

Mt. Haley Township Hall Building Addition

3012 S. Homer Rd.

Merrill, MI 48637

NOTE:
PRE BID ADDENDUM #1
WILL COMPLETE THE
DRAWING SHEET LIST.

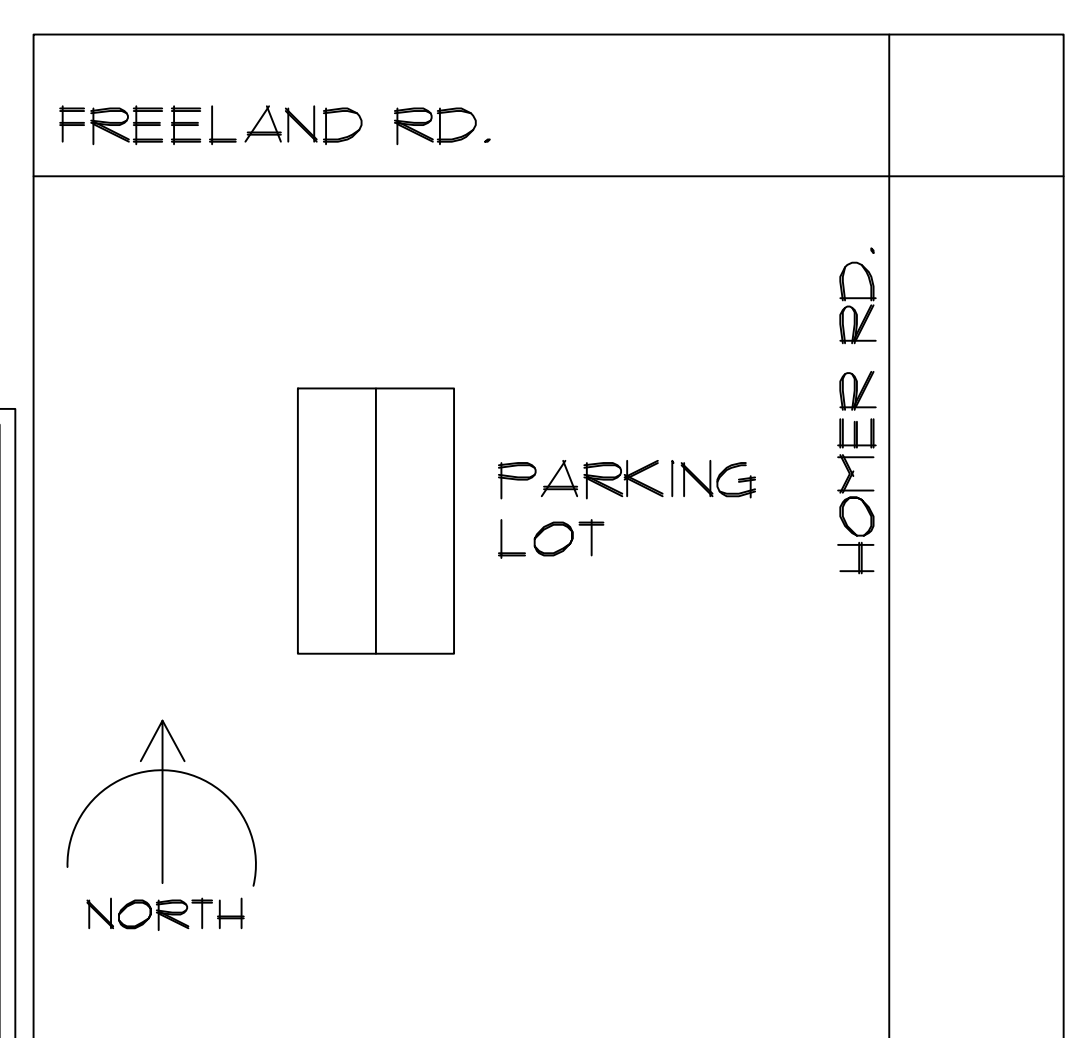
GENERAL SCOPE OF WORK

THE GENERAL SCOPE OF WORK INCLUDES A 30'x40' ADDITION TO THE EXISTING TOWNSHIP HALL. THE ADDITION INCLUDES (3) OFFICES, A RECEPTION AREA, A RECEPTION DESK AREA, A FILE ROOM, A BARRIER FREE RESTROOM, AND A MECHANICAL ROOM.

GENERAL NOTES:
SEE BARRIER FREE STRING BELOW FOR ALL ADA ACCESSORIES & ACCESSORY INSTALLATION REQUIRED LOCATIONS AND DIMENSIONS REQUIRED,
FIELD VERIFY ALL DIMENSIONS PRIOR TO PURCHASE AND/OR INSTALLATION OF EQUIPMENT, CASEWORK AND/OR FIXTURES.

CODE INFORMATION
USE GROUP: BUSINESS - OFFICE ADDITION
BUILDING INTERIOR SQUARE FOOTAGE:
EXISTING BUILDING 2560 SF
ADDITION 1200 SF
OCCUPANCY: OFFICES: 188 SF @ 300 GROSS/PERSON (4) PEOPLE
RECEPTION: 190 SF @ 200 GROSS/PERSON (5) PEOPLE
TOTAL OCCUPANCY (9) PEOPLE
NEW PLUMBING FIXTURES: BARRIER FREE LAV (1)
BARRIER FREE W.C. (1)

LOCATION MAP
3012 S. Homer Rd
Midland, MI 48708



DRAWING LIST

- C5 ARCHITECTURAL COVER SHEET
- C1 CIVIL COVER SHEET
- C2 GENERAL NOTES
- C3 TOPOGRAPHIC SURVEY
- C4 DEMOLITION PLAN
- C5 SITE PLAN
- C6 SITE DETAILS
- C7 GRADING PLAN
- N1 SITE SPECIFICATIONS
- N2 SITE SPECIFICATIONS
- A1 SITE PLAN
- A2 ARCHITECTURAL FOUNDATION PLAN
- A3 FLOOR PLAN
- A4 ELEVATIONS NORTH & EAST
- A5 ELEVATIONS SOUTH & WEST
- A6 BUILDING SECTIONS
- A7 SCHEDULES
- E1 ELECTRICAL POWER
- E2 ELECTRICAL LIGHTING
- E3 ELECTRICAL SPECIFICATIONS
- M1 MECHANICAL HVAC PLANS
- M2 MECHANICAL HVAC SPECIFICATIONS
- P1 SANITARY AND VENT PIPING
- P2 DOMESTIC WATER & GAS PIPING
- S1 GENERAL NOTES, TYPICAL DETAILS
- S2 FOUNDATION PLAN, SECTIONS, SCHEDULES
- S3 ROOF FRAMING PLAN, SECTIONS, SCHEDULES

CONTACTS

MT. HALEY TOWNSHIP
Nic Pelton (989) 835-9243 nic@orvosbuilders.com
Karen Radosa (989) 751-7559 kradosa@msn.com
Township Clerk
Kari McPhillips, Architect (989) 859-8816
kari.mcphillipsarchitecture@gmail.com
STRUCTURAL ENG. SNYDER AND STALEY
CIVIL ENG. LAPHAM ASSOCIATES.
MECHANICAL ENG. MCPHILLIPS ARCHITECTURE

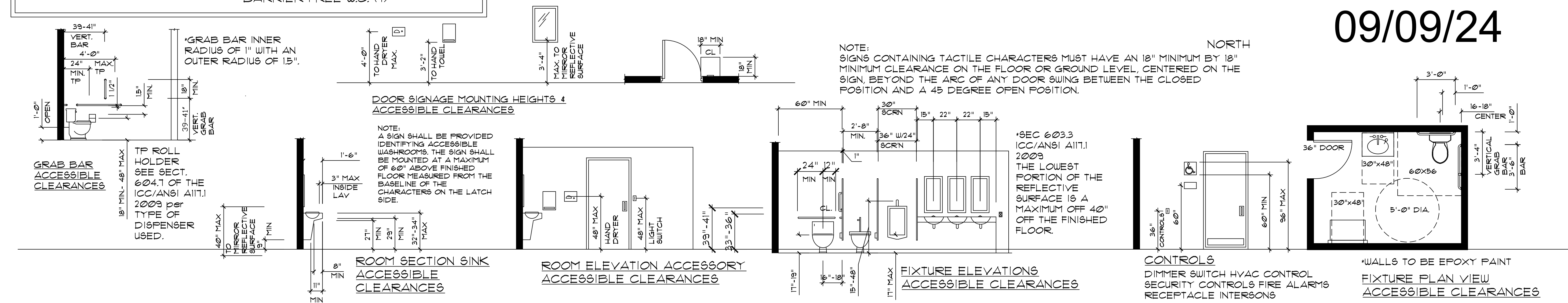
UTILITIES

ELECTRICAL - CONSUMERS ENERGY
(800) 477-5050
WATER - WELL LOCATED IN EAST PARKING LOT
GAS - PROPANE TANK SOUTHWEST OF BLDG.
PHONE/WIFI - TBD

LEGAL DESCRIPTION

SEE DRAWING C1

BID SET
09/09/24



MCPHILLIPS ARCHITECTURE
Kari L. McPhillips, Licensed Architect
261 W. Saginaw Rd., Sanford, MI 48657
989.859.8816
kari.mcphillipsarchitecture@gmail.com



Mt. Haley Township Hall
3012 S. Homer Rd.
Merrill, MI 48637

ADDENDUM #
- 2024
PRINT DATE:
09/09/24
JOB NUMBER:
24001C

CS

Mt. Haley Twp. Hall Addition

Prepared For

McPhillips Architecture

Section 22, T.13N., R.01E., Mount Haley Township, Midland County, Michigan

SITE ADDRESS: 3012 S. Homer Road, Merrill, MI 48637



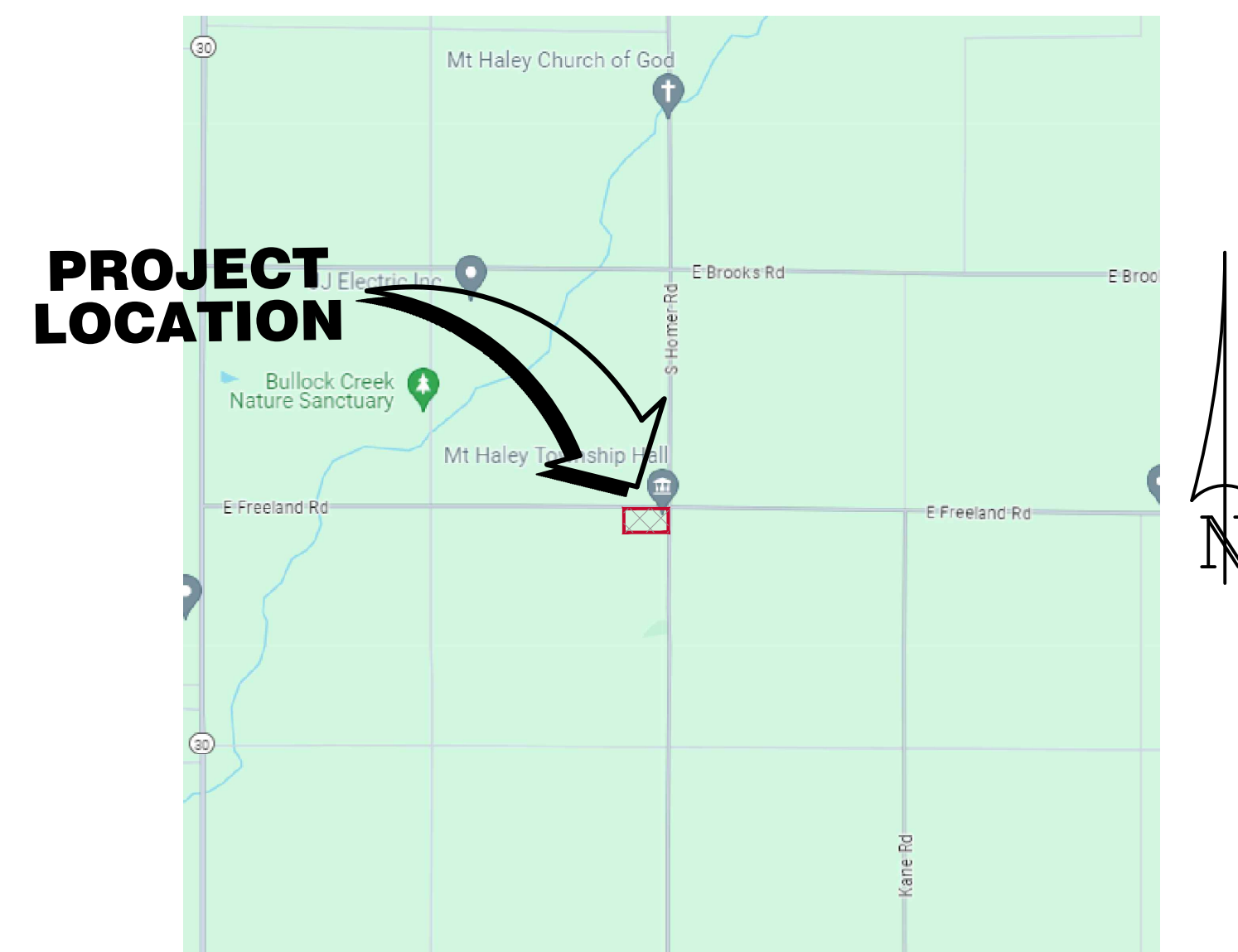
PROJECT NUMBER: P-240223	SCALE: N/A
ENGINEER: Timothy L. Lapham, P.E. 6201027593	SHEET C-1
DRAWN BY: S.E. Bell	
DATE: Aug. 7, 2024	
REVISED:	
REVISED:	
REVISED:	

Property Description:

A parcel of land situated in the Northeast 1/4 of the Northeast 1/4 of Section 22, Town 13 North, Range 1 East, Mt. Haley Township, Midland County, Michigan described as: Beginning at the Northeast corner of Section 22; thence South 00°33'01" East, 208.71 feet along the East section line; thence South 90°00'00" West, 313.07 feet parallel with the North section line; thence North 00°33'01" West, 208.71 feet to the North section line; thence North 90°00'00" East, 313.07 feet along the North section line to the point of beginning.

Sheet Index:

- C-1 Cover Sheet
- C-2 General Notes
- C-3 Topographic Survey
- C-4 Demolition Plan
- C-5 Site Plan
- C-6 Site Details
- C-7 Grading Plan
- N-1 Specifications
- N-2 Specificaitons



LOCATION MAP
N.T.S.

Cover Sheet
Mt. Haley Twp. Hall Addition
McPhillips Architecture
3012 S. Homer Road
Merrill, MI 48637

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APPROVED USE FOR:
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 FINAL RECORD

C-1

- 1. SOIL EROSION:** The DEVELOPER shall submit a detailed Soil Erosion and Sedimentation Control plan and obtain an Act 451 Part 91, Soil Erosion and Sedimentation Control permit. This includes the payment of fees and the providing of necessary bonds. **No earth changes or excavation shall be started prior to the issuance of this permit.** The DEVELOPER shall protect all existing and proposed storm sewer facilities on and adjacent to the site during excavation and construction. All sediment shall be contained on site. Any silt in county drains, storm sewer, culverts, etc. as a result of this project, shall be removed by the DEVELOPER at the cost of the DEVELOPER.
- 2. FLOOD PLAIN OR WETLAND CONSTRUCTION:** The DEVELOPER shall apply to the Michigan Department of Environment Great Lakes and Energy (EGLE) for a permit for the alteration and/or occupation of a flood plain or floodway, as required under PA 451. Evidence of this permit may be required prior to plan approval.
- 3. NPDES STORM WATER DISCHARGE PERMIT:** The owner of the property shall obtain a NPDES Storm Water Discharge permit for construction activities from EGLE as required under Public Act 451. The notice of coverage form shall be submitted with the Soil Erosion Control permit application. All EGLE fees shall accompany the Notice of Coverage.
- 4. ROAD COMMISSION PERMIT:** The DEVELOPER shall obtain a permit from the City of Standish to perform work within the Public Right-of-Way. All fees for the permit, bonds and insurances are the responsibility of the developer.
- 5. UTILITY WARNING :** Underground locations as shown on the plans were obtained from utility owners, and were not field located. A minimum of three (3) working days prior to beginning construction, the contractor shall notify "MISS DIG" (800-482-7171) and have all underground utilities staked before any work may begin. The contractor shall be responsible for the protection and/or relocation of all utilities that may interfere with construction. Three (3) Working Days Before You DIG - Call MISS DIG (1-800-482-7171).

OTHER NOTES

- The contractor shall be responsible to review and be familiar with all portions of these plans. Any discrepancies between different portions of the plans shall be brought to the attention of the Engineer and shall be resolved prior to construction.

BENCHMARKS

Benchmark #1

Nail & Disc Set in Parking Lot North of Building 41'±.

ELEVATION 665.42' NAVD88 Datum

NRCS SOILS MAP



Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CoB	Covert sand, 0 to 6 percent slopes	1.5	98.1%
Pa	Parkhill loam, 0 to 1 percent slopes	0.0	1.9%
Totals for Area of Interest		1.6	100.0%

PLAN LEGEND

- O-ELECT— = OVERHEAD ELECTRIC LINE
- GAS—GAS— = BURIED GAS LINE
- SAN—SAN— = SANITARY SEWER
- WATER— = WATER MAIN
- U-TELE— = UNDERGROUND TELEPHONE
- ⊙ = SANITARY MANHOLE
- ⊙ = STORM MANHOLE
- ⊙ = CATCH BASIN
- ⊙ = CURB INLET
- ⊙ = FIRE HYDRANT
- H = WATER VALVE
- X = LIGHT POLE
- † = STREET SIGN
- = FENCE LINE
- ⊙ = UTILITY POLE
- = FOUND CAPPED IRON
- = SET CAPPED IRON
- = BITUMINOUS PAVING
- = CONCRETE PAVING OR WALKWAY
- ⊙ = PLS SYSTEM CORNER
- R = RECORDED AS IN TITLE DESCRIPTION
- P = PREVIOUSLY DESCRIBED
- M = MEASURED AS
- ⊙ = PROPOSED LIGHT POLE
- ⊙ = EXISTING WELL

ABBREVIATIONS

LIST OF ABBREVIATIONS

Abbreviation	Definition
A.C.	Alternating Current
A.F.C.	Adult Foster Care
ASPH.	Asphalt Paving
ASTM	American Society of Testing Materials
AWS	American Welding Society
AWWA	American Waterworks Association
BLDG.	Building
CIP	Compacted in place
CL	Class
CONC.	Concrete
C.Yd. or CYD	Cubic Yard
DR	Dimension Ratio
°	Degrees
EA	Each
EJ	East Jordan Iron Works
ELEV.	Elevation
EX	Existing
F.F.	Finish Floor
G.P.M.	Gallons Per Minute
I.D.	Inside Diameter
Inv.	Invert
Lbs.	Pounds
LFT	Lineal Feet
L.S.	Lump Sum
Max.	Maximum
MDOT	Michigan Department of Transportation
MH	Manhole
Mil.	Millimeter
Min.	Minimum
MUW	Maximum Unit Weight at optimum moisture content
No.	Number
NSF	National Sanitation Foundation
OSHA	Occupational Safety Health Administration
PSIGP	Pounds per square inch gauge
PVC	Polyvinyl Chloride
R.O.W. or R/W	Right-of-Way
RAD.	Radius
SDR	Standard Dimension Ratio
SYD	Square Yard
T.D.H.	Total Dynamic Head
V.L.F.	Vertical Lineal Feet
'	Minutes of angles or Feet
"	Seconds of angles or Inches
%	Percent
#	Pounds

FWS Wetland Map



Wetland Type	Color
Estuarine and Marine Deepwater	Light Blue
Estuarine and Marine Wetland	Dark Blue
Freshwater Emergent Wetland	Light Green
Freshwater Forested/Shrub Wetland	Dark Green
Freshwater Pond	Blue
Lake	Dark Blue
Other	Light Blue
Riverine	Blue

General Notes
 Mt. Haley Twp. Hall Addition
 McPhillips Architecture
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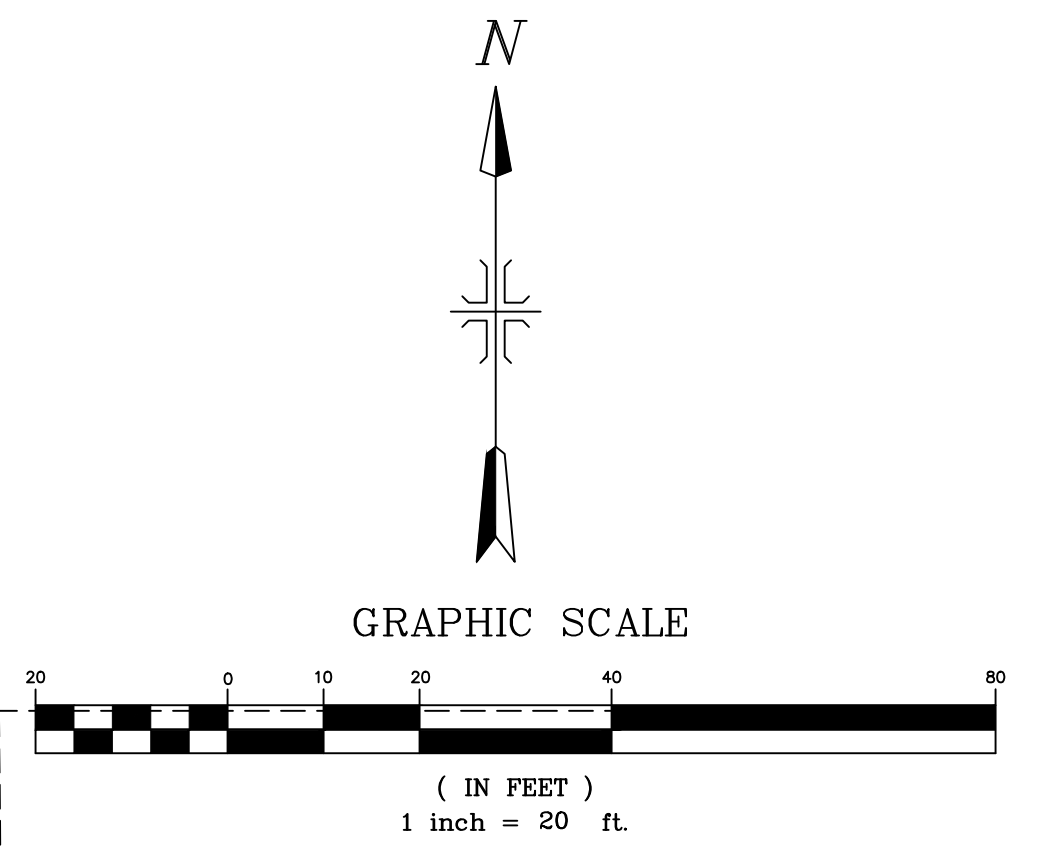
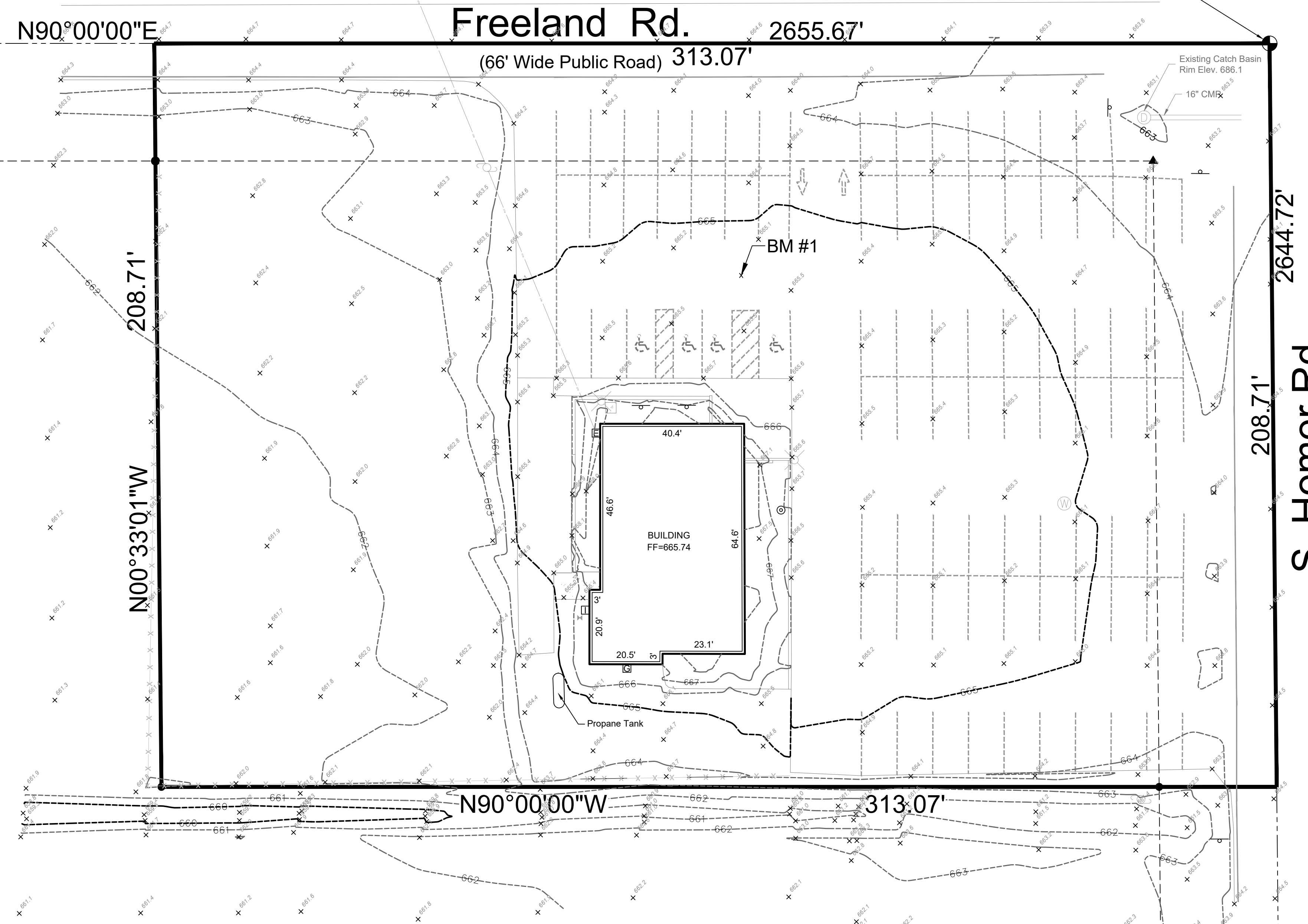
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 ○ FINAL RECORD
C-2

PROJECT NUMBER: P-240223
 ENGINEER: Timothy L. Lapham, P.E. ©201027595
 DRAWN BY: S.E. Bell
 SCALE: N/A
 SHEET: C-2

REVISIONS:
 REVISION:
 REVISION:

N 1/4 Corner, Sec. 22, T13N, R1E
2342.60'

NE Corner, Sec., 22, T13N, R1E



Note:
Topographic Survey Provided By Apex Surveying.

E 1/4 Corner, Sec. 22 T13N, R1E

PROJECT NUMBER: P-240223	DRAWN BY: S.E. Bell	SCALE: 1" = 20'
ENGINEER: Timothy L. Lapham, P.E. 6201027595	DATE: Aug. 7, 2024	SHEET C-3
REVISED:		
REVISED:		

Topographic Survey
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 McPhillips Architecture
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 Merrill, MI 48637

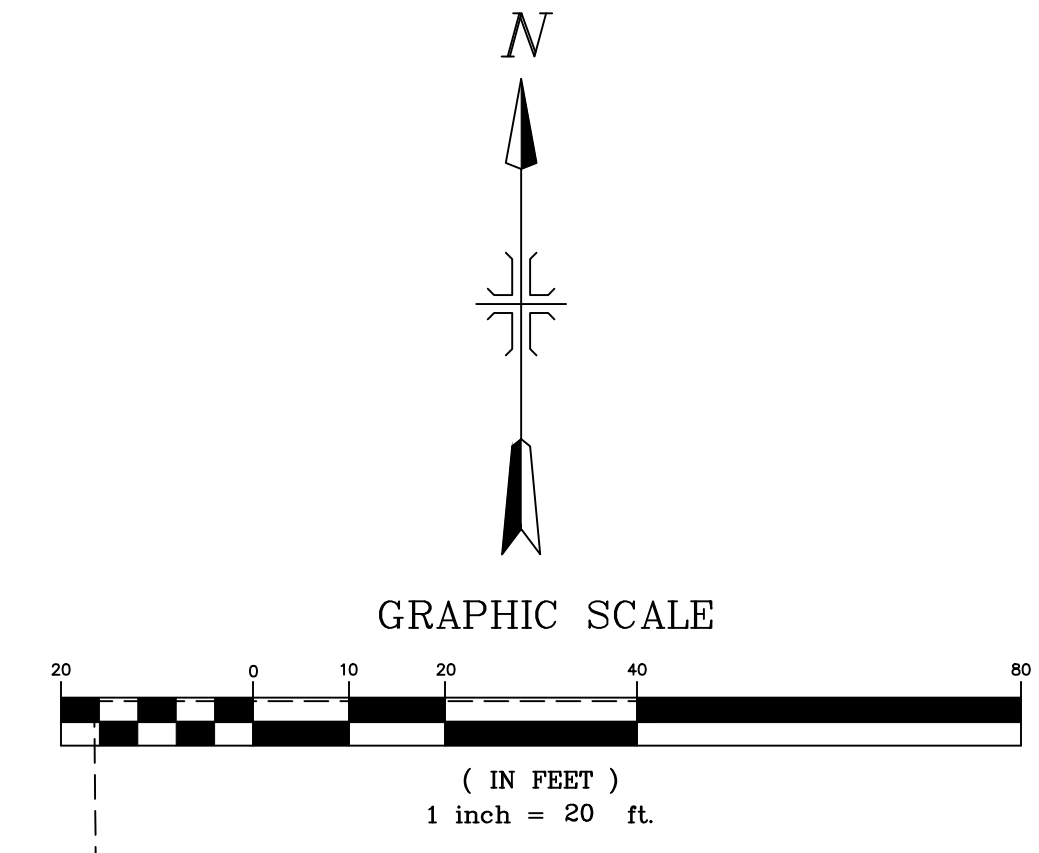
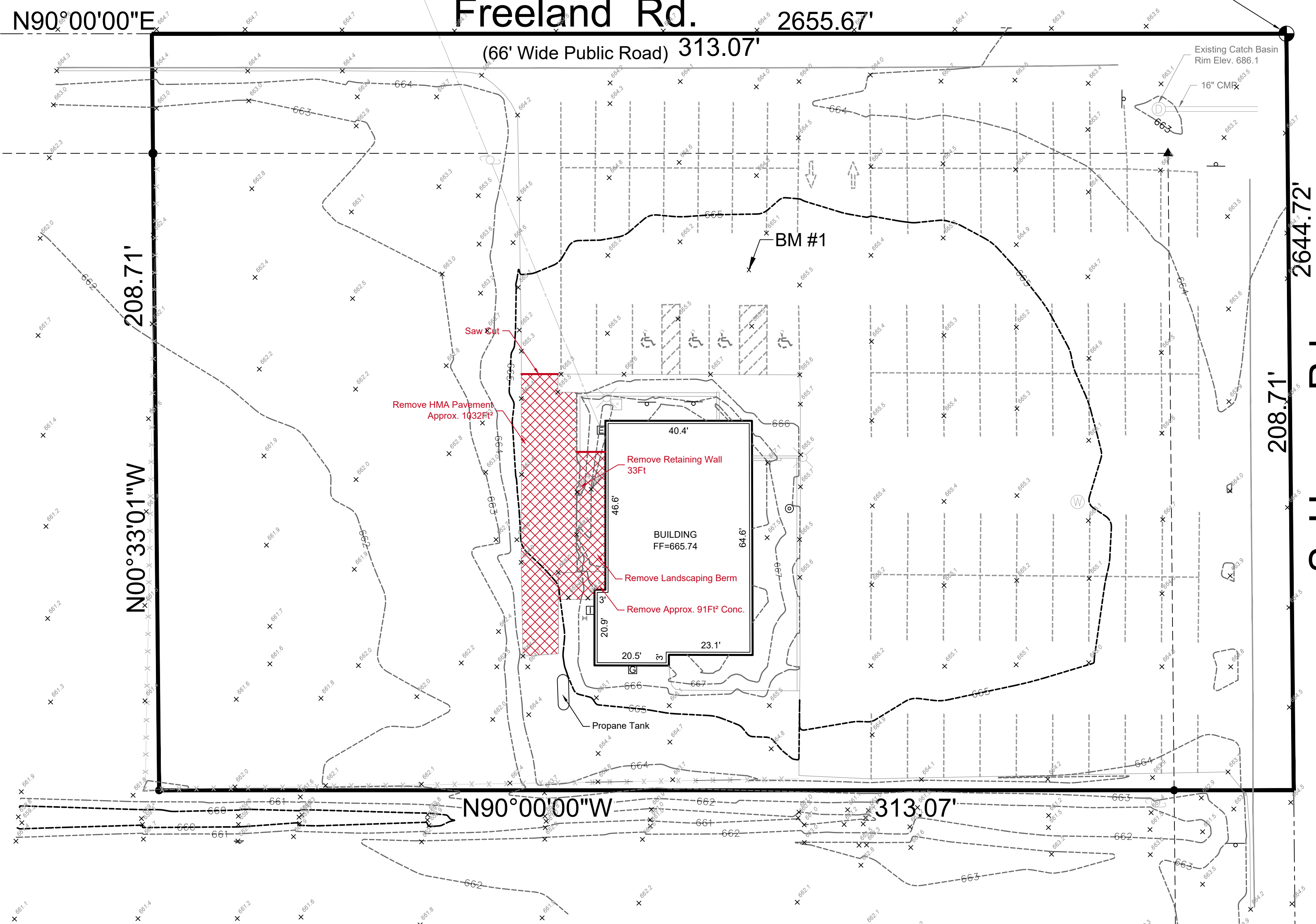
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N 1/4 Corner, Sec. 22, T13N, R1E
2342.60'

NE Corner, Sec. 22, T13N, R1E



E 1/4 Corner, Sec. 22 T13N, R1E

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ENGINEER: Timothy L. Lapham, P.E. 6201027595	DATE: Aug. 7, 2024	SHEET C-4
REVISED:		
REVISED:		

Demolition Plan
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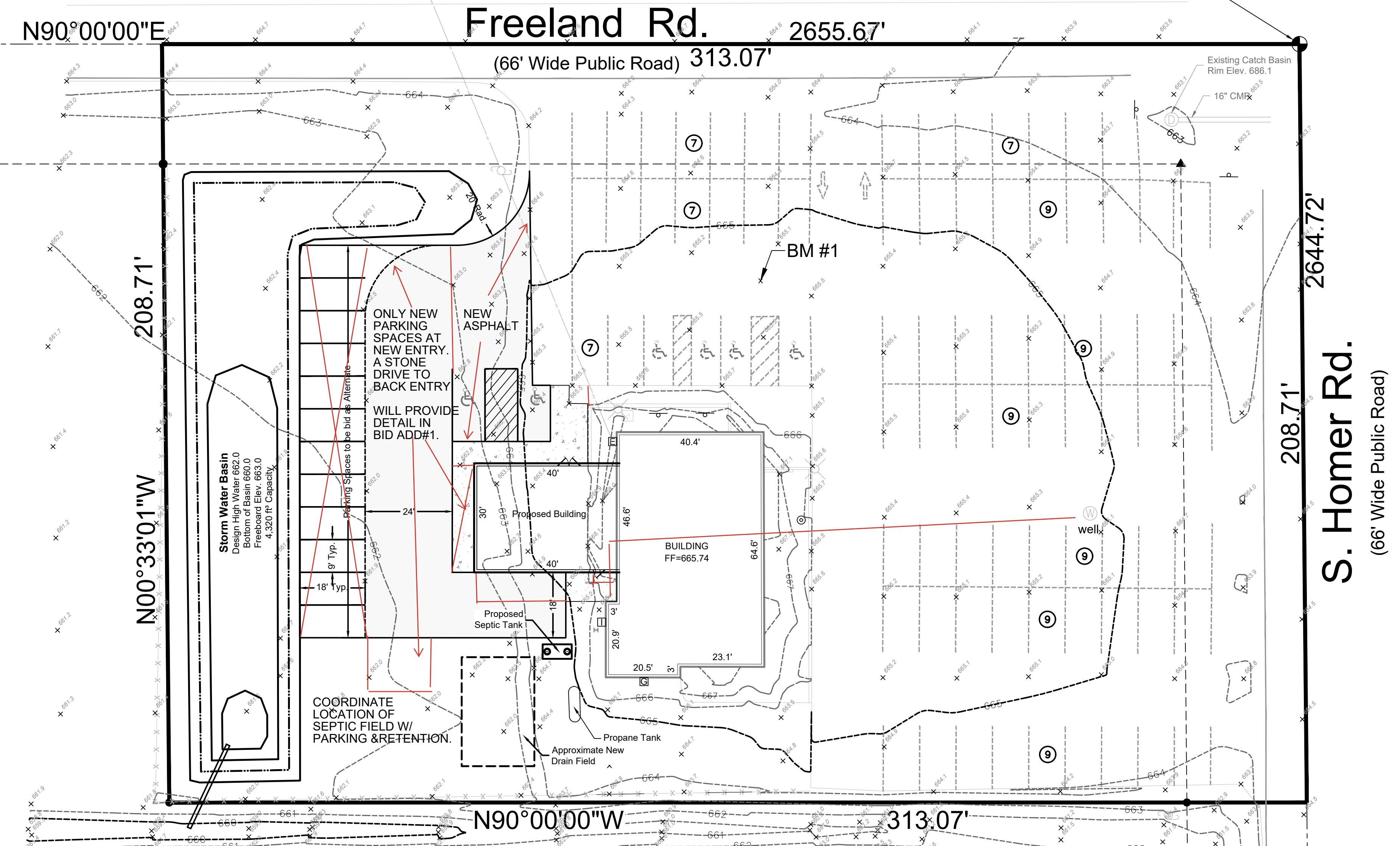
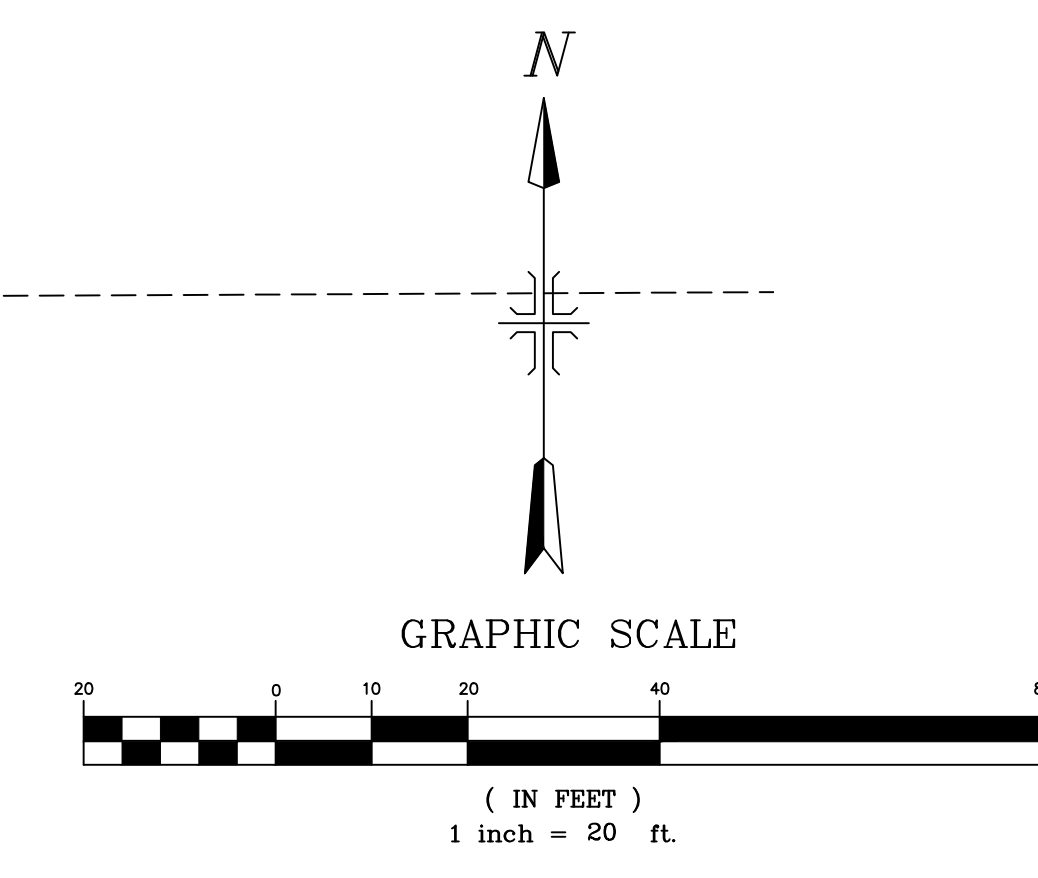
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○ FINAL RECORD	

N 1/4 Corner, Sec. 22, T13N, R1E

NE Corner, Sec. 22, T13N, R1E



Note:
 Site verify gravel road dimensions generally as shown, but based on final location and setback of septic field and tank. Coordinate the septic requirements and the drive w/turnaround. Architect will provide Bid Add. #1 detail.

Site Plan Notes:

1. These plans and specifications are subject to modification during construction when conditions develop that were not apparent during the design and preparation of these plans. All modifications must be approved by local jurisdiction prior to construction and/or implementation.
2. In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct.
3. Should it appear that the work to be done or any matter relative thereto is not sufficiently detailed or explained on these plans, the owner / contractor shall contact the engineer for such further explanations as may be necessary.
4. Before commencement of work, the owner / contractor shall review all plans and specifications and the job site. The owner / contractor shall notify the owner and the engineer of any discrepancies that may require modification to these plans or of any field conflicts.
5. Owner / Contractor agrees that in accordance with generally accepted construction practices, the contractor will be required to assume sole and complete responsibility for job site conditions during the course of construction of the project, including safety of all persons and property. This requirement shall be made to apply continuously and not be limited to normal working hours.
6. Owner / Contractor shall obtain all necessary permits prior to commencing construction involving right-of-ways, and for the construction, modification, or connection to facilities. All workmanship, equipment and materials shall conform to local jurisdiction standards and specifications.
7. Where soil or geologic conditions encountered in grading operations are different from those generally anticipated, or where conditions warrant changes to the recommendations contained therein, a report of soil or geologic conditions shall be submitted along with proposed changes for approval and shall be accompanied by an engineer's opinion as to the safety of the site from the possibility of land slippage, settlement and seismic activity.
8. Meet all current applicable ADA requirements for parking, signage, ramps, sidewalks, and warning notification on sidewalks approaching drives as required.

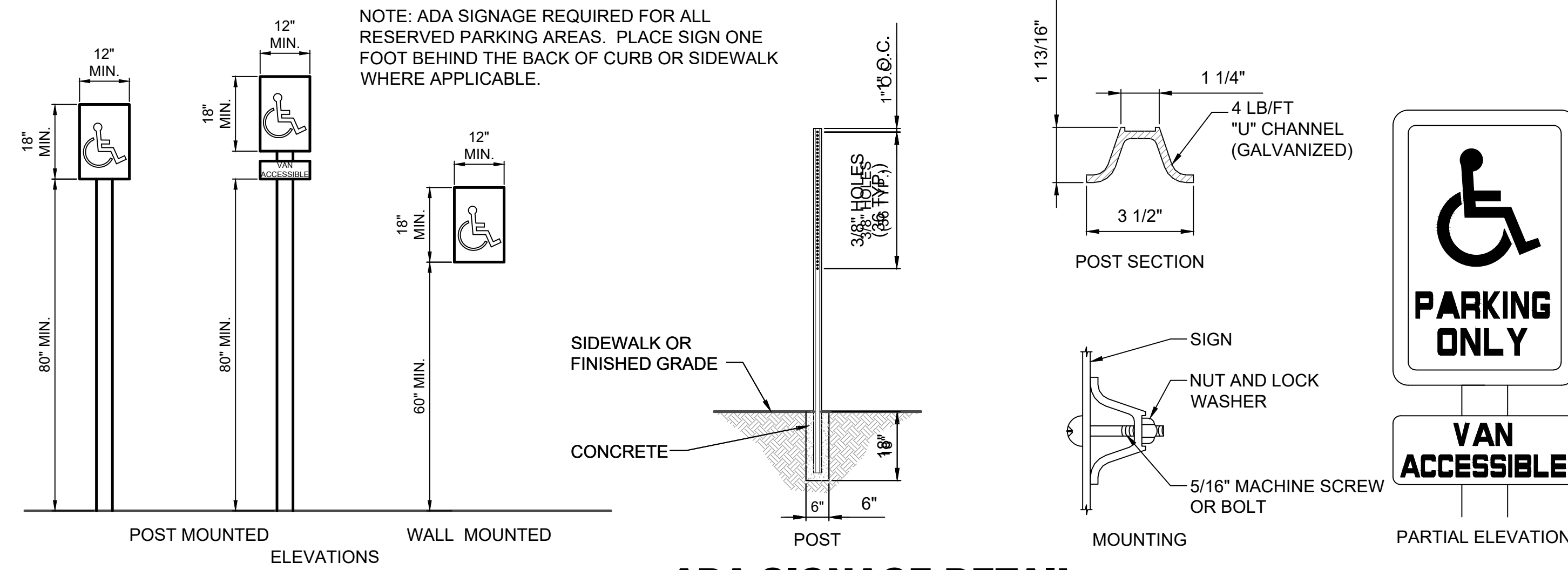
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ENGINEER: Timothy L. Lapham, P.E. 6201027959	DATE: Aug. 7, 2024	SHEET C-5
REVISED:		
REVISED:		

Site Plan
 Mt. Haley Twp. Hall Addition
 McPhillips Architecture
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 Merrill, MI 48637

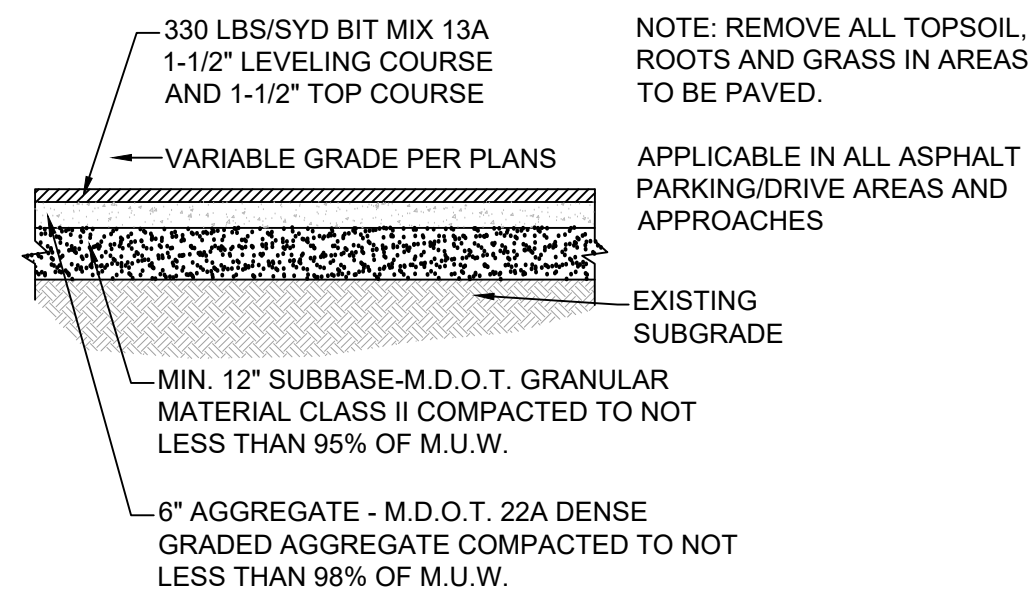
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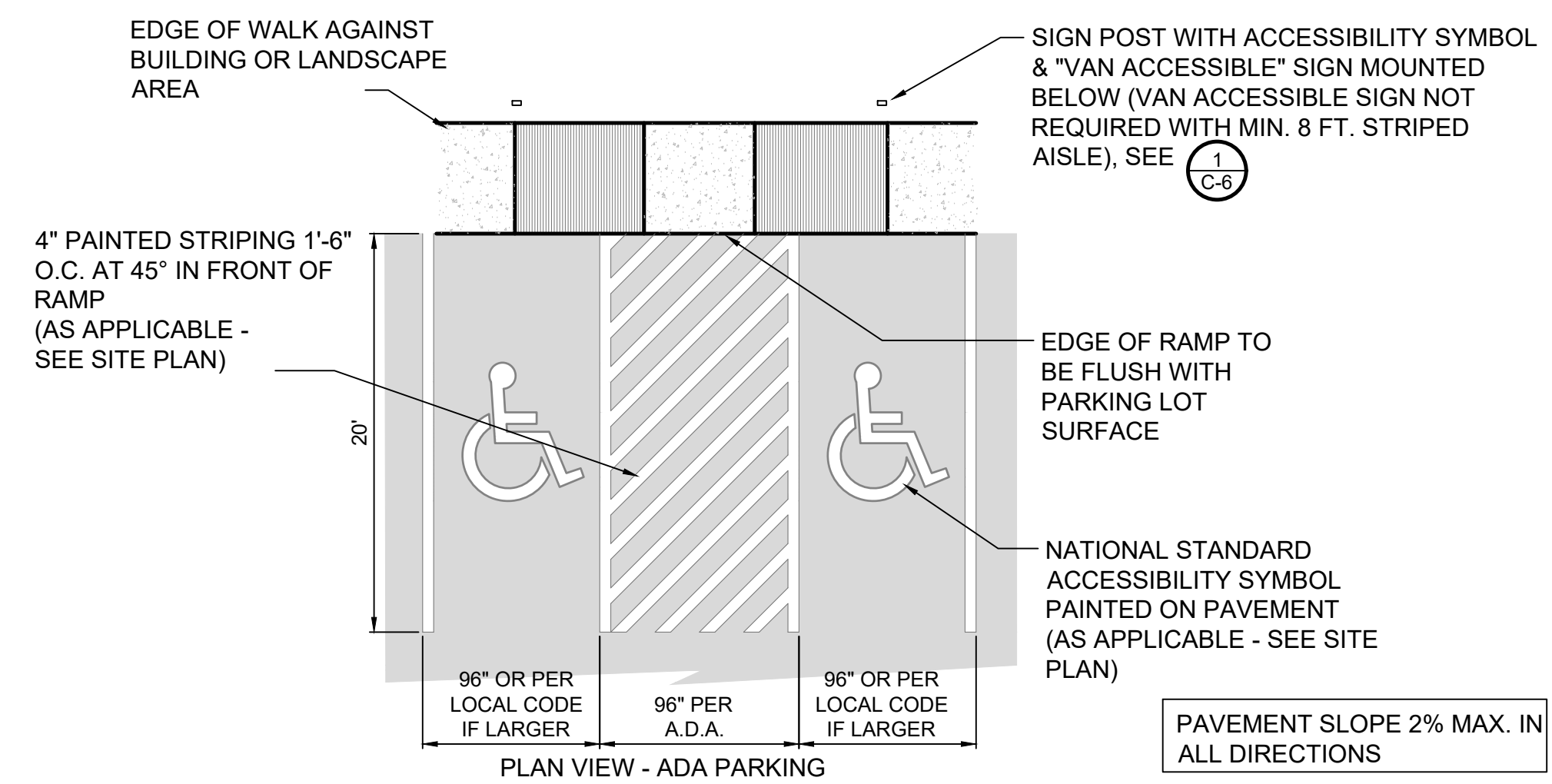
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1 ADA SIGNAGE DETAIL
SCALE: NONE



2 BITUMINOUS PAVEMENT DETAIL
SCALE: NONE



3 ACCESSIBLE PARKING STALLS
SCALE: NONE

PROJECT NUMBER: P-240223	DRAWN BY: S.E. Bell	SCALE: N/A
ENGINEER: Timothy L. Lapham, P.E. 6201027595	DATE: Aug. 7, 2024	SHEET C-6
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REVISED:	REVISED:	

Site Details
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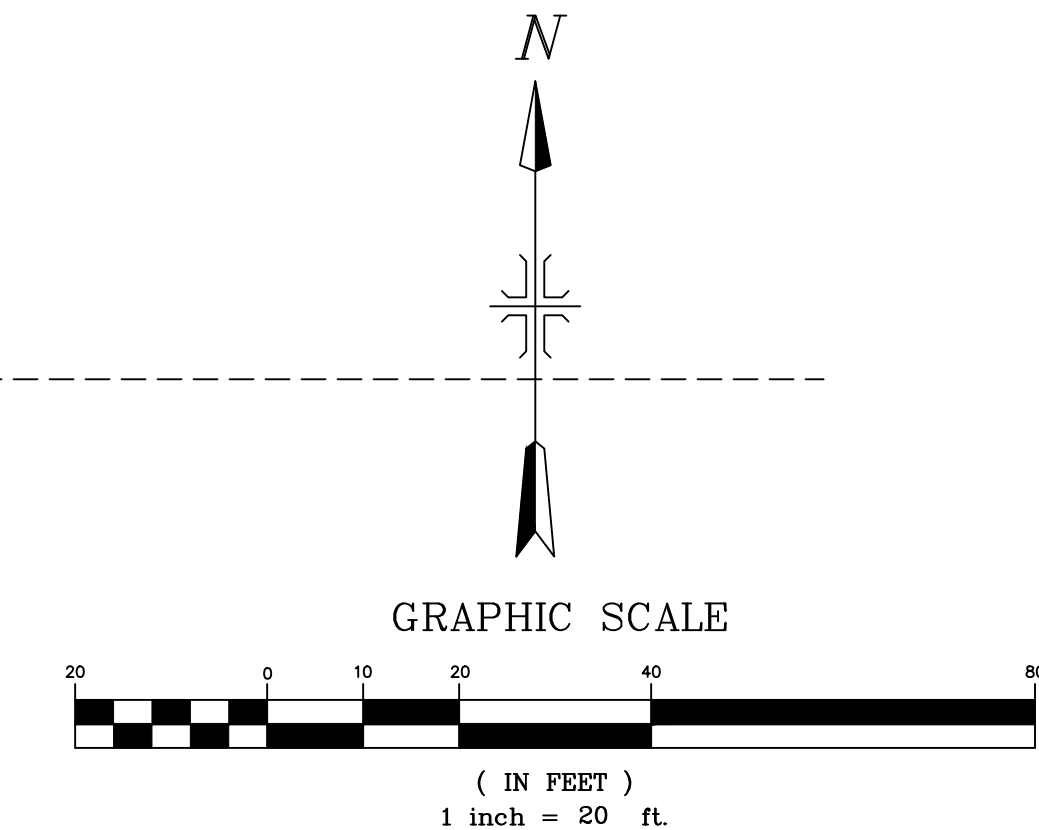
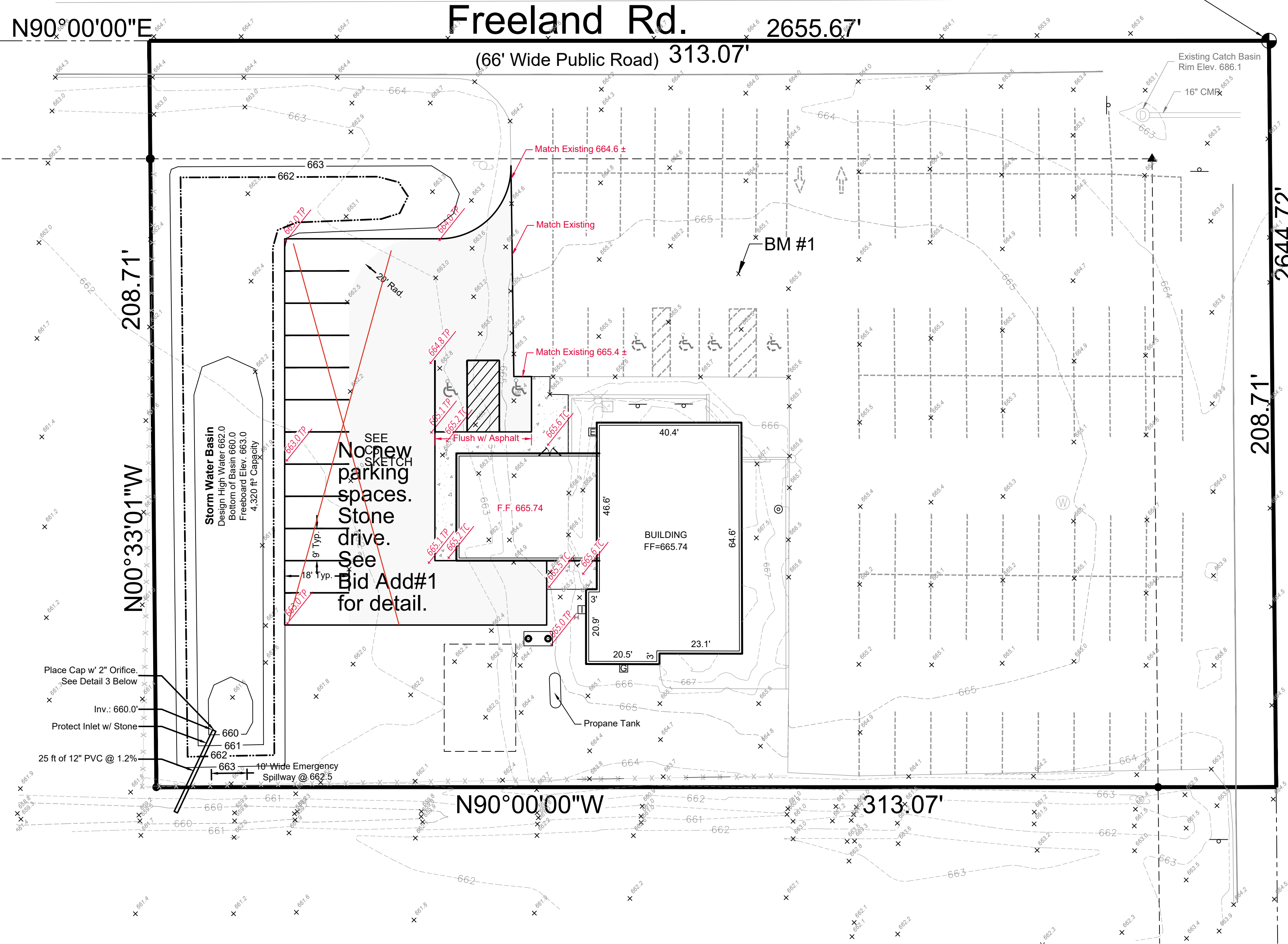
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N 1/4 Corner, Sec. 22, T13N, R1E

NE Corner, Sec., 22, T13N, R1E



LEGEND:

- TP - TOP OF PAVEMENT
- TC - TOP OF CONCRETE
- BC - BACK OF CURB
- GP - GUTTER PAN
- FF - FINISH FLOOR
- G - GROUND
- RIM - RIM ELEVATION
- INV - INVERT ELEVATION
- ELEVATION AT LOCATION
- DIRECTION OF SURFACE FLOW

STORM WATER BASIN STAGE STORAGE TABLE

ELEV	AREA (sq. ft.)	DEPTH (ft)	AVG END INC. VOL. (cu. ft.)	AVG END TOTAL VOL. (cu. ft.)
660	172	N/A	N/A	0
661	1986	1	1079	1079
662	4495	1	3241	4320

Detention Basin calculations
 Project/Orient: P240223 Mt. Haley Twp
 Location: Merrill, MI

Allowable Discharge Rate (Qa)

qa = unit allowable discharge rate (cfs/acre) = 0.25 cfs/acre
 Asite = proposed site area (acres) = 0.6 acr
 Qa = (qa) (Asite) cfs = 0.150 cfs

Discharge Restrictor Requirements

orifice restrictor
 amax = maximum area of orifice (sq. ft)
 h = head difference between 8' 10" line of outlet pipe = 1.20 ft
 and maximum water surface elevation

outlet invert = 660.00 ft
 diam (ft) = 1.00 8'/10" = 0.80 ft
 Maximum water surface level = 662.00 ft

amax (sq ft) = Qa / [0.62 (64.4 h)^{1/2}] = 0.0275 sq ft = 3.96 sq inches
 proposed = 2" inch diameter = 3.14 sq inches less than amax so OK

Storm Water Detention Requirements

ar = designed restrictor area (sq ft) = 0.022 sq ft

Qr = actual discharge rate (cfs) = 0.119 cfs

Qr less than Qa so OK

Qo - maximum flow rate per impervious acre

Cw = weighted runoff coefficient = 0.6 Business neighborhood area

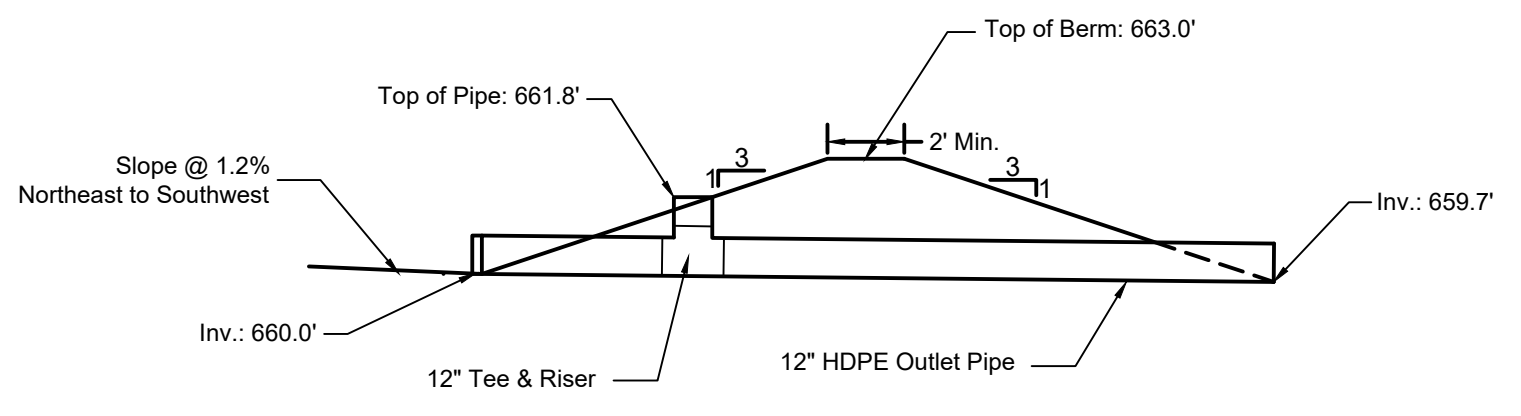
Qo = Qr / (Asite x Cw) = 0.330 cu ft/acre

T = time to maximum volume storage for 100 yr storm = 144 minutes

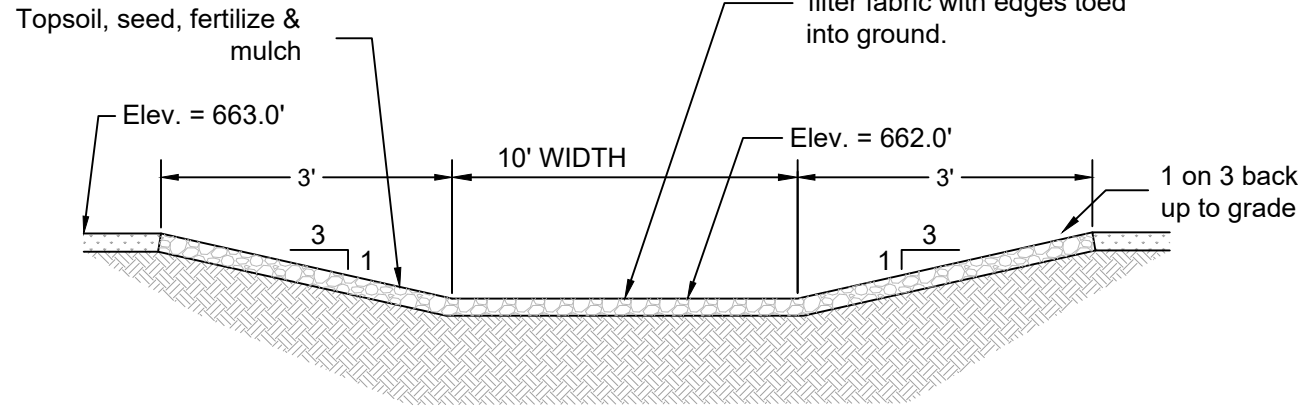
Vs = maximum volume of storage per acre of impervious surface (cu ft/acre)

Vs = 10267 cu ft/acre

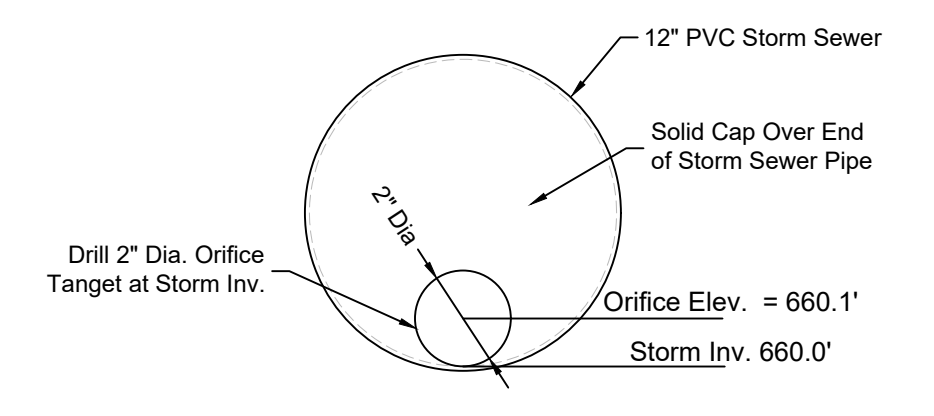
Vt = total volume of storage required for site (cu ft) = 3696 cu ft



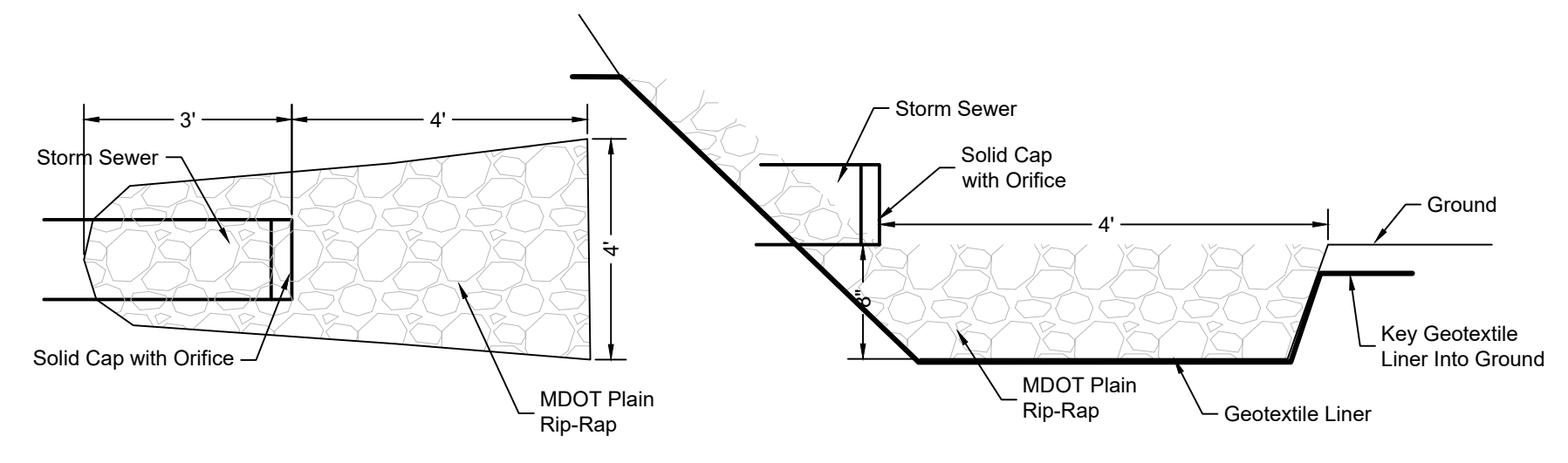
1 DETENTION POND OUTLET DETAIL
 SCALE: 1" = 5'



2 EMERGENCY SPILLWAY
 NOT TO SCALE



3 RESTRICTOR DETAIL
 NOT TO SCALE



4 END SECTION PROTECTION DETAIL
 NOT TO SCALE

Grading Notes:

- The forms for concrete sidewalks, curbs, gutters, and driveways that are to be constructed to conform to existing roads shall be installed to the grades shown on these plans. Prior to placing concrete, the forms shall be inspected and approved by local jurisdiction for conformance to existing road improvements. Grades of new improvements are subject to field adjustment to fit conditions.
- The contractor shall be responsible for matching existing facilities to avoid any abrupt or apparent changes in grades or cross slopes, low spots, or hazardous conditions.
- All grading, back filling, excavation, etc., shall be in accordance with the specification or normal practice if not specified.
- Where unstable or unsuitable materials are encountered during subgrade preparation, the area in question shall be over excavated and replaced with engineered backfill material.
- If requested, a representative of the engineer shall be on the site during grading operations and shall observe the construction and identify any conditions that should be corrected and recommend corrective measures to the contractor.
- All grading, erosion, and sediment control and related work undertaken on this site shall be in accordance with local jurisdiction.
- The contractor shall not disturb any permanent survey points without the consent of local jurisdiction. Any points destroyed shall be replaced by a licensed surveyor at the contractor's expense.
- Grading at the boundaries shall be done so as not to obstruct the runoff of storm waters from adjacent properties.
- All disturbed areas shall be topsoiled, seeded, fertilized and mulched.
- Contractor to maintain all soil erosion control measures. Surrounding paved areas shall be power broomed as necessary to remove mud tracking from the site.
- Contractor shall obtain soil erosion permit prior to any construction.
- All structures, sidewalks, curbs and asphalt shall have a minimum of 12" of clean granular material (MDOT Class II) as a sub-base and compacted to 95% maximum unit density. If pumping or yielding is caused by the compactive efforts, the sand layer shall be increased until density can be obtained without pumping water through the subgrade.

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ENGINEER: Timothy L. Lapham, P.E. ©2010/2019/2024	DATE: Aug. 7, 2024	SHEET C-7
REVISED:	REVISED:	REVISED:
REVISED:	REVISED:	REVISED:

Grading Plan
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<p>CONCRETE FORMING DIVISION 03 10 00</p> <p>PART 1 GENERAL</p> <p>1.01 Scope:</p> <p>A. Provide, install and remove all concrete formwork and accessories necessary for concrete construction as indicated on the drawings and specified herein.</p> <p>1.02 Related Work Specified Elsewhere:</p> <p>A. Concrete Reinforcement -DIVISION 03 20 00 B. Cast-in-place Concrete -DIVISION 03 30 00</p> <p>1.03 Referenced Standards:</p> <p>A. ACI, "ACI Manual of Concrete Practice" B. American Plywood Association, "Plywood for Concrete Forming" C. American Institute of Timber Construction, "Timber Construction Manual" D. National Forest Products Association, "Design of Wood Formwork for Concrete Structures"</p> <p>1.04 Design:</p> <p>A. The Design and Engineering of Concrete Formwork shall be the responsibility of the Contractor.</p> <p>PART 2 PRODUCTS</p> <p>2.01 Form Materials:</p> <p>A. Forms shall be either metal free of irregularities, dents, and/or sags; or plywood made specifically for concrete form use complying with APA "Plywood for Concrete Forming."</p> <p>2.02 Coatings and Release Agents:</p> <p>A. Steel Forms: Colorless mineral oil which will not stain concrete.</p> <p>2.03 Accessories:</p> <p>A. Form ties and spreaders shall be removable or snap-off commercially manufactured metal with cone ends leaving no metal exposed within 1" of finished face of concrete and causing no surface disfigurement greater than 3/4" in diameter.</p> <p>PART 3 EXECUTION</p> <p>3.01 General Requirements:</p> <p>A. Design, install, and remove Concrete Formwork specified herein in strict accordance with the Referenced Standards.</p> <p>3.03 Supplemental Requirements:</p> <p>A. Attach, as required elsewhere in the Construction Documents or as required to properly interface Concrete Work with the Work of other trades, all required accessories, anchor bolts, hangers, sleeves, slots and/or inserts. B. Unless indicated otherwise on the Drawings, provide 3/4" chamfer strips at all outside corners of exposed Cast-in-Place Concrete. C. Earth cuts may be used as forms where concrete is not to be exposed or to receive waterproofing. D. Formwork shall be constructed to the shape, line, and dimension as required by the plans. Do not scale off plans. Construction is to be according to written dimensions. E. Forms shall be sufficiently tight to prevent leakage of concrete and shall be properly braced and tied together to maintain position and shape during concrete placement.</p> <p>END OF SECTION</p> <p>CONCRETE REINFORCEMENT DIVISION 03 20 00</p> <p>PART 1 GENERAL</p> <p>1.01 Scope:</p> <p>A. Provide and install all concrete reinforcement and accessories, complete, as indicated on the drawings and specified herein.</p> <p>1.02 Related Work Specified Elsewhere:</p> <p>A. Concrete Forming -DIVISION 03 10 00 B. Cast-in-Place Concrete -DIVISION 03 30 00</p> <p>1.03 Referenced Standards:</p> <p>A. ACE "ACI Manual of Concrete Practice" B. ASTM A185, "Welded Steel Wire Fabric for Concrete Reinforcement" C. ASTM A615, "Specifications for Pre formed and Plain Built-Steel Bars for Concrete Reinforcement"</p> <p>1.04 Storage of Materials:</p> <p>A. Materials shall be stored so as not to deteriorate due to excessive rusting or become contaminated by foreign substances.</p> <p>PART 2 PRODUCTS</p> <p>2.10 Bar Reinforcement:</p> <p>A. Shall comply with ASTM A615, grade 60 billet steel deformed bars, uncoated finish.</p> <p>2.02 Welded Wire Fabric:</p> <p>A. Shall conform to ASTM A185, plain type.</p> <p>2.03 Accessories:</p> <p>A. Tie Wire: Annealed steel, 16-gauge minimum. B. Reinforcement Supports: Galvanized steel bolster, chairs and supports with plastic coating where in contact with formwork.</p>	<p>PART 3 EXECUTION</p> <p>3.01 General Requirements:</p> <p>A. Design, fabricate and place Concrete Reinforcement specified herein in strict accordance with Referenced Standards.</p> <p>3.02 Supplemental Requirements:</p> <p>A. Unless indicated otherwise on the Drawings, maintain a minimum 3" clearance between all reinforcement specified and the outside face of the concrete enclosing the reinforcement through the use of concrete bricks and galvanized reinforcement bars anchored into adjacent earth where earth cut forms are utilized and through the use of prefabricated chairs and spreaders with vinyl coated feet where concrete formwork utilized.</p> <p>END OF SECTION</p> <p>CAST-IN-PLACE CONCRETE DIVISION 03 30 00</p> <p>PART 1 GENERAL</p> <p>1.01 Scope:</p> <p>A. Provide, place, patch, cure and finish all concrete as indicated on the Drawings and specified herein.</p> <p>1.02 Related Work Specified Elsewhere:</p> <p>A. Concrete Forming -DIVISION 03 10 00 B. Concrete Reinforcement -DIVISION 03 20 00</p> <p>1.03 Submittals:</p> <p>A. Concrete test results. B. Concrete design mix proposed to comply with Specifications. C. Provide Specification indicating materials to actually be utilized under this Section if choice permitted. D. Concrete Truck batch ticket indicating presence of specified admixture and amount added.</p> <p>1.04 Referenced Standards:</p> <p>A. ACI, "Manual of Concrete Practice" B. ASTM C31, "Practice for Making and Curing Concrete Test Specimens in the Field" C. ASTM C33, "Specification for Concrete Aggregates" D. ASTM C39, "Test Method of Compressive Strength of Cylindrical Concrete Specimens" E. ASTM C94, "Specification for Ready-Mixed Concrete" F. ASTM C143, "Test Method for Slump of Hydraulic Cement Concrete" G. ASTM C150, "Specification for Portland Cement" H. ASTM C172, "Method of Sampling Freshly Mixed Concrete" I. ASTM C231, "Test Method of Air Content of Freshly Mixed Concrete By the Pressure Method" J. ASTM C260, "Specification for Air-Entraining Admixtures for Concrete"</p> <p>1.05 Testing:</p> <p>A. Testing of concrete as specified in this section shall be arranged by the Contractor. B. Concrete shall be sampled, handled and tested in strict accordance with the following Referenced Standards for the procedure indicated. 1) Sampling fresh Concrete: ASTM C172 2) Slump Determination: ASTM C143 3) Making, curing, protecting and transporting concrete test specimens: ASTM C31 4) Testing Compressive Strength: ASTM C39 5) Testing Air Content: ASTM C231 C. The following information shall be recorded concerning each sampling by the Testing Technician: 1) Name of Technician taking sample. 2) Date and time of sampling. 3) Air temperature and weather condition at time of sampling. 4) Design compressive strength of Concrete being sampled. 5) Source of Concrete, Truck Number and Ticket Number if batched offsite. 6) List of Admixtures indicated to be present in Concrete on batch ticket. 7) List of Admixtures and/or water added to the Concrete mix on site, whether added before or after sampling taken by Testing Technician and quantity of item added. 8) Specific location in structure in which the concrete is placed after sampling. D. Tests shall be performed for each Concrete Sampling to determine the following: 1) Concrete temperature at time of sampling. 2) Concrete Slump. 3) Concrete Air Content, if air entrainment specified, at the time of sampling. 4) Compressive Strength of Test Cylinders in the following quantities at the following increments from the date of sampling: a) One test at 7 days b) Two tests at 28 days c) One specimen shall be retained in reserve for later testing if required. E. The Testing Laboratory shall prepare a report recording the information required in items C. and D. above and mail the report directly to the Owner, Engineer and Contractor the day of the compressive tests. F. Four cylinders shall be made for each test. Perform a minimum of one test for each 100 cubic yards per class of concrete placed, but in no case shall there be less than one test for each day's concreting per class of concrete. G. Concrete to be tested shall be randomly selected by the Testing Technician without direction from the Contractor or material supplier.</p> <p>PART 2 PRODUCTS</p> <p>2.01 Concrete:</p> <p>A. Concrete shall be composed of Portland Cement in conformance with ASTM C150, aggregates in conformance with ASTM C33 and water in conformance with ASTM C94, proportioned to achieve a compressive strength of 3,500 psi at 28 days unless noted otherwise in the specifications or on the drawings. Unless noted otherwise the maximum allowable slump shall be 4". B. Unless noted otherwise the water-cement ratio shall not exceed .5 by weight. C. Air-entraining Admixture, where specified, shall conform with Referenced Standard ASTM C260. Provide air entraining admixture for all concrete exposed to freeze-thaw cycling. Air content shall be 7% +/- 1%.</p> <p>2.02 Additives:</p> <p>A. Admixtures containing thiocyanates or calcium chloride are not permitted. B. Water reducing chemical admixtures shall conform to ASTM C494 - Type A.</p>	<p>C. Unless specified herein, additives or admixtures shall not be used without written approval from the Engineer.</p> <p>2.03 Curing Compound:</p> <p>A. "Ellis Clear Acrylic cure 309" as manufactured by Ellis Construction Accessories, or equal meeting ASTM C309. Curing compound shall be an acrylic formula designed and certified to be compatible with resilient flooring adhesives.</p> <p>2.04 Non-Shrink Grout:</p> <p>A. "Masterflow 713" by Master Building Co.; "SonogROUT" by Sonnebrone Building Products; "Crystex", as manufactured by L&M Construction Chemicals, Inc., or approved equal; with a minimum compressive strength of 5 psi at 28 days.</p> <p>2.05 Vapor Barrier:</p> <p>A. 6 mil. polyethylene film.</p> <p>PART 3 EXECUTION</p> <p>3.01 General Requirements:</p> <p>A. Mix, transport, test, place, finish and cure all Cast-In-Place Concrete and other products specified herein in strict accordance with Referenced Standards and manufacturer's written specifications. B. Notify Testing Laboratory 24 hours prior to placement of all concrete.</p> <p>3.02 Supplemental Requirements:</p> <p>A. Grind smooth surface projections, remove loose concrete and patch with Non-shrink grout, in strict accordance with manufacturer's written specifications, all surface honeycombs, wall tie holes and other vertical wall surface deformations on concrete walls to be exposed or to receive waterproofing assembly. B. Provide light broom finish on sidewalks unless noted otherwise. C. Apply curing Compound to all slab concrete in strict accordance with manufacturer's written specifications. Apply in sufficient quantity and reapply if necessary depending on weather conditions to protect concrete from premature drying. Apply additional coat of Curing Compound to slab concrete immediately after final cleaning of floor. D. Perform Cold Weather Concrete operations in strict accordance with the requirements of ACI 306R. E. Perform Hot Weather Concrete operations in strict accordance with the requirements of ACI 305R. F. Secure and install items to be embedded in Cast-In-Place Concrete in strict accordance with the manufacturer's written specifications, Referenced Standards and/or as indicated in the Drawings and Specifications.</p> <p>3.03 Defective Concrete:</p> <p>A. Modify or replace concrete not conforming to required strength, levels, lines, details, and elevations. B. Repair or replace concrete not properly placed or not of the specified type or finish.</p> <p>END OF SECTION</p> <p>SITE CLEARING SECTION 31 10 00</p> <p>PART 1 - GENERAL</p> <p>1.01 DESCRIPTION OF WORK</p> <p>The extent of site preparation work expected to be minimal. This work includes, but is not limited to furnishing all labor, material, equipment, tools, incidentals, and services necessary for:</p> <p>Temporary silt fencing Protection of existing trees and vegetation Related work as required</p> <p>1.02 SOIL EROSION AND SEDIMENTATION CONTROL</p> <p>A. Purpose - The purpose of this section is to minimize soil erosion and control sedimentation as required by the Soil Erosion and Sedimentation Control Act, Part 91, PA 451 of 1994 of the State of Michigan as amended. B. Permit - It is anticipated that a Soil Erosion and Sedimentation Control Permit will be required for this project. If a permit is required it shall be obtained prior to construction and shall be the responsibility of the contractor. C. Implementation - It shall be the responsibility of the Contractor to implement the Soil Erosion and Sedimentation Control Plan for this project in strict accordance with the specifications, all work under this section shall be in strict accordance with the construction methods as prescribed by the State of Michigan Department of Natural Resources for the implementation of this legislation. Refer to Michigan Guidebook for Soil Erosion and Sedimentation Control, prepared for and distributed by the Water Resources Commission of the Department of Natural Resources, State of Michigan.</p> <p>1.03 JOB CONDITIONS</p> <p>A. Protection of Existing Improvements - Provide barricades, coverings or other types of protection necessary to prevent damage to existing improvements indicated to remain in place. Protect improvements on adjoining properties and on the Owner's property. Restore any improvements damaged by this work to the original condition as acceptable to the Owner and other parties or authorities having jurisdiction.</p> <p>PART 2 - PRODUCTS</p> <p>2.01 PREASSEMBLED SILT FENCE</p> <p>A. Geotextile fabric - Polypropylene woven fabric, 2.3 oz./sq. yd., UV resistance 80% Propex® 2127, as mfd by Amoco Fabrics and Fibers Company, Austell, GA (770-944-4569), or approved equal. B. Silt Fence posts - As mfd by Amoco Fabrics and Fibers Company, Austell, GA (770-944-4569), or approved equal.</p> <p>PART 3 - EXECUTION</p> <p>3.01 GENERAL</p> <p>Call Miss Dig (1-800-482-7171) 72 hours prior to start of clearing and excavation work. Work shall not begin on site until after the project site has been marked by all utility companies.</p> <p>3.02 PREASSEMBLED SILT FENCE</p> <p>Install silt fencing where shown on drawings and prior to beginning site clearing and grubbing work. Unroll, stretch, and drive fence posts plumb. Posts shall be installed on the downward side of the fencing. The bottom of the fabric shall be placed under 6" of compacted soil to prevent sediment from flowing underneath the fence.</p>	<p>3.03 SITE CLEARING AND GRUBBING</p> <p>Remove vegetation, improvements or obstruction interfering with the installation of new construction. Clear the project site of trees, shrubs and other vegetation - except for those indicated to be left standing. Removal includes new and old stumps of trees and their roots. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction. Completely remove stumps, roots and other debris protruding through the ground surface. Use only hand methods for grubbing inside the drip line of trees indicated to be left standing. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 0.5' loose depth, and thoroughly compact to a density equal to adjacent original ground.</p> <p>3.04 DISPOSAL OF WASTE MATERIALS</p> <p>Burning of combustible cleared and grubbed materials is not permitted on the Owner's property. Remove from the Owner's property and legally dispose of all waste materials and unsuitable or excess soils.</p> <p>3.05 TOPSOIL REMOVAL</p> <p>Topsoil is defined as friable clay loam surface soil found in a depth of not less than 0.4' or greater depth as indicated on the drawings. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones and other objects over 2.0" in diameter, and without weeds, roots and foreign materials. Strip topsoil from within the areas to be occupied by the construction and from other areas within the grading limits to be cut, filled or re-graded. Strip topsoil to whatever depth encountered in a manner to prevent intermingling with the underlying subsoil or objectionable material. Remove heavy growth of grass from areas before strip-ping. Where trees are indicated to be left standing, stop topsoil strip-ping at a sufficient distance to prevent damage to the main root system. Stockpile topsoil as indicated and where it will not interfere with construction operations or site work. Locate topsoil storage piles in areas shown or where otherwise directed. Construct storage piles to freely drain surface water and cover if required to prevent windblown dust. If soil or weather conditions are unsuitable, the Contractor shall cease topsoil removal operations and resume only when directed to do so by the owner or engineer. Dispose of excess topsoil the same as waste material, herein specified.</p> <p>3.06 SILT FENCE REMOVAL</p> <p>Upon completion of all work, remove the silt control fence and legally dispose off project site. Rake and smooth soil along location of silt fence, and seed as required.</p> <p>END OF SECTION</p> <p>EARTH MOVING SECTION 31 20 00</p> <p>PART 1 - GENERAL</p> <p>1.01 DESCRIPTION OF WORK</p> <p>The extent of Earthwork required is shown on the drawings. This work includes, but is not limited to furnishing all labor, material, equipment, tools, incidentals, and services necessary for:</p> <p>Site grading Placement of fill materials Related work as required</p> <p>1.02 QUALITY ASSURANCE</p> <p>A. Codes and Standards - Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction. B. Lines and Grades - The Contractor shall provide all instrumental surveying required to lay out and construct this work in conformance with the drawings.</p> <p>1.03 JOB CONDITIONS</p> <p>A. Site Information - The Contractor shall make his or her own investigation, as he or she deems necessary prior to the bid opening. Data on surface or subsurface conditions is not intended as representations or warranties of accuracy or continuity of actual site conditions. It is expressly understood that the Owner and project consultants employed as representatives of the work will not be responsible for interpretations or conclusions drawn therefrom by the Contractor. Data made available is for the convenience of the Contractor. B. Existing Utilities - Call MISS DIG prior to beginning work on the site. Locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protection during earthwork operations. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult the utility owner immediately for directions. Cooperate with the Owner and utility companies in keeping respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility owner. Do not interrupt existing utilities serving facilities occupied and used by the Owner or others, except when permitted in writing by the owner or engineer, and then only after acceptable temporary utility services have been provided. C. Explosives - The use of explosives is not permitted. D. Protection of Persons and Property - Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washouts and other hazards created by earthwork operations.</p> <p>PART 2 - PRODUCTS</p> <p>2.01 DEFINITIONS</p> <p>A. Standards - Satisfactory soil materials are defined as those complying with American Association of State Highway and Transportation Officials (AASHTO) M145, soil classification Groups A-1, A-2-4, A-2-5 and A-3. Unsatisfactory soil materials are those defined in AASHTO M145 Soil Classification Groups A-2-6, A-2-7, A-4, A-6 and A-7. Also listed as unsatisfactory are peat and other highly organic soils. Cohesion-less soil materials include gravel, sand gravel mixture and gravelly sands. Cohesive soil materials include clay and silty gravel, sand clay mixtures, gravel silt mixtures, clay and silty sands, sand silt mixtures, clays, silts and very fine sands. B. Subbase Material - Subbase material shall be properly graded mixtures of natural or crushed gravel, crushed stone, crushed slag, or natural or processed sand that will readily compact to the required density complying with AASHTO M147, Grade A, unless otherwise indicated or acceptable to the owner or engineer. C. Topsoil - Topsoil shall be fertile, friable organic soil, characteristic of the soils in the project area that will produce heavy growths of vegetation. Topsoil shall be capable of supporting a healthy and vigorous stand of turf (lawn) grass.</p> <p>PART 3 - EXECUTION</p> <p>3.01 EXCAVATION</p> <p>A. Excavation consists of removal and disposal of material encountered when establishing required grade elevations. Earth excavation includes removal and disposal of pavements and other obstructions visible on the ground surface, underground structures and utilities indicated to be demolished and removed, material of any classification indicated in data on subsurface conditions, and other materials encountered that are not classified as rock excavation or unauthorized excavation. Unauthorized excavation consists of removal of materials beyond indicated subgrade elevations or dimensions without specific direction of the owner or engineer. Unauthorized excavation, as well as remedial work directed by the owner or engineer, shall be at the expense of the Contractor.</p>	<p>B. Dewatering - Prevent surface water and subsurface or groundwater from flowing into excavations and from flooding project site and surrounding area. Convey water removed from excavations and rainwater to collecting or runoff areas. Establish and maintain temporary drainage ditches and other diversions outside excavation limits for each structure. Do not use trench excavations as temporary drainage ditches.</p> <p>C. Materials Storage - Stockpile satisfactory excavated materials where directed, until required for fill. Place grade and shape stockpiles for proper drainage. Locate and retain soil materials away from the edge of excavations. Cover stockpile, or provide temporary vegetative cover as may be required to comply with the Soil Erosion and Sedimentation Act. Dispose of excess soil material and waste materials as directed.</p> <p>3.03 COMPACTION</p> <p>Control soil compaction during construction providing minimum percentages of density specified for each area classification. Compact soil to not less than the following percentages of maximum dry density for soils that exhibit a well-defined moisture density relationship determined in accordance with ASTM D 1557.</p> <p>3.04 BACKFILL AND FILL</p> <p>Place acceptable soil material in layers to required subgrade elevations, for each area classification listed below:</p> <p>A. Placement and Compaction - Place fill materials in layers not more than 1.0 foot in loose depth for material compacted by heavy construction equipment and not more than 0.5 foot in loose depth for material compacted by hand operated tampers. B. At Existing Trees to Remain - Remove vegetation within dripline and fill with a single layer of uncomplicated topsoil. Hand grade to attain required finish grade.</p> <p>3.05 DISTRIBUTION OF TOPSOIL</p> <p>Prior to topsoil placement, the subgrade shall be prepared to uniform levels and slope between points where elevations are shown. Abrupt changes in slope are to be rounded off. Loosen subgrade to a minimum depth of 0.4 foot. Remove stones over 1.0" in any dimension and sticks, roots, rubbish and other extraneous matter. Fine rake by York Rake, Viking Roller Blade, or approved equal or by hand to produce a smooth even surface that conforms to the grades established on the drawings. Any irregularities shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall be uniformly distributed to a minimum depth of 0.4 foot after firming, unless otherwise indicated. Topsoil in planting bed areas, if applicable, shall be placed to a minimum depth of 1.0 foot. Topsoil shall be spread in such a manner that finish grading, seeding or sodding, and landscape planting operations can proceed with a minimum of additional soil preparation. Place approximately 50% of the total amount of the topsoil required, work into top of loosened subgrade to create a transition layer, and then place remainder of topsoil. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet or in a condition that may otherwise be detrimental to proper grading. Irregularities in the surface resulting from topsoil spreading or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Provide additional clean topsoil - subject to approval of the owner or engineer - as may be required to complete work. Remove any excess topsoil from the site, or distribute it and grade it as directed by engineer on site if approved by Owner.</p> <p>3.06 MAINTENANCE</p> <p>A. Protection of Graded Areas - Protect newly graded areas from traffic and erosion. Keep free of trash and debris. Repair and reestablish grades in settled, eroded and rutted areas to specified tolerances. B. Reconditioning of Compacted Areas - Where completed compacted areas are disturbed by subsequent construction operation or adverse weather, scarify surface, reshape and compact to required density prior to further construction.</p> <p>3.07 DISPOSAL OF EXCESS AND WASTE MATERIALS</p> <p>Remove excess excavated material, soil, trash, debris and waste materials and legally dispose of such off the property, except as otherwise specifically noted.</p> <p>END OF SECTION</p> <p>BASES, BALLASTS AND PAVING DIVISION 32 10 00</p> <p>PART 1 GENERAL</p> <p>1.01 Scope:</p> <p>A. Provide sub-base, base and bituminous paving for driveways walkway, sidewalk, and concrete pads, as indicated on the drawings, as specified herein, and as needed for a complete and proper installation.</p> <p>1.02 Referenced Standards:</p> <p>A. MDOT Standard Specifications</p> <p>PART 2 PRODUCTS</p> <p>2.01 Materials</p> <p>A. MDOT 22A Aggregate (Base) B. MDOT Class II Granular Material (Subbase) C. MDOT 13A HMA (Pavement) D. Seed, Mulch and Fertilizer (See Seeding Section 32 92 00)</p>	<p>PROJECT NUMBER: P-240223 ENGINEER: Timothy L. Lapham, P.E. ©2010/2015/2016 SCALE: N/A DRAWN BY: S.E. Bell SHEET N-1 DATE: Aug. 7, 2024 REVISIONS: REVISIONS: REVISIONS:</p> <p>Specifications Mt. Haley Twp. Hall Addition McPhillips Architecture 3012 S. Homer Road Merrill, MI 48667</p> <p>LAPHAM ASSOCIATES ENGINEERING PLANNING ENVIRONMENTAL SURVEYING 116 South 3rd Street West Branch, MI 48661 P (989) 345-5030 F (989) 345-7302 www.laphamasoc.com © 2024 COPYRIGHT, LAPHAM ASSOCIATES UNAUTHORIZED COPYING IS PROHIBITED.</p>
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PART 3 EXECUTION

3.01 General Requirements:

A. Base

1. Subgrade Preparation for Subbase - The subgrade shall be smoothed and trimmed to the required line, graded and cross sectioned to receive the sub base course with no topsoil, organic material, sticks, roots or other deleterious materials and shall be compacted to not less than 90 percent (90%) M.U.W.
 2. Subbase Preparation for Base - the subbase shall be smoothed and trimmed to the required line, grade, and cross section to receive the base course and shall be compacted to not less than 95 percent (95%) of M.U.W.
 3. The subbase thus formed shall be maintained in a smooth and compacted condition until the base course has been placed.
 4. No base course shall be placed on the subbase until it has been approved in writing by the Engineer or owner.
 - a. Placing Base - aggregate base shall not be placed when there are indications that the mixture may become frozen before the M.U.W. is attained and in no case shall the base be placed on a frozen subbase or subgrade.
 5. The subbase shall be shaped to the specified crown and grade and maintained in a smooth condition. If hauling equipment should cause ruts in the subbase, such equipment will not be permitted on the subbase but shall be operated on the aggregate base.
 6. The aggregate shall be placed in uniform layers to such a depth that when compacted the course will have the thickness shown on the plans. The aggregate shall be compacted to not less than 98% of M.U.W.
 7. The finished surface shall be shaped to the crown and grade within a tolerance of 3/4 inch, more or less. The surface shall be continuously maintained in a smooth condition.
 8. Should the subbase or aggregate base become damaged due to the Contractor's operation, the subgrade, subbase or base shall be restored to the conditions required by these specifications at the Contractor's expense.
 9. If the subbase or subgrade at any time prior to acceptance of the work becomes soft or unstable to the extent that it is forced up through or prevents compaction of the aggregate, such subbase or subgrade material and aggregate shall be immediately removed and disposed of and new material shall be placed and compacted as required by these documents.
 10. A certification that the base material is in compliance with MDOT Specifications for Aggregate Base under Bituminous 22A shall be furnished to the Owner prior to payment or test slips shall be provided.
- B. Bituminous Paving
1. All materials and placement shall meet the requirements specified he MDOT Specifications, current Edition .
 2. A certification that the bituminous material is in compliance with MDOT Specifications shall be furnished to the Owner prior to payment for the material.
- C. Foundation Preparation
1. Before placing the bituminous mixture, the surface of the foundation shall be swept clean and all foreign material removed.
 2. The finished aggregate base surface shall be shaped to the crown and grade within a tolerance of plus or minus 3/4 inch, and compacted to at least 98% of M.U.W. before placing bituminous material.
 3. Catch basins, manhole covers, and water valve covers shall be adjusted to the proper elevation by removing the castings and setting them to the required elevation by supporting them on a concrete collar or on masonry so constructed as to hold them firmly in place and not allow settlement around them.
- D. Rollers
1. Self-propelled steel tandem rollers weighing not less than eight tons each will be required unless rollers of other types are specifically permitted. Rollers shall be equipped with wheel sprinklers and scrapers.
- E. Placing Bituminous Paving
1. Bituminous mixture shall be placed with an approved mechanical paver. Bituminous material thickness shall not exceed 2-1/2 inches per application. Placing, rolling and other requirements or restrictions shall be governed by the MDOT Specifications, current Edition.
 2. No bituminous material shall be placed without written permission from the Engineer.

END OF SECTION

TURF & GRASSES
SECTION 32 92 00

PART 1 - GENERAL

1.01 SCOPE

The extent of seeding work required for this project is shown on the drawings. The work of this section includes, but is not limited to furnishing all labor, materials, tools, incidentals, equipment and service for:

- Seeding of all turf.
- Related work as required

1.03 DELIVERY, STORAGE AND HANDLING

Seed and fertilizer materials shall be in original unopened containers and shall indicate weight, analysis, germination rate, name, and date code of the manufacturer. Materials shall be stored in an orderly manner, at a location acceptable to the Engineer, in a manner to prevent wetting and/or deterioration.

1.04 PROJECT CONDITIONS

- A. Seed Blend - Submit proposed seed blend to the owner or Engineer for approval.
- B. Seeding - Perform seeding work only after other work affecting ground surface has been completed.
- C. Watering - Provide adequate hose and watering equipment as required.
- D. Germination - Within thirty (30) days after seeding, it is expected that 60-80% of the seed will have germinated and grown.

1.05 SITE CONDITIONS

All unsatisfactory topsoil quantities or qualities or other unsatisfactory conditions detrimental to seeding shall be reported in writing to the Engineer or Owner. Seeding shall not continue prior to correction of, or written acceptance of the encountered conditions by the Owner.

1.06 WARRANTY

The Contractor shall provide a uniform stand of grass and shall provide watering, mowing and maintenance of all seeded areas prior to final acceptance by the Owner. The Contractor shall reseed all areas, with specified materials, which fail to provide a uniform stand of grass until the Owner accepts all affected areas.

PART 2 - PRODUCTS

2.01 TURF SEED

- A. Turf Supplier: All turf seed shall be as supplied from Michigan State Seed Company, 717 Clinton St., Grand Ledge, MI (Ph. 800-647-8873) or approved alternate source.
- B. Permanent cover (& Dormant Cover): shall be a consistent mixture of the following varieties for the Area Designated:

Grade A Mixture
Seed %/Wt Germination
Kentucky Bluegrass (Mix.) 40% 85%
Fine Fescue 40% 85%

Note: On highly erodible slopes, contractor may have to add other varieties to the seed mix such as cereal grass.

2.02 FERTILIZER

Fertilizer for turf areas shall have a chemical analysis of at least 12% available nitrogen, 12% readily available phosphoric acid and 12% total available potash (12-12-12).

2.03 HYDRO-SEED MULCH

Nu-Wool® HydroGreen Plus™ 50/50 Hydroseeding Mulch, prepared for use in a tank of a hydro-mulching machine, as mfd by Nu-Wool, Inc., Jenison, MI, (Ph. 800-748-0128), or approved equal. Mulch shall be made from recycled paper material and be green in color. Mulch may be made from 50% virgin wood fiber and 50% recycled paper where approved by the Engineer.

2.04 STRAW MULCH

Mulch shall be straw or other approved organic material commonly used by the industry for the purpose of the mulching of seeded areas, and approved by the Engineer. Mulch shall be held in place with an approved seal/binder agent and Nu-Wool® HydroGreen Plus™ 50/50 Hydroseeding Mulch.

2.05 STRAW BINDER/ SEALER

Terra-Mulch Tackling Agent III, a water emulsified acrylic resin, Seal, as manufactured by Profile Products, Buffalo Grove, IL, (Ph. 800-508-8681), or approved equal.

2.06 WATER

Water shall be potable water, free of substance harmful to seed growth or other foreign mater. The Contractor shall furnish hoses and other methods of water transportation and application.

PART 3 - EXECUTION

3.01 TURF AREA SURFACE PREPARATION

Topsoil shall be fine raked to produce a smooth even surface that conforms to established grades. All stones, roots, clods 1.0' and larger in diameter, and all foreign matter shall be removed from the surface of areas to be seeded. The area shall be made smooth and uniform and parallel to the finished grade. The tops and bottoms of all slopes shall be rounded to blend into the natural ground or adjacent slopes by vertical curves. Seeded areas will be allowed a tolerance of 0.1 foot. Slope for drainage over turf areas shall have a minimum grade of 0.5%.

3.02 TURF - HYDRO-SEEDING METHOD

- A. This method shall be used for permanent seeding unless otherwise authorized in writing by the Engineer. The mixture of the seed, fertilizer, mulch and a tackifier used shall be as follows (2 parts water to one part mulch):
Grade A Seed Mixture: 4-5# /1,000 sq. ft. (175-220#/acre)
Fertilizer: 3.5# /1,000 sq. ft.
Hydro-Seed Mulch:
On slopes up to 3/1: (38) 40# bags / acre
On slopes from 3/1 to 2:1: (50) 40# bags / acre
Greater than 2:1 slopes: (62.5) 40# bags / acre. Tackifier: 20# /acre (or more based on slope and mfr's recommendations)
- B. Slopes 2:1 and greater shall also be straw mulched after being hydroseeded. Apply straw, and then apply Terra-Mulch Seal and Nu-Wool® HydroGreen Plus™ 50/50 with a hydroseeder at the rate as recommended by mfr.
- C. Protect surfaces and areas from overspray which are not indicated to be hydroseeded, including shrub bed, walks, light poles, etc. Immediately remove and clean hydroseed material from all such areas, which may accidentally have been sprayed.
- D. Provide barriers as required to keep traffic off the seeded areas after they are completed. Contractor shall remove all barriers he installed when turf is established, and before acceptance by Owner.
- E. For dormant cover areas, mulching must also be used on the hydro-seeded areas. The rate of application shall be 3 tons per acre of prepared seed bed.

3.09 TURF - MULCHING

Spread straw at the rate of one bale per 1000 square feet (43.5 bales /acre). Straw shall be mechanically crimped, and a sealer/binder shall be applied by hydro-seeder at the rate of 30# to 1,000 gallons of water along with 150# cellulose fiber per acre.

3.12 WATERING

To the point of acceptance, the Contractor shall be responsible for providing adequate water and application to assure the establishment of a dense, permanent turf. Provide adequate water during germination and after to continually keep the seed bed moist (without puddling).

END OF SECTION

PROJECT NUMBER: P-240223	DRAWN BY: S.E. Bell	SCALE: N/A
ENGINEER: Timothy L. Lapham, P.E. 6201027595	DATE: Aug. 7, 2024	SHEET N-2
REVISED:		
REVISED:		

Specifications
 Mt. Haley Twp. Hall Addition
 McPhillips Architecture
 3012 S. Homer Road
 Merrill, MI 48637

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N-2

GENERAL NOTES

- MODIFICATIONS TO THIS BUILDING HAVE BEEN DESIGNED AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MICHIGAN BUILDING CODE, 2015 EDITION
- THESE STRUCTURAL DRAWINGS SHALL BE WORKED WITH THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, CIVIL /SITE, ETC., DRAWINGS.
- THE STRUCTURE SHALL BE CONSIDERED TO BE IN AN UNSTABLE CONDITION UNTIL ALL WALL AND ROOF STRUCTURES ARE COMPLETED. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR STABILITY AND TO RESIST LATERAL LOADS DURING ERECTION.
- ALL NON LOAD BEARING WALLS SHALL BE CONSTRUCTED TO ALLOW FOR THE VERTICAL DEFLECTION OF THE STRUCTURE ABOVE.

STRUCTURAL DESIGN CRITERIA

- STRUCTURAL DESIGN LOADS HAVE BEEN DETERMINED IN ACCORDANCE WITH MICHIGAN BUILDING CODE, 2015 EDITION:
 - FLOOR LIVE LOADS. OFFICES = 50 PSF, CORRIDORS = 100 PSF (MBC, TABLE 1607.1)
 - ROOF LIVE LOAD = 20 PSF (MBC 1607.12)
 - SNOW LOADS (MBC 1608)
 - GROUND SNOW LOAD, $P_g = 35$ PSF (MBC, FIG. 1608.2)
 - SNOW EXPOSURE FACTOR, $C_e = 1.0$ (ASCE 7-10, FIG. 1.5.2)
 - THERMAL FACTOR, $C_t = 1.0$ (ASCE 7-10, TABLE 7-3)
 - BUILDING CATEGORY II (MBC, TABLE 1604.5)
 - IMPORTANCE FACTOR, $I_s = 1.0$ (ASCE 7-10, TABLE 1.5.2)
 - FLAT ROOF SNOW LOAD, $P_f = 24.5$ PSF + DRIFTING (ASCE 7-10, FIG. 7.3)
 - DRIFTING AND UNBALANCED SNOW LOADS CALCULATED PER ASCE 7-10
- WIND LOADS (MBC 1609)
 - BASIC WIND SPEED $V = 115$ MPH (3-SECOND GUST) (ASCE 7-10, SECTION 26.5.1)
 - BUILDING CATEGORY II (MBC, TABLE 1604.5)
 - IMPORTANCE FACTOR, $I_w = 1.0$ (ASCE 7-10, TABLE 1.5.2)
 - EXPOSURE CATEGORY C (MBC, 1609.4.3)
- EARTHQUAKE LOADS (MBC, 1613)
 - SEISMIC RISK CATEGORY II (MBC, 1613.3.3)
 - SEISMIC IMPORTANCE FACTOR, $I_p = 1.0$ (ASCE 7-10, FIG. 1.5.2)
 - $S_s = 0.063$ (ASCE 7-10, FIG. 22.1); $S_1 = 0.039$ (ASCE 7-10, FIG. 22.2)
 - SITE CLASS = D (ASCE 7-10, TABLE 20.3.1)
 - $F_a = 1.6$ (MBC, TABLE 1613.3.3(1)); $F_v = 2.4$ (MBC, TABLE 1613.3.3(2))
 - $S_{ds} = F_a S_s = 0.100$ (MBC, 1613.3.3); $S_{m1} = F_v S_1 = 0.094$ (MBC, 1613.3.3)
 - $S_{d5} = (2/3) S_{m2} = 0.067$ (MBC, 1613.3.4); $S_{h1} = (2/3) S_{m1} = 0.062$ (MBC, 1613.3.3)
 - SEISMIC DESIGN CATEGORY = A (MBC, TABLES 1613.3.5(1) AND 1613.3.5(2))
 - SEISMIC RESISTING SYSTEM: LIGHT-FRAME WOOD WALLS WITH STRUCTURAL WOOD SHEAR PANELS (ASCE 7-10, TABLE 12.14-1)
 - DESIGN BASE SHEAR = 0.010W (ASCE 7-10, SECTION 12.8.1)
 - SEISMIC RESPONSE COEFFICIENT, $C_s = 0.01$ (ASCE 7-10, SECTION 12.8.1.1)
 - RESPONSE MODIFICATION FACTOR, $R = 6.5$ (ASCE 7-10, TABLE 12.2.1)
 - EARTHQUAKE LOADS CALCULATED PER SECTION 1613.3.5.2 "SIMPLIFIED ANALYSIS PROCEDURE FOR SEISMIC DESIGN OF BUILDINGS"
 - DEFLECTION AMPLIFICATION FACTOR, $C_d = 4$ (ASCE 7-10, TABLE 12.2.1)

FOUNDATION

- FOUNDATIONS ARE DESIGNED FOR A PRESUMPTIVE MAXIMUM ALLOWABLE BEARING CAPACITY OF 2,000 PSF. FOUNDATIONS SHALL BEAR ON NATURAL, UNDISTURBED SOIL OR ENGINEERED FILL PROPERLY PLACED UPON UNDISTURBED SOILS.
- THE CONTRACTOR WILL RETAIN THE SERVICES OF A QUALIFIED GEOTECHNICAL ENGINEER TO MONITOR THE FOUNDATION WORK & DETERMINE THE QUALITY OF THE SOIL AT ALL FOOTING LOCATIONS. IF UNSUITABLE MATERIALS ARE ENCOUNTERED AT THE FOOTING LOCATIONS, THE UNSUITABLE MATERIALS SHALL BE REMOVED & REPLACED WITH COMPACTED ENGINEERED FILL OR THE FOOTING LOWERED AT THE DIRECTION OF THE ARCHITECT OR ENGINEER.
- CONTRACTORS SHALL BE AWARE OF AND VERIFY LOCATION OF ALL UNDERGROUND UTILITIES, TANKS, ETC. DUE CARE SHALL BE EXERCISED DURING EXCAVATION SO THAT EXISTING UTILITIES ARE NOT DAMAGED
- THE AREA OF PROPOSED CONSTRUCTION SHALL BE STRIPPED OF THE EXISTING TOP SOIL & PAVEMENT MATERIALS. ALL REMNANTS OF PREVIOUS STRUCTURES OCCUPYING THE SITE SHALL BE REMOVED AND BACKFILLED WITH ENGINEERED FILL, PROPERLY PLACED AND COMPACTED. FOLLOWING THE REMOVAL OF THE ABOVE ITEMS, IF COHESIVE MATERIALS ARE EXPOSED AT THE SUBGRADE ALL AREAS OF PROPOSED DEVELOPMENT SHALL BE THOROUGHLY PROFFEROLLED UNDER THE OBSERVATION OF A QUALIFIED SOILS ENGINEER. THE PROOF ROLLING SHOULD BE PERFORMED WITH A FULLY LOADED DUMP TRUCK OR OTHER HEAVILY LOADED PNEUMATIC TIRE VEHICLE MAKING CONTINUOUS SIDE-BY-SIDE PASSES ACROSS THE ENTIRE AREA. SUBGRADE AREAS THAT DEFLECT EXCESSIVELY OR PUMP DURING PROOF ROLLING SHOULD BE EXCAVATED AND BACK FILLED WITH ACCEPTABLE ENGINEERED FILL. IF EXISTING GRANULAR FILL MATERIALS ARE EXPOSED UPON STRIPPING OPERATIONS AT THE SUBGRADE, THE AREA SHOULD BE THOROUGHLY DENSIIFIED / COMPACTED SUCH THAT THE TOP 12 INCHES IS COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY VALUE DETERMINED BY ASTM STANDARD D-1557 (MODIFIED PROCTOR)
- UPON COMPLETION OF THE SUB GRADE PREPARATION, THE SITE CAN BE RAISED TO THE PROPER ELEVATION WITH PROPERLY PLACED AND COMPACTED ENGINEERED FILL. ALL COMPACTED BACKFILL SHALL BE A CLEAN, UNIFORM GRADED, GRANULAR MATERIAL AND FREE OF FROZEN CHUNKS, ORGANICS, DEBRIS OR OTHER DELETERIOUS MATERIALS. ALL COMPACTED BACKFILL SHALL BE PLACED IN NO MORE THAN 12" LOOSE LIFTS AND COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF THE MAXIMUM DRY DENSITY DETERMINED BY ASTM D-1557 (MODIFIED PROCTOR). THIS MAY BE DECREASED TO 90% IN THOSE AREAS TO BE LANDSCAPED & NOT SUPPORTING STRUCTURE OR PAVEMENT.

CONCRETE

- THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING, FABRICATION AND CONSTRUCTION OF ALL REINFORCED CONCRETE:
 - BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-14)
- ALL CONCRETE 28 DAY COMPRESSIVE STRENGTH SHALL BE AS FOLLOWS:
 - FOOTINGS & PIERS 3000 PSI
 - SLAB ON GRADE 4000 PSI
 - ALL EXTERIOR EXPOSED CONCRETE SHALL BE ENTRAINED.
- BEFORE PLACING CONCRETE REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, CIVIL / SITE, ETC., DRAWINGS FOR LOCATIONS OF PIPE SLEEVES, EMBEDDED ITEMS, OPENINGS, EQUIPMENT PADS, ELECTRICAL CONDUITS, RECESSES, DRAINS, ETC. ALL OPENINGS FOR PIPE, CONDUITS, ETC. SHALL BE SLEEVED. MINIMUM SLEEVE SPACING SHALL BE 3 SLEEVE DIAMETERS.
- ALL DEFORMED BAR REINFORCEMENT SHALL BE ASTM A615, GRADE 60.
- ALL DEFORMED BAR REINFORCING SHALL BE SPLICED A MINIMUM OF 32 BAR DIAMETERS.
- ALL WELDED WIRE FABRIC SHALL BE ASTM A185-01 SHEETS SHALL BE LAPPED A MINIMUM OF WIRE SPACING + 2".
- PROVIDE RIGHT CORNER BARS W/ STD LAP @ CORNER OF ALL CONC. WALLS. LAP W/ TYPICAL WALL REINFORCING. SIZE OF BAR TO MATCH TYPICAL HORIZONTAL REINFORCING.
- CONTRACTOR TO PROVIDE VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION PER 2015 MBC CODE TABLE 1705.3

CONCRETE MASONRY

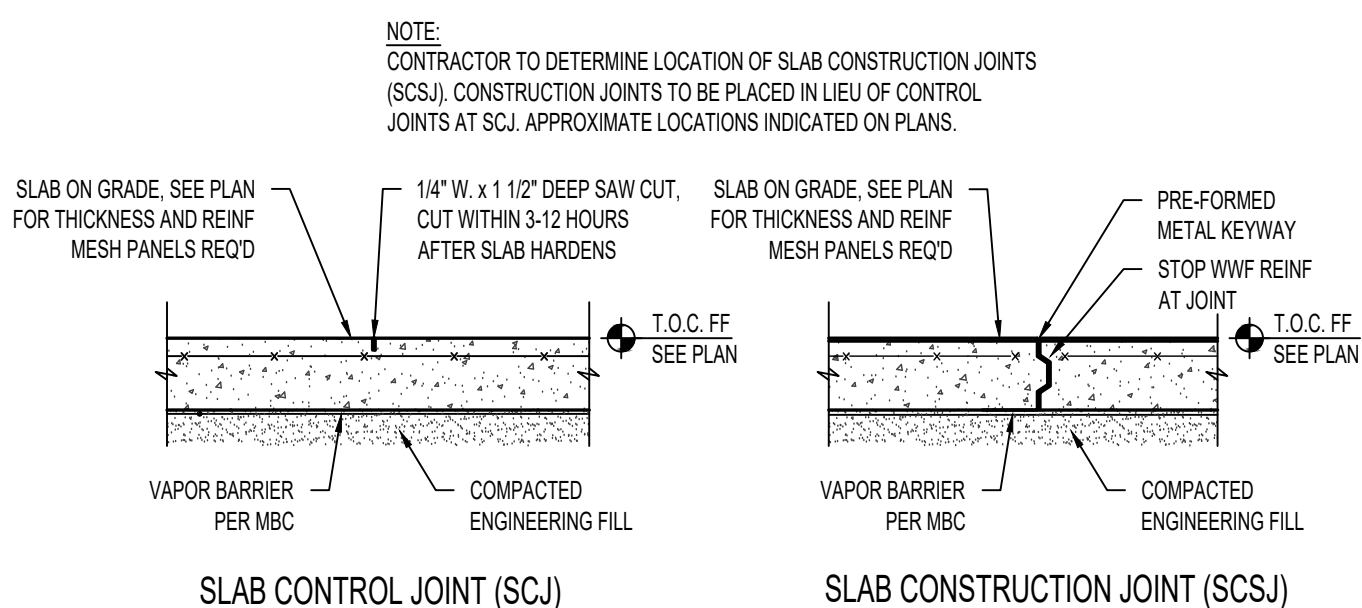
- THE FOLLOWING CODES GOVERN THE DESIGN, DETAILING & CONSTRUCTION OF ALL MASONRY:
 - BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES (ACI 530-13)
 - SPECIFICATIONS FOR MASONRY STRUCTURES (ACI 531-1-13)
- ALL MASONRY SHALL HAVE A COMPRESSIVE STRENGTH, $f_m = 2,000$ PSI.
- ALL MORTAR FOR LOAD BEARING AND EXTERIOR CONCRETE MASONRY SHALL BE TYPE S, ABOVE GRADE AND TYPE N BELOW GRADE PROPORTIONED BY VOLUME ACCORDING TO ASTM C-270.
- ALL GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI, AND SHALL BE PROPORTIONED BY VOLUME ACCORDING TO ASTM C-476.
- ALL CONCRETE MASONRY UNITS SHALL BE ASTM C-90 GRADE N, TYPE I UNITS MEDIUM WEIGHT UNLESS NOTED OTHERWISE. REFER TO ARCHITECTURAL DRAWINGS FOR FURTHER DETAILS WITH REGARD TO FACE FINISH.
- ALL MASONRY WALLS SHALL HAVE HORIZONTAL JOINT REINFORCEMENT (LADDER TYPE) AT 16" O.C. PROVIDE PREFABRICATED CORNER PIECES AT ALL CORNERS & INTERSECTIONS OF WALLS.
- ALL DEFORMED BAR REINFORCING SHALL BE ASTM A-615 GRADE 60. LAP SPLICES IN WALLS SHALL BE A MINIMUM OF 48 BAR DIAMETERS, UNLESS NOTED OTHERWISE.
- REINFORCE ALL MASONRY WALLS AS SHOWN ON SCHEDULE AND DETAILS. PLACE BAR ON CENTERLINE OF WALL IN FULLY GROUTED CELL. FULL HEIGHT OF THE WALL. LAP REINFORCEMENT WITH TYPICAL FOOTING DOWEL. SEE WALL SECTION FOR DOWELS REQUIREMENTS.
- SEE ARCHITECTURAL DRAWINGS FOR MASONRY JOINT LOCATIONS.
- CONTRACTOR TO PROVIDE VERIFICATION AND INSPECTION OF MASONRY CONSTRUCTION PER 2015 MBC CODE SECTION 1705.4.

WOOD FRAMING

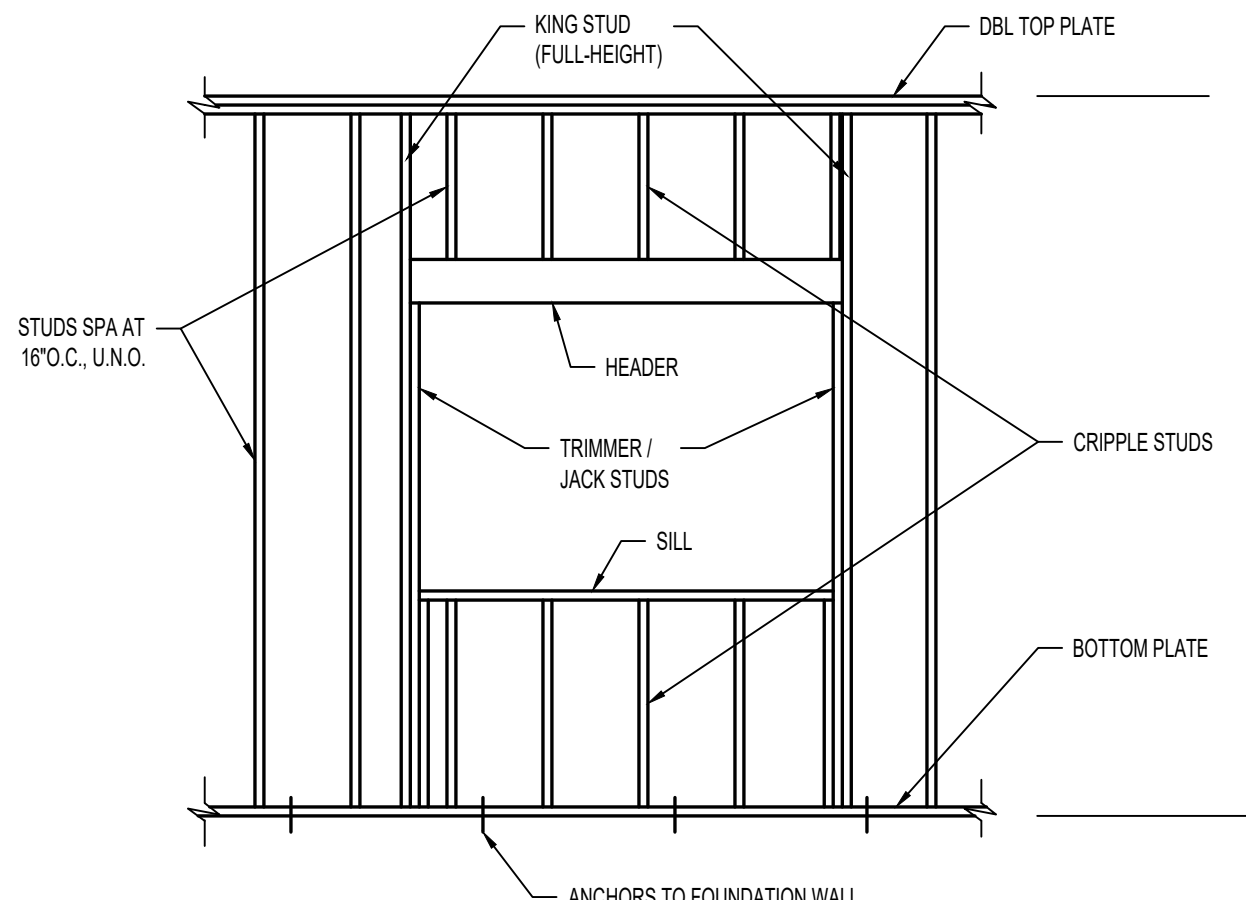
- DIMENSIONAL FRAMING MATERIAL SHALL BEAR THE GRADE MARK OF AN ALSO APPROVED AGENCY AND SHALL HAVE MET THE REQUIREMENTS FOR:
 - PLATES, BLOCKING, WALLS - SPF No. 2 OR BETTER
- ROOF SHEATHING AT THE SLOPED ROOF AREAS SHALL BE 5/8 INCH APA RATED WITH A PANEL SPAN RATING OF 40/20 AND SHALL BE EXTERIOR GRADE.
- NAIL ROOF DECK TO SUPPORTS WITH 8d NAILS SPACED AT 6 INCHES O.C. AT SUPPORTED EDGES AND AT 12 INCHES O.C. AT INTERMEDIATE SUPPORTS.
- WALL SHEATHING TO BE 1/2 INCH APA RATED WITH A PANEL SPAN RATING OF 32/16 AND SHALL BE EXTERIOR GRADE. WALL SHEATHING PANELS ARE TO BE BLOCKED (FRAMING AT ALL PANEL EDGES).
- FASTEN WALL SHEATHING TO SUPPORTS WITH 8d NAILS SPACED AT 6 INCHES O.C. AT SUPPORTED EDGES AND AT 12 INCHES O.C. AT INTERMEDIATE SUPPORTS.
- ALL FRAMING SHALL BE ANCHORED TO SUPPORTS USING SIMPSON STRONG TIE CONNECTORS OR EQUAL. SEE DETAILS FOR SPECIFIC REQUIREMENTS.
- ALL NAILS FOR NAILING OF STRUCTURAL LUMBER SHALL BE COMMON NAILS. ALL NAILING SHALL COMPLY WITH THE RECOMMENDED NAILING SCHEDULE (MBC 05.15, TABLE 2304.10.1)
- ALL FRAMING SHALL BE ERECTED TRUE LEVEL AND/OR PLUMB. MEMBERS SHALL BE SECURELY NAILED OR BOLTED IN PLACE AS DETAILED AT THE PROPER LOCATIONS OR SPACINGS INDICATED. ALL FRAMING MEMBERS SHALL BE OF FULL LENGTH WITHOUT JOINTS UNLESS IT PIECES ADDED OR SPLICED. FURRING, BLOCKING, NAILERS, ETC. SHALL BE SECURELY ANCHORED IN PLACE.
- COMPLY WITH THE RECOMMENDATIONS AND PRACTICES OF THE AITC, NFPA AND AWC FOR THE INSTALLATION OF ALL WOOD FRAMING.
- ALL WOOD IN CONTACT WITH MASONRY OR CONCRETE SHALL BE PRESSURE-TREATED LUMBER.
- PROVIDE TRIMMER AND END SUPPORTS AS SPECIFIED ON HEADER SCHEDULE AT THE END OF ALL HEADERS. PROVIDE FILL PLATES AS NEEDED UNLESS NOTED OTHERWISE.
- WHERE (2) OR MORE UNITS OF STANDARD LUMBER ARE TO BE USED AS A HEADER:
 - PLYS SHALL BE NAILED TOGETHER WITH (2) ROWS OF 8d NAILS AT 12" O.C.
 - PLYS SHALL BE NAILED TOGETHER WITH (2) ROWS OF 16d NAILS AT 12" O.C.
- ALL WOOD PROVIDED SHALL BE SEASONED WITH A MAXIMUM MOISTURE CONTENT
 - 19% AT THE TIME OF DRESSING FOR SAWN LUMBER
 - 18% AT THE TIME OF DRESSING FOR ENGINEERED LUMBER PRODUCTS
- PRE-MANUFACTURED WOOD TRUSS SHOP DRAWINGS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO MANUFACTURING OF TRUSSES.

PREFABRICATED WOOD TRUSSES

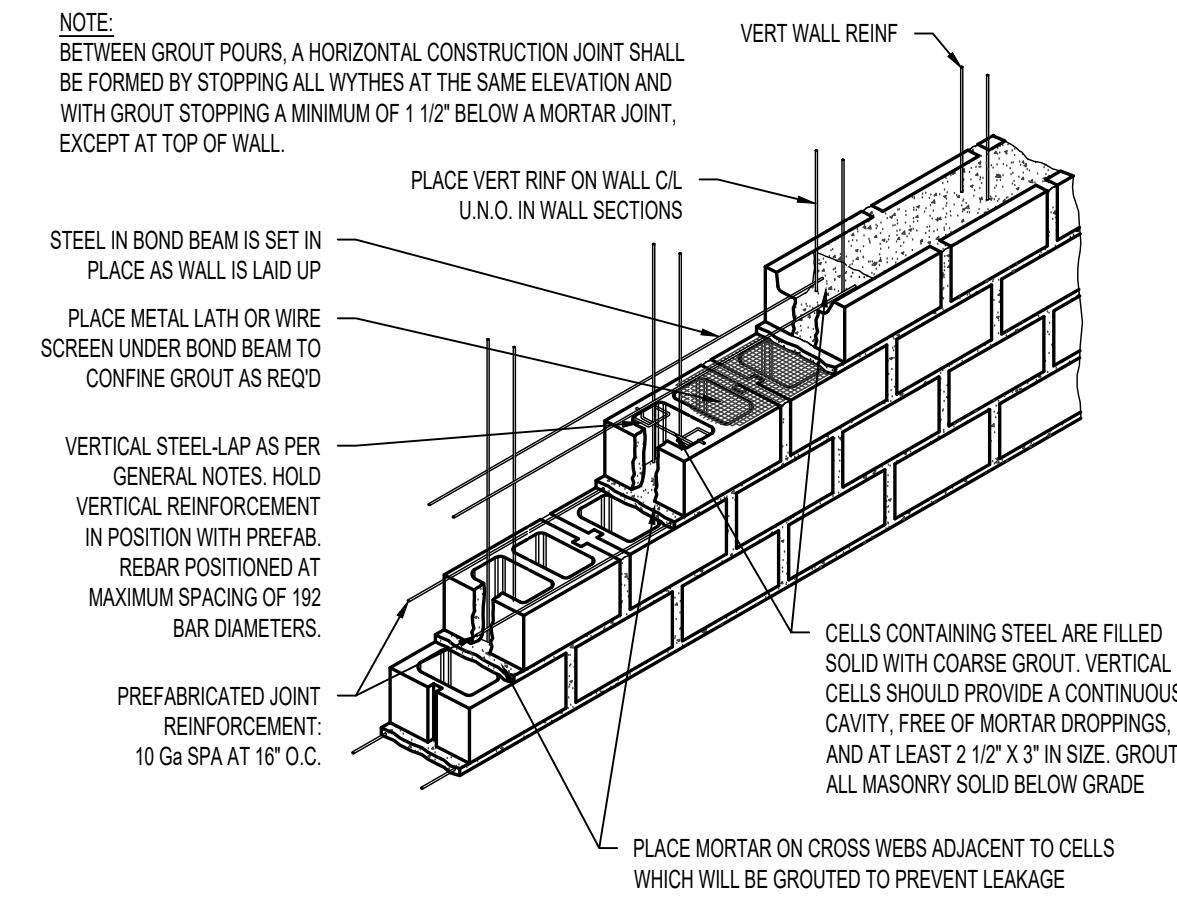
- ALL WOOD TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING LOADS:
 - TOP CHORD DEAD LOAD 10 PSF + WEIGHT OF TRUSS
 - BOTTOM CHORD DEAD LOAD 10 PSF + WEIGHT OF TRUSS
 - TOP CHORD LIVE LOAD SEE STRUCTURAL DESIGN CRITERIA FOR ROOF LIVE AND SNOW LOADING
- THE EXTENT OF ROOF TRUSSES SHOWN ON THE PLANS IS FOR REFERENCE ONLY. THE FABRICATOR SHALL VERIFY ALL DIMENSIONS, TRUSS LAYOUT, CONFIGURATION, NUMBER OF EACH TYPE OF TRUSS REQUIRED, LOADING AND DETAILS.
- WOOD TRUSSES SHALL BE DESIGNED, FABRICATED AND INSTALLED PER TRUSS PLATE INSTITUTE, INC. SPECIFICATIONS AND NFPA NATIONAL, INC. SPECIFICATIONS AND NFPA NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION.
- ALL TRUSSES SHALL BE ANCHORED TO SUPPORTS AS INDICATED AND IF NOT INDICATED, PER MANUFACTURERS RECOMMENDATIONS.
- DEFLECTION OF TRUSSES SHALL BE LIMITED TO MAXIMUM LIVE LOAD DEFLECTION OF SPAN/360.
- SUBMITTALS:
 - SHOP DRAWINGS SHOWING SIZES, DESIGN VALUES, MATERIALS, AND DIMENSIONAL RELATIONSHIPS OF COMPONENTS AS WELL AS BEARING AND ANCHORAGE DETAILS.
 - TO EXTENT ENGINEERING DESIGN CONSIDERATIONS ARE FABRICATOR'S RESPONSIBILITY, SUBMIT DESIGN ANALYSIS AND TEST REPORTS INDICATING TRUSS PERFORMANCE CHARACTERISTICS COMPLY WITH REQUIREMENTS.
 - CALCULATIONS AND SUBMITTALS OF REQUIRED CONNECTORS TO CONNECT TRUSSES TO GIRDER TRUSSES.
 - PROVIDE SHOP DRAWINGS WHICH HAVE BEEN SIGNED AND STAMPED BY A PROFESSIONAL ENGINEER LICENSED TO PRACTICE IN THE STATE OF MICHIGAN.
- DESIGN AND SPECIFICATION OF TEMPORARY AND PERMANENT WOOD TRUSS BRACING BY TRUSS MANUFACTURER AND SHOWN ON SHOP DRAWINGS. TRUSS INSTALLER SHALL PROVIDE AND INSTALL BRACING PER SHOP DRAWINGS.



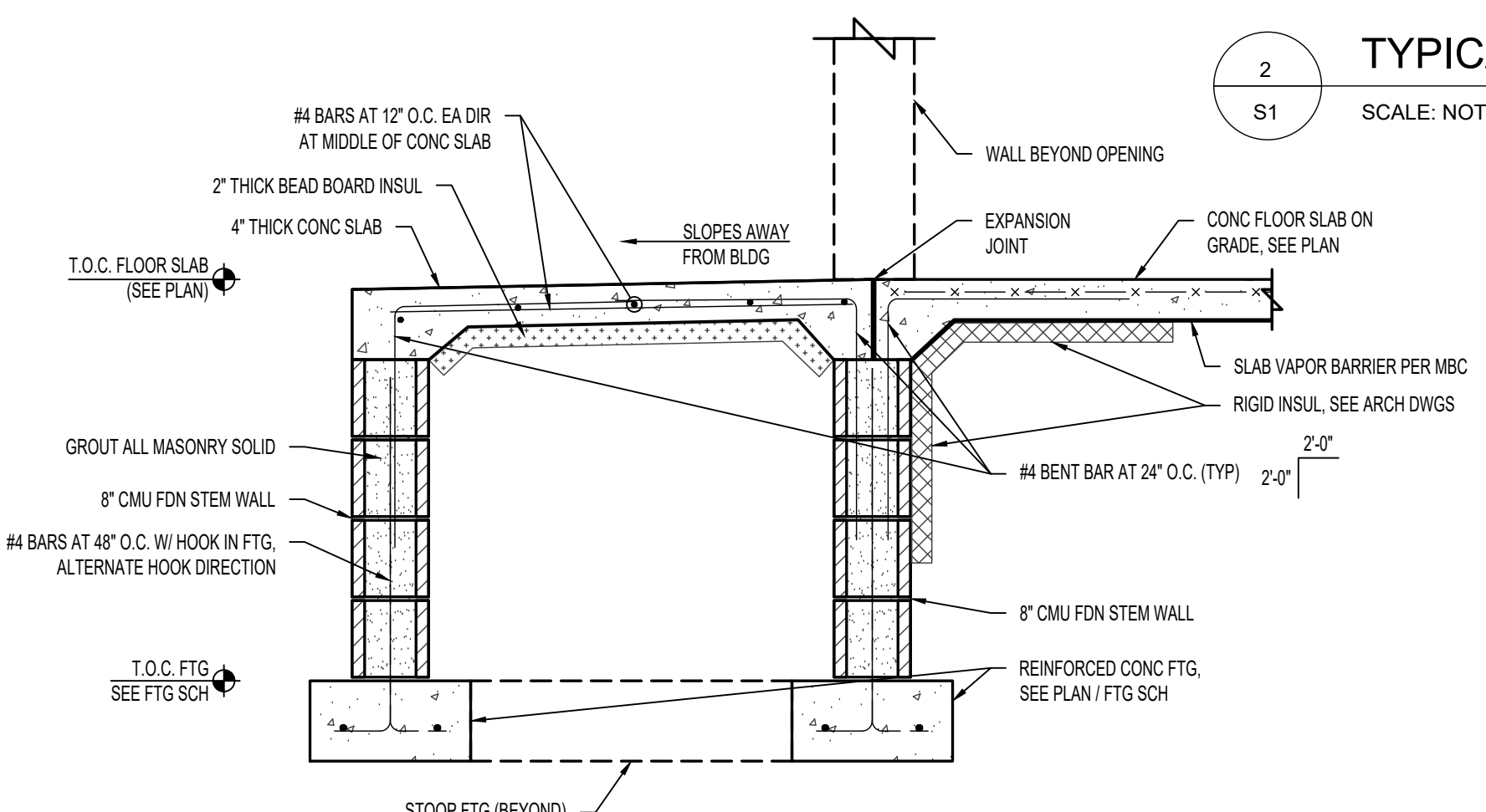
CONCRETE SLAB ON GRADE DETAILS
SCALE: 3/4" = 1'-0"



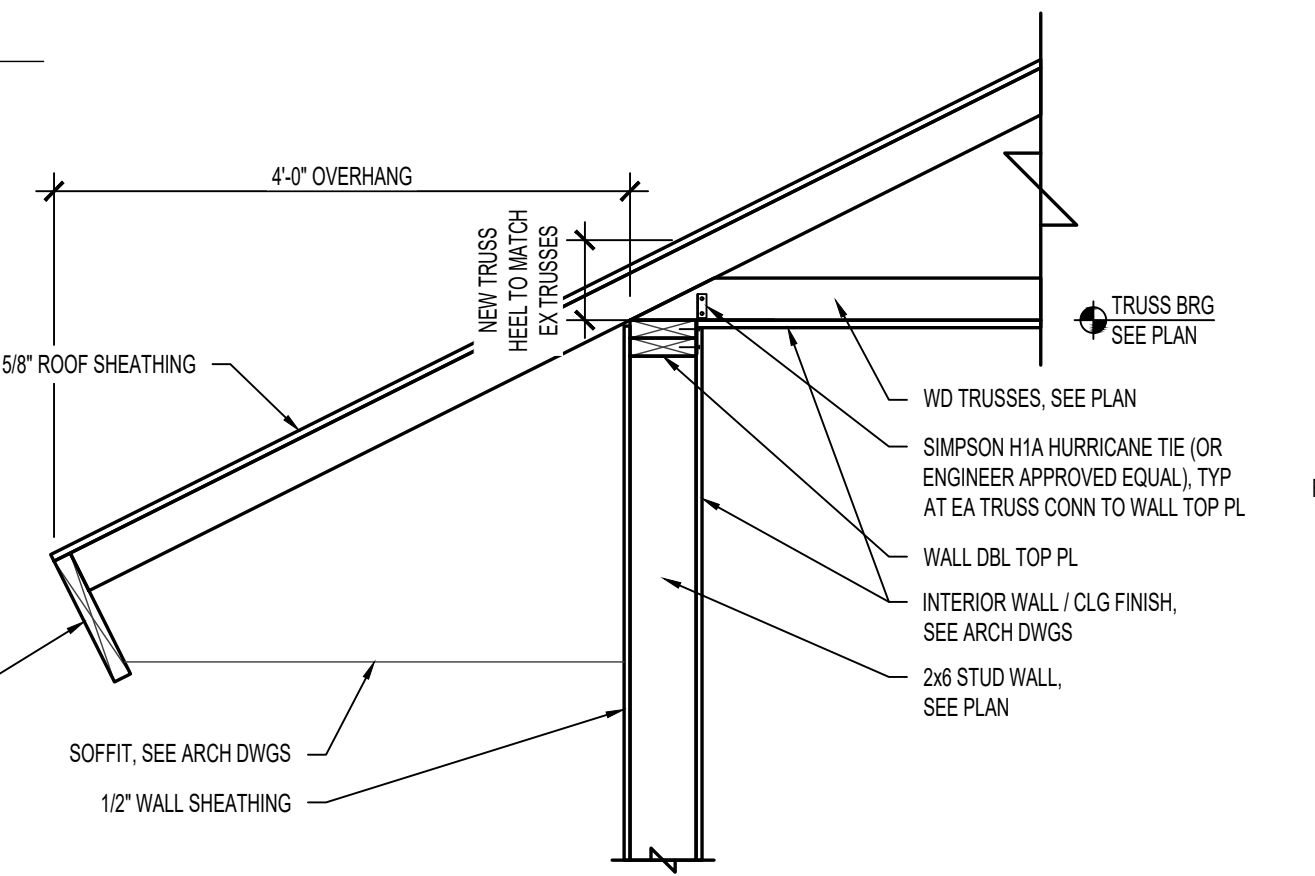
TYPICAL WOOD STUD WALL OPENING
SCALE: NOT TO SCALE



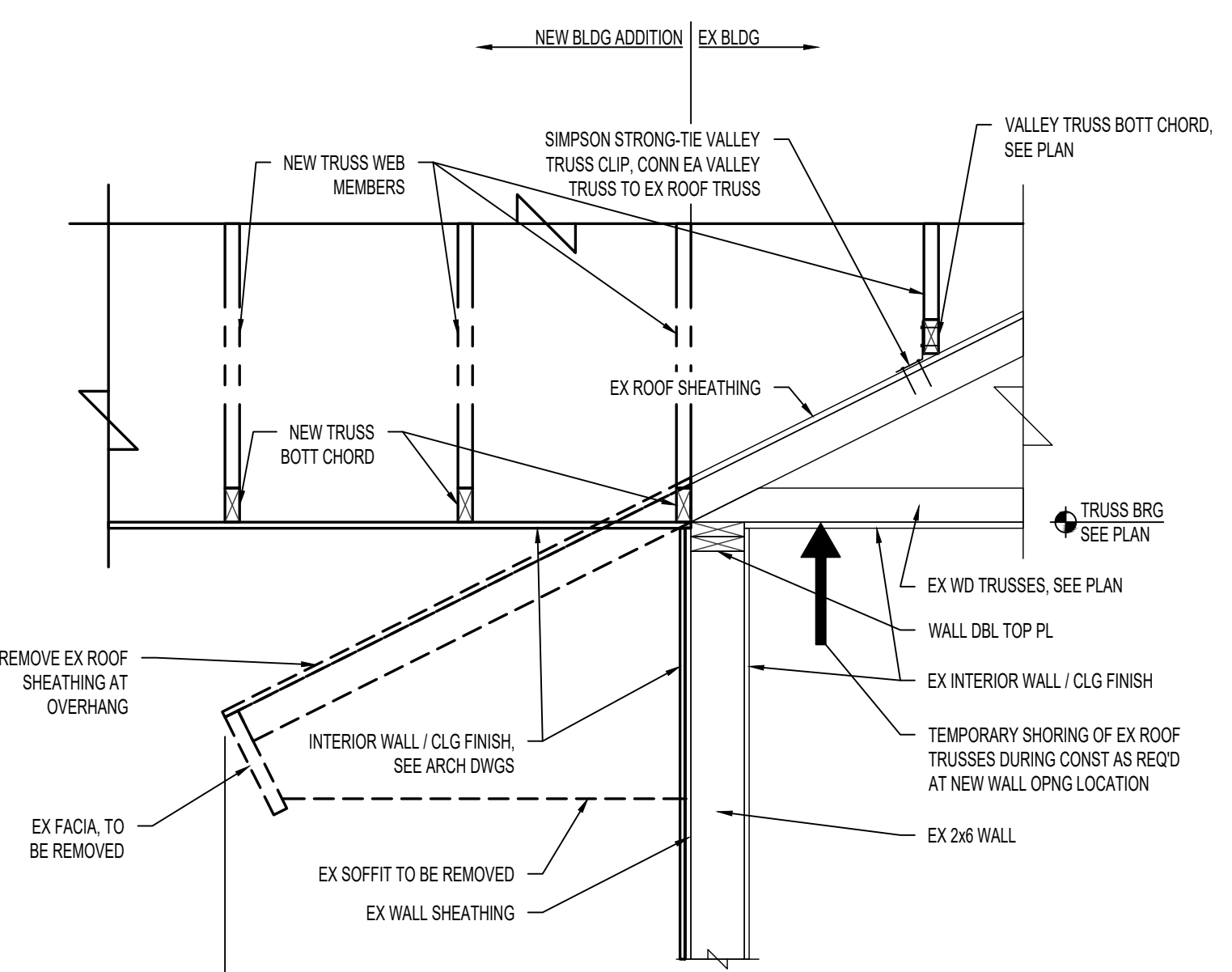
LOW LIFT-GROUTING TECHNIQUE (GROUT IS PLACED IN LIFT UP TO 5'-0")
SCALE: NOT TO SCALE



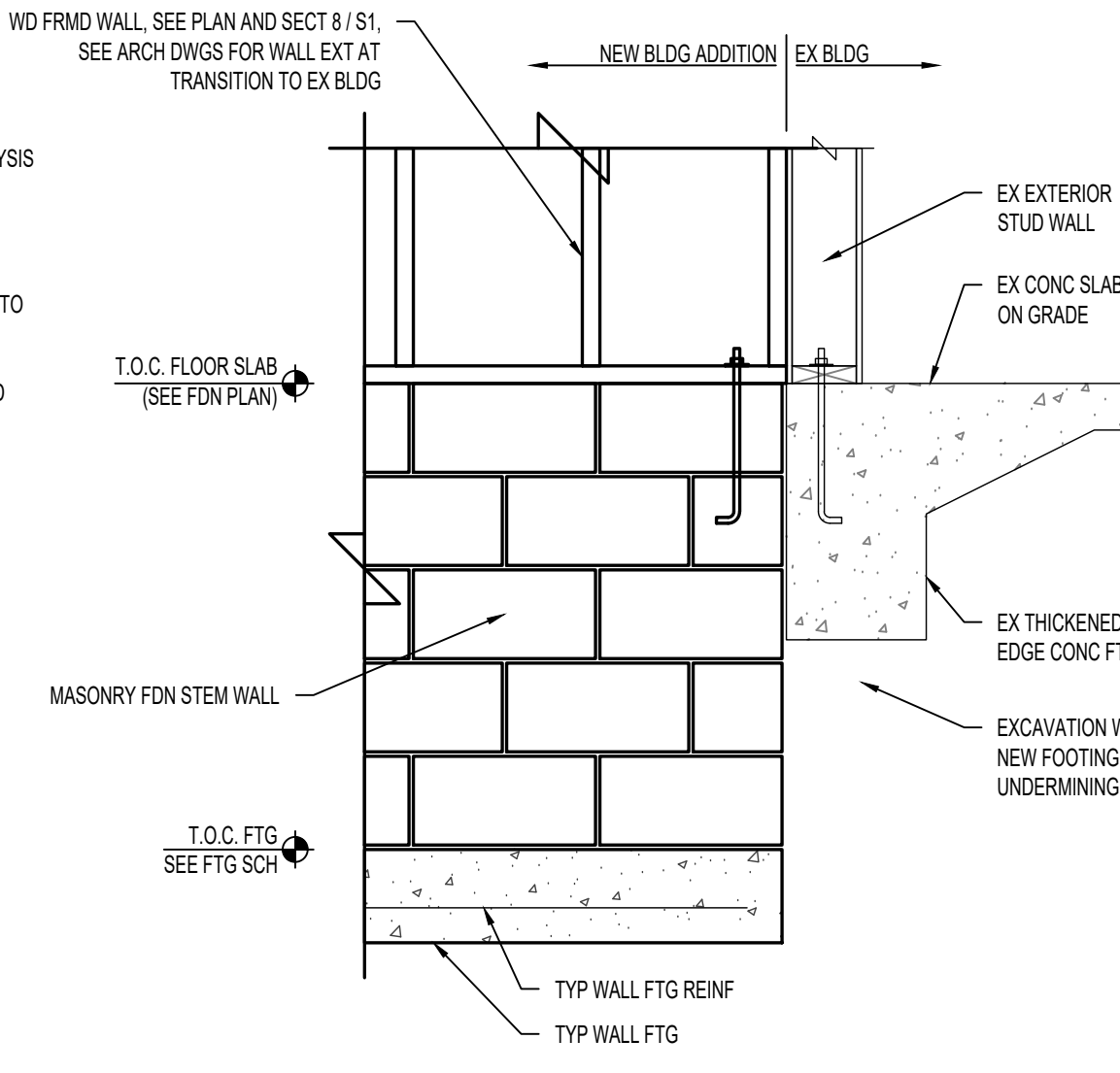
TYPICAL STOOP SECTION
SCALE: NOT TO SCALE



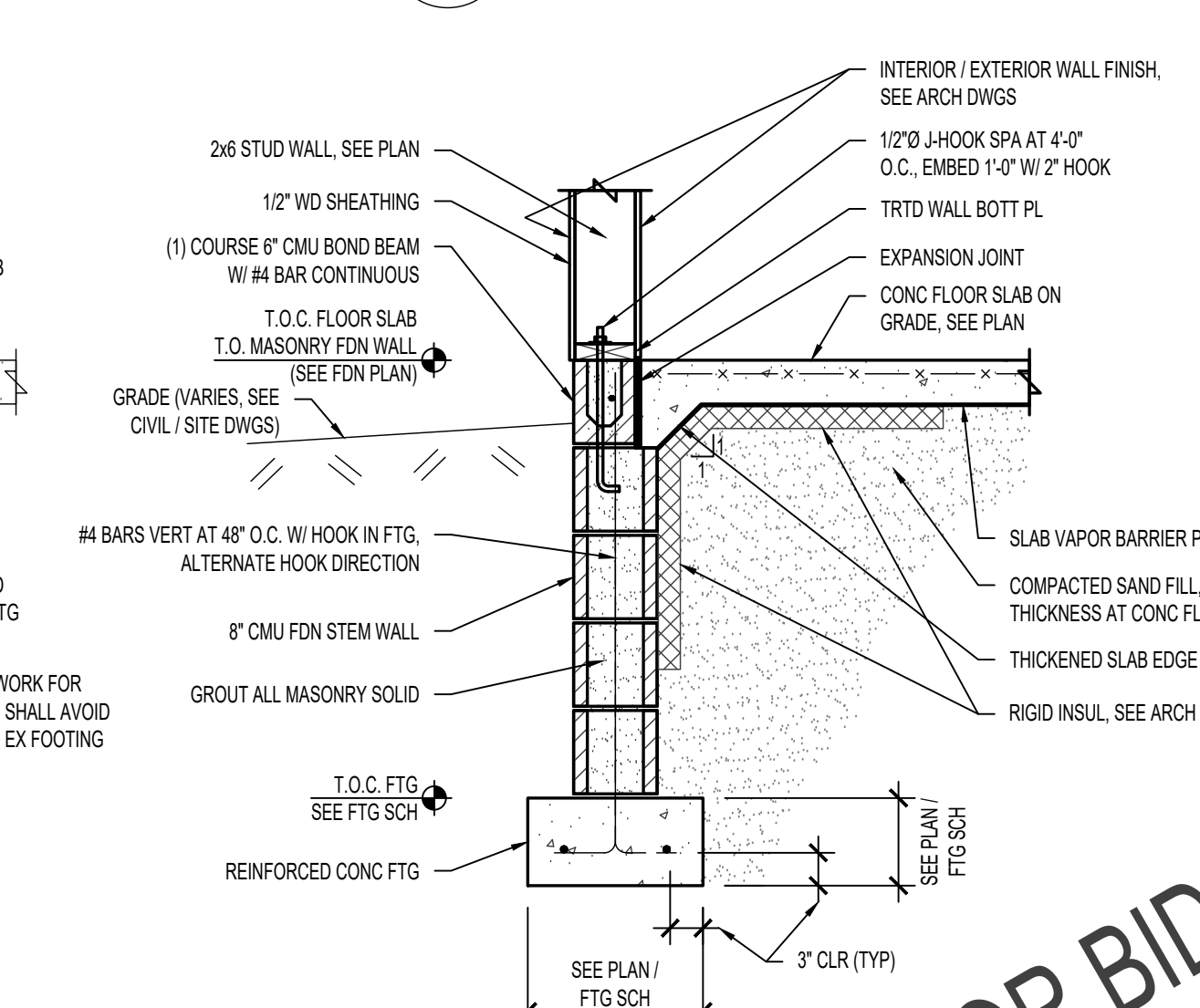
SECTION
SCALE: 3/4" = 1'-0"



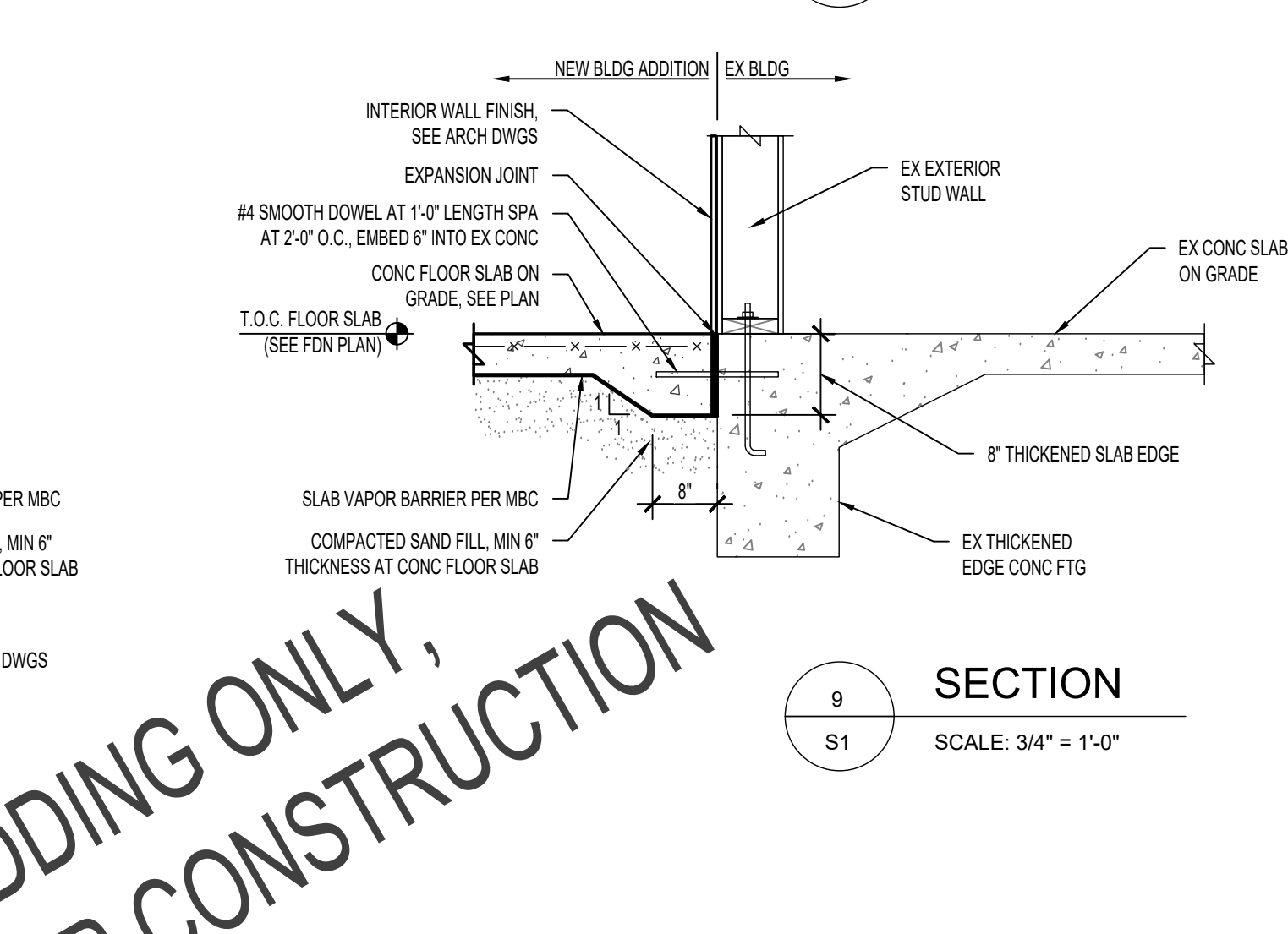
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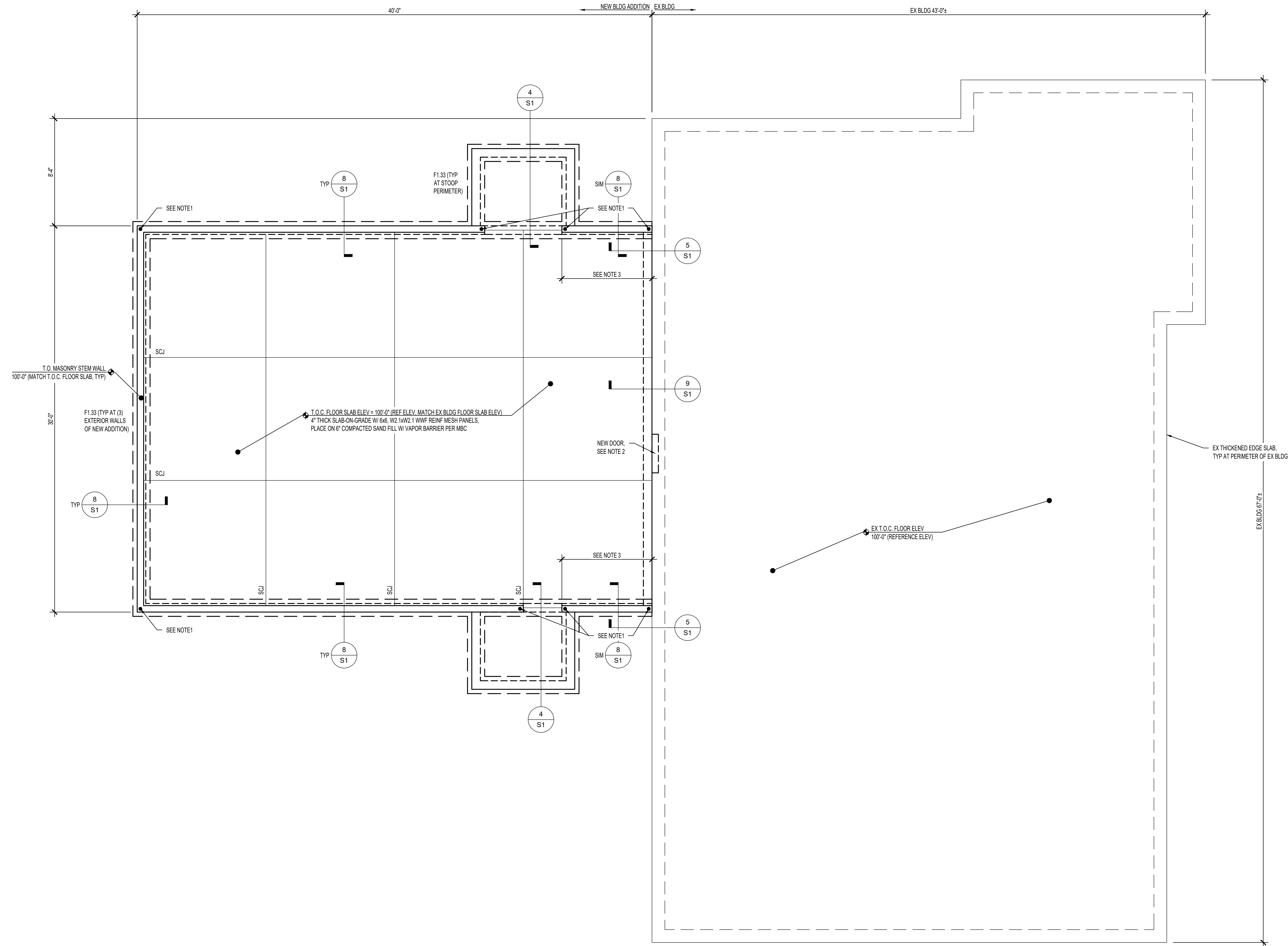
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SNYDER & STALEY ENGINEERING, P.L.L.C.
CONSULTING ENGINEERS
824 TITTABAWASSEE ROAD
SAGINAW, MI 48604
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PROJECT TITLE: TOWNSHIP HALL OFFICE ADDITION MT HALEY TOWNSHIP, MICHIGAN
PREPARED FOR: McPHILLIPS ARCHITECTURE SANFORD, MICHIGAN
SHEET TITLE: GENERAL NOTES, TYPICAL DETAILS, SECTIONS

ISSUED FOR:

09/09/24 BIDDING
PROJECT NUMBER: 24-797-080
DATE: 09/09/2024
DRAWN BY: JPS
CHK'D BY: JPS
SHEET NUMBER: S1
SHT 1 OF 3



FOOTING SCHEDULE

MARK NO.	FOOTING SIZE (LENGTH x WIDTH x THICKNESS)	REINFORCEMENT	TOP OF FOOTING ELEVATION	REMARKS
F1.33	CONTINUOUS x 1'-4" W x 8" T	(2) #4 BARS CONTINUOUS	96'-8"	-



FOUNDATION PLAN

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

NOTES:

1. WALL HOLD-DOWN ANCHOR: SIMPSON STRONG-TIE SSTB24 CAST-IN-PLACE HOLD-DOWN ANCHOR.
2. NEW PASSAGE DOOR, REMOVE EXISTING WALL AS REQUIRED AND INSTALL NEW HEADER AND SUPPORT FRAMING.
3. SEE ARCHITECTURAL DRAWINGS FOR WALL EXTERIOR DETAILS AT TRANSITION TO EXISTING BUILDING.



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SNYDER & STALEY ENGINEERING, P.L.L.C.



CONSULTING ENGINEERS
824 TITTABAWASSEE ROAD
SAGINAW, MI 48604
PH: (989) 797-1710

PROJECT TITLE: TOWNSHIP HALL OFFICE ADDITION
MT HALEY TOWNSHIP, MICHIGAN

PREPARED FOR: McPHILLIPS ARCHITECTURE
SANFORD, MICHIGAN

SHEET TITLE: FOUNDATION PLAN, SCHEDULE

ISSUED FOR

09/09/24 BIDDING

PROJECT NUMBER:
24-797-080

DATE: 09/09/2024

DRAWN BY: JPS

CHK'D BY: JPS

SHEET NUMBER:

S2

SHT 2 OF 3

**FOR BIDDING ONLY,
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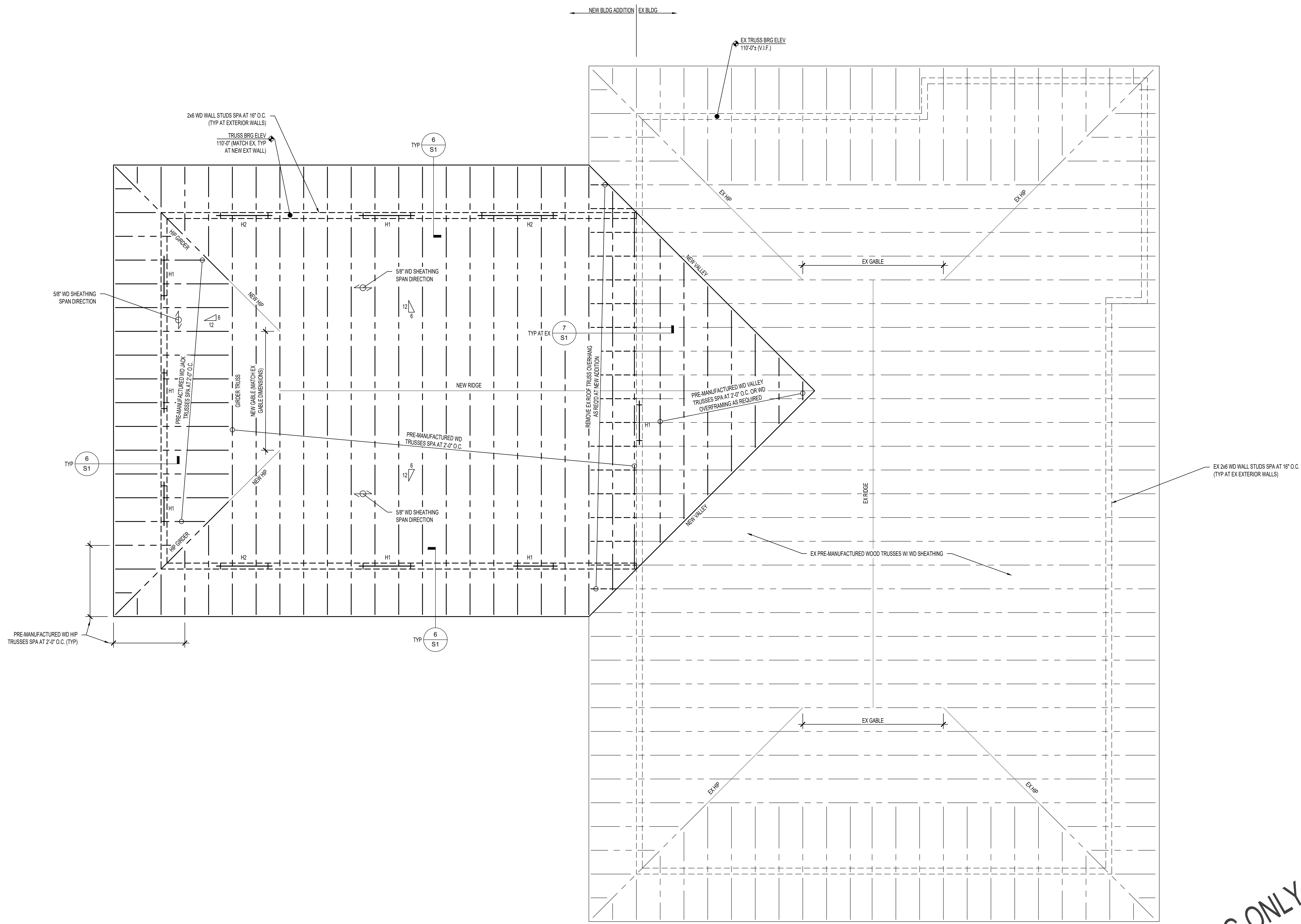


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SNYDER & STALEY ENGINEERING, P.L.C.
 CONSULTING ENGINEERS
 824 TITTABAWASSEE ROAD
 SAGINAW, MI 48604
 PH: (989) 797-1710

PROJECT TITLE: TOWNSHIP HALL OFFICE ADDITION
 MT HALEY TOWNSHIP, MICHIGAN
 PREPARED FOR: McPHILLIPS ARCHITECTURE
 SANFORD, MICHIGAN
 SHEET TITLE: ROOF FRAMING PLAN, SCHEDULE

ISSUED FOR:
 09/09/24 BIDDING
 PROJECT NUMBER: 24-797-080
 DATE: 09/09/2024
 DRAWN BY: JPS
 CHK'D BY: JPS
 SHEET NUMBER:
S3
 SHT 3 OF 3

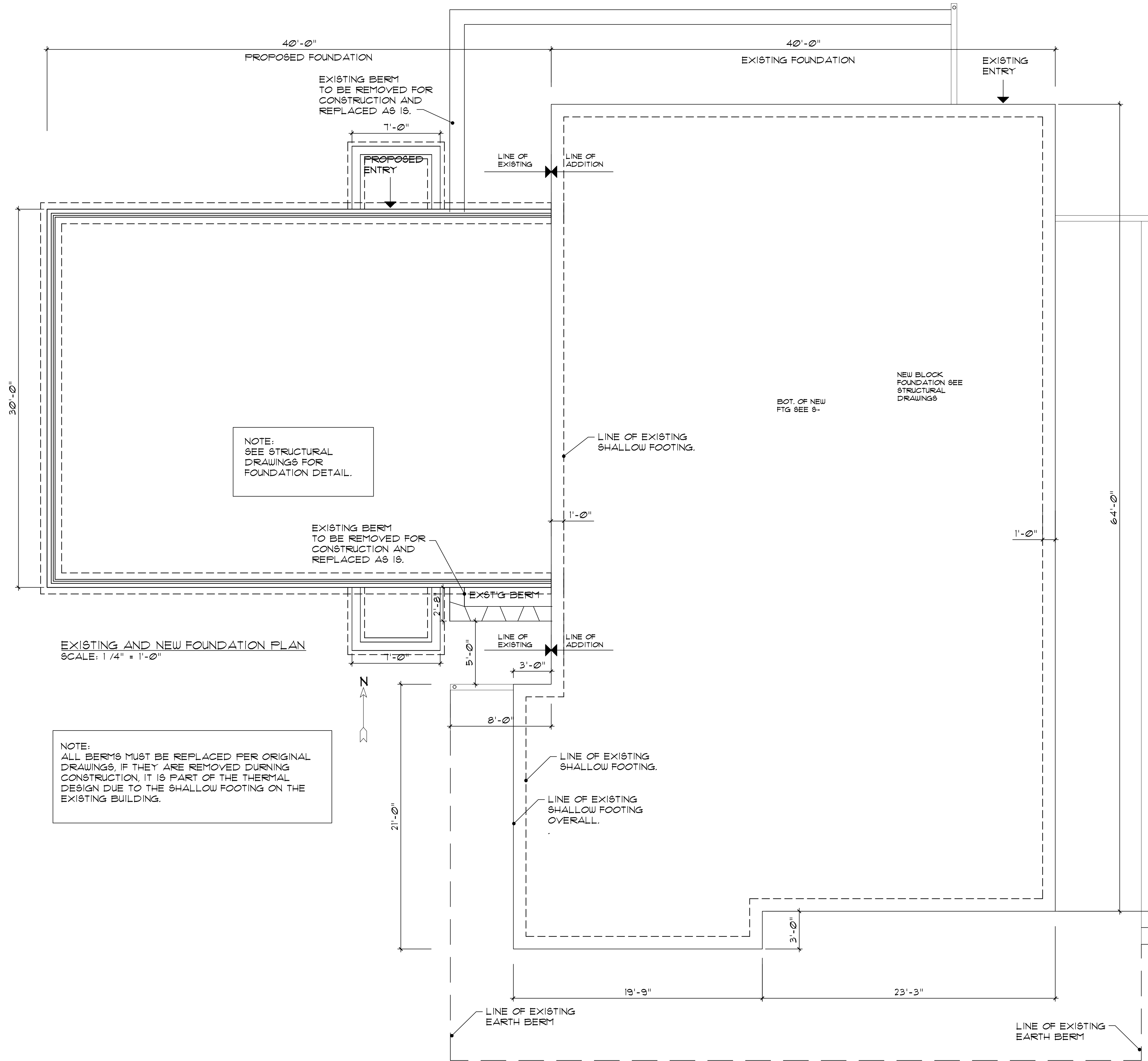


HEADER SCHEDULE

MARK NO.	HEADER SIZE	FULL-HEIGHT / KING STUDS	BEARING / TRIMMER STUDS	REMARKS
H1	(3) 2x6	(1) 2x6	(1) 2x6	.
H2	(3) 2x12	(2) 2x6	(2) 2x6	.

ROOF FRAMING PLAN
 SCALE: 1/4" = 1'-0"

**FOR BIDDING ONLY,
 NOT FOR CONSTRUCTION**



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 Merrill, MI 48637

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A2

NOTE:
PRE BID ADDENDUM #1
WILL COMPLETE THE
DOOR, WINDOW AND
INTERIORS SCHEDULES.

DOOR SWING PER FLOOR PLAN.

DOOR SCHEDULE							
EXTERIOR DOORS							
NUMB.	SET	SIZE	TYPE	SOLID CORE	LOCK TYPE	PANIC BAR	COMMENTS
①		4'x6'-8"			K	X	NEW NORTH ENTRY
②		3'x6'-8"			K	X	NEW SOUTH ENTRY
③		6'x6'-8"			L	X	EXISTING NORTH ENTRY
④		3'x6'-8"			K	X	EXISTING WEST ENTRY
INTERIOR DOORS							
NUMB.	SIZE	TYPE	SOLID CORE	LOCK TYPE	LEVER TYP HANDLE ON ALL DOORS		
⑤	6'x6'-8"	E	X	L	EXISTING NORTH ENTRY		
⑥	4'x6'-8"		X	L	NEW NORTH ENTRY		
⑦	3'x6'-8"		X	L	OFFICE 1		
⑧	3'x6'-8"		X	L	OFFICE 2		
⑨	3'x6'-8"		X	L	OFFICE 3		
⑩	3'x6'-8"		X	L	OFFICE 4		
⑪	3'x6'-8"		X	L	FILE ROOM- 1 HOUR DOOR.		
⑫					HALLWAY (WEST DOOR)		
⑬					HALLWAY (EAST DOOR)		

TYPICAL OFFICE CABINERY PLAN

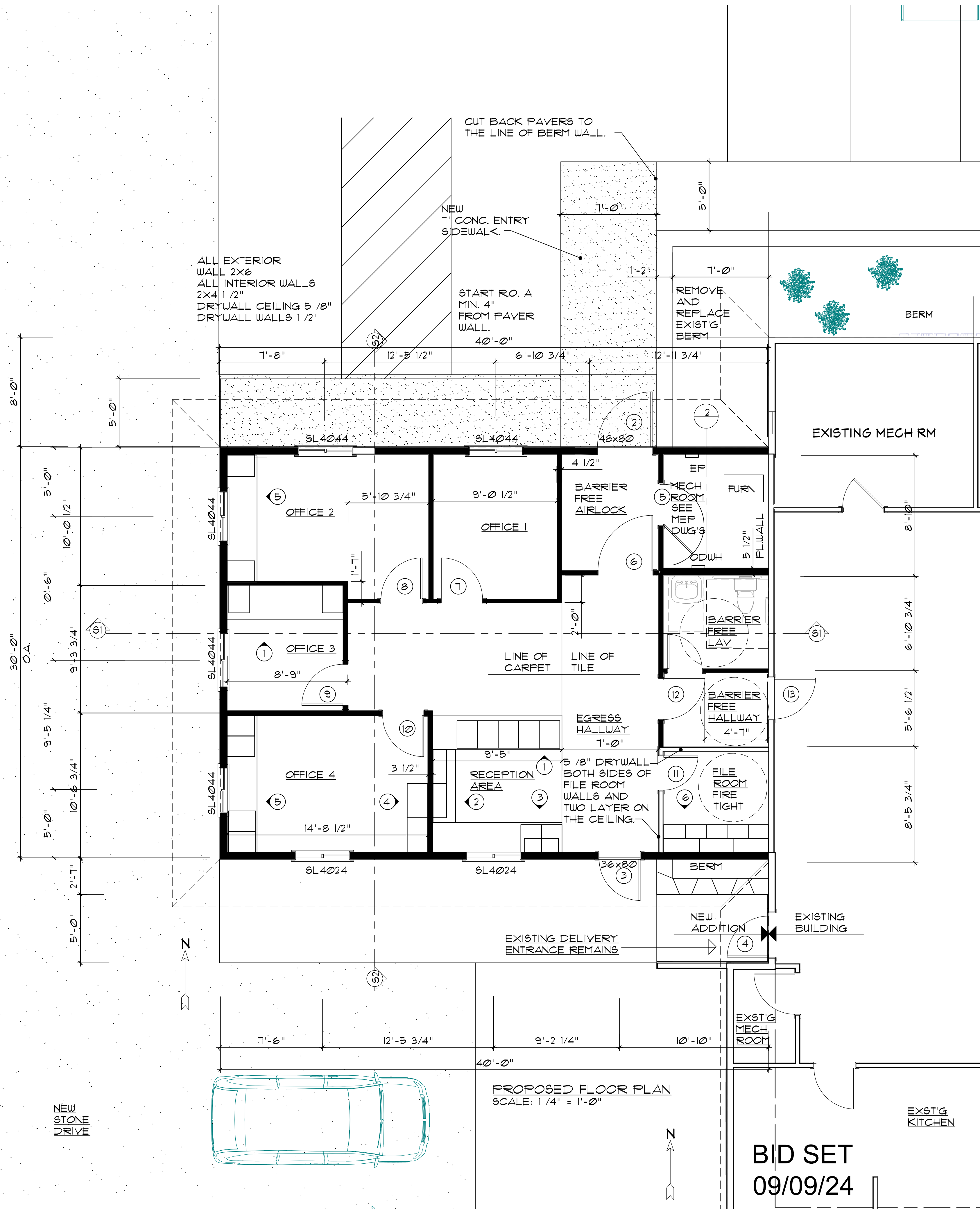
TWO DRAWER METAL FILES, STEELCASE BRAND OR EQUAL, PER PLAN W/LOCKS. 3/4" PLYWOOD TOP WITH FORMICA FINISH COLOR TBD, W/ 1 1/2" OAK FASCIA. PENCIL DRAWER IN KNEE SPACE.

TYPICAL BASEBOARD

4" VINYL COVE BASE OVER HARD SURFACE FLOORS, STRAIGHT 4" BASE OVER CARPETED AREAS.

WINDOW & DOORS

WILL BE LISTED IN THE PRE BID ADD #1.



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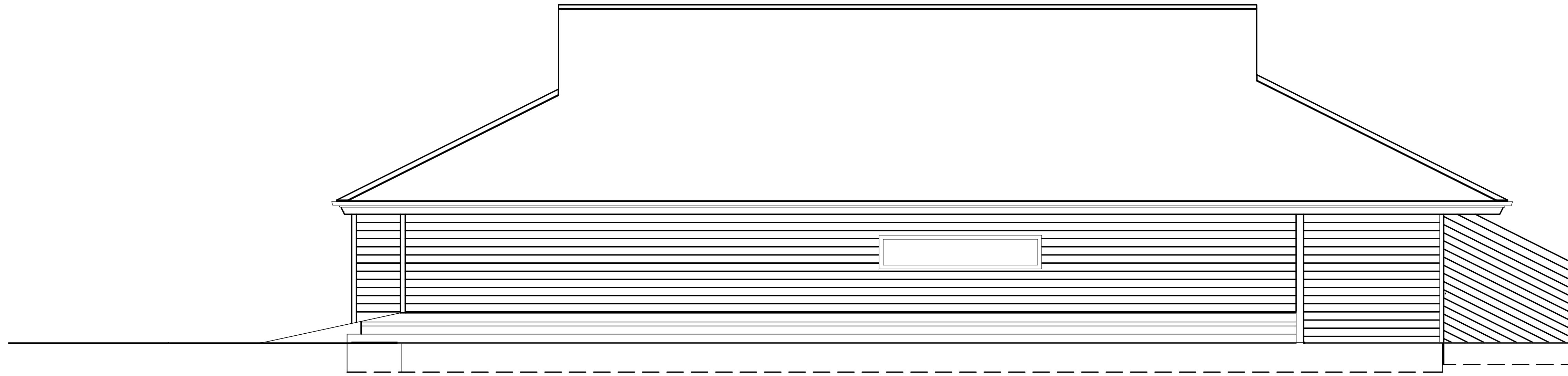
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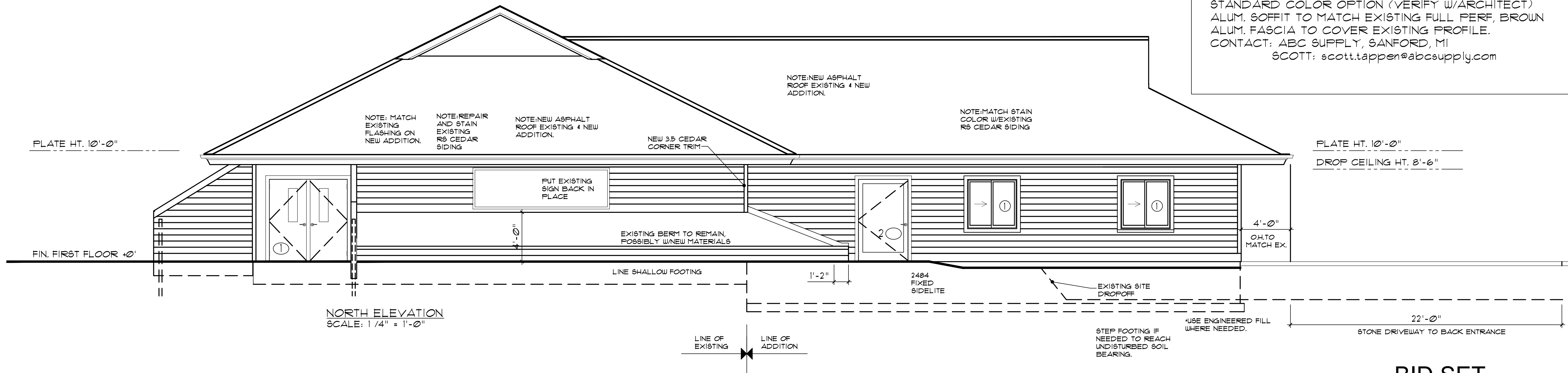
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EAST ELEVATION
SCALE: 1/4" = 1'-0"

NOTE:
PRE BID ADDENDUM #1
WILL COMPLETE THE
ELEVATIONS IF MORE
DETAIL IS NEEDED.



NORTH ELEVATION
SCALE: 1/4" = 1'-0"

NOTE:
SIDING SPEC #1 and SIDING ALTERNATE:
#1 - ROUGH SAWN CEDAR ON THE NEW BUILDING TO MATCH EXISTING. PATCH EXISTING AND PUT NEW 1 X4 CORNERS ON EXISTING AND NEW ADDITION. SEE ATTACHED INFORMATION FROM CROSS AND LINCOLN OUT OF HEMLOCK, MI, SAME OR SIMILAR.
ALTERNATE - REMOVE CEDAR SIDING FROM EXISTING BUILDING, WRAP W/DOW BUILDING WRAP AND VINYL SIDE EXISTING BUILDING AND NEW ADDITION WITH: NORANDEX VINYL, CEDARKNOLLS Ø44MIN. STANDARD COLOR OPTION (VERIFY W/ARCHITECT) ALUM. SOFFIT TO MATCH EXISTING FULL PERF, BROWN ALUM. FASCIA TO COVER EXISTING PROFILE. CONTACT: ABC SUPPLY, SANFORD, MI SCOTT: scott.tappen@abcsupply.com

BID SET
09/09/24

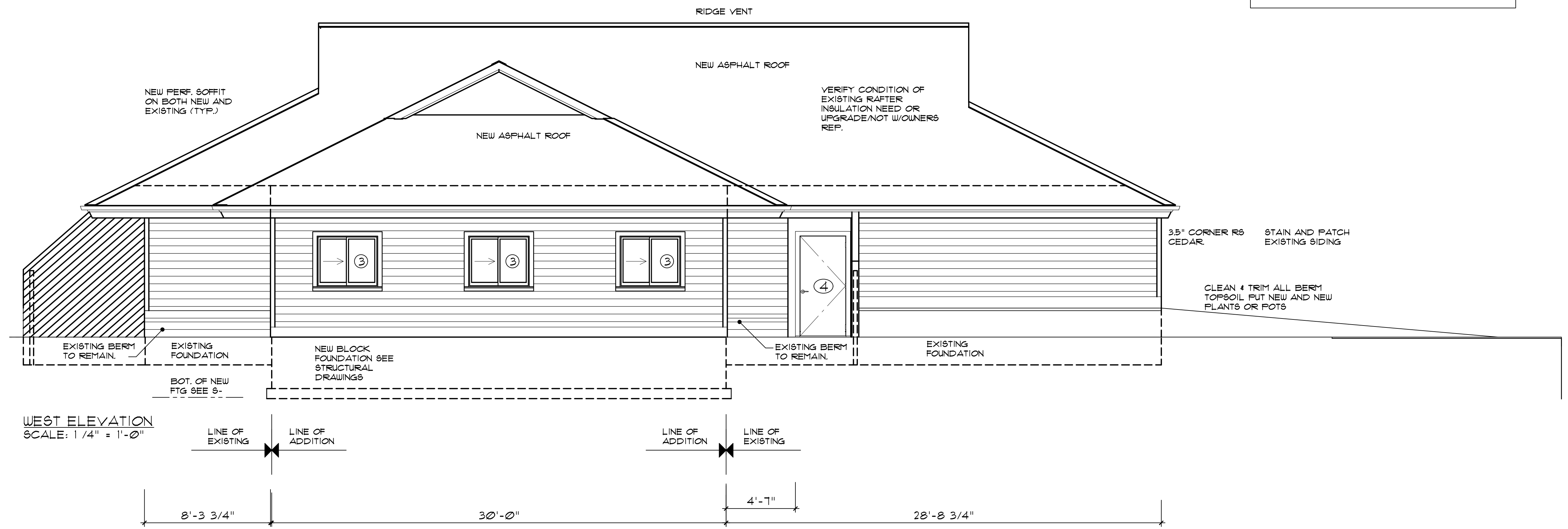
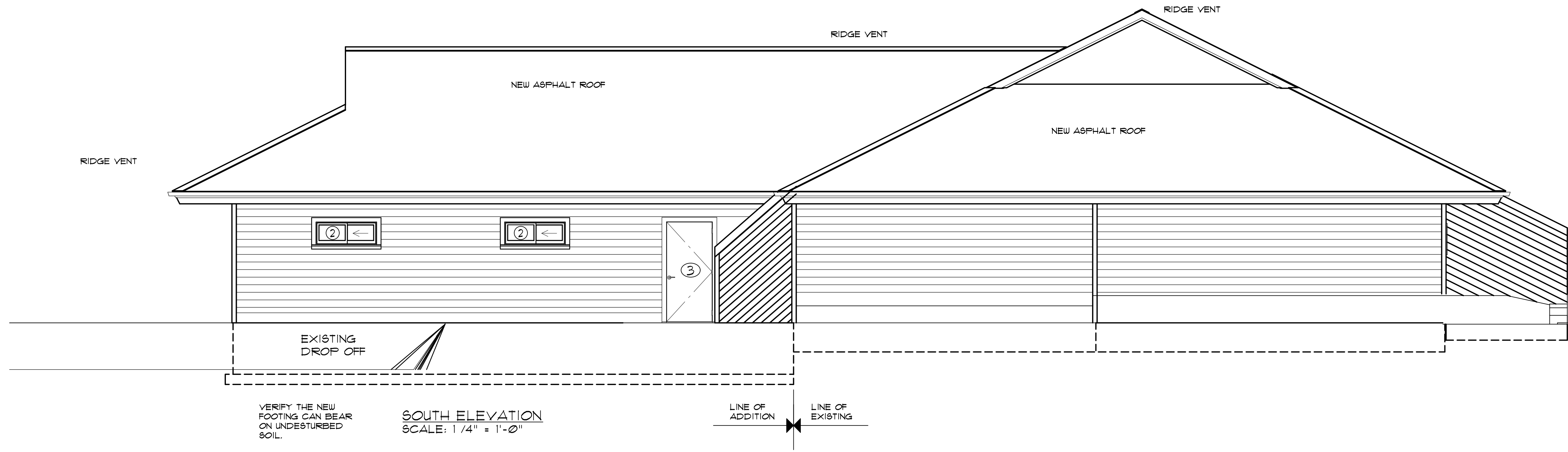
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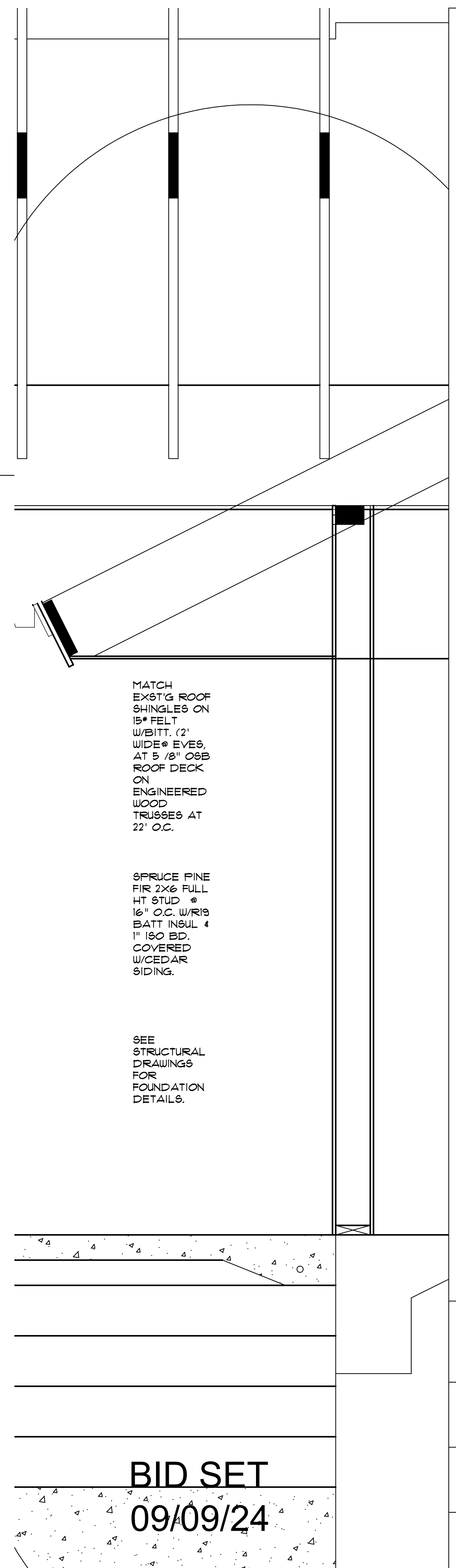
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A4



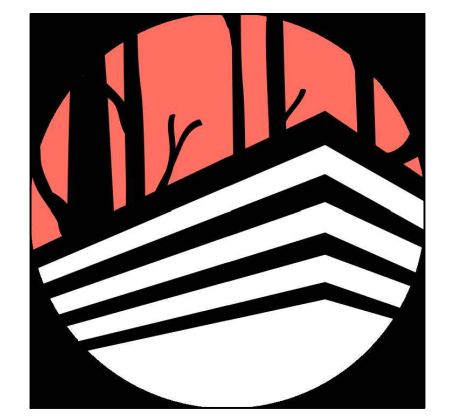
NOTE:
PRE BID ADDENDUM #1
WILL COMPLETE THE
ELEVATIONS AND WALL
SECTION. SEE ORIGINAL



BID SET
09/09/24

BID SET
09/09/24

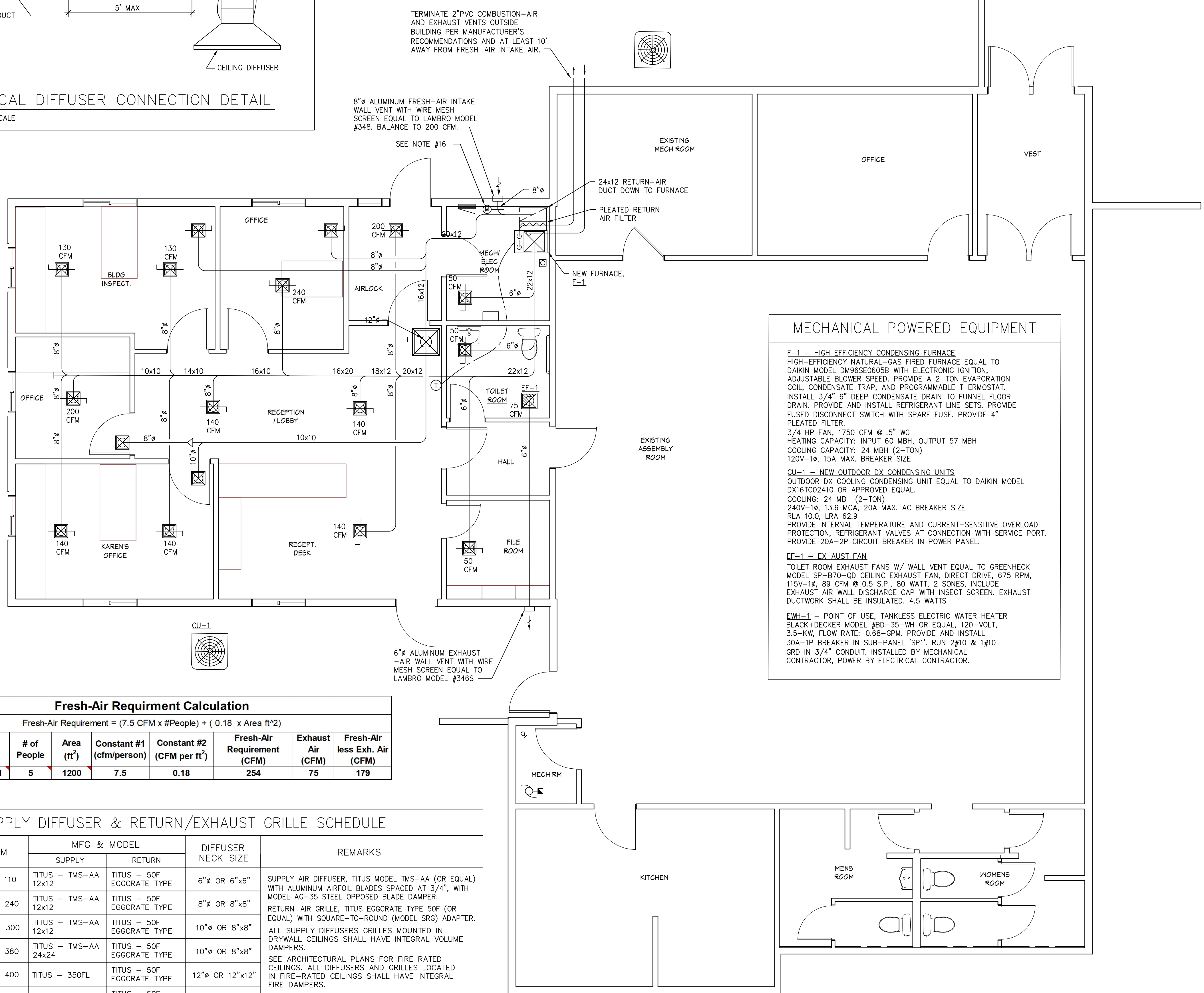
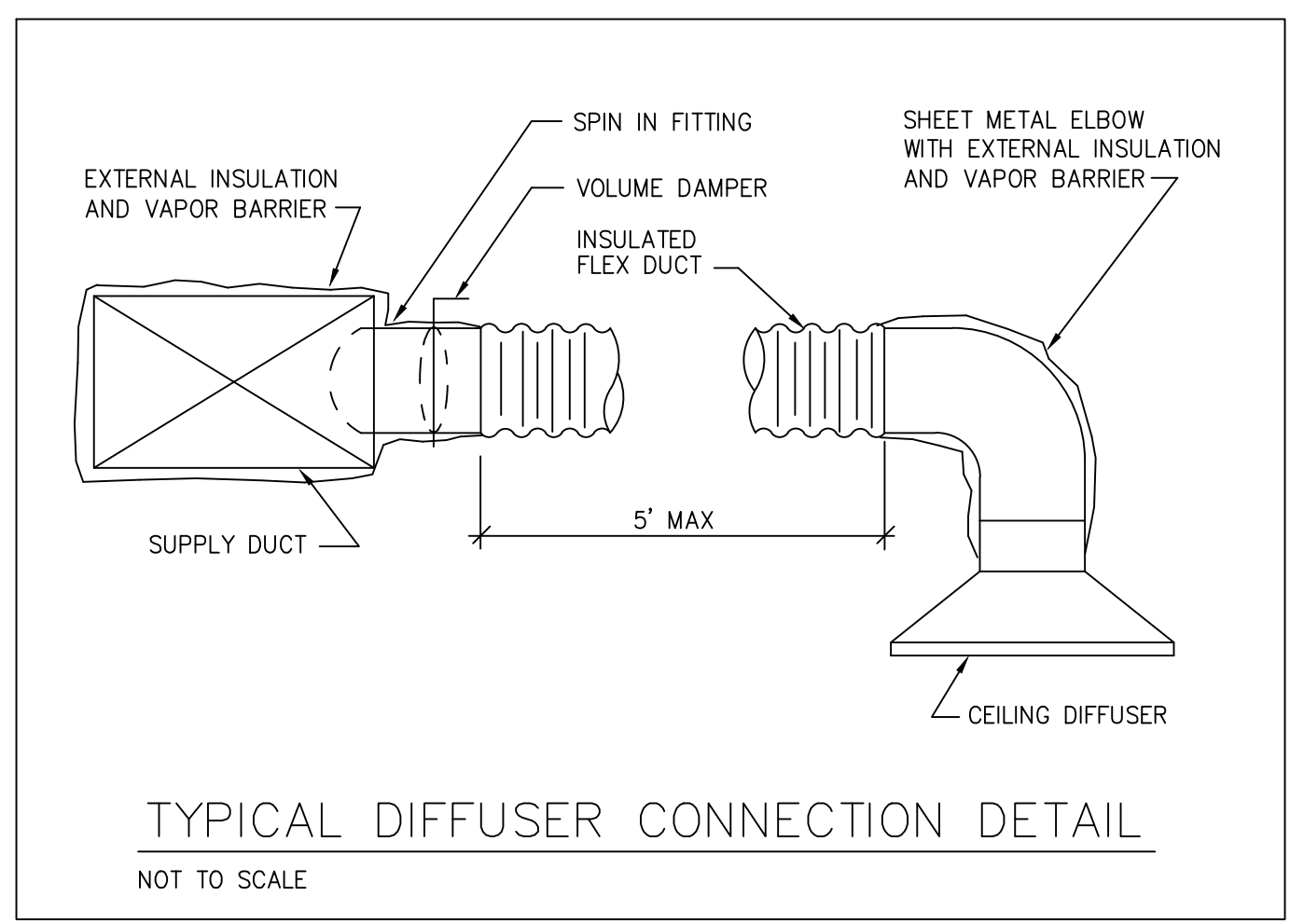
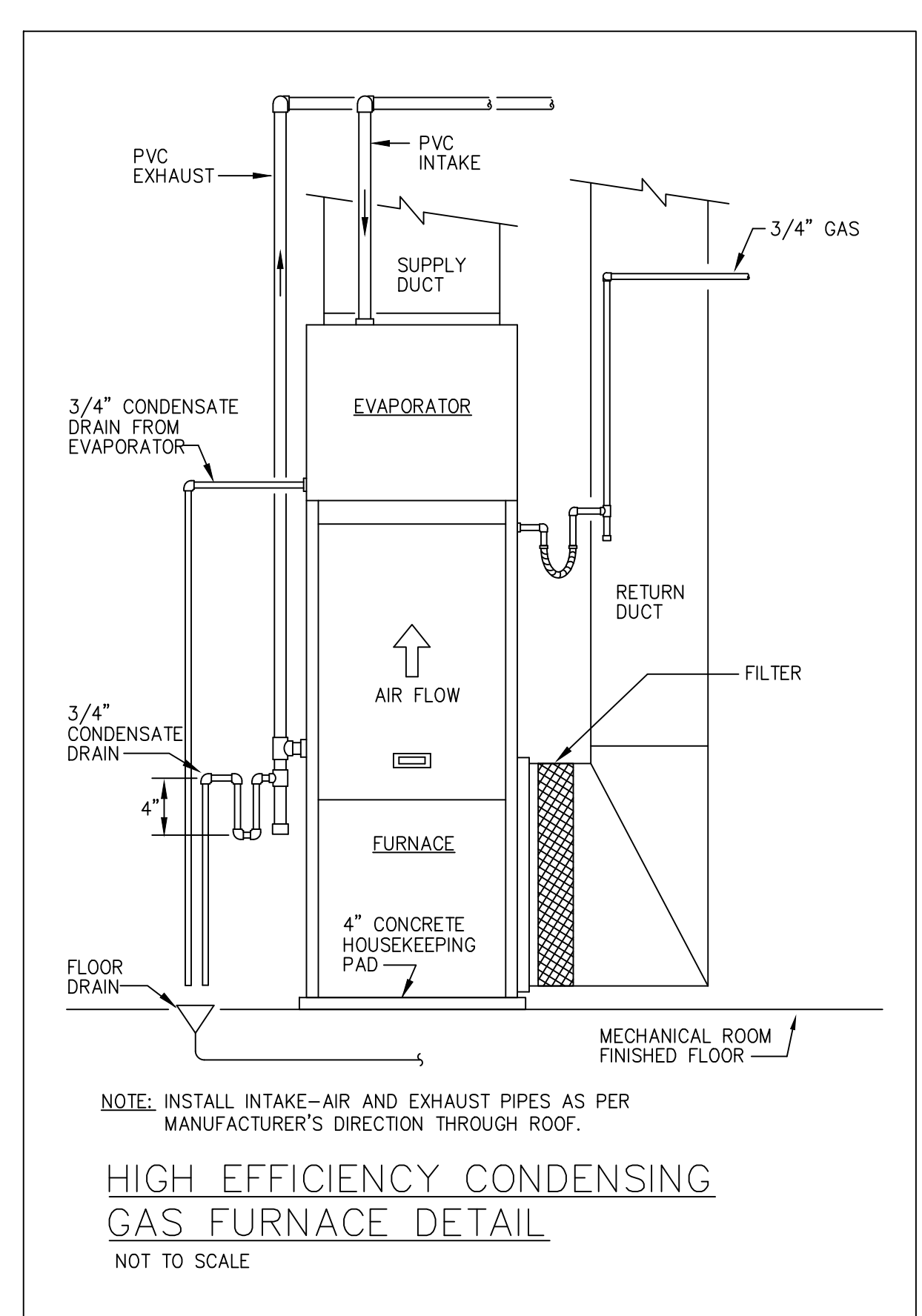
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HIGH EFFICIENCY CONDENSING GAS FURNACE DETAIL
NOT TO SCALE

TYPICAL DIFFUSER CONNECTION DETAIL
NOT TO SCALE

MECHANICAL POWERED EQUIPMENT

F-1 - HIGH EFFICIENCY CONDENSING FURNACE
HIGH-EFFICIENCY NATURAL-GAS FIRED FURNACE EQUAL TO DAIKIN MODEL DM96SE0605B WITH ELECTRONIC IGNITION, ADJUSTABLE BLOWER SPEED. PROVIDE A 2-TON EVAPORATION COIL, CONDENSATE TRAP, AND PROGRAMMABLE THERMOSTAT. INSTALL 3/4" 6" DEEP CONDENSATE DRAIN TO FUNNEL FLOOR DRAIN. PROVIDE AND INSTALL REFRIGERANT LINE SETS. PROVIDE FUSED DISCONNECT SWITCH WITH SPARE FUSE. PROVIDE 4" PLEATED FILTER.
3/4 HP FAN, 1750 CFM @ .5" WG
HEATING CAPACITY: INPUT 60 MBH, OUTPUT 57 MBH
COOLING CAPACITY: 24 MBH (2-TON)
120V-1R, 15A MAX. BREAKER SIZE

CU-1 - NEW OUTDOOR DX CONDENSING UNITS
OUTDOOR DX COOLING CONDENSING UNIT EQUAL TO DAIKIN MODEL DX16TC02410 OR APPROVED EQUAL.
COOLING: 24 MBH (2-TON)
240V-1R, 13.6 MCA, 20A MAX. AC BREAKER SIZE
RLA 10.0, LRA 62.9
PROVIDE INTERNAL TEMPERATURE AND CURRENT-SENSITIVE OVERLOAD PROTECTION, REFRIGERANT VALVES AT CONNECTION WITH SERVICE PORT. PROVIDE 20A-2P CIRCUIT BREAKER IN POWER PANEL.

EF-1 - EXHAUST FAN
TOILET ROOM EXHAUST FANS W/ WALL VENT EQUAL TO GREENHECK MODEL SP-B70-QD CEILING EXHAUST FAN, DIRECT DRIVE, 675 RPM, 115V-1R, 89 CFM @ 0.5 S.P., 80 WATT, 2 SONES, INCLUDE EXHAUST AIR WALL DISCHARGE CAP WITH INSECT SCREEN. EXHAUST DUCTWORK SHALL BE INSULATED. 4.5 WATTS

EW-1 - POINT OF USE, TANKLESS ELECTRIC WATER HEATER
BLACK+DECKER MODEL #BD-35-WH OR EQUAL, 120-VOLT, 3.5-KW, FLOW RATE: 0.68-GPM. PROVIDE AND INSTALL 30A-1P BREAKER IN SUB-PANEL "SP1". RUN 2#10 & 1#10 GRD IN 3/4" CONDUIT. INSTALLED BY MECHANICAL CONTRACTOR, POWER BY ELECTRICAL CONTRACTOR.

MECHANICAL NOTES:

- FABRICATE GALVANIZED DUCT IN ACCORDANCE WITH THE ASHRA GUIDE AND SMACNA LOW PRESSURE DUCT CONSTRUCTION STANDARDS.
- WHEN DUCT SHAPES OR DIMENSIONS ARE CHANGED FROM THOSE SHOWN ON THE DRAWINGS, DUCT CROSS-SECTIONAL AREAS MUST BE MAINTAINED. DUCT SIZES SHOWN ON PLANS ARE MINIMUM CROSS SECTIONAL SIZES.
- DRAWINGS ARE SCHEMATIC ONLY. MECHANICAL CONTRACTOR SHALL RUN MAIN DUCTS IN ATTIC SPACE. FLEX DUCT MAY BE USED AT CONNECTION TO DIFFUSERS. FLEXIBLE DUCTS MUST BE LESS THAN 5 FEET LONG. MINIMIZE BENDS IN FLEXIBLE DUCTS.
- DRAWINGS ARE SCHEMATIC ONLY. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE ROUTING OF ALL DUCTWORK. ANY CHANGES IN DUCT ROUTING, SIZE, OR TRANSITIONS REQUIRED TO MISS OBSTRUCTIONS OR CONFLICTS WITH OTHER TRADES SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR AND SHALL BE AT HIS EXPENSE.
- SUPPLY TAKE-OFF FITTINGS SHALL BE EQUIPPED WITH LOCKING QUADRANT DAMPERS FOR AIR-BALANCING, AS SHOWN ON DRAWINGS.
- BALANCE ALL DIFFUSERS, GRILLES AND FRESH-AIR DUCTS TO THE FLOW RATES SHOWN ON DRAWINGS TO WITHIN +/- 10% OF LISTED FLOW RATES.
- THERMOSTATS SHALL BE PLACED IN AREAS DESIGNATED ON DRAWINGS, ON INTERIOR WALLS AWAY FROM DRAFTS, HEATING, OR COOLING SOURCES.
- MATERIALS EXPOSED WITHIN PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84.
- PROVIDE AND SUPPORT DUCTS WITH MICHIGAN BUILDING CODE ACCEPTED DUCT HANGERS AT INTERVALS NOT EXCEEDING 10 FEET.
- PROVIDE & INSTALL FRESH-AIR INLET AND CONNECT TO MAIN RETURN-AIR DUCT AT FURNACE AS SHOWN AND AS REQUIRED BY LOCAL CODES AND/OR MANUFACTURER'S RECOMMENDATIONS.
- MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL REFRIGERANT LINES FROM FURNACE EVAPORATOR COIL TO OUTDOOR DX CONDENSER.
- PROVIDE ACCESS TO ALL MECHANICAL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURER'S MINIMUM CLEARANCES. OPERATING INSTRUCTIONS SHALL BE PERMANENTLY AND PROMINENTLY AFFIXED TO EACH APPLIANCE OR SHALL BE SHIPPED WITH THE EQUIPMENT. THE INSTRUCTIONS SHALL INDICATE IGNITION PROCEDURES, OPERATING INSTRUCTIONS, OWNER MAINTENANCE, AND SHUTDOWN PROCEDURES.
- PROVIDE AND SUPPORT DUCTS WITH MICHIGAN BUILDING CODE ACCEPTED DUCT HANGERS AT INTERVALS NOT EXCEEDING 10 FEET.
- WHERE FIRE DAMPERS ARE REQUIRED AND SHOWN ON PLANS, FIRE DAMPERS SHALL HAVE ACCESS IN DRYWALL CEILINGS.
- PROVIDE AND INSTALL CONDENSATE DRAINAGE FROM NEW FURNACE. PROVIDE AND INSTALL A CONDENSATE PUMP IF NECESSARY.
- CONNECT 8" FRESH-AIR DUCT TO FURNACE RETURN AIR DUCT. INSTALL MOTORIZED VOLUME DAMPER TO BE OPENED AND ENERGIZED BE FURNACE FAN ACTIVATION.

Fresh-Air Requirement Calculation

Fresh-Air Requirement = (7.5 CFM x #People) + (0.18 x Area ft²)

FURNACE	# of People	Area (ft ²)	Constant #1 (cfm/person)	Constant #2 (CFM per ft ²)	Fresh-Air Requirement (CFM)	Exhaust Air (CFM)	Fresh-Air less Exh. Air (CFM)
F-1, NEW ADDITION	5	1200	7.5	0.18	254	75	179

SUPPLY DIFFUSER & RETURN/EXHAUST GRILLE SCHEDULE

TYPE	TAG	CFM	MFG & MODEL		DIFFUSER NECK SIZE	REMARKS
			SUPPLY	RETURN		
A	☒/☒	10 - 110	TITUS - TMS-AA 12x12	TITUS - 50F EGGRATE TYPE	6"Ø OR 6"x6"	SUPPLY AIR DIFFUSER, TITUS MODEL TMS-AA (OR EQUAL) WITH ALUMINUM AIRFOIL BLADES SPACED AT 3/4", WITH MODEL AG-35 STEEL OPPOSED BLADE DAMPER.
B	☒/☒	120 - 240	TITUS - TMS-AA 12x12	TITUS - 50F EGGRATE TYPE	8"Ø OR 8"x8"	RETURN-AIR GRILLE, TITUS EGGRATE TYPE 50F (OR EQUAL) WITH SQUARE-TO-ROUND (MODEL SRG) ADAPTER.
C	☒/☒	250 - 300	TITUS - TMS-AA 12x12	TITUS - 50F EGGRATE TYPE	10"Ø OR 8"x8"	ALL SUPPLY DIFFUSERS GRILLES MOUNTED IN DRYWALL CEILINGS SHALL HAVE INTEGRAL VOLUME DAMPERS.
D	☒/☒	310 - 380	TITUS - TMS-AA 24x24	TITUS - 50F EGGRATE TYPE	10"Ø OR 8"x8"	SEE ARCHITECTURAL PLANS FOR FIRE RATED CEILINGS. ALL DIFFUSERS AND GRILLES LOCATED IN FIRE-RATED CEILINGS SHALL HAVE INTEGRAL FIRE DAMPERS.
E	☒/☒	390 - 400	TITUS - 350FL	TITUS - 50F EGGRATE TYPE	12"Ø OR 12"x12"	
E	☒/☒	390 - 700	TITUS - 350FL	TITUS - 50F EGGRATE TYPE	12"Ø OR 12"x12"	

NOTE: CEILING MOUNTED SUPPLY DIFFUSERS ARE 4-WAY THROW UNLESS OTHERWISE NOTED.

MECHANICAL HVAC PLAN - NEW ADDITION
SCALE: 1/4"=1'-0"

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M1

MECHANICAL SPECIFICATIONS

WORK REQUIRED

A. WHERE JOB CONDITIONS REQUIRE MINOR DEVIATIONS AND/OR REASONABLE CHANGES IN INDICATED LOCATIONS AND/OR ARRANGEMENTS, SUCH DEVIATIONS AND/OR CHANGES SHALL BE MADE WITHOUT EXTRA COST TO THE OWNER.

B. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS OR METHODS LISTED, MENTIONED OR SCHEDULED ON THE DRAWINGS AND/OR HEREIN INCLUDING ALL LABOR, MATERIALS AND INCIDENTALS NECESSARY AND REQUIRED FOR THEIR COMPLETION AND OPERATION.

PERMITS & INSPECTIONS

A. TAKE OUT ALL PERMITS REQUIRED AND ARRANGE FOR NECESSARY INSPECTIONS AND PAY FOR FEES AND EXPENSES IN CONNECTION THEREWITH AS PART OF THIS WORK.

CODES & STANDARDS

A. ALL WORK SHALL BE EXECUTED IN ACCORDANCE WITH ALL LOCAL AND STATE LAWS, RULES AND REGULATIONS APPLICABLE.

B. SHOULD ANY CHANGES IN PLANS AND SPECIFICATIONS BE REQUIRED TO COMPLY WITH LOCAL REGULATIONS, THE CONTRACTOR SHALL NOTIFY THE ENGINEERS BEFORE SUBMITTING HIS BID. AFTER ENTERING INTO CONTRACT, THE CONTRACTOR WILL BE HELD TO COMPLETE ALL WORK NECESSARY TO MEET THE LOCAL REQUIREMENTS WITHOUT COST TO THE OWNER.

DRAWINGS

A. CONTRACT DRAWINGS

1. THE DRAWINGS ARE NOT INTENDED TO BE SCALED FOR ROUGH-IN MEASUREMENTS NOR TO SERVE AS SHOP DRAWINGS. FIELD MEASUREMENTS FOR GETTING OUT MATERIALS AND FITTING THE INSTALLATION INTO THE BUILDING CONSTRUCTION AND ARRANGEMENT SHALL BE TAKEN BY THE CONTRACTOR.

GUARANTEE & MAINTENANCE MANUALS

A. GUARANTEE

1. THE CONTRACTOR SHALL GIVE TO THE OWNER OR OWNER'S REPRESENTATIVE A WRITTEN GUARANTEE THAT HE WILL MAKE GOOD AT HIS OWN EXPENSE ANY IMPERFECTIONS IN MATERIAL AND WORKMANSHIP WHICH MAY DEVELOP UNDER ORDINARY USE WITHIN A PERIOD OF ONE (1) YEAR FROM FINAL ACCEPTANCE OF THE WORK. THE CONTRACTOR SHALL FILE WITH THE OWNER OR OWNER'S REPRESENTATIVE ANY AND ALL WRITTEN GUARANTEES FROM THE MANUFACTURERS. SUCH GUARANTEES SHALL STATE UNDER WHAT OPERATING CONDITIONS AND PERFORMANCE CAPACITIES THEY ARE BASED.

B. MAINTENANCE MANUALS

1. THE CONTRACTOR SHALL SUBMIT TO THE OWNER OR OWNER'S REPRESENTATIVE A MANUAL PRESENTING FULL DETAILS FOR THE CARE AND MAINTENANCE OF ALL VISIBLE SURFACES AND EQUIPMENT, AS WELL AS CONCEALED OR REMOTE EQUIPMENT WHICH REQUIRES PERIODIC MAINTENANCE.

CUTTING & PATCHING

A. ALL CUTTING AND PATCHING THAT MAY BE NECESSARY IN CONNECTION WITH WORK UNDER THE MECHANICAL CONTRACTOR SHALL BE BY THE MECHANICAL CONTRACTOR. PATCHING SHALL BE DONE WITH EQUAL MATERIALS AS USED IN ORIGINAL CONSTRUCTION.

B. NO CUTTING OF STRUCTURAL MEMBERS OR BURNING OR DRILLING OF HOLES THROUGH BEAMS SHALL BE DONE WITHOUT THE SPECIFIC PERMISSION OF THE ENGINEER.

C. PENETRATIONS THROUGH FIRE RATED WALLS AND FLOORS SHALL BE SEALED WITH A FIRE-RATED SILICONE SEALANT.

DAMAGE TO OTHER WORK

A. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE TO OTHER WORK CAUSED BY HIS WORK OR THROUGH THE NEGLIGENCE OF HIS WORKMEN. ALL REPAIRING OF DAMAGED WORK WILL BE DONE BY THE CONTRACTOR WHO INSTALLED THE WORK, BUT THE COST OF SAME SHALL BE PAID BY THE MECHANICAL CONTRACTOR.

EQUIPMENT SETTING

A. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MATERIALS AND EQUIPMENT AND SETTING IN PLACE.

CLEANING & FINISHING

A. ALL DUCTWORK SHALL BE CLEAN AT COMPLETION OF JOB. ALL CLEANABLE TYPE AIR FILTERS SHALL BE THOROUGHLY WASHED AND RECHARGED AND REINSTALLED AT COMPLETION OF JOB. ALL REPLACEABLE TYPE AIR FILTERS SHALL BE REPLACED WITH NEW FILTERS.

B. AFTER ALL TESTS HAVE BEEN MADE AND THE WORK SPACE PRONOUNCED TIGHT, EACH CONTRACTOR SHALL CAREFULLY MAKE A THOROUGH INSPECTION OF THE ENTIRE INSTALLATION AND EITHER DO HIMSELF, OR ARRANGE TO HAVE THE ENTIRE WORK THOROUGHLY CLEANED, ALL RUBBISH REMOVED AND LEAVE ALL WORK SATISFACTORY TO THE OWNER.

DUCTWORK

A. LOW PRESSURE

1. ALL SHEET METAL IN CONNECTION WITH HEATING AND VENTILATING SYSTEMS DESCRIBED HEREIN, UNLESS OTHERWISE SPECIFIED SHALL BE NO. 1 SMOOTH FINISH OPEN HEARTH GALVANIZED STEEL, EQUAL TO WHEELING COP-R-LOY SOFTITE, PRIME SHEETS NOT LESS THAN THE FOLLOWING GAUGE:

6" TO 12" AND SMALLER NO. 26 GAUGE
13" TO 30" WIDE NO. 24 GAUGE
31" TO 40" WIDE NO. 22 GAUGE

2. ALL ELBOWS OR TURNS SHALL HAVE EASY BEND WITH THROAT RADI NOT LESS THAN 1-1/2 TIMES DIAMETER OR WIDTH OF DUCT UNLESS BUILDING CONDITIONS WILL NOT PERMIT IN WHICH CASE, TURNING VANES AS HEREINAFTER SPECIFIED SHALL BE INSTALLED.

3. CONSTRUCT, BRACE OR SUPPORT DUCTS IN MANNER THAT THEY WILL NOT SAG NOR VIBRATE TO ANY PERCEPTIBLE EXTENT WHEN FANS ARE OPERATING AT MAXIMUM SPEED AND CAPACITY.

DUCT ACCESSORIES

A. VOLUME DAMPERS

1. PROVIDE VOLUME DAMPER OF 18 GAUGE GALVANIZED SHEET IRON AT ALL BRANCHES OF DUCTS AND WHERE SHOWN ON OR NECESSARY TO SECURE THE PROPER DISTRIBUTION OF AIR.

2. DAMPERS CONCEALED IN DUCTS WHICH ARE NOT IN ACCESSIBLE PLACES, BEHIND WALLS, FURRING OR SUSPENDED CEILING SHALL HAVE THE ROD FORMING THE DAMPER TRUNNION EXTENDING TO AN ACCESSIBLE POINT AND CONNECTED TO A MCGUINNES, PERFECTO, OR YOUNG LOCK PROVIDED BY THIS CONTRACTOR.

INSTALLATION OF DUCTWORK

A. FLEXIBLE INSULATION MAY BE USED IN THE ATTIC SPACE TO TERMINATE AT SUPPLY DIFFUSER BUT SHALL NOT EXCEED 5 FEET IN LENGTH.

B. CROSS-BREAK OR KINK ALL FLAT SURFACES TO PREVENT VIBRATION.

C. WHEREVER OBSTRUCTIONS REQUIRE A CHANGE IN DUCT SHAPE, MAINTAIN THE EQUIVALENT AREAS. ALL SIZES SHOWN ON THE DRAWINGS ARE DIMENSIONS INSIDE THE INSULATION.

D. AT ALL DISCHARGE DUCTWORK, INTERNALLY SEAL WITH MASTIC AT ALL JOINTS.

NEW FURNACES

A. EACH FURNACE SHALL HAVE ALUMINIZED STEEL HEAT EXCHANGER AND BURNERS, STEEL CABINET

B. UP-FLOW & HORIZONTAL FURNACES

1. FURNISH AND INSTALL WHERE SHOWN ON PLANS AN UPFLOW HIGH EFFICIENCY FURNACE.

2. HEAT EXCHANGER SHALL BE PREMIUM QUALITY COATED STEEL.

3. BURNERS SHALL BE ALUMINIZED STEEL DESIGNED FOR EVEN GAS DISTRIBUTION.

4. BLOWER SHALL BE CENTRIFUGAL DOUBLE INLET COMPLETE WITH MULTI-SPEED DIRECT DRIVE OR V-BELT DRIVEN MOTOR.

5. CABINET SHALL BE HEAVY DUTY STEEL WITH BAKED ON ENAMEL FINISH.

6. FILTERS SHALL BE 4" PLEATED PERMANENT CLEANABLE OR THROWAWAY.

7. CONTROLS SHALL CONSIST OF DUAL GAS VALVES TO PROVIDE 100% SHUT OFF. MAIN BURNER AND PILOT SHALL BE EXTINGUISHED DURING EACH OFF CYCLE. PILOT SHALL BE ELECTRONIC SPARK IGNITION, MAIN GAS VALVE WILL OPEN ONLY ON PROOF OF PILOT IGNITION. THERMOSTAT SHALL BE PROGRAMMABLE HEAT-COOL-AUTO-OFF WITH FAN ON AUTO SWITCH FURNISHED WITH AIR COOLED CONDENSING UNIT.

EVAPORATOR COIL

A. COIL SHALL MATCH FURNACE AS HEREINBEFORE SPECIFIED AND CONDENSING UNIT AS HEREINAFTER SPECIFIED AND/OR LISTED ON PLANS.

B. DIRECT EXPANSION EVAPORATOR COILS

1. SHALL BE SEAMLESS TUBE ALUMINUM FIN TYPE WITH HEADER AND LOW PRESSURE DROP DISTRIBUTION.

2. COIL PERFORMANCE SHALL BE CERTIFIED IN ACCORDANCE WITH ARI STANDARD 410-64.

3. COILS SHALL BE DESIGNED TO SUIT AND SUPPLIED WITH (AIR SUPPLY UNITS AS HEREINAFTER SPECIFIED) AND MATCHED TO AIR COOLED CONDENSER.

MECHANICAL SUPPORTING DEVICES

A. GENERAL

1. PROVIDE AND INSTALL ALL REQUIRED SUPPORTS FOR PIPING AND DUCTWORK, ETC.

2. SUPPORTS SHALL SECURE PIPES IN PLACE, SHALL PREVENT PIPE VIBRATION, MAINTAIN REQUIRED GRADING BY PROPER ADJUSTMENT, PROVIDE FOR EXPANSION AND CONTRACTION AND SHALL MAKE NEAT APPEARANCE.

3. FASTEN SUPPORTS AND HANGERS TO BUILDING FRAMING WHEREVER PRACTICABLE, HOWEVER, VIBRATION MUST NOT BE TRANSMITTED AT THE POINTS OF CONTACT.

4. HANGERS SHALL BE CAPABLE OF VERTICAL ADJUSTMENT AFTER PIPING IS ERECTED.

5. HANGERS SHALL BE SIZE FOR INSULATION.

REFRIGERANT PIPING

A. REFRIGERANT PIPING SHALL BE TYPE 'L' REFRIGERANT QUALITY COPPER OR PRE-CHARGED LINE SETS.

SOLDERING

A. SOLDERED AND "SWEAT" JOINTS SHALL BE USED FOR ALL COPPER AND BRASS FITTINGS, VALVES AND TUBING, USING THE 50-50 TIN LEAD SOLDER AND SOLDERING FLUX AND METHODS RECOMMENDED BY THE MANUFACTURER OF THE TUBING AND FITTING.

B. 45% SILVER SOLDER SHALL BE USED FOR ALL BURIED PIPE AND ALL REFRIGERANT PIPING.

C. NO LEAD BEARING SOLDER SHALL BE USED ON POTABLE WATER SYSTEMS.

REFRIGERANT PIPING INSULATION

A. REFRIGERANT SUCTION LINES SHALL BE COVERED WITH 1/2" THICK FLEXIBLE TUBING PROPERLY SEALED AND SECURED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

DOMESTIC HOT & COLD WATER PIPING:

BASE BID SHALL BE PEX OR PVC/CPVC. AT EQUIPMENT PIPING SHALL BE TRANSITIONED TO COPPER AND SECURELY FASTENED TO BUILDING STRUCTURE FOR A RIGID CONNECTION TO EQUIPMENT. PROVIDE STOP VALVES AT ALL EQUIPMENT.

DUCT INSULATION (IN UNCONDITIONED SPACES):

A. COVERING ON CONCEALED DUCTWORK SHALL BE 1" THICK .75# DENSITY FLEXIBLE - FIBERGLASS WITH FOIL REINFORCED KRAFT (FRK) JACKET NEATLY PASTED AND STAPLED IN PLACE.

B. COVERING ON ALL EXPOSED DUCTS, FRESH AIR INTAKE DUCTS AND MIXED AIR CHAMBERS SHALL BE EQUAL TO FIBERGLASS 25# EQUIPMENT INSULATION IN EXCESS OF 4#/CU. FT. DENSITY, 1" THICK, SECURED WITH SUITABLE MECHANICAL FASTENERS AND FASTENER CAPS SUPPLIED BY MANUFACTURER. APPLY JOINT SEALING TAPE OWENS-CORNING FIBERGLASS TYPE "C" TO ALL JOINTS, ALL BY INSULATION MANUFACTURER.

VALVES:

A. IN GENERAL, GATE VALVES SHALL BE USED FOR OPEN-CLOSED OPERATION AND GLOBE OR ANGLE VALVES SHALL BE USED WHERE THROTTLING FLOW IS REQUIRED.

B. PROVIDE DRAIN FITTINGS AT LOW POINTS OF ALL HOT WATER HEATING AND DOMESTIC WATER PIPING SYSTEMS CONSISTING OF A NIPPLE AND CAP EXCEPT WHERE OTHERWISE NOTED.

C. GATE VALVES SHALL BE PROVIDED AT EACH TAKE-OFF FROM THE MAIN AS INDICATED ON THE PLANS. WHERE THROTTLING IS REQUIRED, A GLOBE VALVE SHALL BE INSTALLED.

D. ALL VALVES SHALL BE CRANE, GRINNELL, HAMMOND, JENKINS, STOCKHAM, WALWORTH, NIBCO OR LUNKENHEIMER EXCEPT WHERE SPECIFICALLY NOTED. ONE MANUFACTURER THROUGHOUT THE PROJECT.

E. IN GAS LINES, VALVES UP TO AND INCLUDING 2" IN SIZE SHALL BE BROWNSTEAD PLAIN STRAIGHTWAY SCREWED COCKS, CRANE NO. 252, WALWORTH, HOMESTEAD FIG. 2 OR NORDSTROM.SP

F. IN GAS LINES, VALVES 2-1/2" IN SIZE AND LARGER SHALL BE LUBRICATED PLUG TYPE, 150# W.P., SEMI-STEEL BODY, HOMESTEAD NO. 602, NORDSTROM, FIG. 115 OR WALWORTH FIG. 1705.

BALL VALVES:

A. BALL VALVES FOR GENERAL SERVICE SHALL BE SINGLE BODY, CARBON STEEL THREADED OR BRASS WITH SOLDER ENDS AS REQUIRED.

B. IN STEEL PIPE UP TO 3" IN SIZE SHALL BE SCREWED ALL BRONZE WITH UNION BONNET, 150# COMPOSITION DISC

PIPE SLEEVES & ESCUTCHEONS

A. PROVIDE AND INSTALL PIPE SLEEVES FOR ALL PIPING AND DUCTS PASSING THROUGH WALLS, FLOORS AND CEILINGS. PIPE SLEEVES WILL NOT BE REQUIRED IN WALLS ABOVE CEILING UNLESS CEILING SPACES ARE USED FOR AIR PLENUMS.

B. SLEEVES THROUGH WALLS BELOW GRADE AND ALL FLOORS SHALL BE BLACK STEEL PIPE OF SUFFICIENT SIZE TO PERMIT FREE MOVEMENT OF PIPE.

C. SLEEVES THROUGH WALLS AND CEILINGS MAY BE 20 GAUGE GALVANIZED SHEET METAL.

D. WHERE PIPES ARE INSULATED, SLEEVES SHALL BE LARGE ENOUGH TO PASS THE INSULATION.

E. TERMINATE SLEEVES FLUSH WITH WALLS AND CEILINGS, 1/4" ABOVE FLOORS EXCEPT IN EQUIPMENT ROOMS WHICH SHALL TERMINATE 4" ABOVE EQUIPMENT ROOM FLOOR.

F. SET SLEEVES AND OBTAIN APPROVAL OF THEIR LOCATION IN AMPLE TIME TO PERMIT POURING OF CONCRETE OR OTHER CONSTRUCTION WORK AS SCHEDULED.

G. IF SLEEVES HAVE BEEN OMITTED DUE TO FAILURE OF SETTING THEM IN TIME, BEAR COST OF CUTTING OPENINGS, SETTING SLEEVES, AND FILLING IN WITH MATERIALS FOR PARTICULAR CONSTRUCTION WORK AS APPROVED.

H. FILL SPACE BETWEEN SLEEVES AND PIPE IN UNDERGROUND WALLS WITH WATERPROOF SEALANT ON BOTH SIDES OF WALL.

I. WHERE PIPES OR STACKS PASS THROUGH ROOF, USE LEAD SLEEVE WITH EDGES TURNED INTO PIPE AND SOLDERED TO PIPE OR DOW SERALOY FLASHING INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

DAMAGE TO OTHER WORK

A. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE TO OTHER WORK CAUSED BY HIS WORK OR THROUGH THE NEGLIGENCE OF HIS WORKMEN. ALL REPAIRING OF DAMAGED WORK WILL BE DONE BY THE CONTRACTOR WHO INSTALLED THE WORK, BUT THE COST OF SAME SHALL BE PAID BY THE MECHANICAL CONTRACTOR. SEE "CUTTING & PATCHING" HEREINBEFORE SPECIFIED.

HANGERS

A. HANGERS FOR PIPING SHALL BE AS HEREINBEFORE SPECIFIED.

B. HANGERS SHALL BE LOCATED AT ALL CHANGES IN DIRECTION AND ON MINIMUM CENTERS AS FOLLOWS:

1. STEEL PIPING

UP TO 1-1/2" 8"-0" MAX. CENTERS WITH 3/8" MIN. ROD

1-1/2" TO 3" SIZE 10"-0" MAX. CENTERS WITH 1/2" MIN. ROD

4" TO 6" SIZE 12"-0" MAX. CENTERS WITH 5/8" MIN. ROD

2. COPPER PIPING - 8"-0" MIN. CENTERS WITH 3/8" MIN. ROD.

TESTS & ADJUSTMENTS

A. THE FOLLOWING TESTS, IN ADDITION TO THOSE REQUIRED BY CODES, SHALL BE MADE BY THE RESPECTIVE CONTRACTOR WHOSE WORK IS INVOLVED:

1. ALL DOMESTIC WATER LINES SHALL BE TESTED AT A PRESSURE OF 100#/SQ. IN. BEFORE COVERING, IN THE PRESENCE OF THE ARCHITECTS FOR AT LEAST FOUR (4) HOURS, AND ANY DEFECTS MUST BE REPAIRED IMMEDIATELY. UNDERGROUND WATER LINES SHALL BE TESTED FOR EIGHT (8) HOURS.

2. GAS PIPING SHALL BE TESTED PER NFPA PAMPHLET #54.

3. GAS PIPING SHALL BE TESTED WITH SOAP SUDS AT JOINTS AND 50# AIR PRESSURE IN PIPING. ALL LEAKS SHALL BE REMEDIED.

4. REFRIGERANT PIPING SHALL BE TESTED AT 300#/SQ. IN. WITH REFRIGERANT AND APPROVED LEAK DETECTION DEVICES.

5. ALL PIPING WHICH IS REQUIRED TO BE PLACED WITHIN CONSTRUCTION OR CONCEALED SHALL BE CAREFULLY TESTED BEFORE BEING PERMANENTLY COVERED UP.

CLEANING & FINISHING

A. DURING THE CONSTRUCTION PERIOD, MECHANICAL CONTRACTOR SHALL REMOVE ALL THE DEBRIS, RUBBISH, TOOLS, EQUIPMENT, UNUSED MATERIALS, ETC. WHEN REQUESTED BY THE ARCHITECTS.

TESTING & BALANCING

A. TESTING AND BALANCING SHALL BE PERFORMED IN COMPLETE ACCORDANCE AABC NATIONAL STANDARDS FOR FIELD MEASUREMENTS & INSTRUMENTATION, FORM NUMBER 81266, VOLUME ONE, SECTION APPLICABLE TO HYDRONIC BALANCING.

B. INSTRUMENTS USED FOR TESTING AND BALANCING OF AIR AND HYDRONIC SYSTEMS MUST HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX MONTHS AND CHECKED FOR ACCURACY PRIOR TO START OF WORK.

C. TWO (2) COPIES OF THE COMPLETE TEST REPORT SHALL BE SUBMITTED TO THE OWNER OR OWNER'S REPRESENTATIVE PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

WELDED PIPE

A. ELBOWS, TEES, REDUCERS, FLANGES, ETC. SHALL BE TUBE TURN OR EQUAL STANDARD WEIGHT WELDING FITTINGS. WELD-O-LETS MAY BE USED FOR BRANCH TAKE-OFFS WHERE BRANCH IS 1/2 THE MAIN SIZE OR LESS.

B. FLANGES SHALL BE WELDED TO PIPE BY MEANS OF WELDING NECK FLANGES. BLIND FLANGES SHALL BE MADE WITH WELDING NECK FLANGES AND BLIND FLANGES.

ECCENTRIC FITTINGS

A. ECCENTRIC FITTINGS SHALL BE USED WHERE PIPE SIZE REDUCES ON HORIZONTAL RUNS; CONCENTRIC FITTINGS SHALL BE USED ON VERTICAL RUNS. NO BUSHINGS WILL BE ALLOWED. CONCENTRIC FITTINGS MAY BE USED THROUGHOUT FOR WATER SYSTEMS.

INSULATION

A. ALL PIPE INSULATION SHALL BE SECTIONAL PIPE INSULATION, 3.5# PER CU. FT. MIN. FOR ALL CONCEALED WORK, AND 7.0# PER CU. FT. MIN. FOR ALL EXPOSED WORK INCLUDING MECHANICAL ROOMS, ETC. OR OWENS-CORNING FIBERGLAS, JOHNS MANVILLE, GUSTIN BACON OR KNAUF.

COLD WATER PIPING INSULATION

A. COLD PIPING IN EXPOSED AND CONCEALED LOCATIONS SHALL BE COVERED WITH FIBERGLAS 25 ALL SERVICE JACKET (ASJ), UL LISTED WITH FLAME SPREAD OF 25 OR LESS AND FUEL AND SMOKE RATINGS OF 50 OR LESS WITH SELF-SEALING LAP, END JOINT BUTT STRIPS FURNISHED.

B. ALL VALVE BODIES, FITTINGS, FLANGES, UNIONS, ETC. ON COLD LINES SHALL BE COVERED WITH FIBERGLAS OF EQUAL THICKNESS OF PIPE INSULATION AND COVERED WITH PRE-MOLDED PVC FITTING COVER EQUAL TO "ZESTON".

HOT WATER PIPING

A. HOT PIPING IN EXPOSED AND CONCEALED LOCATIONS SHALL BE COVERED WITH FIBERGLAS 25 ALL SERVICE JACKET (ASJ), UL LISTED WITH FLAME SPREAD OF 25 OR LESS AND FUEL AND SMOKE RATINGS OF 50 OR LESS WITH SELF-SEALING LAP, WITH END JOINT BUTT STRIPS FURNISHED.

B. ALL VALVE BODIES, FITTINGS, ETC. ON HOT PIPES SHALL BE COVERED WITH FIBERGLASS OF SAME THICKNESS AS COVERING ON PIPELINES, AND COVERED WITH PRE-MOLDED PVC FITTING COVER EQUAL TO "ZESTON".

C. PROVIDE 1/2" X 4" LONG ARMSTRONG ARMAFLEX INSULATION OR OWENS-CORNING FLEXIBLE TUBING ON HEATING PIPING WITHIN ENCLOSURE WHERE IT PASSES THROUGH VERTICAL COLUMN AT WINDOWS.

OPTIONAL PIPING INSULATION

A. RIGID PHENOLIC FOAM EQUAL TO ARMSTRONG ACCOTHERM OF EQUAL THERMAL RATING WILL BE ACCEPTABLE IF APPROVED BY STATE AND/OR LOCAL FIRE MARSHALL.

B. MOLDED RIGID POLYURETHANE FOAM PIPE INSULATION OF EQUAL THERMAL RATING WILL BE ACCEPTABLE IF APPROVED BY STATE AND/OR LOCAL FIRE MARSHALL.

MINIMUM PIPE INSULATION

PIPE SIZE		
FLUID TEMP.	RUNOUTS UP TO 2"	
120 - 200°F	& MAINS UP TO 1"	1-1/4"-2" 2-1/2"-4"

PIPE SIZE		
INSULATION THICKNESS	3/4"	1" 1"

THICKNESSES SHOWN ARE BASED ON PRODUCTS HAVING A MAXIMUM "K" FACTOR OF 0.26 AT A MEAN TEMPERATURE OF 75F. THESE THICKNESSES CAN BE REDUCED FOR PRODUCTS HAVING SIGNIFICANTLY LOWER "K" VALUES AND SHALL BE INCREASED FOR PRODUCTS HAVING HIGHER "K" VALUES IN ORDER TO PRODUCE EQUIVALENT OR GREATER THERMAL RESISTANCE.

LP OR NATURAL GAS PIPING INSTALLATION

A. WORK REQUIRED INCLUDES FURNISHING OF LABOR, MATERIALS, EQUIPMENT, FEES AND SERVICES FOR AND REASONABLY INCIDENTAL TO PROPER COMPLETION OF ALL GAS SYSTEM WORK HEREIN SPECIFIED.

B. MATERIALS AND EQUIPMENT OF TYPE AND SIZE APPROVED TO GAS COMPANY AND A.G.A. DRIP POCKETS SHALL BE INSTALLED AT BASE OF ALL RISERS AND WHEREVER ELSE REQUIRED.

C. ABOVE GROUND PIPING - BLACK STEEL PIPE WITH WELDING FITTINGS OR THREADED MALLEABLE IRON FITTINGS.

D. USED AS LOCAL SHUT-OFFS: ALL BRONZE, 125 PSI SWP, WALWORTH 591, CRANE 270.

EXECUTION AND DISTRIBUTION

A. RUN GAS PIPING FROM EXISTING LP TANK AS SHOWN ON DRAWINGS.

B. PROVIDE VALVES IN THE BRANCH AND MAKE FINAL CONNECTION.

TESTS

A. GAS PIPING SHALL BE TESTED IN ACCORDANCE WITH NFPA 54.

THERMOSTATS

A. IN GENERAL, LOW VOLTAGE ELECTRIC THERMOSTATS SHALL BE LOCK TYPE WITH RANGE OF 65 DEGREES F. - 85 DEGREES F. THERMOSTATS SHALL HAVE FAN ON-OFF-AUTO SWITCH WITH MANUAL HEATING/COOLING CHANGEOVER. THE THERMOSTATS SHALL BE MOUNTED ON AN APPROVED BASE. THE COVER SHALL HAVE ON IT AN ACCURATE THERMOMETER. THERMOSTAT SHALL HAVE A NIGHT SETBACK.

THROUGH PENETRATION FIRESTOPPING SYSTEMS

PERFORMANCE REQUIREMENTS

A. PROVIDE SYSTEMS THAT ARE UNDERWRITERS LABORATORIES INC.(UL) APPROVED.

1) PROVIDE FIRESTOP PRODUCTS THAT ARE FLEXIBLE ENOUGH TO ALLOW FOR PIPE VIBRATION IN A THROUGH PENETRATION APPLICATION.

2) PROVIDE PRODUCTS WITH THE APPROPRIATE FLAME SPREAD INDEX AND SMOKE DEVELOP INDEX, WHEN TESTED IN ACCORDANCE WITH ASTM E 84.

3) PROVIDE PRODUCTS THAT ARE COMPATIBLE WITH EACH OTHER, WITH THE SUBSTRATES FORMING OPENINGS, AND WITH THE ITEMS, IF ANY, PENETRATING THE FIRESTOPPING.

4) FIRESTOPPING MATERIALS MUST MEET AND BE ACCEPTABLE FOR USE BY ALL APPLICABLE CODES.

5) WHERE APPLICABLE PROVIDE PRODUCTS THAT MEET THE INTENT OF THE F RATING CLASSIFICATION FOR PASSAGE OF FLAME PER ASTM E 814 OR ANSI/UL 1479 FOR THROUGH PENETRATIONS.

6) WHERE APPLICABLE PROVIDE PRODUCTS THAT MEET THE INTENT OF THE T RATING CLASSIFICATION FOR THE TRANSFER OF TEMPERATURE PER ASTM E 814 OR ANSI/UL 1479 FOR THROUGH PENETRATIONS.

7) WHERE APPLICABLE PROVIDE SYSTEMS THAT MEET THE INTENT OF THE L RATING CLASSIFICATION FOR THE MOVEMENT OF SMOKE PER ANSI/UL 1479 FOR THROUGH PENETRATIONS.

8) WHERE APPLICABLE PROVIDE PRODUCTS THAT MEET THE INTENT OF THE W RATING CLASSIFICATION FOR PASSAGE OF WATER PER ANSI/UL 1479 FOR THROUGH PENETRATIONS.

QUALITY ASSURANCE

A. GENERAL: ALL THROUGH-PENETRATION FIRESTOP SYSTEMS SHALL BE INSTALLED WITH APPROVED METHODS USING MATERIALS THAT HAVE BEEN TESTED AND CLASSIFIED TO PRODUCE AN APPROVED ASSEMBLY.

SCOPE/APPLICATION

A. PROVIDE INSTALLED FIRESTOP PRODUCTS THAT LIMIT THE SPREAD OF FIRE, HEAT, SMOKE, AND GASSES THROUGH OTHERWISE UNPROTECTED OPENINGS IN RATED ASSEMBLIES, INCLUDING WALLS, PARTITIONS, FLOORS, ROOF/CEILINGS, AND SIMILAR LOCATIONS, RESTORING THE INTEGRITY OF THE FIRE RATED CONSTRUCTION TO ITS ORIGINAL FIRE RATING.

B. PROVIDE FIRESTOP SYSTEMS LISTED FOR THE SPECIFIC COMBINATION OF FIRE-RATED CONSTRUCTION, TYPE OF PENETRATING ITEM, ANNULAR SPACE REQUIREMENTS, AND FIRE RATING, AND THE FOLLOWING CRITERIA:

1) F-RATING: EQUAL TO OR GREATER THAN THE FIRE-RESISTANCE RATING OF THE ASSEMBLY IN WHICH THE FIRESTOPPING WILL BE INSTALLED.

2) T-RATING: IN HABITABLE AREAS WHERE PENETRATING ITEMS ARE EXPOSED TO POTENTIAL CONTACT WITH MATERIALS ON EXPOSED SIDE(S) OF RATED ASSEMBLY, T-RATING MUST EQUAL ITS F-RATING.

3) L-RATING: L-RATING OF 1 CFM PER LINEAR FOOT (5.5 CU M/H/M) MAXIMUM AT AMBIENT TEMPERATURES. FOR THOSE APPLICATIONS THAT REQUIRE AIR LEAKING PROTECTION.

4) W-RATING: MEETS UL WATER LEAKAGE TEST, W RATING - CLASS 1 REQUIREMENTS

FOR SYSTEMS TESTED AND LISTED IN ACCORDANCE WITH ANSI/UL 1479.

C. WALL PENETRATIONS: THROUGH PENETRATION SYSTEMS MUST BE SYMMETRICAL, WITH THE SAME RATING FROM BOTH SIDES OF THE WALL. MEMBRANE PENETRATIONS MAY BE ASYMMETRICAL.

1) DO NOT BEGIN INSTALLATION UNTIL SUBSTRATES HAVE BEEN PROPERLY PREPARED.

E. INSTALLATION

1) INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S DETAILED INSTALLATION INSTRUCTIONS AND PROCEDURES.

2) INSTALL SO THAT OPENINGS ARE COMPLETELY FILLED AND MATERIAL IS SECURELY ADHERED.

3) WHERE FIRESTOPPING SURFACE WILL BE EXPOSED TO VIEW, FINISH TO A SMOOTH, UNIFORM SURFACE FLUSH WITH ADJACENT SURFACES.

4) DO NOT COVER FIRESTOPPING WITH OTHER CONSTRUCTION UNTIL APPROVAL OF AUTHORITY HAVING JURISDICTION HAS BEEN RECEIVED.



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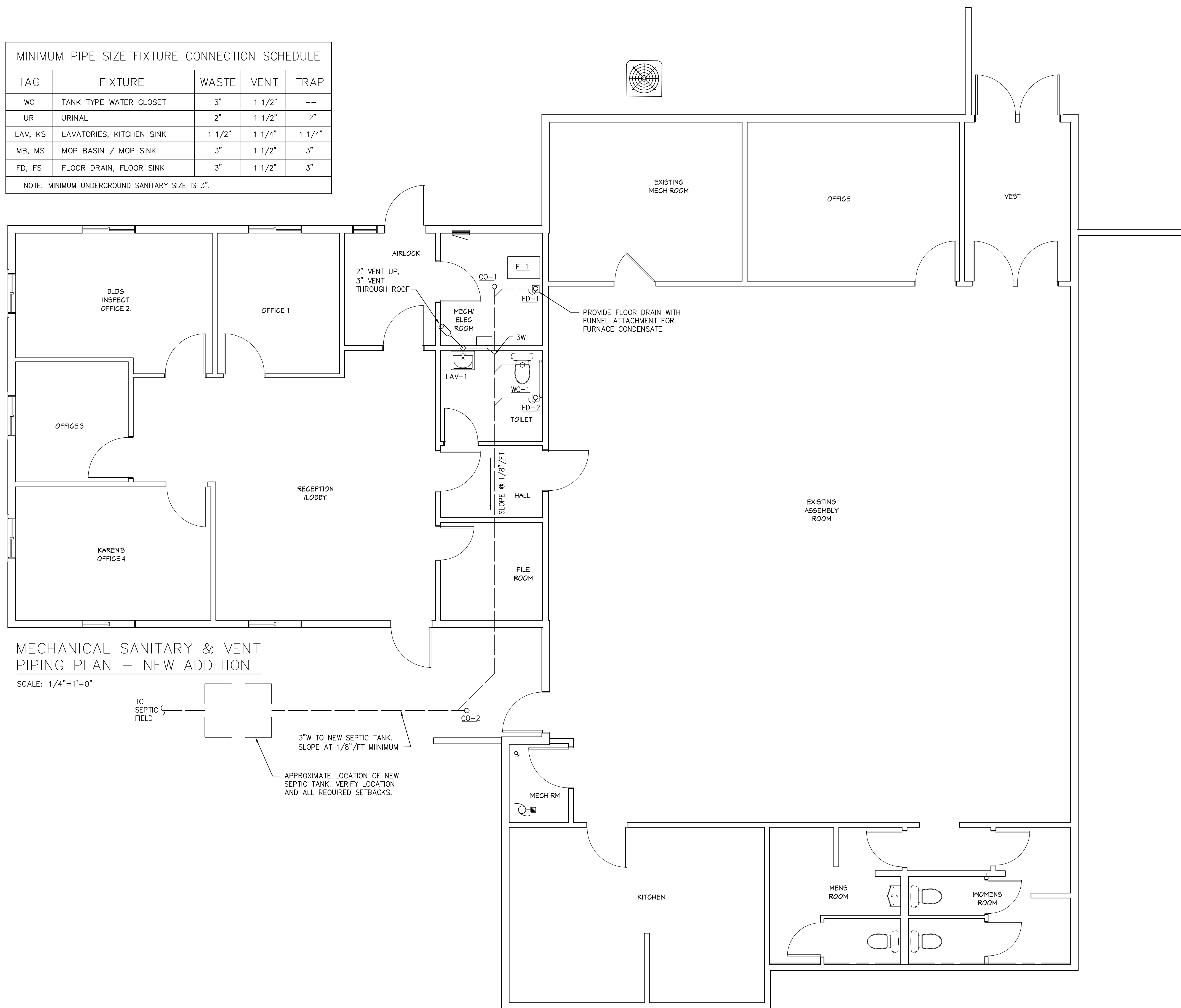
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SANITARY & VENT PIPING NOTES:

- SANITARY AND VENT PIPING IS SHOWN SCHEMATICALLY ONLY.
- SEE MINIMUM FIXTURE CONNECTION SIZE SCHEDULE FOR CONNECTION SIZE TO PLUMBING FIXTURES.
- SANITARY PIPING SHALL BE SLOPED AT 1/8" PER FOOT MINIMUM FOR 3" & LARGER PIPING. 2" SANITARY PIPING SHALL BE SLOPED AT 1/4" PER FOOT MINIMUM.
- ALL PIPE PENETRATIONS THROUGH FIRE RATED WALLS MUST BE SEALED WITH A FIRE RATED SILICONE SEALANT.
- CONDENSATE DRAINAGE FROM FURNACES SHALL BE PROVIDED IN ACCORDANCE WITH MICHIGAN MECHANICAL CODE 307.2. AN AUXILIARY DRAIN PAN OR DRAINAGE SYSTEM SHALL BE REQUIRED (WHERE DAMAGE TO ANY BUILDING COMPONENT COULD OCCUR AS A RESULT OF OVERFLOW FROM THE EQUIPMENT PRIMARY CONDENSATE REMOVAL SYSTEM) UNLESS THE GAS-FIRED EQUIPMENT AUTOMATICALLY SHUTS DOWN IN THE EVENT OF STOPPAGE IN THE CONDENSATE DRAINAGE SYSTEM.
- DRAIN FURNACE CONDENSATE TO FLOOR DRAIN WITH FUNNEL ATTACHMENT.
- PLUMBING CONTRACTOR SHALL VERIFY THE LOCATION AND EFFICACY OF EXISTING UNDERGROUND SANITARY AND SEPTIC TANK INVERT ELEVATIONS TO VERIFY NEW UNDERGROUND SANITARY WILL DRAIN EFFICIENTLY.
- PLUMBING CONTRACTOR SHALL CONNECT NEW SANITARY AND VENT PIPING TO EXISTING PIPING AS NECESSARY AND IN AN EFFICIENT AND WORKMANLIKE MANNER.

TAG	FIXTURE	WASTE	VENT	TRAP
WC	TANK TYPE WATER CLOSET	3"	1 1/2"	--
UR	URINAL	2"	1 1/2"	2"
LAV, KS	LAVATORIES, KITCHEN SINK	1 1/2"	1 1/4"	1 1/4"
MB, MS	MOP BASIN / MOP SINK	3"	1 1/2"	3"
FD, FS	FLOOR DRAIN, FLOOR SINK	3"	1 1/2"	3"

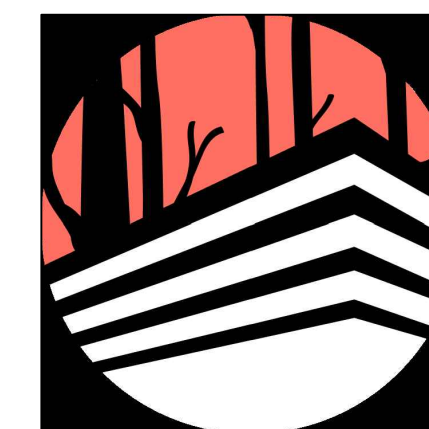
NOTE: MINIMUM UNDERGROUND SANITARY SIZE IS 3".



MECHANICAL SANITARY & VENT PIPING PLAN - NEW ADDITION

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

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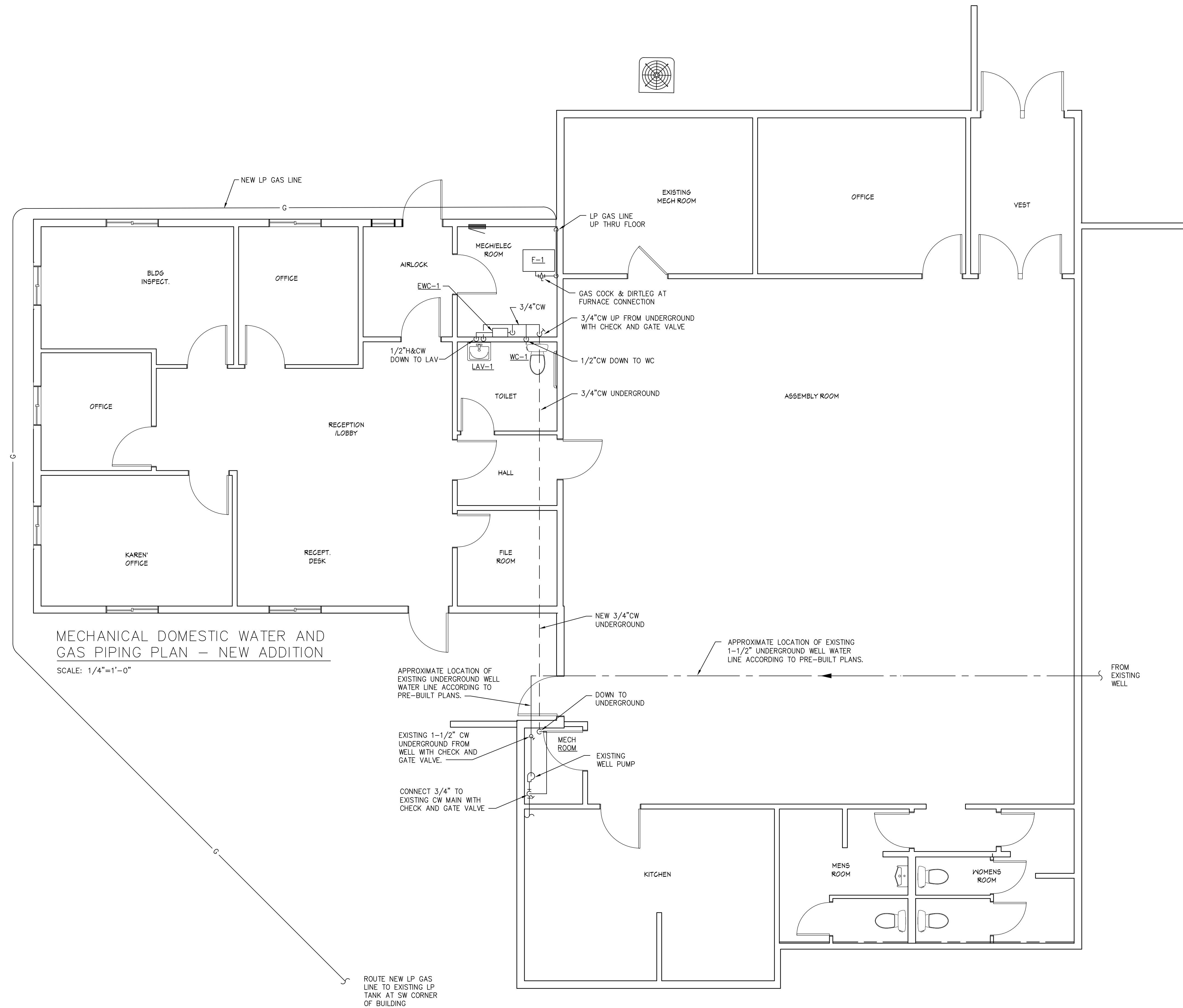
MINIMUM FIXTURE CONNECTION SIZE			
TAG	FIXTURE	HW	CW
WC	WATER CLOSET (FLUSH VALVE)	--	1/2"
LAV	LAVATORY, BATHROOM OR KITCHEN SINK	1/2"	1/2"
EWC	ELECTRIC WATER COOLER	--	1/2"
MS	MOP BASIN/MOP SINK	3/4"	3/4"
UR	URINAL	--	3/4"
NFWH	NON-FREEZE WALL HYDRANT (HOSE BIB)	--	3/4"

DOMESTIC WATER PIPING NOTES:

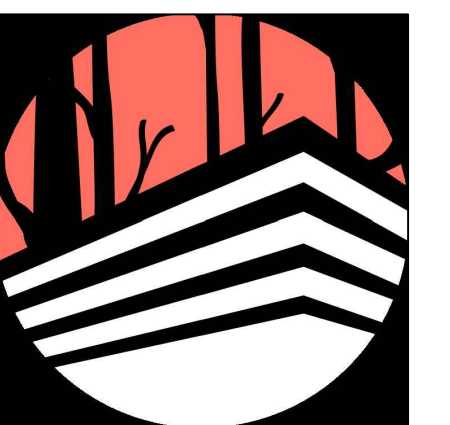
1. PIPING LOCATIONS ARE SCHEMATIC ONLY.
2. BASE BID FOR DOMESTIC WATER PIPING SHALL BE CROSS-LINKED POLYETHYLENE (PEX) WITH COPPER PIPING FOR ALL DROPS/RISES TO PLUMBING FIXTURES.
3. MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS HATCHES WHERE NECESSARY FOR ACCESS, INSPECTION AND MAINTENANCE OF CLEANOUTS, VALVES, AND OTHER EQUIPMENT LOCATED ABOVE CEILINGS OR BEHIND WALLS.
4. ALL DOMESTIC WATER PIPING SHALL BE INSULATED.
5. ALL HAND-WASH FACILITIES SHALL HAVE A.S.S.E 1070 APPROVED MIXING VALVE EQUAL TO WATTS MODEL USC-B-M1 LAVATORY VALVE. OPTION: PROVIDE TEMPERED WATER AS SHOWN IN HOT WATER HEATER DETAIL.
6. PROVIDE AND INSTALL EXPANSION TANK WITH SHUTOFF VALVE ON CW SYSTEM IN 1ST FLOOR MECHANICAL ROOM.
7. ALL PIPE PENETRATIONS THROUGH FIRE RATED WALLS MUST BE SEALED WITH A FIRE RATED SILICONE SEALANT.
8. INSTALL INSULATION ON EXPOSED SANITARY PIPING UNDER SINKS.

PLUMBING EQUIPMENT

- CQ-1** - PVC CLEANOUT IN CONCRETE FLOOR WITH BRONZE COVER.
- CQ-2** - CLEANOUT WITH BRONZE COVER APPLICABLE FOR EXTERIOR ON-GRADE APPLICATION.
- FD-1** - FLOOR DRAIN WITH FUNNEL AND BRONZE COVER APPLICABLE FOR CONCRETE FLOOR.
- FD-2** - FLOOR DRAIN WITH BRONZE COVER APPLICABLE FOR FLOOR TYPE. SEE ARCHITECTURAL PLANS.
- LAV-1** - BARRIER-FREE WALL HUNG LAVATORY BARRIER FREE WALL HUNG LAVATORY SHALL BE WHITE VITREOUS CHINA WITH CAST-IN-PLACE SOAP DISH, COMPLETE WITH ADJUSTABLE P-TRAP AND TAIL PIECE. FAUCET ON 4" CENTERS, 1-1/4" TRAP, GRID DRAIN, 3/4" O.D. COPPER INLETS. PROVIDE WITH LOOSE KEY STOPS, AMERICAN STANDARD 9141.011 WITH FAUCET 7490.172H OR EQUAL. PROVIDE CONCEALED SUPPORT ARMS, ZURN Z-1231 OR EQUAL. INSTALLATION TO CONFORM WITH A.D.A. GUIDELINES. PROVIDE INSULATION ON ALL EXPOSED PIPING.
- WC-1** - POWER FLUSH, TANK TYPE WATER CLOSET SHALL BE POWER FLUSH TANK-TYPE WATER CLOSET, WHITE VITREOUS CHINA, WITH TANK AND ELONGATED BOWL, AND METAL FLUSH HANDLE, WITHOUT SEAT EQUAL TO AMERICAN STANDARD WHITE CADET PRESSURE ASSISTED 1.6 GPF MODEL 2467.016.020 OR EQUAL. PROVIDE 3/8" ANGLE SUPPLY WITH STOP. SEATS SHALL BE INJECTED MOLDED, HIGH STRENGTH SOLID PLASTIC, WHITE WITH OPEN FRONT LESS COVER COMPLETE WITH CHECK-HINGE, EQUAL TO OLSENITE #95.
- EWH-1** - POINT OF USE, TANKLESS ELECTRIC WATER HEATER LISTED ON SHEET M-1.



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ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
	2'x4' L.E.D. LIGHT FIXTURE
	2'x4' L.E.D. LIGHT FIXTURE W/ BATTERY BACKUP
	2'x2' L.E.D. LIGHT FIXTURE
	2'x2' L.E.D. LIGHT FIXTURE W/ BATTERY BACKUP
	L.E.D. DOWNLIGHT RECESSED IN CEILING
	L.E.D. WALL MTD EMERGENCY LIGHT FIXTURE
	EXIT LIGHT, EM - WITH EMERGENCY LIGHTING
	SINGLE POLE SWITCH
	THREE WAY SWITCH
	SINGLE POLE SWITCH W/ PIR VACANCY SENSOR
	EXISTING DUPLEX RECEPTACLE AT WALL
	EXISTING DUPLEX GFI RECEPTACLE
	DUPLEX RECEPTACLE AT WALL
	DUPLEX GFI RECEPTACLE
	SENSOR-CONTROLLED DUPLEX GFI RECEPTACLE
	JUNCTION BOX IN CEILING
	JUNCTION BOX; MOUNTED IN WALL
	PIR LIGHT SENSOR, CEILING MOUNTED
	SMOKE DETECTOR, CEILING MOUNTED
	SINGLE PHASE MOTOR
	DISCONNECT SWITCH
	POWER/LIGHTING PANEL
	W.P. WEATHER PROOF
	G.F.I. GROUND FAULT INTERRUPTER
	DISC. DISCONNECT (SWITCH)
	'A' LIGHTING FIXTURE TYPE 'A'
	AFF ABOVE FINISHED FLOOR
	CKT. CIRCUIT

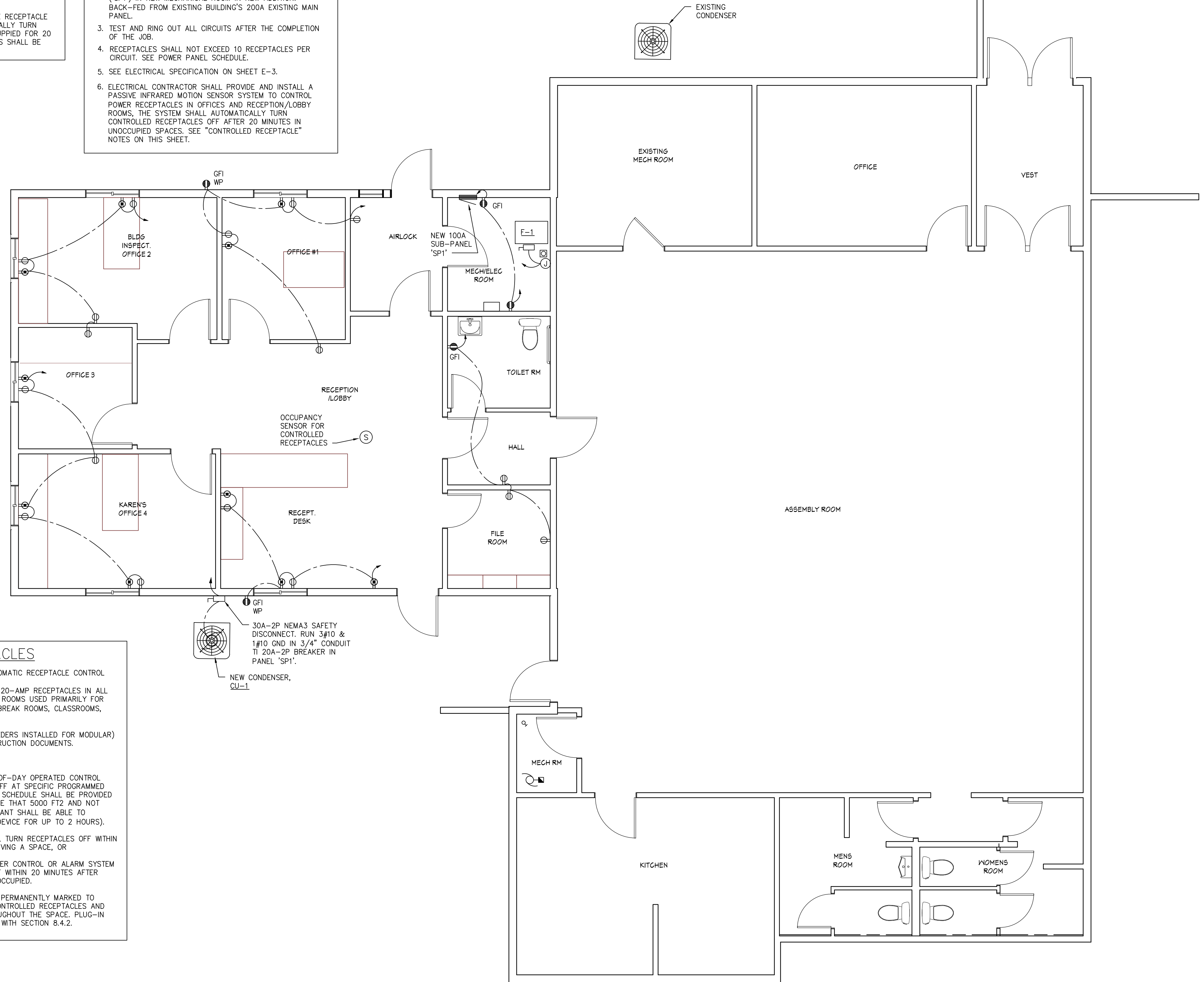
RECEPTACLE SENSOR NOTES:

Ⓢ CEILING MOUNTED VACANCY SENSOR. PROVIDE A PASSIVE INFRARED & ULTRASONIC VACANCY SENSOR CONTROLLER MOUNTED ON CEILING TO AUTOMATICALLY TURN CONTROLLED RECEPTACLES OFF WHEN UNOCCUPIED FOR 20 MINUTES. LUTRON MODEL CAR2S-20-DTR OR EQUAL.

Ⓢ PROVIDE WIRELESS-CONTROLLED DUPLEX RECEPTACLE WHERE SHOWN ON PLAN TO AUTOMATICALLY TURN RECEPTACLE POWER OFF AFTER UNOCCUPIED FOR 20 MINUTES. ALL CONTROLLED RECEPTACLES SHALL BE TAGGED AS CONTROLLED.

POWER NOTES:

1. PROVIDE 100A-2P BREAKER IN EXISTING MAIN PANEL TO FEED NEW SUB-PANEL 'SP1'. RUN 3#3 AND 1#8 GRD IN 1-1/2" CONDUIT FROM MAIN PANEL TO SUB-PANEL 'SP1'.
2. PROVIDE A NEW 100A, 24 CKT., 240V-1Ø POWER PANEL ('SP1') IN NEW MECHANICAL ROOM IN NEW ADDITION. BACK-FED FROM EXISTING BUILDING'S 200A EXISTING MAIN PANEL.
3. TEST AND RING OUT ALL CIRCUITS AFTER THE COMPLETION OF THE JOB.
4. RECEPTACLES SHALL NOT EXCEED 10 RECEPTACLES PER CIRCUIT. SEE POWER PANEL SCHEDULE.
5. SEE ELECTRICAL SPECIFICATION ON SHEET E-3.
6. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL A PASSIVE INFRARED MOTION SENSOR SYSTEM TO CONTROL POWER RECEPTACLES IN OFFICES AND RECEPTION/LOBBY ROOMS. THE SYSTEM SHALL AUTOMATICALLY TURN CONTROLLED RECEPTACLES OFF AFTER 20 MINUTES IN UNOCCUPIED SPACES. SEE "CONTROLLED RECEPTACLE" NOTES ON THIS SHEET.



GENERAL ELECTRICAL REQUIREMENTS

A. MATERIAL - GENERAL: ALL ELECTRICAL MATERIALS SHALL BE NEW, SHALL BE NATIONAL ELECTRIC CODE STANDARD UNLESS BETTER GRADE IS MENTIONED HEREIN, AND SHALL BEAR THE UNDERWRITERS' LABORATORIES' LABEL.

B. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH, AND ALL WORK AND MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ALL APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, ORDINANCES, REGULATIONS, AS WELL AS, THE RULES AND STANDARDS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS, THE NATIONAL ELECTRIC CODES, THE NATIONAL SAFETY CODE, A.I.E.E. AND OSHA.

C. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND CERTIFICATES OF INSPECTION FOR WORK HEREIN SPECIFIED.

D. ELECTRICAL CONTRACTOR SHALL VISIT THE EXISTING SITE AND SHALL EXAMINE TO HIS SATISFACTION, ALL OF THE PHYSICAL CONDITIONS THAT AFFECT HIS CONTRACT PRICE. NO ADDITIONS TO HIS CONTRACT PRICE WILL BE PERMITTED DUE TO IGNORANCE OF EXISTING CONDITIONS.

E. THE CONTRACTOR SHALL SEE THAT ALL NECESSARY CUTTING IN WALLS AND FLOORS IS NEATLY AND CAREFULLY DONE AND REPAIRED IN AN APPROVED AND WORKMANLIKE MANNER.

F. PROVIDE NEW FUSES AND/OR BREAKERS TO MATCH MECHANICAL AND ELECTRICAL EQUIPMENT INSTALLED.

G. ON COMPLETION OF ELECTRICAL WORK, THE INSTALLATION SHALL BE ENTIRELY FREE FROM GROUNDS AND SHORT CIRCUITS. ALL CIRCUITS SHALL BE RUNG OUT AND PROPERLY CHECKED.

H. CIRCUIT ALL NEW ELECTRICAL RECEPTACLES AND LIGHT FIXTURES TO NEW SUB-PANEL 'SP1'.

I. CIRCUIT EMERGENCY AND EXIT LIGHTS SHALL BE CIRCUITED WITH NEW LIGHTS.

CONTROLLED RECEPTACLES

ASHRAE 90.1-2022 SECTION 8.4.2 - AUTOMATIC RECEPTACLE CONTROL

- 1) AT LEAST 50% OF ALL 125V, 15- AND 20-AMP RECEPTACLES IN ALL PRIVATE OFFICES, CONFERENCE ROOMS, ROOMS USED PRIMARILY FOR PRINTING AND/OR COPING FUNCTIONS, BREAK ROOMS, CLASSROOMS, AND INDIVIDUAL WORKSTATIONS
- 2) AT LEAST 25% OR BRANCH CIRCUIT FEEDERS INSTALLED FOR MODULAR) FURNITURE NOT SHOWN ON THE CONSTRUCTION DOCUMENTS.
- 3) THIS CONTROL SHALL FUNCTION ON
 - A. A SCHEDULED BASIS USING A TIME-OF-DAY OPERATED CONTROL DEVICE THAT TURNS RECEPTACLES OFF AT SPECIFIC PROGRAMMED TIMES - AN INDEPENDENT PROGRAM SCHEDULE SHALL BE PROVIDED FOR CONTROLLED AREAS OF NO MORE THAN 5000 FT2 AND NOT MORE THAN ONE FLOOR (THE OCCUPANT SHALL BE ABLE TO MANUALLY OVERRIDE THE CONTROL DEVICE FOR UP TO 2 HOURS).
 - B. AN OCCUPANCY SENSOR THAT SHALL TURN RECEPTACLES OFF WITHIN 20 MINUTES OF ALL OCCUPANTS LEAVING A SPACE, OR
 - C. AN AUTOMATED SIGNAL FROM ANOTHER CONTROL OR ALARM SYSTEM THAT SHALL TURN RECEPTACLES OFF WITHIN 20 MINUTES AFTER DETERMINING THAT THE AREA IS UNOCCUPIED.

ALL CONTROLLED RECEPTACLES SHALL BE PERMANENTLY MARKED TO VISUALLY DIFFERENTIATE THEM FROM UNCONTROLLED RECEPTACLES AND ARE TO BE UNIFORMLY DISTRIBUTED THROUGHOUT THE SPACE. PLUG-IN DEVICES SHALL NOT BE USED TO COMPLY WITH SECTION 8.4.2.

ELECTRICAL POWER PLAN- NEW ADDITION
SCALE: 1/4"=1'-0"

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- 2024

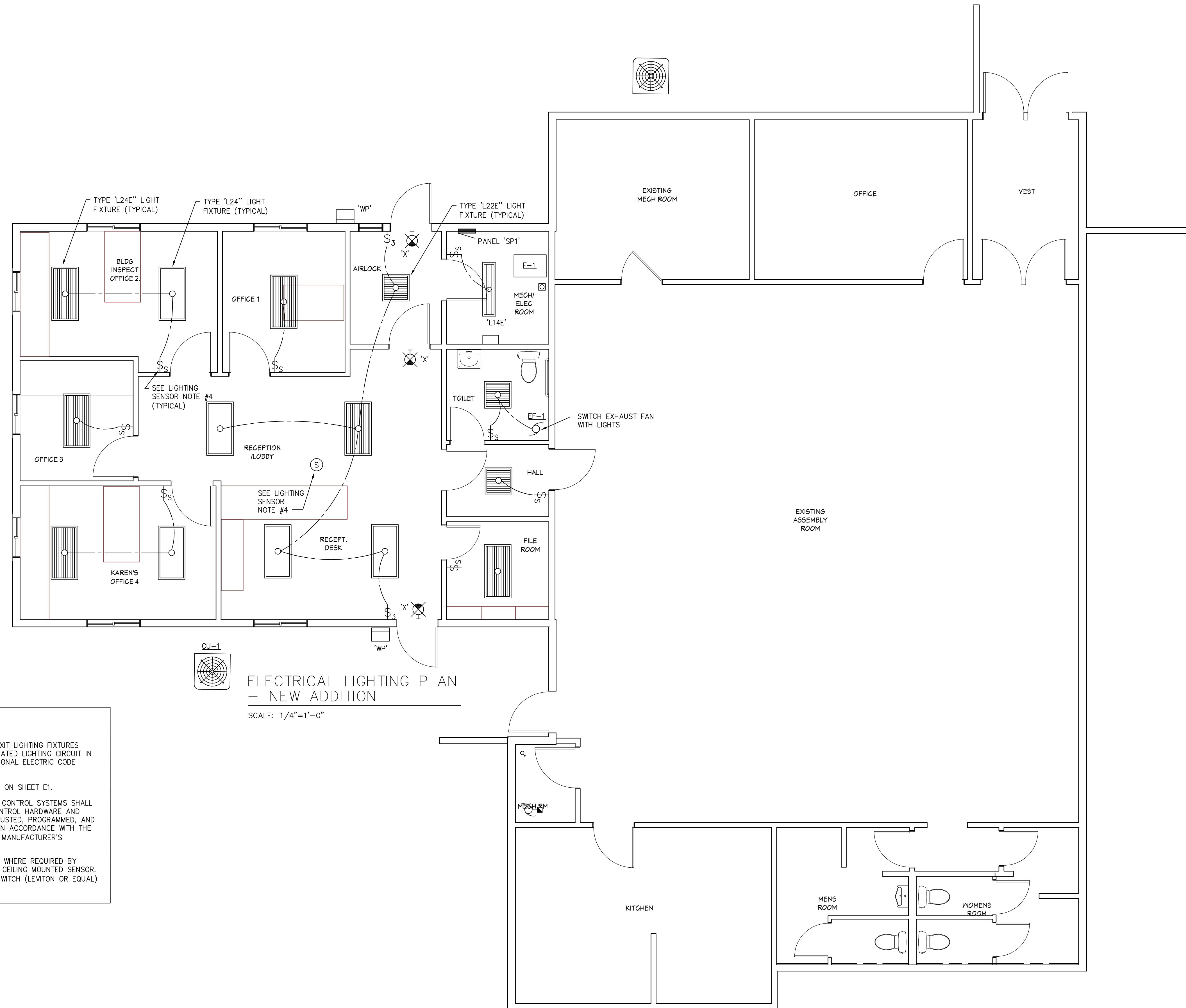
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E1

LIGHT FIXTURE SCHEDULE

- 'L24' SURFACE MOUNTED, LOW PROFILE 2X2 L.E.D. LIGHT FIXTURE. LITHONIA LIGHTING MODEL CPANL-2X2-24/33/44LM-40K-M4 AND OPTIONAL SURFACE MOUNTING KIT 2X4SMKSH. SWITCHABLE LUMEN OUTPUT (24K, 33K, 44K). COLOR TEMP. (CCT) 4000'. 44.8-WATTS/FIXTURE. SURFACE MOUNTING KIT 2X2SMKSH.
- 'L24E' SAME AS 'L24' EXCEPT WITH EMERGENCY BATTERY BACKUP. LITHONIA LIGHTING MODEL CPANL-2X4-24/33/44LM-40K-M4 WITH EMERGENCY BATTERY PACK KIT (MODEL ILBGP10A) AND SURFACE MOUNTING KIT (2X4SMKSH).
- 'L22E' SURFACE MOUNTED, LOW PROFILE 2X2 L.E.D. LIGHT FIXTURE. LITHONIA LIGHTING MODEL CPANL-2X2-24/33/44LM-40K-M4 WITH OPTIONAL SURFACE MOUNTING KIT (2X2SMKSH) AND EMERGENCY BATTERY PACK KIT (MODEL ILBGP10A). SWITCHABLE LUMEN OUTPUT (24K, 33K, 44K). COLOR TEMP. (CCT) 4000'. 40.4-WATTS/FIXTURE. SURFACE MOUNTING KIT 2X2SMKSH.
- 'L14E' SURFACE MOUNTED, LOW PROFILE 1X4 L.E.D. LIGHT FIXTURE. LITHONIA LIGHTING MODEL CPANL-1X4-AL01-SW7-M4 WITH FIELD INSTALLED EMERGENCY BATTERY PACK KIT (ILBGP10A) AND OPTIONAL SURFACE MOUNTING KIT 1X4SMKSH OR CABLE HANGERS (PAC2DNF36). SWITCHABLE LUMEN OUTPUT (24K, 33K, 44K). COLOR TEMP. (CCT) 4000'. 30.4-WATTS/FIXTURE.
- 'WP' EXTERIOR L.E.D. WALL-PACK LIGHT FIXTURE EQUAL TO LITHONIA LIGHTING MODEL ARC2-LED-PS-50K-MVOLT-PE-00BX0. DARK BRONZE HOUSING, 51-WATT, 6500 LUMENS, MOUNTED ON BUILDING 14'-0" ABOVE GRADE WITH PHOTOCELL ON/OFF. SWITCHED AT BREAKER ON DEDICATED CKT.
- 'X' EXIT & EMERGENCY LIGHT FIXTURE. WALL MOUNTED ABOVE DOOR WITH TWIN, ADJUSTABLE L.E.D. LAMPS AND L.E.D. RED "EXIT" LED LETTERING. LITHONIA LIGHTING MODEL LHQM-LED-R-M6 OR APPROVED EQUAL. 4.3 WATTS
- 'EM' WALL MOUNTED, BATTERY BACKUP EMERGENCY LIGHTING FIXTURE. HIGH IMPACT BLACK POLYCARBONATE HOUSING, (2) SWIVEL L.E.D. LAMP HEADS, 640 LUMENS, HIGH-CHARGE INDICATOR. LITHONIA LIGHTING QUANTUM MODEL ELM4L.



LIGHTING SENSOR NOTES:

1. CEILING MOUNTED VACANCY SENSOR. PROVIDE A PASSIVE INFRARED & ULTRASONIC LIGHTING VACANCY SENSOR CONTROLLER MOUNTED ON CEILING TO AUTOMATICALLY TURN LIGHTING OFF WHEN UNOCCUPIED FOR 20 MINUTES. LUTRON LOS-C01-2000-WH OR EQUAL.
2. PROVIDE MANUAL-ON VACANCY WALL SENSOR AT THIS LOCATION. PROVIDE A PASSIVE INFRARED & ULTRASONIC WALL SWITCH SENSOR MOUNTED AT DOOR TO AUTOMATICALLY TURN LIGHTING OFF AFTER UNOCCUPIED FOR 20 MINUTES. LUTRON LOS-WDT-WH OR EQUAL.

LIGHTING NOTES:

1. ALL EMERGENCY LIGHTING AND EXIT LIGHTING FIXTURES SHALL BE CIRCUITED TO A DEDICATED LIGHTING CIRCUIT IN THE LOCAL AREA PER 2017 NATIONAL ELECTRIC CODE 701.12(G)
2. SEE ELECTRICAL SYMBOL LEGEND ON SHEET E1.
3. LIGHTING CONTROL DEVICES AND CONTROL SYSTEMS SHALL BE TESTED TO ENSURE THAT CONTROL HARDWARE AND SOFTWARE ARE CALIBRATED, ADJUSTED, PROGRAMMED, AND IN PROPER WORKING CONDITION IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. OFFICE LIGHTING & RECEPTACLES WHERE REQUIRED BY CODE SHALL BE CONTROLLED BY CEILING MOUNTED SENSOR OR WIRELESS RF SENSOR WALL SWITCH (LEVITON OR EQUAL)

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E2

Division 15: ELECTRICAL SPECIFICATIONS

WORK INCLUDED

1. COMPLETE ELECTRICAL SYSTEMS, INCLUDING SUPERVISION, LABOR, MATERIAL, EQUIPMENT, AND ANY AND ALL OTHER ITEMS NECESSARY TO COMPLETE THE ELECTRICAL SYSTEMS. ALL ITEMS OF EQUIPMENT ARE SPECIFIED IN THE SINGULAR; HOWEVER, THE CONTRACTOR SHALL PROVIDE AND INSTALL THE NUMBER OF ITEMS OF EQUIPMENT AS INDICATED ON CONTRACT DOCUMENTS AND AS REQUIRED FOR COMPLETE SYSTEMS.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS AND CERTIFICATES OF INSPECTION FOR WORK HEREIN SPECIFIED.
3. QUALITY ASSURANCE:
 - A. ALL MATERIALS FURNISHED AND ALL WORK INSTALLED SHALL COMPLY WITH ALL APPLICABLE CODES, THE REQUIREMENTS OF LOCAL UTILITY COMPANIES, AND THE REQUIREMENTS OF ALL GOVERNMENTAL AGENCIES HAVING JURISDICTION.
 - B. ALL ELECTRICAL MATERIAL AND EQUIPMENT SHALL BEAR THE APPROVAL LABEL OF, AND BE LISTED BY THE UNDERWRITERS LABORATORIES, INCORPORATED.
 - C. ALL MATERIALS AND APPARATUS REQUIRED FOR THE WORK SHALL BE NEW, OF FIRST-CLASS QUALITY, AND SHALL BE FURNISHED, DELIVERED, ERECTED, CONNECTED AND FINISHED IN EVERY DETAIL, AND SHALL BE SO SELECTED AND ARRANGED AS TO FIT PROPERLY INTO THE BUILDING SPACES.
 - D. ALL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE MANUFACTURER.
 - E. THE CONTRACTOR SHALL SEE THAT ALL NECESSARY CUTTING IN WALLS AND FLOORS IS NEATLY AND CAREFULLY DONE AND REPAIRED IN AN APPROVED AND WORKMANLIKE MANNER.
 - F. PROVIDE NEW FUSES OR BREAKERS TO MATCH MECHANICAL EQUIPMENT INSTALLED. LABEL ALL BREAKERS AT PANEL.
 - G. ON COMPLETION OF ELECTRICAL WORK, THE INSTALLATION SHALL BE ENTIRELY FREE FROM GROUNDS AND SHORT CIRCUITS. ALL CIRCUITS SHALL BE RUNG OUT AND PROPERLY CHECKED.
 - H. ELECTRICAL CONTRACTOR SHALL GUARANTEE AGAINST MECHANICAL AND ELECTRICAL DEFECTS OF ANY OR ALL EQUIPMENT, MATERIALS AND WORKMANSHIP COVERED BY THESE SPECIFICATIONS AND SHALL MAKE GOOD, REPAIR OR REPLACE, AT HIS OWN EXPENSE, ANY DEFECTIVE EQUIPMENT, MATERIAL, OR PART WHICH MAY SHOW ITSELF WITHIN A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE OF WORK.
4. PROJECT CONDITIONS:
 - A. COOPERATION WITH OTHER TRADES: THE CONTRACTOR SHALL DETERMINE THE SCHEDULE AND SCOPE OF WORK FOR OTHER TRADES AND PREVENT CONFLICTS IN SCHEDULE AND LOCATION OF WORK AND EQUIPMENT.
 - B. EXCAVATING AND BACKFILLING: PROVIDE ALL TRENCH AND PIT EXCAVATION AND BACKFILLING REQUIRED FOR WORK UNDER DIVISION 16.
 - C. ELECTRICAL CONTRACTOR SHALL VISIT THE EXISTING SITE AND SHALL EXAMINE TO HIS SATISFACTION, ALL OF THE PHYSICAL CONDITIONS THAT AFFECT HIS CONTRACT PRICE. NO ADDITIONS TO HIS CONTRACT PRICE WILL BE PERMITTED DUE TO IGNORANCE OF EXISTING CONDITIONS.
5. AS-BUILT DRAWINGS
 - A. AT THE CONCLUSION OF THE PROJECT, THE CONTRACTOR SHALL FURNISH A COMPLETE SET OF AS-BUILT DRAWINGS. DRAWINGS SHALL ALSO INCLUDE DIMENSIONED LOCATIONS AND DEPTHS OF ALL UNDERGROUND UTILITIES.

BASIC MATERIALS AND METHODS

1. ELECTRICAL CONNECTIONS TO EQUIPMENT AND SYSTEMS
 - A. EQUIPMENT WIRING SHALL BE AS FOLLOWS:
 - (1). ALL POWER AND SHALL BE PROVIDED UNDER DIVISION 16.
 - (2). ALL STARTERS (FURNISH UNDER DIVISION 15) SHALL BE INSTALLED UNDER DIVISION 16.
 - (3). MAKE FINAL CONNECTIONS TO ALL EQUIPMENT READY FOR OPERATION AS SHOWN ON DRAWINGS, WITH THE FOLLOWING EXCEPTION OF THE ELEVATOR.
 - (4). PROVIDE POWER TO A FUSED DISCONNECT SWITCH IN THE ELEVATOR EQUIPMENT ROOM.
 - B. BUSHINGS: BUSHINGS FOR ALL CONDUIT SHALL BE SELF-EXTINGUISHING THERMOPLASTIC TYPE -150°-127°C TEMPERATURE RATING.
 - C. CONDUIT: ELECTRIC METALLIC TUBING SHALL BE HOT DIPPED GALVANIZED OR ELECTRO-GALVANIZED AND USED ON THE EXTERIOR AND INSIDE THE BUILDING. USE WHERE CONDUCTORS ARE EXPOSED IN GARAGE AREA.
 4. JUNCTION AND PULL BOXES: PULL BOXES, CABLE SUPPORT BOXES AND LARGE JUNCTION BOXES FOR INDOOR USE SHALL BE MADE OF CODE GAUGE STEEL OF NO LESS THAN 12 GAUGE. COVERS SHALL BE HELD IN PLACE WITH PLATED STEEL SCREWS.
 5. OUTLET BOXES
 - A. OUTLET BOXES AND COVERS SHALL BE SHEET STEEL KNOCKOUT TYPE, ZINC-COATED OR CADMIUM-PLATED AND SHALL BE OF PROPER CODE SIZE FOR THE NUMBER OF WIRES OF CONDUITS SQUARE AT THE END OF A RUN AND CONTAINING A SINGLE DEVICE OR "HANDY BOX" TYPE MAY BE USED.
 1. IN STUD WALLS, PLASTIC BOXES MAY BE USED WHERE ALLOWED BY CODE.
 - C. BOXES SHALL BE SEPARATED TO PREVENT SOUND TRANSMISSION. ELECTRICAL BOXES OPPOSITE EACH OTHER SHOULD BE SEPARATED HORIZONTALLY BY A MINIMUM OF 8 INCHES TO PROVIDE AN ADEQUATE ACOUSTICAL BARRIER AND 24 INCHES WHERE REQUIRED BY CODE AND U.L. DESIGN. BACK-TO-BACK BOXES SHALL NOT BE USED.
 6. WIRE AND CABLE - 600V:
 - A. SERVICE LATERAL CONDUCTORS AS REQUIRED BY THE UTILITY COMPANY.
 - B. 600 VOLT WIRE AND CABLE FOR BRANCH CIRCUITS AND FEEDERS SHALL BE SINGLE-CONDUCT OR COPPER, NO. 12 MINIMUM.
 - C. WIRE NO. 10 AND SMALLER (EXCEPT FIXTURE WIRE) MAY BE STRANDED OR SOLID. WIRE NO. 8 AND LARGER SHALL BE STRANDED.
 - D. FOR BRANCH CIRCUITS AND FEEDERS, NO. 10 AND SMALLER, INSULATION TYPE THHN.
 - E. FOR BRANCH CIRCUITS AND FEEDER, NO. 8 AND LARGER, INSULATION TYPE THW, THWN OR THHN.
 - F. FOR UNDERGROUND INSTALLATION, INSULATION TYPE USE- RHW OR THWN.
 - G. FOR DRY AREAS WITH AN AMBIENT ABOVE 100°F., INSULATION TYPE THHN.
 - H. FOR INSTALLATION IN DAMP AREAS, USE INSULATION TYPE THWN.
 - I. MINIMUM 120/208V SYSTEM COPPER WIRE SIZE; GENERAL #12; OVER 100'-0" #10; OVER 200', (INCREASE CONDUIT SIZE WHERE REQUIRED).
 - J. BRANCH CIRCUIT CONDUCTORS IN CONTINUOUS FLUORESCENT FIXTURE WIRING CHANNELS SHALL BE NO. 12 THHN.
 - K. ALL TERMINATIONS AND/OR SPLICES SHALL BE MADE WITH OWNER APPROVED HIGH COMPRESSION TERMINATIONS AND NOT WITH MECHANICAL TYPE LUGS.
 7. SWITCHES: SWITCHES SHALL BE IVORY OR MATCH WALL FINISH AND BE BRYANT TYPE #4901 OR EQUAL.
 8. WALL BOX DIMMERS: TO BE OF ONE MANUFACTURER SUCH AS LUTRON "NOVA" SERIES OR EQUAL.
 9. RECEPTACLES: RECEPTACLES SHALL BE 20 AMPERES, 125 VOLTS, AC DUPLEX GROUNDING TYPE. VERIFY COLOR WITH ARCHITECT. GROUND FAULT INTERRUPTERS SHALL BE PROVIDED FOR ALL RECEPTACLES IN TOILET ROOMS, KITCHEN, AND JANITOR'S CLOSET.
 10. PLATES: PLATES SHALL BE SMOOTH PLASTIC WITH COLOR SAME AS DEVICE.
 11. WIRING METHODS:
 - A. THE BRANCH CIRCUIT WIRING METHODS AS SHOWN ON ELECTRICAL DRAWINGS ARE CONDUIT AND WIRES, WHICH IS FOR CIRCUIT CLARIFICATION ONLY. THE BRANCH CIRCUIT WIRING METHODS NMC, MC, A.C., RIGID PVC, ENT, AND EMT ARE ACCEPTABLE, WHERE ALLOWED BY CODE WITH THE FOLLOWING EXCEPTIONS:
 - (1) NMC: SHALL HAVE COPPER CONDUCTORS AND SHALL NOT BE USED FOR EXPOSED WORK.
 - (2) A.C., MC: SHALL HAVE COPPER CONDUCTORS AND SHALL NOT BE USED FOR EXPOSED WORK.

- (3) ENT: SHALL NOT BE USED FOR EXPOSED WORK.
- (4) EMT: SHALL NOT BE USED FOR DIRECT EARTH BURIAL FOR OUTSIDE SITE WORK.
- B. PVC SCHEDULE 40 CONDUIT SHALL BE USED FOR THE OWNERS OR ELECTRIC UTILITY COMPANY FEEDERS. (VERIFY IF CONCRETE ENCASEMENT REQUIRED)
- C. CONDUITS SHALL BE RUN CONCEALED. WHERE EXPOSED CONDUIT RUNS ARE SHOWN OR REQUIRED, THEY SHALL BE RUN PARALLEL TO BUILDING CONSTRUCTION AND SHALL BE SUITABLY SUPPORTED AT REQUIRED INTERVALS.
- D. OPEN ENDS SHALL BE CAPPED WITH APPROVED MANUFACTURED CONDUIT SEALS AS SOON AS INSTALLED AND KEPT CAPPED UNTIL READY TO PULL IN CONDUCTORS.
12. INSTALLATION OF WIRE AND CABLE - 600V: BRANCH CIRCUIT CONDUCTORS SHALL BE COLOR-CODED TO DIFFERENTIATE THE PHASES, THE SAME COLOR BEING ASSIGNED TO THE SAME PHASE THROUGHOUT THE JOB. PHASE INDICATION SHALL BE AS FOLLOWS:
 - a. 120/240(208) VOLTS
 - b. PHASE A - BLACK
 - c. PHASE B - RED
 - d. PHASE C - BLUE (NOT USED)
 - e. NEUTRAL - WHITE
 - f. GROUND - GREEN
13. WIRING DEVICES:
 - a. INSTALL GFI RECEPTACLES IN ALL PUBLIC AND EMPLOYEE TOILET ROOMS, BATHROOMS, AND ANY OTHER AREAS AS SHOWN ON THE DRAWING.
 - b. VERIFY DOOR SWINGS AND INSTALL LIGHT SWITCH BOXES ON THE LATCH SIDE OF DOOR UNLESS OTHERWISE NOTED.

SERVICE AND DISTRIBUTION

1. FURNISH AND INSTALL ELECTRICAL SERVICE SYSTEM INCLUDING:UTL
 - A. ELECTRICAL WORK AS DIRECTED BY POWER COMPANY AND FOR METERING AND GROUNDING.
 - B. ELECTRICAL DUCT BANK AND CABLES FOR SERVICE LATERAL FROM UTILITY COMPANY TRANSFORMER TO MAIN DISTRIBUTION SWITCHBOARD.
 - C. MAIN DISTRIBUTION SWITCHBOARD AND C/T COMPARTMENT FOR POWER COMPANY CURRENT TRANSFORMER AND METERING EQUIPMENT.
 - D. ALL DISTRIBUTION EQUIPMENT SHALL BE OF ONE MANUFACTURER.
2. FURNISH AND INSTALL COMPLETE POWER AND LIGHTING SYSTEMS INCLUDING FEEDER DISTRIBUTION AND BRANCH CIRCUITS.
3. FURNISH AND INSTALL GROUNDING AND BONDING WORK.
4. FURNISH AND INSTALL POWER SYSTEM WORK, INCLUDING DISCONNECT SWITCH FOR ALL EQUIPMENT, WITH PROPERLY SIZED AND COORDINATED SHORT-CIRCUIT PROTECTION BASED ON AVAILABLE FAULT CURRENT FROM UTILITY COMPANY. EQUIPMENT SHALL BE SERIES RATED.
5. DESCRIPTION OF SYSTEM
 - A. 120/240 VOLT, 1 PHASE, 3 WIRE DISTRIBUTION SYSTEMS.
 - B. ELECTRIC SERVICE TO THE FACILITY BY LOCAL UTILITY COMPANY AT 120/240 VOLT, 1 PHASE, 3 WIRE
 - C. EMERGENCY POWER SHALL BE ACCOMPLISHED WITH BATTERY PACK EXIT AND EMERGENCY LIGHTS FOR INTERIOR.
6. PANELBOARDS OR SWITCHBOARDS:
 - A. PROVIDE PANELBOARDS AS INDICATED ON DRAWINGS. THE DEVICES SHALL BE BOLT-ON TYPE AND SEQUENCE-PHASED, UNLESS OTHERWISE INDICATED.
 - B. PANELBOARD CABINETS SHALL BE MADE OF CODE GAUGE GALVANIZED SHEET STEEL, FULL FLANGED, WITH DOORS HAVING CONCEALED HINGES, AND FLUSH OR SURFACE TYPE TRIM, AS REQUIRED, WITH ROTATING, QUARTER-TURN TRIM CLAMPS. DOORS SHALL HAVE KEY OPERATED COMBINATION CATCH AND LOCK, ALL KEYS ALIKE.
 - C. ALL CIRCUIT BREAKERS SHALL BE THERMAL MAGNETIC BOLT-ON TYPE, WITH INTERRUPTING CAPACITIES TO SATISFY DOWNSTREAM FAULT CURRENTS FROM POWER COMPANY TRANSFORMER FAULT CURRENT VALUES.
 - D. ALL PANELBOARDS SHALL BE OF THE SAME MANUFACTURER.
 - E. PANELBOARD DIRECTORIES SHALL IDENTIFY EACH BRANCH CIRCUIT.
7. DISCONNECT SWITCHES:
 - A. ALL DISCONNECT SWITCHES SHALL BE HEAVY DUTY TYPE OF PROPER VOLTAGE AND AMPERAGE RATING. WHERE INDICATED, SWITCHES SHALL BE OF THE FUSED TYPE. UNDER ALL CONDITIONS THE SWITCH WILL BE PROVIDED WITH THE SUITABLE NEMA ENCLOSURE.
 - B. DISCONNECT SWITCHES FOR MOTORS SHALL BE HORSEPOWER RATED WITH INTERLOCKED COVERS.
 8. PRIMARY FEEDER:
 - A. PRIMARY FEEDER SHALL BE FURNISHED AND INSTALLED BY THE LOCAL UTILITY COMPANY. PROVIDE AND INSTALL CONDUIT WHERE REQUIRED.
 9. GROUNDING SYSTEM:
 - A. THE MAIN GROUNDING CONDUCTOR SHALL ORIGINATE AT A CONNECTION TO THE STREET SIDE OF THE BUILDING'S WATER MAIN.

LIGHTING

1. WORK INCLUDED
 - A. INSTALLATION OF ALL LIGHT FIXTURES AND ACCESSORIES, PHOTOCELLS, SWITCHES AND ALL CIRCUITING TO SAME.
 - B. PROVIDE ALL EXTERIOR LIGHT FIXTURES, BRACKET, POLES AS SHOWN ON SCHEDULES, CONDUITS, WIRES, JUNCTION BOXES, MOUNTING FACILITIES, SWITCHES, CONTROL EQUIPMENT FOR COMPLETE INSTALLATION AND OPERATION OF ALL LIGHTING SYSTEMS.
2. LIGHTING FIXTURES:
 - A. THE CONTRACTOR SHALL MAINTAIN COMPLETE INVENTORY RECORDS OF ALL MATERIALS RECEIVED IN STORAGE AND ON JOB SITE AND FORWARD DUPLICATE COPIES TO THE OWNER'S REPRESENTATIVE EACH WEEK.
 3. EXIT LIGHTS:
 - A. STENCIL FACE TYPE SHALL BE USED IN ALL PUBLIC AREAS.
 - B. LETTERS AND ARROWS SHALL BE OF COLOR REQUIRED BY LOCAL CODE
 - C. LETTERS SHALL BE 6" HIGH.

TESTING

1. FURNISH ALL LABOR, MATERIALS, EQUIPMENT, METERS, INSTRUMENTS AND NECESSARY ACCESSORIES REQUIRED FOR PERFORMANCE TESTING AND RETESTING WHEN REQUIRED, OWNERS AND THEIR REPRESENTATIVES SHOULD BE PRESENT TO VIEW THE TESTING PROCEDURE.
2. ALL TESTS SHALL BE MADE BEFORE SYSTEMS ARE PAINTED, COVERED OR ENCLOSED IN BUILDING CONSTRUCTION, WHERE CONDITIONS PERMIT.
3. ALL SYSTEMS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUND, SHALL BE FREE FROM MECHANICAL AND ELECTRICAL DEFECTS, AND SHALL SHOW AN INSULATION RESISTANCE BETWEEN PHASE CONDUCTORS, AND BETWEEN PHASE CONDUCTORS AND GROUND NOT LESS THAN REQUIRED BY NEC. ALL CIRCUITS SHALL BE TESTED FOR PROPER NEUTRAL CONNECTION.

BALANCING

1. NEW FEEDERS AND BRANCH CIRCUITS FOR POWER AND LIGHTING SHALL BE CONNECTED TO PANEL BOARDS IN SUCH MANNER THAT LOADS CONNECTED THERETO WILL BE BALANCED ON ALL PHASES AS CLOSELY AS PRACTICABLE. SHOULD THERE BE ANY UNFAVORABLE CONDITION OF UNBALANCE ON ANY PART OF THE ELECTRICAL SYSTEMS, MAKE SUCH CHANGES THAT MAY BE REQUIRED TO REMEDY THE UNBALANCED CONDITIONS. FURNISH OWNER WITH READINGS FOR EACH FEEDER TO PANELBOARDS SUPPLIED FROM DISTRIBUTION PANELBOARD AT COMPLETION OF PROJECT.

RECORD DRAWINGS

1. AS WORK PROGRESSES RECORD ON ONE (1) SET OF CONTRACT ELECTRICAL DRAWINGS ALL CHANGES FROM THE INSTALLATION ORIGINALLY INDICATED.
2. AT COMPLETION OF THE ELECTRICAL WORK, SUBMIT TO THE OWNER'S REPRESENTATIVE, FOR APPROVAL AND RECORD, THE ABOVE COMPLETE SET OF RECORD DRAWINGS, SHOWING THE ENTIRE WORK AS ACTUALLY INSTALLED.

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