1400NG	(4) 4/500KCML, 4/0G, 3"	1400NG	(4) 4/700KCML, 4/0G, 3 1/2"
1600G	(5) 4/400KCML, 4/0G, 3"	1600NG	(5) 4/400KCML, 4/0G, 3"	1600NG	(5) 4/600KCML, 4/0G, 3 1/2"
2000G	(5) 4/600KCML, 4/0G, 3"	2000NG	(5) 4/600KCML, 4/0G, 3 1/2"	2000NG	(6) 4/700KCML, 4/0G, 3 1/2"
2500G	(7) 5/500KCML, 350KCML, G, 3 1/2"	2500NG	(7) 4/500KCML, 350KCML, G, 3 1/2"	2500NG	(7) 4/700KCML, 350KCML, G, 3 1/2"
3000G	(8) 5/500KCML, 400KCML, G, 3 1/2"	3000NG	(8) 4/500KCML, 400KCML, G, 3 1/2"	3000NG	(8) 4/750KCML, 400KCML, G, 4"
3500G	(9) 5/400KCML, 400KCML, G, 4"	3500NG	(9) 4/600KCML, 400KCML, G, 4"	3500NG	(10) 4/700KCML, 400KCML, G, 4"
4000G	(10) 3/600KCML, 500KCML, G, 4"	4000NG	(10) 4/600KCML, 500KCML, G, 4"	4000NG	(11) 4/700KCML, 500KCML, G, 4"

MV-1

- | | |
|------|-------------------------------------|
| MV-2 | 3/20, 15KV CABLE/IEC-MV-105-4C |
| MV-3 | 3/20KCMIL, 15KV CABLE/IEC-MV-105-5C |
- NOTES:**
1. AMPACITY: THIMBLIN, 75 DEG. RATING NEC: 2023
 2. BASED ON EMT. E.C. RESPONSIBLE FOR SIZE CHANGES WHEN DIFFERENT TYPE OF CONDUIT IS USED
 3. LIGHTING LOADS ARE CONSIDERED NON-LINEAR. THEREFORE MOST PANELS ARE NON-LINEAR.
- ALUMINUM CONDUIT MAY BE USED IN PLACE OF COPPER. CONDUITORS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND INDUSTRY STANDARDS. IT IS THE RESPONSIBILITY OF THE E.C. TO ADJUST CONDUIT SIZES AND CONDUIT SIZES AND REVIEW VOLTAGE DROP AND ADJUST IF ALUMINUM CONDUCTOR ARE TO BE USED.

** CONDUCTOR AMPACITY REDUCED TO 80% PER NEC AMPACITY TABLE 310.15(B)(3)(a). ASSUMING NONLINEAR LOADS, THE NEUTRAL SHALL BE CONSIDERED TO BE A CURRENT-CARRYING CONDUCTOR.



4/18/2025

[illegible]

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ARCHITECTURE PLANNING ENGINEERING

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Renovation

Markdom Renovation

400 Parkland Dr.
Charlotte, MI 48813

ELECTRICAL ON-LINE & DETAILS

Issued	Drawing No. E5.1
Project No. 22067	

LIGHT FIXTURE LEGEND								4/18/2025
FIXTURE TYPE	DESCRIPTION	MANU.	CATALOG PART#	FINISH	VOLTAGE	LAMPS	Wattage	REMARKS
A3	2X2 LED TROFFER DIRECT/INDIRECT DIMMABLE 3000 LUMENS	METALUX LITHONIA COLUMBIA DAY-BRITE	22ARS- STAK 2X2 3000LM-80CRI-35K-COL-MIN10 LCAT22-35- 2FGXG4L-	WHITE	120	LED 3500K	34	10W BATTERY PACK WHERE NOTED SELF DIAGNOSTICS
A4	2X2 LED TROFFER DIRECT/INDIRECT DIMMABLE 4000 LUMENS	METALUX LITHONIA COLUMBIA DAY-BRITE	22ARS-L3C3-UNV STAK 2X2 4000LM-80CRI-35K-COL-MIN10 LCAT22-35-MWHE-G-EDU 2FGXG4L-835-2-RS-UNV-DIM	WHITE	120	LED 3500K	34	10W BATTERY PACK WHERE NOTED SELF DIAGNOSTICS
E	POLYCARBONATE EXIT WITH BATTERY	LITHONIA COMPASS	SURE-LITE LSI LQMSW3R120/277-ELN-SD CER	WHITE BLACK SEE NOTES ON DWG	120	LED RED	N/A	SELF DIAGNOSTICS, BATTERY COLOR BLACK NOTED ON PLANS WORSHIP/STAGE
E1	POLYCARBONATE EXIT WITH REMOTE HEAD CAPABILITY NICKEL CADMIUM BATTERY	LITHONIA LSI COMPASS SURE-LITE	LHQM-LED-WR-HO-RO-SD LPRS CERRC LPX-R5-SD	WHITE BLACK SEE NOTES ON DWG	120	LED RED	N/A	SELF DIAGNOSTICS, BATTERY COLOR BLACK NOTED ON PLANS WORSHIP/STAGE
EM1	REMOTE DUAL HEAD WEATHERPROOF	LITHONIA CHLORIDE LSI DUAL-LITE SURE-LITE	RRLDBK CORDB SRP-25-D-BK	BLACK	120	LED	NA	MOUNT AT 8'-0" AFF COLOR BLACK
V4	4' VANITY LIGHT 3500 LUMENS	LITHONIA OXYGEN LUMENCIA AFX LIGHTING	FMVCCLS-48-MVOLT-35K-90CRI-BN 3-536-24-35K LLFL5554D-B-MN-MCT L1A4804LAJMVSN	BRUSHED NICKEL	120	LED 3500K	36	MOUNT ABOVE MIRROR
XW3	LED EXTERIOR WALL MOUNT NO BATTERY	LITHONIA	DSXW1 P4 40K T3M PHOTOCELL & MOTION SENSOR	BLACK	120/277	LED 4000K	29	
XW4	LED EXTERIOR WALL MOUNT NO BATTERY	McGRAW EDISON GARDCO BEACON LITHONIA	DSXW1 P7 40K TFTM PHOTOCELL & MOTION SENSOR	BLACK	120/277	LED 4000K	73	
SL3	PARKING LOT LIGHTING ROUND POLE 17'-6" POLE ON CONCRETE BASE	LUMARK LITHONIA BEACON LSI INDUSTRIES	DSX1 LED P4 40K 80CRI T3M PHOTOCELL & MOTION SENSOR	BLACK	120/277	LED 4000K	124	PROVIDE PHOTOCELL AND MOTION SENSOR ALUMINUM ROUND POLE

LIGHT FIXTURE SCHEDULE NOTES:

1. ALL FIXTURES SHOWN HALF SHADED OR WITH "E" SUFFIX ARE TO BE PROVIDED WITH AN EMERGENCY BATTERY PACK AS SPECIFIED ABOVE.

3/15/2025		LIGHTING CONTROL SCHEDULE - RP1									
LOAD NUMBER	LOCATION	FIXTURE TYPE	CIRCUIT	DIMMER TYPE	FUNCTION	VOLT	QTY	FIXTURE WATTAGE	TOTAL WATTAGE	REMARKS	
X01	BUILDING SIGNAGE		L-46	NON-DIM		120	1	100	100		
101	OPEN OFFICE	A3 & A4	L-48	0-10V		120	38	34	1292	NOTE 2 & 3	
102	ENTRY	R2	L-48	0-10V		120	4	34	138	NOTE 2 & 3	
								TOTAL WATTAGE	1428		
LIGHTING CONTROL NOTES:											
1. LIGHTING CONTROL SYSTEM TO MEET MICHIGAN 2015 ENERGY CODE. PROVIDE SYSTEM AS NOTED.											
2. COORDINATE HOURS OF OPERATION AND PRESET OFF AND ON TIMES WITH OWNER PRIOR TO PROGRAMMING.											
3. CONTROL STATION A1 (3 LOCATIONS) - WALK THRU (101 50%), ON (101) DIM UP & DOWN (101)											
4. CONTROL STATION B1 WALK THRU (101 50%), ON (101), ON (102), OFF (102)											



COMcheck Software Version 4.1.5.5

Interior Lighting Compliance Certificate

Project Title: _____

Project Type: _____

Project Information

Energy Code: 90.1 (2013) Standard

Project Title: Markdom Components

Project Type: New Construction

Owner/Agent:

Construction Site: 400 Parkland Dr.
Charlotte, NC 28213

Designer/Contractor:

Lynn Surdock
WPF Engineering LLC
8200 Peachtree Ave
Rockford, MI 49341
Lsurdock@wpe-engineering.com

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft ²)	C Allowed Watts / ft ²	D Allowed Watts (B X C)
1-Office	7780	0.82	6380
Total Allowed Watts =			6380

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-Office				
LED 1: A3; 2x2; Other:	1	27	34	918
LED 2: A4; 2x2; Other:	1	85	34	2890
LED 3: V4; vanity; Other:	1	2	36	72
Total Proposed Watts =				3880

Interior Lighting PASSES: Design 39% better than code

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 90.1 (2013) Standard requirements in COMcheck Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title _____

Signature _____

Date _____

Project Title: Markdom Components

Data filename: C:\Users\m3nols\WPF Engineering, LLC\Clients - Documents\Jeffery Parker\Markdom Components\ComCheck\Markdom Components.cck

Report date: 04/07/25

Page 1 of 6



COMcheck Software Version 4.1.5.5

Exterior Lighting Compliance Certificate

Project Information

Energy Code: 90.1 (2013) Standard

Project Title: Markdom Components

Project Type: New Construction

Exterior Lighting Zone: 1 (Developed rural area (LZ1))

Owner/Agent:

Designer/Contractor:

Lynn Surdock
 WPF Engineering, LLC
 8200 Peachtree Ave
 Rockford, MI 49341
 lsurdock@wfp-engineering.com

Allowed Exterior Lighting Power

A Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
Other door (not main entry)	9 ft of door	20	Yes	180
4297 (Loading dock)	4207 ft2	0.5	Yes	2104
Total Tradable Watts (a) =				2284
Total Allowed Watts =				2284
Total Allowed Supplemental Watts (b) =				500

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.
 (b) A supplemental allowance equal to 500 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Other door (not main entry) (9 ft of door width): Tradable Wattage				
LED 1: xwl: wallpack: Other	1	2	73	146
4297 (Loading dock 4207 ft2): Tradable Wattage				
LED 2: xwl: wallpack: Other:	1	2	73	146
LED 3: SL4: pole: Other:	1	1	124	124
Total Tradable Proposed Watts =				416

Exterior Lighting PASSES: Design 85% better than code

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 90.1 (2013) Standard requirements in COMcheck Version 4.1.5.5 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title

Signature

Date

Project Title: Markdom Components

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Report date: 04/07/25

Page 2 of 6

SYSTEMS SYMBOL LEGEND		
SYMBOL	DESCRIPTION	MTG. HT. TO ⌀
	FIRE ALARM PULL STATION	46"
	FIRE ALARM HORN/STROBE LIGHT	80"
	AREA SMOKE DETECTOR-PHOTOELECTRIC	—
	VISUAL ONLY ALARM	80"
	MAGNETIC DOOR HOLD OPEN	—
	CARBON MONOXIDE SENSOR- E.C TO ROUGH-IN SINGLE GANG BOX AND 1/2" C. TO ACCESSIBLE CEILING SPACE.	—
	DUCT SMOKE DETECTOR	—
	HEAT DETECTOR	—
	O.S.&Y TAMPER SWITCH	—
	WATER FLOW SWITCH	—
	REMOTE ALARM KEY TEST SWITCH	46"
	FIRE ALARM CONTROL RELAY	—
	FIRE ALARM CONTROL PANEL	—
	FIRE ALARM ANNUNCIATOR PANEL	—
	CARD READER	46"
	SECURITY DOOR CONTACT	AT DOOR HEAD

F.A. NOTES:

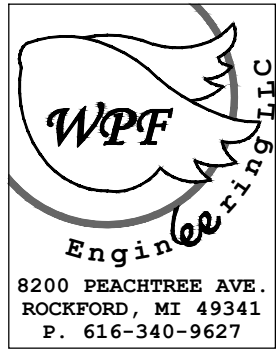
1. E.C. TO PROVIDE CONNECTION TO ALL DUCT DETECTORS WHETHER SHOWN ON ELECTRICAL DRAWINGS OR NOT. COORDINATE QUANTITY AND LOCATIONS WITH MECHANICAL CONTRACTOR SCHEDULES, REVIEWING ALL CFM REQUIREMENTS. PROVIDE DUCT DETECTORS IF NOT NOTED TO BE PROVIDED BY M.C.
2. E.C. TO PROVIDE CONNECTIONS TO ALL FLOW AND TAMPER SWITCHES WHETHER SHOWN ON ELECTRICAL DRAWINGS OR NOT. COORDINATE QUANTITY AND LOCATIONS WITH FIRE PROTECTION DRAWINGS AND/OR DESIGN BUILD CONTRACTOR.
3. E.C. TO PROVIDE EMERGENCY POWER TO FIRE ALARM BOOSTER POWER SUPPLIES WHEN EMERGENCY POWER SYSTEM IS AVAILABLE.

ELECTRICAL SYMBOL LEGEND		
SYMBOL	DESCRIPTION	MTG. HT. TO ⌀
	SINGLE POLE, 2-POLE, 3-WAY SWITCH, OR 4-WAY SWITCH - SPEC. GRADE	46"
	LINE VOLTAGE, 3-WAY DIMMER, LOW VOLTAGE, 0-10V DIMMER SWITCHES	46"
	IR SWITCH	46"
	DUAL BUTTON IR SWITCH	
	IR SWITCH WITH 0-10V DIMMING, PROVIDE 0-10V DIMMING CONTROL WIRES FROM SWITCH TO FIXTURES	
	SINGLE BUTTON DUAL TECHNOLOGY SWITCH	46"
	DUAL BUTTON DUAL TECHNOLOGY SWITCH	
	OCCUPANCY SENSOR	
	PHOTO CELL	
	CONTROL STATION	46"
	SPLIT WIRED RECEPTACLE C - DENOTES CONTROLLED VIA RELAY OR OCC SENSOR	18"
	WATER RESISTANT GROUND FAULT CIRCUIT INTERRUPTER WITH WEATHERPROOF WHILE IN USE COVER	18"
	DUPLEX OUTLET-SPEC. GRADE CIRCLE AROUND SYMBOL= CEILING MOUNTED	18"
	(2) DUPLEX OUTLET-SPEC. GRADE CIRCLE AROUND SYMBOL= CEILING MOUNTED	18"
	SPECIAL OUTLET-CHARACTERISTICS AS NOTED ON PLANS	AS NOTED
	DATA OUTLET-4" SQ. BOX W/ 1 GANG RAISED COVER, 1-1/4" C. UP WALL TO CLG. SPACE CIRCLE AROUND SYMBOL= CEILING MOUNTED	18"
	TV OUTLET-4" SQ. BOX W/ 1 GANG RAISED COVER, 1-1/4" C. UP WALL TO CLG. SPACE CIRCLE AROUND SYMBOL= CEILING MOUNTED	18"
	JUNCTION BOX - HUBBELL NSAV62M WITH RECEPTACLE KIT HUBBELL NSMCP. PROVIDE CONNECTOR PLATE FOR NV	AS NOTED
	FLOOR BOX, 2 RECEPTACLE, 2 LOW VOLTAGE 1-1/4" TO FLOORBOX FOR LOW VOLTAGE OR PER PLAN	--
	FLOOR BOX, 1 RECEPTACLE, 2 LOW VOLTAGE 1-1/4" TO FLOORBOX FOR LOW VOLTAGE OR PER PLAN	--
	FLOOR BOX, 1 FURNITURE, 1 DATA ROUGH-IN LOCATION IN BOX. SEE FLOOR BOX SCHEDULE ON DRAWINGS 1-1/4" TO FLOORBOX FOR LOW VOLTAGE OR PER PLAN	--
	POWER ONLY FLOOR BOX. SEE FLOOR BOX SCHEDULE ON DRAWINGS FOR REQUIREMENTS 1-1/4" TO FLOORBOX FOR LOW VOLTAGE OR PER PLAN	--
	COMMUNICATION ONLY FLOOR BOX. SEE FLOOR BOX SCHEDULE ON DRAWINGS FOR REQUIREMENTS 1-1/4" TO FLOORBOX FOR LOW VOLTAGE OR PER PLAN	--
	JUNCTION BOX -4" SQ. BOX W/ 2 GANG RAISED COVER, 1" C. UP WALL TO CLG. SPACE UNLESS OTHERWISE NOTED	AS NOTED
	FUSED DISCONNECT SWITCH- FDS-HEAVY DUTY	46"
	NON-FUSED DISCONNECT SWITCH- NFDS-HEAVY DUTY	46"
	SW. AND PLUGFUSE HOLDER-BUSMANN "SSU" & FUSESTAT FUSE	AT EQUIPT.
	MANUAL MOTOR STARTER W/PILOT LIGHT H-DENOTES WITH HAND-OFF-AUTO SW.	46"
	MAGNETIC MOTOR STARTER-MS	46"
	COMBINATION MAG. STARTER FUSED DISC. SWITCH - CS/FDS	46"
	VARIABLE FREQUENCY DRIVE	---
	SINGLE PHASE ELECTRIC MOTOR	---
	THREE PHASE ELECTRIC MOTOR	---
	SURFACE OR FLUSH MTD. BRANCH CIRCUIT PANELBOARD	72" TO TOP
	SURFACE OR FLUSH MOUNTED LIGHTING CONTROL PANEL	72" TO TOP
	TRANSFORMER	---
	PUSH BUTTON	46"
	THERMOSTAT- E.C. TO ROUGH-IN SINGLE GANG BOX AND 1/2" C. TO ACCESSIBLE CEILING SPACE.	46"

SYMBOL NOTES:

1. "AC" DENOTES ABOVE COUNTER. COORDINATE HEIGHT WITH ARCHITECT.
2. "H" DENOTES HORIZONTAL MOUNTING OF DEVICE.
3. "W" DENOTES WALL MOUNTED AT 46" AFF.
4. "B" DENOTES MOUNTED IN BASE.
5. "F" DENOTES MOUNTED IN FACE OF CABINETS.

Mark	Description	Date
	BIDDING & PERMIT SET	04/18/2025



4/18/2025

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April 18, 2025
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PANELBOARD LOADSHEET - 3 PHASE												
LTG. MTRS. REC. OTHER				44.85 TOTAL LOAD (KVA)				FILE NO. 4/18/2025				
4191.00 960.00 10800.00 28900.00				44.45 TOT. DIV. LOAD (KVA)				PROJECT # 0				
4.19 0.96 10.80 28.90				123.58 TOT. DIV. AMPS				PHASE 3				
1.00 1.00 Note 1 1.00				154.23 TOT. DIV. AMPS X 1.25				VOLTAGE 208				
4.19 0.96 10.40 28.90								CIRCUIT CAPACITY 60				
								MAIN BREAKER/LUGS 225				
								MOUNTING SURFACE				
								TVSS: 200% NEUTRAL				
PANEL LOCATION				PANEL ID BPL								
VOLT AMPS				DESCRIPTION				VOLT AMPS				
CKT NO	LTG	MTRS	REC	OTHER	CKT BREAKER	L CKT BREAKER	DESCRIPTION	OTHER	REC	MTRS	LTG	CKT NO
1				720	600 2 RECEIPTS	A 1P200G1	VENDING MACHINE	1200				2
2				720	600 2 OFFICES 123 & 124	B 1P200G1	VENDING MACHINE	1200				4
3				720	400 IT	C 1P200G1	VENDING MACHINE	1200				4
5				720	1200 IT	A 1P200	BREAKROOM	540				6
9				720	600 2 OFFICES 115 & 121	B 1P200	BREAKROOM COUNTER	180				10
11				720	200 Huddle	C 1P200	BREAKROOM COUNTER	360				12
13				720	600 OFFICES 117 & 118	A 1P200G1	EWIC	200				14
15				720	600 OFFICES 114 & 115	B 1P200G1	HAND DRYER	1200				16
17				540	300 ENTRY/CONF	C 1P200G1	HAND DRYER	1200				18
19				720	200 CONF 111 & 113	A 1P200G1	HAND DRYER	1200				20
21				1080	800 OFFICE 110,111 & Huddle	B 1P200G1	HAND DRYER	1200				22
23				180	600 OPEN OFFICE FLOX	C 1P200G1	HAND DRYER	1200				24
25				180	600 OPEN OFFICE FLOX	B 1P200G1	HAND DRYER	0				26
27				180	600 OPEN OFFICE FLOX	B 1P200G1	HAND DRYER	0				28
29				180	600 OPEN OFFICE FLOX	C 1P200G1	HAND DRYER	0				30
31				180	600 OPEN OFFICE FLOX	A 1P200G1	HAND DRYER	0				32
33				180	600 OPEN OFFICE FLOX	B 1P200G1	HAND DRYER	0				34
35				180	600 OPEN OFFICE FLOX	C 1P200G1	RESTROOMS AND EF-1	900	960			36
37				180	600 OPEN OFFICE FLOX	A 1P200						38
39				180	600 OPEN OFFICE FLOX	B 1P200	OPEN OFFICE FLOX	600	180			40
41				180	600 OPEN OFFICE FLOX	C 1P200	OPEN OFFICE FLOX	600	180			42
SUBT	0	0	8460	11500				11000	2340	960		0

April 18, 2025
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SECTION 26 0500-BASIC ELECTRICAL REQUIREMENTS

PART 1 GENERAL

1.01 RELATED SECTIONS

A. The general provisions of the Contract, including General and Supplementary Conditions and General Requirements (if any), apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

- A. This Section specifies several categories of provisions for electrical work, including:
1. Certain adaptive expansions of requirements specified in Division 1.
 2. General performance requirements within the electrical systems as a whole.
 3. General work to be performed as electrical work because of its close association.
 4. Drawings and Specifications:
 - a. Drawings: Refer to the E-Series Drawings for graphic representations, schedules, and notations showing electrical work.
 - b. Specifications: Refer to the bid categories for the related primary technical specifications of electrical work.
 - c. Drawings and Specifications are intended to supplement each other, and all work specified or indicated in either shall be provided.

1.03 COORDINATION OF ELECTRICAL WORK

- A. General: Refer to the Division 1 sections for general coordination requirements applicable to the entire scope of work. It is recognized that the documents are diagrammatic in showing physical relationships which must be established within the electrical work, and in its interface with other work, including utilities and mechanical work. Such establishment is the exclusive responsibility of the Electrical Contractor.
- B. Advise other trades of openings required in their work for the installation of large electrical equipment.
- C. The Electrical Contractor shall be responsible for all subcontractors and suppliers, and include in his bid all materials, labor, and equipment to other trades involved in accordance with all local customs, rules, regulations, jurisdictional awards, and decisions and secure compliance of all parts of the specifications and drawings regardless of Sectional inclusion in these specifications.
- D. Equipment Clearance:
1. Electrical Contractor to coordinate with the Mechanical Contractor's equipment locations, to insure adequate clearance is maintained, as required by the National Electrical Code, applicable state and local codes, and for future maintenance and operation.
- E. Wall, Floor and Ceiling Openings:
1. Locate all openings and provide the General Contractor with details and templates of all openings necessary for installation of electrical work.
 2. In general, all openings and required intels shall be provided by the General Contractor. Size and location of openings is the responsibility of this Contractor. Cracks and rough edges left following the installation of equipment shall be caulked or covered by the equipment installing contractor.
 3. E.C. is responsible for preventing water from entering through any exterior wall or floor penetrations via conduits or cracks and/or rough edges of openings made.

1.04 PRODUCT SUBSTITUTIONS

A. Substitutions requested for review during or after bidding may be reviewed by the WPF Engineering upon request at a fee of \$500.00 per product review.

1.05 SUBMITTAL PROCEDURES

A. General: Refer to Division 1 for general administrative/procedural requirements related to shop drawings. Provide Shop drawings for all equipment as specified in individual specification sections.

1.06 SITE AND PROJECT DOCUMENTATION EXAMINATION

- A. Submission of proposal is considered evidence the Electrical Contractor has visited site, examined drawings and specifications of all trades including Architectural, Structural, Mechanical and Electrical, and fully informed himself with all project and site conditions. It is also evidence that they are proficient, experienced, and knowledgeable of all standards, codes, ordinances, permits, and regulations which affect his completion, cost, and time required, and that all costs are included in the proposal.
- B. Each Electrical Contractor and subcontractor shall examine all drawings and specifications of his trade and work shown on drawings, shop drawings and field layouts of all other trades (including Architectural, Structural, Mechanical and Electrical) working on the project prior to starting his required work, and coordination of all work with other trades.
- C. All schedules on drawings and specifications are only for convenience of the Electrical Contractor. Each Electrical Contractor shall make his own count and, where fixtures or equipment are shown on drawings but not on schedule, provide like equipment or fixtures for like rooms or use.

1.07 QUALITY ASSURANCE, STANDARDS, AND SYMBOLS

- A. General: Refer to Division 1 for general administrative/procedural requirements related to compliance with codes and standards. Specifically, for the electrical work (in addition to standards specified in individual work sections), the following standards are imposed, as applicable to the work in each instance:
1. NEC (NFPA 70), National Electrical Code
 2. AWS, American Welding Society, Standards for Welding
 3. ANSI C2, National Electrical Safety Code
 4. ANSI C73, Dimensions of Attachment Plugs & Receptacles
 5. NECA, Standards for Installation
 6. NEMA, Standards for Materials and Products
 7. ASTM, American Society for Testing Materials
 8. ASA, American Standards Association
 9. NFPA, National Fire Protection Association
 10. UL, Underwriters' Laboratories, Inc.
 11. OSHA, Occupational Safety and Health Act
 12. ADA, Americans with Disabilities Act
- B. NOTE: ALWAYS REFER TO THE MOST CURRENT ADOPTED CODES AND STANDARDS.
- C. All work to be provided and tested in accordance with all applicable local, county and state laws, ordinances, codes, rules, and regulations.
- D. Where quantities, sizes, or other requirements on drawings or specifications are in excess of code requirements, drawings or specifications govern.
- E. When conflict exists between referenced specifications or standards, more stringent requirements govern. No extra compensation for such compliance requirements shall be allowed.
- F. No work shall be covered or enclosed until tested in accordance with applicable codes and regulations, and successful tests witnessed and approved by authorized inspection authority. Written approvals shall be secured by the Electrical Contractor and submitted to Engineer before final acceptance of work.
- G. In general, all material where applicable shall be labeled or listed by Underwriters' Laboratories, Inc.
- H. Permits and Fees: Give all notices, file all drawings, obtain necessary approvals, obtain all permits, pay all fees, deposits and expenses required for installation of all work under this Contract.

PART 2 PRODUCTS

2.01 PRODUCTS, ELECTRICAL WORK

- A. General: Refer to Division 1 sections for general requirements on products, materials and equipment. The following provisions expand or modify the requirements as applicable to electrical work.
- B. Compatibility: Provide products which are compatible with other products of the electrical work, and with other work requiring interface with the electrical work, including electrical connections and control devices. For exposed electrical work, coordinate colors and finishes with other work.
- C. Standards:
1. All electrical material, equipment and accessories shall be new and conform to all applicable standards, codes and requirements and all applicable local, state and federal specifications.
 2. All products shall be of established manufacturers regularly engaged in making type of materials to be provided and complete with all parts, accessories, connections, etc., reasonably incidental thereto as specified in detail or as described in manufacturer's catalog. All properly tested, cleaned, adjusted, lubricated and put in complete working order ready for service.

2.05 FIRE STOPPING

- A. Sealing of openings between floors, through rated fire and smoke wall, existing or created by the contractor for their work shall be the responsibility of the contractor.
- B. Sealing material and application of this material shall be accomplished in such a manner which is acceptable to the local fire and building authorities having jurisdiction over this work.
- C. Any openings created by or the contractor and left unused shall also be sealed as part of this work.

PART 3 EXECUTION

3.01 CERTIFICATE OF INSPECTION

A. Provide Engineer's office evidence that installation has been inspected and approved by municipal or state inspector having jurisdiction over electrical work involved.

3.02 RECORD DRAWINGS AND OPERATIONAL AND MAINTENANCE MANUALS

- A. Maintain a white-print set of Electrical Contract Drawings and submittals in clean, undamaged condition for mark-up of actual installation on either Electrical Contract Drawings or submittals which vary substantially from the work as shown. Comply with additional Division 1 requirements relative to record drawings.
- B. Contractor to provide copies of all Operational and Maintenance Manuals per specifications. Comply with additional Division 1 requirements relative to operational and maintenance manuals.
- C. Contractor responsible for securing all elevations and locations prior to concealment.
- 3.03 PLACING SYSTEMS INTO OPERATION
- A. General:
1. Electrical Contractor shall be responsible for all start-up procedures, system checks and phase balancing, coordinating work of other Contractors and Subcontractors
 2. All equipment installed, tested and operated in accordance with manufacturer's recommendations at normal operating conditions.
 3. All permanent electrical equipment used during construction periods shall be cleaned, and damaged equipment replaced.
 4. Place all systems into operation when weather or other considerations require their use. Perform repair, adjustment and balancing operations as often as required to assure satisfactory operation before final acceptance.

3.04 ADJUSTMENTS AND BALANCING

A. Subsequent to the installation of the electrical power and distribution system and upon the beginning of operation, Contractor shall make all necessary adjustments to equipment installed or connected by him under this Contract so as to insure proper operation of the same. Contractor shall measure phase balance and make necessary adjustments to any portion of the electrical system that is substantially out of balance.

3.05 TESTING

A. All equipment shall be factory tested using industry standard testing procedures. Refer to individual specification sections for specific testing requirements.

3.06 GUARANTEE

- A. Provide written guarantee for all work performed under this Contract for a period of not less than one year from the date of substantial completion.
- B. Acceptance date of substantial completion shall be the date of Owner occupancy as defined by Architect/Engineer.
- C. Contractor shall make all necessary alterations, repairs, adjustments, replacements during guarantee period as directed by Architect/Engineer to comply with Drawings and Specifications at no cost to Owner.
- D. Repair or replacements made under guarantee to bear further one year guarantee from date of acceptance of repair or replacement.

3.07 ELECTRICAL WORK CLOSEOUT

- A. General: Refer to the Division 1 Sections for general closeout requirements.
- B. Coordinate closeout operations with closeout of mechanical systems and other power consuming equipment as follows:
1. Test run electrical equipment in coordination with test runs of mechanical systems.
 2. Clean and lubricate operational equipment.
 3. Instruct Owner's operating personnel thoroughly in the operation, sequencing, maintenance and safety/emergency provisions of the electrical systems.
 4. Turn over the operations to the Owner's personnel at the time(s) of substantial completion.
 5. Until the time of final acceptance of the total work of the Contract, respond promptly with consultation and services to assist the Owner's personnel with operation of electrical systems.
- C. Conditions of Final Closeout:
1. All completion checklists signed and returned to Engineer.
 2. Maintenance manuals submitted and approved.
 3. Record drawings submitted and approved.
 4. Final certificate of electrical inspection and Contractor's written 1 year warranty submitted and approved.
 5. Circuit directory in each panelboard. Electrical component identification complete.
 6. Equipment clean-up and final adjustments made.
 7. Contractor has instructed Owner's representative in the safe operation and use of the electrical systems.
 8. All temporary wiring and facilities have been removed.

SECTION 26 0502 - MINOR ELECTRICAL DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical demolition.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment for patching and extending work: Refer to individual specification sections for additional requirements in addition to section 1609S.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements are as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Demolition drawings are based on casual field observation and existing record documents.
- D. Report discrepancies to Architect before disturbing existing installation.
- E. Report existing code violation to Architect
- F. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings to be removed.
- B. Coordinate utility service outages with utility company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations.
- D. Existing Electrical Service: Maintain existing system in service until new system is complete and ready for service. Disable system only to make switchovers and connections. Minimize outage duration.
1. Obtain permission from Owner at least 24 hours before partially or completely disabling system.
 2. Make temporary connections to maintain service in areas adjacent to work area.
- E. Existing Telephone System: Maintain existing system in service. Minimize outage duration.
1. Notify Owner at least 24 hours before partially or completely disabling system.
 2. Notify telephone utility company at least 24 hours before partially or completely disabling system.
 3. Make temporary connections to maintain service in areas adjacent to work area.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Remove, relocate, and extend existing installations to accommodate new construction.
- B. Remove abandoned wiring to source of supply.
- C. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
- D. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets which are not removed unless noted to be patched on plans.
- E. Disconnect and remove abandoned panelboards and distribution equipment.
- F. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
- G. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- H. Repair adjacent construction and finishes damaged during demolition and extension work.

- I. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- J. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.
- K. Existing branch circuits serving lights, outlets and other loads need not be replaced, unless otherwise indicated, if no other work is required on that circuit. New circuit extensions from unaltered existing circuits shall be made to replaced or relocated branch circuit panels.
- L. Reconnect all existing loads which are not abandoned or removed whether shown on Drawing or not. This requirement is intended to cover the replacement of panels such that all required branch circuits are reconnected.
- M. Circuiting in Remodel Area, if not shown on plans, shall be left to discretion of Electrical Contractor except as follows:
1. When indicated, certain outlets shall be circuited as shown on plans. Do not add any other loads to these circuits.

2. Do not intermix lighting, outlets and motors on same branch circuit.
3. Limit lighting loads to 1500 VA per 20 amp circuit for 120V and 3500 VA per 20 amp circuit for 277V.
4. Do not install more than five (5) convenience outlets on a 20 amp branch circuit.
5. Circuit motors to comply with regulation of National Electrical Code.

3.04 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

SECTION 26 0505 - OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance requirements for overcurrent protective devices.
- B. Short circuit study.
- C. Coordination study and analysis.

1.02 REFERENCES

- A. IEEE 242 - IEEE Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.
- B. IEEE 399 - IEEE Recommended Practice for Industrial and Commercial Power Systems Analysis.
- C. NFPA 70 - (National Electrical Code; National Fire Protection Association)

1.03 SUBMITTALS

- A. See Section 26 0500 - Basic Electrical Requirements - Submittal procedures.
- B. Study Report: Submit protective device studies as specified, prior to submission of product data submittals or ordering or fabrication of protective devices.
1. Include stamp or seal and signature of preparing engineer.
- C. Field Engineer Qualifications.
- D. Field Inspection Report: Show final adjusted settings of protective devices.

1.04 QUALITY ASSURANCE

- A. Computer Software for Study Preparation: Use the latest edition of commercially available software utilizing specified methodologies.
- B. Contractor Responsibility: Provide all project-related data needed by study preparer, including equipment, wire sizes, insulation types, conduit types, and actual circuit lengths.
- C. Owner's Responsibility: Provide data on relevant Owner power distribution equipment.

SECTION 26 0519 - BUILDING WIRE AND CABLE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wire and cable for 600 volts and less.
- B. Wiring connectors and connections.

1.02 RELATED SECTIONS

- A. Section 31 2316 - Excavation.
- B. Section 31 2323 - Fill and Backfill: Bedding and backfilling.
- C. Section 31 2316.13 - Trenching for Site Utilities: Excavating, bedding, and backfilling.
- D. Section 26 0553 - Electrical Identification.

1.03 REFERENCES

- A. Install per NECA (National Electrical Contractors Association)
- B. Meet NEMA (National Electrical Manufacturers Association) standard requirements
- C. Install per NFPA 70 (National Electrical Code; National Fire Protection Association)

1.04 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience and with service facilities within 100 miles of Project.
- C. Products: Furnish products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 WIRING REQUIREMENTS

- A. Concealed Dry Interior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- B. Exposed Dry Interior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- C. Above Accessible Ceilings: Use only building wire with Type THHN/THWN insulation in raceway.
- D. Wet or Damp Interior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- E. Exterior Locations: Use only building wire with Type THHN/THWN insulation in raceway.
- F. Underground Installations: Use only building wire with Type THHN/THWN insulation in raceway, unless noted on plan.
- G. Use stranded conductors for control circuits.
- H. Use conductor not smaller than 12 AWG for power and lighting circuits.
- I. Use conductor not smaller than 14 AWG for control circuits.
 - J. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 75 feet.
 - K. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 200 feet.
 - L. Conductor sizes are based on copper unless indicated as aluminum or "AL".
 - M. Aluminum conductor to be sized to match circuit requirements for conductor ampacity and voltage drop. Use of Aluminum conductor must be approved by Architect.

2.02 WIRE MANUFACTURERS

- A. Cerro Wire & Cable Company: www.cerro.com.
- B. Industrial Wire & Cable, Inc.: www.industwire.com.
- C. Southwire Company: www.southwire.com.
- D. Rome Cable Corporation.
- E. Cablec.
- F. Futronix Systems Corp.
- G. Substitutions: See Section 26 0500 - Basic Electrical Requirements: Product Substitutions.

2.03 BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation: Thermoplastic material rated 60 degrees C.

2.04 METAL CLAD CABLE

- A. Description: NFPA 70, Type MC.
- B. Conductor: Copper.
- C. Insulation Voltage Rating: 600 volts.
- D. Insulation Temperature Rating: 90 degrees C.
- E. Insulation Material: Thermoplastic.
- F. Armor Material: Aluminum.
- G. Armor Design: Interlocked metal tape.
- H. Jacket: PVC; use in locations indicated.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work likely to damage wire and cable has been completed.
- C. Verify that raceway installation is complete and supported.
- D. Verify that field measurements are as indicated.

3.02 PREPARATION

A. Completely and thoroughly swab raceway before installing wire.

3.03 INSTALLATION

- A. Install wire and cable securely, in a neat and workmanlike manner, as specified in NECA 1.
- B. Route wire and cable as required to meet project conditions.
1. Wire and cable routing indicated is approximate unless dimensioned.
 2. Where wire and cable destination is indicated and routing is not shown, determine exact routing and lengths required.
 3. Include wire and cable of lengths required to install connected devices within 10 ft of location shown.
- C. Use wiring methods indicated.

- D. Pull all conductors into raceway at same time.
- E. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- F. Protect exposed cable from damage.
- G. Support cables above accessible ceiling, using spring metal clips or metal cable ties to support cables from structure or ceiling suspension system. Do not rest cable on ceiling panels.
- H. Use suitable cable fittings and connectors.
- I. Neatly train and lace wiring inside boxes, equipment, and panelboards.
- J. Clean conductor surfaces before installing lugs and connectors.
- K. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
- L. Terminate aluminum conductors with tin-plated aluminum-bodied compression connectors only. Fill with anti-oxidant compound before installing conductor.
- M. Use suitable reducing connectors or mechanical connector adaptors for connecting aluminum conductors to copper conductors.
- N. Use split bolt connectors for copper conductor splices and taps, 6 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
- O. Use solderless pressure connectors with insulating covers for copper conductor splices and taps, 8 AWG and smaller.
- P. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.
- Q. Trench and backfill for direct burial cable installations. Install warning tape along entire length of direct burial cable.
- R. Identify and color code wire and cable under provisions of Section 26 0553. Identify each conductor with its circuit number or other designation indicated.
- S. Lighting: Conduit and wire to first light fixture junction box; MC cable permitted from that point on.
- T. All branch feeders shall be in conduit to the box in ceiling just before vertical runs. MC cable permitted vertically in walls to receptacles/devices except as noted below:
- a. No MC cable permitted for dedicated circuits.
 - b. No MC cable permitted in copy rooms or work rooms.
 - c. No MC cable permitted in kitchens or break rooms.

3.04 FIELD QUALITY CONTROL

- A. Perform field inspection and testing in Industry standards
- B. Inspect and test in accordance with NETA STD ATS.
- C. Perform inspections and tests listed in NETA STD ATS.

SECTION 26 0522 - ELECTRIFIED FURNITURE CONNECTIONS

PART 1 GENERAL

1.01 RELATED SECTIONS

A. The general provision of the Contract, including General and Supplementary Conditions and General Requirements, apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

A. Install and wire all electrified furniture connection whips (pre-wired LTFMC) furnished with the modular office furniture.

1.03 REFERENCES

- A. NFPA 70 - National Electrical Code

PART 2 PRODUCTS

2.01 MATERIALS

- A. Electrified Furniture Connection Whips: 5-wire or 8-wire lightweight flexible metal conduit connection whips (pre-wired)
- B. Length: 6 feet in length, with pre-wired connector on one end suitable for use with electrified raceway system in modular office furniture.
- C. Owner provided (by systems furniture supplier)

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Connect electrified furniture connection whips to the building electrical system at wall or floor outlets as indicated on the drawings.

SECTION 26 0526 - GROUNDING AND BONDING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Grounding and bonding components.
- B. Provide all components necessary to complete the grounding system(s) consisting of:
1. Metal underground water pipe.
 2. Metal frame of the building.
 3. Concrete-Encased electrodes (new buildings)
 4. Ground Electrode
 5. The terms "connect" and "bond" are used interchangeably in this specification and have the same meaning.

1.02 REFERENCES

- A. Install per NFPA 70 - (National Electrical Code; National Fire Protection Association)
- B. Install per NFPA 99 - (Standard for Health Care Facilities; National Fire Protection Association)

1.03 SUBMITTALS

- A. See Section 26 0500 - Basic Electrical Requirements - Submittal procedures.
- B. Test Reports: Indicate overall resistance to ground and resistance of each electrode.
- C. Project Record Documents: Record actual locations of components and grounding electrodes.
- D. Certificate of Compliance: Indicate approval of installation by authority having jurisdiction.

1.04 QUALITY ASSURANCE

- A. Conform to requirements of NFPA 70.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years' experience.
- C. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING CONDUCTORS

- A. Equipment grounding conductors shall be UL 83 insulated stranded copper, except that sizes 10AWG and smaller shall be solid copper. Insulation color shall be continuous green for all equipment grounding conductors, except that wire sizes 4 AWG and larger shall be permitted to be identified per NEC.
- B. Bonding conductors shall be ASTM B8 bare stranded copper, except that sizes 10AWG and smaller shall be ASTM B1 solid bare copper wire.
- C. Electrical System Grounding: Conductor sizes shall not be less than what is shown on the drawings and not less than required by the NEC, whichever is greater.

2.02 GROUND RODS

- A. Copper clad steel, 3/4" diameter by 10 feet long, conforming to UL 467.
- B. Quantity of rods shall be as required to obtain a 25 ohms ground resistance.

2.03 CONCRETE-ENCASED ELECTRODE

A. Electrode shall be encased by at least 2 inches of concrete, located horizontally near the bottom or vertically, within that portion of a concrete foundation or footing that is in direct contact with the earth. See code section 250.52.A.3 for further requirements.

2.04 SPLICES AND TERMINATION COMPONENTS

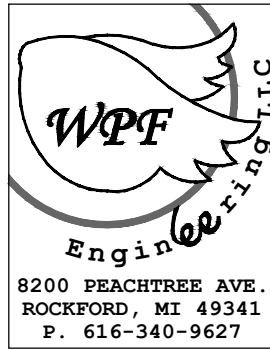
A. Components shall meet or exceed UL 467 and be clearly marked with the manufacturer, catalog number, and permitted conductor size(s).

2.05 GROUND CONNECTIONS

- A. Below Grade: Exothermic-welded type connectors
- B. Above Grade:
1. Bonding jumpers: Compression type connectors, using zinc-plated fasteners and external tooth lockwashers.
 2. Ground Busbars: Two-hole compression type lugs using tin-plated copper or copper alloy bolts and nuts.
 3. Rack and Cabinet Ground Bars: one-hole compression-type lugs using zinc-plated or copper alloy fasteners.

2.06 EQUIPMENT RACK AND CABINET GROUND BARS

A. Provide solid copper ground bars designed for mounting on the framework of open or cabinet-enclosed equipment racks with minimum dimensions of 4 mm thick by 19 mm wide.



4/18/2025

Mark	Description	Date
	BIDDING & PERMIT SET	04/18/2025
Building Design & Documentation ©2023-2025 Jeffrey Parker Architects, Inc.		
ARCHITECTURE PLANNING ENGINEERING		
855 28th Street SE Grand Rapids, MI 49508		
Phone: 616-241-0090 Fax: 616-241-0098		
Renovation		
Markdom Renovation		
400 Parkland Dr. Charlotte, MI 48813		
ELECTRICAL SPECIFICATIONS		
Issued	Drawing No.	
Project No. 22067	E6.1	

April 18, 2025
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- 2.07 GROUND TERMINAL BLOCKS
A. At any equipment mounting location (e.g. backboards and hinged cover enclosures) where rack-type ground bars cannot be mounted, provide screw lug-type terminal blocks.
- 2.08 SPLICE CASE GROUND ACCESSORIES
A. Splice case grounding and bonding accessories shall be supplied by the splice case manufacturer when available. Otherwise, use 6 AWG insulated ground wire with shield bonding connectors.

PART 3 EXECUTION

- 3.01 GENERAL
A. Verify existing conditions prior to beginning work.
B. Verify that final backfill and compaction has been completed before driving rod electrodes.
C. Ground in accordance with the NEC, as shown on drawings, and as specified.
- 3.02 INSTALLATION
A. Install ground electrodes. Install additional rod electrodes as required to achieve specified resistance to ground.
B. Provide grounding electrode conductor and connect to reinforcing steel in foundation footing. Bond steel together. Concrete-Encased Electrode.
C. Provide bonding to meet requirements described in Quality Assurance.
D. Provide isolated grounding conductor for circuits supplying equipment as shown on plans.
E. Equipment Grounding Conductor: Provide separate, insulated conductor within each feeder and branch circuit raceway. Terminate each end on suitable lug, bus, or bushing.
F. Provide #6 AWG bare copper to communication backboard(s), security, audio visual and communication racks, and cable tray.
G. All ground rods, ground grids, building steel and otherwise normally inaccessible shall be connected utilizing exothermic welds.
H. When making ground and ground bonding connections, apply a corrosion inhibitor to all contact surfaces. Use corrosion inhibitor appropriate for protecting a connection between the metals used.
I. Special Grounding: For patient care area electrical power system grounding, conform with NEC and NFPA 99.
J. In operating rooms and at intensive care and coronary care type beds, bond the gases and suction piping, at the outlets, directly to the room or patient ground bus.
K. Bond the lightning protection system to the electrical grounding electrode system.

- 3.03 FIELD QUALITY CONTROL
A. Provide test reports indicating overall resistance to ground and resistance of each electrode.
- SECTION 26 0529 - HANGERS AND SUPPORTS

PART 1 GENERAL

- 1.01 SECTION INCLUDES
A. Conduit and equipment supports.
B. Anchors and fasteners.
- 1.02 REFERENCES
A. Install per NECA (National Electrical Contractors Association)
B. Install per NFPA 70 – (National Electrical Code; National Fire Protection Association)
- 1.03 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

- 2.01 MANUFACTURERS
A. Thomas & Betts Corporation.
B. Threaded Rod Company.
C. Erico.
D. Threadco.
E. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.

2.02 MATERIALS

- A. Hangers, Supports, Anchors, and Fasteners - General: Corrosion-resistant materials of size and type adequate to carry the loads of equipment and conduit, including weight of wire in conduit.
B. Supports: Fabricated of structural steel or formed steel members; galvanized.
C. Anchors and Fasteners:
1. Do not use powder-actuated anchors, spring clips, or beam clamps.
2. Obtain permission from Architect before using powder-actuated anchors.
3. Concrete Structural Elements: Use precast inserts, expansion anchors, powder-actuated anchors, or preset inserts.
4. Steel Structural Elements: Use beam clamps, steel spring clips, steel ramset fasteners, or welded fasteners.
5. Concrete Surfaces: Use self-drilling anchors or expansion anchors.
6. Hollow Masonry, Plaster, and Gypsum Board Partitions: Use toggle bolts or hollow wall fasteners.
7. Solid Masonry Walls: Use expansion anchors or preset inserts.
8. Sheet Metal: Use sheet metal screws.
9. Wood Elements: Use wood screws.
D. Formed Steel Channel:
E. Steel Spring Clips:

PART 3 EXECUTION

- 3.01 INSTALLATION
A. Install hangers and supports as required to adequately and securely support electrical system components, in a neat and workmanlike manner, as specified in NECA 1.
1. Do not fasten supports to pipes, ducts, mechanical equipment, or conduit.
2. Do not drill or cut structural members.
3. Obtain permission from Architect before drilling or cutting structural members.
B. Rigidly weld support members or use hexagon-head bolts to present neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.
C. Install surface-mounted cabinets and panelboards with minimum of four anchors.
D. In wet and damp locations use steel channel supports to stand cabinets and panelboards 1 inch off wall.

SECTION 26 0533 - BOXES

PART 1 GENERAL

- 1.01 SECTION INCLUDES
A. Wall and ceiling outlet boxes.
B. Floor boxes.
C. Pull and junction boxes.
- 1.02 REFERENCES
A. Install per NECA (National Electrical Contractors Association)
B. Meet NEMA (National Electrical Manufacturers Association) standard requirements
C. Install per NFPA 70 (National Electrical Code; National Fire Protection Association)
- 1.03 SUBMITTALS
A. See Section 26 0500 - Basic Electrical Requirements - Submittal procedures.
B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations for floor boxes.
C. Project Record Documents: Record actual locations and mounting heights of outlet, pull, and junction boxes on project record documents.
- 1.04 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Products: Provide products listed and classified by Underwriters Laboratories, Inc., as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

- 2.01 MANUFACTURERS
A. Appleton Electric
B. Arc-Co./Division of Arcade Technology
C. Unity Manufacturing
D. Raco.
E. Thomas & Betts (Steel City)
F. Hubbell
G. Quazite
H. Wiremold
I. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.

2.02 OUTLET BOXES

- A. Sheet Metal Outlet Boxes: NEMA OS 1, galvanized steel.
1. Luminaire and Equipment Supporting Boxes: Rated for weight of equipment supported; include 1/2 inch male fixture studs where required.
2. Concrete Ceiling Boxes: Concrete type.
B. Nonmetallic Outlet Boxes: NEMA OS 2.
C. Cast Boxes: NEMA FB 1, Type FD, aluminum. Provide gasketed cover by box manufacturer. Provide threaded hubs.
D. Wall Plates for Finished Areas: As specified in Section 16140 (26 2726).

2.03 PULL AND JUNCTION BOXES

- A. Sheet Metal Boxes: NEMA OS 1, galvanized steel.
B. Hinged Enclosures: As specified in Section 26 2716.
C. Surface Mounted Cast Metal Box: NEMA 250, Type 4; flat-flanged, surface mounted junction box:
1. Material: Galvanized cast iron.
2. Cover: Flush with ground flange, neoprene gasket, and stainless steel cover screws.
D. In-Ground Cast Metal Box: NEMA 250, Type 6, outside flanged, recessed cover box for flush mounting:
1. Material: Galvanized cast iron.
2. Cover: Smooth cover with neoprene gasket and stainless steel cover screws.
3. Cover Legend: "ELECTRIC"
E. In-Ground Fiberglass Handholes: Die molded fiberglass
1. Cable Entrance: Pre-cut 4x4 inch cable entrance at center bottom of each side.
2. Cover: weatherproof fiberglass, nonskid finish
3. Cover Legend: Refer to plans and details.
4. Hardware: Stainless steel inserts and bolts

PART 3 EXECUTION

- 3.01 EXAMINATION
A. Verify locations of floor boxes and outlets in offices and work areas prior to rough-in.
- 3.02 INSTALLATION
A. Install boxes securely, in a neat and workmanlike manner, as specified in NECA 1.
B. Install in locations as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and as required by NFPA 70.
C. Coordinate installation of outlet boxes for equipment connected under Section 26 2717.
D. Set wall mounted boxes at elevations to accommodate mounting heights indicated.
E. Electrical boxes are shown on Drawings in approximate locations unless dimensioned.
1. Adjust box locations up to 10 feet if required to accommodate intended purpose, obtain approval from Architect prior to installation.
F. Orient boxes to accommodate wiring devices oriented as specified in Section 26 2726.
G. Maintain headroom and present neat mechanical appearance.
H. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
I. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
J. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 16010 – Fire Stopping.
K. Coordinate mounting heights and locations of outlets mounted above counters, benches, and backslashes.
L. Locate outlet boxes to allow luminaires positioned as shown on reflected ceiling plan and elevations.
M. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices.
N. Use flush mounting outlet box in finished areas.
O. Locate flush mounting box in masonry wall to require cutting of masonry unit corner only. Coordinate masonry cutting to achieve neat opening.
P. Do not install flush mounting box back-to-back in walls; provide minimum 6 inches separation.
Q. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
R. Use stamped steel bridges to fasten flush mounting outlet box between studs.
S. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
T. Use adjustable steel channel fasteners for hung ceiling outlet box.
U. Do not fasten boxes to ceiling support wires.
V. Support boxes independently of conduit.
W. Use gang box where more than one device is mounted together. Do not use sectional box.
X. Use gang box with plaster ring for single device outlets.
Y. Use cast outlet box in exterior locations exposed to the weather and wet locations.
Z. Use cast floor boxes for installations in slab on grade; formed steel boxes are acceptable for other installations.
AA. Set floor boxes level.
- 3.03 ADJUSTING
A. Adjust floor boxes flush with finishing floor material.
B. Adjust flush-mounting outlets to make front flush with finished wall material.
C. Install knockout closures in unused box openings.
D. Adjust handholes such that cover is 1/4" above grade.

- 3.04 CLEANING
A. Clean interior of boxes to remove dust, debris, and other material.
B. Clean exposed surfaces and restore finish.

SECTION 26 0534 -CONDUIT

PART 1 GENERAL

- 1.01 SECTION INCLUDES
A. Conduit, fittings and conduit bodies.
- 1.02 REFERENCES
A. Meet ANSI (American National Standard) standard requirements
B. Install per NECA (National Electrical Contractors Association)
C. Meet NEMA (National Electrical Manufacturers Association) standard requirements
D. Install per NFPA 70 (National Electrical Code; National Fire Protection Association)

- 1.03 SUBMITTALS
A. Project Record Documents: Accurately record actual routing of conduits larger than 1-1/4 inches.

PART 2 PRODUCTS

- 2.01 CONDUIT REQUIREMENTS
A. Conduit Size: Comply with NFPA 70.
B. Underground Installations:
1. Minimum Size: 3/4 inch unless otherwise specified.
2. Within Five Feet from Foundation Wall: Use thickwall nonmetallic conduit.
3. Under Slab on Grade: Use thinwall non-metallic conduit.
a. No conduit shall be allowed in slab, except panelboard feeders.
b. Rigid steel conduit shall be used when below a hazardous area.
c. Provide rigid factory elbows for all slab penetrations
C. Roadway: Use thick wall non-metallic conduit.
D. Outdoor Locations Above Grade: Use rigid steel conduit.
E. Wet and Damp Locations: Use rigid steel conduit.
F. Dry Locations:
1. Concealed: Use electrical metallic tubing.
2. Exposed:
a. In unfinished spaces below 8'-0" A.F.F.: Use intermediate metal conduit.
b. In unfinished spaces above 8'-0" A.F.F.: Use electrical metallic tubing.
c. In all finished spaces use electrical metallic tubing unless noted on plan

2.02 METAL CONDUIT

- A. Manufacturers:
1. Allied Tube & Conduit
2. Beck Manufacturing, Inc.
3. Wheatland Tube Company
4. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.
B. Rigid Steel Conduit: ANSI C80.1.
C. Rigid Aluminum Conduit: ANSI C80.5.
D. Intermediate Metal Conduit (IMC): Rigid steel.
E. Fittings and Conduit Bodies: NEMA FB 1; material to match conduit.

2.03 FLEXIBLE METAL CONDUIT

- A. Manufacturers:
1. AFC Cable Systems, Inc
2. Electri-Flex Company
3. International Metal Hose
4. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.
B. Description: Interlocked steel construction
C. Fitting: NEMA FB 1

2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT

- A. Manufacturers:
1. AFC Cable Systems, Inc
2. Electri-Flex Company.
3. International Metal Hose.
4. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.
B. Description: Interlocked steel construction with PVC jacket.
C. Fittings: NEMA FB 1.

2.05 ELECTRICAL METALLIC TUBING (EMT)

- A. Manufacturers:
1. Allied Tube & Conduit
2. Beck Manufacturing, Inc
3. Wheatland Tube Company
4. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.
B. Description: ANSI C80.3; galvanized tubing.
C. Fittings and Conduit Bodies: NEMA FB 1; steel or malleable iron set screw type.

2.06 NONMETALLIC CONDUIT

- A. Manufacturers:
1. AFC Cable Systems, Inc
2. Electri-Flex Company.
3. International Metal Hose
4. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.
B. Thin Wall Description: NEMA TC 2; Schedule 40 PVC.
C. Thick Wall Description: NEMA TC2; Schedule 80 PVC
D. Fittings and Conduit Bodies: NEMA TC 3.

2.07 NONMETALLIC TUBING

- A. Manufacturers:
1. Beck Manufacturing, Inc
2. Cantex, Inc.
3. Lamson & Sessions (Carlton)
4. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.
B. Thin Wall Description: NEMA TC 2.
C. Fittings and Conduit Bodies: NEMA TC 3.

PART 3 EXECUTION

- 3.01 EXAMINATION
A. Verify that field measurements are as shown on drawings.
B. Verify routing and termination locations of conduit prior to rough-in.
C. Conduit routing is shown on drawings in approximate locations unless dimensioned. Route as required to complete wiring system.
- 3.02 INSTALLATION
A. Install conduit securely, in a neat and workmanlike manner, as specified in NECA 1.
B. Install steel conduit as specified in NECA 101.
C. Install nonmetallic conduit in accordance with manufacturer's instructions.
D. Arrange supports to prevent misalignment during wiring installation.
E. Support conduit using coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers.
F. Group related conduits; support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
G. Fasten conduit supports to building structure and surfaces under provisions of Section 26 0529.
H. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
I. Do not attach conduit to ceiling support wires.
J. Arrange conduit to maintain headroom and present neat appearance.
K. Route exposed conduit parallel and perpendicular to walls.
L. Route conduit installed above accessible ceilings parallel and perpendicular to walls.
M. Route conduit under slab, where permitted, from point-to-point.
N. Do not cross conduits in slab.
O. Maintain adequate clearance between conduit and piping.
P. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.
Q. Cut conduit square using saw or pipecutter; de-burr cut ends.
R. Bring conduit to shoulder of fittings; fasten securely.
S. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
T. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations.
U. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Use factory elbows for bends in metal conduit larger than 2 inch size.
V. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
W. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.
X. Provide suitable pull string in each empty conduit except sleeves and nipples.
Y. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
Z. Ground and bond conduit under provisions of Section 26 0526.
AA. Identify conduit under provisions of Section 26 0553.
AB. All conduit shall be concealed in finished areas unless otherwise noted.
AC. Do not install horizontal runs of conduit in masonry walls.
AD. Use rigid 90° bends in all underground conduit.

3.03 INTERFACE WITH OTHER PRODUCTS

- A. Install conduit to preserve fire resistance rating of partitions and other elements.
B. Install conduit to preserve vapor retarder and air infiltration barrier in exterior walls and floor penetrations.
C. Route conduit through roof openings for piping and ductwork wherever possible. Where separate roofing penetration is required, coordinate location and installation method with roofing installation.

SECTION 26 0926 LIGHTING CONTROL RELAY PANEL

PART 1 GENERAL

- 1.01 SECTION INCLUDES
A. Relay control panel and associated control devices, Occupancy Sensors

1.02 DESCRIPTION OF WORK

- A. Electrical Contractor shall coordinate all of the work in this section with all of the trades covered in other sections of the specification to provide a complete operable system.
B. Related work requirements are indicated in the following sections of this specification.
C. Theatrical lighting control to be by others coordinate with Theatrical lighting plans. Alternate relay lighting manufacturers shall be required to communicate with the theatrical lighting control system for sweeps (off) only. Architectural lighting in those spaces shall be controlled with the theatrical lighting. The circulating for those spaces is called out as Zones.

1.03 SUBMITTAL

- A. See Section 26 0500 – Basic Electrical Requirements - Submittal procedures.
Submittal documentation shall consist of:
B. Bill of Materials - Manufacturer shall submit in bill of material form an itemized list of all materials being supplied to meet the specifications.
C. Product Data - Manufacturer shall submit data on each of the components proposed for the networked low voltage lighting control system.
D. One-Line Diagram - Manufacturer shall submit a one-line diagram of the proposed system configuration with relative placement of all equipment.
E. Typical Wiring Diagrams - Submit typical wiring diagrams for all proposed equipment with sufficient details for all interconnections.
F. Panel Schedule - Shall include panel number, relay number, circuit number, load description, switch/input and load schedules.
G. Provide manufacturer's occupancy layout to engineer for approval showing what type of sensor,

placement and mounting for all areas requiring motion sensor coverage. Manufacturer to provide required product to meet square footage requirements in each room

1.05 QUALITY ASSURANCE

- A. STANDARDS
1. NEC Compliance - Comply with NEC as applicable to electrical wiring work.
2. NEMA Compliance - Comply with applicable portions of NEMA Standards pertaining to types of electrical equipment and enclosures.
3. UL Approvals - Lighting Control Panels are to be UL listed as a complete system under UL 916 Energy Management Equipment.
4. Local Codes – Comply with all local codes for work of this nature.
B. Component Pre-testing - All components and assemblies are to be factory pre-tested and burned-in prior to installation.
C. System Checkout - Factory trained technicians shall be available to functionally test system after installation to verify proper operation and confirm that the enclosure wiring and addressing conform to the wiring documentation.
D. System Support - Factory trained application engineers shall be available for on-site training as well as telephone support

1.06 SUPPORT SERVICES

- A. Local Support – The manufacturer shall have service representatives within a 60-mile radius of the installation.
B. Technical Support - The manufacturer shall provide free telephone support to the owner for one years after completion of construction and start-up.
C. Extended Service Coverage - Maintenance agreements shall be available from the manufacturer to provide service for the system both during and after the warranty period.

1.07 WARRANTY

- A. Installation Warranty - The installing contractor shall provide a written warranty agreeing to provide labor and materials to replace any portion of the lighting control system equipment or wiring that fails due to materials or workmanship for a period of twelve months from warranty commencement.
B. Manufacturer's Warranty - The manufacturer shall provide a written warranty agreeing to provide parts to replace any portion of the lighting control system equipment that fails due to material or workmanship for a period of one years from date of shipment.
C. Warranty Commencement. Warranty shall begin at the point of substantial completion of the system installation, which is defined as the date when commissioning and owner training has been completed and the owner obtains beneficial use of the system.
D. Warranty Replacement - The manufacturer shall be able to ship replacement parts within 24 hours for any component that that fails due to material or workmanship during the warranty period.

PART 2 PRODUCTS

2.01 LIGHTING CONTROL SYSTEM

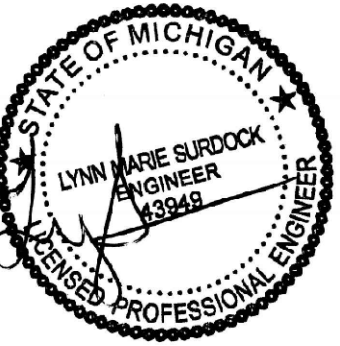
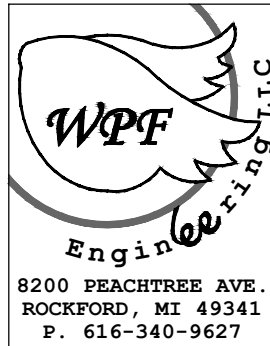
- A. The lighting control system panels shall be capable of stand-alone operation based upon internal astronomical time clock.
- B. Manufacturers:
1. Lighting Control Design
2. Leviton
3. Lutron
4. ILC
5. Hubbell Building Automation
7. Wattstopper
8. Cooper Controls
9. Touche
10. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.

2.02 LIGHTING CONTROL PANEL HARDWARE

- A. Enclosure – Each relay panel shall have the following features:
1. Minimum of 16 gauge steel construction and completely painted with enamel type paint or equal.
2. Available in 16, 32 or up to 48/64 relay sizes as indicated on the drawings.
3. Maximum of 20" wide and 4" deep, height shall vary depending on the relay capacity of the enclosure.
4. A cover secured by screws shall be provided to enclose the high voltage compartment. It shall be properly marked to warn of the danger of high voltage.
5. The unit shall be wired to accept the maximum number of relays (16, 32 or 48/64 relays) without requiring the addition of any automation cards, relay output modules or additional electronics. Any number of relays, up to the maximum size, may be installed in any one of the sizes listed.
6. Door shall be hinged with key lock and painted to match enclosure.
B. Lighting Control Relay – Each control circuit shall be connected through a single pole or Double pole as indicated on plans, single throw momentary-pulsed mechanically latching contactor rated at 20 amps, 120-277 VAC. Relay shall be:
1. Mechanically latching relay.
2. Relays shall attach to the barrier and plug into the Relay Interface Board. Screw termination is acceptable.
3. Individual relays shall have built in lever for manual override. Lever shall also indicate status of relay.
4. Relay shall be rated for a minimum of 50,000 cycles at full load.
5. The load contacts shall be rated as follows: 20A, 125 VAC Tungsten; 20 A @ 277 VAC H.I.D. Ballast or Resistive.
6. All relays shall be factory wired for low voltage control and shall not have to be rewired in the field regardless of panel zoning requirements.
7. Systems using multiple relays mounted on printed circuit boards (relay cards) are not acceptable.
C. TVSS Protection – Provide TVSS protection on all control panels, mount above control panel. Leviton 51001-WM or equal to meet UL1449 and testing per ANSI/IEEE C62.41

2.03 SYSTEMS ELECTRONICS

- A. The system electronics shall consist of pre-assembled electronics including a panel controller, output interface modules, optional switch input modules as required by the drawings, interconnect cables and power supply.
B. Panel Controller – It shall provide:
1. 60 Output Capability. The unit shall provide switching for up to 60 loads. Outputs shall be sequenced to reduce the inrush effects on the power system.
2. Commanded Load Feedback – The unit shall provide Real Time status of the commanded state of each lighting zone.
3. Output energize time – The unit shall provide energize durations max. 2 seconds. All circuits shall not be turned on or off simultaneously, but staged on and off to prevent line surges.
4. Relay Grouping – The unit shall provide selectable grouping of relays in up to 60 lighting zones. Any output can be assigned to any lighting zone without any rewiring.
5. Occupant Flash Warning – The unit shall provide selectable occupant flash warning with selectable on time after the occupant flash warning from 10 seconds to 60 minutes in duration.
6. Output Refresh Rate - The unit shall provide the capability to send commands to its outputs to assure proper status based on a user selectable rate of every 3-30 minutes. This feature is important for areas where power company fluctuations occur.
7. Selectable Switch Input Types - The unit shall provide maintained, momentary on, momentary off, momentary on/off and linked switch inputs with selectable switch input timers of up to 16 hours. The system shall have the ability to disable the switches during occupied hours in public spaces to prevent the lights from accidentally being turned off.
8. Selectable Switch Input Polarity - The unit shall provide for normally open or normally closed switch inputs or be 2-wire polarity reversing switches.
9. Isolated RS-485 serial communications port.
10. Local Programming – All features shall be selectable by a Laptop, PC, or removeable touch screen.
11. Remote Programming – All features shall be selectable via modem.
12. Light Level Sensor Input mounted on building exterior for parking lot lighting and exterior building lighting.
13. Local LED's shall indicate communication and system OK.
14. Memory Loss Protection - Nonvolatile memory shall be provided so data is not lost during power outages or brown outs. Battery backed memory shall not be allowed eliminating the need to replace batteries.
15. Filtering to reduce noise emissions and power line spikes.
16. Serial Priority - The unit shall provide the capability to have serial commands take priority over momentary switch inputs. This feature only applies to systems that utilize the RS-485 communication capability.
17. Maintained Input Priority – Maintained switch inputs shall have the capability of having priority over serial commands and momentary switch inputs.
18. Independent Operation - Capability to function independently of other panels if a network failure



4/18/2025

Mark	Description	Date
	BIDDING & PERMIT SET	04/18/2025
Building Design & Documentation ©2023-2025 Jeffrey Parker Architects, Inc.		
		
ARCHITECTURE PLANNING ENGINEERING		
855 28th Street SE Grand Rapids, MI 49508		Phone: 616-241-0090 Fax: 616-241-0098
Renovation <i>Markdom Renovation</i>		
400 Parkland Dr. Charlotte, MI 48813		
ELECTRICAL SPECIFICATIONS		
Issued		Drawing No.
Project No. 22067		E6.2

April 18, 2025
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occurs. All the features listed here shall continue to operate.
C. Output Interface Module - Each of the low voltage coils on the outputs shall plug into an interface for ease of installation and replacement.
D. Panel Controller Power Supply - The unit shall provide a single transformer with primary fusing. It shall be capable of 120V or 277V +10%, primary power. Units with single primary transformers shall be unacceptable. A grounding stud shall be provided in the high voltage compartment to ground primary power. Power shall be provided from the panelboard busses.

2.04 DEVICE NETWORK AND SWITCHES
A. The lighting control system shall include a network of lighting override switches and relays. The switches and local relays shall be located at each of the areas indicated on the drawings.
B. Switches - Shall be provided with the following minimum features:
1. Each switch shall provide a push button switch with an embedded color LED to indicate the status of the lighting group controlled by the switch.
2. Each switch shall be mounted with a Decora style plate.
3. The switch shall mount in a standard single gang junction box.
4. Each switch shall have a printed label to describe lights controlled.

2.05 PANEL CONTROLLER ITEMS
A. Light Level Sensor
1. Outdoor - Outdoor models shall have a hood over the aperture to shield the sensor from direct sunlight. The outdoor sensor circuitry shall be completely encased in an optically clear epoxy resin. Outdoor sensors shall mount to a standard threaded 1/2" conduit or fit a 1/2" knockout. The Outdoor sensor range shall be between 0 and 750 FC.
2. Indoor light level sensor.
3. Programming software (programming relay groups).

2.06 OCCUPANCY SENSORS
A. Manufacturers:
1. Hubbell (Basis of Design)
2. Leviton
3. WattStopper
4. Novitas
5. Sensor Switch
6. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.

B. Products:
1. Passive Infrared Adaptive Technology Switch - as indicated on plan:
a. Hubbell IW SZP3P (manual on/auto off)
2. Passive Infrared Adaptive Technology Switch with dual relay to control exhaust fan - as indicated on plan:
a. Wattstopper PIW-200 (manual on/auto off) – 5 Minute delay on EF switch.
3. Ultrasonic/Passive Infrared Adaptive Dual Technology Sensor Ceiling sized per manufacturer for proper coverage
a. 500 sq.ft. - Hubbell Omni-DT500
b. 1000 sq.ft. - Hubbell Omni-DT1000
c. 2000 sq.ft. - Hubbell Omni-DT2000
d. Hallways - Hubbell Omni-DT2000
4. Ultrasonic/Passive Infrared Adaptive Dual Technology Sensor Wall
a. 1600 sq.ft. - Hubbell LO-DT
5. Ultrasonic Sensor with Daylight Control:
a. Photocell shall be adjustable from 5 to 300 foot candles.
b. Photozell control shall have an adjustable time delay to prevent lights from cycling during temporary interruptions of ambient light.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install the lighting control equipment according to the manufacturers written instructions. Contractor shall make all necessary wiring connections to external devices and equipment.
B. Provide and install all wiring between control devices as indicated in the contract drawings, details, and/or indicated in the manufacturer's submittal package.
C. Bundle and support wiring in enclosures
D. A separate voice grade private line or 24 hour access PABX station port with RJ11 jack shall be furnished for each Lighting control system.
E. Provide all work for a complete system, including complete system testing and checkouts. All components shall be properly mounted and wired according to manufacturer's specifications and instructions.

3.02 COMMISSIONING
A. Manufacturer's Field Services - Arrange and pay for the services of factory-authorized service representatives to commission, test and program the lighting control system
B. Accurate "Record" Drawings shall be furnished by the Contractor to aid the Owner in programming. These should indicate the load controlled by each relay and the identification number for that relay. They should also identify the physical location of each switch connected to an input.
C. Provide up to Three (3) service calls for programming changes for one (1) year from the date of substantial completion.
D. Provide up to Three (3) Service calls for adjustment of Occupancy sensors after initial Adaptive Technology adjustment period of 1 month for one (1) year from date of substantial completion.

3.03 COORDINATION
A. It shall be the responsibility of the Installing Contractor to receive and store materials and equipment necessary to his work. It is intended that Specifications and Plans shall include everything required and necessary for proper and complete installation of the Lighting Control System even though every item may not be particularly mentioned in detail. The Contractor shall timely deliver to other trades any equipment that must be installed during construction. Installing Contractor shall be responsible for field measurements and coordination of the physical size of all equipment with the architectural requirements of the spaces into which the equipment will be installed.

3.04 TRAINING
A. Electrical Contractor shall set the occupancy sensors time delays per Manufacturer's recommendations and Owner's instructions.
B. Electrical Contractor shall provide a minimum of 8 hours of training by factory-authorized service representative to the Owner's representative in the use, operation, adjustment and maintenance of the equipment.
C. Electrical Contractor shall instruct Owner to keep a log of Occupancy Sensor issues for 1 month period to be turned over to contractor for correction. Contractor to instruct Owner to make no modifications to Occupancy Sensors in 1 month period due to adaptive technology of Sensors.

SECTION 26 2416 PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Power distribution panelboards.
B. Lighting and appliance panelboards.

1.02 REFERENCES

A. Meet NEMA (National Electrical Manufacturers Association)
B. Install per NECA (National Electrical Contractors Association)
C. Install per NFPA 70 – (National Electrical Code; National Fire Protection Association)

1.03 SUBMITTALS

A. See Section 26 0500 - Basic Electrical Requirements - Submittal procedures.
B. Shop Drawings: Indicate outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement and sizes.
C. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
D. Project Record Documents: Record actual locations of panelboards and record actual circuiting arrangements.
E. Maintenance Data: Include spare parts listing; source and current prices of replacement parts and supplies; and recommended maintenance procedures and intervals.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.
C. All equipment specified within shall be of the same manufacturer.
D. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Cutler-Hammer/Eaton Corporation
B. GE Company
C. Square D Company
D. Siemens ITE
E. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.

2.02 POWER DISTRIBUTION PANELBOARDS

A. Description: NEMA PB 1, circuit breaker type.
B. Panelboard Bus: Aluminum, ratings as indicated. Provide aluminum ground bus in each panelboard.
C. Provide 100% neutral buss unless noted otherwise.
D. Minimum integrated short circuit rating:
1. 240 Volt Panelboards: 22,000 amperes rms symmetrical.
2. 480 Volt Panelboards: 22,000 amperes rms symmetrical.
E. Fusible Switch Assemblies: NEMA KS 1, quick-make, quick-break, load interrupter enclosed knife switch with externally operable handle. Provide interlock to prevent opening front cover with switch in ON position. Handle lockable in OFF position. Fuse clips: Designed to accommodate Class R fuses.
F. Molded Case Circuit Breakers: With integral thermal and instantaneous magnetic trip in each pole; UL listed. For air conditioning equipment branch circuits provide circuit breakers UL listed as Type HACR.
G. Circuit Breaker Accessories: Trip units and auxiliary switches as indicated.
H. Enclosure: NEMA PB 1, unless noted otherwise.
I. Cabinet Front: Surface type, fastened with hinge and latch, hinged door with flush lock, metal directory frame, finished in manufacturer's standard gray enamel.

2.03 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: NEMA PB1, circuit breaker type, lighting and appliance branch circuit panelboard.
B. Panelboard Bus: Aluminum, ratings as indicated. Provide aluminum ground bus in each panelboard; provide insulated ground bus where scheduled.
C. Provide 100% neutral buss unless noted otherwise.
D. Minimum Integrated Short Circuit Rating: As indicated.
1. 240 Volt Panelboards: 10,000 amperes rms symmetrical.
2. 480 Volt Panelboards: 22,000 amperes rms symmetrical.
E. Molded Case Circuit Breakers: Thermal magnetic trip circuit breakers, bolt-on type, with common trip handle for all poles; UL listed.
1. Type SWD for lighting circuits.
2. Type HACR for air conditioning equipment circuits.
3. Class A ground fault interrupter circuit breakers where scheduled.
4. Do not use tandem circuit breakers.
F. Enclosure: NEMA PB 1, Type 1.
G. Cabinet Box: 6 inches deep, 20 inches wide for 240 volt and less panelboards, 20 inches wide for 480 volt panelboards.
H. Cabinet Front: Flush cabinet front with concealed trim clamps, concealed hinge, metal directory frame, and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install panelboards in accordance with NEMA PB 1.1 and NECA 1.
B. Install panelboards plumb. Install recessed panelboards flush with wall finishes.
C. Height: 6 feet to top of panelboard; install panelboards taller than 6 feet with bottom no more than 4 inches above floor.
D. Provide filler plates for unused spaces in panelboards.
E. Provide typed handwritten circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
F. Provide typed or neatly handwritten circuit directory for each branch circuit panelboard. Revise directory to reflect circuiting changes required to balance phase loads.
G. Provide engraved plastic nameplates under the provisions of Section 26 0553.
H. Provide spare conduits out of each recessed panelboard to an accessible location above ceiling. Identify each as SPARE.
1. Minimum spare conduits: 5 empty 1 inch.
I. Ground and bond panelboard enclosure according to Section 26 0526.
J. In commercial kitchens all equipment under the hood shall have shunt trip breakers. All equipment in the kitchen shall be GFI protected. Provide breakers and/or GFI receptacles to meet the requirements per the NEC.

3.02 ADJUSTING

A. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 10 percent of each other. Maintain proper phasing for multi-wire branch circuits.

3.03 CLEANING

A. Touch up scratched or marred surfaces to match original finish.

SECTION 26 2717 EQUIPMENT WIRING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical connections to equipment.

1.02 REFERENCES

A. Install per NECA (National Electrical Contractors Association)
B. Meet NEMA (National Electrical Manufacturers Association) standard requirements
C. Install per NFPA 70 (National Electrical Code; National Fire Protection Association)

1.03 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.04 COORDINATION

A. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
B. Determine connection locations and requirements.
C. Sequence rough-in of electrical connections to coordinate with installation of equipment.
D. Sequence electrical connections to coordinate with start-up of equipment.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
1. Colors: Conform to NEMA WD 1.
2. Cord Construction: NFPA 70, Type SO multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
B. Disconnect Switches: As specified in Section 26 2818 and in individual equipment sections.
C. Wiring Devices: As specified in Section 26 2726.
D. Flexible Conduit: As specified in Section 26 0534.
E. Wire and Cable: As specified in Section 26 0519.
F. Boxes: As specified in Section 26 0533.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.
B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
D. Provide receptacle outlet to accommodate connection with attachment plug.
E. Provide cord and cap where field-supplied attachment plug is required.
F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
H. Install terminal block jumpers to complete equipment wiring requirements.
I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.
J. Coolers and Freezers: Cut and seal conduit openings in freezer and cooler walls, floor, and ceilings.
K. Wire connections made on motors 5 HP and greater shall use either a split bolt or screw termination.

Cover with three (3) layers of tape (rubber, Cambridge, and Scotch 33).
L. Provide appropriate fusing for motor circuits per manufacturers requirements.

SECTION 26 2726 WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches
B. Receptacles
C. Device plates and decorative box covers
D. Access floor boxes

1.02 REFERENCES

A. Install per NECA (National Electrical Contractors Association)
B. Meet NEMA (National Electrical Manufacturers Association) standard requirements
C. Install per NFPA 70 (National Electrical Code; National Fire Protection Association)

1.03 SUBMITTALS

A. See Section 26 0500 - Basic Electrical Requirements - Submittal procedures.
B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.
C. Manufacturer's Installation Instructions.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Products: Provide products listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cooper Wiring Devices (Arrow Hart)
B. GE Wiring Devices
C. Leviton Manufacturing, Inc
D. Hubbell Inc.
E. LeGrand (Pass & Seymour)
F. Bryant
G. Lutron
H. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.

2.02 WALL SWITCHES

A. Wall Switches: Heavy Duty, AC only general-use snap switch
1. Manufacturer:
a. Leviton CSB1 or approved equal.
2. Body and Handle: Ivory plastic with toggle handle.
3. Indicator Light: Lighted handle type switch; red handle.
4. Ratings:
a. Voltage: 120-277 volts, AC.
b. Current: 20 amperes.
B. Switch Types: Single pole, double pole, 3-way,4-way and pilot.

2.03 RECEPTACLES

A. Receptacles: Heavy duty
1. Device Body: plastic, Standard color to be selected at shop drawing approval.
2. Configuration: Refer to plans and as specified
B. Duplex Convenience Receptacles: Type 5 – 20R.
1. Manufacturer:
a. Leviton 5801 or approved equal
C. Duplex Convenience Receptacles: Type 5 – 15R.
1. Manufacturer:
a. Leviton BR15-X or approved equal
D. Single Convenience Receptacles: Type 5-20R.
1. Manufacturer:
a. Leviton 5801 or approved equal.
E. GFCI Receptacles: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements. 5-20R
1. Manufacturer:
a. Leviton 6398 or approved equal.
F. Tamper Resistant Receptacles: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements. 5-15R
1. Manufacturer:
a. Hubbell RR15S**TR or approved equal.
b. Hubbell RRD15S**TR or approved equal. – Decorator Style
G. Tamper Resistant GFCI Receptacles: Convenience receptacle with integral ground fault circuit interrupter to meet regulatory requirements. 5-20R
1. Manufacturer:
a. Hubbell GFTR20 or approved equal.
H. Water Resistant Receptacles. 5-20R
1. Manufacturer:
a. Leviton or approved equal

2.04 TV BACKBOX AND RECEPTACLE

A. HUBBELL NSAV6SM 2-gang wall enclosure with steel cover NSAV6C.
1. Receptacle kit NSOKP
2. A/V connectors and plates as required for cabling to be provided.

2.05 WALL PLATES

A. Cover Plates: nylon in finished spaces. (Color to be selected at shop drawing approval).
B. Cover Plates: Galvanized steel plates in unfinished spaces.
C. Cover Plates: Smooth stainless steel in kitchen areas.
D. Weatherproof Cover Plates: Gasketed cast metal with gasketed in use device cover.
E. Roof Receptacle Cover Plates: Shall have an appropriate in-use cover installed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that outlet boxes are installed at proper height.
B. Verify that wall openings are neatly cut and will be completely covered by wall plates.
C. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.

3.02 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean debris from outlet boxes.

3.03 INSTALLATION

A. Install securely, in a neat and workmanlike manner, as specified in NECA 1.
B. Install devices plumb and level.
C. Install switches with OFF position down.
D. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.
E. Do not share neutral conductor on load side of dimmers.
F. Do not share neutrals on dedicated circuits.
G. Install receptacles with grounding pole on top.
H. Connect wiring device grounding terminal to outlet box with bonding jumper.
I. For Isolated Ground receptacles (IG), connect wiring device grounding terminal only to branch circuit isolated equipment grounding conductor.
J. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
K. Connect wiring devices by wrapping conductor around screw terminal.
L. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
M. Install protective rings on active flush cover service fittings.
N. Where more than one wall switch is installed in same location, set under one cover plate.
O. Make any necessary adjustments to the system at no charge to the Owner during warranty period.

3.04 INTERFACE WITH OTHER PRODUCTS

A. Coordinate locations of outlet boxes provided under Section 16138 (26 0537) to obtain mounting heights specified.
B. Install wall switch 48 inches above finished floor.
C. Install convenience receptacle 18 inches above finished floor.
D. Install convenience receptacle 6 inches to center above backsplash of counter when noted on plan as "AC". Verify exact location with Architectural drawings.
E. Install dimmer 48 inches above finished floor.
F. Coordinate the installation of wiring devices with underfloor duct service fittings provided under

Section 16133 (26 0540).
G. Coordinate the installation of wiring devices with floor box service fitting provided under Section16128 (26 0537).

3.05 FIELD QUALITY CONTROL

A. Perform Manufacturers standard field inspection, testing, and adjusting
B. Inspect each wiring device for defects.
C. Operate each wall switch with circuit energized and verify proper operation.
D. Verify that each receptacle device is energized.
E. Test each receptacle device for proper polarity.
F. Test each GFCI receptacle device for proper operation.

SECTION 26 2818 ENCLOSED SWITCHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fusible switches.
B. Nonfusible switches.

1.02 REFERENCES

A. Meet NEMA (National Electrical Manufacturers Association) standard requirements
B. Install per NFPA 70 (National Electrical Code; National Fire Protection Association)

1.03 SUBMITTALS

A. See Section 26 0500 - Basic Electrical Requirements - Submittal procedures.
B. Product Data: Provide switch ratings and enclosure dimensions.
C. Project Record Documents: Record actual locations of enclosed switches.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cutler-Hammer/Eaton Corporation
B. GE Company
C. Square D Company
D. Siemens ITE
E. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.

2.02 COMPONENTS

A. Fusible Switch Assemblies: NEMA KS 1, Type HD enclosed load interrupter knife switch.
1. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
2. Handle lockable in OFF position.
3. Fuse clips: Designed to accommodate NEMA FU1, Class R fuses.
B. Nonfusible Switch Assemblies: NEMA KS 1, Type HD enclosed load interrupter knife switch.
1. Externally operable handle interlocked to prevent opening front cover with switch in ON position.
2. Handle lockable in OFF position.
C. Enclosures: NEMA KS 1.
1. Interior Dry Locations: Type 1.
2. Exterior Locations: Type 3R.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Install fuses in fusible disconnect switches per manufacturer's nameplate rating.
C. Apply adhesive tag on inside door of each fused switch indicating NEMA fuse class and size installed.

3.02 FIELD QUALITY CONTROL

A. Inspect and test each switch per manufacturer's recommendations.

SECTION 26 5113 INTERIOR LUMINAIRES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior luminaires and accessories
B. LED Drivers
C. Emergency power supply
D. Emergency Transfer Device

1.02 REFERENCES

A. Meet ANSI (American National Standard) standard requirements
B. Install per NECA (National Electrical Contractors Association)
C. Meet NEMA (National Electrical Manufacturers Association) standard requirements
D. Install per NFPA 70 (National Electrical Code; National Fire Protection Association)
E. Install per NFPA 101 (Code for Safety to Life from Fire in Buildings and Structures; National Fire Protection Association)

1.03 SUBMITTALS

A. See Section 26 0500 - Basic Electrical Requirements - Submittal procedures.
B. Shop Drawings: Indicate dimensions and components for each luminaire that is not a standard product of the manufacturer.
C. Verify the type of ceiling and suspension method prior to ordering fixtures.
D. Product Data: For each luminaire type, submit luminaire information including catalog cuts with highlighted catalog numbers and required accessories:

- Luminaire:
 - o Manufacturer and catalog number,
 - o Type (identification) as indicated on the plans and schedule,
 - o Delivered lumens,
 - o Input watts,
 - o Efficacy,
 - o Color rendering index.
- Driver:
 - o Manufacturer and catalog number,
 - o Type (Non-Dimming, Step-dimming, Continuous dimming, etc.),
 - o Power Factor, Crest Factor, THD, etc.

E. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by product testing agency specified under Quality Assurance. Include instructions for storage, handling, protection, examination, preparation, and installation of product.
F. Operation and Maintenance Data: Instructions for each product.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70 and NFPA 101.
B. LED Luminaires shall meet all Design Lights Consortium® (DesignLights.org) Product Qualification Criteria. This does not require that the luminaire be listed on the Design Lights Consortium®
C. Luminaire shall be certified by a Nationally Recognized Testing Laboratory (UL, ETL, or IEC).
D. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years' experience.
E. Products: Listed and classified by Underwriters Laboratories, Inc. as suitable for the purpose specified and indicated.

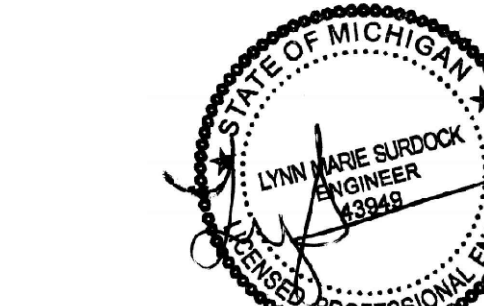
PART 2 PRODUCTS

2.01 LUMINAIRES

A. Furnish products as indicated in Schedule included on the Drawings. If the fixture designation is omitted from a light fixture, assume a fixture of the type used in similar areas in preparing Bid. Confirm type with Owner's Representative prior to ordering.
B. Substitutions: See Section 26 0500 – Basic Electrical Requirements: Product Substitutions.
1. Pre-Qualification of contractor –offered substitutions are required (7 days prior to bid date. Failure to submit within the deadline constitutes a guarantee that only the base specified product(s) will be supplied and no other products will be considered.
Provide calculations showing performance of proposed fixture, coordinate with engineer for reflectance's and architectural components that may affect light level, and provide photometric file in .ies format to Engineer.
Provide PDF submittal of proposed substitution to engineer.
C. Refer to fixture schedule for lamping of fixture. Manufacturer to label all fixtures as maximum allowable socket wattage per lamping noted in schedule. This is for current and future LEED documentation purposes.

2.02 CONTROL UNITS

A. Emergency Lighting Control Unit
1. Lighting fixtures identified on the plans as being fed by normal power source and/or emergency source and/or controlled with local switching and/or relays shall be provided with intelligent switching devices meeting UL 924, NEC, OSHA and Life Safety Codes. Provide Branch Circuit



4/18/2025

Mark	Description	Date
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BIDDING & PERMIT SET		04/18/2025
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ELECTRICAL SPECIFICATIONS

Issued	Drawing No.
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Project No. 22067	E6.3
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E6.4

HVAC ABBREVIATIONS			
ACCU AL	AIR COOLED CONDENSING UNIT ACOUSTICALLY LINED	HVAC	HEATING VENTILATING AND AIR CONDITIONING
APPROX ARCH	APPROXIMATE ARCHITECTURAL	HTGS	HOT WATER HEATING SUPPLY
CLG	CEILING	HTGR	HOT WATER HEATING RETURN
CONC	CONCRETE	INSUL	INSULATION
CONN	CONNECTION	LAT	LEAVING AIR TEMPERATURE
COORD	COORDINATE	MC	MECHANICAL CONTRACTOR
CP	CONDENSATE PUMP	MECH	MECHANICAL
DB	DOWN	MFG	MANUFACTURER
DN	DRY BULB	MMS	MANUAL MOTOR STARTER
DWIG	DRAWING	NFDS	NON-USED DISCONNECT SWITCH
EA	EACH	OA	OUTSIDE AIR
EAT	ENTERING AIR TEMPERATURE	RA	RETURN AIR
EC	ELECTRICAL CONTRACTOR	RM	ROOM
EQUIP	EQUIPMENT	RTU	ROOF TOP UNIT
ESP	EXTERNAL STATIC PRESSURE	SA	SUPPLY AIR
EXIST	EXISTING	SHT	SHEET
FDS	FUSED DISCONNECT SWITCH	STOR	STORAGE
FF	FINISHED FLOOR	TYP	TYPICAL
FLEX	FLEXIBLE	W/	WITH
FLR	FLOOR	W/O	WITHOUT
FPM	FEET PER MINUTE	WB	WET BULB
GALV	GALVANIZED		

MECHANICAL (DIVISION 23) SPECIFICATION:

GENERAL REQUIREMENTS

PROVIDE EQUIPMENT AND COMPONENTS INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM. CONTRACTOR WILL BE RESPONSIBLE FOR RECEIVING, RIGGING AND INSTALLING ALL EQUIPMENT PROVIDED PART OF THEIR WORK CATEGORY.

DEFINITIONS: FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION. INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE. PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE. RECEIVE MEANS TO COORDINATE AND ACCEPT DELIVERY OF EQUIPMENT AT JOBSITE.

MECHANICAL EQUIPMENT IDENTIFICATION: PROVIDE ENGRAVED PLASTIC LAMINATE LABEL FOR EACH MAJOR ITEM OF MECHANICAL EQUIPMENT & EACH OPERATIONAL DEVICE. LETTERS TO BE A MINIMUM OF 1/2" HIGH.

OPERATIONS AND MAINTENANCE MANUALS (O&M): AT COMPLETION OF PROJECT PROVIDE A MINIMUM OF TWO O&M MANUALS IN THREE RING BINDERS TO THE OWNER/TENANT. MANUALS SHALL HAVE TABS LABELED WITH ALL SECTIONS SEPARATED WITH A CLEAR INDEX AT THE FRONT. PROVIDE A WARRANTY LETTER AT THE FRONT OF THE MANUAL STATING DATES OF WARRANTY (START DATE AND END DATE) AND CONTACTS WITH PHONE NUMBERS FOR WARRANTY WORK. PROVIDE A NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE INCLUDING RECOMMENDED SETPOINTS. MANUALS SHALL INCLUDE SUBMITTALS OF ALL EQUIPMENT, SIZE AND OPTIONS SELECTED. PROVIDE ALL BALANCING REPORTS, PROVIDE MANUFACTURER LITERATURE FOR OPERATIONS AND MAINTENANCE FOR ALL THE EQUIPMENT ON THE PROJECT. ALL PERIODIC AND ROUTINE MAINTENANCE SHALL BE CLEARLY IDENTIFIED. PROVIDE A CONTROLS SECTION LISTING SYSTEM OPERATING AND CONTROL INSTRUCTIONS, MAINTENANCE, CALIBRATION, WIRING DIAGRAMS, SCHEMATICS AND CONTROL SEQUENCE DESCRIPTIONS.

TESTING AND BALANCING: TEST AND ADJUST ALL MECHANICAL SYSTEMS AND EQUIPMENT TO ASSURE PROPER BALANCE AND OPERATION. PERFORM TESTS IN ACCORDANCE WITH THE MOST CURRENT NEBB OR AABC, AND ASHRAE STANDARDS. ELIMINATE OBJECTIONABLE NOISE AND VIBRATION, AND ASSURE PROPER FUNCTION OF CONTROLS. BALANCING CONTRACTOR SHALL BE AN INDEPENDENT CERTIFIED TEST AND BALANCE CONTRACTOR, WITH NEBB OR AABC CERTIFICATION. SUBMIT COMPLETED AND CERTIFIED TEST AND BALANCE REPORT TO OWNER'S REPRESENTATIVE. BALANCE ALL SYSTEMS TO WITHIN 5% OF AIR FLOWS AND WATER FLOWS INDICATED ON THE DRAWINGS.

GENERAL DUCT REQUIREMENTS

DUCT TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" AND MATCHING MATERIAL OF DUCT SYSTEM. PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING, SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE.

INDOOR DUCT INSULATION: PROVIDE INSULATION FOR ALL CONCEALED SUPPLY & OA DUCTWORK. PROVIDE MINIMUM 1.5" THICK BLANKET TYPE FIBERGLASS INSULATION COMPLYING WITH ASTM C-553, TYPE II, WITH FACTORY APPLIED KRAFT BONDED TO ALUMINUM FOIL, REINFORCED WITH FIBERGLASS VAPOR BARRIER/JACKET. JACKET SHALL CONFORM TO ASTM C-1136, TYPE II. INSTALLED R-VALUE SHALL BE 4.2 OR HIGHER WITH A 3/4 PCF DENSITY -OR- PROVIDE MINIMUM 1" THICKNESS INTERNAL ACOUSTIC DUCT LINER (R3.5). INTERNAL DUCT LINER TO BE EQUAL TO JOHNS MANSVILLE LINACoustic RC. NOTE: ALL RECTANGULAR RA & SA DUCTWORK TO BE LINED WITHIN 15' OF EQUIPMENT OR AS NOTED ON PLANS. EXPOSED SPIRAL DUCT SHALL NOT BE INSULATED OR INTERNALLY LINED.

GENERAL DUCT REQUIREMENTS CONTINUED

OUTDOOR DUCT INSULATION: EXTERIOR EXPOSED SUPPLY AND RETURN DUCT SHALL BE EXTERNALLY INSULATED WITH 2" THICKNESS OF 3" PCF FIBERGLASS BOARD INSULATION ATTACHED TO DUCT EXTERIOR WITH ADHESIVES AND WELD PINS; PROVIDE EXTERIOR DUCT WEATHERPROOF JACKETING OF 3M VENTURECLAD 1577 CW-E, EMBOSSED ALUMINUM FINISH, 14 MIL THICKNESS -OR- PROVIDE MINIMUM 1.5" THICKNESS INTERNAL ACOUSTIC DUCT LINER (R6.0), INTERNAL DUCT LINER TO BE EQUAL TO JOHNS MANSVILLE LINACoustic RC.

DUCT SEALANT: PROVIDE WATER BASED SYNTHETIC LATEX EMULSION PERMANENTLY FLEXIBLE HIGH VELOCITY DUCT SEALANT, DUCTMATE INDUSTRIES, INC. PRO SEAL OR EQUIVALENT. SEALANT TO BE LOW VOC LEED COMPLIANT CAPABLE OF 15" W.G., NFPA 90A AND 90B APPROVED, UL 181B-M LISTED AND UL 723 CLASSIFIED. INSTALL PER MANUFACTURER INSTRUCTIONS. SEALANT SHALL BE APPROVED FOR PLENUM INSTALLATIONS AND MEET FLAME SPREAD AND SMOKE DEVELOPMENT RATINGS FOR PLENUM APPLICATIONS.

SHEET METAL DUCT SHEETMETAL DUCTWORK: PROVIDE SHEETMETAL DUCTWORK FABRICATED AND INSTALLED IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS. FOR 2" W.G. PRESSURE CLASS, SEAL CLASS "A" (UNLESS OTHERWISE INDICATED ON DUCT SYSTEM SCHEDULE). SHEETMETAL SHALL BE GALVANIZED SHEET STEEL OF LOCK FORMING QUALITY, WITH G60 ZINC COATING. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEETMETAL. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES AT ALL 90° ELBOWS.

RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALV STEEL CHANNEL FRAME, 16 GAUGE GALVANIZED STEEL BLADES, MINIMUM 1/2" HEXAGONAL AXLE, MOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".

ROUND VOLUME DAMPERS: PROVIDE ROUND MANUAL. BALANCING DAMPER AT ALL RUN OUTS TO CEILING SUPPLY AIR DIFFUSERS. PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE, MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEETMETAL BRACKET BEYOND DUCT COVERING. WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.

FLEXIBLE DUCT CONNECTORS: PROVIDE U.L. LABELED 30 OUNCE NEOPRENE COATED FIBERGLASS FABRIC DUCT CONNECTORS AT DUCT CONNECTIONS TO ALL VIBRATING EQUIPMENT.

PIPING REQUIREMENTS

NATURAL GAS PIPING:

NATURAL GAS PIPING: ALL NATURAL GAS PIPING SHALL BE SCH 40 STEEL PIPE, ASTM A53, WITH SCREWED JOINTS AND 150 LB MALLEABLE IRON FITTINGS FOR NPS 2" AND SMALLER, AND SCH 40 WELDED JOINTS AND FITTINGS FOR NPS 2-1/2" AND LARGER. PRESSURE TEST NEW GAS PIPE SYSTEMS TO 5 PSI FOR 30 MINUTES WITH NO LOSS OF PRESSURE BEFORE PLACING INTO SERVICE. LEAK TEST ALL GAS PIPE SCREWED JOINTS AND UNIONS BEFORE PLACING INTO SERVICE.

ALL OUTDOOR GAS PIPING SHALL BE PAINTED WITH 2 COATS ALKYD ENAMEL PAINT FOR CORROSION PROTECTION. COLOR 'GREY' UNLESS DIRECTED OTHERWISE BY OWNER OF ARCHITECT.

SHUTOFF/STOP VALVES: CWP RATED 125 PSIG BRONZE OR CAST IRON PLUG VALVE

APPLIANCE GAS VALES: CWP RATED 125 PSIG BRONZE OR CAST IRON PLUG VALVE.

APPLIANCE PRESSURE REGULATORS: CAST IRON OR DIE CAST ALUMINUM BODY, SPRING DIAPHRAGM TYPE, ANSI Z21.18, REFER TO PLANS FOR CAPACITY AND PRESSURE TURNDOWN REQUIREMENTS. STAINLESS STEEL VENT SCREEN, INSTALL IN ORIENTATION THAT PREVENTS WATER INTRUSION INTO VENT OPENING PER MFGR INSTRUCTIONS.

PIPE HANGERS: PROVIDE ADJUSTABLE CLEVIS STYLE PIPE HANGERS FOR NEW. PIPING WITH 1/4" TREADED HANGER RODS FOR PIPE SIZES UP TO 1-1/4" NPS AND 3/8" TREADED HANGER RODS FOR PIPE SIZE ABOVE 1-1/4" NPS.

REFRIGERANT PIPING:

ALL REFRIGERATION PIPING SHALL BE TYPE ACR COPPER TUBE, ASTM B-88, WITH BRAZED OR FLARED JOINTS AND FITTINGS, INSTALLED PER MFG'S INSTRUCTION.

SERVICE AND ISOLATION VALVES, FORGED BRASS BODY AND CAP, PTFE SEATS & GASKETS, MALE SAE FLARE X FEMALE SAE FLARE, FULL PORT UNI-BODY DESIGN, 700 PSIG RATED, EQUIPPED WITH ACCESS FITTING FOR REFRIGERATION SERVICE, CAPABLE OFF VALVE OPERATION WITHOUT REMOVAL OF SEAL CAP.

PROVIDE AP ARMAFLEX BLACK LAPSEAL PRE-FORMED PIPE FLEXIBLE CLOSED CELL INSULATION FOR ALL INTERIOR AND EXTERIOR REFRIGERATION PIPING.

EXTERIOR PIPE INSULATION SHALL BE PROTECTED WITH EITHER:

- VENTURE-CALD JACKETING
- BRUSH APPLIED ARMAFLEX WB WHITE UV RESISTANT COATING.

PROVIDE ADJUSTABLE CLEVIS STYLE HANGER FOR INDIVIDUAL HORIZONTAL PIPING LESS THAN 20 FT LONG.

SUPPORT PIPE HANGERS WITH TREADED HANGER RODS: 1/4" TREADED HANGER RODS FOR PIPE SIZES UP TO 1-1/2".

CHILLED WATER PIPING:

2" AND SMALLER: SCH 40 STEEL PIPE, ASTM A53, WITH SCREWED JOINTS AND 150 LB MALLEABLE IRON FITTINGS, TYPE L COPPER TUBE WITH SOLDERED OR BRAZED JOINTS AND FITTINGS, OR SCH 80 CPVC, ASTM D2846 WITH SOLVENT WELDED JOINTS & FITTINGS.

FOR NPS 2-1/2" AND LARGER: SCH 40 WELDED JOINTS AND FITTINGS, MECHANICAL ROLL GROOVED JOINTS AND FITTINGS, OR SCH 80 CPVC, ASTM D2846 WITH SOLVENT WELDED JOINTS & FITTINGS. WHERE MECHANICAL COUPLINGS ARE UTILIZED, PROVIDE FLEXIBLE STYLE COUPLINGS AT 90 DEGREE ELBOWS AND 2ND JOINT FROM ELBOW TO ACCOMMODATE THERMAL EXPANSION; PROVIDE RIGID COUPLINGS AT ALL OTHER LOCATIONS.

CLEAN AND FLUSH ALL NEW PIPE, REMOVE AND CLEAN ALL STRAINERS BEFORE PLACING INTO SERVICE. PRESSURE TEST ALL NEW PIPING WITH WATER AT 1.5 TIMES SYSTEM PRESSURE WITH NO LOSS OF PRESSURE FOR 24 HOURS BEFORE PLACING INTO SERVICE. VENT PIPING SYSTEM AS NECESSARY TO REMOVE AIR BEFORE TURNING OVER TO OWNER.

VALVES TO BE CWP RATED 125 PSIG BRONZE BODY BALL VALVES FOR 2" AND SMALLER; DUCTILE IRON LUG STYLE BUTTERFLY VALVES BETWEEN WELD FLANGES FOR 2-1/2" AND LARGER WITH LEVEL HANDLE, STAINLESS STEEL STEM AND BUNA-N OR EPDM SEAT.

GAUGES TO BE LIQUID IN GLASS THERMOMETER - THERCIRE OR EQUAL, METAL CASE 9" GLASS W/ BLUE OR RED LIQUID, GLASS WINDOW, ALUMINUM OR BRASS STEM FOR THERMOWELL INSTALLATION.

PRESSURE GAUGES - ASHCROFT OR EQUAL DIRECT MOUNT, METAL CASE DIAL TYPE PRESSURE GAUGE, 6" DIAL, SEALED CASE, BOURBON TUBE PRESURE ELEMENT, GLASS WINDOW W/ METAL RING, PIPE THREADED BOTTOM OUTLET.

HANGERS TO BE ADJUSTABLE CLEVIS STYLE PIPE HANGERS FOR NEW. PIPING WITH 1/4" TREADED HANGER RODS FOR PIPE SIZES UP TO 1-1/4" NPS AND 3/8" TREADED HANGER RODS FOR PIPE SIZE ABOVE 1-1/4" NPS.

PROVIDE OVERSIZED PIPE HANGERS WITH INSULATION SHIELD AND SADDLE FOR NEW CHILLED WATER PIPING TO ALLOW FOR CONTINUOUS INSULATION AND VAPOR BARRIER.

MECH CODE COMPLIANCE NOTES:

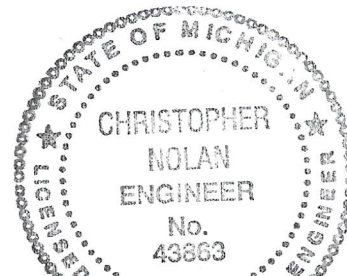
- CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLATION OF SYSTEM IN COMPLIANCE WITH 2021 MICHIGAN MECHANICAL CODE (MMC), ASHRAE 90.1-2013, AND ALL OTHER APPLICABLE STATE AND LOCAL CODES.
- NEW AIR HANDLING SYSTEMS (RTU'S) ALL HAVE RATED AIRFLOW CAPACITY OF MORE THAN 2000 CFM; DUCT SMOKE DETECTOR FOR SUPPLY AND RETURN IS REQUIRED FOR NEW ROOFTOP AIR HANDLING UNITS PER 2021 MMC 606.2.1 AND NFPA 90A 6.4.2. CONTRACTOR TO FIELD VERIFY EXISTING FIRE ALARM SYSTEM AND INTEGRATE NEW SMOKE DETECTORS.
- SYSTEMS AS DESIGNED AND EQUIPMENT AS SPECIFIED MEET OR EXCEED THE MINIMUM PRESCRIPTIVE REQUIREMENTS OF THE MICHIGAN ENERGY CODE ASHRAE 90.1-2013.
- NO NEW RTU HVAC SYSTEM ABOVE 2000 CFM. NO DUCT SMOKE DETECTORS WILL BE PROVIDED FOR HVAC SYSTEMS WITH CAPACITIES LESS THAN 2000 CFM PER 2021 MMC 606.2.1.
- NEW MAU SYSTEMS LARGER THAN 2000 CFM ARE LIMITED TO THE EXISTING MANUFACTURING SPACE, AND SERVE ONLY ONE SINGLE ROOM; PER 2021 MMC 606.2 EXCEPTION THESE SYSTEM ARE NOT CAPABLE OF SPREADING SMOKE BEYOND THE ENCLOSING WALLS, CEILING AND FLOORS OF THE ROOM AND AS SUCH DO NOT REQUIRE A DUCT SMOKE DETECTOR.
- NEW EQUIPMENT AND SYSTEMS MEET OR EXCEED THE MINIMUM EFFICIENCY REQUIREMENTS OF THE ASHRAE 90.1-2013 ENERGY STANDARD.
- ALL GAS PIPING HAS BEEN SIZED IN ACCORDANCE WITH THE 2015 IFGC LONGEST LENGTH METHOD 402.4.1.
- ALL NEW NATURAL GAS PIPING HAS BEEN SIZED BASED ON THE BRANCH LENGTH METHOD OF 2018 INTERNATIONAL FUEL GAS CODE (IFGC); CONTRACTOR SHALL INSTALL GAS PIPING SYSTEM SHOWN IN ACCORDANCE WITH 2015 IFGC. (SEE PLANS)
- CONTRACTOR SHALL PROVIDE AIRFLOW TEST AND BALANCE REPORT TO OWNER AND ENGINEER PRIOR TO SUBSTANTIAL COMPLETION. AIRSIDE TEST&BALANCE WILL BE REQUIRED FOR ALL NEW AND MODIFIED AIRSIDE SYSTEMS. WATERSIDE TEST&BALANCE WILL BE REQUIRED FOR NEW FLUID COOLER, EXISTING DISTRIBUTION PUMPS, AND COIL TEST FOR ALL NEW HVAC UNITS.
- CONTRACTOR SHALL PROVIDE CLOSE-OUT DOCUMENTS TO OWNER THAT INCLUDE TWO (2) SETS OF OPERATING, MAINTENANCE AND WARRANTY MANUALS AND AS-BUILT DRAWING MARK-UPS.
- CONTRACTOR SHALL SECURE ALL REQUIRED PERMITS AND SHALL ARRANGE FOR FOR ALL REQUIRED INSPECTIONS RELATING TO THEIR WORK SCOPE; INCLUDE COST OF ALL PERMITS AND FEES.

GENERAL NOTES:

- CONTRACTOR SHALL INCLUDE ALL APPLICABLE SALES AND USE TAXES FOR MATERIAL AND EQUIPMENT PROVIDED AS REQUIRED.
- CONTRACTOR RESPONSIBLE FOR CREATING OPENINGS THRU ANY ROOFS, CEILINGS AND WALLS FOR THEIR DUCT AND PIPING SYSTEMS; OVSERSIZE OPENING AS REQUIRED TO ACCOUNT FOR THERMAL EXPANSION. UTILIZE PIPE ROOF JACK FOR ROOF PIPE PENETRATIONS THROUGH ROOF AND SEAL WEATHERTIGHT.
- ALL DUCTWORK IS TO BE INSTALLED PER LATEST EDITION OF SMACNA "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE".
- DUCTWORK DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
- ROUTE ALL DUCTWORK AND PIPE AT RIGHT ANGLES TO WALLS, INSTALL HORIZONTAL PIPE DEAD LEVEL UNLESS IDENTIFIED OTHERWISE.
- CONTRACTOR SHALL FURNISH & INSTALL HANGERS AND BUILDING ATTACHMENTS AS REQUIRED FOR ALL DUCTWORK AND PIPING SYSTEMS.
- ALL DUCT, PIPE AND CONDUIT PENETRATIONS OF THE OFFICE AREA WALLS AND CEILINGS SHALL BE SEALED AIRTIGHT WITH ZERO LIGHT TRESPASS AROUND OPENING.
- PROVIDE 1 YEAR WARRANTY ON WORKMANSHIP.
- CONTRACTOR RESPONSIBLE FOR ALL REQUIRED PERMITS AND FEES RELATIVE TO THEIR WORK SCOPE.
- COMPLETED INSTALLATIONS SHALL CONFORM TO ALL APPLICABLE LOCAL, STATE, AND FEDERAL CODES AND ORDINANCES INCLUDING, BUT NOT LIMITED TO THE LATEST EDITIONS OF THE FOLLOWING: STATE BUILDING CODE, NFPA-90A, NFPA-96 AND NFPA-101.
- CONTRACTOR TO VISIT THE SITE PRIOR TO BID AND VERIFY ALL PERTINENT EXISTING CONDITIONS.

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CHRISTOPHER J. NOLAN, P.E.
MI - REGISTRATION # 6301 043663
EXP. DATE 6/14/2027

VENTILATION SUMMARY: RTU-1																
ROOM NAME	ROOM #	CLASSIFICATION	AREA (SF)	OCCUPANT DENSITY #/1000SF	# OCCUPANTS	CFM OA PER OCCUPANT	Rp VENT CFM	CFM OA PER SF AREA	Ra VENT FCM	BASE OA CFM	Ez	TOTAL REQ'D OA CFM	DESIGN SA CFM	PERCENT OA AT UNIT	DESIGN OA CFM	MEETS TABLE 403.3 REQUIREMENT
BREAK ROOM	100	OFFICE	900	5.0	4.5	5	22.5	0.06	54.0	76.5	1.0	76.5	1350	6%	77	YES
HALLWAY	102	CORRIDOR	250	0.0	0.0	0	0.0	0.06	15.0	15.0	1.0	15.0	250	6%	45	YES
TOTALS:			1150		4.5					91.5		91.5	1600		122	YES
1. ALL VENTILATION AIR PROVIDED BY FRESH AIR DAMPER ON RTU-1; UNITS OPERATE WITH FAN ON CONTINUOUSLY DURING OCCUPIED PERIODS																

VENTILATION SUMMARY: RTU-2																
ROOM NAME	ROOM #	CLASSIFICATION	AREA (SF)	OCCUPAN T DENSITY #/1000SF	# OCCUPANTS	CFM OA PER OCCUPAN	Rp VENT CFM	CFM OA PER SF AREA	Ra VENT FCM	BASE OA CFM	Ez	TOTAL REQ'D OA CFM	DESIGN SA CFM	PERCENT OA AT UNIT	DESIGN OA CFM	MEETS TABLE 403.3 REQUIREMENT
HUDDLE ROOM	118	OFFICE	133	5.0	0.7	5	3.3	0.06	8.0	11.3	1.0	11.3	200	10%	20	YES
OFFICE	119	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	125	10%	13	YES
OFFICE	120	OFFICE	100	5.0	0.5	5	2.5	0.06	6.0	8.5	1.0	8.5	125	10%	13	YES
IT	121	STORAGE	115	0.0	0.0	0	0.0	0.06	6.9	6.9	1.0	6.9	60	10%	6	YES
OFFICE	122	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	125	10%	13	YES
OFFICE	123	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	125	10%	13	YES
OPEN OFFICE	125	OFFICE	3000	5.0	15.0	5	75.0	0.06	180.0	255.0	1.0	255.0	2440	10%	255	YES
RESTROOMS		RESTROOMS										0.0	800	10%	80	YES
TOTALS:			3693		17.9					311.0		311.0	4000		400	YES
1. ALL VENTILATION AIR PROVIDED BY FRESH AIR DAMPER ON RTU-2; UNITS OPERATE WITH FAN ON CONTINUOUSLY DURING OCCUPIED PERIODS																

VENTILATION SUMMARY: RTU-3																
ROOM NAME	ROOM #	CLASSIFICATION	AREA (SF)	OCCUPAN T DENSITY #/1000SF	# OCCUPANTS	CFM OA PER OCCUPAN	Rp VENT CFM	CFM OA PER SF AREA	Ra VENT FCM	BASE OA CFM	Ez	TOTAL REQ'D OA CFM	DESIGN SA CFM	PERCENT OA AT UNIT	DESIGN OA CFM	MEETS TABLE 403.3 REQUIREMENT
HUDDLE ROOM	109	OFFICE	140	5.0	0.7	5	3.5	0.06	8.4	11.9	1.0	11.9	175	18%	32	YES
OFFICE	110	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	150	18%	27	YES
OFFICE	111	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	150	18%	27	YES
CONF ROOM	112	CONFERENCE	370	50.0	18.5	5	92.5	0.06	22.2	114.7	1.0	114.7	630	18%	115	YES
ENTRY	113	OFFICE	220	5.0	1.1	5	5.5	0.06	13.2	18.7	1.0	18.7	350	18%	63	YES
OFFICE	114	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	150	18%	27	YES
OFFICE	115	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	150	18%	27	YES
OFFICE	116	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	150	18%	27	YES
OFFICE	117	OFFICE	115	5.0	0.6	5	2.9	0.06	6.9	9.8	1.0	9.8	150	18%	27	YES
TOTALS:			1420		23.8					204.0		204.0	2055		371	YES
1. ALL VENTILATION AIR PROVIDED BY FRESH AIR DAMPER ON RTU-3; UNITS OPERATE WITH FAN ON CONTINUOUSLY DURING OCCUPIED PERIODS																

Mark	Description	Date
	BIDDING & PERMIT SET	04/16/2025

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Jeffrey
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Addition & Renovation

Markdom Renovation

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Charlotte, MI 48813

MECHANICAL GENERAL
INFORMATION

Issued

Drawing No.

Project No.
22067

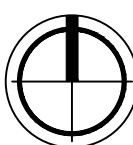
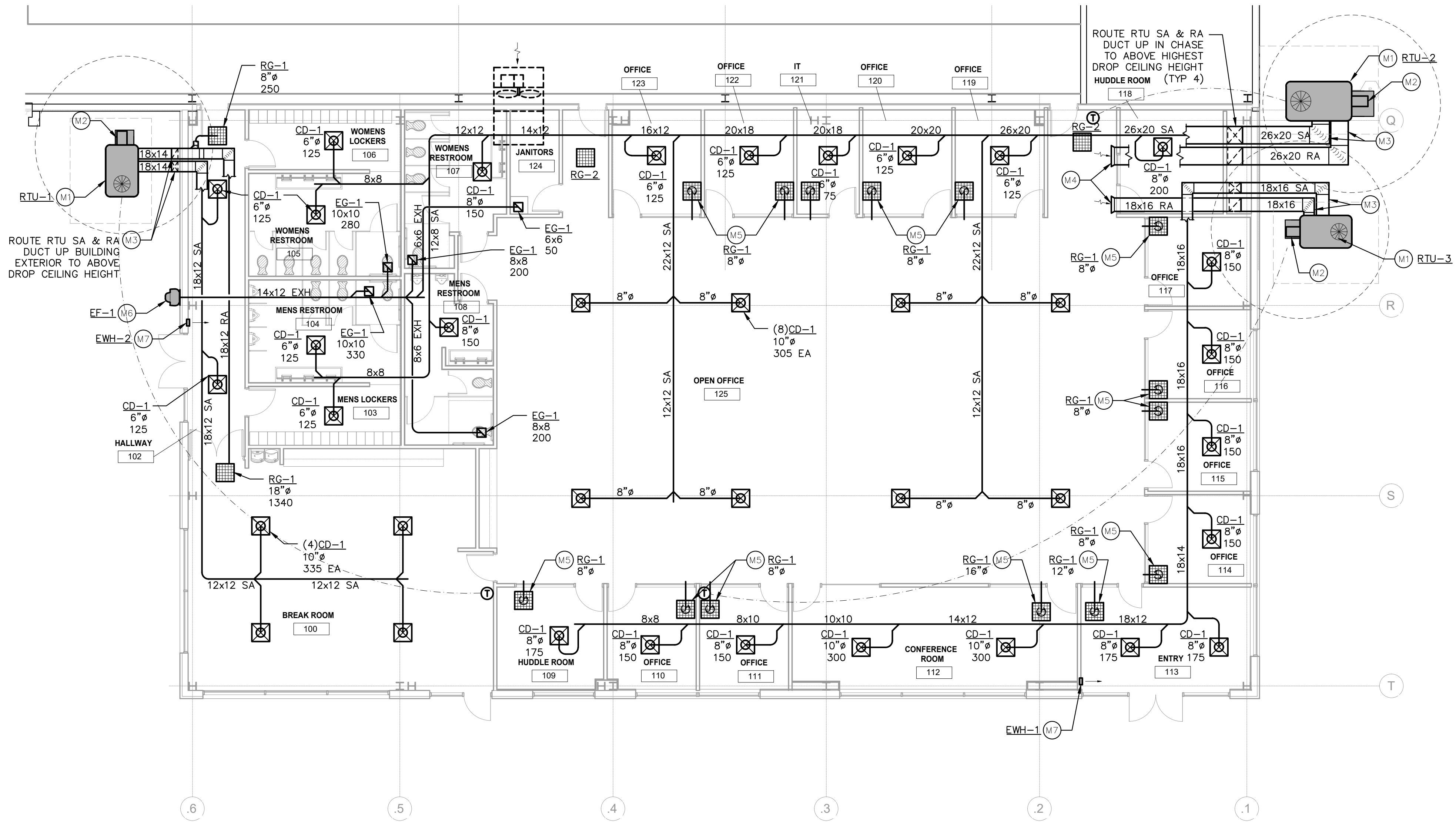
M-0.1

GENERAL HVAC NOTES:

1. PROVIDE TURNING VANES IN ALL 90° MITERED ELBOWS.
2. DUCT RUNOUT SIZES TO MATCH DIFFUSER OR GRILLE NECK SIZE UNLESS SHOWN OTHERWISE.
3. ALL SUPPLY DIFFUSER RUNOUT DUCT TO HAVE BD AS FAR AS POSSIBLE FROM DIFFUSER.
4. FLEX CONNECTORS TO CD'S TO BE THE SAME SIZE AS THE CD COLLAR, MAX 5 FT LONG.
5. ALL RECTANGULAR DUCT TAKE-OFFS TO HAVE 45° LEADING EDGE OR CONICAL SPIN IN FITTINGS.
6. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL TRADES AND PROPER INSTALLATION OF ALL MECHANICAL SYSTEM.
7. DUCT DIMENSIONS SHOWN REPRESENT FREE AREA REQUIRED. INCREASE FOR INTERNAL DUCT ACOUSTIC LINING AS REQUIRED.
8. LOCATE THERMOSTATS/SENSORS AT 48" AFF
9. LOCATE THERMOSTATS AND/OR ROOM TEMP SENSORS TO BEST REPRESENT OCCUPANT ROOM COMFORT - TCC RESPONSIBLE FOR FINAL LOC BASED ON RELATIVE LOC TO SUPPLY AND RETURN AIR GRILLES, OUTSIDE WINDOW, ROOM FURNITURE LAYOUT AND OWNER COORDINATION.

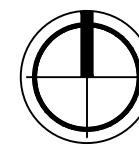
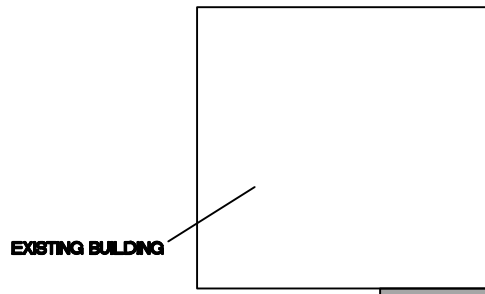
KEYED MECHANICAL SCOPE NOTES:

- (M1) GRADE MOUNTED GAS/ELECTRIC ROOFTOP UNIT; CONTRACTOR TO INSTALL UNIT ON ELEVATED ROOF CURB ON CONCRETE GRADE PAD, AND INSTALL ASSOCIATED DUCTWORK AND GAS PIPING.
- (M2) POWERED EXHAUST PROVIDED BY WITH ROOFTOP UNIT, FIELD INSTALLED, POWERED BY ROOFTOP UNIT & WIRED BY MC.
- (M3) OUTDOOR EXPOSED RECTANGULAR SUPPLY & RETURN DUCTWORK BETWEEN UNIT SIDE CONNECTION AND BUILDING EXTERIOR WALL PENETRATION. PROVIDE 1-1/2" THICK INTERNAL ACOUSTIC LINING FOR BOTH SA & RA DUCTWORK (MIN R=6.7 FOR OUTDOOR EXPOSED HEATING & COOLING DUCTWORK). ALL OUTDOOR EXPOSED DUCTWORK TO BE CONSTRUCTED TO SMACNA SEAL CLASS 'A' (FULLY SEALED - ALL JOINTS, SEAMS AND DUCT WALL PENETRATIONS) FOR WEATHER PROTECTION.
- (M4) TERMINATE RETURN AIR DUCT ABOVE CEILING WITH OPEN END, REFER TO BELLMOUTH FITTING DETAIL FOR INFO.
- (M5) TRANSFER GRILLE WITH FLEX DUCT. DUCT SIZE MATCHES GRILLE CONNECTION. ROUTE THRU OFFICE WALL TO TERMINATE ABOVE OPEN OFFICE CEILING IN RETURN AIR PLENUM, REFER TO TRANSFER GRILLE DETAIL FOR INFO.
- (M6) EXHAUST FAN MOUNTED HIGH ON WALL. REFER TO FAN SCHEDULE FOR INFO.
- (M7) WALL MOUNTED ELECTRIC HEATER, SEMI-RECESSED. REFER TO ELECTRIC WALL HEATER SCHEDULE FOR INFO.
- (M8) CEILING MOUNTED EXHAUST FAN. REFER TO FAN SCHEDULE FOR INFO.
- (M9) VERTICAL MAKE-UP AIR UNIT ON STAND ON EXIST PAD. REFER TO DIRECT-FIRED MAKE UP AIR UNIT SCHEDULE FOR INFO.



OFFICE ADDITION MECHANICAL PLAN

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

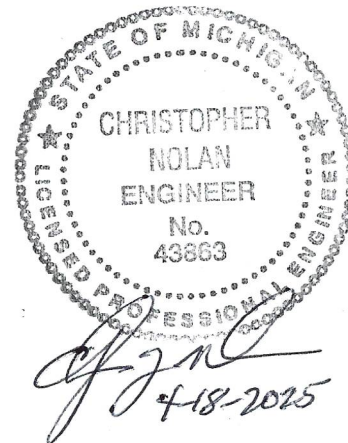


KEY PLAN

SCALE: NONE

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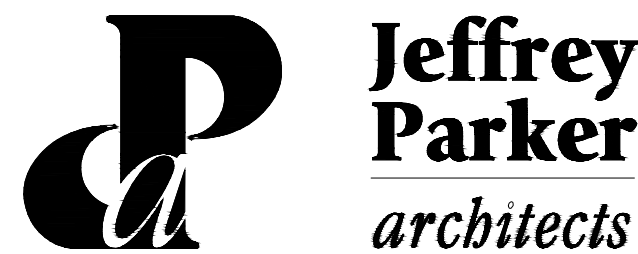
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CHRISTOPHER J. NOLAN, P.E.
MI - REGISTRATION # 43863
EXP. DATE 11/14/2027

Mark	Description	Date
	BIDDING & PERMIT SET	04/16/2025

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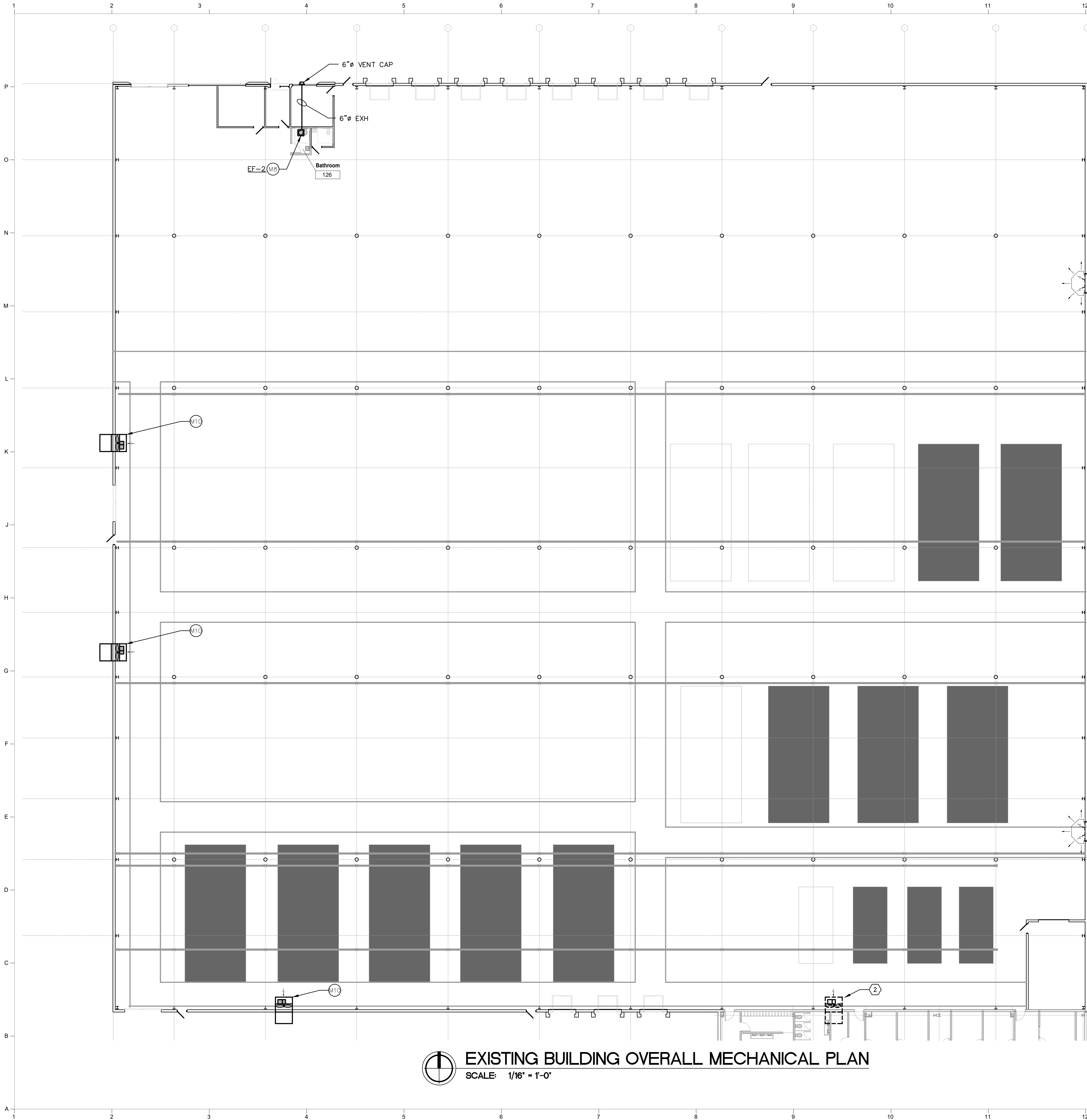
MECHANICAL PLAN

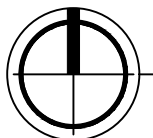
Issued

Project No.
22087

Drawing No.

M-1.1



 **EXISTING BUILDING OVERALL MECHANICAL PLAN**
SCALE: 1/16" = 1'-0"

GENERAL HVAC NOTES:

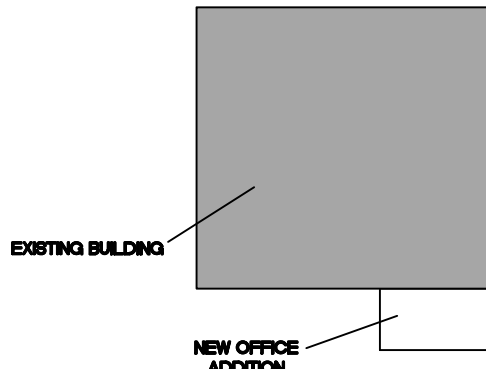
1. PROVIDE TURNING VANES IN ALL 90° MITERED ELBOWS.
2. DUCT RUNOUT SIZES TO MATCH DIFFUSER OR GRILLE NECK SIZE UNLESS SHOWN OTHERWISE.
3. ALL SUPPLY DIFFUSER RUNOUT DUCT TO HAVE BD AS FAR AS POSSIBLE FROM DIFFUSER.
4. FLEX CONNECTORS TO CD'S TO BE THE SAME SIZE AS THE CD COLLAR, MAX 5 FT LONG.
5. ALL RECTANGULAR DUCT TAKE-OFFS TO HAVE 45° LEADING EDGE OR CONICAL SPIN IN FITTINGS.
6. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF ALL TRADES AND PROPER INSTALLATION OF ALL MECHANICAL SYSTEM.
7. DUCT DIMENSIONS SHOWN REPRESENT FREE AREA REQUIRED. INCREASE FOR INTERNAL DUCT ACOUSTIC LINING AS REQUIRED.
8. LOCATE THERMOSTATS/SENSORS AT 48" AFF
9. LOCATE THERMOSTATS AND/OR ROOM TEMP SENSORS TO BEST REPRESENT OCCUPANT ROOM COMFORT – TCC RESPONSIBLE FOR FINAL LOC BASED ON RELATIVE LOC TO SUPPLY AND RETURN AIR GRILLES, OUTSIDE WINDOW, ROOM FURNITURE LAYOUT AND OWNER COORDINATION.

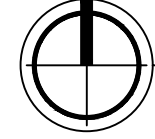
KEYED HVAC DEMOLITION NOTES:

- 1 REMOVE EXIST MAKE-UP AIR HANDLER FOR REPLACEMENT. DISCHARGE HEAD TO REMAIN FOR REUSE
- 2 REMOVE EXIST RELIEF FAN AND DAMPER & HOOD; GENERA TRADES TO PATCH REMAINING WALL OPENING

KEYED MECHANICAL SCOPE NOTES:

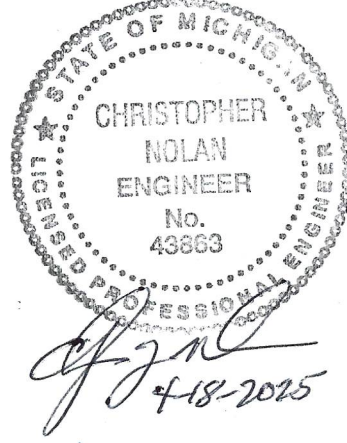
- M1 GRADE MOUNTED GAS/ELECTRIC ROOFTOP UNIT; CONTRACTOR TO INSTALL UNIT ON ELEVATED ROOF CURB ON CONCRETE GRADE PAD, AND INSTALL ASSOCIATED DUCTWORK AND GAS PIPING.
- M2 POWERED EXHAUST PROVIDED BY WITH ROOFTOP UNIT, FIELD INSTALLED, POWERED BY ROOFTOP UNIT & WIRED BY MC.
- M3 OUTDOOR EXPOSED RECTANGULAR SUPPLY & RETURN DUCTWORK BETWEEN UNIT SIDE CONNECTION AND BUILDING EXTERIOR WALL PENETRATION. PROVIDE 1-1/2" THICK INTERNAL ACOUSTIC LINING FOR BOTH SA & RA DUCTWORK (MIN R=6.7 FOR OUTDOOR EXPOSED HEATING & COOLING DUCTWORK). ALL OUTDOOR EXPOSED DUCTWORK TO BE CONSTRUCTED TO SMACNA SEAL CLASS 'A' (FULLY SEALED – ALL JOINTS, SEAMS AND DUCT WALL PENETRATIONS) FOR WEATHER PROTECTION.
- M4 TERMINATE RETURN AIR DUCT ABOVE CEILING WITH OPEN END, REFER TO BELLMOUTH FITTING DETAIL FOR INFO.
- M5 TRANSFER GRILLE WITH FLEX DUCT. DUCT SIZE MATCHES GRILLE CONNECTION. ROUTE THRU OFFICE WALL TO TERMINATE ABOVE OPEN OFFICE CEILING IN RETURN AIR PLENUM, REFER TO TRANSFER GRILLE DETAIL FOR INFO.
- M6 EXHAUST FAN MOUNTED HIGH ON WALL. REFER TO FAN SCHEDULE FOR INFO.
- M7 WALL MOUNTED ELECTRIC HEATER, SEMI-RECESSED. REFER TO ELECTRIC WALL HEATER SCHEDULE FOR INFO.
- M8 CEILING MOUNTED EXHAUST FAN. REFER TO FAN SCHEDULE FOR INFO.
- M9 VERTICAL MAKE-UP AIR UNIT ON STAND ON EXIST PAD. REFER TO DIRECT-FIRED MAKE UP AIR UNIT SCHEDULE FOR INFO.
- M10 REUSE EXISTING WALL MOUNTED PROPELLER EXHAUST FAN



 **KEY PLAN**
SCALE: NONE

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CHRISTOPHER J. NOLAN, P.E.
MI - REGISTRATION# 43810-43883
EXP. DATE# 4/18/2027

Mark	Description	Date
	BIDDING & PERMIT SET	04/16/2025

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Charlottesville, MI 48813

MECHANICAL PLAN

Issued	Drawing No.
Project No. 22087	M-2.1

ROOF TOP UNIT SCHEDULE

MARK	LOCATION AND SERVICE	MODEL	SUPPLY FAN						FILTERS	COMPRESSOR		COOLING COIL						HEATING MODULE			EER @ ARI COND	IEER @ ARI COND	WEIGHT (LBS)	ELECTRICAL			CONTROLS		DISCONNECT		REMARKS	
			DESIGN CFM	FRESH AIR		ESP	RPM	HP		UNIT NOM TONS	NO OF COMP	TYPE	EDB (°F)	EWB (°F)	AMBIENT (°F)	SQ FT COIL	SENS MBH	TOTAL MBH	FUEL	MBH INPUT				MBH OUTPUT	VOLT	MCA	MOCP	TYPE	BY	TYPE		BY
				MIN%	CFM																											
RTU-1	BREAK ROOM 100	YSK048	1600	6	100	0.7"	1200	1	2" MERV 8	4	1	R-454B	80	67	95	6.81	37.0	49.7	NG	80/56	64.8/45.3	12	14	609	460V/3PH	13	15	NOTE 7.	DIV 23	NOTE 6.	DIV 23	1., 3., 4., 5.
RTU-2	OPEN OFFICE 125	YSK120	4000	10	400	0.9"	1366	3.1	2" MERV 8	10	2	R-454B	80	67	95	11.84	92.3	115.7	NG	200/140	162/113	11	14.6	950	460V/3PH	33	45	NOTE 7.	DIV 23	NOTE 6.	DIV 23	2., 3., 4., 5.
RTU-3	OFFICE 111	YSK060	2000	18	360	0.7"	1200	1	2" MERV 8	5	1	R-454B	80	67	95	7.99	47.8	61.4	NG	100/70	81/56.7	12	14	630	460V/3PH	15	20	NOTE 7.	DIV 23	NOTE 6.	DIV 23	2., 3., 4., 5.

1. BASED ON TRANE PRECEDENT SERIES, SIDE DISCHARGE & INTAKE, DIRECT DRIVE ECM SUPPLY FAN MOTOR, 2-STAGE LOW GAS HEAT, STANDARD EFFICIENCY, A2L REFRIGERANT W/ LEAK DETECTION SYSTEM AND CONTROLS, LOW LEAK ECONOMIZER W/ POWERED EXHAUST.
2. BASED ON TRANE PRECEDENT SERIES, SIDE DISCHARGE & INTAKE, DIRECT DRIVE ECM SUPPLY FAN MOTOR, 2-STAGE MEDIUM GAS HEAT, STANDARD EFFICIENCY, A2L REFRIGERANT W/ LEAK DETECTION SYSTEM AND CONTROLS, LOW LEAK ECONOMIZER W/ POWERED EXHAUST.
3. INSTALL ON 24" FACTORY CURB ON GRADE.
4. PROVIDE FACTORY HAIL GUARDS FOR CONDENSER COIL OF PAINTED GALVANIZED STEEL TO MATCH UNIT CASING
5. PROVIDE COMPLETE EXTRA/SPARE SET OF UNIT FILTERS
6. FACTORY NFDS AND POWERED 115 GFCI CONVENIENCE OUTLET
7. PROVIDE WITH PROGRAMMABLE T-STAT CONTROL.

DIRECT-FIRED MAKE UP AIR UNIT SCHEDULE

MARK	LOCATION AND SERVICE	MODEL	CFM	ESP	TSP	HP	RPM	HEATING MODULE			FILTERS	ELECTRICAL				CONTROL MEANS		DISCONNECT		REMARKS
								TYPE	MBH INPUT	TEMP RISE		VOLT	FLA	MCA	MOCP	TYPE	BY	TYPE	BY	
MAU-1	EAST EXTERIOR EXIST BUILDING	4049	3500	0.75	1.51	15		NAT GAS	3402	90°F	NOTE 4.	460V/3PH	21	27.5	48.3	NOTE 5.	DIV 23	NFDS	DIV 26	1., 2.
MAU-2	EAST EXTERIOR EXIST BUILDING	4049	3500	0.75	1.51	15		NAT GAS	3402	90°F	NOTE 4.	460V/3PH	21	27.5	48.3	NOTE 5.	DIV 23	NFDS	DIV 26	1., 2.

1. BASED ON RAPID 4000 SERIES VERTICAL DIRECT FIRED MAKE-UP AIR AND HEATING UNIT, BOTTOM OUTSIDE AIR INLET, SIDE RETURN INTAKE, SIDE SUPPLY DISCHARGE, PREMIUM EFF MOTOR W/ VFD, & MODULATING 80/20 DAMPER
2. 120V POWERED OUTLET AND LIGHT, 48" STAND, LEFT HAND CONTROLS AND ACCESS DOORS.
3. REQUIRES 1 PSIG NATURAL GAS PRESSURE.
4. 1" ALUMINIUM WASHABLE FILTERS.
5. 7-DAY PROGRAMMABLE THERMOSTAT. PROVIDE UNIT WITH BACNET INTERFACE.

FAN SCHEDULE

MARK	LOCATION OR SERVICE	MODEL	CFM	SP	RPM	ELECTRICAL				CONTROL		DISCONNECT		REMARKS
						VOLT	HP	FLA	MOCP	TYPE	BY	TYPE	BY	
EF-1	ADDITION RESTRM EXH	CUE-120-VG	1150	0.8"	1483	115V/1PH	1/2	6.6	15	NOTE 3.	DIV 23	NFDS	DIV 23	1.
EF-2	BATHRM 126 EXHAUST	SP-B70	70	0.2"		115V/1PH	17.1W	0.16	15	NOTE 4.	DIV 23	MMS	DIV 23	2.

1. BASED ON GREENHECK VARI-GREEN DIRECT DRIVE SPUN ALUMINUM INLINE WALL MOUNTED FAN WITH WITH BACKDRAFT DAMPER.
2. BASED ON GREENHECK DIRECT DRIVE INLINE CEILING MOUNTED EXHAUST FAN WITH WITH GRILLE.
3. EXHAUST FAN TO CYCLE ON/OFF - REFER TO CONTROL SEQUENCES
4. EXHAUST FAN TO CYCLE ON/OFF WITH LIGHT SWITCH.

ELECTRIC WALL HEATER SCHEDULE

MARK	LOCATION	MODEL	KW	BTU/HR	ELECTRICAL			CONTROLS		DISCONNECT		REMARKS
					VOLT	AMPS	MOCP	TYPE	BY	TYPE	BY	
EW-1	ENTRY 113	CWH1151DSFPQ	3	10,239	208V/1PH	14.4	15	NOTE 2	MFR	NFDS	MFR	1.
EW-1	HALLWAY 102	CWH1151DSFPQ	3	10,239	208V/1PH	14.4	15	NOTE 2	MFR	NFDS	MFR	1.

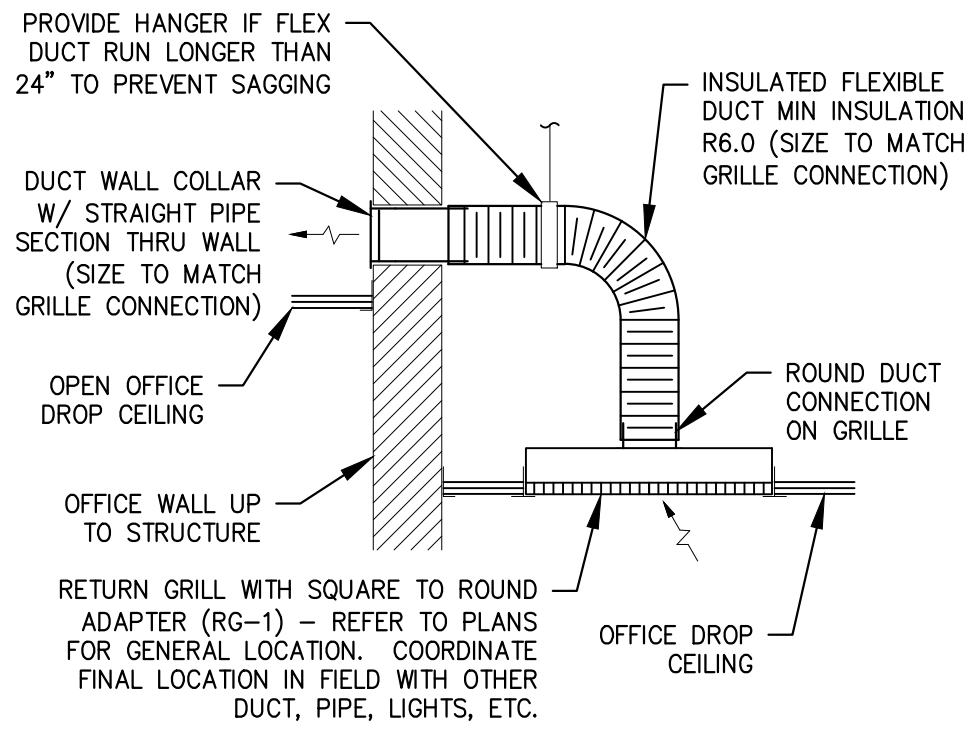
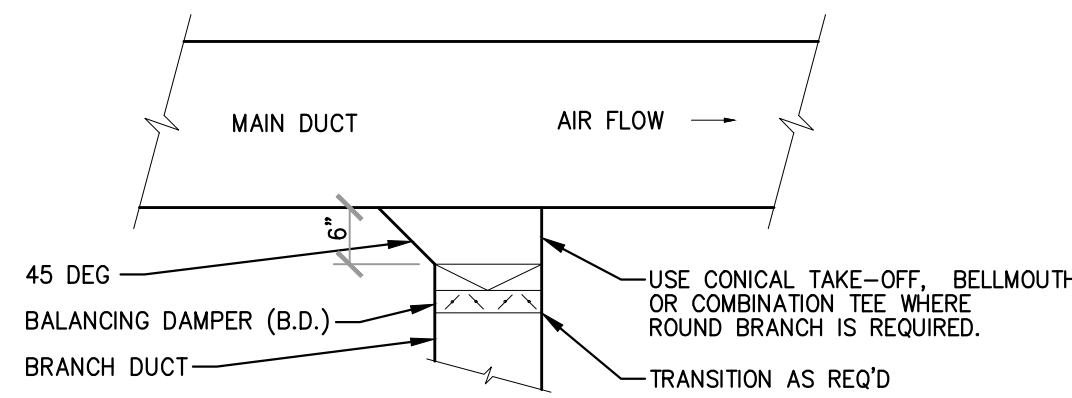
1. BASED ON Q-MARK SERIES 3420 HEAVY-DUTY COMMERCIAL FAN FORCED HEATER W/ INTERNAL ELECTRICAL DISCONNECT, STANDARD WHITE COLOR, 4" RECESSED.
2. INTERNAL SINGLE POLE THERMOSTAT WITH CONEALED ADJUSTMENT FOR STAND ALONE OPERATION, NO BMCS INTEGRATION

DIFFUSER, REGISTER & GRILLE SCHEDULE

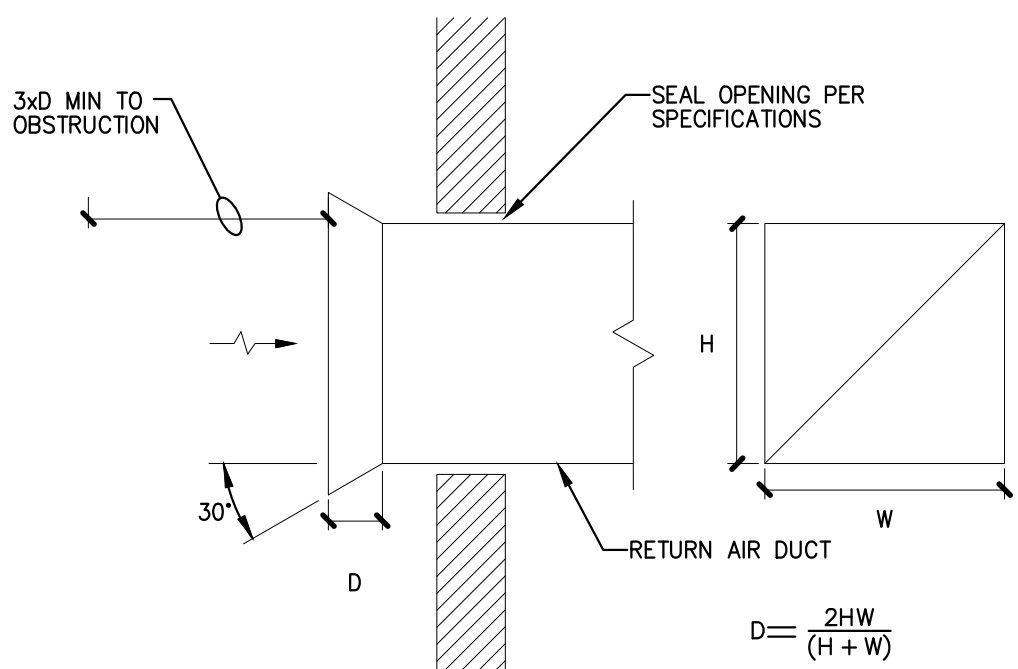
MARK	SERVICE	MODEL	VOLUME CONTROL DAMPER	FINISH	REMARKS
CD-1	SQUARE CEILING SUPPLY DIFFUSER	TMS	NO	STANDARD WHITE	1. ROUND NECK, 24x24 LAY-IN
RG-1	EGGCRATE RETURN GRILLE	50F	NO	STANDARD WHITE	1. 1/2" GRID, 22"x22" LAY-IN W/ BORDER WITH ROUND NECK ADAPTER
EG-1	EGGCRATE EXHAUST GRILLE	50F	NO	STANDARD WHITE	1. 1/2" GRID, SURFACE MOUNTED WITH ROUND NECK ADAPTER

1. BASED ON TITUS MODELS

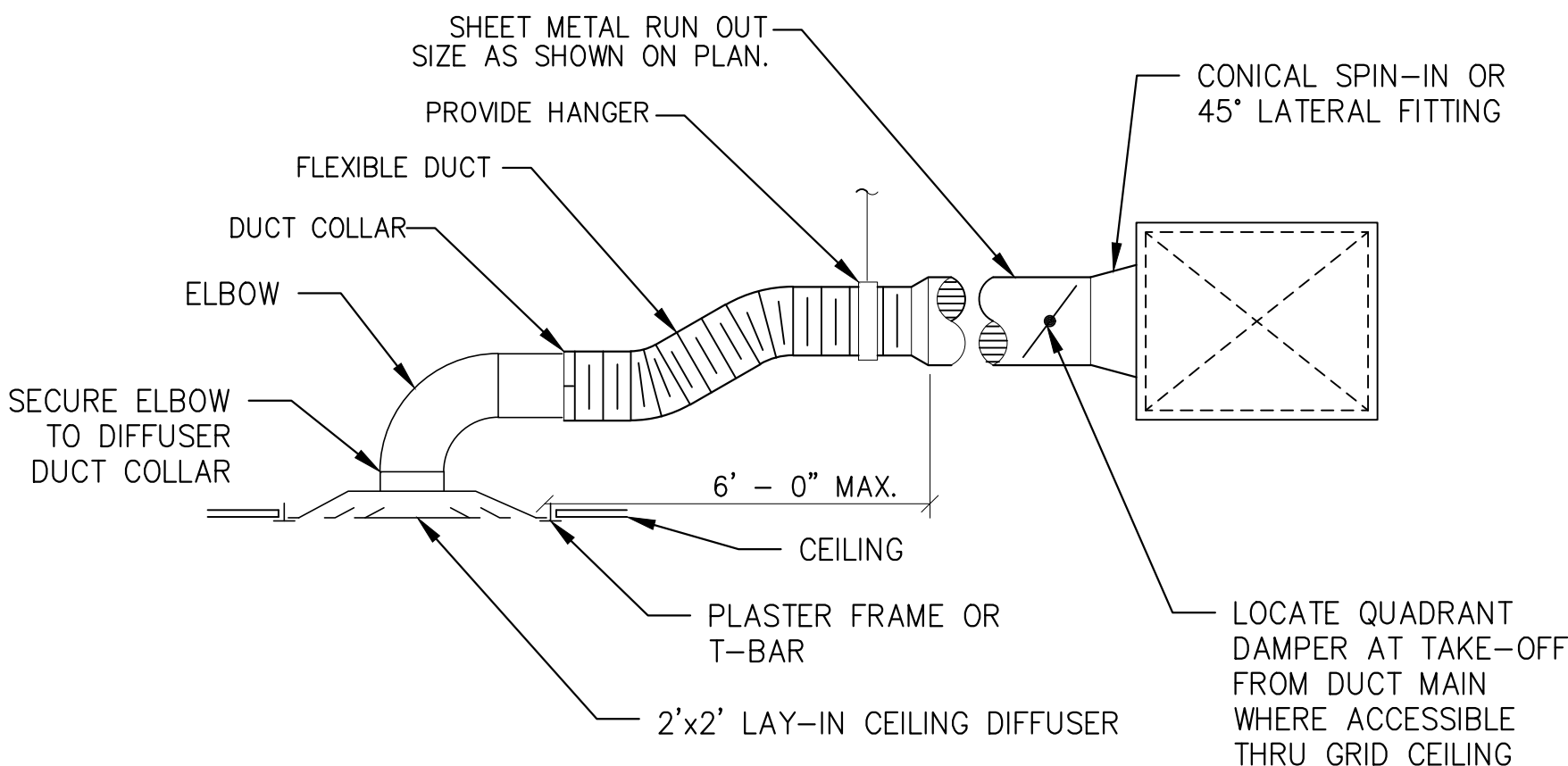
- NOTES:
1. AIR FLOW DIRECTION SHOWN FOR SUPPLY.
 2. DO NOT PROVIDE BD ON HIGH PRESSURE SUPPLY DUCT PRIOR TO VAV BOXES



TRANSFER GRILLE DETAIL NOT TO SCALE



BELLMOUTH FITTING DETAIL NOT TO SCALE



CEILING DIFFUSER RUN OUT DETAIL NOT TO SCALE

DUCT BRANCH TAKE-OFF DETAIL NOT TO SCALE

HVAC LEGEND

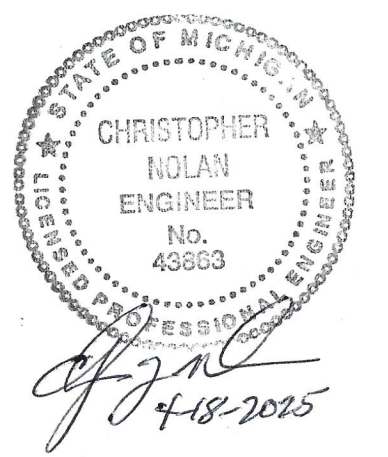
DUCTWORK	BALANCE DAMPER
EXISTING DUCTWORK OR EQUIPMENT TO REMAIN	MOTORIZED DAMPER
RECTANGULAR DUCTWORK SUPPLY AIR ELBOW DOWN	COMBINATION FIRE/SMOKE DAMPER IN HORIZ DUCT
RECTANGULAR DUCTWORK SUPPLY AIR ELBOW UP	FIRE DAMPER IN HORIZONTAL DUCT
RECTANGULAR DUCTWORK RETURN AIR, EXHAUST AIR, OR OUTSIDE AIR ELBOW DOWN	EXHAUST/RETURN AIRFLOW ARROW
RECTANGULAR DUCTWORK RETURN AIR, EXHAUST AIR, OR OUTSIDE AIR ELBOW UP	SUPPLY AIRFLOW ARROW
ROUND DUCTWORK ELBOW DOWN	SENSOR
ROUND DUCTWORK ELBOW UP	FLEXIBLE DUCTWORK CONNECTION
RECTANGULAR DUCT SIZE: FIRST NUMBER INDICATES SIZE FOR SIDE SHOWN.	QUANTITY
ROUND DUCT SIZE: FIRST NUMBER INDICATES SIZE FOR SIDE SHOWN.	AIR DEVICE TAG
24x12	NECK SIZE
24"x	AIR FLOW CFM
24x12ø	AIR DEVICE DESIGNATION
MOTORIZED SMOKE DAMPER	CONNECTION OF NEW ONTO EXISTING
	CEILING DIFFUSER (ROUND NECK)
	RETURN/EXHAUST GRILLE

HVAC PIPING LEGEND

BALANCING VALVE	DIRECTION OF FLOW
CHECK VALVE	PIPE FLEXIBLE CONNECTION
BUTTERFLY VALVE	HTGS HEATING SUPPLY
BALL VALVE	HTGR HEATING RETURN
TWO WAY MOTORIZED	STRAINER
PUMP	PRESSURE GAUGE
PIPE ELBOW	PRESSURE/TEMPERATURE PLUG
RISER UP	THERMOMETER
RISER DOWN	TEMPERATURE SENSOR
BRANCH UP	DIFFERENTIAL PRESS SENSOR
BRANCH DOWN	
UNION	
CAP	
LIQUID IN GLASS THERMOMETER	

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