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Drawings Path: Lee's Summit 2023000333
Room Number: Lot 7, 2024-14

A. DESIGN CRITERIA

1. Design Codes:
a. International Building Code: IBC 2018
b. Minimum Design Loads for Buildings and Other Structures: ASCE 7-16

2. Design Loads:

- a. Dead Loads
Wood Floors = 27 psf
Composite Deck w/ LW Concrete = 51 psf
Walls within Residential Units = 15 psf (additive to floor load)
Roof = 20 psf plus mechanical equipment shown on roof plan
King Size Brick Veneer = 36 psf max allowed
Large Format Masonry = 70 psf max allowed
EIFS Finish System = 10 psf max allowed

- b. Live Loads (reducible per code UNO)
Slab on Grade = 100 psf
Private Rooms and Corridors Serving them = 40 psf
Mechanical/Storage = 125 psf (non-reducible)
Balconies = 60 psf (1.5 x Occupancy Served)
Typical Roof = 20 psf
Handrails = 200 lb point load at any point on handrail or on top rail
Public Rooms = 100 psf linear load on top rail
Public Corridors = 100 psf (non-reducible)

- c. Roof Snow Load
Ground Snow Load (p_g) = 20 psf
Flat Roof Snow Load (p_f) = 14 psf
Snow Exposure Factor (C_e) = 1.0
Snow Load Importance (I_s) = 1.0
Thermal Factor (C_t) = 1.0
Slope Factor (C_d) = 1.0
Main Roof Parapet Snow Drift Load (p_d) = 36 psf
Main Roof Parapet Snow Drift width (w) = 17'-3"
Balcony Snow Drift Load = 40 psf
Balcony Snow Drift width (w) = Full Balcony Depth
Rain on Snow Surcharge = 5 psf

- d. Wind Load
Basic Design Wind Speed, V = 109 mph (3 sec. Gust)
ASD Wind Speed, V_{ASD} = 85 mph
Risk Category = II
Wind Exposure = C
Internal Pressure Coefficient (C_{pi}) = +0.18
Components and Cladding (psf):

Zone	A=100'±	A=50'±	A=100'±
Negative Zone 1	-46.8	-42	+16/-34
Negative Zone 1'	-28.5	-28.5	+16/-46
Negative Zone 2	-65.4	-55.7	+16/-48
Negative Zone 3	-65.4	-55.7	+26/-28
Positive Zone 1 & 1'	16	16	16
Positive Zones 2 & 3	28.5	25.6	24.3
Negative Zone 4	-30.9	-26.7	-27.9
Negative Zone 5	-38.0	-29.6	-32.1
Positive Zone 4 & 5	28.5	24.3	25.6

- Notes:
1. A is the Effective Wind Area as defined in ASCE 7 Ch. 26.
2. Linear interpolation between tabulated values is permitted.
3. Elements with Tributary Area (A) > 700 ft² shall be permitted to be designed using provisions for MWFRS.
4. Ultimate loads shown.

- e. Earthquake Load
Risk Category = II
Seismic Importance Factor (I_e) = 1.0
Mapped Spectral Response Acceleration Parameters
 $S_s = 0.059g$ $S_1 = 0.089g$
Design Spectral Response Acceleration Parameters
 $S_{DS} = 0.086$ $S_{D1} = 0.088$
Soil Site Class: B
Seismic Design Category: B
Basic Seismic Force Resisting System(s)
Wood Walls with Wood Structural Panels (ASCE 7 Table 12.2-1 Line A.15)
 $R = 6.5$ $\Omega_0 = 3.0$ $C_s = 0.013$ $C_d = 4.0$
(Ω_0 reduced to 2.5 per ASCE7-16 Table 12.2-1 footnote E)
Wood Walls with Panels of other Materials (Gypsum) (ASCE 7 Table 12.2-1 Line A.17)
 $R = 2.0$ $\Omega_0 = 2.5$ $C_s = 0.043$ $C_d = 2.0$
(Ω_0 reduced to 2.0 per ASCE7-16 Table 12.2-1 footnote B)
Ordinary Reinforced Masonry Shear Walls (ASCE 7 Table 12.2-1 Line A.9)
 $R = 2.0$ $\Omega_0 = 2.5$ $C_s = 0.043$ $C_d = 1.75$
Design Base Shear, $V = C_s \times W$
Analysis Procedure = Equivalent Lateral Force Procedure (ASCE 7-16 Chapter 12.8)

- f. Rain Load
100 Year 15 min. Rain Intensity (I) = 7.5 in/hr

3. Allowable Deflections:
Total Load Live/Snow/Wind Load Absolute Maximum
Floor Joists/Trusses L/360 1"
Roof Joists/Trusses L/240 1.5"
Wall Framing (flexible finish) L/360 0.75"
Wall Framing (brittle/brick finish) L/600 0.5"

Canilever deflection limits are the more restrictive of 2 x the appropriate L — limit (e.g. 2L/360 = L/180) or absolute maximum value listed above, measured at the tip of the cantilever U.N.O.

4. Soil Properties:

- a. Foundation design is based on the following to be considered part of the construction documents:

- i. Geotechnical Report prepared by Vaughn Rupnow, PE, dated May 31, 2024, confirming Rammed Aggregate Piers as a viable foundation option with allowable subgrade bearing pressure of 6,000 psf.

- It is the Owner's decision to proceed with Rammed Aggregate Piers.

B. STRUCTURAL ENGINEERING DESIGN NARRATIVE

1. McClure Engineering Company (McClure, MEC) is the Structural Engineer of Record (EOR) responsible for the documentation of structural design criteria, strength and stability the primary vertical and lateral load-carrying systems in their completed form, and conformance of the structural design to the applicable building codes. These drawings produced by McClure convey the structural engineering design for the project, which includes the following components and systems:

- a. Foundations consisting of concrete frost walls, pedestals, and footing supported by rammed aggregate piers.
b. Slabs on grade.
c. Residential Building Framing:
i. Load-bearing wood wall and opening framing.
ii. Wood floor and roof trusses and dimensional lumber joists.
iii. Concrete on composite deck floor framing.
d. Steel framed balconies with non-composite deck.
e. Parking Garage Framing:
i. Concrete Masonry Unit walls at stair and elevator towers.
ii. Structural steel beams and columns.
iii. Steel decking composite with concrete.
iv. Exterior CFS wall framing.
f. Retail Building Framing:
i. Structural steel framing.
ii. Steel decking composite with concrete.
iii. CMU wall stair framing.
iv. Exterior CFS wall framing.
g. Level 2 force resisting system:
i. Composite deck diaphragm and CMU shearwalls
ii. Level 3 and above:
Lateral force resisting system:
Plywood diaphragms and wood shear walls with gypsum or plywood sheathing as indicated in shearwall schedule.

2. The following items are Deferred Submittals. Framing intent and additional requirements for these structural components are provided within these drawings:

- a. Structural steel connections – see general notes section "Structural Steel"
b. Exterior and miscellaneous CFS wall framing below level 2
c. Wood rooftop trusses – see general notes section "Wood Framing and Fastening" / see S001 and S002 for applicable design criteria
d. All premanufactured canopy and awning framing including connections to the structure.
e. Handrails at balconies – see S001 "Design Criteria" for applicable loading
* Reference section "D. Submittal Requirements." Coordinate requirements of these drawings with those of other design consultant drawings and the Project Specifications.

3. The following items are specifically excluded from McClure's design scope as represented on these drawings:

- a. Requirements for fire rating of assemblies or fire protection of structural members
b. Global stability of soil mass
c. Any exterior slabs, bollards, curbs, and any enclosures not shown on these drawings
d. Interior non-load-bearing wood framed walls or furring
e. Shoring design, formwork design, temporary bracing, and other means and methods items

C. GENERAL NOTES

1. All construction shall conform to the Design Codes in Section "A. Design Criteria," including all applicable standards and documents referenced within those codes.
2. Plan and detail notes provided on specific sheets within these drawings supplement information in these General Notes. Always coordinate the requirements of these notes with what is shown within the drawings.
3. Unless noted specifically on a plan, all floor plans show framing for the roof indicated walls, openings, posts, columns supporting that floor.
4. Contract Document Coordination:
a. The drawings contained herein are intended to be utilized in conjunction with other design consultant's drawings (architectural, civil, mechanical, etc.). It is the responsibility of the Contractor to coordinate the requirements of the drawings into their shop drawings and construction.
i. Refer to the Project Specifications issued as part of the contract documents for information supplemental to these drawings.
Should conflicts between these drawings and the Specifications exist, the Contractor shall bring them to the attention of the structural engineer for clarification.
ii. Refer to the architectural, mechanical, electrical, and civil drawings for location and size of block outs, inserts, openings, curbs, bases & pads, and dimensions not shown on these drawings.
c. Refer to the architectural drawings for size and location of doors and window openings, exterior wall assemblies, and floor, wall, and roof finishes. Refer to the mechanical and electrical drawings for additional information including locations of mechanical units, generators, etc.
d. Omissions or conflicts between various elements of the drawings, notes and details shall be brought to the attention of the structural engineer and resolved before proceeding with the work.
5. Use of Drawings in Construction:
a. The Contractor shall verify all dimensions and conditions at the job site before commencing work and shall report any discrepancies to the engineer responsible for the design of that work.
b. Do not use scaled dimensions; use written dimensions or, where no dimension is provided, consult the structural engineer for clarification before proceeding with the work.
i. Where member locations are not specifically dimensioned, members are either located on columns lines or are equally spaced between located members.
c. Details and keynotes shown shall be incorporated into the project at all appropriate locations, whether specifically called out or not.
d. McClure may provide the contractor with electronic files for their convenience and use in the preparation of shop drawings. These electronic files are not construction documents; the contractor is not relieved of his/her duty to fully comply with the contract documents, including the need to confirm and coordinate all dimensions and details, take field measurements, verify field conditions, and coordinate the contractor's work with that of other contractors for the project.
6. Change Orders During Construction:
a. Openings shall not be cut or otherwise made in any structural member unless that opening is specifically shown on these drawings. The Contractor shall seek approval in writing from the structural engineer for any design incorporating additional openings.
b. Support details shown for Architectural, Mechanical, Electrical, and Plumbing equipment as well as elevators is based upon available information from the manufacturer (if any) at the time these drawings were submitted. The Contractor shall coordinate requirements of actual equipment supplied with details and shall provide any additional framing required.
c. The Contractor shall be permitted to modify any architectural, mechanical, electrical, or plumbing load imposed on the structure that is not documented on the Contract Documents or differs from what is originally shown. Provide documentation of location, load, size, and anchorage of all undocumented loads in excess of 250 lbs.
7. Construction Sequence and Details:
a. These drawings and the related Specifications represent the finished structure and, except where specifically shown, do not indicate the method or means of construction. Loads on the structure during construction shall not exceed the design loads indicated in Section "A. Design Criteria." The Contractor shall supervise and direct the work and shall be solely responsible for all construction means, methods, procedures, techniques, and sequence.

- a. The Contractor is responsible for compliance with all applicable job-related safety standards proceeding from governing organizations (e.g. OSHA).
b. It is the responsibility of the Contractor to ensure the stability of the structural elements during construction as a result of means and methods by providing shoring, bracing, etc. as required.
i. Substantly considerations should include all applicable temporary construction and environmental loads per ASCE 37 which may include wind and seismic forces.
ii. Temporary bracing shall remain in place until positive connection is made between the floor/roof diaphragm and the lateral force resisting elements.
iii. The Contractor may at their discretion employ a Specialty Structural Engineer, licensed in the state where the project is located, for the design of any temporary bracing, lifting, rigging, and shoring.
c. The Contractor shall consider the effects of thermal movements due to hot or cold weather construction and the potential for extreme temperature variations before the structure is complete.
d. Any foundation wall restrained by a floor is not designed to be backfilled prior to the complete construction of the floor and the lateral bracing elements (shear walls, braced frames, etc.) below it. For backfilling before this time, temporary bracing shall be designed and provided by the Contractor.
e. The Contractor is responsible for the protection and repair of any adjacent existing structures, surfaces, and areas which may be damaged as a result of the work.

D. SUBMITTAL REQUIREMENTS

1. Submittal Procedures:
a. The Contractor shall provide all submittals in PDF format unless otherwise requested or indicated in the Project Specifications.
b. All submittals must be reviewed by the Contractor prior to McClure's review. The Contractor is responsible for reviewing each submittal for basic coordination with these drawings and to verify that all the required components of the submittal are incorporated. The submittal must bear the electronic review stamp of the Contractor before McClure will proceed with the review.
c. Incomplete submittals or submittals not meeting the requirements of this section will not be reviewed. McClure will notify the contractor that the submittal is incomplete or unacceptable and that resubmission is required.
i. Submittals requiring engineering calculations for all or a portion of the work are considered incomplete without the sealed calculations and will not be reviewed.
ii. Shop Drawings shall be original drawings. Submissions incorporating any portion or reproduction of the contract documents will not be reviewed.
iii. Deferred Submittals not meeting the seal requirements of section D.2.b are considered incomplete and will not be reviewed.
iv. Resubmittals with comments from a previous review left unaddressed or without any response will not be reviewed.
d. Allow two weeks for review of all submittals unless an agreement for expedited review is made in writing by McClure.
e. McClure's submittal review scope of work includes a single submittal review and one review of the revised submittal if required (two reviews total of the same submittal). Time required for review of a submittal is considered an additional service and will be billed hourly. McClure reserves the right to withhold review of a submittal surpassing the allowance until proper billing to the responsible party can be established.
f. Submittals must be returned to the Contractor by McClure bearing a stamp marked "Reviewed No Exception Taken" or "Reviewed With Comments/Exceptions" prior to proceeding with the work. Submittals marked "Reject/Resubmit" must be revised according to the comments provided prior to commencing with the respective scope of work.
2. Deferred Submittals:
a. See Section "B. Structural Engineering Design Narrative" for the list of items considered Deferred Submittals.
b. Deferred Submittals shall bear the seal of a professional engineer licensed in the state where the project is located. If the project requires a licensed Structural Engineer (S.E.) as the Engineer of Record according to state laws, the same qualification level applies to the engineer sealing the Deferred Submittals.
c. Deferred Submittal items shall not be installed until the Deferred Submittal documents have been approved by the Building Official.

Submittal Name	Items Required:				
	Product Data	Shop Drawings	Test Records	Engineering Drawings	Engineering Calculations
1. Concrete Mix Designs	X				
2. Concrete Break Reports		X	X		
3. Concrete Reinforcing Layout	X	X			
4. Concrete Anchor Bolts & Embedded Plates					
5. Concrete & CMU Anchors (Post-Installed)	X				
6. Post-Installed Anchor Substitutions	X				X
7. Post-Installed Connection Geometry Alteration	X			X	
8. Structural Steel Framing	X	X			
9. Structural Steel Framing Connections	X	X			X
10. Steel Floor Deck	X	X			
11. Metal Railings & Connections	X	X			X
12. Metal Ladders & Connections	X	X			X
13. Fall Arrest Systems	X	X			X
14. Wood Framing Materials	X				X
15. Wood Floor & Roof Trusses incl. Reactions				X	X
16. Wood Truss Connections to Supporting Structure				X	X
17. Specialty Wood Fasteners	X				
18. Manufactured Wood Shear Panels	X				
19. Exterior CFS Wall Framing below Podium Level	X	X		X	X
20. Premanufactured Canopies and Awnings	X	X		X	X
21. Masonry Wall Materials	X	X	X		
22. Masonry Reinforcing		X			

- b. "Product Data" may indicate mill certifications, material data sheets, Evaluation Service Reports (ESRs), etc. See requirements of each material section of the general notes for further information.
c. Where "Engineering Drawings" and/or "Engineering Calculations" are indicated, the submittal must comply with the requirements of item "2. Deferred Submittals" above.
4. Submittals For Record:
a. The following items impact the structural design and therefore must be submitted to the engineer; however, they do not require review. They will be returned stamped as "Received For Record."
i. Elevator Shop Drawings with Loads to Structure
ii. Mechanical Equipment Shop Drawings with Weight
iii. Brick & Stone Veneers Including Weights

E. CONCRETE

1. Reinforced concrete shall have the following minimum 28 day compressive strengths:
a. Slab on grade, unless noted otherwise 4000 psi normal weight
b. Foundations and Grade Beams 5000 psi normal weight
c. Drilled piers and pile caps 5000 psi normal weight
d. Slabs on non-composite metal deck 4000 psi normal weight
e. Slabs on composite metal deck 4000 psi lightweight
2. All concrete exposed to weather shall have 6% (+/- 1%) air entrainment.
3. Submit mix designs for all concrete mixes prior to placement. All submittals shall include the following:
a. Batch quantities including admixture dosage rates.
b. Strength test results for test mixes.
c. Cured unit weight results (for lightweight concrete mixes only).
d. Aggregate source(s) and gradation(s).
e. Product data for all admixtures, fly ash and other cementitious materials.
f. Product data for all admixtures.
4. Provide minimum concrete cover for reinforcing bars as follows (unless specified otherwise on sections and details):
a. Cast-in-place concrete:
i. Concrete cast against and permanently exposed to earth: 3"
ii. Concrete exposed to earth and weather (formed):
1. #5 and smaller 2-1/2"
2. #6 and larger 3"
iii. Concrete not exposed to weather and not in contact with ground:
1. Slabs and walls 3/4"
2. Beams and columns 1-1/2"
5. Provide construction or control joints in slab on grade as shown on plans. If joint pattern is not shown, provide joints at 10'-0" x 10'-0" and at locations to conform to bay spacing wherever possible (at column centerlines, half bays, third bays, etc.).
6. Interface of all slab and beam construction joints shall be roughened with 1/4" amplitude. Surface of construction joints shall be clean and free of laitance. Immediately before new concrete is placed, construction joints shall be moistened and standing water removed.
7. Construction joints in walls shall be kept and placed at locations approved by the Architect and Structural Engineer.
8. Provide control joints in all relating walls at 15 ft to 20 ft intervals.
9. Elevator pit walls shall not have control joints as they are part of the lateral system.
10. Provide P.V.C. waterstops in all below grade construction joints and at other locations as shown.
11. Provide compressible filler and sealant in all slab-on-grade and wall and column interfaces that are not dove-tailed together.
12. All column pockets shall be filled with concrete after column is erected.
13. Sleeves and openings in slabs not shown on structural drawings or outside the parameters of typical sleeve details are not permitted, unless approved by the Structural Engineer.
14. Conduit and pipes embedded in slabs, walls, or grade beams shall be no larger in outside dimension than 1/3 the overall member thickness and shall be placed no closer than 3 diameters or widths on center.
15. Conduits and pipes shall be permitted in concrete piers or columns.
16. See "G. Foundations" section 5 for requirements at slab on grade.
17. Bond break material for split joints shall be one of the following: 1/8" thick tempered wood particleboard, 1/8" thick high-density plastic elastomeric strips, two layers of 10mil polyethylene sheeting or equivalent.
18. Provide concrete housekeeping pads under all mechanical, plumbing, fire protection, and electrical equipment per plans. Pads shall extend beyond equipment a nominal 6" on all sides. Provide reinforcing per details.
19. At floor drains, locally slope floor towards drain. See architectural and plumbing drawings for drain locations.
20. Foundation walls shall be temporarily braced until positive attachment is made to final framing per details. This is a means and methods item.

F. REINFORCING FOR CONCRETE

1. General
a. All reinforcing steel to be ASTM A615, Grade 60, deformed bars, unless noted otherwise.
i. Any reinforcing to be welded shall be ASTM A706 and welded with E60 electrodes.
ii. Alternatively, ASTM A615 reinforcing may be welded with E90 electrodes and proper preheat according to AWS D1.4.
iii. E70 electrodes are not permitted for welding rebar.
b. Welded wire fabric shall be ASTM A185. Welded wire fabric shall be in flat sheets.
c. All reinforcing bars to be detailed and placed in accordance with the ACI Manual of Standard Practice for Detailing Reinforced Concrete Structures' specifications.
d. All reinforcing, including dowels, shall be securely tied and cast with the lower member. Placing reinforcing after concrete has been placed will not be permitted.
e. Field bending of reinforcing parallel embedded in concrete will not be allowed unless specifically noted on the drawings or approved by the Structural Engineer.
f. All reinforcing bars shall be contact lap spliced or doweled as follows, unless noted otherwise:

Tension Development and Splice Lengths for $f_c = 5,000$ psi										
Bar Size	Development			Class "B" Splice		Standard 90 deg. Hook		Embed Length	Leg Length	Bend Dia
	Top	Other	Bar	Top	Other	Top	Other			
#3	17	13	22	17	6	6	2-1/4			
#4	22	17	29	22	6	8	3			
#5	28	22	36	28	8	10	3-3/4			
#6	33	26	43	33	9	12	4-1/2			
#7	49	37	63	49	11	14	5-1/4			
#8	55	43	72	55	12	16	6			
#9	63	48	81	63	14	19	9-1/2			
#10	70	54	91	70	15	22	10-3/4			
#11	78	60	101	78	17	24	12			
#14	94	72	---	---	29	31	18-1/4			
#18	125	96	---	---	39	41	24			

Tension Development and Splice Lengths for $f_c = 4,000$ psi										
Bar Size	Development			Class "B" Splice		Standard 90 deg. Hook		Embed Length	Leg Length	Bend Dia
	Top	Other	Bar	Top	Other	Top	Other			
#3	19	15	24	19	6	6	2-1/4			
#4	25	19	32	25	7	8	3			
#5	31	24	40	31	9	10	3-3/4			
#6	37	29	48	37	10	12	4-1/2			
#7	54	42	70	54	12	14	5-1/4			
#8	62	48	80	62	14	16	6			
#9	70	54	91	70	15	19	9-1/2			
#10	79	61	102	79	17	22	10-3/4			
#11	87	67	113	87	19	24	12			
#14	105	81	---	---	32	31	18-1/4			
#18	139	107	---	---	43	41	24			

1. Straight development and Class "B" splice lengths shown on plans are based on uncoated bars assuming center-to-center bar spacing $\geq 3"$ d, without ties or stirrups or $\geq 2"$ d, with ties or stirrups, and bar clear cover $\geq 1.0"$ d. Normal weight concrete as well as no transverse reinforcement are both assumed.
2. Standard 90 deg. hook embedment lengths are based on bar side cover $\geq 2.5"$ and bar end cover $\geq 2"$ without ties around hook.
3. For special seismic considerations, refer to ACI 318 Code Chapter 21.
4. All tension splices shall be Class "B" splices unless noted otherwise on plans.
g. All welded wire fabric shall be lapped 12" or 48 wire diameters, whichever is greater.
h. Provide (2) #5 x 6" diagonals at all corners of openings and re-entrant corners, unless noted otherwise.
i. Dowels between foundation and walls shall be the same grade, size, and spacing as the vertical wall reinforcing, unless noted otherwise.
j. Provide corner bars to match longitudinal reinforcing in all footings. Provide (2) corner bars at tee intersections.
k. Provide 500 pounds of miscellaneous straight bar reinforcing (#4 & #5) to be used in field for special conditions. Labor for placing same to be included.
2. Slabs and Slabs-on-Grade
a. All slabs on grade to be reinforced with 6x6 – W2.9xW2.9 welded wire fabric, unless noted otherwise.

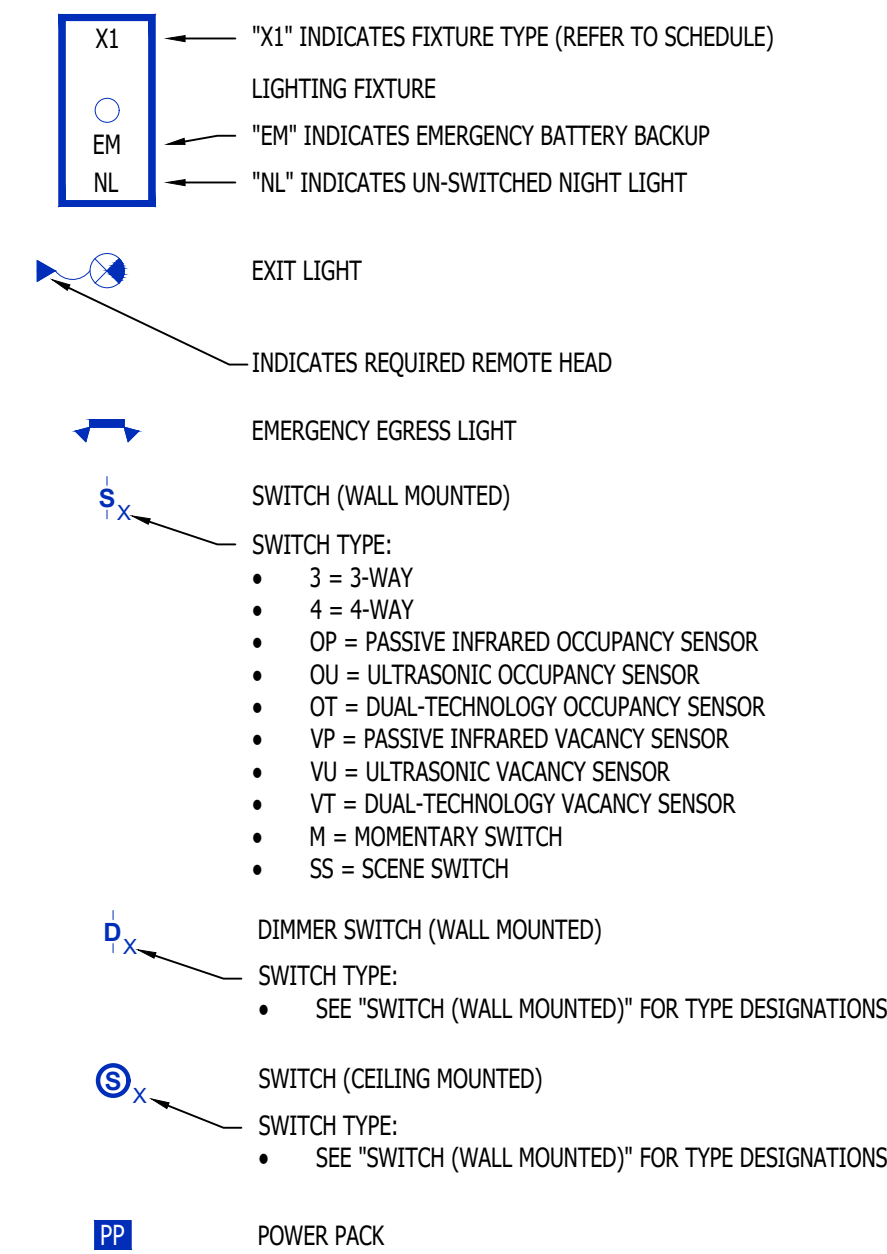
G. FOUNDATIONS

1. Soil Properties
a. Foundation design is based on the following to be considered part of the construction documents:
i. Geotechnical Report prepared by Vaughn Rupnow, PE, dated May 31, 2024, confirming Rammed Aggregate Piers as a viable foundation option with allowable subgrade bearing pressure of 6,000 psf.
It is the Owner's decision to proceed with Rammed Aggregate Piers.
2. A geotechnical representative shall be retained on site for all construction activity to verify that all proper requirements have been met to meet the design requirements outlined in the geotechnical report. Representative shall be someone familiar with all documents of the geotechnical investigation provided for the project.
3. The Contractor shall provide dewatering of excavations from surface water and ground water. Do not place concrete if water is present at base of excavation.
4. Footings
a. All footings shall bear on suitable subgrade prepared in accordance with the geotechnical report. The underlying soils and the structural fill shall have a minimum safe load bearing capacity of 2,500 psf.
b. Remove all existing topsoil, pavement, organic materials, and other soil that appears to be unsuitable prior to preparing the footing subgrade.
c. If any adverse soil conditions are encountered which extend below footing level such as those listed above, the general contractor shall contact the geotechnical engineer immediately in order to remedy the condition before continuation of work.
d. No footings shall be placed in water or on frozen ground. All exterior construction shall be carried down to minimum 3'-0" below finished adjacent exterior grade.
5. Slab on Grade
a. Slabs shall be constructed as shown on the plans.
b. Slabs-on-grade shall be placed on subgrade prepared in accordance with the requirements of the geotechnical report and the details in these construction documents.
c. A 10mil minimum vapor retarder shall be installed under all slabs on grade in occupied or conditioned spaces per the drawings. See the geotechnical report for additional information regarding the installation of the vapor retarder.
d. Slab on grade shall be founded on 6" deep 1/2" clean aggregate base compacted to at least 95% of maximum dry density and within 2% of optimum moisture content.
e. The upper 24" of subgrade extending beyond the footprint of the building shall consist of low volume change material (per the geotechnical report).
f. Provide joints at 30 x slab thickness (+/-) in both directions and located to conform to bay spacing wherever possible (at column centerlines, half bays, third bays, etc.). Submit control joint layout for approval by the Structural Engineer.
g. Saw cut control joints shall be done late enough to prevent raveling of the cut edges and early enough to prevent racking of the slab ahead of the saw blade.
h. Plumbing and utilities passing through the slab on grade shall be constructed with flexible fittings to allow for slab movement. The expected slab movement for the parking slab shall be considered up to 2" minimum for fittings.
i. Concrete slab to be cured according to ACI Standards. Concrete slab cure to be compatible with any sealer, grout, or adhesive that may be used in the floor later.
j. Locally slope floor towards any floor drains. See architectural and plumbing drawings for drain locations.
6. Geotechnical Testing Agency Requirements
a. If the geotechnical representative on other takes exception to anything in the Geotechnical Report and requires additional field investigation to clarify those exceptions, the cost of such investigation shall be included in the additional fee for field quality control and testing and identified as such. All other exceptions shall be documented and approved by the geotechnical engineer.
b. The geotechnical representative must have read all documents pertaining to the geotechnical report for the project and have understood and accepted the criteria contained in the report.
c. The geotechnical representative must understand and be able to make decisions affecting the work for field observations and conditions described in the report during construction. The representative must be capable of advising the owner or contractor for procedures regarding, but not limited to, sub-grade preparation, dewatering activities, and other construction considerations.
7. See notes on sheets and details for additional information.

H. POST-INSTALLED ANCHORS TO CONCRETE AND MASONRY

1. Post-installed anchors shall be expansion, adhesive, or screw anchors as indicated in the details, unless noted otherwise. Only use the anchor type indicated. All anchors on the project of each type must be by the same manufacturer; see below for substitution requirements.
a. Expansion anchors:
i. Concrete:
Hilti KWIK Bolt TZ (ICC-ES ESR1917)
Simpsom Strong-Bolt 2 (ICC-ES ESR3037)
DeWalt Power-Stub SD2 (ICC-ES ESR2502)
ii. Grout-filled Concrete Masonry:
Hilti KWIK Bolt 3 (ICC-ES ESR1385)
Simpsom Strong-Bolt 2 (UES ESR2040)
DeWalt Power-Stub SD1 (ICC-ES ESR2966)
b. Adhesive anchors (threaded rods shall be ASTM A193 B7 for all anchors):
i. Concrete:
Hilti HIT RE 500-SD (ICC-ES ESR2322) or Hilti HIT-HY 200 (ICC-ES ESR3187)
Simpsom AT-XP (UES ESR2658), SET-XP (ICC-ES ESR2508) or ET-HP (ICC-ES ESR3372)
DeWalt Pure 110+ (ICC-ES ESR3208), PE1000+ (ICC-ES ESR2583), Pure 50+ (ICC-ES ESR3576), AC 200+ (ICC-ES ESR4027), or AC100+ Gold (ICC-ES ESR2582)
ii. Solid grouted concrete masonry:
Hilti HIT-HY 70 anchor adhesive (ICC-ES ESR3342)
Simpsom AT-XP (UES ESR2811), SET-XP (UES ESR2658) or ET-HP (UES ESR2411)
DeWalt AC100+ Gold (ICC-ES ESR3200)
iii. Hollow concrete or multi-weight clay masonry:
Hilti HIT-HY 70 with screen tubes (ICC-ES ESR3342)
Simpsom SET-XP (UES ESR2658)
DeWalt AC100+ Gold with screen tubes (ICC-ES ESR3200)
c

LIGHTING PLAN SYMBOL LEGEND



OCCUPANCY SENSOR

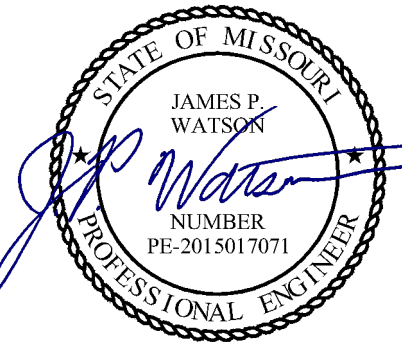
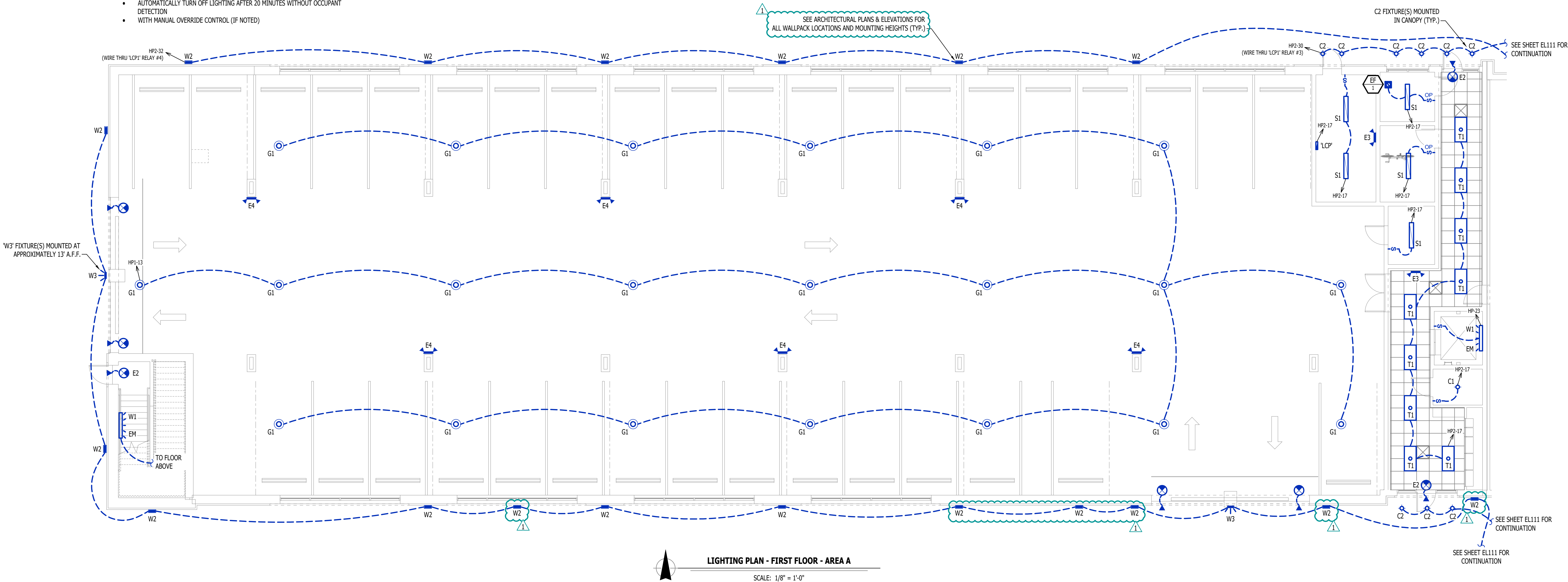
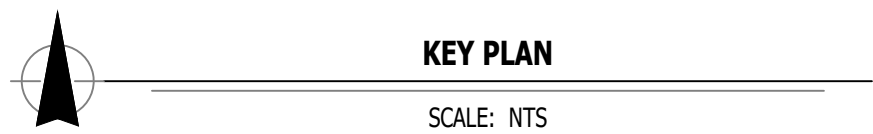
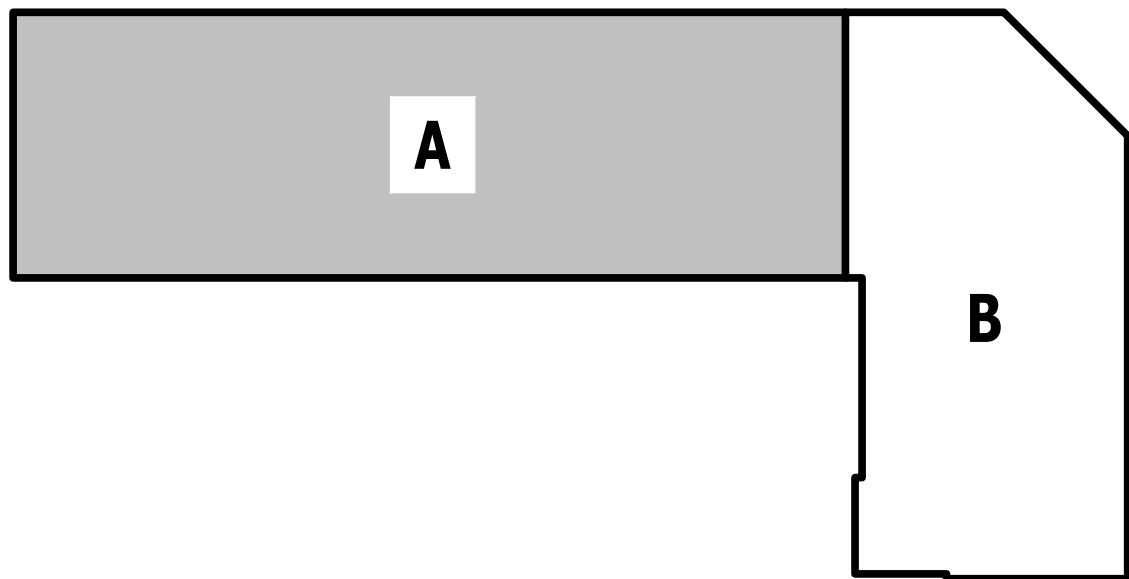
- AUTO FULL-ON (OR 50% IF NOTED)
- AUTOMATICALLY TURN OFF LIGHTING AFTER 20 MINUTES WITHOUT OCCUPANT DETECTION
- WITH MANUAL OVERRIDE CONTROL (IF NOTED)

VACANCY SENSOR

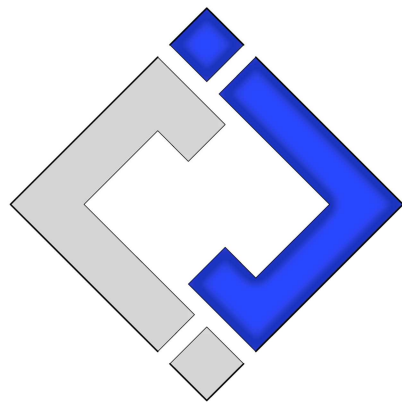
- MANUAL FULL-ON
- AUTOMATICALLY TURN OFF LIGHTING AFTER 20 MINUTES WITHOUT OCCUPANT DETECTION
- WITH MANUAL OVERRIDE CONTROL (IF NOTED)

LIGHTING PLAN GENERAL NOTES:

- REFER TO E500 AND/OR E600 SERIES SHEETS FOR ADDITIONAL LIGHTING NOTES, DETAILS, REQUIREMENTS, AND SCHEDULES.
- OCCUPANCY/VACANCY SENSOR QUANTITIES AND GENERAL LOCATIONS SHOWN FOR REFERENCE ONLY. CONTRACTOR TO PROVIDE & INSTALL SENSOR WITH SPACING PER MANUFACTURER'S SPECIFICATIONS AND INCLUDE ADDITIONAL SENSORS IF NECESSARY. CEILING-MOUNTED SENSORS SHALL BE INSTALLED WITHIN MANUFACTURER'S ACCEPTABLE MOUNTING HEIGHT RANGE.
- ELECTRICAL CONTRACTOR SHALL REVIEW ALL PROJECT DOCUMENTS AND COORDINATE LOCATION OF ALL FIXTURES, WIRING, HANGERS / SUPPORTS, ETC. WITH HVAC AND PLUMBING TRADES BEFORE INSTALLATION OF ANY MATERIAL. ADDITIONAL COSTS ASSOCIATED WITH LACK OF COORDINATION WILL NOT BE REIMBURSED.
- "W2" UP/DOWN WALL-SCONCE FIXTURES SHALL BE DIRECTED ONTO BUILDING FACADE TO MINIMIZE ANY UPWARD GLARE IN COMPLIANCE WITH CITY OF LEE'S SUMMIT UDC 8-270(B) ACCENT LIGHTING.



James Watson, P.E. December 04, 2024
PE-2015017071
MO Certificate of Authority # 2018029680



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J2 PROJECT No: J221010

J2 DESIGN: ACW

ISSUE TITLE DATE

PERMIT SET 11 - 11 - 2024

REVISION 1 12 - 04 - 2024

MECHANICAL - ELECTRICAL - PLUMBING DESIGN DRAWINGS FOR:

The Village at Discovery - Lot 7

1920 NE Discovery Ave.
Lee's Summit, Jackson County, MO

AHJ APPROVAL STAMP

SHEET TITLE

LIGHTING PLAN -
FIRST FLOOR -
AREA A

SHEET NUMBER

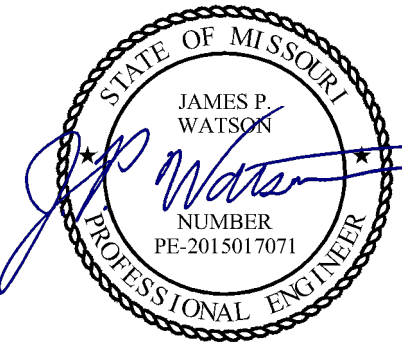
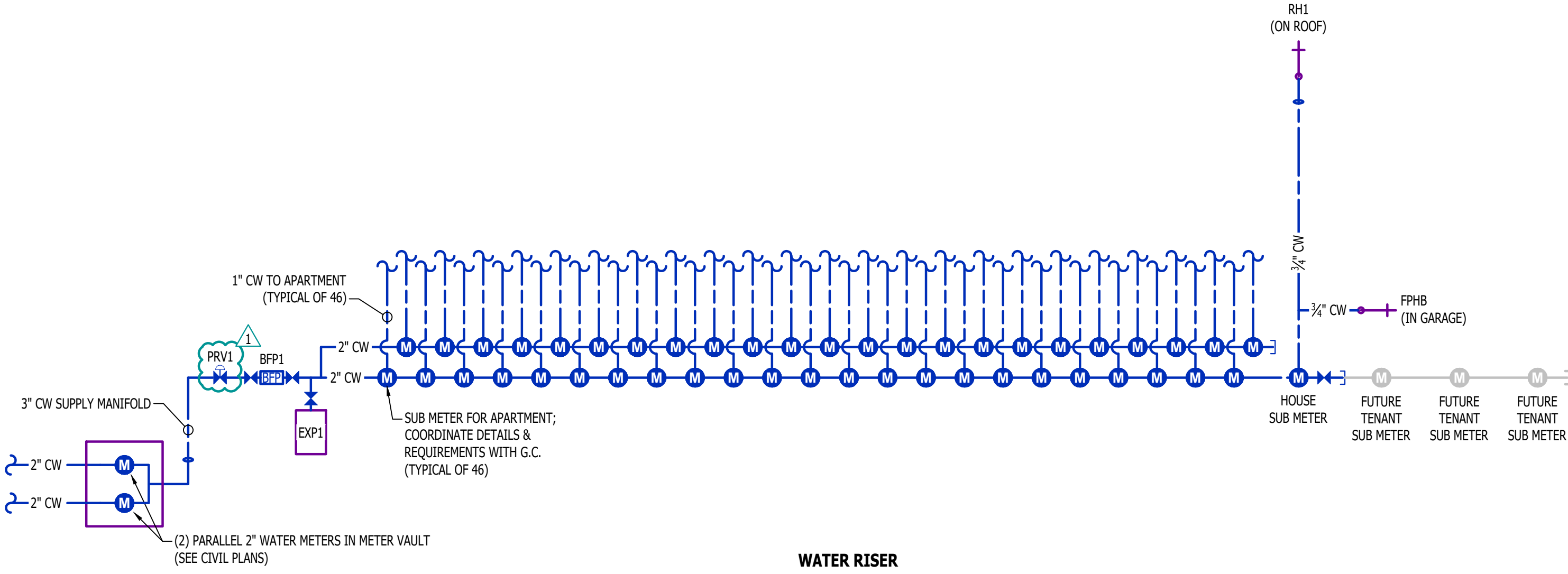
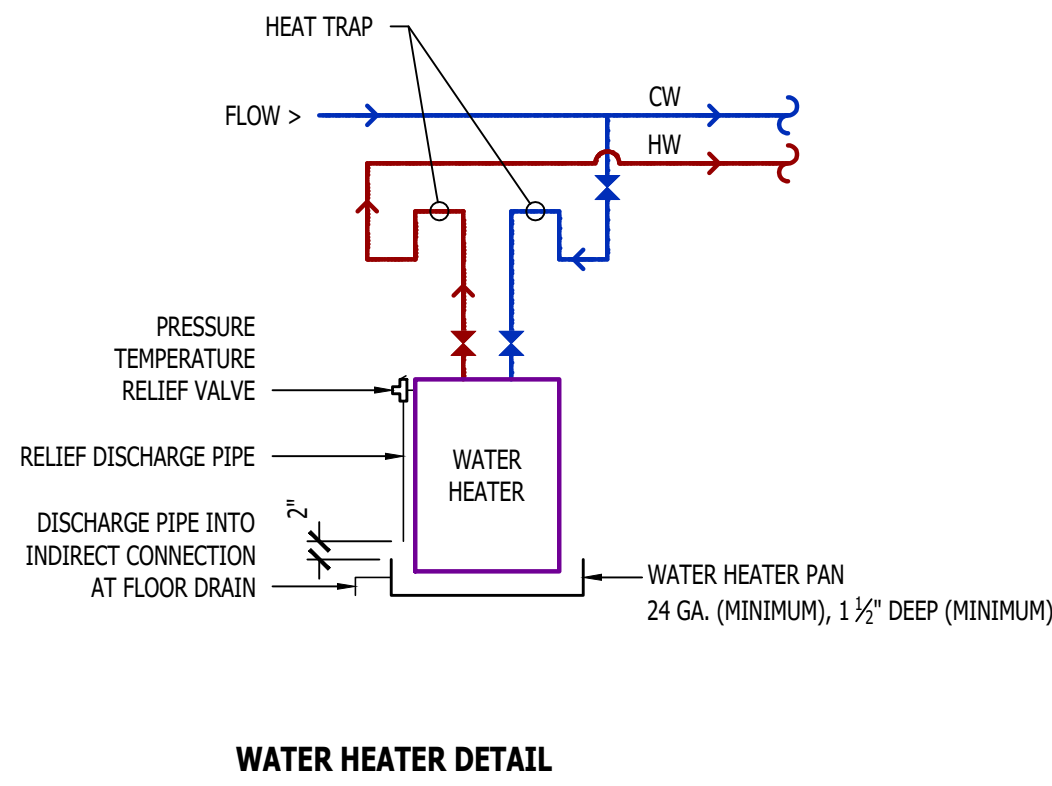
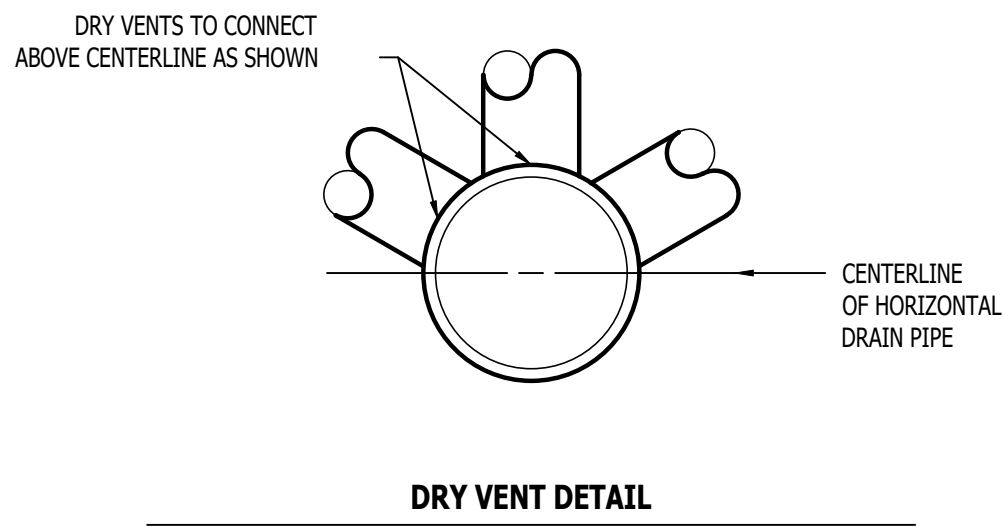
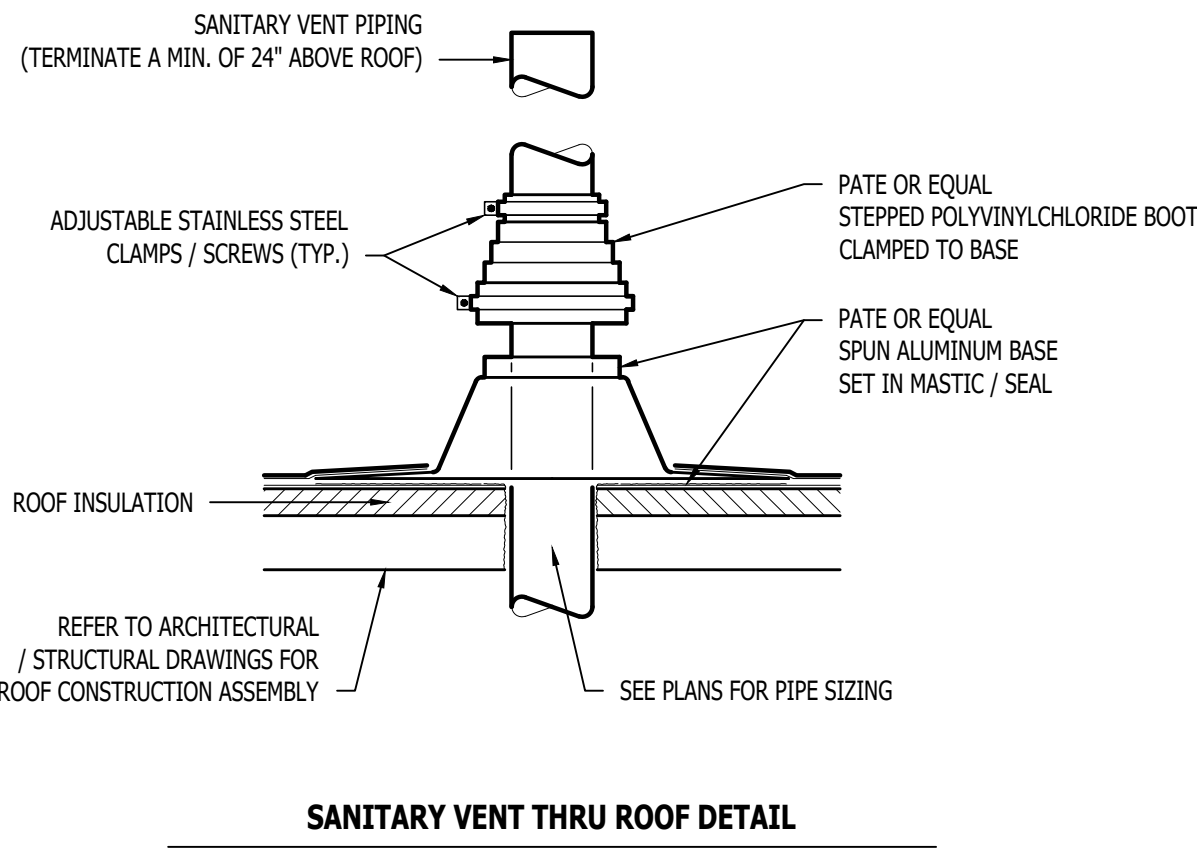
EL101

PLUMBING SPECIFICATIONS

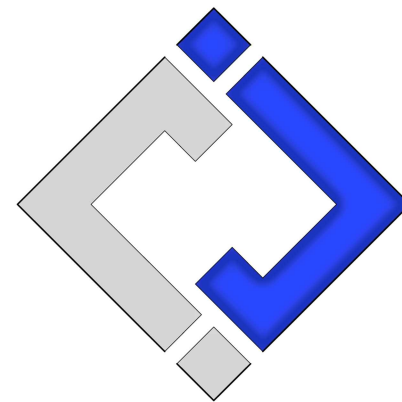
- 1. GENERAL**
- 1.1. PLUMBING CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL ESCUTCHEONS, ¼ TURN STOPS, P-TRAPS, AND SUPPLY LINES TO PROVIDE A COMPLETE SYSTEM AT EACH FIXTURE INDICATED ON PLANS UNLESS NOTED OTHERWISE.
- 1.2. ALL PLUMBING SYSTEMS SHALL BE INSTALLED LEVEL, PLUMB, AND PARALLEL/PERPENDICULAR TO BUILDING ORIENTATION WHERE POSSIBLE.
- 1.3. COORDINATE ALL PIPING INSTALLATIONS WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THRU STRUCTURAL ELEMENTS AS NECESSARY, VERIFY WITH STRUCTURAL ENGINEER.
- 1.4. VERIFY ALL UTILITY CONNECTION POINTS WITH PROPOSED PLUMBING LAYOUTS PRIOR TO BEGINNING WORK.
- 1.5. CLEAN ALL PLUMBING FIXTURES AND CHANGE FAUCET AERATORS AND SINK STRAINERS AT PROJECT COMPLETION PRIOR TO TURNING OVER TO OWNERSHIP.
- 2. EQUIPMENT / FIXTURES**
- 2.1. ALL EQUIPMENT AND/OR FIXTURES MUST MEET OR EXCEED THE PERFORMANCE, FUNCTIONAL INTENT, AND AESTHETICS AS MODELS SPECIFIED ON PLANS. WHERE SPECIFIC MANUFACTURERS AND/OR MODELS ARE INDICATED ON PLANS OR WITHIN SCHEDULES, CONTRACTOR TO PROVIDE MODEL INDICATED OR APPROVED EQUAL. VERIFY SUBSTITUTION APPROVAL PRIOR TO PURCHASE OR INSTALLATION OF EQUIPMENT.
- 2.2. CONTRACTOR TO SUPPLY SUBMITTALS FOR ALL EQUIPMENT FOR REVIEW BY ARCHITECT AND ENGINEER. FORMAL APPROVAL SHALL BE RECEIVED BY CONTRACTOR PRIOR TO EQUIPMENT PURCHASE.
- 2.3. CONTRACTOR TO SHARE APPROVED EQUIPMENT SUBMITTALS WITH ANY PERTINENT ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTORS WITHIN TWO WEEKS OF RECEIVING APPROVED SUBMITTALS FROM ARCHITECT/ENGINEER.
- 3. SANITARY**
- 3.1. BELOW AND ABOVE GRADE WASTE AND VENT PIPING IN BUILDING TO BE SOLID CORE SCHEDULE 40 PVC LISTED FOR DWV APPLICATIONS.
- 3.2. NO WASTE OR VENT PIPING INSTALLED BELOW GRADE SHALL BE SMALLER THAN 2".
- 3.3. MINIMUM SLOPES FOR WASTE PIPING (UNLESS NOTED OTHERWISE ON PLANS):
- 3.3.1. 2 ½" OR LESS DIAMETER: ¼" PER FOOT
- 3.3.2. 3" TO 6" DIAMETER: ½" PER FOOT
- 3.3.3. 8" OR LARGER DIAMETER: ¾" PER FOOT
- 3.4. ACCESSIBLE FULL PIPE SIZE CLEANOUTS SHALL BE PROVIDED & INSTALLED ON BUILDING SANITARY LINES AT LOCATIONS SHOWN ON PLANS, AT INTERVALS OF NO MORE THAN 100', AT EVERY CHANGE IN DIRECTION GREATER THAN 45°, AND AT THE BASE OF EACH WASTE STACK.
- 3.5. WASTE AND VENT PIPING IN PLENUMS SHALL BE CAST IRON, PLENUM-RATED CPVC, OR PVC WITH AN INSULATION WRAP LISTED FOR USE AS SUCH AN ASSEMBLY.
- 3.6. ALL VENT PIPE TERMINATIONS SHALL BE LOCATED EITHER 10' HORIZONTALLY OR 3' ABOVE MECHANICAL AIR INTAKE LOCATIONS. TERMINATIONS SHALL NOT BE INSTALLED UNDER ANY OPERABLE BUILDING OPENING OR OPERABLE ADJACENT BUILDING OPENING. CONTRACTOR TO OFFSET VENT PIPING AS NECESSARY TO MEET THESE REQUIREMENTS.
- 4. DOMESTIC WATER**
- 4.1. ALL DOMESTIC WATER PIPING TO BE EITHER COPPER OR PEX, SHALL CONFORM TO NSF 61 AND BE LISTED FOR USE IN POTABLE WATER SYSTEMS.
- 4.1.1. WHERE PEX PIPING IS USED, IT SHALL BE INCREASED ONE PIPE SIZE FROM WHAT IS INDICATED ON PLANS FOR ALL PORTIONS OF DISTRIBUTION SYSTEM.
- 4.1.2. PEX-A MAY BE INSTALLED AT SIZES INDICATED ON PLANS ONLY IF AN ENGINEERED PLAN IS SUBMITTED SHOWING ACCEPTABLE PRESSURE DROPS AND FLUID VELOCITIES, APPROVAL MUST BE GRANTED PRIOR TO PURCHASE AND INSTALLATION.
- 4.1.3. COPPER WATER PIPING BELOW GRADE SHALL BE TYPE "K". BELOW GRADE JOINTS SHALL BE SILVER SOLDERED. THERE SHALL BE NO JOINTS IN WATER PIPING LOCATED BENEATH BUILDING SLAB.
- 4.1.4. COPPER WATER PIPING ABOVE GRADE SHALL BE TYPE "L".
- 4.2. PROVIDE WATER HAMMER ARRESTORS AT ALL QUICK-CLOSE VALVES. FIXTURES REQUIRING WATER HAMMER ARRESTORS INCLUDE BUT ARE NOT LIMITED TO PLUSH VALVES, SENSOR FAUCETS, AND WASHING MACHINE BOXES. AIR CHAMBERS SHALL NOT BE PERMITTED.
- 4.3. ALL DOMESTIC WATER PIPING SHALL BE ROUTED WITHIN BUILDING THERMAL ENVELOPE AND WITHIN WALL CAVITIES, ABOVE FINISHED CEILINGS, OR BELOW SLAB TO REMAIN CONCEALED UNLESS OTHERWISE NOTED. NOTIFY ENGINEER OF ANY NECESSARY ADJUSTMENTS THAT REQUIRE PIPING TO BE EXPOSED.
- 4.4. DOMESTIC WATER PIPING INSULATION
- 4.4.1. ALL HW PIPING, WHETHER COPPER OR PEX, SHALL BE INSULATED WITH PLENUM RATED CLOSED CELL ELASTOMERIC INSULATION.
- 4.4.1.1. FOR PIPING LESS THAN 1½", INSULATION THICKNESS TO BE 1".
- 4.4.1.2. FOR PIPING 1½" OR GREATER, INSULATION THICKNESS SHALL BE 1½".
- 4.4.2. CW COPPER PIPING TO INSULATED WITH ½" PLENUM RATED CLOSED CELL ELASTOMERIC INSULATION. CW PEX NEED NOT BE INSULATED UNLESS NOTED OTHERWISE ON PLANS.
- 5. GAS PIPING**
- 5.1. GAS PIPING SHALL BE INSTALLED LEVEL, PLUMB, AND PARALLEL OR PERPENDICULAR TO BUILDING ORIENTATION WHERE POSSIBLE.
- 5.2. QUARTER-TURN FULL-PORT SHUTOFF VALVES SHALL BE INCLUDED AT EACH APPLIANCE CONNECTION, AS WELL AS AN IN-LINE REGULATOR FROM DELIVERY PRESSURE TO APPLIANCE OPERATING PRESSURE IF REQUIRED. INCLUDE SEDIMENT TRAPS PER IFGC REQUIREMENTS.
- 5.1. NATURAL GAS AND LIQUID PROPANE (LP) PIPING TO SHALL BE SCHEDULE 40 BLACK STEEL.
- 5.2. PIPE JOINTS SHALL BE THREADED WITH CLASS 150 FITTINGS, OR WELDED. NOTIFY OWNER/GC OF ANY NECESSARY HOT-WORK ASSOCIATED WITH WELDED CONNECTIONS.
- 5.3. WHERE PIPING IS EXPOSED ON EXTERIOR FACE OF BUILDING, PAINT TO MATCH BUILDING. PAINT YELLOW IN ALL OTHER LOCATIONS.
- 5.4. ON ROOFTOPS, INSTALL GAS PIPE WITH "ROOFTOP BLOW" PER MANUFACTURER'S INSTRUCTION.
- 6. STORM DRAIN PIPING**
- 6.1. ABOVE AND BELOW GRADE STORM PIPING SHALL BE SOLID CORE SCHEDULE 40 PVC.
- 6.2. ALL PRIMARY & SECONDARY STORM DRAIN PIPING & FITTINGS SHALL BE INSULATED WITH ½" FIBERGLASS INSULATION WITH ASJ JACKET.
- 6.3. STORM DRAIN PIPING IN PLENUMS SHALL BE CAST IRON, PLENUM-RATED CPVC, OR PVC WITH AN INSULATION WRAP LISTED FOR USE AS SUCH AN ASSEMBLY.

PLUMBING CONNECTION SIZING SCHEDULE					
FIXTURE		SANITARY PIPING		SUPPLY PIPING	
TYPE	TYPICAL ABBREVIATION	WASTE CONNECTION	VENT CONNECTION	COLD WATER CONNECTION	HOT WATER CONNECTION
DRINKING FOUNTAIN	DF	1-1/2"	1-1/4"	1/2"	-
FLOOR DRAIN	FD	3"	2"	-	-
HAND / HAIR SINK	HS / SK	2"	1-1/4"	1/2"	1/2"
HOSE BIBB	HB	-	-	3/4"	-
LAVATORY	LAV	1-1/2"	1-1/4"	1/2"	1/2"
MOP SINK	MS	3"	1-1/2"	1/2"	1/2"
ICE MAKER OUTLET BOX	REF	-	-	1/2"	-
SHOWER	SH	3"	1-1/2"	1/2"	1/2"
URINAL	UR	2"	1-1/4"	3/4"	-
WATER CLOSET (FLUSH TANK)	WC	3"	2"	1/2"	-
WATER CLOSET (FLUSH VALVE)	WC	3"	2"	1"	-
NOTES: 1. SIZES SHOWN ABOVE ARE TYPICAL UNLESS NOTED OTHERWISE ON PLANS					

TAG	DESCRIPTION	MANUFACTURER (OR EQUAL)	MODEL (OR EQUAL)	NOTES
AAV1	AIR ADMITTANCE VALVE	OATEY	39020	1.5" - 6 DPU MAX
BFP1	BACKFLOW PREVENTER	WILKINS	975XL2	RPZ - SIZE AS INDICATED ON PLANS
DN1	DOWNSPOUT NOZZLE	ZURN	Z199	
EXP1	EXPANSION TANK	WATTS	DETA-100	
FCO1	FLOOR CLEAN OUT	ZURN	Z1400	
FD1	FLOOR DRAIN	ZURN	Z415-BZ	WITH Z1072 TRAP SEAL
FPHB1	FROST PROOF HOSE BIB	WOODFORD	MODEL 67	
RH1	FROST PROOF ROOF HYDRANT	WOODFORD	SRH-MS	
FS1	FLOOR SINK	ZURN	FD2370	
HB1	HOSE BIB	JR SMITH	5670-H	INTEROR HOSE BIB WITH VACUUM BREAKER
LAV1	LAVATORY - INTEGRAL BOWL	-	-	WITH PFISTER #G142-8000 CHROME FAUCET
LAV2	LAVATORY (WALL HUNG W/MANUAL FAUCET)	AMERICAN STANDARD	0355.012	WITH ZURN Z81104-XL FAUCET, 1/4 TURN STOPS, BRAIDED STAINLESS STEEL SUPPLIES, TRUBRO LAV GUARD 2, & 'TMV1'
PRV1	PRESSURE REDUCING VALVE	ZURN	600XL	3" INLET / 3" OUTLET
RD1	ROOF DRAIN	ZURN	Z100	
REF1	REFRIGERATOR BOX	SILOUX CHIEF	696-G1000	
REF1	REFRIGERATOR BOX	SILOUX CHIEF	696-G1000	
RH1	ROOF HYDRANT	WOODFORD	SRH-MS	
SK1	KITCHEN SINK	DAYTON	DSESR12722	WITH PFISTER #F-529-CRS FAUCET,15E DISPOSAL #BADGER-1 & ST5-00 AIR SWITCH
SP1	SUMP PUMP	ZOELLER	153-0002	120V, 1/2 HP WITH "OIL MINDER" CONTROLS
TMV1	THERMOSTATIC MIXING VALVE - POINT OF USE	WATTS	LFUSG	
TUB1	TUB / SHOWER	AQUARIS	G6030TS	WITH PFISTER R89-0300 SHOWER TRIM KIT
TUB2	ADA TUB / SHOWER	AQUATIC	2603SMTE	WITH GRAB BARS & ADA HANDHELD SHOWER ASSEMBLY
WB1	WASHER BOX	SILOUX CHIEF	696-G2303	
WC1	WATER CLOSET - STANDARD HEIGHT - TANK	AMERICAN STANDARD	215CA.004	WITH CHURCH 7200SLEC SEAT AND COVER, STAINLESS BRAIDED SUPPLY, AND 1/4 TURN SHUT-OFF.
WC2	WATER CLOSET - ADA HEIGHT - TANK	AMERICAN STANDARD	215AA.004	WITH CHURCH 7200SLEC SEAT AND COVER, STAINLESS BRAIDED SUPPLY, AND 1/4 TURN SHUT-OFF.
WH1	WATER HEATER - ELECTRIC - LOWBOY	AO SMITH	ECLB-40	38 GALLON, 208V 1PH, 4500W; WITH 'EXP1'
WH2	WATER HEATER - ELECTRIC - POINT OF USE	AO SMITH	EGSP6	6 GALLON, 120V, 1500W WITH HOLDRITE #40-SWHP-W WALL HUNG PLATFORM; WITH 'EXP1'
YCO1	YARD CLEAN OUT	ZURN	Z1400	
NOTES: 1. VERIFY NECESSARY FIXTURES MEET ADA REQUIREMENTS WITH ARCHITECT PRIOR TO INSTALLATION				



James Watson, P.E. December 04, 2024
PE-2015017071
MO Certificate of Authority # 2018029680



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J2 PROJECT No: J21010

J2 DESIGN: ACW

ISSUE TITLE DATE

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REVISION 1 12 - 04 - 2024

MECHANICAL - ELECTRICAL - PLUMBING DESIGN DRAWINGS FOR:

The Village at Discovery - Lot 7

1920 NE Discovery Ave.
Lee's Summit, Jackson County, MO

AHJ APPROVAL STAMP

SHEET TITLE

PLUMBING DETAILS & SCHEDULES

SHEET NUMBER

P501