LOT 7, BUILDING 31

420 SW Longview Blvd
Lee's Summit, MO 64081

PERMIT SET

GENERAL NOTES

1. GENERAL CONTRACTOR AND ALL OTHER CONTRACTORS WORKING ON THIS CONSTRUCTION PROJECT SHALL MEET ALL APPLICABLE CODE REQUIREMENTS. ALL CONSTRUCTION AND MATERIALS SHALL COMPLY WITH ANY AND ALL APPLICABLE CODES, REGULATIONS, DIRECTIVES AND LAWS. CONTRACTOR SHALL BE KNOWLEDGEABLE OF ALL CITY REGULATIONS AND CODE ISSUES AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT UPON DISCOVERY OF ANY DISCREPANCIES ON THE DOCUMENTS OR CONDITIONS OF THE PROJECT SITE.

2. SUBSTANTIAL COMPLETION SHALL BE ESTABLISHED ON DELIVERY OF OCCUPANCY PERMIT. FINAL COMPLETION SHALL BE DEEMED COMPLETED WHEN ALL PUNCH LIST ITEMS ARE COMPLETED AND APPROVED, ALL SUPPORT EQUIPMENT INSTALLED AND COMPLETE. OWNER WILL DETERMINE FINAL COMPLETION.

3. THE RESPONSIBILITIES CONCERNING THE PREPARATION AND REVIEW OF THE APPLICATION FOR PAYMENT AND PAYMENT SCHEDULE SHALL BE ADDRESSED IN THE AGREEMENTS BETWEEN THE OWNER, ARCHITECT, AND CONTRACTOR.

4. THE ARCHITECT WILL BE AVAILABLE TO THE OWNER AND CONTRACTOR DURING CONSTRUCTION. THE ARCHITECT WILL ASSIST THE OWNER AND/OR CONTRACTOR IN OBTAINING A BUILDING PERMIT.

5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE CONSTRUCTION PROCESS, MATERIAL VERIFICATION, AND WORKER SAFETY.

6. THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR DETAILS AND ACCURACY, FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, AND FOR TECHNIQUES OF ASSEMBLY.

7. ALL CUTTING AND PATCHING SHALL BE PERFORMED IN A NEAT AND WORKMAN LIKE MANNER. ANY EXISTING FINISHES DISTURBED OR DAMAGED BY THE CONTRACTOR OR TRADES UNDER CONTRACT DURING THE COURSE OF THE WORK SHALL BE REPAIRED TO MATCH EXISTING.

8. NO SUBSTITUTES OF SPECIFIED CONSTRUCTION ITEMS, EQUIPMENT AND FINISHES WILL BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE OWNER AND ARCHITECT.

9. ALL BIDDING CONTRACTOR(S) SHALL VISIT THE SITE OF THE PROPOSED WORK AND FULLY ACQUAINT THEMSELVES WITH THE EXISTING CONDITIONS OF THE PROJECT SITE, AS THEY CURRENTLY EXIST, SO THEY MAY FULLY UNDERSTAND THE FACILITIES, DIFFICULTIES AND RESTRICTIONS PRIOR TO SUBMITTING ANY BIDS.

10. THE CONTRACTOR SHALL PROVIDE THE OWNER WITH SCHEDULING INFORMATION PRIOR TO CONSTRUCTION, WHICH WILL BE UPDATED IF THERE ARE ANY CHANGES.

11. ALL REQUIRED COMMUNICATION SHALL BE THROUGH THE ARCHITECT AND OWNER.

12. DO NOT SCALE DRAWINGS. THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS AND CONDITIONS ON THE JOBSITE. INFORMATION CONTAINED IN THESE DRAWINGS IS GENERAL AND NOT BASED ON EXISTING DOCUMENTS AND FIELD MEASUREMENTS. THE INFORMATION CONTAINED HEREIN MAY REQUIRE ADJUSTMENTS OR MODIFICATIONS TO CONFORM TO EXISTING CONDITIONS AND DESIGN INTENT OF DOCUMENTS. THE CONTRACTOR MUST NOTIFY ARCHITECT OF ANY CONFLICTS AND/OR VARIATIONS.

13. CONTRACTOR SHALL FURNISH & INSTALL ALL ITEMS SHOWN ON THE DRAWINGS UNLESS SPECIFICALLY NOTED OTHERWISE.

18. ALL CONTRACTORS SHALL GUARANTEE ALL WORK EXECUTED UNDER THIS CONTRACT; BOTH AS TO MATERIAL AND WORKMANSHIP, FOR A PERIOD OF TWELVE MONTHS AFTER DATE OF SUBSTANTIAL COMPLETION. IN ADDITION, ANY DAMAGE TO ADJACENT AREAS/SURFACES CAUSED BY FAULTY MATERIALS OR WORKMANSHIP SHALL ALSO BE REPAIRED TO THE OWNER'S SATISFACTION AT NO ADDITIONAL COST.

20. CONTRACTOR TO INSTALL ALL MATERIAL PER MANUFACTURERS' REQUIREMENTS, UL RATING REQUIREMENTS, SPECIFIC TRADE GUIDELINES, INDUSTRY STANDARDS, AND BUILDING CODES. ALL NEW FINISHES TO COMPLY WITH IBC CHAPTER 8.

21. PROVIDE SIGNAGE MEETING ADA REQUIREMENTS AND LOCATIONS DICTATED BY THE CITY AND LOCAL CODES. DESIGN, CONTENT, AND LOCATIONS SHALL BE PROVIDED TO THE OWNER AND ARCHITECT PRIOR TO INSTALLATION.

25. THE CONTRACTOR MUST SUBMIT TO OWNER AN INSURANCE CERTIFICATE WITH MINIMUM COVERAGE OF $1,000,000 IN GENERAL LIABILITY OR EQUAL. THIS CERTIFICATE MUST NAME THE OWNER AS ADDITIONAL INSURED.

26. ALL CHANGES, DEVIATIONS, MODIFICATIONS, ADDITIONS OR DELETIONS FROM THE CONTRACT OF CONSTRUCTION OF APPROVED ARCHITECTURAL PLANS SHALL BE APPROVED BY THE OWNER AND ARCHITECT.

27. DIMENSIONS ARE FROM OUTSIDE FACE OF FULL BED MASONRY, OR FROM FACE OF MTL STUD ON ALL OTHER MATERIALS, UNLESS NOTED OTHERWISE. (THIN BRICK & THIN STONE VENEERS ARE DIMENSIONED TO FACE OF STUD).

28. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING ALL INTERIOR SURFACES AND EXTERIOR DEBRIS SPECIFIC TO CONSTRUCTION ACTIVITIES PRIOR TO OCCUPANCY OF THE SPACES BY THE OWNER. ADDITIONAL CLEANING FOLLOWING THE RECONCILIATION OF PUNCHLIST ITEMS SHALL ALSO BE INCLUDED. FINAL CLEANUP SHALL CONSIST OF THE FOLLOWING:

a. REMOVE ALL CONSTRUCTION DEBRIS, UNUSED MATERIALS, TOOLS, ETC.
b. CLEAN INTERIOR AND EXTERIOR SURFACES OF STOREFRONT GLASS AND FRAMES
c. CLEAN ALL FLOORS
d. REPLACE ALL FILTER MEDIA IN HVAC SYSTEMS

LOCATOR PLAN

DRAWING SYMBOLS

WALL SECTION — 1 / A101 — SIM

ELEVATION MARKS (EXTERIOR // INTERIOR) — 1// A101 — 1/A101 SIM.

ELEVATION MARKS (EXTERIOR // INTERIOR) — 1 / A1.1 — SIM

REVISION MARK + CLOUD — 1

ROOM TAG — Room name 101

ELEVATION MARK — LEVEL 1 100'-0"

CONSTRUCTION KEYNOTE — 1

GLAZING FRAME MARK — A10

GLAZING MARK — GL1

DOOR MARK — 101A

WINDOW MARK — W1

WALL PARTITION TYPE — P4

FLOOR TRANSITION

EXISTING PARTITION

NEW PARTITION

DEMOLITION PARTITION

PROJECT TEAM

OWNER:
BOX REAL ESTATE DEVELOPMENT
3175 SW Rockbridge Dr
Lee's Summit, MO 64081
CONTACT: RUSSELL PEARSON
P: 816 589 4415
E: russell@nai-heartland.com

MEP:
JSC ENGINEERS
1901 NW Blue Pkwy tower-3rd floor
Unity Village, MO 64065
CONTACT: JUSTIN SMOTHERS
P: 816 272 5289
E: jsmothers@jscengineers.com

CONTRACTOR:
TBD

STRUCTURAL :
STAND STRUCTURAL ENGINEERING, INC.
8234 ROBINSON ST
OVERLAND PARK, KS 66204
CONTACT: JOHN FUNK
P: 913 214 2169
E: jfunk@stand-sei.com

ARCHITECTURAL:
CLOCKWORK
423 DELAWARE ST. SUITE 102
KANSAS CITY, MO 64105
CONTACT: JEFF WINDMEYER
P: 660 815 1316
E: jeff@clockwork-ad.com

CIVIL:
SCHLAGEL ASSOCIATES
14920 W. 107TH ST.
LENEXA, KS 66215
CONTACT: JEFFREY SKIDMORE
P: 913 492 5158
E: js@schlagelassociates.com

SHEET INDEX

GENERAL
A000 TITLE SHEET
A001 CODE PLANS & ANALYSIS

CIVIL
C1.0 SITE PLAN
C2.0 GRADING PLAN
C3.0 STORM SEWER PLAN & PROFILE
C4.0 SITE UTILITY PLAN
C5.0 EROSION CONTROL PLAN
C6.0 EROSION CONTROL DETAILS
C7.0 SIDEWALK & CURB DETAILS
C8.0 PAVEMENT DETAILS
C9.0 STORM SEWER DETAILS
C10.0 UTILITY DETAILS

LANDSCAPE
L1.0 LANDSCAPE PLAN

ARCHITECTURAL
AS100 ARCHITECTURAL SITE PLAN
A010 DOOR SCHEDULE & WALL TYPES
A101 FLOOR PLANS
A110 ROOF PLAN
A111 ROOF PLAN DETAILS
A200 EXTERIOR ELEVATIONS
A201 EXTERIOR ELEVATIONS
A210 EXTERIOR IMAGERY
A300 BUILDING SECTIONS
A400 WALL SECTIONS
A401 WALL SECTIONS
A410 WALL SECTION DETAILS
A411 SERVICE ENCLOSURE DETAILS

STRUCTURAL
S001 STRUCTURAL GENERAL NOTES
S030 TYPICAL DETAILS - CONCRETE
S040 TYPICAL DETAILS - MASONRY
S050 TYPICAL DETAILS - STEEL
S055 TYPICAL DETAILS - COLD FORMED
S100 FOUNDATION PLAN / SECOND FLOOR FRAMING PLAN
S102 ROOF FRAMING PLAN
S400 BRACED FRAME ELEVATIONS
S401 BRACED FRAME DETAILS
S500 FOUNDATION DETAILS
S510 FLOOR FRAMING SECTIONS
S520 ROOF FRAMING SECTIONS

MECH / PLUMB
MP001 MECHANICAL & PLUMBING SPECS & SYMBOLS
MP101 MECHANICAL & PLUMBING PLANS
MP102 PLUMBING PLANS - WATER & GAS

ELECTRICAL
E001 ELECTRICAL SPECS & SYMBOLS
E101 ELECTRICAL PLAN - LIGHTING
E102 ELECTRICAL PLAN - POWER
E201 ELECTRICAL DIAGRAMS & SCHEDULES
E202 ELECTRICAL DIAGRAMS & SCHEDULES

clockwork
423 DELAWARE, STE 102
KANSAS CITY, MISSOURI 64105
www.clockwork-ad.com

LOT 7, BUILDING 31
420 SW LONGVIEW BLVD
LEE'S SUMMIT, MO, 64081

STATE OF MISSOURI
CHRISTIAN J. ARNOLD
NUMBER A-2003027158
ARCHITECT

REV	ISSUE	DATE
	Permit Submittal	05.17.2021
2	Permit Review	08.19.2021

TITLE SHEET

A000

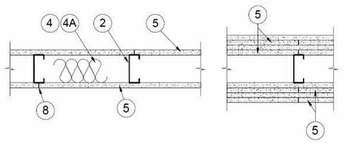
20.01.N.LV BUILDING 31

Design No. U419

May 28, 2020

Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr (See Items 4 & 5 through 5K)

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Floor and Ceiling Runners —** (Not Shown) — For use with Item 2 — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.

2. **Steel Studs —** Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

3. **Wood Structural Panel Sheathing —** (Optional, For use with Item 5 Only) — (Not Shown) — 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, gypsum panels attached over OSB or plywood panels and fastener lengths for gypsum panels increased by min. 1/2 in.

4. **Batts and Blankets* —** (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5.

4C. **Fiber, Sprayed* —** (Optional) and as an alternate to Batts and Blankets (Item 4B) where insulation is required - Spray applied granulated mineral fiber material. The fiber is applied with adhesive at a minimum density of 4.0 pcf to completely fill the wall cavity in accordance with the application instructions supplied with the product. See **Fiber, Sprayed** (CCAZ).
AMERICAN ROCKWOOL MANUFACTURING, LLC — Type Rockwool Premium Plus

5. **Gypsum Board* —** Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2C, 2D, 2F, 2G, 2O	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	1 layer, 5/8 in. thick	Optional
1	2-1/2	1 layer, 1/2 in. thick	1-1/2 in.
1	1-5/8	1 layer, 3/4 in. thick	Optional
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
2	3-1/2	1 layer, 3/4 in. thick	3 in.
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	2 layers, 3/4 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional
4	2-1/2	2 layers, 3/4 in. thick	2 in.

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX or WRC; 3/4 in. thick Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SGX, SHX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX, SGX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Types IP-X3 or ULTRACODE

When Item 7B, **Steel Framing Members***, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) shall be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in item 6.

6. **Fasteners —** (Not Shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). **Single layer systems:** 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. **Two layer systems:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer. **Three-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Screws offset min 6 in. from layer below. **Four-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

7. **Furring Channels —** (Optional, Not Shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Item 5A.

7A. **Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel, 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.
PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75).

7B. **Framing Members* —** (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 5. Not for use with Item 5A.

7G. **Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. or 1-1/2 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ga) to studs (Item 2). Clips spaced max. 48 in. OC. Clips secured to studs with No. 8 x 1-1/2 in. minimum self-crilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips.
CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

8. **Joint Tape and Compound —** Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.

9. **Siding, Brick or Stucco —** (Optional, Not Shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

10. **Caulking and Sealants* —** (Optional, Not Shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.
UNITED STATES GYPSUM CO — Type AS

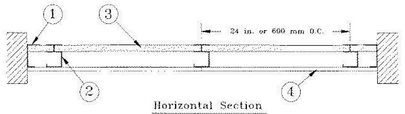
Design No. U415

July 12, 2018

Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

System A — 1 Hr.



Horizontal Section

1. **Floor, Side and Ceiling Runners —** "J" - shaped runner, min 2-1/2 in. deep (min 4 in. deep when System C is used), with unequal legs of 1 in. and 2 in., fabricated from min 24 MSG (min 20 MSG when Item 4A, 4B, 4C, 4D or 7 are used) galv steel. Runners positioned with short leg toward finished side of wall. Runners attached to structural supports with steel fasteners located not greater than 2 in. from ends and not greater than 24 in. OC. "E" - shaped studs (Item 2A) may be used as side runners in place of "J" - shaped runners.

2. **Steel Studs —** "C-H" - shaped studs, min 2-1/2 in. deep (min 4 in. deep when System C is used), fabricated from min 25 MSG (min 20 MSG when Items 2D, 4A, 4B, 4C, 4D or 7 is used) galv steel. Cut to lengths 3/8 to 1/2 in. less than floor-to-ceiling height and spaced 24 in. or 600 mm OC (max 16 in. OC when Items 4A, 4B, 4C, or 4D are used).

3. **Gypsum Board* —** Gypsum liner panels, nom 1 in. thick, 24 in. or 600 mm (for metric spacing) wide. Panels cut 1 in. less in length than floor to ceiling height. Vertical edges inserted in "H" portion of "C-H" studs or the gap between the two 3/4 in. legs of the "E" studs. Free edge of end panels attached to long leg of vertical "J" - runners with 1-5/8 in. long Type S steel screws spaced not greater than 12 in. OC. When wall height exceeds liner panel length, liner panel may be butted to extend to the full height of the wall. Horizontal joints need not be backed by steel framing. In System I, butt joints in liner panels are staggered min 36 in. Butt joints backed with 6 in. by 22 in. strips of 3/4 in. thick gypsum wallboard (Item 4). Wallboard strips centered over butt joints and secured to liner panels with six 1-1/2 in. long Type G steel screws, three screws along the 22 in. dimension at the top and bottom of the strips.

CGC INC — Type SLX

UNITED STATES GYPSUM CO — Type SLX

USG BORAL DRYWALL SFZ LLC — Type SLX

USG MEXICO S A DE C V — Type SLX

4. **Gypsum Board* —**

System A — 1 Hr

Gypsum panels, with beveled, square or tapered edges, nom 5/8 in. thick; 48 in. or 1200 mm wide, applied vertically or horizontally, attached to studs with 1 in. long Type S steel screws spaced 12 in. when installed vertically or 8 in OC when installed horizontally. Horizontal joints need not be backed by steel framing.

CGC INC — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, USGX, WRC, WRX

UNITED STATES GYPSUM CO — Types AR, C, FRX-G, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SGX, SHX, ULIX, ULX, WRC, WRX, USGX. When ULIX is used insulation, Item 6, **Batts and Blankets*** is required and minimum stud depth is 4 in.

USG BORAL DRYWALL SFZ LLC — Types C, SCX, SGX, USGX

USG MEXICO S A DE C V — Types AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULX, USGX, WRC, WRX

Gypsum panels, with beveled, square or tapered edges, nom 3/4 in. thick, 4 ft wide (or 1200 mm for metric spacing) wallboard with square or tapered edges. Total of four layers to be used. First and second (inner) layers applied vertically or horizontally over the steel studs. Horizontal joints need not be backed by steel framing. When applied vertically, joints centered over studs and staggered min 24 in., otherwise all joints staggered min 12 in. First layer secured to studs with 1-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 24 in. OC. Second layer secured to studs with 2-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 12 in. OC. Third layer applied vertically over the furring channels (Item 2C) with a 1-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 12 in. OC. Fourth layer applied vertically or horizontally with 2-1/4 in. long Type S self-drilling, self-tapping bugle-head steel screws spaced 12 in. OC. When applied vertically, joints to be staggered min 24 in. from third layer, otherwise all joints staggered min 12 in.

CGC INC — Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO — Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — Type ULTRACODE

USG MEXICO S A DE C V — Types IP-X3 or ULTRACODE

5. **Joint Tape and Compound —** (Not Shown)

Systems A, B, C, E, F, G, H, I

Joints on outer layers of gypsum boards (Item 4 and 4A) covered with paper tape and joint compound. Paper tape and joint compound may be omitted when gypsum boards are supplied with square edges. Exposed screw heads covered with joint compound.

6. **Batts and Blankets* —**

(Optional) — Mineral wool or glass fiber batts partially or completely filling stud cavity. Any mineral wool or glass fiber batt mineral bearing the UL Classification Marking as to Fire Resistance.

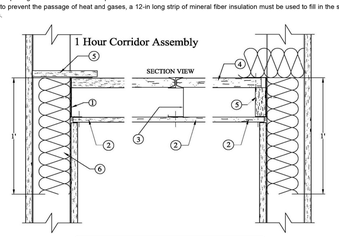
System A With Type ULIX Gypsum Boards

Placed in stud cavities, any min. 3-1/2 in. thick glass fiber insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance. See **Batts and Blankets (BKNV or BZJZ) Categories** for names of Classified companies.

AER-09038

One Hour Corridor Ceiling or Underside Stair Applications, See Figure 8

1. A minimum 2-1/2-in deep 24 gauge J-runner attached horizontally to perimeter or boundary walls with a power actuated fasteners.
2. Gypsum Wall Board:
   a. For a one (1) hour assembly: Attach one (1) layer of 5/8-in thick SHEETROCK® Brand FIRECODE® Core Gypsum Panel (Type X), to the underside of the "Corridor Ceiling" of the C-H stud and the perimeter J-runners. Use 1-in long Type S screws that are spaced 12-in o.c. in the field and at the edges.
3. Install the C-H studs perpendicular to the J-runner spaced 24-in o.c. with the C-section of the C-H stud facing downward towards the corridor side of the assembly with two (2) screws a minimum 1/2-in long Type S-12 screws, one on each side.
4. 1-in thick SHEETROCK® Brand Gypsum Liner Panel - Friction-fitted in "H" portion of C-H studs.
5. Ripper Board:
   a. Where the liner panel (Item 4) is cut short to be installed, gaps must be filled by using a strip of 1-in thick SHEETROCK Brand Gypsum Liner Panel.
   b. As an alternative you can use mineral fiber insulation to prevent exposure to the top leg of the J-runner that forms the ceiling.
   c. Where the wall section extends above the corridor ceiling, above corridor height a rip of board must be used to cap the opening between studs and a strip of mineral fiber insulation as described in item 6 must be used.
6. In order to prevent the passage of heat and gases, a 12-in long strip of mineral fiber insulation must be used to fill in the stud cavity of the walls.



1-Hour Exit Corridor Ceiling and Stair Soffits[1]	
Single layer 5/8-in gypsum panels	Maximum Span
212CH25-18[2,3]	8-ft - 6-in
212CH20-34[2,3]	10-ft - 4-in
400CH25-18[2,3]	9-ft - 3-in
400CH20-34[2,3]	14-ft - 11-in
600CH20-34[2,3]	20-ft - 10-in

Notes:
1. Based on L/240 allowable deflection with studs at 24-in o.c. and JR24 runner.
2. J-Runner connection to wallbuilding must meet or exceed 189-lbs capacity at every stud location (24-in o.c.).
3. J-Runner connection to wallbuilding must meet or exceed 386-lbs capacity at every stud location (24-in o.c.).

Figure 8 - One Hour Corridor Ceiling or Underside Stair Assembly and Limiting Spans

Design No. U905

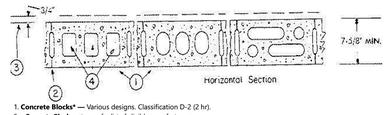
March 02, 2020

Bearing Wall Rating — 2 HR.

Nonbearing Wall Rating — 2 HR

This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



Horizontal Section

1. **Concrete Blocks* —** Various designs. Classification D-2 (2 hr).
See **Concrete Blocks** category for list of eligible manufacturers.

2. **Mortar —** Blocks laid in full bed of mortar, nom. 3/8 in. thick, of not less than 2-1/4 and not more than 3-1/2 parts of clean sharp sand to 1 part Portland cement (proportioned by volume) and not more than 50 percent hydrated lime (by cement volume). Vertical joints staggered.

3. **Portland Cement Stucco or Gypsum Plaster —** Add 1/2 hr to classification if used. Where combustible members are framed in wall, plaster or stucco must be applied on the face opposite framing to achieve a max. Classification of 1-1/2 hr. Attached to concrete blocks (Item 1).

4. **Loose Masonry Fill —** If all core spaces are filled with loose dry expanded slag, expanded clay or shale (Rotary Kiln Process), water repellant vermiculite masonry fill insulation, or silicone treated perlite loose fill insulation add 2 hr to classification.

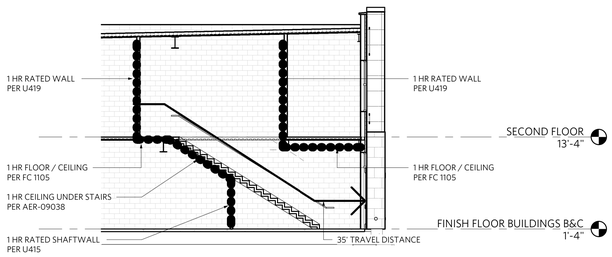
FLOOR-CEILING SYSTEMS, NONCOMBUSTIBLE

GA FILE NO. FC 1105	GENERIC	1 HOUR FIRE	50 to 54 STC SOUND

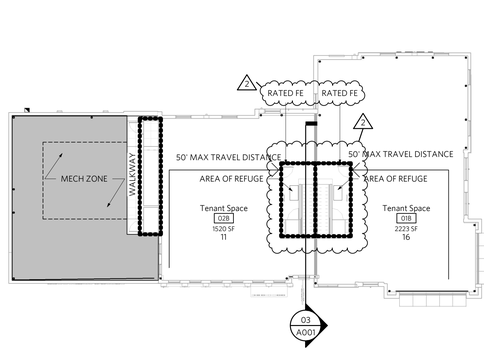
GYPSUM WALLBOARD, STEEL JOISTS, CONCRETE SLAB

One layer 1/2" type X gypsum wallboard or gypsum veneer base applied at right angles to 3 5/8" steel studs 24" o.c. with 1" Type S drywall screws 12" o.c. Studs wire tied with double strand 18 gage wire 8" o.c. to steel joists 24" o.c. supporting 3/8" rib metal lath and 2 1/2" concrete slab. (One hour restrained and unrestrained.)

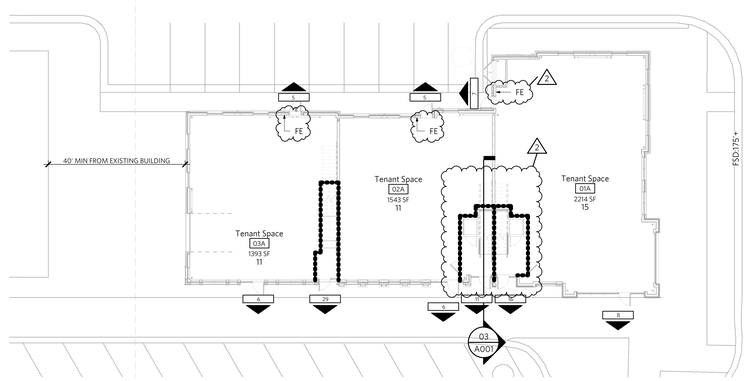
Approx. Ceiling Weight: 2 psf
Fire Test: FM FC-134, 12-16-69
Sound Test: See FC 2030 (NGC 4075, 3-25-69)



03 | Code Section - Interior Exit Stairs
1/8" = 1'-0"



02 | SECOND FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"



01 | FIRST FLOOR LIFE SAFETY PLAN
1/16" = 1'-0"

CODE REVIEW

APPLICABLE CODES:
2018 International Building Code
2018 International Plumbing Code
2018 International Mechanical Code
2018 International Fire Code
2017 National Electrical Code
ICC/ANSI A117.1-2009, Accessible and Usable Buildings and Facilities

CHAPTER 3 *USE AND OCCUPANCY CLASSIFICATION*
BUSINESS, GROUP B

CHAPTER 5 *GENERAL BUILDING HEIGHTS AND AREAS [TABLE 503]*

GROUP:	B		
TYPE:	IIB		
ALLOWABLE HEIGHT:	55'	ACTUAL:	34'
ALLOWABLE STORIES:	3	ACTUAL:	2
ALLOWABLE AREA:	23,000	ACTUAL:	6,175 SF

CHAPTER 6 *TYPE OF CONSTRUCTION*
IIB, UNPROTECTED

FIRE RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS [IBC 601]:

BUILDING ELEMENT	*RATING*
PRIMARY STRUCTURAL FRAME	0 HR
BEARING WALLS	
EXTERIOR	0 HR
INTERIOR	0 HR
NONBEARING WALLS	
EXTERIOR	0 HR
INTERIOR	0 HR
FLOOR CONSTRUCTION AND ASSOCIATED	0 HR
ROOF CONSTRUCTION AND ASSOCIATED	0 HR

FIRE RESISTANCE RATING REQUIREMENT FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE [IBC 602]:

GROUP B	X>30	0 HR

CHAPTER 7 *FIRE AND SMOKE PROTECTION FEATURES*
MAXIMUM AREA OF EXTERIOR OPENINGS [IBC 705.8]

FIRE SEPARATION DISTANCE	*DEGREE OF OPENING PROTECTION*	*ALLOWABLE AREA*
30' OR GREATER	UNPROTECTED, NON-SPRINKLERED	NO LIMIT

706 - FIRE WALLS:
706.1.1 PARTY WALLS, EXCEPTION 2:
PARTY WALLS ARE NOT REQUIRED WHERE THE COMBINED AREAS ON BOTH SIDES OF THE WALL ARE LESS THAN THE ALLOWABLE AREA BY CODE (IN THIS INSTANCE, THE WHOLE BUILDING FALLS UNDER THE ALLOWABLE AREA. THE INTENT IS TO HAVE SEPERATE OWNERSHIP OF EACH PORTION OF BUILDING).

CHAPTER 9 *FIRE PROTECTION SYSTEMS*
907 - FIRE ALARMS
907.2.2 GROUP B
FIRE ALARMS NOT REQUIRED AS THE BUILDING HAS FEWER THAN 500 TOTAL OCCUPANTS, AND THE LEVEL ABOVE HAS FEWER THAN 100 OCCUPANTS.

FIRE EXTINGUISHERS TO BE PROVIDED IN ACCORDANCE WITH THE IBC
NFPA 10 REQUIRED SMOKE DETECTORS TO BE PROVIDED
ALL PROVIDED AND INSTALLED BY GENERAL CONTRACTOR

CHAPTER 10 *MEANS OF EGRESS*
BUILDING AREAS AND OCCUPANT LOAD [IBC 1004]:
BASED ON BUSINESS FUNCTION:
1 OCC PER 150 SF
ROOFTOP PATIO BASED ON ASSEMBLY WITHOUT FIXED SEATS
1 OCC PER 15 SF
AREAS AND OCCUPANCIES INDICATED ON PLAN

EXIT ANAYSIS:
GROUND LEVEL:
2 MEANS OF ACCESSIBLE EGRESS PROVIDED, MINIMUM OF 1 REQUIRED.
MAXIMUM TRAVEL DISTANCE TO EXIT NOT EXCEED 75'

SECOND LEVEL:
TABLE 1006.3.3(2) - ONE EXIT ACCESS ALLOWABLE WITH FEWER THAN 29 OCCUPANTS & TRAVEL DISTANCE NOT TO EXCEED 75'
INTERIOR EXIT STAIRS USED DUE DUE TO LONGER TRAVEL DISTANCE.

1023 - INTERIOR EXIT STAIRS
1023.2 - CONSTRUCTION
STAIRS CONNECTING LESS THAN 4 STORIES TO HAVE A 1HR FIRE BARRIER
1023.4 - OPENINGS
PER TABLE 716.1(2) - DOORS TO BE 60 MIN RATED
1023.7 - INTERIOR EXIT STAIRS EXTERIOR WALLS
NON-RATED, NON PROTECTED.
NO WALLS / BUILDINGS WITHIN LESS THAN 180 DEGREES.

1009.3.3 - AREA OF REFUGE AT TOP OF EXIT ACCESS STAIRS

EGRESS WIDTH PER OCCUPANT SERVED [IBC 1005], WITHOUT SPRINKLER:
STAIRWAYS .3 INCHES PER OCC.
OTHER EGRESS COMPONENTS .2 INCHES PER OCC.

OCCUPANT LOAD TO BE POSTED IN CONSPICUOUS LOCATION.

CHAPTER 29 PLUMBING SYSTEMS
TBD AS PART OF TENANT FINISHES
EACH TENANT SPACE TO PREPPED FOR FUTURE FIXTURE LOCATIONS

LOCAL JURISDICTION
CITY OF LEE'S SUMMIT, MISSOURI

ZONING N/A

CODE LEGEND

101	AREA TAG
●●●●●●●●●●	1 HOUR RATED
————	PRIMARY EXIT ACCESS
435	EXIT LOAD
FE	FULLY RECESSED 2A10BC FIRE EXTINGUISHER

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423 DELAWARE, STE 102
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LOT 7, BUILDING 31
420 SW LONGVIEW BLVD
LEE'S SUMMIT, MO, 64081

STATE OF MISSOURI
CHRISTIAN J. ARNOLD
NUMBER A-2020027158
ARCHITECT

REV	ISSUE	DATE
	Permit Submittal	05.17.2021
2	Permit Review	08.19.2021

CODE PLANS & ANALYSIS

A001

20.01.NLV BUILDING 31

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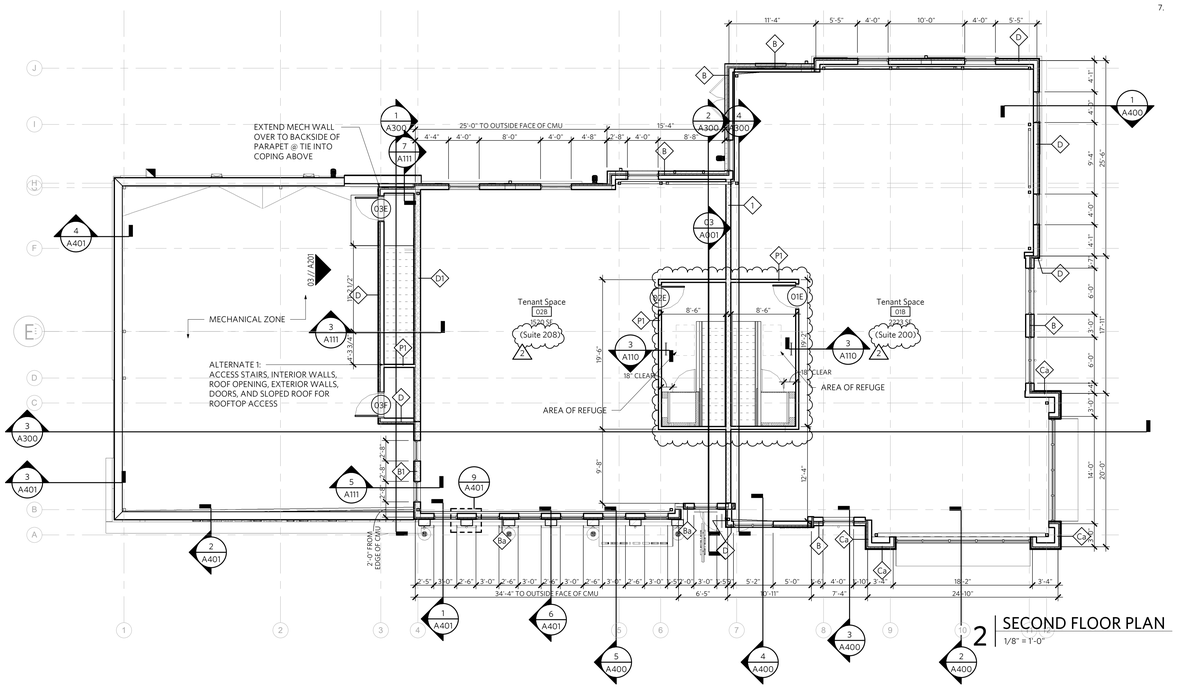
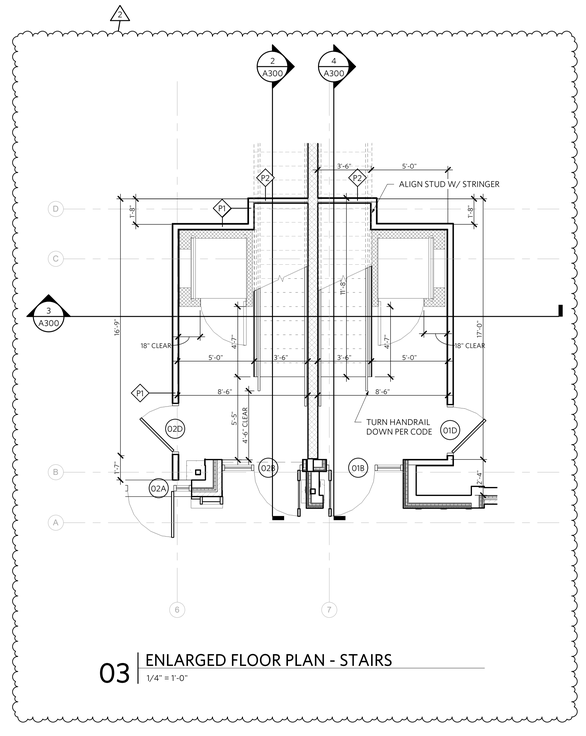
GENERAL NOTES-FLOOR PLAN

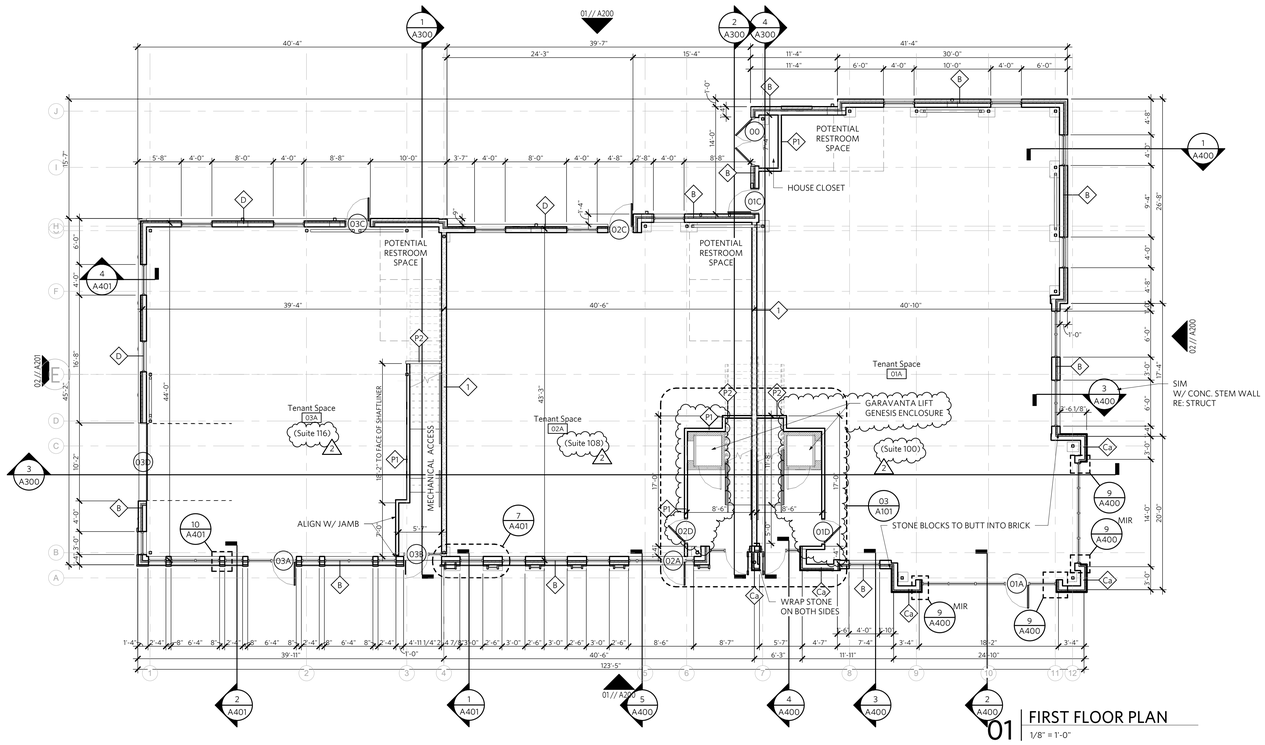
1. CONTRACTOR TO COORDINATE ALL MEP AND STRUCTURAL REQUIREMENTS.
2. CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND PROVIDING ALL BLOCKING AS REQUIRED FOR KITCHEN EQUIPMENT, TENANT PROVIDED TV, LIGHT FIXTURES, RESTROOM ACCESSORIES, ETC.
3. CONFIRM DIMMERS AND SWITCHING WITH MEP.
4. PROVIDE CONDUIT AND PULL STRING FOR IT/AV/SECURITY WORK AS REQUIRED. COORDINATE WITH MEP & IT/AV/SECURITY.
5. WINDOWS ARE TO BE CENTERED UNLESS DIMENSIONED OTHERWISE.
6. EGRESS DOORS TO HAVE MINIMUM WIDTH 32" BETWEEN THE FACE OF DOOR AND THE STOP WHEN OPEN 90°
7. ALL DIMENSIONS FROM FULL BED MASONRY UNIT WALLS, ARE FROM OUTER FACE OF MASONRY. ALL DIMENSIONS FROM OTHER WALL TYPES, ARE FROM FACE OF MTL STUD.



2 SECOND FLOOR PLAN
1/8" = 1'-0"



03 ENLARGED FLOOR PLAN - STAIRS
1/4" = 1'-0"



01 FIRST FLOOR PLAN
1/8" = 1'-0"

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FLOOR PLANS

A101

20.01.NLV BUILDING 31

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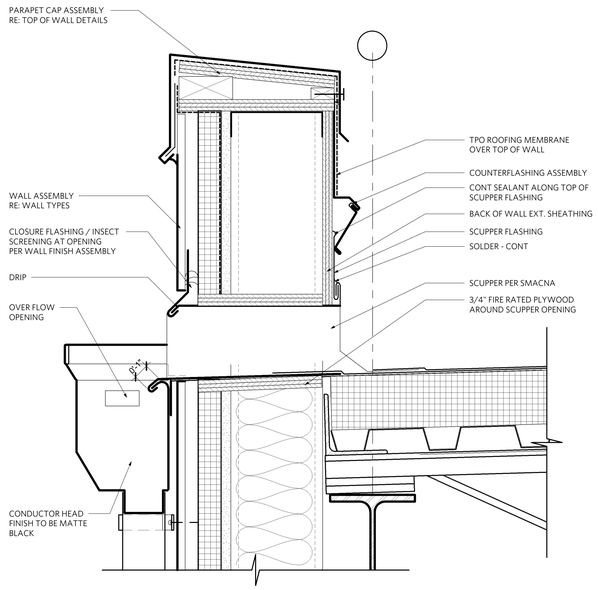
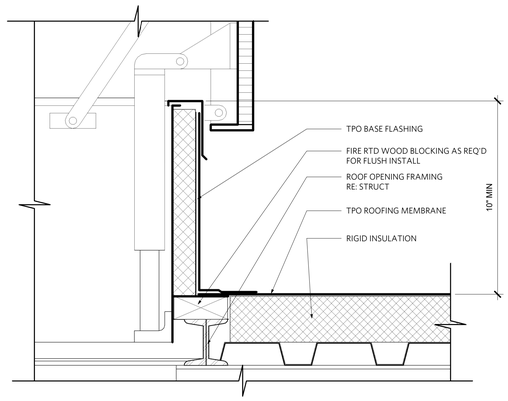
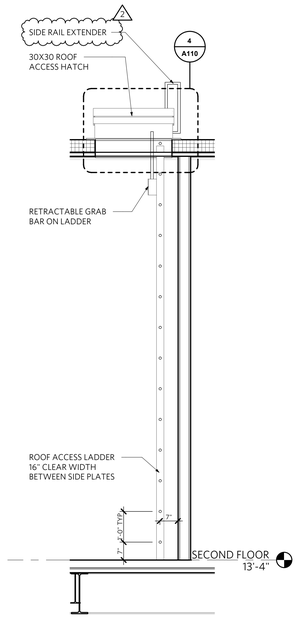


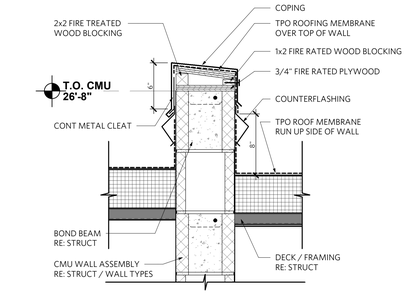
5 | Thru-Wall Scupper @ Metal Stud
3" = 1'-0"



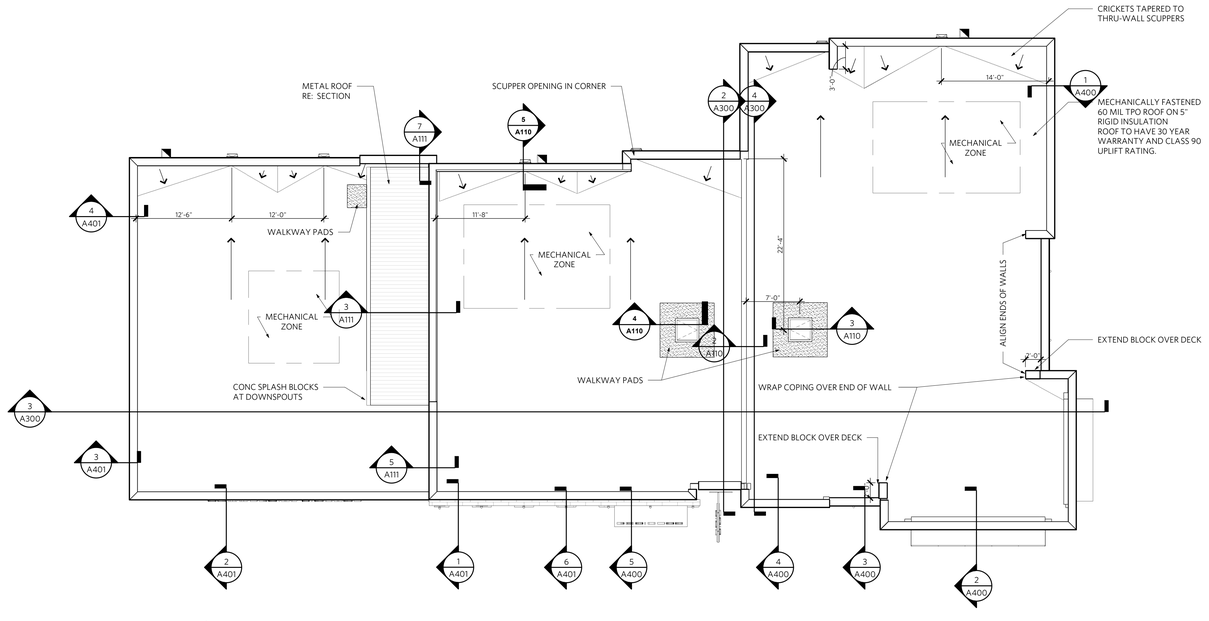
4 | Roof Hatch at Single Ply Roof
3" = 1'-0"



3 | Section - Roof Access Ladder
1/2" = 1'-0"



2 | Roof Detail - Demising Wall Cap
1 1/2" = 1'-0"



1 | ROOF PLAN
1/8" = 1'-0"

GENERAL NOTES-ROOF PLAN

A. PROVIDE BOOTS AT ALL RTU'S AND SLEEVES AT ALL ROOF PENETRATIONS. INSTALL PER MANUFACTURERS INSTALLATION INSTRUCTIONS.
B. COORDINATE RTU CURB AND REINFORCEMENT WITH STRUCTURAL
C. PROVIDE CRICKET (ISO OR EPS) AT HIGH SIDE OF ALL RTU'S.
D. PROVIDE MINIMUM INSULATION VALUES FOR CLIMATE ZONE PER GENERAL INFORMATION / CODE REVIEW.
E. AT PARAPET WALL CAP, PROVIDE ALUMINUM BRAKE METAL WALL CAP WITH CONTINUOUS CLEAT, RE: SMACNA ARCHITECTURAL SHEET METAL MANUAL 2003 FIGURE3-4A. COLOR PER EXTERIOR ELEVATIONS
F. WHERE DISSIMILAR METALS WILL CONTACT EACH OTHER OR CORROSIVE SUBSTRATES, PROTECT AGAINST GALVANIC REACTION BY COATING CONTACT SURFACES WITH BITUMINOUS COATING OR BY OTHER PERMANENT SEPARATION AS RECOMMENDED BY FABRICATOR OR MANUFACTURER OF DISSIMILAR METALS.
G. WHERE INSTALLING METAL FLASHING DIRECTLY ON CEMENTITIOUS OR WOOD SUBSTRATES, INSTALL A COURSE OF FELT UNDERLAYMENT AND COVER WITH A SLIP SHEET OR INSTALL A POLYETHYLENE UNDERLAYMENT.
H. INSTALL SHEET METAL TRIM WITHOUT OIL CANNING, BUCKLING AND TOOL MARKS.
I. INSTALL SHEET METAL FLASHING AND TRIM TRUE TO LINE AND LEVELS INDICATED. PROVIDE UNIFORM, NEAT SEAMS WITH MINIMUM EXPOSURE OF SOLDER, WELDS AND ELASTOMERIC SEALANT.
J. INSTALL SHEET METAL FLASHING AND TRIM TO FIT SUBSTRATES AND TO RESULT IN WATERTIGHT PERFORMANCE. VERIFY SHAPES AND DIMENSIONS OF SURFACES TO BE COVERED BEFORE FABRICATING SHEET METAL.

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ROOF PLAN

A110

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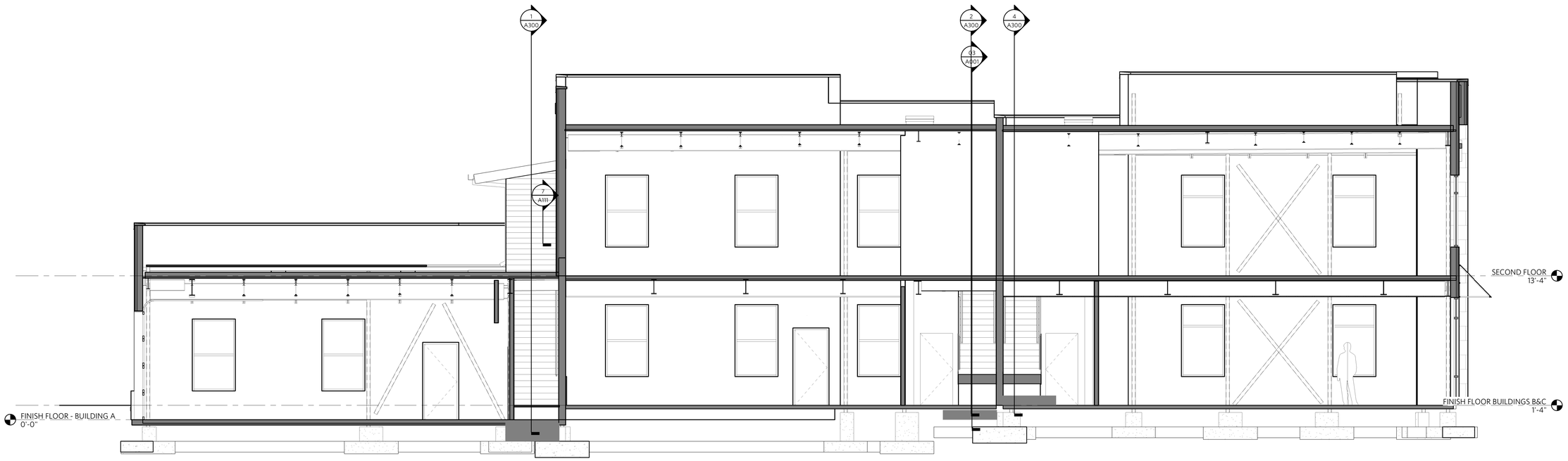
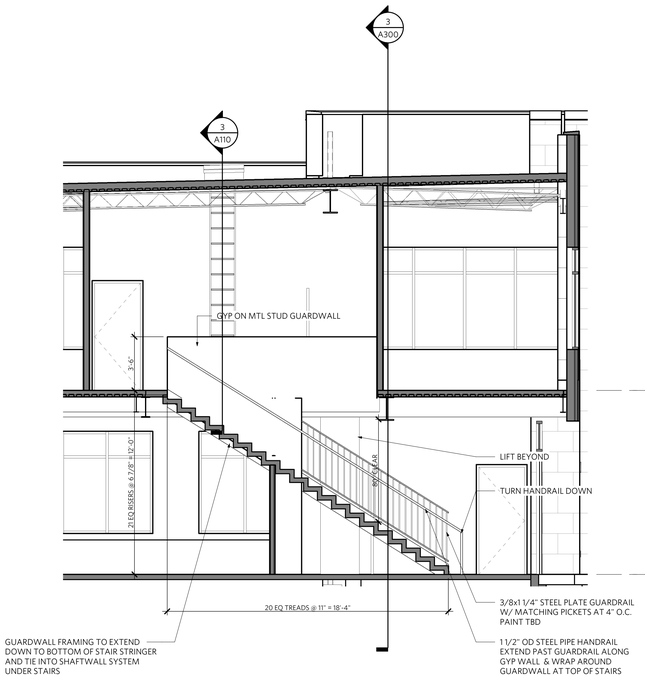
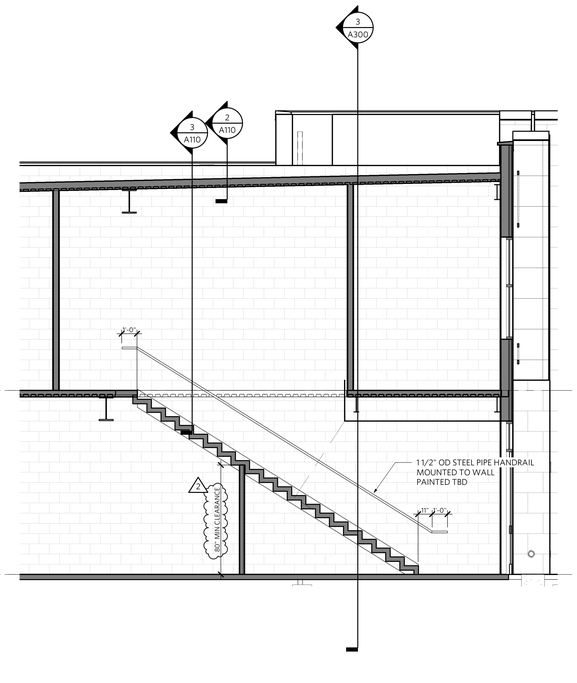


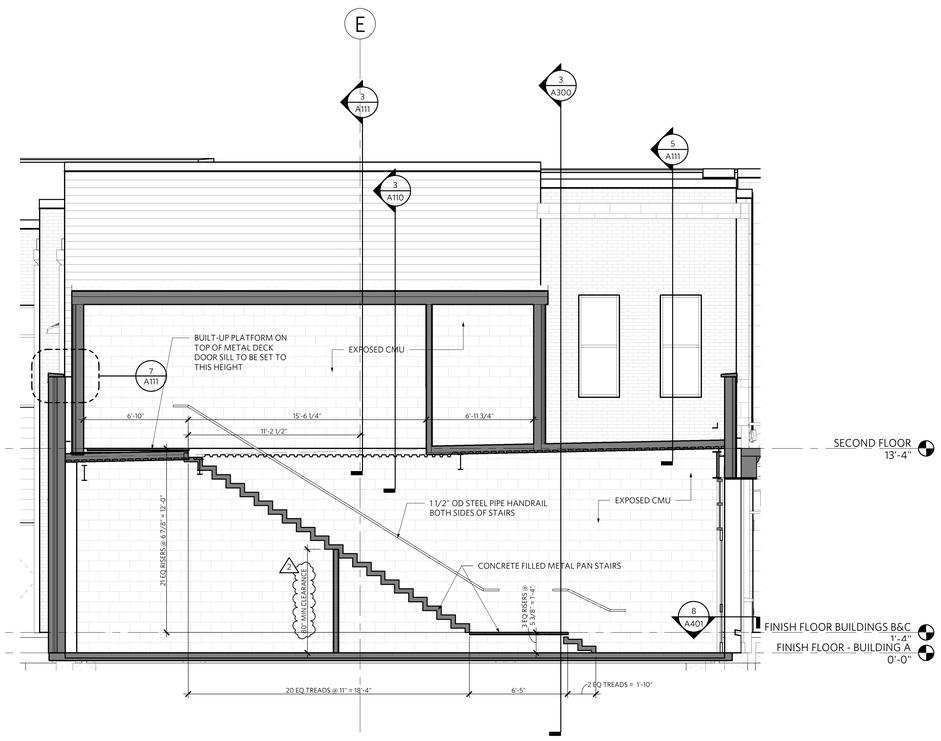
3 | Section - Through Building
1/4" = 1'-0"



4 | Section - Stair Access w/ Lift
1/4" = 1'-0"



2 | Section - Stair Access to 2nd Floor
1/4" = 1'-0"



1 | Section - Mechanical Access Stairs
1/4" = 1'-0"

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BUILDING SECTIONS

A300

20.01 NLV BUILDING 31

UNIT HEATER SCHEDULE

MARK	LOCATION	MANUFACTURER	MODEL	TYPE	ELECTRICAL AMPS	ELECTRICAL VOLTS	ELECTRICAL PH	ELECTRICAL KW	NOTES
EWH-1	HOUSE CLOSET	QMARK	LFK151F	FAN FORCED	12.5	120	1	1.5	A,B

NOTES:
A. PROVIDE WALL MOUNT BRACKET.
B. PROVIDE WITH INTEGRAL BIMETALLIC THERMOSTAT.

PLUMBING FIXTURE SCHEDULE

FD	FLOOR DRAIN: JAY R. SMITH # 2005L (-A), CAST IRON BODY AND CLAMPING COLLAR, ADJUSTABLE 6" ROUND NICKEL BRONZE STRAINER. PROVIDE WITH PROSET SYSTEMS "TRAP GUARD" INSERT FOR ACTUAL FLOOR DRAIN MODEL AND SIZE PROVIDED.
FPRH	ROOF HYDRANT: WOODFORD SRH, FREEZLESS ROOF HYDRANT WITH ANTI-SIPHON VACUUM BREAKER, 3/4" MALE HOSE THREAD, LEVER OPERATOR
RPZ1	REDUCED PRESSURE ZONE BACKFLOW PREVENTER: 1-1/2", WATTS # LF009QT, MEETING ASSE 1013, LEAD FREE CAST BRONZE BODY, QUARTER TURN TESTING COCKS, QUARTER TURN BALL VALVES, AND # 909AG AIR GAP FITTING.
RPZ2	REDUCED PRESSURE ZONE BACKFLOW PREVENTER: 1", WATTS # LF009QT, MEETING ASSE 1013, LEAD FREE CAST BRONZE BODY, QUARTER TURN TESTING COCKS, QUARTER TURN BALL VALVES, AND # 909AG AIR GAP FITTING.

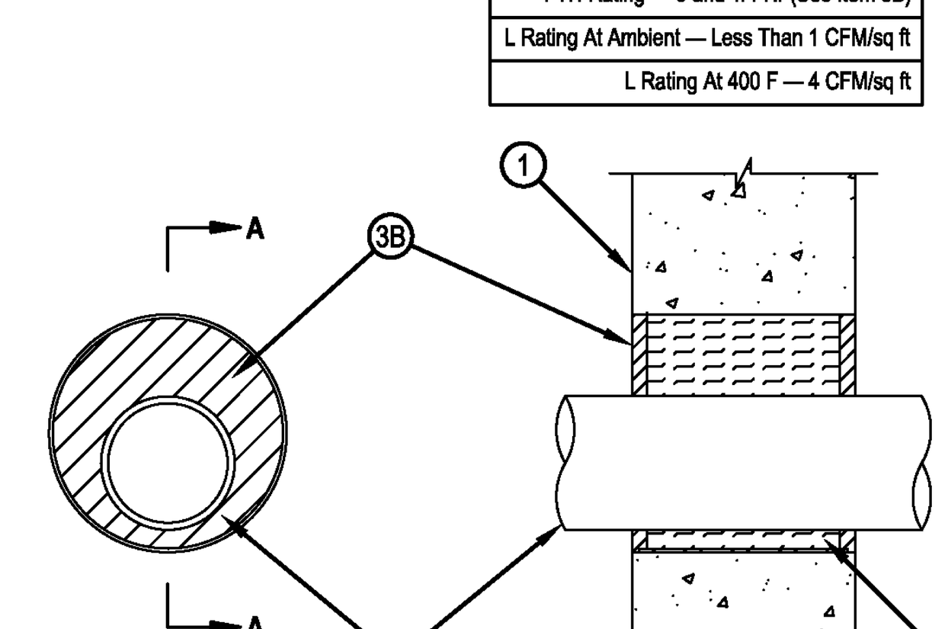
1

System No. W-J-1020

WJ 1020

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
T Rating — 0 and 1/4 Hr (See Item 3B)	F Rating — 2 Hr
L Rating At Ambient — Less Than 1 CFM/sq ft	FT Rating — 0 and 1/4 Hr (See Item 3B)
L Rating At 400 F — 4 CFM/sq ft	FH Rating — 2 Hr
	FTH Rating — 0 and 1/4 Hr (See Item 3B)
	L Rating At Ambient — Less Than 1 CFM/sq ft
	L Rating At 400 F — 4 CFM/sq ft



1. Wall Assembly — Min 5 in. (127 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m3) concrete. Wall may also be constructed of any UL Classified Concrete Blocks*. Max diam of opening is 8 in. (203 mm).
See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
2. Through Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The annular space between pipe, conduit or tubing and periphery of opening shall be min 3/4 in. (19 mm) to max 3-1/2 in. (89 mm). The following types and sizes of metallic pipes, conduits or tubing may be used:
A. Conduit — Nom 4 in. (102 mm) diam (or smaller) electrical metallic tubing or steel conduit.
B. Copper Tubing — Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
C. Copper Pipe — Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.

HILTI
Hilti Firestop Systems
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Page: 1 of 2

System No. W-J-1020

WJ 1020

3. Firestop System — The hourly Ratings for the firestop systems are dependent upon the type and size of pipe, annular space, fill material thickness and fill material type as described in the table below. When the annular space in the table shows a range of distances, the penetrating item may be installed either concentrically or eccentrically within the firestop system. The firestop systems shall consist of the following:
A. Packing Material — Mineral wool batt insulation firmly packed into opening as a permanent form. As an option to the above, backer rod and/or foamed plastic backer material may be used. Packing material to be recessed from both surfaces of wall to accommodate the required thickness of fill material.
B. Fill, Void or Cavity Material — Sealant* — Applied within the annulus, flush with both surfaces of wall as shown in the table below:

Pipe Type	Min Fill Mtl Thkns In. (mm)	F Rating Hr.	T Rating Hr.
2A	1/4 (6)	2	1/4
2B	1/2 (13)	2	0

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-One Sealant or FS-ONE MAX Intumescent Sealant

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Hilti Firestop Systems
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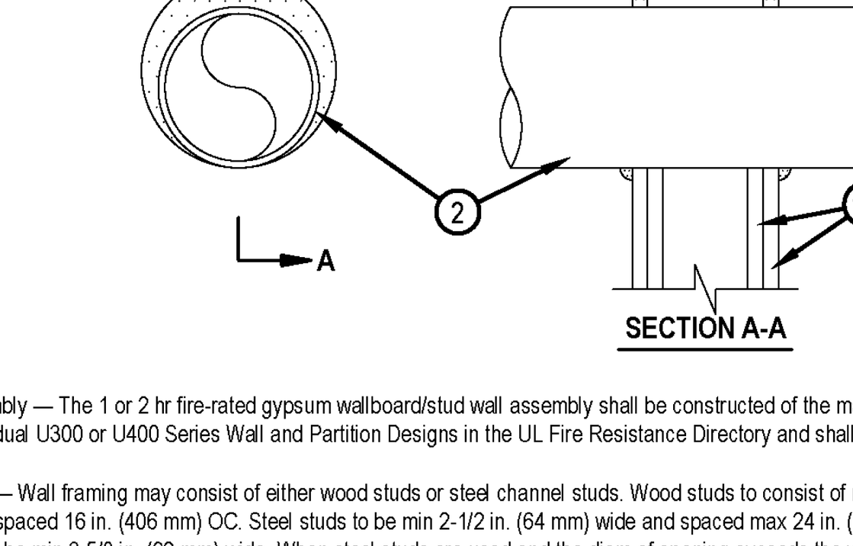
System No. W-L-1054

WL 1054

Classified by Underwriters Laboratories, Inc. to UL 1479 and CAN/ULC-S115

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Ratings —1 and 2 Hr (See Items 1 and 3)	F Ratings — 1 and 2 Hr (See Items 1 and 3)
T Rating — 0 Hr	FT Rating — 0 Hr
L Rating (Without Movement) at Ambient — Less Than 1 CFM/sq ft	FH Ratings —1 and 2 Hr (See Items 1 and 3)
L Rating (Without Movement) at 400°F — Less Than 1 CFM/sq ft	FTH Rating — 0 Hr
M Rating (Movement) — See Table 1	FTH Rating — 0 Hr
	L Rating at Ambient — Less Than 5.1 L/s/m2
	L Rating at 204°C — Less Than 5.1 L/s/m2



1. Wall Assembly — The 1 or 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300 or U400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
A. Studs — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (406 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC. For M Rating, steel studs to be min 3-5/8 in. (92 mm) wide. When steel studs are used and the diam of opening exceeds the width of stud cavity, the opening shall be framed on all sides using lengths of steel stud installed between the vertical studs and screw-attached to the steel studs at each end. The framed opening in the wall shall be 4 to 6 in. (102 to 152 mm) wider and 4 to 6 in. (102 to 152 mm) higher than the diam of the penetrating item such that, when the penetrating item is installed in the opening, a 2 to 3 in. (51 to 76 mm) clearance is present between the penetrating item and the framing on all four sides.
B. Gypsum Board* — 5/8 in. (16 mm) thick, 4 ft (122 cm) wide with square or tapered edges. The gypsum board type, thickness, number of layers, fastener type and sheet orientation shall be as specified in the individual U300 or U400 Series Design in the UL Fire Resistance Directory. Max diam of opening is 32-1/4 in. (819 mm) for steel stud walls. Max diam of opening is 14-1/2 in. (368 mm) for wood stud walls.
The F and FH Ratings of the firestop system are equal to the fire rating of the wall assembly. The M Rating is applicable only to 1 hr rated walls.

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Page: 1 of 2

System No. W-L-1054

WL 1054

2. Through-Penetrants — One metallic pipe, conduit or tubing to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 0 in. to max 2-1/4 in. (57 mm). Pipe may be installed with continuous point contact. Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
A. Steel Pipe — Nom 30 in. (762 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
B. Iron Pipe — Nom 30 in. (762 mm) diam (or smaller) cast or ductile iron pipe.
C. Conduit — Nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing or 6 in. (152 mm) . diam steel conduit.
D. Copper Tubing — Nom 6 in. (152 mm) diam (or smaller) Type L (or heavier) copper tubing.
E. Copper Pipe — Nom 6 in. (152 mm) diam (or smaller) regular (or heavier) copper pipe.
3. Fill, Void or Cavity Material* — Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall. At the point or continuous contact locations between pipe and wall, a min 1/2 in. (13 mm) diam bead of fill material shall be applied at the pipe wall interface on both surfaces of wall.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE MAX Intumescent Sealant

Movement Direction	Penetrant Item	Nominal Penetrant Diameter	Annular Space	Movement	Sealant Depth	F-Rating	L Rating with Movement
Y	2A, 2C*	2 in.	Max 2-1/4 in.	5%	5/8 in.	1 hr	N/A
Z	2A, 2C*	2 in.	2-1/4 in.	0.25 in.	5/8 in.	1 hr	N/A

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

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Page: 2 of 2

APPROVED FIRE STOP DETAILS. SEAL ALL WALL PENETRATIONS IN ACCORDANCE WITH THESE DETAILS OR AN ALTERNATIVE APPROVED UL LISTED METHOD APPLICABLE FOR THE WALL TYPE.

MECHANICAL & PLUMBING SPECIFICATIONS

1. GENERAL PROVISIONS:
A. PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING AND MECHANICAL SYSTEMS OUTLINED.
B. OBTAIN ALL PERMITS, FEES, LICENSES, INSPECTIONS, AND CERTIFICATIONS OF COMPLIANCE OR APPROVAL AS REQUIRED BY AUTHORITIES.
C. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF THE GOVERNMENTAL BODIES HAVING JURISDICTION OVER THE SITE.
D. ALL TESTING REQUIRED BY AUTHORITIES SHALL BE CONSIDERED PART OF THIS WORK.
E. DURING CONSTRUCTION, ALL FIXTURES, EQUIPMENT, PIPE, DUCT, ETC. SHALL BE COVERED, PLUGGED, OR CAPPED AS REQUIRED TO KEEP CLEAN AND UNDAMAGED. ALL DAMAGED ITEMS SHALL BE RESTORED TO ORIGINAL CONDITION OR REPLACED. ALL PROTECTIVE COVERING SHALL BE REMOVED BEFORE FINAL ACCEPTANCE.
F. PROVIDE ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, AND ROOFS AS NECESSARY. PATCH AROUND ALL OPENINGS SHALL MATCH ADJACENT AREA. COORDINATE ALL ROOFING WORK WITH OWNER OR RESPONSIBLE PARTY, SO THAT THE EXISTING ROOFING WARRANTY WILL BE MAINTAINED.
G. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS AGAINST DEFECT FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE.
H. INSPECTION OF THE SITE: THIS CONTRACTOR SHALL THOROUGHLY ACQUAINT HIMSELF WITH THE MEP DRAWINGS, SPECIFICATIONS, DETAIL, AND THE SITE. THIS CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY SPECIAL OR UNUSUAL PROBLEMS, CONFLICTS, OR OBSTRUCTIONS THAT AFFECT HIS BID.
I. FOR THE PURPOSE OF CLEARNESS AND LEGIBILITY, THE MECHANICAL AND PLUMBING DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND DO NOT SHOW ALL OFFSETS AND FITTINGS REQUIRED FOR INSTALLATION. DO NOT SCALE DRAWINGS. THE SIZE AND LOCATION OF EQUIPMENT IS SHOWN TO SCALE WHEREVER POSSIBLE. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DATA AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION SECTIONS WHERE MECHANICAL WORK INTERFACES WITH OTHER TRADES.
J. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN ITEMS INDICATED ON THE PLANS OR WITH CODE REQUIREMENTS, THE NOTE OR CODE WHICH PRESCRIBES AND ESTABLISHES THE MORE COMPLETE JOB OR HIGHER STANDARD SHALL PREVAIL.
K. INSTALL MATERIALS AND SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SUBMITTALS. INSTALL MATERIALS IN PROPER RELATION WITH ADJACENT CONSTRUCTION AND WITH UNIFORM APPEARANCE FOR EXPOSED WORK. COORDINATE WITH WORK OF OTHER SECTIONS. COMPLY WITH APPLICABLE REGULATIONS AND CODE REQUIREMENTS. PROVIDE PROPER CLEARANCES FOR SERVICING.
L. INCLUDE ALL BASIC MATERIALS AND CONSTRUCTION METHODS INCLUDING PIPES, PIPE FITTINGS, AND SPECIALTIES AND SUPPORTING DEVICES, VALVES, PIPE AND VALVE IDENTIFICATION, PUMPS, VIBRATION ISOLATION, ETC.
M. FURNISH ADEQUATE ACCESS PANELS AND DOORS TO ALLOW FOR FUTURE PIPING ALTERATIONS, REPLACEMENT, AND MAINTENANCE OF PIPING. PROPERLY IDENTIFY ALL ACCESS PANELS AND DOORS.

2. OPERATION AND MAINTENANCE MANUALS:
A. DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPILE OPERATING INSTRUCTIONS, WIRING DIAGRAMS, CATALOG CUTS, LUBRICATION AND PREVENTIVE MAINTENANCE INSTRUCTIONS, PARTS LISTS, ETC. FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.
B. ALL LITERATURE AND INSTRUCTIONS SHIPPED WITH THE EQUIPMENT SHALL BE SAVED FOR INCLUSION IN THE OPERATING AND MAINTENANCE MANUALS.
C. ALL LITERATURE LISTED ABOVE AND ALL PAPERS LISTING WARRANTIES, ETC. SHALL BE BOUND IN A 3-RING BINDER AND LABELED WITH THE PROJECT NAME, ADDRESS, ARCHITECT, ENGINEER AND CONTRACTORS.

3. MANUFACTURERS:
A. MANUFACTURERS, MODEL NUMBERS, ETC. INDICATED OR SCHEDULED ON THE DRAWINGS SHALL BE INTERPRETED AS HAVING ESTABLISHED A STANDARD OF QUALITY AND SHALL NOT BE CONSTRUED AS LIMITING COMPETITION. ARTICLES, FIXTURES, ETC. OF EQUAL QUALITY BY MANUFACTURERS SHALL BE ACCEPTABLE, SUBJECT TO STRUCTURAL AND ELECTRICAL CONSTRAINTS OF THE PROJECT DESIGN.
B. THE ELECTRICAL SYSTEM DESIGN IS BASED IN PART ON THE SPECIFIED EQUIPMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE ELECTRICAL REQUIREMENTS OF THE EQUIPMENT BEING FURNISHED. ANY CHANGES TO THE ELECTRICAL SYSTEM DUE TO HVAC EQUIPMENT OTHER THAN THE SPECIFIED EQUIPMENT BEING FURNISHED SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

4. MOTORS:
A. PROVIDE THERMAL OVERLOAD PROTECTION FOR EACH MOTOR PROVIDED BY THIS WORK.

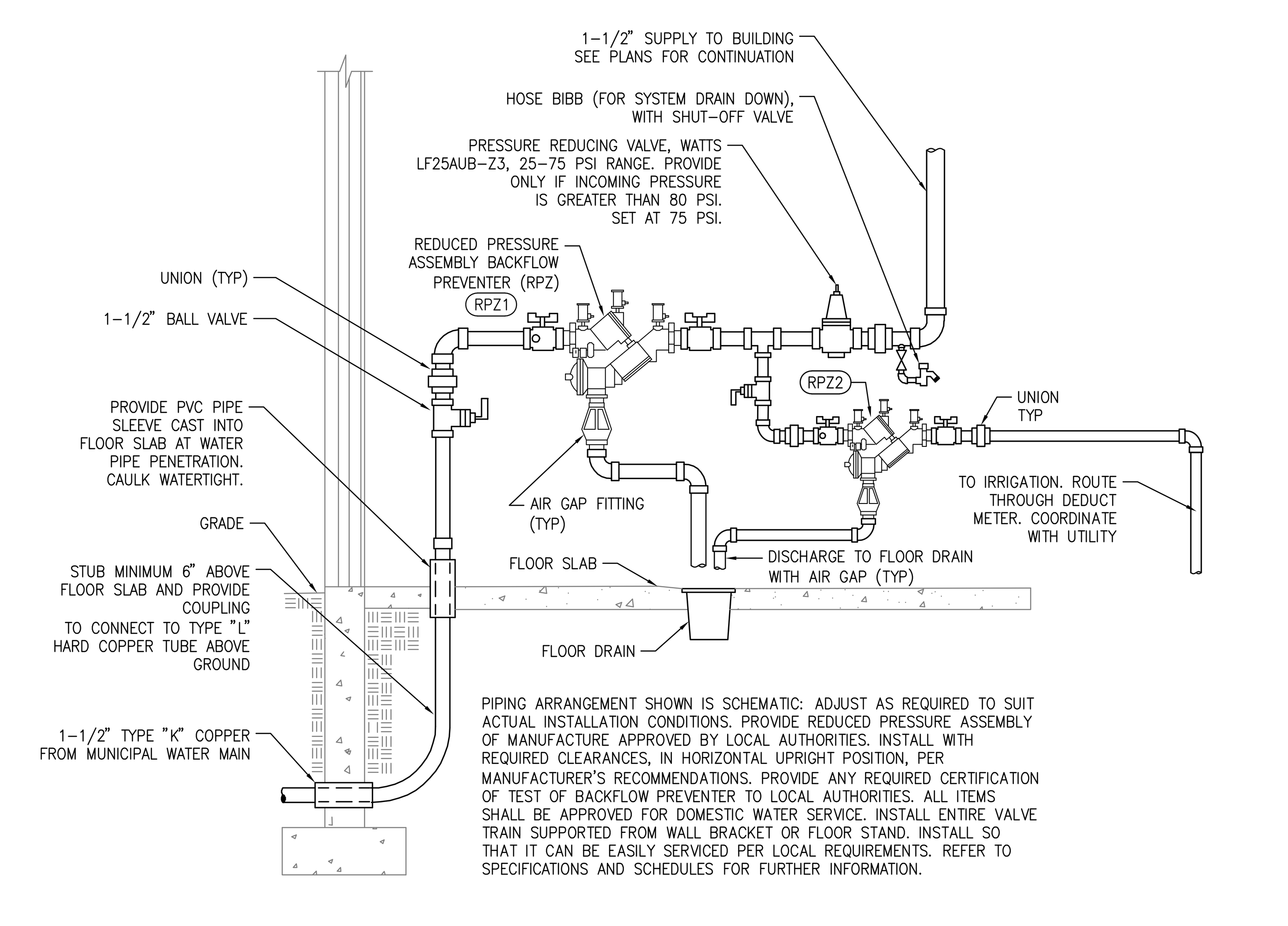
5. PLUMBING:
A. PROVIDE AN APPROVED WATER HAMMER ARRESTOR FOR EACH PLUMBING FIXTURE SUPPLY AS REQUIRED BY FIXTURE MANUFACTURER.
B. ALL EXPOSED PIPE IN FINISHED AREAS SHALL BE CHROME PLATED BRASS PIPE, NO FERROUS PIPE.
C. PROVIDE CLEANOUTS AT EACH CHANGE IN DIRECTION AND AT 100 FOOT INTERVALS IN STRAIGHT RUNS.
D. PROVIDE ACCESS PANELS FOR ALL CONCEALED VALVES AND TRAPS.
E. CLEANOUTS:
1. VINYL TILE FLOOR (FCO): JR SMITH #4140, OR EQUAL.
2. QUARRY TILE FLOOR (FCO): JR SMITH #4200, OR EQUAL.
3. CARPETED FLOOR (FCO): JR SMITH #4020-Y, OR EQUAL.
4. UNFINISHED FLOOR (FCO): JR SMITH #4020, OR EQUAL.
5. WALL (WCO): JR SMITH #4472, OR EQUAL, 24" ABOVE THE FLOOR.
6. GRADE (GCO): JR SMITH #4256, OR EQUAL, WITH HEAVY DUTY CAST IRON BODY AND COVER.
F. ALL SEWER PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.
1. INSTALL 2-1/2" AND SMALLER PIPE AT 1/4" PER FOOT FALL.
2. INSTALL 3" AND LARGER PIPE AT 1/8" PER FOOT FALL.
3. CONDENSATE DRAIN SHALL BE INSTALLED AT 1/8" PER FOOT FALL.
G. PROVIDE DIELECTRIC UNIONS WITH APPROPRIATE END CONNECTION TO MATCH THE PIPE SYSTEM IN WHICH INSTALLED (SCREWED, SOLDERED, OR FLANGED). PROVIDE DIELECTRIC UNIONS ON ALL PIPING CONNECTIONS TO HOT WATER HEATERS AND EXPANSION JOINTS.
H. ALL SEWER PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.
1. INSTALL 4" AND SMALLER PIPE AT A MINIMUM OF 2% SLOPE.
2. INSTALL 6" AND LARGER PIPE AT A MINIMUM OF 1% SLOPE.

6. PIPING
A. DOMESTIC COLD WATER (ABOVEGROUND).
1. TYPE L HARD DRAWN COPPER TUBING, ASTM B-88 WITH WROUGHT BRONZE SOLDERED FITTINGS.
2. GATE VALVE: CRANE #428 OR EQUAL.
3. GLOBE VALVE: CRANE #7 OR EQUAL.
4. BALL VALVE: CRANE #932 OR EQUAL.
B. DOMESTIC COLD WATER, 1"-3" (UNDERGROUND).
1. TYPE K HARD OR SOFT DRAWN COPPER TUBING, ASTM B-88 WITH WROUGHT BRONZE SOLDERING FITTINGS.
C. SANITARY SEWER AND VENTS (UNDERGROUND, INTERIOR TO BUILDING).
1. WASTE, DRAIN, VENT PIPE, AND FITTINGS ABOVE GROUND INSIDE OF THE BUILDING SHALL BE SERVICE WEIGHT HUB-AND-SPIGOT OR NO-HUB CAST IRON PIPE. SCHEDULE 40 DWV PVC SOLID PLASTIC PIPE MAY BE USED WHERE PERMITTED BY CODES. APPROVED PVC PIPING RUNNING IN RETURN AIR PLENUM SPACE SHALL BE INSTALLED WITH A 1-HOUR RATED COVERING OVER ALL PIPE, FITTINGS AND VALVES.
4. SEWER LINES SHALL BE LOCATED IN GENERAL AS SHOWN ON THE DRAWINGS. THE EXACT LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR IN SUCH A MANNER AS TO MAINTAIN PROPER CLEARANCES AND SUFFICIENT SLOPE TO ENSURE DRAINAGE.
5. VENT STACKS SHALL BE EXTENDED FULL SIZE THROUGH THE ROOF AND FLASHED WITH 4 POUND LEAD SHEETS TURNED DOWN INTO THE STACK AT LEAST 2" AND EXTENDED 12" IN ALL DIRECTIONS FROM THE PIPE AT THE ROOF LINE. VENTS THROUGH ROOF SHALL NOT BE LESS THAN 3". PVC PIPING SHALL NOT BE USED FOR VENT PIPING THROUGH THE ROOF. WHERE APPLICABLE FOR ROOFING SYSTEM USED, PROVIDE FLASHING VIA PLEATED EPDM CONE IN LIEU OF LEAD. ALL VENT STACKS IN OR AT OUTSIDE WALLS SHALL BE OFFSET 1'-6" MINIMUM FROM OUTSIDE WALLS BEFORE GOING THROUGH THE ROOF, TO FACILITATE FLASHING.
D. STORM SEWER, SANITARY SEWER, SAND-OIL WASTE AND VENTS (EXTERIOR TO BUILDING)
1. SEE CIVIL PLANS.
E. ALL PIPE HANGERS AND SUPPORTS SHALL BE STANDARD PRODUCTS OF GRINNELL, FEE AND MASON, OR ANVIL. HANGER SPACING SHALL BE IN ACCORDANCE WITH MSS-SP-69.
F. SLEEVES
1. PROVIDE, SET, AND PROPERLY LOCATE PIPE SLEEVES AS REQUIRED FOR THIS WORK. ALL SLEEVES SHALL BE OF SUFFICIENT SIZE TO PERMIT PIPE MOVEMENT DUE TO EXPANSION AND CONTRACTION AND TO ACCOMMODATE PIPE INSULATION.
2. INTERIOR PARTITIONS: 16 GAUGE GALVANIZED STEEL, PACK BETWEEN PIPE AND SLEEVE WITH FIRE SAFING AND CAULK AT EACH END WITH FIRE RESISTANT SEALANT.
3. ROOF: PROSET OR EQUAL, MANUFACTURED PVC SCHEDULE 40 PIPE SLEEVE WITH WATERPROOF SEAL. COORDINATE WITH ROOFING CONTRACTOR AND FLASH AS REQUIRED TO MAINTAIN ROOF WARRANTY.
4. PLUMBING VENTS: FLASH ROOF VENT INTO ROOFING SYSTEM AS REQUIRED BY THE ROOFING CONTRACTOR TO MAINTAIN THE EXISTING ROOF WARRANTY. ALL PLUMBING VENT TERMINALS SHALL TERMINATE A MINIMUM OF 12" ABOVE ROOF OR EQUAL TO HEIGHT OF PARAPET, WHICHEVER IS GREATER.
G. PROVIDE CHROME PLATED ESCUTCHEONS ON ALL PIPE ENTERING FINISHED AREAS.

7. INSULATION AND DUCT LINING:
A. ALL INSULATIONS AND ACCESSORIES SHALL HAVE A FIRE HAZARD CLASSIFICATION WITH A FLAME SPREAD RATING OF NOT OVER 25, A FUEL CONTRIBUTION RATING OF NOT OVER 50, AND A SMOKE DEVELOPMENT RATING OF NOT OVER 50, IN ACCORDANCE WITH NFPA.
B. PIPE INSULATION (ABOVE GRADE):
1. THE PIPE INSULATION USED SHALL HAVE A THERMAL CONDUCTIVITY OF 0.27 BTU PER IN/HR*SQ-FT*F OR LESS.
2. FLEXIBLE CLOSED CELL ELASTOMERIC THERMAL INSULATION, UNSLIT OR PRESLIT WITH PRESSURE SENSITIVE ADHESIVE SYSTEM FOR CLOSURE AND VAPOR SEALING, EQUAL TO ARMSTRONG AP ARMAFLEX OR ARMAFLEX 2000.
3. FOR NON CIRCULATING SYSTEMS THE FIRST 8 FEET OF INLET AND OUTLET PIPING BETWEEN THE TANK AND HEAT TRAP (INCLUDING THE HEAT TRAP) MUST BE INSULATED.
4. INSULATION SCHEDULE:
a. DOMESTIC COLD WATER: 1/2"
b. DOMESTIC HOT WATER: 1"

8. TESTING, BALANCING AND CLEANING:
A. ALL PIPING SHALL BE TESTED FOR LEAKS BEFORE BEING CONCEALED IN WALL CONSTRUCTION OR COVERED WITH INSULATION.
B. SEWER AND VENT PIPING SHALL BE HYDROSTATICALLY TESTED WITH NO LESS THAN 10 FEET OF HEAD FOR A PERIOD OF NOT LESS THAN 15 MINUTES, PER THE LOCAL PLUMBING CODE, WITH NO LEAKS.
C. DOMESTIC WATER PIPING SHALL BE HYDROSTATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 60 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.
D. BEFORE DOMESTIC WATER PIPING IS PLACED IN SERVICE, ALL DOMESTIC WATER DISTRIBUTION SYSTEMS, INCLUDING THOSE FOR COLD WATER AND HOT WATER SYSTEMS, SHALL BE FLUSHED, STERILIZED AND CHLORINATED IN ACCORDANCE WITH THE HEALTH DEPARTMENT REGULATIONS. THE SYSTEMS SHALL BE THOROUGHLY FLUSHED OF ALL DIRT AND FOREIGN MATTER, THEN FILLED WITH WATER TREATED WITH 50 PPM OF CHLORINE. DURING THE FILLING PROCESS, VALVES AND FAUCETS SHALL BE OPENED SEVERAL TIMES TO ASSURE TREATMENT OF THE ENTIRE SYSTEM. THE TREATED WATER SHALL BE LEFT IN THE SYSTEM FOR 24 HOURS AFTER WHICH TIME THE SYSTEM SHALL BE FLUSHED; IF THE RESIDUAL CHLORINE IS NOT LESS THAN 10 PPM, THE FLUSHING SHALL BE REPEATED. AFTER STERILIZATION SAMPLES OF WATER FROM THE SYSTEM SHALL BE APPROVED BY THE BOARD OF HEALTH.
E. THE INSPECTION AUTHORITY HAVING JURISDICTION SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO PERFORMANCE OF ALL TESTS SO THAT THEY TESTS MAY BE WITNESSED IF DEEMED NECESSARY.
F. DUCTWORK AND PIPING SHALL BE BALANCED BY QUALIFIED BALANCING PERSONNEL WHO HAVE PREVIOUS EXPERIENCE WITH BALANCING PROCEDURES AND ARE FAMILIAR WITH TESTING AND BALANCING PROCEDURES OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).
1. BALANCING SHALL INCLUDE THE BALANCING OF THE EQUIPMENT AND AIR DISTRIBUTION SYSTEMS TO PROVIDE DESIGN QUANTITIES INDICATED AND VERIFICATION PERFORMANCE OF ALL EQUIPMENT AND AUTOMATIC CONTROLS.
2. WITH IN 30 DAYS OF THE COMPLETION OF THE TESTING AND BALANCING WORK, SUBMIT THE TEST AND BALANCING REPORT BEARING THE SIGNATURE OF THE TEST AND BALANCE ENGINEER. THE REPORTS SHALL BE CERTIFIED PROOF THAT THE SYSTEMS HAVE BEEN TESTED, ADJUSTED, AND BALANCED IN ACCORDANCE WITH THE REFERENCED STANDARDS; ARE AN ACCURATE REPRESENTATION OF HOW THE SYSTEMS HAVE BEEN INSTALLED AND ARE OPERATING. REPORTS SHALL BE BOUND IN A VINYL BINDER AND THE BINDER LABELLED OR MAY BE AN ELECTRONIC PDF SUBMITTAL.

9. ELECTRIC WALL HEATERS
A. UNIT SHALL INCLUDE ELECTRIC HEATING ELEMENTS WITH SAFETY AND DISCONNECT DEVICES AS REQUIRED BY NEC, INCLUDING RELAYS, CONTROLLERS AND REQUIRED EQUIPMENT TO FORM A COMPLETE AND FUNCTIONAL HEATER.
B. ELEMENTS SHALL BE HEAVY DUTY ALUMINUM-FINNED, COPPER CLAD STEEL SHEATH. PROVIDE AUTOMATIC RESET THERMAL OVER-HEAT PROTECTION. THERMAL PROTECTOR SHALL BE LINEAR TYPE TO SENSE TEMPERATURES THE ENTIRE LENGTH OF HEATING ELEMENT.
C. FANS SHALL BE DIRECT DRIVE USING PERMANENT SPLIT CAPACITOR TYPE MOTORS WITH BUILT-IN AUTOMATIC RESET MOTOR OVERLOAD PROTECTION.
D. FURNISH INTEGRAL FAN DELAY SWITCH TO PREVENT DISCHARGE OF COLD AIR, BY DELAYING START-UP OF THE FAN MOTOR UNTIL HEATING ELEMENTS HAVE WARMED UP. FAN DELAY SWITCH SHALL MAINTAIN MOTOR OPERATION AFTER HEATING ELEMENTS HAVE BEEN DE-ENERGIZED TO DISSIPATE ANY RESIDUAL HEAT.



PIPING ARRANGEMENT SHOWN IS SCHEMATIC: ADJUST AS REQUIRED TO SUIT ACTUAL INSTALLATION CONDITIONS. PROVIDE REDUCED PRESSURE ASSEMBLY OF MANUFACTURE APPROVED BY LOCAL AUTHORITIES. INSTALL WITH REQUIRED CLEARANCES, IN HORIZONTAL UPRIGHT POSITION, PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE ANY REQUIRED CERTIFICATION OF TEST OF BACKFLOW PREVENTER TO LOCAL AUTHORITIES. ALL ITEMS SHALL BE APPROVED FOR DOMESTIC WATER SERVICE. INSTALL ENTIRE VALVE TRAIN SUPPORTED FROM WALL BRACKET OR FLOOR STAND. INSTALL SO THAT IT CAN BE EASILY SERVICED PER LOCAL REQUIREMENTS. REFER TO SPECIFICATIONS AND SCHEDULES FOR FURTHER INFORMATION.

DOMESTIC WATER SERVICE ENTRY

1

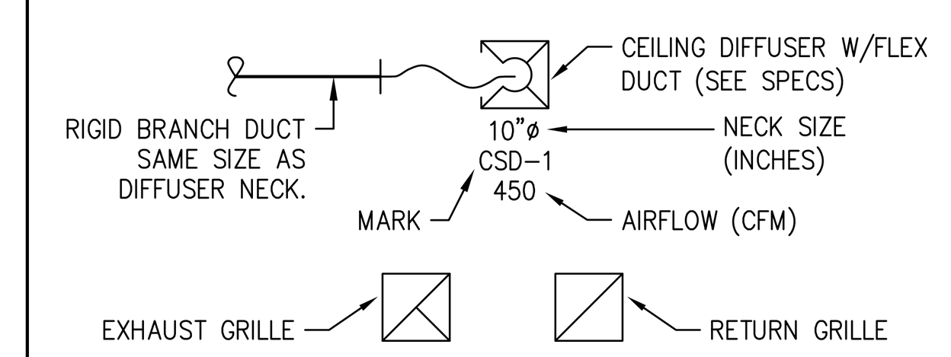
SCALE : NO SCALE

MECHANICAL SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ETC, ARE NECESSARILY USED ON THE DRAWINGS.

- SPIN-IN FITTING WITH MANUAL VOLUME DAMPER
- BRANCH DUCT WITH 45° RECTANGLE-ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
- ELBOW WITH TURNING VANES
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT UP
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT DOWN
- SUPPLY AIR DUCT UP
- SUPPLY AIR DUCT DOWN
- EQUIPMENT WITH FLEXIBLE DUCT CONNECTION
- MANUAL VOLUME DAMPER
- SQUARE TO ROUND TRANSITION
- DUCT TRANSITION
- BRANCH DUCT
- RD — DUCT MOUNTED SMOKE DETECTOR (SD=SUPPLY/RD=RETURN)

FD	FIRE DAMPER	CO2	CARBON DIOXIDE SENSOR
FSD	FIRE SMOKE DAMPER	HS	HUMIDITY SENSOR
SD	SMOKE DAMPER	SP	STATIC PRESSURE SENSOR
MD	MOTORIZED DAMPER	TS	TEMPERATURE SENSOR
BD	BACKDRAFT DAMPER	H	HUMIDISTAT
VD	VOLUME DAMPER	T	THERMOSTAT



PLUMBING SYMBOLS

SYMBOL	DESCRIPTION
SS	SANITARY SEWER (ABOVE GRADE)
SS (dashed)	SANITARY SEWER (BELOW GRADE)
GW	GREASE WASTE (BELOW GRADE)
CD	CONDENSATE DRAIN
V	VENT PIPING
G	G = GAS PIPING LESS THAN 2 PSI
MPG	MPG = GAS PIPING 2 PSI
CW	COLD WATER PIPING
HW	HOT WATER PIPING
HWR	RECIRCULATING HOT WATER
FW	FIRE WATER
	PIPE ELBOW DOWN
	PIPE ELBOW UP
	GATE VALVE
	RPZ BACKFLOW PREVENTER
	BALL VALVE
	STRAINER
	PRESSURE REDUCING VALVE
	PLUG VALVE
	CONTROL VALVE
	FLOOR CLEANOUT (FCO)
	CLEANOUT AT GRADE (GCO)
	WALL CLEANOUT (WCO)
	FLOOR DRAIN
	FLOOR SINK
	CAPPED PIPE
	HOSE BIB

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MIN	MINIMUM
AFG	ABOVE FINISHED GRADE	N/C	NORMALLY CLOSED
AHU	AIR HANDLING UNIT	N/O	NORMALLY OPEN
BFF	BELOW FINISHED FLOOR	ORD	OVERFLOW ROOF DRAIN
BFG	BELOW FINISHED GRADE	PDI	PLUMBING DRAINAGE INSTITUTE
BOP	BOTTOM OF PIPE	PVC	POLYVINYL CHLORIDE
BOS	BOTTOM OF STRUCTURE	PRV	PRESSURE REDUCING VALVE
BTU	BRITISH THERMAL UNIT	RPM	REVOLUTIONS PER MINUTE
CFM	CUBIC FEET PER MINUTE	SF	SQUARE FEET
CFH	CUBIC FEET PER HOUR	TDH	TOTAL DYNAMIC HEAD
DN	DOWN	UL	UNDERWATER LABORATORIES, INC.
DFU	DRAINAGE FIXTURE UNIT	UNO	UNLESS NOTED OTHERWISE
ETR	EXISTING TO REMAIN	V	VOLT(S)
FD	FLOOR DRAIN	VCP	VITRIFIED CLAY PIPE
FFA	FROM FLOOR ABOVE	VS	VENT STACK
FFB	FROM FLOOR BELOW	VTR	VENT THROUGH ROOF
FF	FINISHED FLOOR	W/	WITH
FLA	FULL LOADS AMPS	W/O	WITHOUT
FLR	FLOOR	WC	WATER COLUMN
GPM	GALLON PER MINUTE	WS	WATER STACK
IE	INVERTED ELEVATION	WSFU	WATER SUPPLY FIXTURE UNIT
WC	INCHES OF WATER COLUMN		
kW	KILOWATT		
MAX	MAXIMUM		
MBH	1000 BTU PER HOUR		

ANNOTATION

- # — PLAN WORK NOTE
- RTU 1 — MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- PLUMBING FIXTURE DESIGNATION
- CONNECTION POINT OF NEW WORK TO EXISTING
- A / M1 — DETAIL REFERENCE UPPER NUMBER INDICATED DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER

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email: jsmothers@jscengineers.com

STATE OF MISSOURI — JUSTIN R. SMOTHERS — NUMBER PE-2012003568 — PROFESSIONAL ENGINEER
08-17-2021

REV	ISSUE	DATE
1	PLANCHECK	2021 08 17

LOT 7, BUILDING 31

3140 SW LONGVIEW BLVD
LEE'S SUMMIT, MO, 64081

MECHANICAL & PLUMBING SPECS & SYMBOLS

MP001

20.01.NLV BUILDING 31

GENERAL NOTES

A. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF WORK. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.

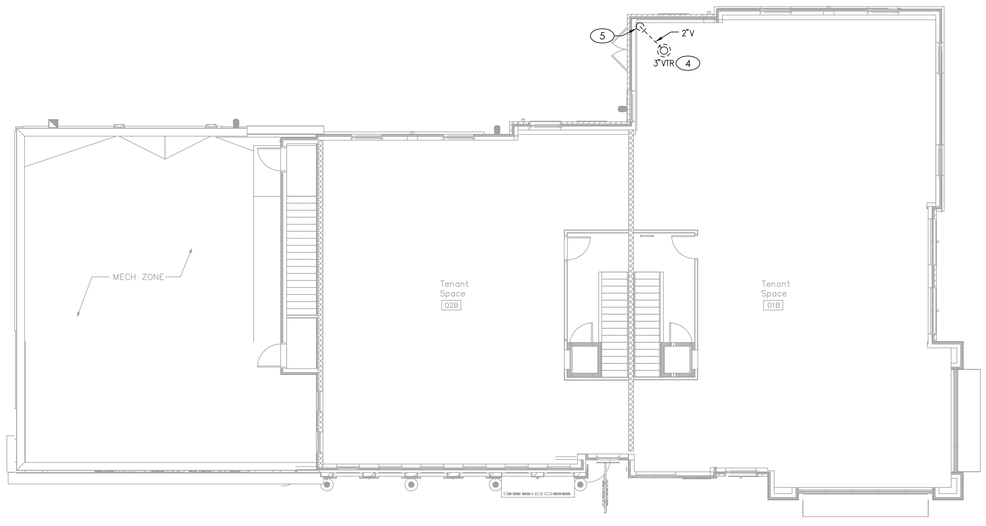
B. PROVIDE THE ARCHITECT AND OWNER WITH A COPY OF THE INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS.

C. EXACT LOCATION AND ELEVATIONS OF ALL EXISTING UTILITIES SHALL BE VERIFIED PRIOR TO ANY INSTALLATION OR CONNECTIONS THEREOF.

D. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.

(#) KEYED PLAN NOTES

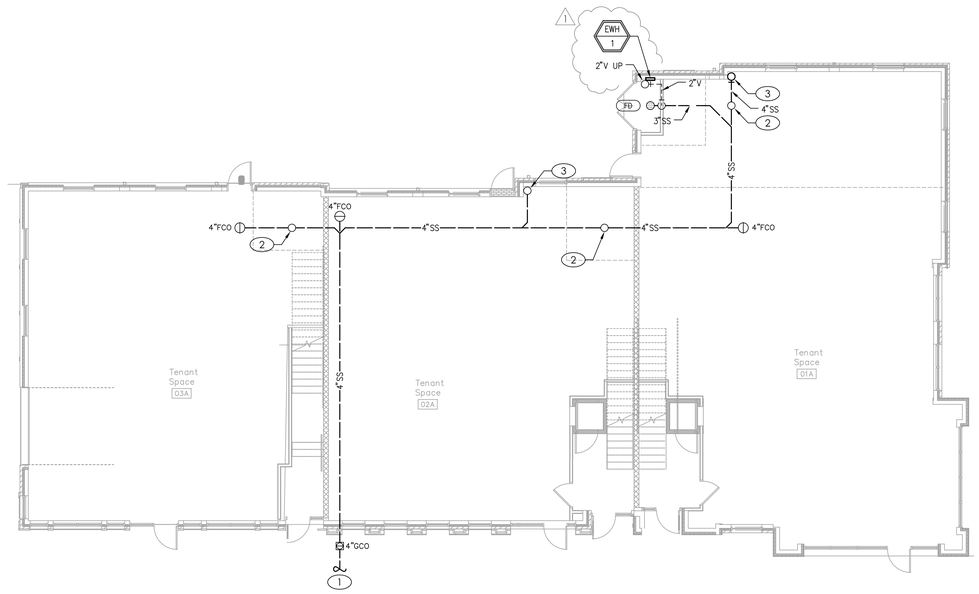
1. 4" SANITARY TO UTILITY SERVICE. CONTRACTOR SHALL WORK WITH LOCAL WASTE WATER AUTHORITY AND BEAR ALL COST FOR INSTALLATION OF A NEW SEWER LINE CONNECTING INTO THE SEWER MAIN FOR A COMPLETE INSTALLATION. REFER TO CIVIL PLANS FOR CONTINUATION. COORDINATE INVERT ELEVATION WITH EXISTING SITE UTILITIES PRIOR TO START OF WORK.
2. INSTALL 4" SANITARY SEWER STUB-OUT AND CAP FOR FUTURE TENANT CONNECTION. EXTEND 4" PVC UP 6" ABOVE FINISHED FLOOR. PRIOR TO START OF WORK COORDINATE STUB-OUT LOCATION WITH OWNER.
3. 4"SS RISER FROM BELOW GRADE UP TO CEILING FOR FUTURE SECOND FLOOR TENANT CONNECTION. CAP 12" BELOW CEILING.
4. 2" VENT TO 3" VENT THRU ROOF. LOCATE MINIMUM 3'-0" FROM EDGE OF ROOF AND 10'-0" FROM RTU OUTSIDE AIR INTAKE. COORDINATE PIPE PENETRATION WITH ROOFING CONTRACTOR SO NOT TO VOID ROOF WARRANTY. SEAL ROOF PENETRATION WEATHERTIGHT.
5. 2"V RISER FROM FIRST FLOOR FIXTURES.



SECOND FLOOR WASTE & VENT PLAN

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

2



FIRST FLOOR MECH, WASTE & VENT PLAN

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

1

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STATE OF MISSOURI
JUSTIN R. SMOTHERS
NUMBER PE-2012003566
PROFESSIONAL ENGINEER
08-17-2021

REV	ISSUE	DATE
1	PLANCHECK	2021 08 17

MECHANICAL & PLUMBING PLANS

MP101

20.01.NLV BUILDING 31

GENERAL NOTES

A. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF WORK. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.

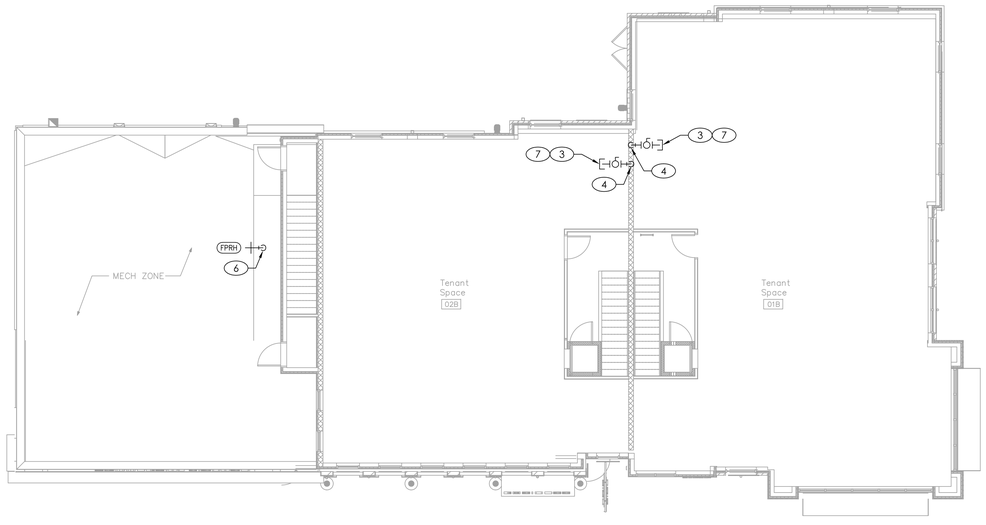
B. PROVIDE THE ARCHITECT AND OWNER WITH A COPY OF THE INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS.

C. EXACT LOCATION AND ELEVATIONS OF ALL EXISTING UTILITIES SHALL BE VERIFIED PRIOR TO ANY INSTALLATION OR CONNECTIONS THEREOF.

D. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.

(#) KEYED PLAN NOTES

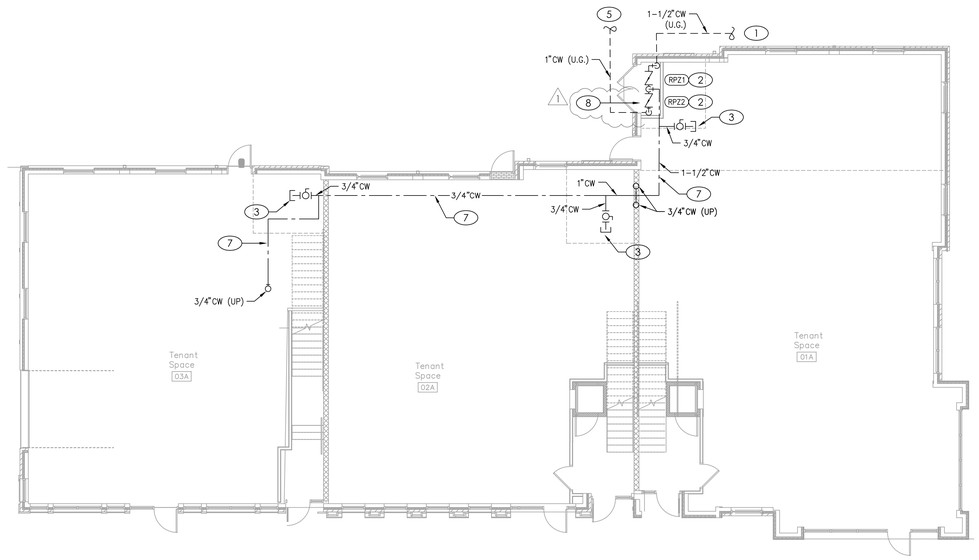
1. 1-1/2" DOMESTIC COLD WATER TO UTILITY SERVICE. SEE CIVIL PLANS FOR CONTINUATION. CONTRACTOR SHALL WORK WITH THE WATER COMPANY FOR THE INSTALLATION OF A NEW WATER MAIN ENTRANCE, INCLUDING TAP, METER, METER PIT, PIPING, ETC. FOR A COMPLETE INSTALLATION.
2. PROVIDE RPZ BACKFLOW PREVENTER AS SCHEDULED. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO INSTALLATION. INSTALL BACKFLOW PREVENTER 24" ABOVE FINISHED FLOOR (CENTERLINE ELEVATION) AND MINIMUM 12" CLEARANCE FRONT AND BACK. PROVIDE DRAIN FROM BFP TO FLOOR DRAIN AND DISCHARGE WITH AIR GAP. SEE INSTALLATION DETAIL ON SHEET MP001.
3. PROVIDE CAPPED 3/4"CW LINE IN CEILING SPACE FOR FUTURE TENANT.
4. 3/4"CW FROM FIRST FLOOR.
5. 1"CW TO IRRIGATION SYSTEM.
6. 3/4"CW TO FREEZE PROOF ROOF HYDRANT. COORDINATE EXACT LOCATION WITH OWNER PRIOR TO START OF WORK.
7. PROVIDE HEAT TRACE FOR DOMESTIC WATER LINE IN THIS TENANT SPACE. COORDINATE WITH ELECTRICAL CONTRACTOR FOR LOCATION OF POWER SOURCE. EACH TENANT SPACE SHALL HAVE SEPARATE HEAT TRACE SYSTEMS.
8. COORDINATE INSTALLATION OF WATER SERVICE ENTRY WITH ELECTRICAL CONTRACTOR TO ALLOW FOR REQUIRED ELECTRICAL PANEL WORKING CLEARANCES. COORDINATE REQUIREMENT PRIOR TO START OF WORK.



SECOND FLOOR WATER & GAS PLAN

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

2



FIRST FLOOR WATER & GAS PLAN

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

1

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PLUMBING PLANS:
WATER & GAS

MP102

20.01.NLV BUILDING 31

ELECTRICAL SPECIFICATIONS

PART I – GENERAL

A. CONDITIONS
1. FURNISH AND INSTALL A COMPLETELY WIRED AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO, THESE MAJOR ITEMS.
   A. LIGHTING FIXTURES AS INDICATED AND SPECIFIED ON THE PLANS.
   B. ELECTRICAL PANELS, SERVICE, CONDUIT, WIRING, ETC., FOR ALL OUTLETS AND EQUIPMENT.
   C. TELEPHONE, TELEVISION, AND FIRE ALARM. OUTLETS AND CONDUIT AS INDICATED.
2. OBTAIN AND REVIEW ALL OTHER DRAWINGS INCLUDING REFLECTED CEILING PLAN, INTERIOR AND EXTERIOR ELEVATIONS, FURNITURE PLANS AND ALL MILL WORK DRAWINGS. COORDINATE INSTALLATION OF ALL ELECTRICAL DEVICES AND EQUIPMENT PRIOR TO ROUGH–IN.
3. OBTAIN SUBMITTAL AND SHOP DRAWINGS FROM OTHER TRADES AND EQUIPMENT TO COORDINATE INSTALLATION ACCORDINGLY.
4. INSTALLATION SHALL COMPLY WITH ALL CURRENT APPLICABLE CODES AND GOVERNING AGENCIES HAVING JURISDICTION.
5. FIRE ALARM SYSTEM, IF REQUIRED PER IBC, SHALL BE DESIGN–BUILD BY OWNER'S/GC'S FIRE ALARM CONTRACTOR. DESIGN SHALL BE IN ACCORDANCE WITH NFPA 72. FIRE ALARM CONTRACTOR SHALL SUBMIT STAMPED DRAWINGS TO AHJ FOR REVIEW AND APPROVAL. FIRE ALARM CONTRACTOR IS RESPONSIBLE FOR TESTING AND VERIFYING THAT THE AUDIBILITY OF THE FIRE ALARM SYSTEM MEETS A MINIMUM OF 15 DBA ABOVE AMBIENT NOISE LEVELS. ADD HORNS WHERE REQUIRED TO MAINTAIN MINIMUM LEVELS.
6. PROVIDE FIRE STOP ON ALL PIPING THAT PENETRATES RATED WALLS. METHOD OF FIRE STOP SHALL MEET WALL RATING. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE RATED WALLS. THIS CONTRACTOR SHALL PROVIDE FIRE RATED ENCLOSURES AROUND ALL ROUGH–IN BOXES, PANELS, ETC. THAT ARE LOCATED IN FIRE RATED WALLS AND SHALL FIRE CAULK ALL OPENINGS IN RATED ASSEMBLIES.

B. RELATED WORK BY OTHERS
1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, TRENCH, AND BACKFILL FOR ELECTRICAL SERVICE ENTRANCE FROM THE MAIN SERVICE TO UTILITY POINT OF ELECTRICAL SERVICE. ELECTRICAL CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE ELECTRICAL SERVICE ENTRANCE WITH SERVING UTILITY COMPANY.
2. THE ELECTRICAL CONTRACTOR SHALL PROVIDE CONDUIT, TRENCH, AND BACKFILL FOR PRIMARY PHONE AND CATV SERVICE FROM THE TELEPHONE TERMINAL BOARD OR CABINET TO THE PHONE COMPANY AND CATV COMPANY POINT OF SERVICE COORDINATE WITH LOCAL UTILITY COMPANIES.

C. CODES, REGULATIONS, AND STANDARDS
1. THE INSTALLATION SHALL COMPLY WITH APPLICABLE LOCAL AND STATE CODES AND ORDINANCES, WITH THE REGULATIONS OF THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE AND WITH THE REQUIREMENTS OF THE POWER, TELEPHONE, AND CATV COMPANIES FURNISHING SERVICES TO THIS INSTALLATION.
2. THE LATEST EDITIONS OF THE FOLLOWING INDUSTRY STANDARDS, SPECIFICATIONS, AND CODES ARE MINIMUM REQUIREMENTS:
   A. THE NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION STANDARDS.
   B. THE NATIONAL ELECTRICAL CODE, INCLUDING LOCAL AMENDMENTS.
   C. UNDERWRITER LABORATORIES INCORPORATED STANDARDS.
   D. AMERICAN NATIONAL STANDARDS INSTITUTE.
   E. INTERNATIONAL BUILDING CODE.

D. INSPECTION OF SITE
1. PRIOR TO SUBMITTING A BID FOR ELECTRICAL WORK, THE CONTRACTOR SHALL VISIT THE SITE OF THE PROPOSED CONSTRUCTION AND SHALL THOROUGHLY ACQUAINT HIMSELF WITH EXISTING UTILITIES, AND WORKING CONDITIONS TO BE ENCOUNTERED, ETC. ALLOWANCE WILL NOT BE MADE FOR NONCOMPLIANCE WITH THIS CONDITION AFTER BIDDING.
2. ELECTRICAL INSTALLATION SHALL MEET THE EXISTING CONDITIONS.

E. STORAGE AND HANDLING OF MATERIAL
1. DELIVER MATERIALS AND EQUIPMENT TO THE PROJECT IN THE MANUFACTURER'S ORIGINAL, UNOPENED, LABELED CONTAINERS. PROTECT AGAINST MOISTURE, TAMPERING, OR DAMAGE FROM IMPROPER HANDLING OR STORAGE. CONTRACTOR SHALL PROTECT AND BE RESPONSIBLE FOR ANY DAMAGE TO WORK OR MATERIALS UNTIL FINAL ACCEPTANCE BY THE OWNER, AND SHALL MAKE GOOD WITHOUT COST TO THE OWNER, ANY DAMAGE OR LOSS THAT MAY OCCUR DURING THIS PERIOD.
2. ARRANGE FOR TIMELY DELIVERY OF MATERIALS AND EQUIPMENT TO THE JOB SITE IN ORDER TO MINIMIZE THE LENGTH OF TIME BETWEEN DELIVERY AND INSTALLATION.
3. COVER AND PROTECT ANY MATERIAL WHICH MAY BE AFFECTED BY THE WEATHER WHILE IN TRANSIT OR STORED AT THE PROJECT SITE. ANY MATERIAL FOUND DEFECTIVE OR NOT INSTALLED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS MAY BE REJECTED BY THE ENGINEER.

F. CLEANUP
1. KEEP THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIALS, OR RUBBISH CAUSED BY EMPLOYEES OR WORK UNDER THIS DIVISION OF THE SPECIFICATIONS. AT THE COMPLETION OF THE WORK REMOVE ALL SURPLUS MATERIALS, TOOLS, ETC., AND LEAVE THE PREMISES BROOM–CLEAN.

G. EXCAVATION, CUTTING, AND FITTING
1. PERFORM ALL EXCAVATION AND BACK FILLING REQUIRED FOR WORK PERFORMED UNDER THIS DIVISION OF THE SPECIFICATIONS. USE EXCAVATED MATERIALS FOR BACKFILL UNLESS OFF SITE MATERIALS ARE DEEMED NECESSARY.
2. PERFORM THE EXCAVATION, CUTTING, FITTING, REPAIRING, AND FINISHING OF THE WORK NECESSARY FOR THE INSTALLATION OF THE EQUIPMENT OF THIS SECTION. HOWEVER, NO CUTTING OF THE WORK OF OTHER TRADES OR OF ANY STRUCTURAL MEMBERS SHALL BE DONE WITHOUT THE CONSENT OF THE ARCHITECT.

H. DRAWINGS
1. THE DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND LOCATIONS OF THE ELECTRICAL WORK DATA PRESENTED ON THESE DRAWINGS ARE AS ACCURATE AS PLANNING CAN DETERMINE, BUT FIELD VERIFICATION OF ALL DIMENSIONS, LOCATIONS, LEVELS, ETC., TO SUIT FIELD CONDITIONS IS REQUIRED. REVIEW ALL ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DRAWINGS AND ADJUST ALL WORK TO MEET THE REQUIREMENTS OF CONDITIONS SHOWN. THE ARCHITECTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER ALL OTHER DRAWINGS. DISCREPANCIES BETWEEN DIFFERENT PLANS, OR BETWEEN DRAWINGS AND SPECIFICATIONS, OR REGULATIONS AND CODES GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IN WRITING BEFORE THE DATE OF BID OPENING. IF DISCREPANCIES ARE NOT REPORTED, THE CONTRACTOR SHALL BID THE GREATER QUANTITY OR BETTER QUALITY, AND APPROPRIATE ADJUSTMENTS WILL BE MADE AFTER CONTRACT AWARD. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD MEASURE AND CONFIRM MOUNTING HEIGHTS AND LOCATION OF ELECTRICAL EQUIPMENT WITH RESPECT TO COUNTERS, RADIATION, ETC. DO NOT SCALE DISTANCES OFF THE ELECTRICAL DRAWINGS, USE ACTUAL BUILDING DIMENSIONS.

I. COOPERATION WITH OTHER CONTRACTORS
1. COOPERATE WITH THE OTHER TRADES SO THAT THE INSTALLATION OF THE ELECTRICAL OUTLETS AND EQUIPMENT WILL BE PROPERLY COORDINATED. CONDUIT, LIGHTING FIXTURES, AND OTHER EQUIPMENT LOCATIONS SHALL BE VERIFIED WITH OTHER TRADES TO AVOID CONFLICT WITH THE PIPING, DUCTWORK, STEEL, BEAMS, OR OTHER OBSTRUCTIONS.
2. CAREFULLY VERIFY THE LOCATIONS OF THE OUTLET BOXES AND DETERMINE THAT THEY HAVE NOT BEEN DISTURBED DURING THE INSTALLATION OF MATERIALS OF OTHER TRADES.
3. COORDINATE THE LOCATION OF THE TRENCHES AND CONDUITS FOR ELECTRICAL AND TELEPHONE UTILITY SERVICES WITH THE GENERAL CONTRACTOR.
4. COORDINATE HVAC AND PLUMBING EQUIPMENT CONNECTION REQUIREMENTS WITH HVAC AND PLUMBING CONTRACTORS.

J. RECORD DRAWINGS
1. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN A SET OF DRAWINGS AT THE JOB SITE FOR THE EXCLUSIVE PURPOSE OF MAINTAINING A RECORD OF ALL WORK INSTALLED AND TO SHOW ANY DEVIATIONS FROM THE WORK INDICATED ON THE DRAWINGS.
2. AT THE COMPLETION OF THE PROJECT, ONE SET OF REPRODUCIBLE DRAWINGS, SHOWING ALL RECORD CONDITIONS, SHALL BE DELIVERED TO THE OWNER FOR ACCEPTANCE PRIOR TO FINAL PAYMENT.

PART II – PRODUCTS AND EXECUTION

A. MATERIALS
1. ALL MATERIALS SHALL BE NEW AND OF QUALITY AS SPECIFIED ON THE PLANS OR SPECIFICATIONS AND MUST CARRY THE UNDERWRITER'S LABORATORIES APPROVAL COVERING THE PURPOSE FOR WHICH THEY ARE USED, IN ADDITION TO MEETING ALL REQUIREMENTS OF THE CURRENT APPLICABLE CODES AND REGULATIONS.

B. SHOP DRAWINGS AND APPROVALS
1. THE ITEMS SPECIFIED HEREIN AND ON DRAWINGS ARE USED AS A STANDARD OF QUALITY. ANY MATERIALS OF EQUAL QUALITY AND AESTHETIC VALUE WILL BE GIVEN CONSIDERATION AS A SUBSTITUTE FOR THE MATERIALS SPECIFIED. NO APPROVAL WILL BE GIVEN TO A SPECIFIC CATALOG NUMBER, MODEL, OR TYPE OF EQUIPMENT, PRIOR TO BIDDING. AFTER BIDDING, THE DECISION OF THE ARCHITECT AND/OR ENGINEER DETERMINING EQUAL MATERIALS WILL BE FINAL.
2. THE CONTRACTOR SHALL SUBMIT SEVEN (7) IDENTICAL BOUND SETS OF SHOP DRAWINGS ON THE FOLLOWING ITEMS:
   A. LIGHTING FIXTURE CUTS AND PERFORMANCE DATA.
   B. OUTLINE DRAWINGS AND DATA SHEETS OF EACH PANELBOARD, LOAD CENTERS, AND DISTRIBUTION PANELS.
   C. OUTLINE DRAWINGS OF ALL SWITCH GEAR COMPONENTS.
   D. WIRING DEVICES AND COVERPLATES.
   E. ALL CIRCUIT BREAKERS INSTALLED IN PANELBOARDS, LOAD CENTERS, AND DISTRIBUTION PANELS.
3. SUBMIT ITEMS AT ONE TIME IN A NEAT AND ORDERLY MANNER WITHIN 15 DAYS OF AWARD OF CONTRACT. PARTIAL SUBMITTALS WILL NOT BE ACCEPTABLE.

C. SYSTEM GROUNDING
1. GROUNDING SHALL COMPLY WITH REQUIREMENTS OF ARTICLE 250. ALL EXPOSED NONCURRENT CARRYING METALLIC PARTS OF ELECTRICAL EQUIPMENT, METALLIC RACEWAY SYSTEMS, METALLIC CABLE ARMOR, GROUNDING CONDUCTOR OF NONMETALLIC SHEATHED CABLES, GROUNDING CONDUCTOR IN NONMETALLIC RACEWAYS, AND GROUNDED CONDUCTORS OF THE WIRING SYSTEM SHALL BE GROUNDED.
2. GROUNDING CONDUCTOR (NEUTRAL) OF THE WIRING SYSTEM SHALL BE CONNECTED TO THE SYSTEM GROUNDING CONDUCTOR AT A SINGLE PLACE IN EACH SYSTEM BY REMOVABLE BONDING JUMPERS, SIZED ACCORDING TO THE APPLICABLE PROVISIONS OF THE NATIONAL ELECTRICAL CODE. THE GROUNDED CONDUCTOR (NEUTRAL) TO THE GROUNDING CONDUCTOR CONNECTION SHALL BE LOCATED IN THE ENCLOSURE FOR THE SYSTEM'S OVERCURRENT PROTECTION OR WHERE OTHERWISE INDICATED ON THE PLANS OR SPECIFICATIONS.
3. A GROUND BUS SEPARATE FROM THE NEUTRAL BUS SHALL BE PROVIDED IN ALL DISTRIBUTION PANELS AND PANELBOARDS. PROPER TORQUE ON GROUND BUS SHALL BE VERIFIED, PER MANUFACTURER'S RECOMMENDATIONS, PRIOR TO ENERGIZING EQUIPMENT.
4. GROUND BUSES AND NEUTRAL BUSES IN ALL DISTRIBUTION PANELS, LOAD CENTERS, PANELBOARDS, AND THOSE PROVIDED IN ANY EQUIPMENT SHALL BE ISOLATED EXCEPT WHERE REQUIRED TO BE CONNECTED AS SPECIFIED ABOVE FOR THE SERVICE ENTRANCE
5. WHEN INDICATED ON THE DRAWINGS, EQUIPMENT GROUNDING CONDUCTORS SHALL BE EXTENDED FROM THE GROUND BUS IN THE DISTRIBUTION EQUIPMENT TO THE RECEPTACLE, FIXTURE OR DEVICE LUGS WHERE THEY ARE PROVIDED. WHERE LUGS ARE NOT PROVIDED, EQUIPMENT GROUNDING CONDUCTORS SHALL BE CONNECTED TO EQUIPMENT ENCLOSURES. THE CONNECTIONS SHALL BE ARRANGED SUCH THAT REMOVAL OF THE RECEPTACLE, EQUIPMENT GROUND CONDUCTORS, OR GROUND JUMPERS FROM GROUND BUSING SHALL NOT AFFECT THE GROUND SYSTEM.
6. RACEWAYS MAY NOT BE USED AS A GROUNDING CONDUCTOR FOR POWER AND LIGHTING CIRCUITS. ALL CONDUIT SHALL HAVE SEPARATE CODE SIZED GREEN GROUND WIRE INSTALLED IN THE CONDUIT TO INSURE A CONTINUOUS GROUNDING PATH.
7. IN INACCESSIBLE LOCATIONS, MAKE CONNECTIONS BY EXOTHERMIC WELD PROCESS.
8. IN ACCESSIBLE LOCATIONS, CONNECTIONS SHALL BE MADE WITH BOLTED THROUGH, APPROVED SOLDERLESS BRONZE GROUNDING DEVICES.

D. WIRE
1. CONDUCTOR SIZES SHOWN ON THE DRAWINGS ARE BASED ON COPPER WIRE. UNLESS OTHERWISE SPECIFIED, ALL WIRE SHALL BE TYPE XHHW OR SE FOR FEEDERS OR BRANCH CIRCUITS LARGER THAN 4 AWG, TYPE THHN/THWN INSULATION FOR FEEDERS AND BRANCH CIRCUITS 4 AWG AND SMALLER. ALL BRANCH CIRCUIT WIRING SHALL BE COPPER.
2. ALUMINUM CONDUCTORS MAY BE UTILIZED FOR SERVICE ENTRANCE AND PANEL FEEDERS. CONDUCTORS SHALL BE ALUMINUM ALLOW AA–8000 SERIES.
3. THE WIRES SHALL BE MARKED WITH COLOR TO SIMPLIFY CIRCUIT IDENTIFICATION. UNLESS OTHERWISE REQUIRED BY LOCAL ORDINANCES GROUND WIRES SHALL BE GREEN, NEUTRAL WIRES SHALL BE 120V–WHITE, AND LIVE WIRES 208Y/120V AND 120/240 SHALL BE BLACK (PHASE A), RED (PHASE B), AND BLUE (PHASE C). CIRCUIT SHALL BE LABELED IN EACH J–BOX.
4. ALL CONDUCTORS SHALL BE RATED 600 VOLT.
5. SPLICES IN EXTERIOR PULL BOXES AND MANHOLES SHALL BE WEATHERPROOF USING "SCOTCHCAST" SPLICE KIT OR APPROVED EQUAL. SEAL ENDS OF CONDUITS AND DUCTS WITH "DUCTSEAL" OR APPROVED EQUAL.
6. PROVIDE SOLID CONDUCTOR FOR 12 AWG AND SMALLER.
7. ALL WIRING WITHIN RESIDENTIAL UNITS ONLY MAY BE TYPE NM CABLE.
8. NO WIRE SHALL BE INSTALLED IN THE CONDUIT SYSTEM UNTIL THE CONDUIT SYSTEM IS COMPLETE. USE MINERALAC NO. 100 OR EQUIVALENT AS A LUBRICANT TO FACILITATE THE INSTALLATION OF THE CONDUCTORS IN THE CONDUIT SYSTEM.
9. MC CABLE WITH COPPER CONDUCTORS AND GROUND WIRE MAY BE USED WHERE PERMITTED.

E. CONDUIT
1. ALL WIRING SHALL BE INSTALLED IN LISTED METALLIC CONDUIT EXCEPT AS PERMITTED IN OTHER SECTIONS. RGS, WITH A 20 MIL PVC COATING WILL BE USED WHEN IN CONTACT WITH EARTH. IMC MAY BE USED IN INDOOR LOCATIONS NOT IN CONTACT WITH THE EARTH. EMT MAY BE USED IN INDOOR LOCATIONS NOT IN CONTACT WITH EARTH, NOT IN CONCRETE SLABS OR WALLS AND NOT SUBJECT TO DAMAGE. PVC MAY BE USED IN OR BELOW CONCRETE AND DIRECT BURIED IN EARTH. FLEXIBLE STEEL CONDUIT SHALL BE USED FOR INDOOR FINAL CONNECTIONS TO EQUIPMENT IN LENGTHS NOT TO EXCEED 72". LIQUID–TIGHT FLEXIBLE STEEL CONDUIT SHALL BE FOR OUTDOOR FINAL CONNECTIONS TO EQUIPMENT NOT TO EXCEED 48".
2. WHERE CONDUIT ENTERS OUTLET BOXES, FIXTURES OR CABINETS, FIRMLY FASTEN WITH STEEL SET SCREW, COMPRESSION CONNECTORS, OR DOUBLE LOCKNUTS FOR GRC. ALL CONNECTIONS SHALL HAVE BUSHINGS OR INSULATED THROAT CONNECTORS. FIRMLY FASTEN CONDUIT TO THE BUILDING CONSTRUCTION. RUN EXPOSED CONDUIT PARALLEL TO THE BUILDING LINES, SUPPORTED BY APPROPRIATE HANGERS (UNISTRUT, T & B OR APPLETON, OR EQUAL).
3. COVER METALLIC CONDUIT IN CONTACT WITH EARTH WITH POLYETHYLENE TAPED SPIRAL WRAPPED, 1/2 LAPPED TO PROVIDE 20 MIL. THICKNESS. TAPE SHALL BE SCOTCH NO. 50 TAPE. CONDUIT AND DUCTS NOT UNDER BUILDINGS AND FEEDER DUCTS SHALL BE INSTALLED PER N.E.C. 300–5. MAKE JOINTS WITH COMPOUND TO BE WATERTIGHT.
4. SCHEDULE 40 PVC CONDUIT SHALL BE PERMITTED UNDERGROUND WITH PROPER FITTINGS, ALL UL APPROVED AND CEMENTED JOINTS. PENETRATIONS THROUGH FLOOR SLABS AND BENDS GREATER THAN 22° SHALL BE WRAPPED RIGID GALVANIZED STEEL ELBOWS.
5. FITTINGS AND CONDUIT BODIES SHALL BE STEEL. DIECAST FITTINGS ARE NOT ACCEPTABLE.
6. CONDUIT SIZES SHALL BE AS REQUIRED BY CODE AND AS INDICATED OR SPECIFIED.
7. ALL EMPTY CONDUIT SYSTEMS SHALL HAVE A 200 LB. TEST NYLON PULL STRING TO FACILITATE INSTALLATION OF FUTURE WIRE.
8. WIRING, CONDUITS, AND OUTLETS SHALL BE CONCEALED WITH THE BUILDING STRUCTURE, EXCEPT THAT CERTAIN MOTOR AND LIGHTING FEEDER CONDUITS MAY BE RUN EXPOSED IN CERTAIN AREAS AS INDICATED ON THE DRAWINGS.
9. CONDUIT PENETRATION THROUGH ROOF SHALL HAVE ROOF FLASHING WITH CAULK TYPE COUNTER FLASHING SLEEVE. INSTALLATION SHALL BE WATERTIGHT.
10. CONDUITS SHALL BE ROUTED PARALLEL AND PERPENDICULAR TO THE STRUCTURE.

F. OUTLET, PULL, AND JUNCTION BOXES
1. EACH SWITCH, LIGHT. RECEPTACLE OR OTHER OUTLET, INSTALLED IN RESIDENTIAL UNITS, SHALL BE PROVIDED WITH A CODE SIZED, PLASTIC OUTLET BOX. JUNCTION AND PULL BOXES SHALL BE CODE SIZED, PLASTIC OR METAL OUTLET BOX. ALL OTHER OUTLET BOXES SHALL BE STEEL
2. BOXES INSTALLED IN POURED CEMENT FLOORS SHALL BE FLUSH TYPE CAST IRON OR STEEL WITH WATERTIGHT GASKETED COVERS. WHERE BOXES ARE INSTALLED IN FLOORS WITH TILE OR CARPET FLOOR COVERING, COVERS SHALL BE OF THE RECESSED TYPE TO ACCOMMODATE THE FLOOR COVERING.
3. BOXES INSTALLED FOR THE ALARM, COMPUTER, AND SECURITY SYSTEM SHALL BE PROVIDED WITH APPROPRIATE COVER PLATES.
4. BOXES FOR TELEPHONE, COMPUTER, T.V., FIRE ALARM, SECURITY, AND SIMILAR SYSTEMS SHALL BE MINIMUM 2–1/8" DEEP.

G WIRING DEVICES
1. WALL SWITCHES SHALL BE SPECIFICATION GRADE AC SILENT TYPE SWITCHES, 20A 120/277 VOLT.
2. RECEPTACLES SHALL BE SPECIFICATION GRADE, DUPLEX TYPE. NEMA5–20R, 20 AMPERE, 120VOLT GROUNDED TYPE. SPECIAL APPLICATION RECEPTACLES SHALL BE INDICATED ON PLANS. MOUNT WITH THE GROUND DOWN.
3. DEVICE PLATES SHALL BE EQUAL TO SIERRA SMOOTH–LINE PLASTIC WALL PLATES. COLOR SHALL BE WHITE, UNLESS OTHERWISE NOTED.
4. RECEPTACLES IN OUTDOOR AND WET LOCATIONS SHALL BE INSTALLED WITH A HINGED OUTLET COVER/ENCLOSURE CLEARLY MARKED AND U.L. LISTED SUITABLE FOR WET LOCATIONS WHILE IN USE, EQUAL TO TAYMAC SPECIFICATION GRADE.

H. SERVICE ENTRANCE SECTION
1. THE SERVICE ENTRANCE EQUIPMENT SHALL BE AS INDICATED ON THE DRAWINGS. EQUIPMENT SHALL CARRY THE U.L. LABEL AND SHALL CONFORM TO THE POWER COMPANY REGULATIONS.
2. SERVICE ENTRANCE EQUIPMENT SHALL BE PROVIDED WITH A FULLY RATED COPPER OR ALUMINUM BUS. HORIZONTALLY TAPERED BUSSING SHALL NOT BE ALLOWED.

I. DISTRIBUTION PANELS
1. DISTRIBUTION PANELS SHALL BE PROVIDED WITH FULLY RATED COPPER OR ALUMINUM BUS. HORIZONTAL TAPERED BUSSING SHALL NOT BE ALLOWED
2. ACCEPTABLE MANUFACTURERS – CUTLER HAMMER, SEIMENS, SQUARE D OR GENERAL ELECTRIC
3. FACTORY ASSEMBLED DEAD FRONT, METAL ENCLOSED, AND SELF–SUPPORTING SWITCH BOARD ASSEMBLY CONFORMING T NEMA PB 2 AND UL 891, AND COMPLETE FROM INCOMING LINE TERMINALS TO LOAD SIDE TERMINATIONS.
4. LINE AND LOAD TERMINATIONS: ACCESSIBLE FROM FRONT ONLY OF THE SWITCH BOARD. SUITABLE FOR CONDUCTOR MATERIALS AND NUMBER OF CONDUCTORS USED.
5. BUS CONNECTIONS: BOLTED. ACCESSIBLE FROM FRONT FOR MAINTENANCE. PROVIDE BELLEVILLE WASHERS FOR PROPERLY TORQUE ALL CONNECTIONS
6. PROVIDE FULLY–RATED NEUTRAL BUS AND FULLY RATED GROUND BUS MATCHING MATERIAL USED FOR MAIN BUS.
7. FUTURE PROVISIONS: FULLY EQUIP SPACES FOR FUTURE DEVICES WITH BUSSING AND BUS CONNECTIONS SUITABLY INSULATED AND BRACED FOR SHORT CIRCUIT CURRENTS. CONTINUOUS CURRENT RATING AS INDICATED ON DRAWINGS.
8. ALL CIRCUIT BREAKERS SHALL BE BOLT–ON TYPE.

J. PANEL BOARDS
1. CIRCUIT BREAKER TYPE AS INDICATED ON DRAWINGS. UNLESS INDICATED OTHERWISE, ALL PANELS SHALL HAVE PANEL HAVE PANEL BOARD TYPE CONSTRUCTION WITH BOLT–ON CIRCUIT BREAKERS FOR 3ø PANELS
2. MANUFACTURERS SHALL BE GENERAL ELECTRIC, SQUARE D, SEIMENS, CUTLER–HAMMER WITH VOLTAGE, SIZES, AND RATINGS AS INDICATED ON DRAWINGS.
3. THE CIRCUIT BREAKERS SHALL BE OPERABLE IN ANY POSITION AND BE REMOVABLE FROM THE FRONT OF THE PANEL BOARD WITHOUT DISTURBING THE ADJACENT UNITS. BRANCH BREAKERS SHALL BE OF SUCH DESIGN THAT COMBINATION OF SINGLE–POLE, DOUBLE–POLE, AND THREE–POLE BREAKERS CAN BE ASSEMBLED ON THE SAME PANEL. EACH BRANCH CIRCUIT SHALL BE CLEARLY NUMBERED. BRANCH AND MAN TERMINALS SHALL BE SOLDERLESS TYPE. HANDLE TIES TO FORM MULTI–POLE BREAKERS NOT ACCEPTABLE.

K. LOAD CENTER
1. CIRCUIT BREAKER TYPE AS INDICATED ON DRAWINGS. MANUFACTURERS SHALL BE GENERAL ELECTRIC, SQUARE D, SIEMENS, CUTLER–HAMMER/EATON WITH VOLTAGE, SIZES, AND RATINGS AS INDICATED ON DRAWINGS.
2. THE CIRCUIT BREAKERS SHALL BE OPERABLE IN ANY POSITION AND BE REMOVABLE FROM THE FRONT OF THE PANEL BOARD WITHOUT DISTURBING THE ADJACENT UNITS. BRANCH BREAKERS SHALL BE OF SUCH DESIGN THAT COMBINATION OF SINGLE–POLE AND DOUBLE–POLE BREAKERS CAN BE ASSEMBLED ON THE SAME PANEL. EACH BRANCH CIRCUIT SHALL BE CLEARLY NUMBERED. BRANCH AND MAIN TERMINALS SHALL BE OF THE SOLDERLESS TYPE. HANDLE TIES TO FORM MULTI–POLE BREAKERS NOT ACCEPTABLE.
   A. CIRCUIT BREAKERS SHALL BE PLUG–IN TYPE
3. WIRE TERMINATION FOR PANEL BOARDS AND CIRCUIT BREAKERS SHALL BE LISTED AS SUITABLE FOR 75 DEGREES C.
4. PROVIDE A TYPEWRITTEN CIRCUIT INDEX BEHIND CLEAR PLASTIC COVER ON INSIDE OF DOOR. INFORMATION SHALL INCLUDE ROOM AND TYPE LOAD SERVED. ALL CIRCUIT BREAKERS SHALL BE IDENTIFIED, INCLUDING SPARES. INDEX CARD FRAME SHALL BE METAL, SECURED TO DOOR.
5. PANEL BOARDS/LOAD CENTERS TO BE PROVIDED WITH COPPER BUSSIING ONLY.

L. LIGHTING FIXTURES
1. PROVIDE ALL LIGHTING FIXTURES, WIRED AND CONNECTED. THE DRAWINGS INDICATE THE FIXTURES FOR EACH LOCATION. PROVIDE LAMPS FOR ALL FIXTURES. THE LAMPS SHALL BE BY THE SAME MANUFACTURER. VERIFY CEILING CONSTRUCTION BEFORE ORDERING RECESSED UNITS. PROVIDE PLASTER FRAMES AND HANGERS AS REQUIRED. CEILING CONSTRUCTION, ARCHITECTURAL ACCESSORIES, VOLTAGE, AND BALLASTS TO MEET THE EXISTING CEILING CONDITION.

M. LIGHTING CONTROL
1. FURNISH AND INSTALL TIME SWITCHES, PHOTOCELLS, CONTRACTORS AND FULL LIGHTING CONTROL SYSTEMS AS REQUIRED FOR LIGHTING CONTROLS INDICATED ON THE DRAWINGS.
2. TIME SWITCHES SHALL BE EQUAL TO PARAGON, GENERAL ELECTRIC, TORK, OR INTERMATIC AND SHALL HAVE SIZE AND NUMBER OF POLES AS REQUIRED.
3. PHOTOCELLS SHALL BE EQUAL TO TORK OR INTERMATIC WITH VOLTAGE AS INDICATED.

N. TELEPHONE AND CABLE TELEVISION SYSTEMS
1. TELEPHONE WALL OUTLETS SHALL CONSIST OF STANDARD BOXES MOUNTED 18" ABOVE THE FLOOR UNLESS OTHERWISE INDICATED. PROVIDE A TERMINAL MOUNTING BOARD FOR THE INCOMING SERVICE CABLE.
2. CABLE TELEVISION OUTLETS SHALL CONSIST OF STANDARD BOXES MOUNTED 18" ABOVE THE FLOOR UNLESS OTHERWISE INDICATED. PROVIDE A TERMINAL MOUNTING BOARD FOR THE INCOMING SERVICE CABLE.

O. GUARANTEE
1. GUARANTEE ALL MATERIAL FURNISHED AND ALL WORKMANSHIP PERFORMED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE OF WORK. ANY DEFECTS DEVELOPING WITHIN THIS PERIOD, TRACEABLE TO MATERIAL FURNISHED AS A PART OF THIS SECTION OR WORKMANSHIP PERFORMED HEREUNDER, SHALL BE MADE GOOD AT NO EXPENSE TO THE OWNER.

SYMBOLS LEGEND

NOTE: THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ETC, ARE NECESSARILY USED ON THE DRAWINGS.

- FLUORESCENT OR LED FIXTURE (SEE SCHEDULE)
- FIXTURE WITH EMERGENCY BATTERY BALLAST UNIT
- TRACK LIGHT
- DOWNLIGHT FIXTURE WITH EMERGENCY BATTERY BALLAST UNIT
- WALL MOUNTED FIXTURE WITH EMERGENCY BATTERY BALLAST UNIT
- DOWNLIGHT FIXTURE
- WALL MOUNTED FIXTURE
- PENDANT MOUNTED FIXTURE
- WALL WASHER
- SINGLE FACE EXIT SIGN – UNIVERSAL MOUNTED
- SINGLE FACE EXIT SIGN W/ DIRECTIONAL ARROWS – UNIVERSAL MTD
- DOUBLE FACE EXIT SIGN W/ DIRECTIONAL ARROWS – UNIVERSAL MTD
- DUAL HEADED EMERGENCY UNIT
- COMBO DUAL HEADED EMERGENCY AND EXIT SIGN UNIT
- A — LETTER INDICATES LIGHT FIXTURE AS INDICATED ON FIXTURE SCHED
- S — SINGLE POLE SWITCH @ +48" UNLESS NOTED
- S_{abc} — SWITCH BANK @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- S_2 — 2 POLE SWITCH @ +48" UNLESS NOTED
- S_3 — 3–WAY SWITCH @ +48" UNLESS NOTED
- S_4 — 4–WAY SWITCH @ +48" UNLESS NOTED
- S_D — DIMMER SWITCH – SIZE AS REQUIRED @ +48" UNLESS NOTED
- S_{3D} — 3–WAY DIMMER SWITCH – SIZE AS REQUIRED @ +48" UNLESS NOTED
- S_{3Dxy} — 3–WAY DIMMER SWITCH BANK @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- S_S — SWITCH SENSOR @ +48" UNLESS NOTED
- S_M — MANUAL MOTOR STARTER
- OS — LOW VOLTAGE OCCUPANCY SENSOR – PROVIDE WITH ALL CONTROL UNITS AND EXTRA CONTROL CABLE
- SOSa — WALL SWITCH WITH OCCUPANCY SENSOR. TWO BUTTON DIGITAL LOW VOLTAGE WALL SWITCH. PROVIDES ON/OFF/0–10V DIMMING. SWITCH @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED.
- SDa — TWO BUTTON DIGITAL LOW VOLTAGE WALL SWITCH. PROVIDES ON/OFF/0–10V DIMMING. SWITCH @ +48" UNLESS NOTED. LOWER CASE LETTER INDICATES FIXTURE CONTROLLED. PROVIDE EXTRA CONTROL CABLES NEEDED TO FIXTURE CONTROLLED.
- LC — LIGHTING CONTACTOR
- P# — LIGHTING CONTROLS POWER PACK (SEE LIGHTING CONTROLS SCHEDULE FOR TYPE INDICATED BY "#")
- DH — DAYLIGHT SENSOR (SEE LIGHTING CONTROLS SCHEDULE)
- X — OCCUPANCY SENSOR (SEE LIGHTING CONTROLS SCHEDULE FOR TYPE INDICATED BY "X")
- CAMERA
- S — SPEAKER
- TELEPHONE OUTLET@ +18" UNLESS NOTED
- # — DATA OUTLET @ +18" UNLESS NOTED. # DENOTES CAT 5 CABLE COUNT
- COMBINATION TELEPHONE/DATA OUTLET @ +18" UNLESS NOTED
- TV — TELEVISION OUTLET @ +18" UNLESS NOTED
- DD — DUCT DETECTOR
- HD — HEAT DETECTOR
- SD — 120 VOLT SMOKE DETECTOR WITH SOUNDER BASE AND BATTERY BACKUP
- AUXILIARY SYSTEM TERMINAL CABINET
- SWITCHBOARD, MOTOR CONTROL CENTER OR DISTRIBUTION BOARD
- 3 PHASE, 4 WIRE PANELBOARD, UNO
- G — GENERATOR
- T — TRANSFORMER
- MOTOR OUTLET
- DISCONNECT SWITCH – SIZE AND TYPE NOTED
- COMBINATION FUSED STARTER DISCONNECT SWITCH FUSE SIZE AS INDICATED, STARTER SIZE '1'
- EF 1 — MECHANICAL EQUIP. CONNECTION, SEE SCHED. ON MECH. PLAN
- J — JUNCTION BOX
- CONDUIT RUN CONCEALED IN WALL OR ABOVE CEILING
- CONDUIT RUN BELOW FLOOR OR GRADE
- SPECIAL HEAVY DUTY RECEPTACLE – SIZE AS NOTED. @ +18" UNLESS NOTED
- 1/2 SWITCHED RECEPTACLE @ +18" UNLESS NOTED
- FIRE RATED POKE THRU WITH TYPE INDICATED
- FLUSH FLOOR BOX WITH TYPE INDICATED
- SINGLE RECEPTACLE @ +18" UNLESS NOTED
- DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- DOUBLE DUPLEX RECEPTACLE @ +18" UNLESS NOTED
- GFI — GFI DUPLEX RECEPTACLE
- S — FULL SWITCHED RECEPTACLE
- DUPLEX RECEPTACLE INSTALLED ABOVE COUNTERTOP
- WP — DUPLEX RECEPTACLE WITH WEATHERPROOF COVERPLATE @ 18" UNLESS NOTED
- P1–3,5,7 — HOMERUN TO PANELBOARD, INFORMATION AT ARROWS ARE CIRCUIT NUMBERS AND PANELBOARD FOR TERMINATION. REFER TO ASSOCIATED NOTE FOR BRANCH CIRCUIT CONDUCTOR SIZES.
- INDICATES 1/2" CONDUIT CONCEALED IN CEILING OR WALL WITH (3) CONDUCTORS. (1) PHASE, (1) NEUTRAL AND (1) GROUND WIRE. ALL ARE #12 AWG UNLESS NOTED OTHERWISE.
- WHIP COUNT INDICATES NUMBER OF HOT CONDUCTORS
- (E) — INDICATES EXISTING DEVICE TO REMAIN
- COMBINATION FIRE ALARM HORN/STROBE WALL MOUNTED.
- FIRE ALARM STROBE LIGHT WALL MOUNTED.
- COMBINATION FIRE ALARM HORN/STROBE CEILING MOUNTED.
- FIRE ALARM STROBE LIGHTS CEILING MOUNTED.
- F — FIRE ALARM MANUAL PULL STATION WALL MOUNTED. INSTALL WITH TOP 48" AFF.
- FAA — FIRE ALARM ANNUNCIATOR.
- FACP — FIRE ALARM CONTROL PANEL.
- FIRE ALARM SYSTEM CEILING SMOKE DETECTOR.

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JUSTIN R. SMOTHERS
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REV	ISSUE	DATE
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ELECTRICAL SPECS & SYMBOLS

E001

20.01.NLV BUILDING 31

GENERAL NOTES

A. REFER TO ARCHITECTURAL DRAWINGS AND ELEVATIONS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF ALL LIGHTING FIXTURES.

B. REFER TO LIGHTING FIXTURE SCHEDULE FOR LIGHT FIXTURE TYPES AND REQUIREMENTS. .

C. CONNECT ALL EXIT SIGNS AND EMERGENCY LIGHTING UNITS TO THE INDICATED CIRCUIT WITH A SEPARATE AND UN-SWITCHED CONDUCTOR BYPASSING ALL CONTROLS AND CONTACTORS. REFER TO MANUFACTURER'S WRITTEN INSTRUCTIONS FOR PROPER INSTALLATION AND TESTING.

D. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT COORDINATION AND CONFLICT ISSUES BE RESOLVED PRIOR TO INSTALLATION OF LIGHT FIXTURES.

E. ROUTE ALL EXPOSED, RIGID CONDUIT TIGHT TO STRUCTURE, PARALLEL TO BUILDING LINES AND IN UNISTRUT CABLE/PIPE TRAY WHERE POSSIBLE. COORDINATE CONDUIT ROUTING AND INSTALLATION WITH OTHER TRADES PRIOR TO ROUGH-IN. SUPPORT CONDUIT FROM STRUCTURE NOT ROOF DECK. MAINTAIN 2" MIN SPACING FROM BOTTOM OF ROOF DECK TO PREVENT ROOFING SCREWS FROM PENETRATING CONDUITS.

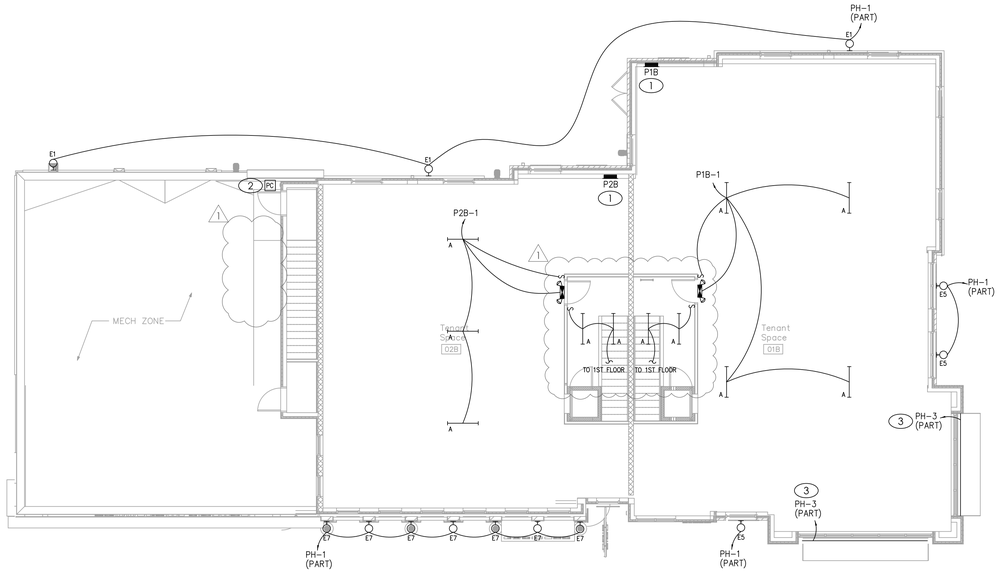
F. THROUGH WIRING OF RECESSED LIGHT FIXTURES, IN SUSPENDED CEILINGS, IS NOT PERMITTED. CONNECT EACH LIGHT FIXTURE BY A WHIP TO A JUNCTION BOX. PROVIDE CABLE WHIPS OF SUFFICIENT LENGTH TO ALLOW FOR RELOCATING EACH LIGHT FIXTURE WITHIN A 5-FOOT RADIUS OF ITS INSTALLED LOCATION, BUT NOT EXCEEDING 6 FEET IN UNSUPPORTED LENGTH.

G. ALL INTERNALLY ILLUMINATED SIGNS SHALL BE PROVIDED WITH AN ACCESSIBLE DISCONNECTION MEANS. VERIFY EACH SIGN IS FURNISHED WITH AN INTEGRAL DISCONNECT SWITCH. PROVIDE WEATHERPROOF DISCONNECT SWITCHES WITHIN SIGHT OF ALL SIGNS AS REQUIRED. MAKE FINAL CONNECTION AS REQUIRED.

1 H. SEE SHEET MP001 FOR ACCEPTABLE WALL PENETRATION METHODS.

(#) KEYED PLAN NOTES

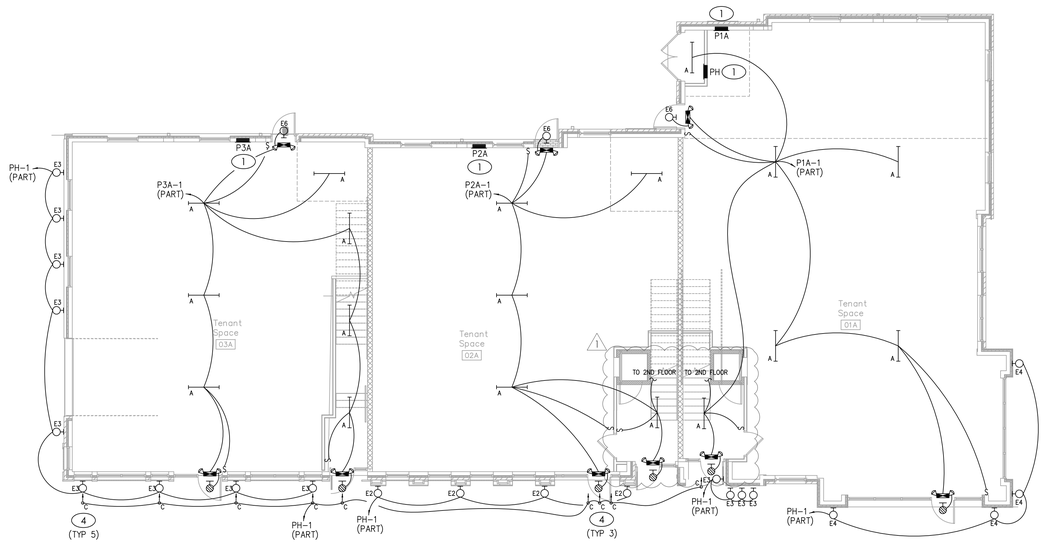
1. REFER TO SINGLE LINE DIAGRAM ON SHEET E-201 AND PANELBOARD SCHEDULES ON SHEET E-202 FOR MORE INFORMATION.
2. PHOTOCELL FOR CONTROL OF EXTERIOR LIGHTING FIXTURES. MOUNT PHOTOCELL TO TOP OF PARAPET AND POINT NORTH.
3. WET LOCATION LED TAPE LIGHT TO BE MOUNTED 45DEG CHANNEL ON EXTERIOR SIDE OF STRUCTURAL WINDOW FRAME. PROVIDE FIXTURES, DRIVERS/TRANSFORMERS, AND OTHER ACCESSORIES TO FILL LATERAL PORTION AT TOP OF WINDOW FRAME AND VERTICAL PORTIONS AT EACH SIDE OF WINDOW FRAME. PROVIDE INDIVIDUAL DRIVER/TRANSFORMER FOR EACH MANUFACTURER-RECOMMENDED STANDARD LENGTH OF FIXTURE. LOCATE DRIVERS ON INTERIOR SIDE OF WALL IN INCONSPICUOUS, ACCESSIBLE LOCATION. COORDINATE EXACT LOCATION OF DRIVER BANK AND MOUNTING WITH ARCHITECT PRIOR TO CONSTRUCTION. CONTROL VIA PHOTOCELL.
4. WET LOCATION LED DOWNLIGHT MOUNTED IN SOFFIT ABOVE. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION.



SECOND FLOOR LIGHTING PLAN

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

2



FIRST FLOOR LIGHTING PLAN

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

1

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PROFESSIONAL ENGINEER
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ELECTRICAL PLANS: LIGHTING

E101

20.01.NLV BUILDING 31

GENERAL NOTES

A. DRAWINGS ARE DIAGRAMMATIC AND SHALL NOT BE SCALED. REFER TO ARCHITECTURAL PLANS OR FIELD MEASUREMENTS FOR DIMENSIONS.

B. ALL WORK SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70) AND ALL LOCAL BUILDING CODES AND AMENDMENTS.

C. ALL ROOF AND WALL PENETRATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. PROVIDE ALL REQUIRED SLEEVES, FLASHINGS, CURBS, REINFORCED ANGLES, SUPPORTING FRAMES, ETC. UNLESS THEY ARE SPECIFICALLY CALLED OUT TO BE FURNISHED BY OTHERS.

D. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACE AVAILABLE, AND WITHOUT INTERFERENCES.

E. THIS CONTRACTOR SHALL PERFORM ALL WORK INDICATED AND/OR AS REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF THE ELECTRICAL SYSTEMS.

F. THE ELECTRICAL SYSTEM DESIGN IS BASED IN PART ON THE SPECIFIED HVAC AND PLUMBING EQUIPMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE EXACT LOCATIONS AND ELECTRICAL REQUIREMENTS OF ALL EQUIPMENT BEING FURNISHED. ANY CHANGES TO THE ELECTRICAL SYSTEM DUE TO HVAC EQUIPMENT SUBSTITUTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

G. ALL POWER WIRING SHALL BE BY THE ELECTRICAL CONTRACTOR. ALL CONTROL WIRING SHALL BE ROUTED BY THE ELECTRICAL CONTRACTOR WITH FINAL CONTROL DEVICE (T-STATS) LANDINGS BY THE MECHANICAL CONTRACTOR.

H. ALL WIRING SHALL BE IN APPROVED RACEWAY.

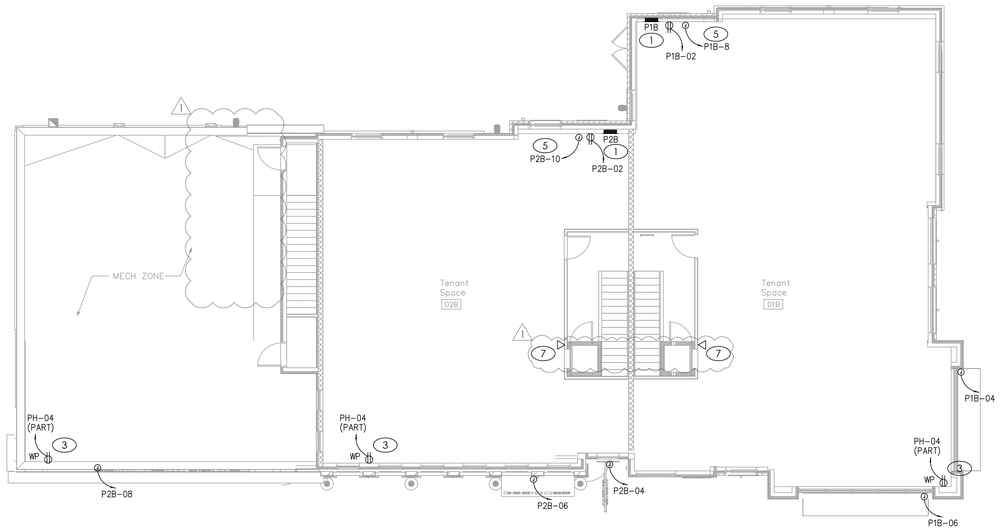
I. WIRE SIZE SHALL BE MINIMUM #12 AWG, THWN SOLID COPPER UNLESS OTHERWISE NOTED. PROVIDE GROUND WIRE WHERE REQUIRED BY CODE. INCREASE WIRE SIZE TO COMPENSATE FOR VOLTAGE DROP WHERE TOTAL LENGTH OF ANY BRANCH EXCEEDS 100 FEET.

K. FIRE ALARM, AUDIO/VIDEO AND SURVEILLANCE SYSTEMS BY OTHERS.

L. SEE SHEET MP001 FOR ACCEPTABLE WALL PENETRATION METHODS.

(#) KEYED PLAN NOTES

1. REFER TO SINGLE LINE DIAGRAM ON SHEET E-201 AND PANELBOARD SCHEDULES ON SHEET E-202 FOR MORE INFORMATION.
2. MAKE CONNECTION TO DIVISION 22/23 EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE ELECTRICAL CONNECTION WITH DIVISION 22/23 CONTRACTOR.
3. WEATHERPROOF RECEPTACLE AT PARAPET WALL FOR "CHRISTMAS LIGHT" LOAD. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO CONSTRUCTION.
4. JUNCTION BOX FOR HARDWIRE CONNECTION TO VERTICAL LIFT. COORDINATE EXACT CONNECTION REQUIREMENTS WITH EQUIPMENT SPECIFICATIONS PRIOR TO CONSTRUCTION.
5. JUNCTION BOX FOR HARDWIRE CONNECTION TO HEAT TRACE SYSTEM BY OTHERS. COORDINATE EXACT JUNCTION BOX/CONNECTION LOCATION AND REQUIREMENTS WITH DIVISION 22/23 CONTRACTOR PRIOR TO CONSTRUCTION.
6. COORDINATE WITH PLUMBING CONTRACTOR TO ENSURE INSTALLATION OF BACKFLOW PREVENTER DOES NOT ENCROACH UPON ELECTRICAL PANEL WORKING CLEARANCE.
7. ROUTE 1-1/4" CONDUIT BACK TO TELECOMMUNICATIONS BACKBOARD. COORDINATE EXACT ROUTING AND STUB-OUT LOCATION WITH ARCHITECT & LIFT INSTALLER PRIOR TO CONSTRUCTION.

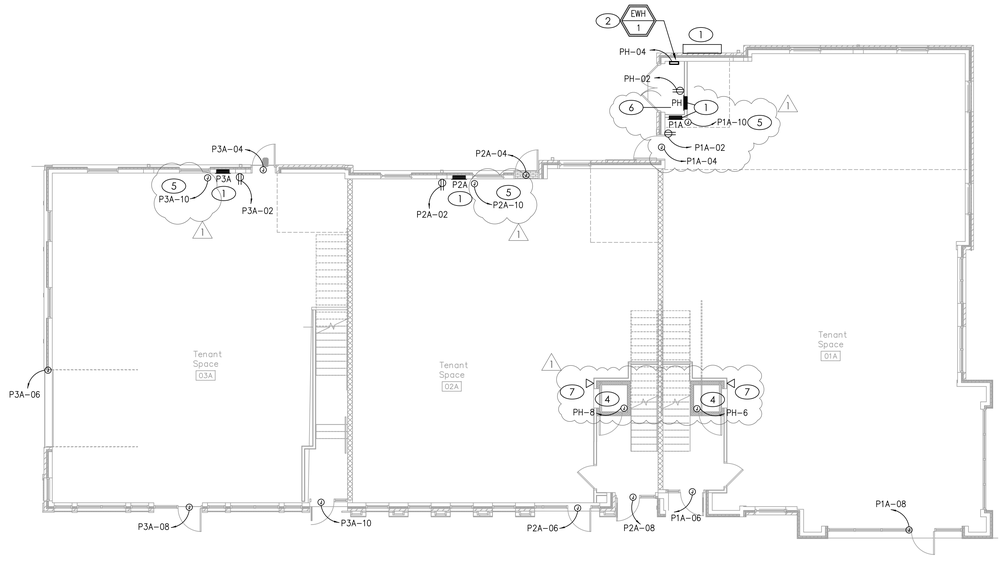


SECOND FLOOR POWER PLAN

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

2

NORTH



FIRST FLOOR POWER PLAN

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

1

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ELECTRICAL PLANS: POWER

E102

20.01.NLV BUILDING 31

ELECTRICAL LIGHTING SCHEDULE (OR EQUAL, VERIFY ALL SELECTIONS AND FINISHES WITH OWNER AND ARCHITECT PRIOR TO ORDERING).

FIXTURE TYPE	MANUFACTURER NAME	MANUFACTURER SERIES	VOLT AMPS	MOUNTING	LAMP TYPE	REMARKS	VOLT
A	LITHONIA	CSS 4' STRIP LIGHT	35.8	SUSPENDED	INCLUDED 3500K LED	4' LED STRIP LIGHT - COORDINATE MOUNTING WITH CEILING PER ROOM.	120
C	LITHONIA	WF4	10	RECESSED	INCLUDED 4000K LED	4" LED CAN LIGHT - WET LOCATION RATED	120
D	ELEMENTAL LED OR EQUAL	BLAZE BASICS LED TAPE LIGHT	3W/FT	SURFACE	INCLUDED 3000K LED	LED LINEAR TAPE LIGHT - 200LM/FT - 3000K - WET LOCATION RATED - PROVIDE DRIVERS/TRANSFORMERS AND OTHER ACCESSORIES AS NECESSARY TO MAKE COMPLETE SYSTEM IN ACCORDANCE WITH DESIGN INTENT - CONTROL VIA EXTERIOR PHOTOCELL	120
E1	LITHONIA	WDGE3-P3-40K-80CRI-R4-MVOLT-SRM-E15WC	71	WALL SURFACE	INCLUDED 4000K LED	EXTERIOR WALL PACK	120
E2	LUMINIS	ECLIPSE EC-613-EC6W	24	WALL SURFACE	INCLUDED 4000K LED	EXTERIOR ARCHITECTURAL WALL FIXTURE	120
E3	EATON	LUMIERE 1235E-SQ	4	WALL RECESSED	INCLUDED 4000K LED	EXTERIOR STEP LIGHT - PROVIDE WITH TRANSFORMERS/DRIVERS AS NECESSARY TO MAKE FULLY OPERATIONAL SYSTEM	12
E4	LUMINIS	NAUTILUX-LED NT854R	25	WALL RECESSED	INCLUDED 4000K LED	EXTERIOR STEP LIGHT	120
E5	LUMINIS	LUMISTIK CL325	20	WALL SURFACE	INCLUDED 4000K LED	EXTERIOR ARCHITECTURAL TUBE LIGHT	120
E6	LUMINIS	SCIROCCO-LED SR528	18	WALL SURFACE	INCLUDED 4000K LED	EXTERIOR EGRESS LIGHT	120
E7	LUMINIS	SYRIOS-LED SY300	13	WALL SURFACE	INCLUDED 3500K LED	EXTERIOR ARCHITECTURAL WALL UPLIGHT	120
	LITHONIA	ELM2-SD	5	SURFACE	INCLUDED LED	EMERGENCY EGRESS LIGHTING UNIT WITH 90 MIN. BATTERY PACK	120
	LITHONIA	LHQM-LED-R-SD	5	SURFACE	INCLUDED LED	EMERGENCY EXIT EGRESS COMBO LIGHTING UNIT WITH RED FACE EXIT SIGN AND 90 MIN. BATTERY PACK	120
	LITHONIA	ELA-B-T-QWP-L0309-SD	5	SURFACE	INCLUDED LED	OUTDOOR EMERGENCY REMOTE EGRESS LIGHTING UNIT	120

Short-Circuit and Voltage Drop Calculations

Distances are for calculation purposes only and shall not be used for contractor takeoffs nor bidding - Contractor shall notify Engineer of any field condition that results in a change of 10% or greater circuit distance

The following calculations are based on the "Point-by-Point" method where:

$ISC_{(2)} = ISC_{(1)} \times M_{(1)}$ M= 1/(1+f)

$ISC_{(1)}$ = short circuit current at fault point 1

$ISC_{(2)}$ = short circuit current at fault point 2

Feeder: $f_{(3Ø)} = \frac{1.732 \times L \times Isc}{C \times E}$ XFMR: $f_{(3Ø)} = \frac{IP(sca) \times Vp \times 1.73 \times \%Z}{100,000 \times KVA}$ $IS_{(3\text{-}ph)} = \frac{Vp \times M \times IP_{(sca)}}{Vs}$

Feeder: $f_{(1Ø)} = \frac{2 \times L \times Isc}{C \times E}$ XFMR: $f_{(1Ø)} = \frac{IP(sca) \times Vp \times \%Z}{100,000 \times KVA}$

IP = Primary short circuit current
Vp = Primary voltage
IS= Secondary short circuit current
Vs= Secondary voltage
L = Length of circuit
C = "C" Factor from Bussman table where "C" = 1 / impedance per linear foot
E = Line to line volts

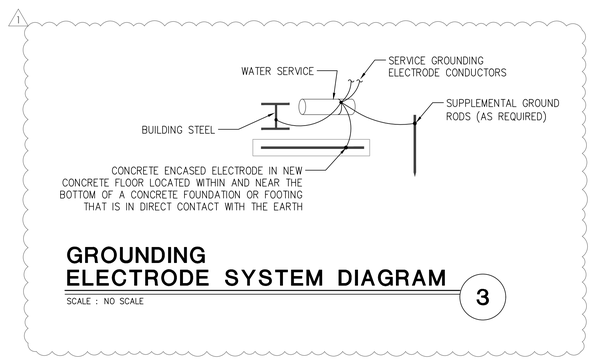
Feeder Types =
NM - Non Magnetic Conduit, M - Magnetic Conduit, FB - Feeder Busway, PB - Plug-in Busway, TX - Transformer

VOLTAGE DROP (3Ø):
%VD= ((R x cos(arccos(pf)) + X x sin (arccos(pf))) x L/# x I x 1.73) / E
VOLTAGE DROP (1Ø):
%VD= ((R x cos(arccos(pf)) + X x sin(arccos(pf))) x 2 x L/# x I) / E

%VD CUM= Cumulative Voltage Drop from Fault Point 1 to Fault Point #
R= resistance in ohms per LF
X= reactances in ohms per LF

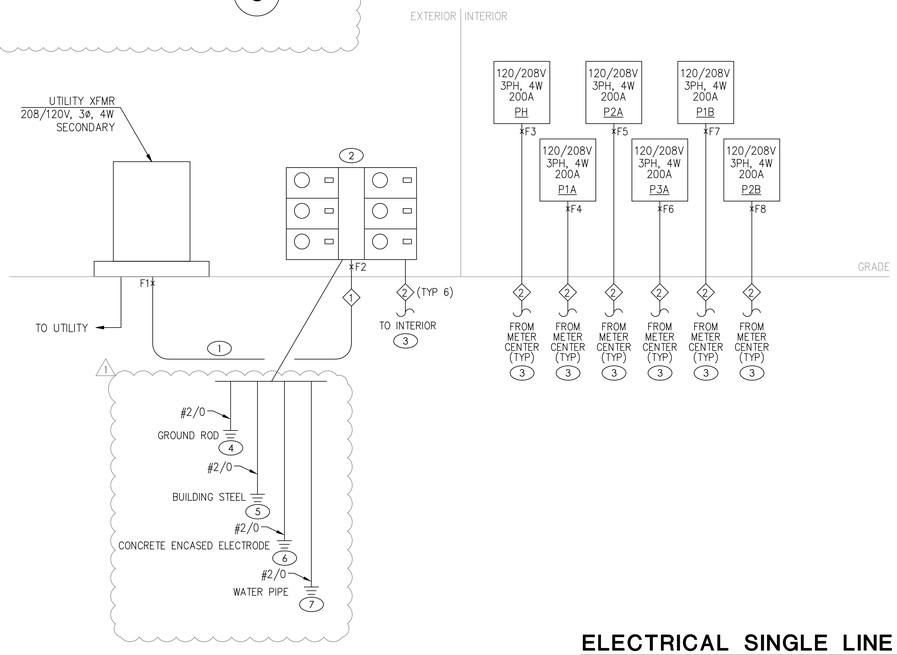
Date of Calculations: 09/22/2020
System Voltage: 208Y/120V - 3 phase

Fault Point (F#)	Bus/Feeder Description	Source (Fault Point)	Phase	Source Isc (amps)	Feeder: Conduit Type/ TX	Material	Quantity of Parallel Sets and Bus/ Phase & Neutral Size			Conductor 'C' Value	Busway 'C' Value	L-L Voltage (E)	Circuit Length (L)	Load Power Factor (pf)	Circuit Load (Amperage)	Conductor: Resistance (R)	Reactance (X)	Arccos (pf) (Radians)	Transformer: Type	Degree Rise	kVA	New Xfmr Z	Existing Xfmr Z	Secondary Voltage	Tap Setting	f	M	Fault Current (amps)	Voltage Drop (%VD)	Cumulative Voltage Drop (%VD)	Fault Point (F#)
1	Utility Service Point	55,580 at the secondary of the utility transformer																							Source Isc + 6X Motor Contribution =			57380			1
	Motor Contribution	300 The connected full load motor amps (includes compressors) on the system																												
2	TO MDP	1	3	57380	NM	AL	4	Set(s) of	350	AWG	16813	--	208	150	0.8	80	0.000061	0.000040	0.643501							1.066	0.48	27777	-0.18%	-0.18%	2
3	TO PNLBD 'PH'	2	3	27777	M	CU	1	Set(s) of	3/0	AWG	12844	--	208	20	0.8	4	0.000079	0.000052	0.643501							0.360	0.74	20422	-0.01%	-0.19%	3
4	TO PNLBD 'P1A'	2	3	27777	M	CU	1	Set(s) of	3/0	AWG	12844	--	208	30	0.8	15	0.000079	0.000052	0.643501							0.540	0.65	18034	-0.04%	-0.22%	4
5	TO PNLBD 'P2A'	2	3	27777	M	CU	1	Set(s) of	3/0	AWG	12844	--	208	70	0.8	15	0.000079	0.000052	0.643501							1.261	0.44	12287	-0.08%	-0.26%	5
6	TO PNLBD 'P3A'	2	3	27777	M	CU	1	Set(s) of	3/0	AWG	12844	--	208	100	0.8	11	0.000079	0.000052	0.643501							1.801	0.36	9917	-0.09%	-0.27%	6
7	TO PNLBD 'P1B'	2	3	27777	M	CU	1	Set(s) of	3/0	AWG	12844	--	208	35	0.8	19	0.000079	0.000052	0.643501							0.630	0.61	17038	-0.05%	-0.23%	7
8	TO PNLBD 'P2B'	2	3	27777	M	CU	1	Set(s) of	3/0	AWG	12844	--	208	55	0.8	16	0.000079	0.000052	0.643501							0.990	0.50	13955	-0.07%	-0.25%	8



GROUNDING ELECTRODE SYSTEM DIAGRAM 3

SCALE : NO SCALE



ELECTRICAL SINGLE LINE DIAGRAM 1

SCALE : NO SCALE

SC/VD CALCULATIONS 2

SCALE : NO SCALE

FEEDER NUMBER	
1	(4) 4"C (PVC) W/ 4 #350 AL EACH
2	(1) 2"C W/ 4 #3/0 CU & 1 #6 CU GRND

1. PROVIDE NEW CONDUCTORS TO UTILITY TRANSFORMER. VERIFY EXACT LOCATION AND REQUIREMENTS WITH UTILITY PRIOR TO TRENCHING.
2. PROVIDE NEW UTILITY METER SECTION PER UTILITY REQUIREMENTS IN COORDINATION WITH SWITCHGEAR VENDOR. BASIS OF DESIGN IS GENERAL ELECTRIC TMP3SB10R MAIN BREAKER MODULE – BOTTOM CENTER FEED CONSTRUCTION – 1000A MCB, 65KAIC PROTECTED, 3PH, 4WIRE. PROVIDE WITH (6) TOTAL TENANT METER SOCKETS – BASIS OF DESIGN IS GENERAL ELECTRIC TMPR12322R – TWO STACKS OF (3) 225A METER SOCKETS ON EACH SIDE OF CENTER FEED SECTION. VERIFY ACTUAL METERING SCHEME IS PROPERLY SELECTED, APPROVED BY UTILITY, AND PRICED AS SUCH PRIOR TO BIDDING.
3. EXTEND TENANT SERVICE FEEDERS FROM EXTERIOR METER CENTER TO TENANT PANEL.
4. PROVIDE NEW GROUND PER NEC 250.52(A)(5). REFER TO DIAGRAM 3 THIS SHEET.
5. BOND PER NEC 250.52(A)(2). REFER TO DIAGRAM 3 THIS SHEET.
6. PROVIDE NEW GROUND PER NEC 250.52(A)(3). REFER TO DIAGRAM 3 THIS SHEET.
7. PROVIDE NEW GROUND PER NEC 250.52(A)(1). REFER TO DETAIL 3 THIS SHEET.

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64105
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MEP ENGINEER:
JSC ENGINEERS
MO COA NO. 2012009786 | KS COA NO. E-2618
1501 NW BLUE PARKWAY, UNITY VILLAGE, MO 64065
3rd FLOOR UNITY VILLAGE TOWER
phone: (816) 272-5269
email: jsmothers@jscengineers.com

LOT 7, BUILDING 31
3140 SW LONGVIEW BLVD
LEE'S SUMMIT, MO, 64081

STATE OF MISSOURI
JUSTIN R. SMOTHERS
NUMBER PE-2012003956
PROFESSIONAL ENGINEER
08-17-2021

REV	ISSUE	DATE
1	PLANCHECK	2021 08 17

ELECTRICAL DIAGRAMS & SCHEDULES

E201

20.01 NLV BUILDING 31

PANELBOARD: PH (NEW)

BUS AMPS: 225A
MAIN SIZE/TYPE: 200A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: MDP
A/C RATING: FCA +10% MINIMUM FULLY RATED
SERVES: HOUSE
MOUNTING: RECESSED
LOCATION: BACK OF HOUSE

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	LTG - EXTERIOR VIA TC	1,200			12	20	1	1	20	12	180			RCPT - HOUSE CLOSET	2
3	LTG - EXTERIOR TAPE VIA TC		550		12	20	1	1	20	12		540		RCPT - PARAPET XMAS LIGHTS	4
5	SPARE					20	1	1	20	12			1,200	PWR - LIFT 1	6
7	SPARE					20	1	1	20	12	1,200			PWR - LIFT 2	8
9	SPARE					20	1	1	20					SPARE	10
11	SPARE					20	1	1	20					SPARE	12
13	SPARE					20	1	1	20					SPARE	14
15	SPARE					20	1	1	20					SPARE	16
17	SPARE					20	1	1	20					SPARE	18
19	SPARE						1	1						SPARE	20
21	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	22
23	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	24
25	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	26
27	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	28
29	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	30
31	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	32
33	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	34
35	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	36
37	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	38
39	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	40
41	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	42
	SUBTOTAL	1,200	550								1,380	540	1,200	SUBTOTAL	

		LOAD	CONN. VA	DF
TOTAL PHASE A - VA	2,580	COOLING		1.00
AMPS	22	HEATING		0
TOTAL PHASE B - VA	1,090	LIGHTING	1,750	1.25
AMPS	9	RECEPTACLES	720	1.0/.5
TOTAL PHASE C - VA	1,200	MOTORS	2,400	1.00
AMPS	10	SUPP HEAT		1.00
TOTAL PNLBD - VA	4,870	MISC EQUIP		1.00
AMPS	14			

LOAD	CONN. VA	DF
REFRIG		1.00
SIGN/DISP		1.25
KITCHEN		1.00
EXISTING		1.00
LRG MOTOR		1.25
SHOW WNDW		1.25
LTG TRACK		1.00

TOTAL DEMAND
5,308 VA
15 A

PANELBOARD NOTES

PANELBOARD: P2A (NEW)

BUS AMPS: 225A
MAIN SIZE/TYPE: 200A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: MDP
A/C RATING: FCA +10% MINIMUM FULLY RATED
SERVES: P2A
MOUNTING: RECESSED
LOCATION: BACK OF HOUSE

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	LTG - TENANT SPACE P2A	500			12	20	1	1	20	12	180			RCPT - BY PANEL	2
3	SPARE					20	1	1	20	12		1,200		PWR - SIGNAGE 1	4
5	SPARE					20	1	1	20	12			1,200	PWR - SIGNAGE 2	6
7	SPARE					20	1	1	20	12	1,200			PWR - SIGNAGE 3	8
9	SPARE					20	1	1	20	12		1,200		PWR - HEAT TRACE	10
11	SPARE					20	1	1	20					SPARE	12
13	SPARE					20	1	1	20					SPARE	14
15	SPARE					20	1	1	20					SPARE	16
17	SPARE					20	1	1	20					SPARE	18
19	SPARE					20	1	1	20					SPARE	20
21	SPARE						1	1						PROVISIONAL SPACE	22
23	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	24
25	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	26
27	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	28
29	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	30
31	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	32
33	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	34
35	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	36
37	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	38
39	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	40
41	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	42
	SUBTOTAL	500									1,380	2,400	1,200	SUBTOTAL	

		LOAD	CONN. VA	DF
TOTAL PHASE A - VA	1,880	COOLING		1.00
AMPS	16	HEATING		0
TOTAL PHASE B - VA	2,400	LIGHTING	500	1.25
AMPS	20	RECEPTACLES	180	1.0/.5
TOTAL PHASE C - VA	1,200	MOTORS		1.00
AMPS	10	SUPP HEAT		1.00
TOTAL PNLBD - VA	5,480	MISC EQUIP	1,200	1.00
AMPS	15			

LOAD	CONN. VA	DF
REFRIG		1.00
SIGN/DISP	3,600	1.25
KITCHEN		1.00
EXISTING		1.00
LRG MOTOR		1.25
SHOW WNDW		1.25
LTG TRACK		1.00

TOTAL DEMAND
6,505 VA
18 A

PANELBOARD NOTES

SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

PANELBOARD: P1B (NEW)

BUS AMPS: 225A
MAIN SIZE/TYPE: 200A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: MDP
A/C RATING: FCA +10% MINIMUM FULLY RATED
SERVES: P1B
MOUNTING: RECESSED
LOCATION: BACK OF HOUSE

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	LTG - TENANT SPACE P1B	500			12	20	1	1	20	12	180			RCPT - BY PANEL	2
3	SPARE					20	1	1	20	12		1,200		PWR - SIGNAGE 1	4
5	SPARE					20	1	1	20	12			1,200	PWR - SIGNAGE 2	6
7	SPARE					20	1	1	20	12	1,200			PWR - HEAT TRACE	8
9	SPARE					20	1	1	20					SPARE	10
11	SPARE					20	1	1	20					SPARE	12
13	SPARE					20	1	1	20					SPARE	14
15	SPARE					20	1	1	20					SPARE	16
17	SPARE					20	1	1	20					SPARE	18
19	SPARE					20	1	1	20					SPARE	20
21	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	22
23	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	24
25	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	26
27	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	28
29	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	30
31	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	32
33	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	34
35	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	36
37	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	38
39	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	40
41	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	42
	SUBTOTAL	500										1,380	1,200	1,200	SUBTOTAL

		LOAD	CONN. VA	DF
TOTAL PHASE A - VA	1,880	COOLING		1.00
AMPS	16	HEATING		0
TOTAL PHASE B - VA	1,200	LIGHTING	500	1.25
AMPS	10	RECEPTACLES	180	1.0/.5
TOTAL PHASE C - VA	1,200	MOTORS		1.00
AMPS	10	SUPP HEAT		1.00
TOTAL PNLBD - VA	4,280	MISC EQUIP	1,200	1.00
AMPS	12			

LOAD	CONN. VA	DF
REFRIG		1.00
SIGN/DISP	2,400	1.25
KITCHEN		1.00
EXISTING		1.00
LRG MOTOR		1.25
SHOW WNDW		1.25
LTG TRACK		1.00

TOTAL DEMAND
5,005 VA
14 A

PANELBOARD NOTES

SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

PANELBOARD: P1A (NEW)

BUS AMPS: 225A
MAIN SIZE/TYPE: 200A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: MDP
A/C RATING: FCA +10% MINIMUM FULLY RATED
SERVES: P1A
MOUNTING: RECESSED
LOCATION: BACK OF HOUSE

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	LTG - TENANT SPACE P1A	500			12	20	1	1	20	12	180			RCPT - BY PANEL	2
3	SPARE					20	1	1	20	12		1,200		PWR - SIGNAGE 1	4
5	SPARE					20	1	1	20	12			1,200	PWR - SIGNAGE 2	6
7	SPARE					20	1	1	20	12	1,200			PWR - SIGNAGE 3	8
9	SPARE					20	1	1	20	12		1,200		PWR - HEAT TRACE	10
11	SPARE					20	1	1	20					SPARE	12
13	SPARE					20	1	1	20					SPACE	14
15	SPARE					20	1	1	20					SPACE	16
17	SPARE					20	1	1	20					SPACE	18
19	SPARE					20	1	1	20					SPACE	20
21	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	22
23	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	24
25	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	26
27	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	28
29	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	30
31	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	32
33	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	34
35	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	36
37	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	38
39	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	40
41	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	42
	SUBTOTAL	500									1,380	2,400	1,200	SUBTOTAL	

		LOAD	CONN. VA	DF
TOTAL PHASE A - VA	1,880	COOLING		1.00
AMPS	16	HEATING		0
TOTAL PHASE B - VA	2,400	LIGHTING	500	1.25
AMPS	20	RECEPTACLES	180	1.0/.5
TOTAL PHASE C - VA	1,200	MOTORS		1.00
AMPS	10	SUPP HEAT		1.00
TOTAL PNLBD - VA	5,480	MISC EQUIP	1,200	1.00
AMPS	15			

LOAD	CONN. VA	DF
REFRIG		1.00
SIGN/DISP	3,600	1.25
KITCHEN		1.00
EXISTING		1.00
LRG MOTOR		1.25
SHOW WNDW		1.25
LTG TRACK		1.00

TOTAL DEMAND
6,505 VA
18 A

PANELBOARD NOTES

SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

PANELBOARD: P2B (NEW)

BUS AMPS: 225A
MAIN SIZE/TYPE: 200A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: MDP
A/C RATING: FCA +10% MINIMUM FULLY RATED
SERVES: P2B
MOUNTING: RECESSED
LOCATION: BACK OF HOUSE

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	LTG - TENANT SPACE P3A	500			12	20	1	1	20	12	180			RCPT - BY PANEL	2
3	SPARE					20	1	1	20	12		1,200		PWR - SIGNAGE 1	4
5	SPARE					20	1	1	20	12			1,200	PWR - SIGNAGE 2	6
7	SPARE					20	1	1	20	12	1,200			PWR - SIGNAGE 3	8
9	SPARE					20	1	1	20	12		1,200		PWR - HEAT TRACE	10
11	SPARE					20	1	1	20					SPARE	12
13	SPARE					20	1	1	20					SPARE	14
15	SPARE					20	1	1	20					SPARE	16
17	SPARE					20	1	1	20					SPARE	18
19	SPARE					20	1	1	20					SPARE	20
21	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	22
23	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	24
25	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	26
27	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	28
29	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	30
31	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	32
33	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	34
35	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	36
37	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	38
39	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	40
41	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	42
	SUBTOTAL	500										1,380	2,400	1,200	SUBTOTAL

		LOAD	CONN. VA	DF
TOTAL PHASE A - VA	1,880	COOLING		1.00
AMPS	16	HEATING		0
TOTAL PHASE B - VA	2,400	LIGHTING	500	1.25
AMPS	20	RECEPTACLES	180	1.0/.5
TOTAL PHASE C - VA	1,200	MOTORS		1.00
AMPS	10	SUPP HEAT		1.00
TOTAL PNLBD - VA	5,480	MISC EQUIP	1,200	1.00
AMPS	15			

LOAD	CONN. VA	DF
REFRIG		1.00
SIGN/DISP	3,600	1.25
KITCHEN		1.00
EXISTING		1.00
LRG MOTOR		1.25
SHOW WNDW		1.25
LTG TRACK		1.00

TOTAL DEMAND
6,505 VA
18 A

PANELBOARD NOTES

SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

PANELBOARD: P3A (NEW)

BUS AMPS: 225A
MAIN SIZE/TYPE: 200A MCB
VOLTS/PHASE: 208Y/120V, 3PH, 4W
SECTION: 1

FED FROM: MDP
A/C RATING: FCA +10% MINIMUM FULLY RATED
SERVES: P3A
MOUNTING: RECESSED
LOCATION: BACK OF HOUSE

LINE-SIDE LUGS: MECHANICAL
EQUIPMENT GROUND BUS

CKT NO.	DESCRIPTION	VOLTAMPS/PHASE A	B	C	WIRE NO.	BKR AMP	P	P	BKR AMP	WIRE NO.	VOLTAMPS/PHASE A	B	C	DESCRIPTION	CKT NO.
1	LTG - TENANT SPACE P3A	500			12	20	1	1	20	12	180			RCPT - BY PANEL	2
3	SPARE					20	1	1	20	12		1,200		PWR - SIGNAGE 1	4
5	SPARE					20	1	1	20	12			1,200	PWR - SIGNAGE 2	6
7	SPARE					20	1	1	20	12	1,200			PWR - SIGNAGE 3	8
9	SPARE					20	1	1	20	12		1,200		PWR - SIGNAGE 4	10
11	SPARE					20	1	1	20	12			1,200	PWR - HEAT TRACE	12
13	SPARE					20	1	1	20					SPARE	14
15	SPARE					20	1	1	20					SPARE	16
17	SPARE					20	1	1	20					SPARE	18
19	SPARE					20	1	1	20					SPARE	20
21	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	22
23	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	24
25	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	26
27	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	28
29	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	30
31	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	32
33	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	34
35	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	36
37	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	38
39	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	40
41	PROVISIONAL SPACE						1	1						PROVISIONAL SPACE	42
	SUBTOTAL	500										1,380	2,400	2,400	SUBTOTAL

		LOAD	CONN. VA	DF
TOTAL PHASE A - VA	1,880	COOLING		1.00
AMPS	16	HEATING		0
TOTAL PHASE B - VA	2,400	LIGHTING	500	1.25
AMPS	20	RECEPTACLES	180	1.0/.5
TOTAL PHASE C - VA	2,400	MOTORS		1.00
AMPS	20	SUPP HEAT		1.00
TOTAL PNLBD - VA	6,680	MISC EQUIP	1,200	1.00
AMPS	19			

LOAD	CONN. VA	DF
REFRIG		1.00
SIGN/DISP	4,800	1.25
KITCHEN		1.00
EXISTING		1.00
LRG MOTOR		1.25
SHOW WNDW		1.25
LTG TRACK		1.00

TOTAL DEMAND
8,005 VA
22 A

PANELBOARD NOTES

SIGN/DISPLAY - SIGNAGE & DISPLAY CASE

ELECTRICAL PANELBOARD SCHEDULES

SCALE : NO SCALE

1

clockwork

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08-17-2021

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ELECTRICAL DIAGRAMS & SCHEDULES

E201

20.01 NLV BUILDING 31