*2018 UNIFORM MECHANICAL CODE E 605.1.3.1
WHOLE-HOUSE VENTILATION CALCULATION:

UNIT #235 / #335
(1+1) (7.5) = 15 CFM
(989 SF) (0.03) = 30 CFM
TOTAL = 45 CFM (5"Φ DUCT)

UNIT #230 / #330
(1+1) (7.5) = 15 CFM
(760 SF) (0.03) = 23 CFM
TOTAL = 38 CFM (5"Φ DUCT)

UNIT #435
(2+1) (7.5) = 22.5 CFM
(1,500 SF) (0.03) = 45 CFM
TOTAL = 68 CFM (6"Φ DUCT)

UNIT #430
(1+1) (7.5) = 15 CFM
(1,128 SF) (0.03) = 34 CFM
TOTAL = 49 CFM (5"Φ DUCT)

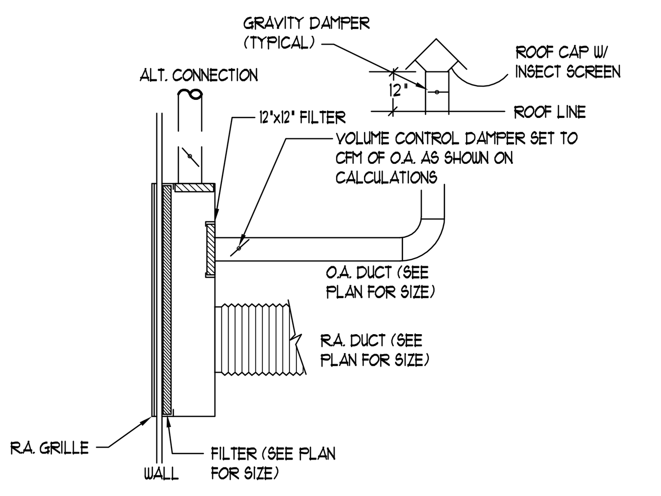
## OUTSIDE AIR CALCULATIONS - COMMON AREAS

| ROOM | $E_Z$ | $R_P$ (CFM/PERSON) | $P_Z$ | $R_A$ (CFM/SQ FT) | $A_Z$ | TOTAL (CFM) | COMMENTS |
|---|---|---|---|---|---|---|---|
| LOBBY | 1.0 | 7.5 | 12 | 0.06 | 413 | 115 | |
| GYM | 1.0 | 20 | 4 | 0.06 | 332 | 100 | |
| CORRIDOR (TYP.) | 1.0 | - | - | 0.06 | 740 | 45 | |

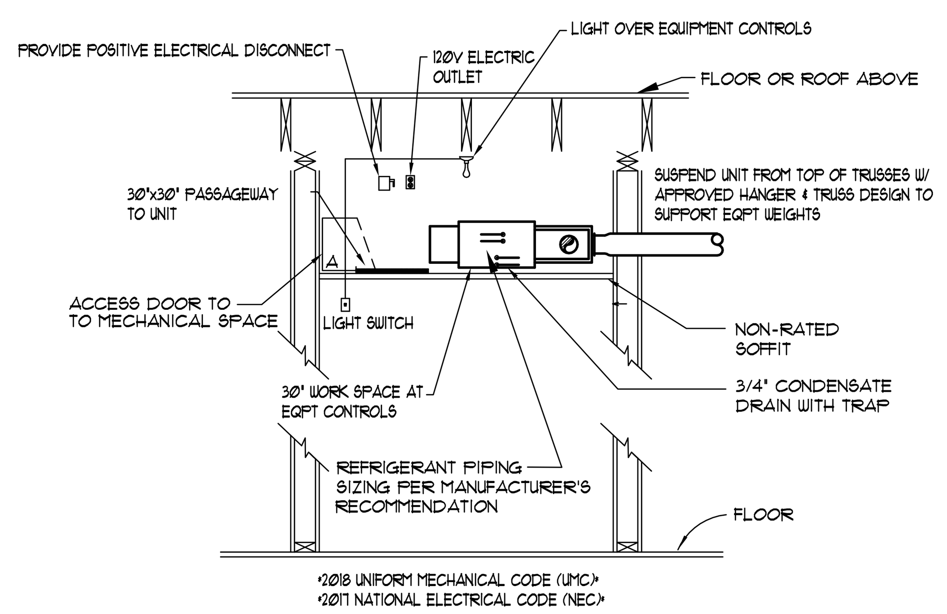
## DIFFUSER AND GRILLE SCHEDULE

DEVICE TYPE / CFM

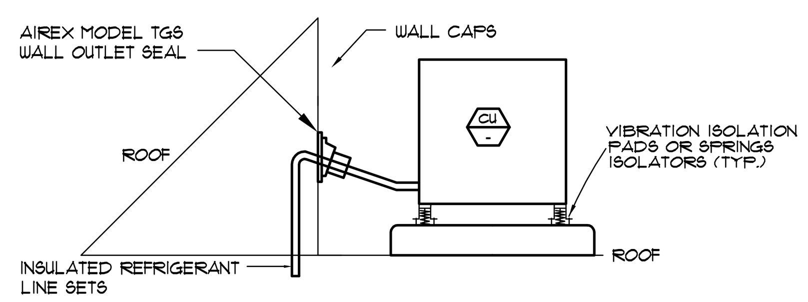
| MARK | TYPE | NECK SIZE | PANEL SIZE | MANUFACTURER MODEL | REMARKS |
|---|---|---|---|---|---|
| S1 / -- | SUPPLY SURFACE | SEE PLAN | 6" X 6" | TRUAIRE 304M | PROVIDE OBD |
| S2 / -- | SUPPLY SURFACE | SEE PLAN | 8" X 8" | TRUAIRE 304M | PROVIDE OBD |
| S3 / -- | SUPPLY SURFACE | SEE PLAN | 10" X 10" | TRUAIRE 304M | PROVIDE OBD |
| S4 / -- | SUPPLY SURFACE | SEE PLAN | 12" X 12" | TRUAIRE 304M | PROVIDE OBD |
| S5 / -- | SUPPLY ROUND | SEE PLAN | 12"Φ | TRUAIRE 880 | |
| R1 / -- | RETURN SURFACE | SEE PLAN | 20" X 20" | TRUAIRE 290 | W/ FILTER |
| R2 / -- | RETURN SURFACE | SEE PLAN | 30" X 20" | TRUAIRE 290 | W/ FILTER |




RETURN AIR W/ OA CONNECTION — 3 / M1.01
NO SCALE




FANCOIL UNIT DETAIL — 1 / M1.01
NO SCALE




CONDENSING UNIT MOUNTING DETAIL — 2 / M1.01
NO SCALE

## DUCTLESS MINI-SPLIT HEAT RECOVERY UNIT SCHEDULE (CORRIDORS/LOBBY)

UNIT MARK / NUMBER

| INDOOR UNIT: MARK (QUANTITY) | TONNAGE | AIR FLOW (CFM) | E.S.P. (IN W.C.) | O.A. (CFM) | ELECTRICAL VOLTS / Φ / F.L.A. | OPER. WEIGHT (LBS.) | MANUFACTURER/ MODEL NUMBER | OUTDOOR UNIT: MARK | ELECTRICAL VOLTS / Φ / MCA / MOCP | COOLING TOTAL CAP. (MBH) | EER | HEATING TOTAL CAP. (MBH) | COP | OPER. WEIGHT (LBS.) | MANUFACTURER/ MODEL NUMBER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FC 1 (18) | 1.5 | 283-410 | 0.40 | -- | 208-230 / 1 / 0.5 | 45 | AC PRO GMV-ND18T | CU 1 | 208-230 / 3 / 99 / 125 | 184 | 12.1 | 206 | 2.4 | 1322 | AC PRO GMV-Q192UM | REFER TO NOTES 1, 2, 3, 4 |

NOTES:
1. FANCOIL UNIT SHALL BE PROVIDED w/ CONDENSATE OVERFLOW SWITCH.
2. PROVIDE PROGRAMMABLE THERMOSTAT PER 2018 IECC.
3. PLACE CONDENSING UNIT ON VIBRATION ISOLATION PADS.
4. SEE FLOOR PLAN FOR OA AMOUNT.

## DUCTED MINI-SPLIT HEAT PUMP UNIT SCHEDULE (APTS)

UNIT MARK / NUMBER

| INDOOR UNIT: MARK (QUANTITY) | TONNAGE | AIR FLOW (CFM) | E.S.P. (IN W.C.) | O.A. (CFM) | ELECTRICAL VOLTS / Φ / AMPS | OPER. WEIGHT (LBS.) | MANUFACTURER/ MODEL NUMBER | OUTDOOR UNIT: MARK | ELECTRICAL VOLTS / Φ / MCA / MOCP | COOLING TOTAL CAP. (MBH) | SEER | HEATING TOTAL CAP. (MBH) | HSPF | OPER. WEIGHT (LBS.) | MANUFACTURER/ MODEL NUMBER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FC 2 (8) | 2 | 820 | 0.40 | -- | 208-230 / 1 / 15 | 104 | AC PRO AFH24D3F31 | CU 2 | 208-230 / 1 / 23.4 / 35 | 24 | 16 | 27.3 | 9.0 | 152 | AC PRO AUHD24ND3FI0 | REFER TO NOTES 1, 2, 3, 4 |
| FC 3 (24) | 3 | 1170 | 0.40 | -- | 208-230 / 1 / 15 | 125 | AC PRO AFH36D3F31 | CU 3 | 208-230 / 1 / 23.9 / 40 | 34 | 16 | 41 | 9.0 | 226 | AC PRO AUHD36ND3FI0 | REFER TO NOTES 1, 2, 3, 4 |

NOTES:
1. FANCOIL UNIT SHALL BE PROVIDED w/ DUCTED RETURN & CONDENSATE OVERFLOW SWITCH.
2. PROVIDE PROGRAMMABLE THERMOSTAT PER 2018 IECC.
3. PLACE CONDENSING UNIT ON VIBRATION ISOLATION PADS.
4. SEE FLOOR PLAN FOR OA AMOUNT.

## DUCTLESS MINI-SPLIT HEAT PUMP UNIT SCHEDULE (MECH & FIRE RISER ROOMS)

UNIT MARK / NUMBER

| INDOOR UNIT: MARK (QUANTITY) | TONNAGE | AIR FLOW (CFM) | E.S.P. (IN W.C.) | O.A. (CFM) | ELECTRICAL VOLTS / Φ / F.L.A. | OPER. WEIGHT (LBS.) | MANUFACTURER/ MODEL NUMBER | OUTDOOR UNIT: MARK | ELECTRICAL VOLTS / Φ / MCA / MOCP | COOLING TOTAL CAP. (MBH) | SEER | HEATING TOTAL CAP. (MBH) | HSPF | OPER. WEIGHT (LBS.) | MANUFACTURER/ MODEL NUMBER | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FC 4 (5) | .75 | 206-294 | 0.40 | -- | 208-230 / 1 / 0.2 | 22 | AC PRO GMV-N09G | CU 4 | 208-230 / 1 / 31 / 60 | 48.0 | 16 | 54.0 | 9 | 243 | AC PRO GMV-48UL | REFER TO NOTES 1, 2, 3 |

NOTES:
1. FANCOIL UNIT SHALL BE PROVIDED w/ CONDENSATE OVERFLOW SWITCH.
2. PROVIDE PROGRAMMABLE THERMOSTAT PER 2018 IECC.
3. PLACE CONDENSING UNIT ON VIBRATION ISOLATION PADS.

## PACKAGED ROOFTOP HEAT PUMP UNIT SCHEDULE (GYM)

UNIT MARK / NUMBER

| MARK | TONNAGE | AIR FLOW (CFM) | O.A. (CFM) | E.S.P. (IN. W.C.) | ELECTRICAL VOLT / Φ / MCA / MOCP | COOLING CAPACITY: SENSIBLE (MBH) | TOTAL (MBH) | EAT (°F) DB/WB | AMBIENT TEMP (°F) | SEER | HEATING CAPACITY: OUTPUT (MBH) | HSPF | AUX (KW) | OPERATING WEIGHT (LBS) | MANUFACTURER / MODEL NUMBER (OR EQUAL) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RTU 1 | 3 | 1,200 | 100 | 0.5 | 208-230 / 3 / 20 / 25 | 24.0 | 30.1 | 80/67 | 115 | 14 | 34.2 | 8.1 | -- | 495 | CARRIER 50KC0A04A2A5 | REFER TO NOTE 1 |

NOTES:
1. PROVIDE 14" HIGH ROOF CURB AND PROGRAMMABLE THERMOSTAT PER 2018 IECC.

## EXHAUST FAN SCHEDULE

UNIT MARK / NUMBER

| MARK | TYPE | CFM | ESP IN W.G. | FAN RPM | ELECTRICAL VOLTS / PHASE / - | MANUFACTURER/ MODEL NUMBER OR EQUAL | CONTROLLED BY | OPERATING WEIGHT (LBS.) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| EF 1 | CEILING/WALL | 110 | 0.5 | - | 120 / 1 / 0.3 AMP | BROAN XB110 | ON/OFF SWITCH W/ CONT. LOW SPEED | 12.3 | PROVIDE ROOF CAP W/INSECT SCREEN AND BACKDRAFT DAMPER. 6"Φ EXHAUST DUCT |
| EF 2 | UTILITY-SET ROOFTOP | 250 | 0.75 | 1150 | 208 / 3 / 3/4 HP | ACME GBRD13D | ON/OFF SWITCH | 146 | TRASH CHUTE EXHAUST, MOUNT ON SPRING ISOLATION. |

## MECHANICAL SPECIFICATIONS

1. HVAC SYSTEM INSTALLATION(S) SHALL COMPLY WITH 2018 UMC AND UPC. ENERGY CONSERVATION SHALL BE 2018 IECC.
2. HVAC SYSTEM EQUIPMENT SHALL BE INSTALLED, PER MANUFACTURERS RECOMMENDATIONS AND REQUIREMENTS.
3. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL BUILDING CONDITIONS FOR THE HVAC SYSTEM INSTALLATION. MECHANICAL PLANS AND SYSTEM DESIGN ARE BASED ON SPECIFIC ARCHITECTURAL PLANS. ARCHITECTURAL CHANGES OR MODIFICATIONS MAY RESULT IN SYSTEM PROBLEMS AND/OR CONFLICTS. CONTRACTOR SHALL IMMEDIATELY NOTIFY BUILDER OF THESE PROBLEMS AND/OR CONFLICTS FOR REVIEW AND RESOLUTION.
4. LINE RECTANGULAR SUPPLY AND RETURN AIR DUCT PLENUMS, UNLESS OTHERWISE INDICATED, WITH 1" OF 1-1/2 LB. DUCT LINER. LINER TO BE ATTACHED TO DUCT USING CODE APPROVED ADHESIVE AND/OR MECHANICAL FASTENERS.
5. ALL ROUND SUPPLY AND RETURN AIR DUCT TO BE INSULATED WITH LOW DENSITY, FOIL-FACED WRAP (MINIMUM R-6.0), UNLESS OTHERWISE ALLOWED BY CODE.
6. ALL FLEXIBLE DUCT SHALL BE INSULATED (MINIMUM R-6), UNLESS OTHERWISE ALLOWED BY CODE, WITH PLASTIC VAPOR BARRIER AT THE INTERIOR AND EXTERIOR STEEL WIRE COIL REINFORCEMENTS. BAND CLAMP AND TAPE SEAL ALL JOINTS TO MAINTAIN VAPOR BARRIER INTEGRITY. FLEXIBLE DUCT AND DUCT SYSTEMS SHALL COMPLY WITH UL-181.
7. ALL RECTANGULAR SUPPLY AND RETURN AIR DUCT TO BE INSULATED WITH DUCT WRAP WITH A VAPOR-PROOF JACKET OF ALUMINUM FOIL OR OTHER APPROVED UL-LABELED FOIL TYPE (MINIMUM R-6), UNLESS OTHERWISE ALLOWED BY CODE. ALL JOINTS AND LAPS TO BE SECURED WITH STAPLES AND COVERED WITH APPROVED METALLIC DUCT TAPE
8. EXHAUST DUCT SHALL NOT BE INSULATED.
9. INSTALL AND SUPPORT FLEXIBLE DUCT TO PREVENT SAGGING AND PINCHING. KEEP DUCT LENGTHS TO A MINIMUM (PER THE DRAWINGS).
10. PROVIDE FLEXIBLE DUCT CONNECTIONS AT ALL AIR MOVEMENT EQUIPMENT AND WHEN INDICATED, ATTIC MOUNTED A/C EQUIPMENT.
11. TEST AND BALANCE SYSTEM AIR FLOWS TO EACH DUCT, GRILLE AND REGISTER TO CONFORM TO THOSE SPECIFIED ON THE HVAC PLANS.
12. DUCTWORK SHALL BE HUNG AND/OR SUPPORTED IN ACCORDANCE WITH SMACNA AND THE 2018 UMC.
13. PROVIDE SEISMIC SUPPORTS FOR DUCTWORK WHERE THE DUCTS ARE SUSPENDED FROM HANGERS MORE THAN 12" IN LENGTH OR IF THE DUCTWORK HAS A CROSS SECTIONAL AREA OF 6 SQ. FT. OR GREATER. SEISMIC SUPPORTS TO BE VERIFIED BY STRUCTURAL ENGINEER.
14. MECHANICAL AND LIGHT FIXTURES WEIGHING 20 LBS BUT NOT MORE THAN 56 LBS. MUST HAVE TWO 12 GAGE WIRES CONNECTING THEM TO THE CEILING SYSTEM HANGERS OR THE STRUCTURE ABOVE.
15. MECHANICAL AND LIGHT FIXTURES WEIGHING MORE THAN 56 LBS. MUST BE INDEPENDENTLY SUPPORTED DIRECTLY FROM THE STRUCTURE ABOVE.

## SYMBOL LEGEND

| SYMBOL | DESCRIPTION | ABBREVIATIONS |
|---|---|---|
| | SUPPLY AIR DIFFUSER | SA |
| | RETURN AIR GRILLE | RA |
| | EXHAUST AIR GRILLE | EA |
| T | THERMOSTAT | |
| S / X | DIFFUSER TYPE "S" BALANCED FOR X CFM | |
| | EXISTING | (E) |
| | ABOVE FINISHED FLOOR | AFF |
| DD | DUCT DETECTOR | |
| | MANUAL VOLUME DAMPER | MVD |

## MECHANICAL SHEET INDEX

| SHEET NUMBER: | SHEET NAME: |
|---|---|
| M1.01 | SPECIFICATIONS, SCHEDULES, DETAILS, OA CALCS, AND SYMBOL LEGEND |
| M1.02 | U.L. SYSTEMS |
| M2.01 | 1ST FLOOR - MECHANICAL PLAN |
| M2.02 | 2ND FLOOR - MECHANICAL PLAN |
| M2.03 | 3RD FLOOR - MECHANICAL PLAN |
| M2.04 | 4TH FLOOR - MECHANICAL PLAN |
| M2.05 | 5TH FLOOR - MECHANICAL PLAN |
| M3.01 | ROOF - MECHANICAL PLAN |

**COMcheck Software Version COMcheckWeb**

## Envelope Compliance Certificate

**Project Information**

Energy Code: 2018 IECC
Project Title: 31 WATER ST
Location: Henderson, Nevada
Climate Zone: 3b
Project Type: New Construction
Vertical Glazing / Wall Area: 70%

Construction Site:
31 WATER ST
HENDERSON, Nevada 89015

Owner/Agent:

Designer/Contractor:
MARIANO ENGINEERING
6040 S DURANGO DR STE 100
LAS VEGAS, Nevada 89113

**Additional Efficiency Package(s)**

Reduced interior lighting power. Requirements are implicitly enforced within interior lighting allowance calculations.

| Building Area | Floor Area |
|---|---|
| 1-Multifamily : Residential | 38541 |

**Envelope Assemblies**

| Assembly | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Proposed U-Factor | Budget U-Factor(a) |
|---|---|---|---|---|---|
| Roof: Attic Roof, Wood Joists, [Bldg. Use 1 - Multifamily] | 8428 | 38.0 | 0.0 | 0.027 | 0.027 |
| Floor: Unheated Slab-On-Grade, [Bldg. Use 1 - Multifamily] (c) | 490 | --- | --- | 0.730 | 0.730 |
| NORTH | | | | | |
| Ext. Wall N: Concrete Block, 6in., Solid Grouted, Light Density, Furring: Wood, [Bldg. Use 1 - Multifamily] | 6702 | 13.0 | 0.0 | 0.074 | 0.104 |
| Window: Metal Frame: Fixed, Perf. Specs.: Product ID N/A, SHGC 0.25, [Bldg. Use 1 - Multifamily] (b) | 4088 | --- | --- | 0.280 | 0.460 |
| Door: , Perf. Specs.: Product ID N/A, SHGC 0.25, [Bldg. Use 1 - Multifamily] (b) | 592 | --- | --- | 0.280 | 0.770 |
| EAST | | | | | |
| Ext. Wall E: Concrete Block, 8in., Solid Grouted, Light Density, Furring: Wood, [Bldg. Use 1 - Multifamily] | 2990 | 13.0 | 0.0 | 0.073 | 0.104 |
| Window: Metal Frame: Fixed, Perf. Specs.: Product ID N/A, SHGC 0.25, [Bldg. Use 1 - Multifamily] (b) | 1420 | --- | --- | 0.280 | 0.460 |
| Door: , Perf. Specs.: Product ID N/A, SHGC 0.25, [Bldg. Use 1 - Multifamily] (b) | 288 | --- | --- | 0.280 | 0.770 |
| SOUTH | | | | | |
| Ext. Wall S: Concrete Block, 6in., Solid Grouted, Light Density, Furring: Wood, [Bldg. Use 1 - Multifamily] | 6702 | 13.0 | 0.0 | 0.074 | 0.104 |
| Window: Metal Frame: Fixed, Perf. Specs.: Product ID N/A, SHGC 0.25, [Bldg. Use 1 - Multifamily] (b) | 5134 | --- | --- | 0.280 | 0.460 |
| Door: , Perf. Specs.: Product ID N/A, SHGC 0.25, [Bldg. Use 1 - Multifamily] (b) | 640 | --- | --- | 0.280 | 0.770 |
| WEST | | | | | |
| Ext. Wall W: Concrete Block, 6in., Solid Grouted, Light Density, Furring: Wood, [Bldg. Use 1 - Multifamily] | 2990 | 13.0 | 0.0 | 0.074 | 0.104 |

Project Title: 31 WATER ST — Report date: 03/23/20
Data filename: — Page 1 of 16

| Assembly | Gross Area or Perimeter | Cavity R-Value | Cont. R-Value | Proposed U-Factor | Budget U-Factor(a) |
|---|---|---|---|---|---|
| Window: Metal Frame: Fixed, Perf. Specs.: Product ID N/A, SHGC 0.25, [Bldg. Use 1 - Multifamily] (b) | 1420 | --- | --- | 0.280 | 0.460 |

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.
(b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.
(c) Slab-On-Grade proposed and budget U-factors shown in table are F-factors.

**Envelope PASSES: Design 1% better than code**

**Envelope Compliance Statement**

*Compliance Statement:* The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 2018 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title    Signature    Date

Project Title: 31 WATER ST — Report date: 03/23/20
Data filename: — Page 2 of 16

**COMcheck Software Version COMcheckWeb**

## Mechanical Compliance Certificate

**Project Information**

Energy Code: 2018 IECC
Project Title: 31 WATER ST
Location: Henderson, Nevada
Climate Zone: 3b
Project Type: New Construction

Construction Site:
31 WATER ST
HENDERSON, Nevada 89015

Owner/Agent:

Designer/Contractor:
MARIANO ENGINEERING
6040 S DURANGO DR STE 100
LAS VEGAS, Nevada 89113

**Additional Efficiency Package(s)**

Reduced interior lighting power. Requirements are implicitly enforced within interior lighting allowance calculations.

**Mechanical Systems List**

| Quantity | System Type & Description |
|---|---|
| 8 | HVAC System (Single Zone): Split System Heat Pump<br>Heating Mode: Capacity = 27 kBtu/h, Proposed Efficiency = 9.00 HSPF, Required Efficiency = 8.20 HSPF<br>Cooling Mode: Capacity = 24 kBtu/h, Proposed Efficiency = 16.00 SEER, Required Efficiency: 14.00 SEER |
| 24 | HVAC System (Single Zone): Split System Heat Pump<br>Heating Mode: Capacity = 41 kBtu/h, Proposed Efficiency = 9.00 HSPF, Required Efficiency = 8.20 HSPF<br>Cooling Mode: Capacity = 34 kBtu/h, Proposed Efficiency = 16.00 SEER, Required Efficiency: 14.00 SEER |
| 1 | HVAC System (Single Zone): VRF Condensing Unit, Air Cooled w/ Heat Recovery Heat Pump<br>Heating Mode: Capacity = 206 kBtu/h, No minimum efficiency requirement applies<br>Cooling Mode: Capacity = 184 kBtu/h, No minimum efficiency requirement applies<br>Fan System: None |
| 1 | HVAC System (Single Zone): Single Package Heat Pump<br>Heating Mode: Capacity = 34 kBtu/h, Proposed Efficiency = 8.10 HSPF, Required Efficiency = 8.00 HSPF<br>Cooling Mode: Capacity = 30 kBtu/h, Proposed Efficiency = 14.00 SEER, Required Efficiency: 14.00 SEER |
| 1 | HVAC System (Single Zone): VRF Condensing Unit, Air Cooled Heat Pump<br>Heating Mode: Capacity = 54 kBtu/h, No minimum efficiency requirement applies<br>Cooling Mode: Capacity = 48 kBtu/h, No minimum efficiency requirement applies<br>Fan System: None |

Project Title: 31 WATER ST — Report date: 04/06/20
Data filename: — Page 1 of 12

Ron Mariano

Digitally signed by Ron Mariano
DN: cn=Ron Mariano, o=MARIANO ENGINEERING, ou, email=ron@marianoeng.com, c=US
Date: 2020.04.16 13:16:31 -07'00'


MARIANO ENGINEERING
ENGINEERING A SUSTAINABLE FUTURE
6040 S. Durango Dr., Ste. 100 Las Vegas, NV 89113
Phone: office 702.3610020, cell 702.5213700
Website: Marianoeng.com


SEAL
RONALD G. MARIANO
Expires 12-31-21
MECHANICAL
No. 14730
PROFESSIONAL ENGINEER STATE OF NEVADA
4/16/20

A NEW SHELL BUILDING IMPROVEMENT
31 SOUTH WATER STREET
CITY OF HENDERSON , NV 89015
APN #179-18-611-055

31 WATER STREET LLC
PROJECT NUMBER: 0201909
DATE: 03.09.2020


P. JAMES ARCHITECT
ARCHITECTURE
PLANNING
DESIGN
4629 VICTORIA BEACH WAY
LAS VEGAS, NV 89103
702.683.3277


| REV | DATE | REVISIONS Description |
|---|---|---|

SHEET
M1.01

SEAL

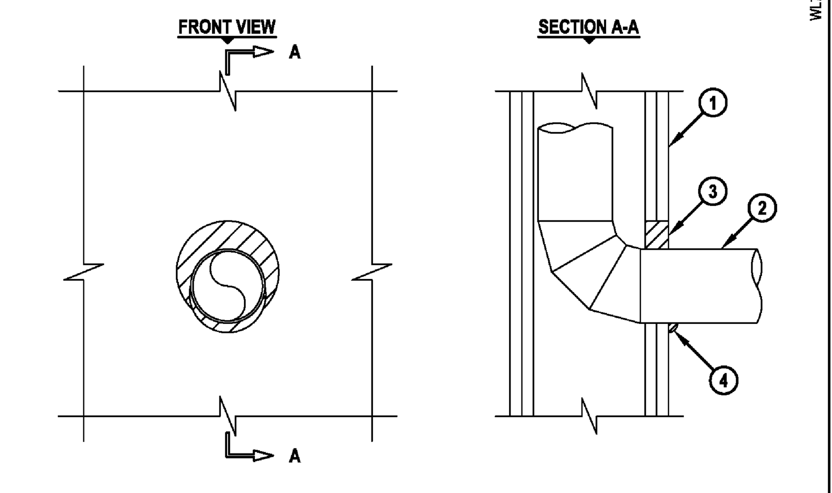
RONALD G. MARIANO
PROFESSIONAL ENGINEER STATE OF NEVADA
Expires 12-31-21
MECHANICAL
No. 14730
4/16/20

## UL/cUL SYSTEM NO. W-L-7198

**SHEET METAL DUCT THROUGH GYPSUM WALL ASSEMBLY (MEMBRANE)**

F-RATING = 2-HR.
T-RATING = 2-HR.
L-RATING AT AMBIENT = LESS THAN 1 CFM / SQ FT
L-RATING AT 400°F = LESS THAN 1 CFM / SQ FT

WL7198b.011415




1. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U300, U400 OR V400 SERIES) (2-HR. FIRE-RATING) TO INCLUDE THE FOLLOWING CONSTRUCTION FEATURES :
   A. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 6" LUMBER (SPACED MAXIMUM 24" OC). STEEL STUDS TO BE MINIMUM 6" WIDE (SPACED MAXIMUM 24" OC).
   B. NOMINAL 5/8" THICK GYPSUM WALLBOARD. TYPE, NUMBER OF LAYERS, AND SHEET ORIENTATION AS SPECIFIED IN THE INDIVIDUAL UL DESIGN.
2. MAXIMUM 4" DIAMETER GALVANIZED STEEL DUCT (MIN. 30 GA.).
3. MINIMUM 1-1/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
4. MINIMUM 1/2" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5-1/2".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

| Hilti Firestop Systems | HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000 | Sheet 1 of 1 / Scale 11/64" = 1" / Date Jan. 14, 2015 | Drawing No. WL 7198b |
|---|---|---|---|

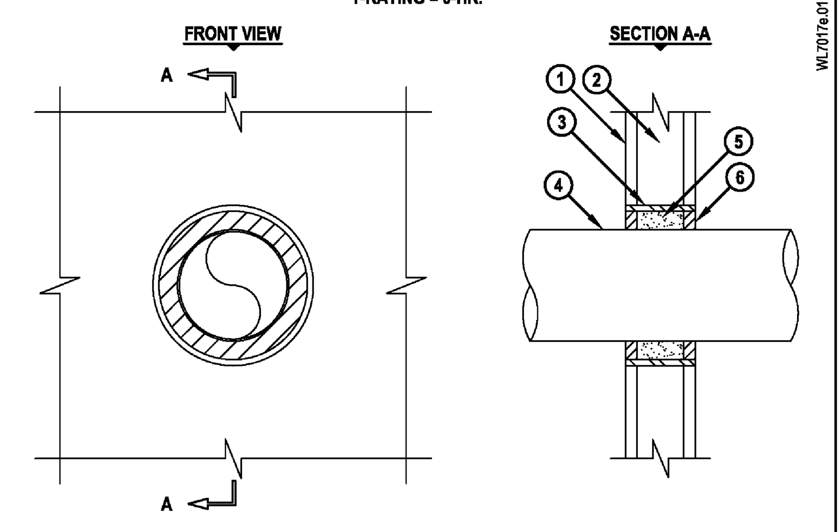
*Saving Lives through Innovation and Education*

## UL/cUL SYSTEM NO. W-L-7017

**METAL DUCT (WITHOUT DAMPER) THROUGH GYPSUM WALL ASSEMBLY**

F-RATING = 1-HR.
T-RATING = 0-HR.

WL7017e.011415




1. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U300 OR U400 SERIES) (1-HR. FIRE-RATING).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. MAXIMUM 8" NOMINAL DIAMETER STEEL PIPE SLEEVE (SCHEDULE 40 OR HEAVIER).
4. MAXIMUM 6" DIAMETER SHEET METAL DUCT (MINIMUM 28 GAUGE).
5. HILTI CF-AS CJP OR CF 812 FILLER FOAM RECESSED TO ACCOMMODATE FIRESTOP SEALANT.
6. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 8-5/8".
2. ANNULAR SPACE = MINIMUM 1/2", MAXIMUM 1-1/2".

| Hilti Firestop Systems | HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000 | Sheet 1 of 1 / Scale 11/64" = 1" / Date Jan. 14, 2015 | Drawing No. WL 7017e |
|---|---|---|---|

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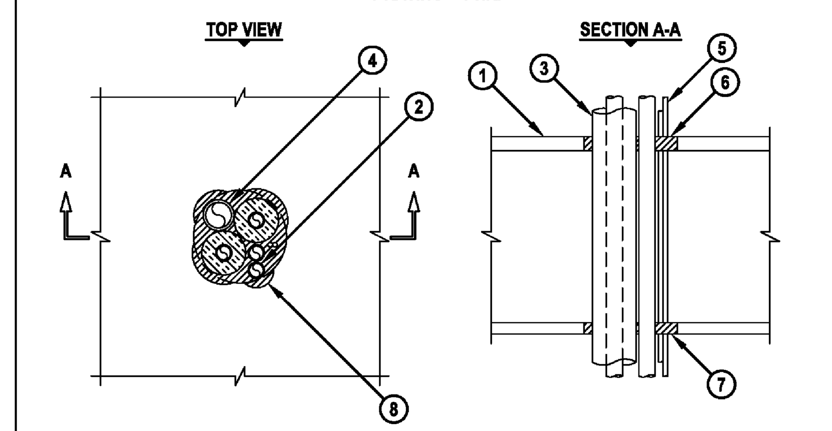
## UL SYSTEM NO. F-C-8026

**MULTIPLE HVAC LINE SET THROUGH WOOD FLOOR/CEILING ASSEMBLY**

F-RATING = 1-HR.
T-RATING = 1-HR.

FC8026b.010815




1. WOOD FLOOR/CEILING ASSEMBLY (UL/cUL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. PENETRATING METALLIC ITEMS TO BE ANY OF THE FOLLOWING (ONE OR MORE) :
   A. MAXIMUM 3/4" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 3/4" NOMINAL DIAMETER COPPER PIPE.
3. NOMINAL 3/4" THICK AB/PVC PIPE INSULATION INSTALLED ON ONE OR MORE METALLIC PIPES.
4. PENETRATING NONMETALLIC ITEMS TO BE ONE OF THE FOLLOWING (SEE NOTE NO. 3 BELOW) :
   A. MAXIMUM 1-1/4" NOMINAL DIAMETER PVC PLASTIC PIPE (CELLULAR OR SOLID CORE).
   B. MAXIMUM 1-1/4" NOMINAL DIAMETER CPVC PLASTIC PIPE (CLOSED PIPING SYSTEM ONLY).
5. MAXIMUM 4-PAIR NO. 18 AWG THERMOSTAT CABLE WITH PVC JACKET (MAX. QTY. = 2).
6. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
7. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT.
8. MINIMUM 1/4" BEAD HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1".
3. NONMETALLIC PIPE SHALL BE SPACED MINIMUM 1-1/2" FROM NON-INSULATED THROUGH PENETRANTS.
4. CLOSED OR VENTED PIPING SYSTEM. (PVC = SCHEDULE 40; CPVC = SDR 13.5).
5. [NOT SHOWN, OPTIONAL] CHASE WALL - THE THROUGH PENETRANT MAY BE ROUTED THROUGH A 1-HR. FIRE-RATED GYPSUM CHASE WALL ASSEMBLY.

| Hilti Firestop Systems | HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000 | Sheet 1 of 1 / Scale 1/8" = 1" / Date Jan. 08, 2015 | Drawing No. FC 8026b |
|---|---|---|---|

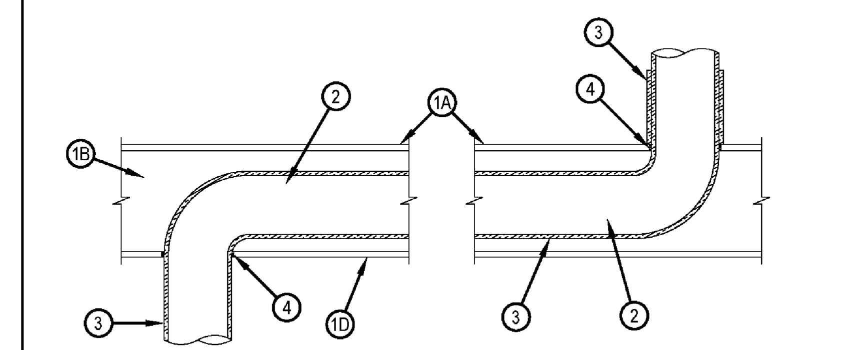
*Saving Lives through Innovation and Education*

## System No. F-C-7058

FC 7058

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

| ANSI/UL1479 (ASTM E814) | CAN/ULC S115 |
|---|---|
| F Rating — 1 Hr | F Rating — 1 Hr |
| T Rating — 1 Hr | FT Rating — 1 Hr |
| | FH Rating — 1 Hr |
| | FTH Rating — 1 Hr |




1. Floor-Ceiling Assembly — The 1 hr fire-rated solid or trussed lumber joist floor-ceiling assembly shall be constructed of the materials and in the manner specified in the individual L500 Series Floor-Ceiling Designs in the UL Fire Resistance Directory. The general construction details of the floor-ceiling assembly are summarized below:
   A. Flooring System — Lumber or plywood subfloor with finish floor of lumber, plywood or Floor Topping Mixture* as specified in the individual Floor-Ceiling Design. Max diam of floor opening is 11 in. (279 mm).
   B. Wood Joists — Nom 10 in. (254 mm) deep (or deeper) lumber, steel or combination lumber and steel joists, trusses or Structural Wood Members* with bridging as required and with ends firestopped. Additional framing members installed to form a square enclosure around the perimeter of the opening in the floor and ceiling.
   C. Furring Channels — (Where Required - Not Shown) - Resilient galv steel furring installed perpendicular to wood joists between gypsum board and wood joists as specified in the individual Floor-Ceiling Design. Furring channels spaced max 24 in. (610 mm) OC. If furring channels are used within the assembly, additional furring channels to be installed along the periphery of the opening.
   D. Gypsum Board* — Nom 4 ft (1.2 m) wide by 5/8 in. (16 mm) thick as specified in the individual Floor-Ceiling Design. Gypsum board secured to wood joists or furring channels as specified in the individual Floor-Ceiling Design. Max diam of ceiling opening is 11 in. (279 mm).
2. Steel Air Duct — Max 7 in. (178 mm) diam by min 0.0157 in. (No. 30 gauge or 0.40 mm) thick galv steel air duct to be centered within the opening. Max one steel air duct to be installed within opening. Steel duct to be rigidly supported on top side of floor-ceiling assembly.

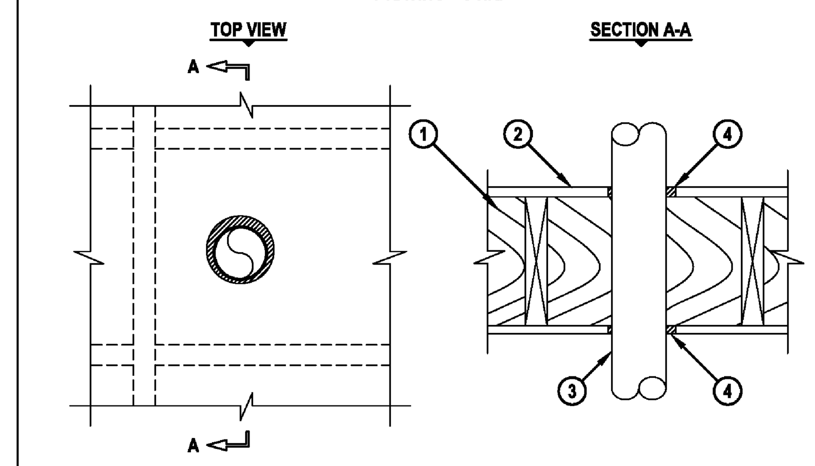
| Hilti Firestop Systems | Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. March 27, 2017 | Page: 1 of 2 |
|---|---|---|

## UL/cUL SYSTEM NO. F-C-7013

**METAL DUCT (WITHOUT DAMPER) THROUGH WOOD FLOOR/CEILING ASSEMBLY**

F-RATING = 1-HR.
T-RATING = 0-HR.

FC7013d.010815




1. WOOD FLOOR/CEILING ASSEMBLY (UL/cUL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. MAXIMUM 4" NOMINAL DIAMETER SHEET METAL DUCT (MINIMUM 28 GAUGE).
4. MINIMUM 3/4" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT FLUSH WITH TOP SURFACE OF FLOOR OR SOLE PLATE.
5. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX OR FS-ONE INTUMESCENT FIRESTOP SEALANT FLUSH WITH BOTTOM SURFACE OF CEILING OR LOWER TOP PLATE.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 5".
2. ANNULAR SPACE = MINIMUM 1/4", MAXIMUM 3/4".
3. [NOT SHOWN, OPTIONAL] CHASE WALL - THE THROUGH PENETRANT MAY BE ROUTED THROUGH A 1-HR. FIRE-RATED GYPSUM CHASE WALL.

| Hilti Firestop Systems | HILTI, Inc. Tulsa, Oklahoma USA (800) 879-8000 | Sheet 1 of 1 / Scale 1/8" = 1" / Date Jan. 08, 2015 | Drawing No. FC 7013d |
|---|---|---|---|

*Saving Lives through Innovation and Education*

## Nailor Industries Inc.

**CEILING RADIATION DAMPER**
FOR WOOD TRUSS CEILING ASSEMBLIES
GRILLE MOUNT • STEEL PLENUM • SIDE INLET
MODEL: 0756

CLASSIFIED C UL US

**QUALIFICATIONS:**
- UL 263 CLASSIFIED CEILING DAMPER. Category CABS. (File # R6660).
- 1 hour rated for use in UL floor/ceiling design numbers L550/L562/L574/L579/L585/M501/M503 and roof/ceiling design numbers P531/P538/P545/P547/P552. (Other proprietary UL design numbers may be similar. Local approval by AHJ is required to use a Nailor design when not specified).
- Meets NFPA 90A requirements.

**DESCRIPTION:**
Ceiling dampers are designed to function as a heat barrier in air handling openings penetrating fire resistive membrane ceilings. Model 0756 has been especially designed and tested to provide protection and simple installation in specific UL design wood truss ceiling assemblies.
The 0756 assembly consists of a rectangular ceiling damper recessed in a sheet metal register box (boot) with a round inlet collar, that accommodates a steel grille register or diffuser.

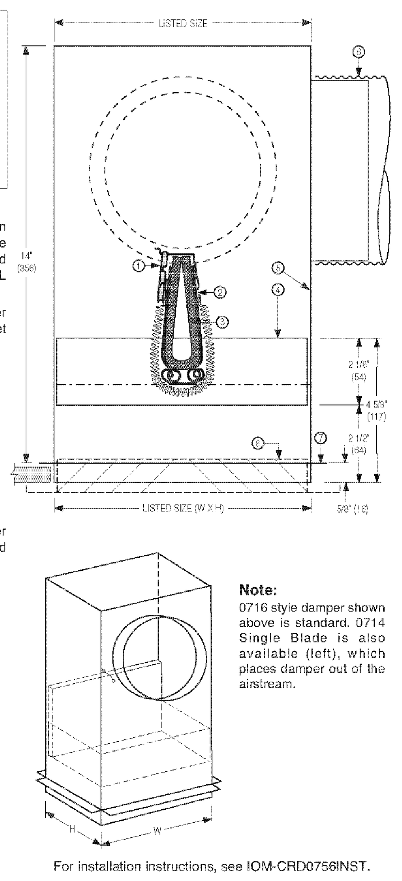
**STANDARD CONSTRUCTION:**
1. Fusible Link: UL Listed, 212°F (100°C), standard.
2. Blades: 22 ga. (0.85) roll-formed galv. steel.
3. Blade Insulation: Non-asbestos UL Classified.
4. Damper Frame: 22 ga. (0.85) galvanized steel.
5. Steel Plenum/Sub-Frame: 26 ga. (0.55) minimum with round connection collar.
6. Duct: UL Classified Class 0 or 1 flexible air duct connection by others.
7. Flange: 5/8" (16) plaster flange.
8. Steel Grille/Register/Diffuser: By Nailor or others. Bottom of damper sub-frame is flush with ceiling. Standard depth for grille clearance is 2 1/2" (64).

**Model 0756 Sizes (W x H):**

| Minimum | Maximum | W x H = |
|---|---|---|
| 6" x 4" (152 x 102) | 16" x 12" (406 x 305) | Nominal Grille/Register Size |

**Available Duct Connection Size:** 4" through 10" (102 – 254) dia. Building code and UL Classification require damper installation in accordance with manufacturers instructions.

**OPTIONS:**
1. Non-standard temp. UL listed fusible link
   ❑ 165 165°F (74°C)
2. Damper Style:
   **0715** Butterfly (Two Blades) Damper standard
   ❑ **0714** Single Blade Damper
3. Installation Support Angles. 26" (660) long.
   ❑ **ISA** 2 @ 3/4" x 3/4" x 16 ga. (19 x 19 x 1.6) or
   ❑ **ISB** 2 @ 1 1/2" x 1 1/2" x 22 ga. (38 x 38 x 0.85)



Note:
0716 style damper shown above is standard. 0714 Single Blade is also available (left), which places damper out of the airstream.

For installation instructions, see IOM-CRD0756INST.

| SCHEDULE TYPE: | | | | |
|---|---|---|---|---|
| PROJECT: Park Lane | Dimensions are in inches (mm). | | | |
| ENGINEER: Encon | DATE | B SERIES | SUPERSEDES | DRAWING NO. |
| CONTRACTOR: Whiting-Turner | 7 - 11 - 16 | 0700 | 4 - 28 - 14 | 0756 |

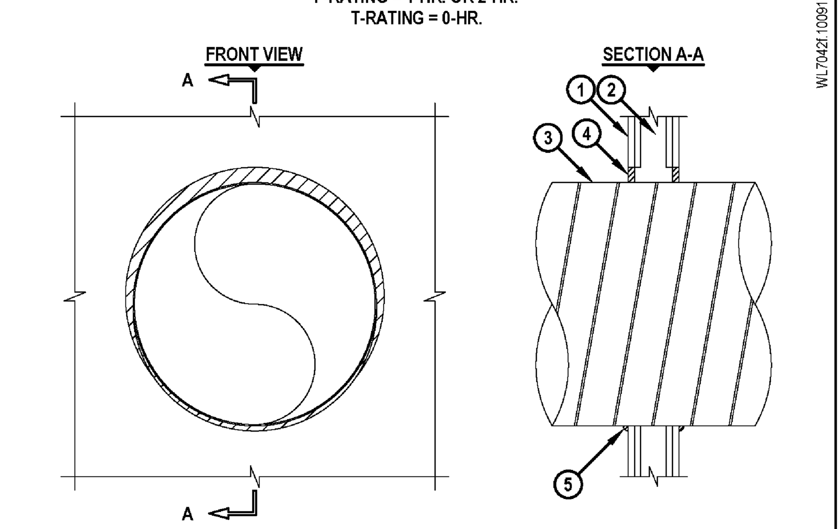
Nailor Industries Inc. reserves the right to change any information concerning product or pricing without notice.

## UL/cUL SYSTEM NO. W-L-7042

**METAL DUCT (WITHOUT DAMPER) THROUGH GYPSUM WALL ASSEMBLY**

F-RATING = 1-HR. OR 2-HR.
T-RATING = 0-HR.

WL7042f.100917




1. GYPSUM WALL ASSEMBLY (UL/cUL CLASSIFIED U300 OR U400 SERIES) (1-HR. OR 2-HR. FIRE-RATING) (2-HR. SHOWN).
2. [NOT SHOWN] WOOD STUDS TO CONSIST OF NOMINAL 2" x 4" LUMBER. STEEL STUDS TO BE MINIMUM 2-1/2" WIDE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 24" NOMINAL DIAMETER SPIRAL WOUND SHEET METAL DUCT (MIN. 28 GA.).
   B. MAXIMUM 12" NOMINAL DIAMETER SHEET METAL DUCT (MIN. 28 GAUGE).
4. MINIMUM 5/8" DEPTH HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT, HILTI CP 606 FLEXIBLE FIRESTOP SEALANT, HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT, OR HILTI CFS-S SIL SL FIRESTOP SILICONE SEALANT.
5. MINIMUM 1/2" BEAD HILTI FS-ONE MAX INTUMESCENT FIRESTOP SEALANT, HILTI CP 606 FLEXIBLE FIRESTOP SEALANT, OR HILTI CFS-S SIL GG FIRESTOP SILICONE SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING FOR STEEL STUD WALLS = 25-1/2".
2. MAXIMUM DIAMETER OF OPENING FOR WOOD STUD WALLS = 14-1/2".
3. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

| Hilti Firestop Systems | HILTI, Inc. Plano, Texas USA (800) 879-8000 | Sheet 1 of 1 / Scale 3/32" = 1" / Date Oct. 09, 2017 | Drawing No. WL 7042f |
|---|---|---|---|

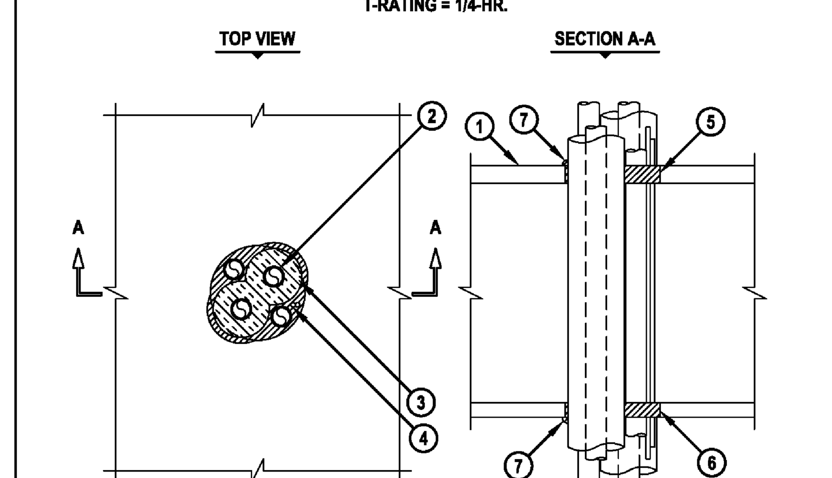
*Saving Lives through Innovation and Education*

## UL/cUL SYSTEM NO. F-C-8032

**MULTIPLE HVAC LINE SET THROUGH WOOD/FLOOR CEILING ASSEMBLY**

F-RATING = 1-HR.
T-RATING = 1/4-HR.

FC8032c.102704




1. WOOD FLOOR/CEILING ASSEMBLY (UL/cUL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. PENETRATING METALLIC ITEMS TO BE ANY OF THE FOLLOWING (ONE OR MORE):
   A. MAXIMUM 3/4" NOMINAL DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 3/4" NOMINAL DIAMETER COPPER PIPE OR TUBING.
3. NOMINAL 3/4" THICK AB/PVC PIPE INSULATION INSTALLED ON ONE OR MORE METALLIC PIPES.
4. MAXIMUM 4-PAIR NO. 18 AWG THERMOSTAT CABLE WITH PVC JACKET (MAXIMUM QUANTITY = 2).
5. MINIMUM 3/4" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT.
6. MINIMUM 5/8" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT.
7. MINIMUM 1/2" BEAD HILTI CP 606 FLEXIBLE FIRESTOP SEALANT APPLIED AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1".
3. CHASE WALL (NOT SHOWN). (OPTIONAL). THE THROUGH PENETRANT MAY BE ROUTED THROUGH A 1-HR. FIRE-RATED GYPSUM CHASE WALL ASSEMBLY.

| HILTI® FIRESTOP SYSTEMS | HILTI, Inc. Tulsa, Oklahoma USA (918) 252-6000 | Sheet 1 of 1 / Scale 7/32" = 1" / Date Oct. 27, 2004 | Drawing No. FC 8032c |
|---|---|---|---|

*Saving Lives through Innovation and Education*

## System No. F-C-7058

FC 7058

3. Duct Wrap Materials* — Nom 1/2 in. (13 mm) thick, 8 pcf (128 kg/m3) or nom 1-1/2 in. (38 mm) thick, 6 pcf (96 kg/m3) with foil-scrim facers. The steel duct shall be wrapped with one layer of duct wrap installed with 1 in. (25 mm) transverse and longitudinal overlaps or tightly butted compression joints in accordance with the manufacturer's installation instructions. The duct wrap is secured with min No. 18 Gauge (0.040 in. or 1 mm) galvanized steel wire formed into a loop on one end, with the other end passed through the loop, pulled hand tight and bent over. Tie wires spaced a max 12 in. (305 mm) OC. The annular space between the insulated steel duct and the periphery of the opening shall be a nom 1/4 in. (6 mm). A min 12 in. high collar consisting of an additional layer of 1/2 in. (13 mm) thick, 8 pcf (128 kg/m3) or of nom 1-1/2 in. (38 mm) thick, 6 pcf (96 kg/m3) duct wrap, installed over the duct wrap flush with the top surface of the floor and extending upward. All seams and edges shall be sealed with min 3 in. (76 mm) wide pressure sensitive aluminum foil tape.
UNIFRAX I L L C — FyreWrap® DPS or FyreWrap® Elite 1.5
4. Fill, Void or Cavity Material* - Sealant — Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with the bottom surface of ceiling. Min 3/4 in. (19 mm) thickness of fill material applied within annulus on top surface of floor.
SPECIFIED TECHNOLOGIES INC — SpecSeal Series SSS Sealant or SpecSeal LCI Sealant
DGS NELSON FIRESTOP — FS1900 Sealant
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant or FS-ONE MAX Intumescent Sealant
TREMCO INC — Fyre-Sil Sealant
DAP PRODUCTS INC — DAP Fire Stop Fire-Rated Silicone Sealant
3M COMPANY 3M FIRE PROTECTION PRODUCTS — FB-1000 NS Sealant
NUCO INC — Self Seal GG-200

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

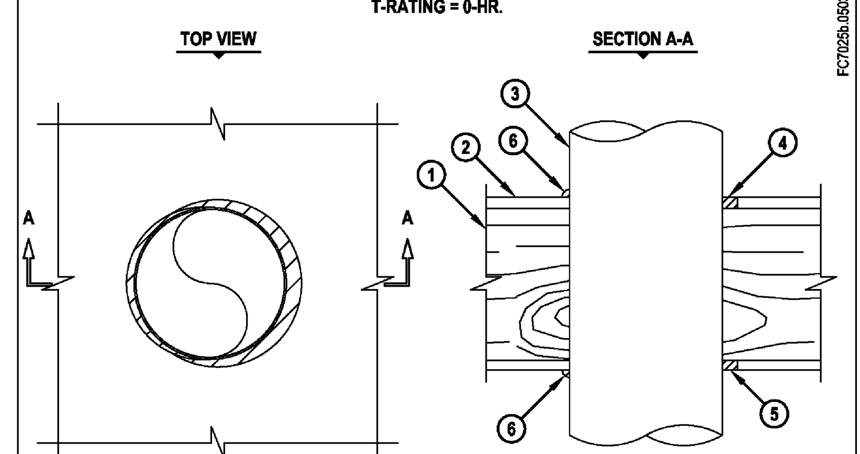
| Hilti Firestop Systems | Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. March 27, 2017 | Page: 2 of 2 |
|---|---|---|

## UL/cUL SYSTEM NO. F-C-7025

**SHEET METAL DUCT THROUGH 1-HR. WOOD FLOOR ASSEMBLY**

F-RATING = 1-HR.
T-RATING = 0-HR.

FC7025b.050305




1. WOOD FLOOR ASSEMBLY (UL/cUL CLASSIFIED L500 SERIES) (1-HR. FIRE-RATING).
2. LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD, OR FLOOR TOPPING MIXTURE.
3. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 10" NOMINAL DIAMETER SHEET METAL DUCT (MIN. 28 GA.).
   B. MAXIMUM 4" NOMINAL DIAMETER SHEET METAL DUCT (MIN. 30 GA.).
4. MINIMUM 3/4" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT.
5. MINIMUM 5/8" DEPTH HILTI CP 606 FLEXIBLE FIRESTOP SEALANT.
6. MINIMUM 1/2" BEAD HILTI CP 606 FLEXIBLE FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES : 1. MAXIMUM DIAMETER OF OPENING = 11".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1".
3. CHASE WALL (NOT SHOWN, OPTIONAL). THE THROUGH PENETRANT, MAY BE ROUTED THROUGH A 1-HR. FIRE-RATED GYPSUM CHASE WALL.

| HILTI® FIRESTOP SYSTEMS | HILTI, Inc. Tulsa, Oklahoma USA (918) 252-6000 | Sheet 1 of 1 / Scale 9/64" = 1" / Date MAY 03, 2005 | Drawing No. FC 7025b |
|---|---|---|---|

*Saving Lives through Innovation and Education*

## RUSKIN®

3900 Dr. Greaves Rd. • Kansas City, MO 64030 • (816) 761-7476 • FAX (816) 765-8955

### CFD(R)2, CFD(R)3 and CFD(R) 3.5 CEILING FIRE DAMPERS
UL Classified Radiation Dampers

#### APPLICATION
UL Fire Rated Floor/Ceiling Assemblies and Roof/Ceiling Assemblies require specially tested and classified Ceiling Dampers (also called Ceiling Fire Dampers or Radiation Dampers) to provide fire and heat protection where HVAC components penetrate the ceiling membrane. **Standard, 1 1/2 and 3 hr. primary fire dampers DO NOT provide the necessary protection.**

Ruskin CFD(R)2 and CFD(R)3 are UL Classified to provide protection to HVAC penetrations of up to 324 sq. in. (2090) maximum opening size through UL fire rated assemblies with fire resistance ratings of 3 hours or less. Penetrations larger than 324 sq. in. (2090) and up to 576 sq. in. (3716) require model CFD4. The quantity and frequency of permissible HVAC ceiling penetrations are described in the UL Fire Resistance Directory.

#### WOOD TRUSS CEILING APPLICATION
The Ruskin CFD7T ceiling fire damper is the ceiling fire damper to use if the application is a wood truss ceiling. The CFD7T is UL approved for use in wood truss ceiling design L586 which is similar to wood truss ceiling designs like L528, L521, L534, L546, L550, etc.

UL CLASSIFIED
ULC LISTED
UL555C Listing R8039

#### STANDARD CONSTRUCTION
**FRAME**
24 gage (.7) galvanized steel. Frame depths are as shown in following chart.

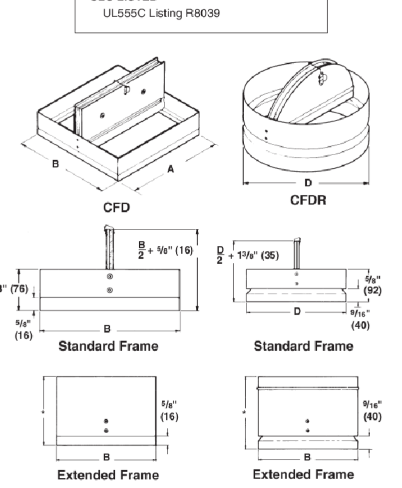
| DAMPER MODEL | FRAME STYLE | B DIMENSION or D DIAMETER | FRAME DEPTH |
|---|---|---|---|
| CFD2 CFD3 CFD3.5 | Standard | All sizes | 3" (76) |
| | Extended | 4" to 10" (102 to 254)<br>11" to 14" (279 to 356)<br>15" to 24" (381 to 607) | 6 3/8" (162)<br>8 3/16" (208)<br>11 3/16" (284) |
| CFDR2 CFDR3 CFD(R)3.5 | Standard | All sizes | 3 5/8" (92) |
| | Extended | 5" to 10" (127 to 254)<br>11" to 14" (279 to 356)<br>15" to 20" (381 to 508) | 6 3/4" (171)<br>6 3/4" (171)<br>11 3/4" (298) |

**BLADE**
24 gage (.7) galvanized steel, with UL Classified insulation as required.

**FUSIBLE LINK**
165°F (74°C) is standard. 212°F (100°C) is available at no additional cost.

**MINIMUM SIZE (Damper Sizes)**
CFD2/CFD3 – 5"w x 4"h (127 x 102).
CFDR2 – 12" (305) diameter.
CFDR3/3.5 – 5" (127) diameter.

**MAXIMUM SIZE (Damper Sizes)**
CFD3 – 70 sq. in. (452) maximum.
CFD2 – 324 sq. in. (2090) with height or width dimensions not greater than 24" (607).
CFDR2 – 20" (508) diameter.
CFDR3/3.5 – 10" (254) diameter.



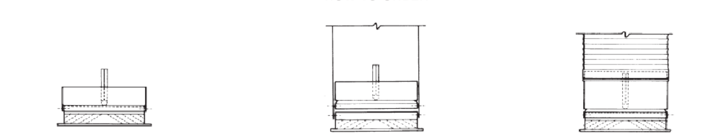

#### OPTIONS
- VA Volume Adjust to balance airflow.

Dimensions shown in parentheses ( ) indicate millimeters.

Spec CFD(R)2 & 3-1008/Replaces CFD(R)2 & 3 -707 *ALL STATED SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION.* ©Ruskin 2008

### CFD(R)2, CFD(R)3 and CFD(R)3.5 CEILING FIRE DAMPERS

#### HOW TO ORDER

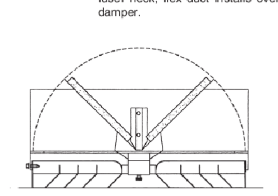


**Ductless Installation**
Order "actual size" with **standard** frame. Damper installs over diffuser neck.

**Steel Duct Installation**
Order "deduct 1/4" (6)" with **standard** frame. Damper installs inside duct.

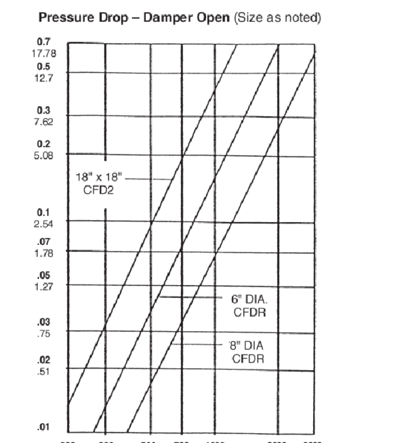
**Flex Duct Installation**
Order "actual size" with **extended** frame. Damper installs over diffuser neck; flex duct installs over damper.

#### UL Listed Fusible Volume Adjustment Option
The standard, fusible link can be replaced with a simple mechanism that permits adjustment of damper blades to balance airflow. A standard 3/16" (5) hex (Allen) wrench is used for adjustment. In fire conditions, the damper closes regardless of volume setting. This feature must be added to the damper at fabrication. 165°F or 212°F (74°C or 100°C) (specify temperature) fusible volume adjustment options are available. **Caution: Volume Adjust hangs below a rectangular damper 1 1/8" (29). Volume Adjust hangs below a round damper 3/8" (10).**



CFD(R)2, 3, 3.5 with Fusible Volume Adjustment

**Pressure Drop – Damper Open** (Size as noted)



Air Velocity in FEET and METERS per minute through FACE AREA.
Tested per AMCA Std. 500, Fig. 5.2, ductwork upstream.

RUSKIN®

## A NEW SHELL BUILDING IMPROVEMENT
31 SOUTH WATER STREET
APN #179-18-611-055 CITY OF HENDERSON , NV 89015

## 31 WATER STREET LLC
DATE: 03.09.2020 PROJECT NUMBER: 0201909

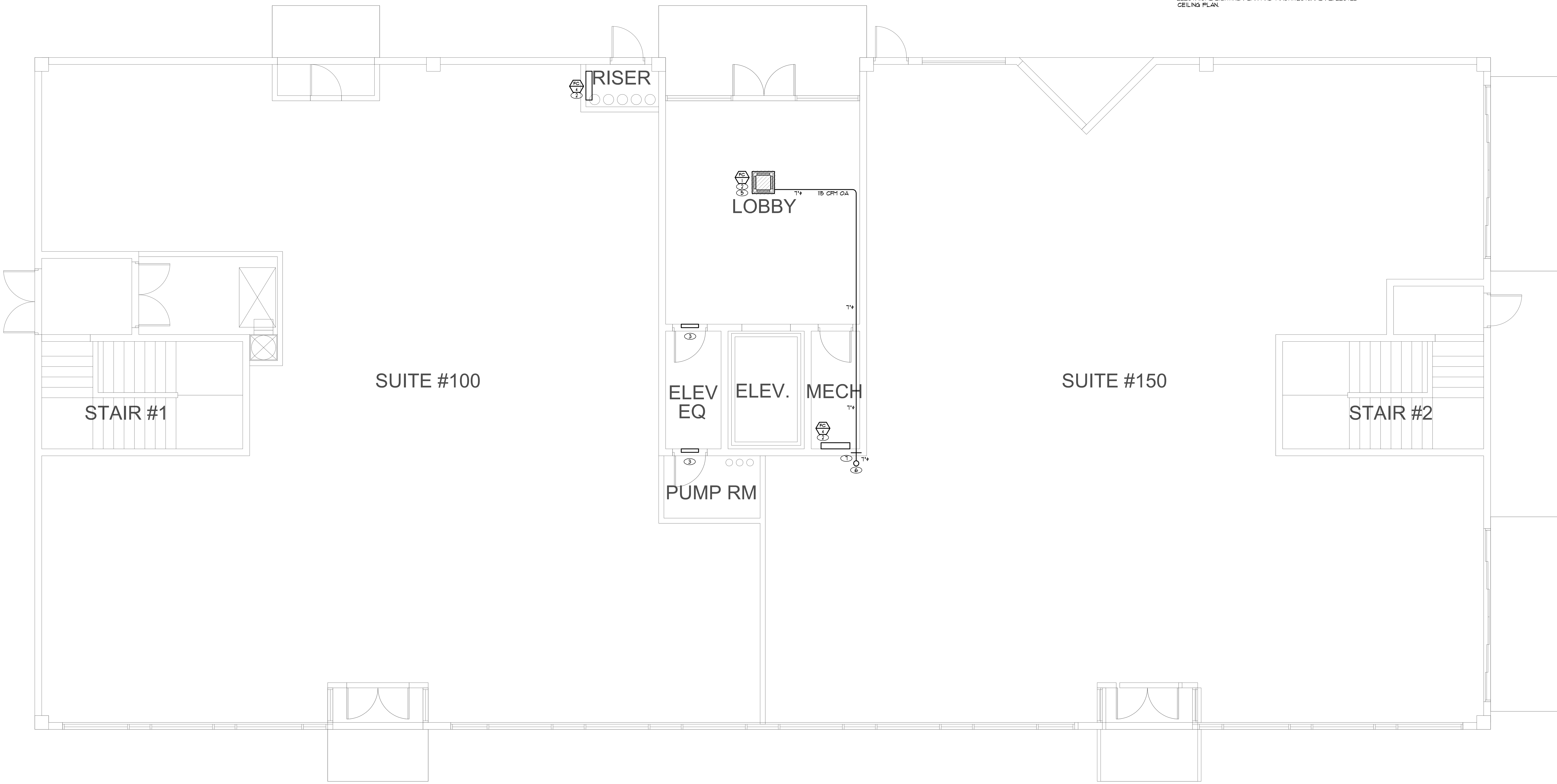
P. JAMES ARCHITECT

ARCHITECTURE
PLANNING
DESIGN
4629 VICTORIA BEACH WAY
LAS VEGAS, NV 89103
702.683.3277

| REV | REVISIONS Description | DATE |
|---|---|---|

MARIANO ENGINEERING
ENGINEERING A SUSTAINABLE FUTURE
6040 S. Durango Dr., Ste. 100 Las Vegas, NV 89113
Phone: office 702.361.0020, cell 702.521.3700
Website: Marianoeng.com

SHEET
M1.02




## NOTES:

1. PROVIDE 7-DAY PROGRAMMABLE THERMOSTAT PER 2018 IECC.
2. ROUTE PRIMARY CONDENSATE DRAIN LINE TO NEAREST LAV TAILPIECE OR OTHER CODE APPROVED PLUMBING FIXTURE. IF SECONDARY LINE IS NEEDED, ROUTE TO CONSPICUOUS PLACE OUTSIDE SUCH AS OVER WINDOW.
3. PROVIDE HIGH AND LOW 20"x20" DOOR LOUVERS.
4. PLACE CONDENSING UNIT ON 4" THICK CONCRETE PAD. DO NOT ATTACH TO STRUCTURE. PROVIDE AIREX (OR EQUAL) WALL OUTLET SEAL AT REFRIGERATION PIPE PENETRATION PER MANUFACTUER REQUIREMENTS.
5. PROVIDE 5 SIDED FIRE RATED BOX FOR CASSETTE TYPE FANCOIL UNIT. CONTRACTOR TO COORDINATE WITH TRUSS DESIGNER TO ALLOW FANCOIL UNIT AND 5 SIDED BOX AT THIS LOCATION.
6. 7"ɸ OA DUCT FROM ABOVE. ROUTE TO FANCOIL UNIT.
7. PROVIDE FIRE DAMPER AT RATED PENETRATION.

## GENERAL NOTES:

1. COORDINATE ALL DIFFUSER AND GRILLE LOCATIONS WITH THE ELECTRICAL LIGHTING PLAN AND ARCHITECTURAL REFLECTED CEILING PLAN.

NORTH

**1ST FLOOR - MECHANICAL PLAN**

SCALE: ¼" = 1'-0"

A
M2.01


MARIANO ENGINEERING
ENGINEERING A SUSTAINABLE FUTURE
6040 S. Durango Dr., Ste. 100 Las Vegas, NV 89113
Phone: office 702.361.0020, cell 702.521.3700
Website: Marianoeng.com


SEAL

RONALD G. MARIANO
Expires 12-31-21
MECHANICAL
No. 14730
PROFESSIONAL ENGINEER STATE OF NEVADA
4/16/20

A NEW SHELL BUILDING IMPROVEMENT
31 SOUTH WATER STREET
CITY OF HENDERSON, NV 89015
APN #179-18-611-055

31 WATER STREET LLC
PROJECT NUMBER: 0201909
DATE: 03.09.2020


P. JAMES ARCHITECT
ARCHITECTURE
PLANNING
DESIGN
4629 VICTORIA BEACH WAY
LAS VEGAS, NV 89103
702.683.3277


REVISIONS

| REV | Description | DATE |
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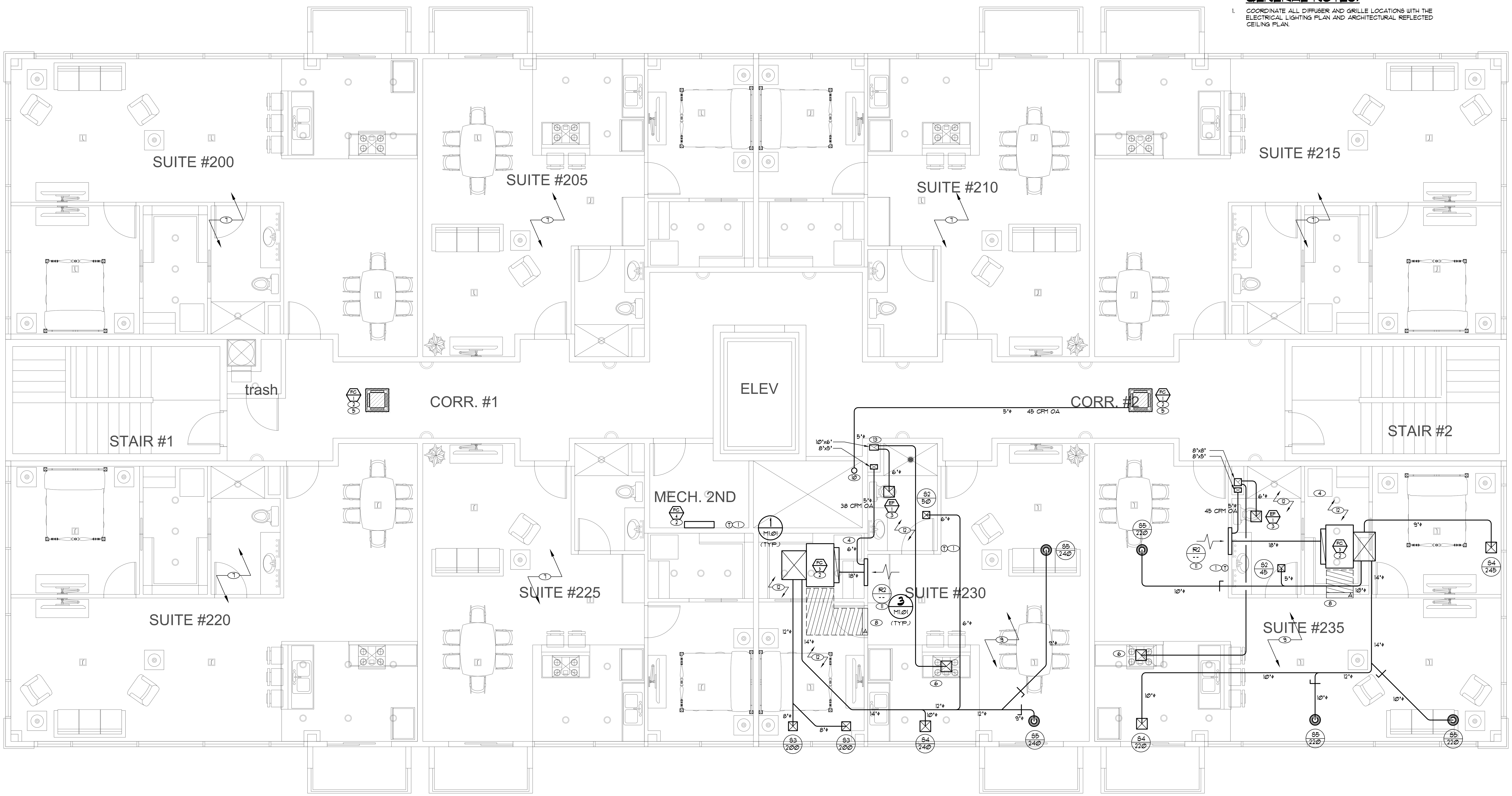
SHEET

M2.01




## NOTES:

1. PROVIDE 7-DAY PROGRAMMABLE THERMOSTAT PER 2018 IECC.
2. ROUTE PRIMARY CONDENSATE DRAIN LINE TO NEAREST LAV TAILPIECE OR OTHER CODE APPROVED PLUMBING FIXTURE. IF SECONDARY LINE IS NEEDED, ROUTE TO CONSPICUOUS PLACE OUTSIDE SUCH AS OVER WINDOW.
3. EXHAUST DUCT TO OUTSIDE AT AN APPROVED CAP. MINIMUM 10 FT FROM NEAREST AIR INTAKE. RUN CONTINUOUSLY AT LOW-SPEED TO SATISFY VENTILATION REQUIREMENT SHOWN ON SHEET M1.01.
4. DRYER TO BE VENTLESS / ALL-ELECTRIC TYPE.
5. PROVIDE 5 SIDED FIRE RATED BOX FOR CASSETTE TYPE FANCOIL UNIT. CONTRACTOR TO COORDINATE WITH TRUSS DESIGNER TO ALLOW FANCOIL UNIT AND 5 SIDED BOX AT THIS LOCATION.
6. KITCHEN HOOD EXHAUST SYSTEM TO BE INSTALLED PER MANUFACTURER'S REQUIREMENTS. EXHAUST DUCT ROUTE TO OUTSIDE TO TERMINATE TO AN AUTOMATIC OR GRAVITY DAMPER. (100 CFM MINIMUM)
7. SUITE TO MATCH SIMILAR EXAMPLE AS SHOWN.
8. PROVIDE ACCESS DOOR TO FANCOIL SPACE HIGH ON WALL.
9. PROVIDE SPIRAL DUCT IN EXPOSED CEILING AREA.
10. OA DUCT THROUGH CHASE. 8"ϕ DUCT FROM ABOVE, 7"ϕ DUCT TO BELOW.
11. OA CONNECTION AT R.A.G. VOLUME CONTROL DAMPER SET TO CFM SHOWN.
12. CEILING TO BE DROPPED AT THIS AREA. PLEASE SEE ARCHITECTURAL PLAN FOR MORE INFORMATION.
13. DUCT CONNECTIONS AT THE EXHAUST PLENUM SHALL BE DONE AT DIFFERENT ELEVATIONS.

## GENERAL NOTES:

1. COORDINATE ALL DIFFUSER AND GRILLE LOCATIONS WITH THE ELECTRICAL LIGHTING PLAN AND ARCHITECTURAL REFLECTED CEILING PLAN.

NORTH

## 2ND FLOOR - MECHANICAL PLAN

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

A
M2.02

MARIANO ENGINEERING
ENGINEERING A SUSTAINABLE FUTURE
6040 S. Durango Dr., Ste. 100 Las Vegas, NV 89113
Phone: office 702.361.0020, cell 702.521.3700
Website: Marianoeng.com

SEAL

PROFESSIONAL ENGINEER STATE OF NEVADA
RONALD G. MARIANO
Expires 12-31-21
MECHANICAL
No. 14730
4/16/20

# A NEW SHELL BUILDING IMPROVEMENT

31 SOUTH WATER STREET
APN #179-18-611-055
CITY OF HENDERSON , NV 89015

31 WATER STREET LLC

DATE: 03.09.2020
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|---|---|---|
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REVISIONS

SHEET

M2.02

## NOTES:

(1) PROVIDE 7 DAY PROGRAMMABLE THERMOSTAT PER 2018 IECC.

(2) ROUTE PRIMARY CONDENSATE DRAIN LINE TO NEAREST LAV TAILPIECE OR OTHER CODE APPROVED PLUMBING FIXTURE. IF SECONDARY LINE IS NEEDED, ROUTE TO CONSPICUOUS PLACE OUTSIDE SUCH AS OVER WINDOW.

(3) EXHAUST DUCT TO OUTSIDE AT AN APPROVED CAP. MINIMUM 10 FT FROM NEAREST AIR INTAKE. RUN CONTINUOUSLY AT LOW-SPEED TO SATISFY VENTILATION REQUIREMENT SHOWN ON SHEET M1.01.

(4) DRYER TO BE VENTLESS / ALL-ELECTRIC TYPE.

(5) PROVIDE 5 SIDED FIRE RATED BOX FOR CASSETTE TYPE FANCOIL UNIT. CONTRACTOR TO COORDINATE WITH TRUSS DESIGNER TO ALLOW FANCOIL UNIT AND 5 SIDED BOX AT THIS LOCATION.

(6) KITCHEN HOOD EXHAUST SYSTEM TO BE INSTALLED PER MANUFACTURER'S REQUIREMENTS. EXHAUST DUCT ROUTE TO OUTSIDE TO TERMINATE TO AN AUTOMATIC OR GRAVITY DAMPER. (100 CFM MINIMUM)

(7) SUITE TO MATCH SIMILAR EXAMPLE AS SHOWN.

(8) PROVIDE ACCESS DOOR TO FANCOIL SPACE HIGH ON WALL.

(9) PROVIDE SPIRAL DUCT IN EXPOSED CEILING AREA.

(10) OA DUCT THROUGH CHASE. 8"Φ DUCT FROM ABOVE, 8"Φ DUCT TO BELOW.

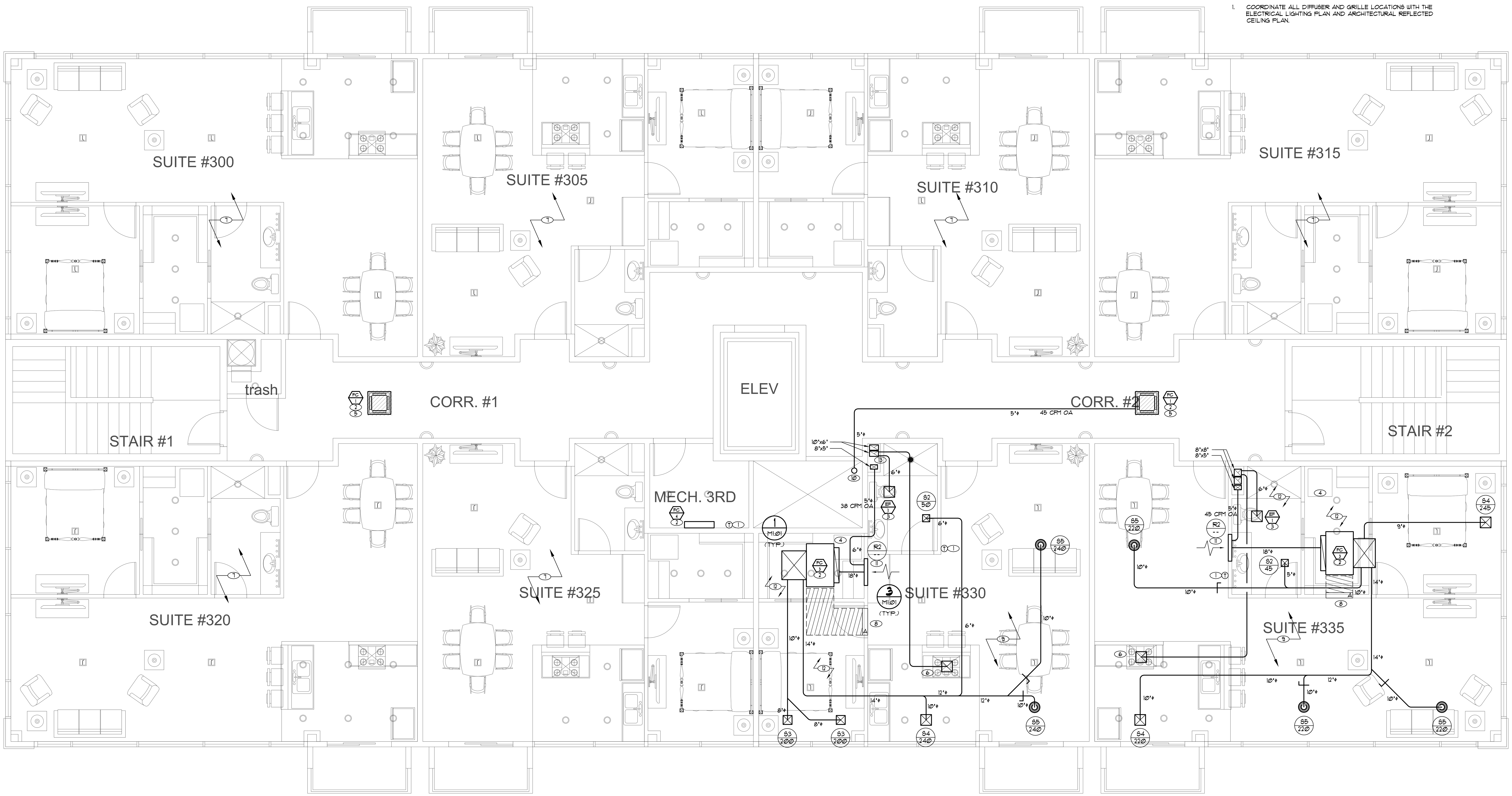
(11) OA CONNECTION AT R.A.G. VOLUME CONTROL DAMPER SET TO CFM SHOWN.

(12) CEILING TO BE DROPPED AT THIS AREA. PLEASE SEE ARCHITECTURAL PLAN FOR MORE INFORMATION.

(13) DUCT CONNECTIONS AT THE EXHAUST PLENUM SHALL BE DONE AT DIFFERENT ELEVATIONS.

## GENERAL NOTES:

1. COORDINATE ALL DIFFUSER AND GRILLE LOCATIONS WITH THE ELECTRICAL LIGHTING PLAN AND ARCHITECTURAL REFLECTED CEILING PLAN.




NORTH

**3RD FLOOR - MECHANICAL PLAN**

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

A M2.03

MARIANO ENGINEERING
ENGINEERING A SUSTAINABLE FUTURE
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Phone: office 702.361.0020, cell 702.521.3700
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A NEW SHELL BUILDING IMPROVEMENT
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APN #179-18-611-055 CITY OF HENDERSON , NV 89015

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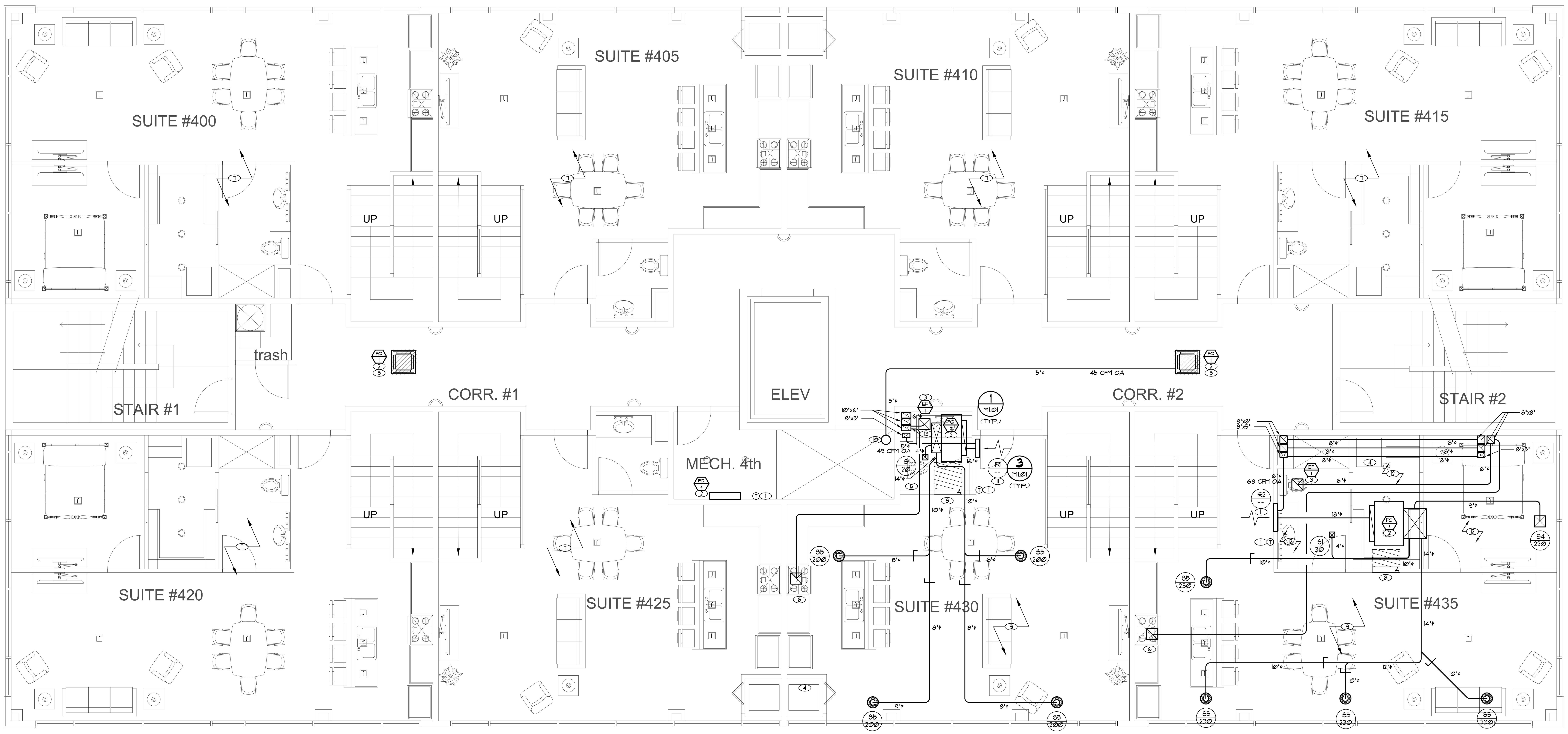
SHEET
M2.03

## NOTES:

1. PROVIDE 7 DAY PROGRAMMABLE THERMOSTAT PER 2018 IECC.
2. ROUTE PRIMARY CONDENSATE DRAIN LINE TO NEAREST LAV TAILPIECE OR OTHER CODE APPROVED PLUMBING FIXTURE. IF SECONDARY LINE IS NEEDED, ROUTE TO CONSPICUOUS PLACE OUTSIDE SUCH AS OVER WINDOW.
3. EXHAUST DUCT TO OUTSIDE AT AN APPROVED CAP. MINIMUM 10 FT FROM NEAREST AIR INTAKE. RUN CONTINUOUSLY AT LOW-SPEED TO SATISFY VENTILATION REQUIREMENT SHOWN ON SHEET M1.01.
4. DRYER TO BE VENTLESS / ALL-ELECTRIC TYPE.
5. PROVIDE 5 SIDED FIRE RATED BOX FOR CASSETTE TYPE FANCOIL UNIT. CONTRACTOR TO COORDINATE WITH TRUSS DESIGNER TO ALLOW FANCOIL UNIT AND 5 SIDED BOX AT THIS LOCATION.
6. KITCHEN HOOD EXHAUST SYSTEM TO BE INSTALLED PER MANUFACTURER'S REQUIREMENTS. EXHAUST DUCT ROUTE TO OUTSIDE TO TERMINATE TO AN AUTOMATIC OR GRAVITY DAMPER. (100 CFM MINIMUM)
7. SUITE TO MATCH SIMILAR EXAMPLE AS SHOWN.
8. PROVIDE ACCESS DOOR TO FANCOIL SPACE HIGH ON WALL.
9. PROVIDE SPIRAL DUCT IN EXPOSED CEILING AREA.
10. OA DUCT THROUGH CHASE. 9"ϕ DUCT FROM ABOVE, 8"ϕ DUCT TO BELOW.
11. OA CONNECTION AT R.A.G. VOLUME CONTROL DAMPER SET TO CFM SHOWN.
12. CEILING TO BE DROPPED AT THIS AREA. PLEASE SEE ARCHITECTURAL PLAN FOR MORE INFORMATION.
13. DUCT CONNECTIONS AT THE EXHAUST PLENUM SHALL BE DONE AT DIFFERENT ELEVATIONS.

## GENERAL NOTES:

1. COORDINATE ALL DIFFUSER AND GRILLE LOCATIONS WITH THE ELECTRICAL LIGHTING PLAN AND ARCHITECTURAL REFLECTED CEILING PLAN.




NORTH

**4TH FLOOR - MECHANICAL PLAN**
SCALE: 1/4" = 1'-0"
A / M2.04

SEAL
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PROFESSIONAL ENGINEER
STATE OF NEVADA
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No. 14730
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APN #179-18-611-055
CITY OF HENDERSON , NV 89015

## 31 WATER STREET LLC
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6040 S. Durango Dr., Ste. 100 Las Vegas, NV 89113
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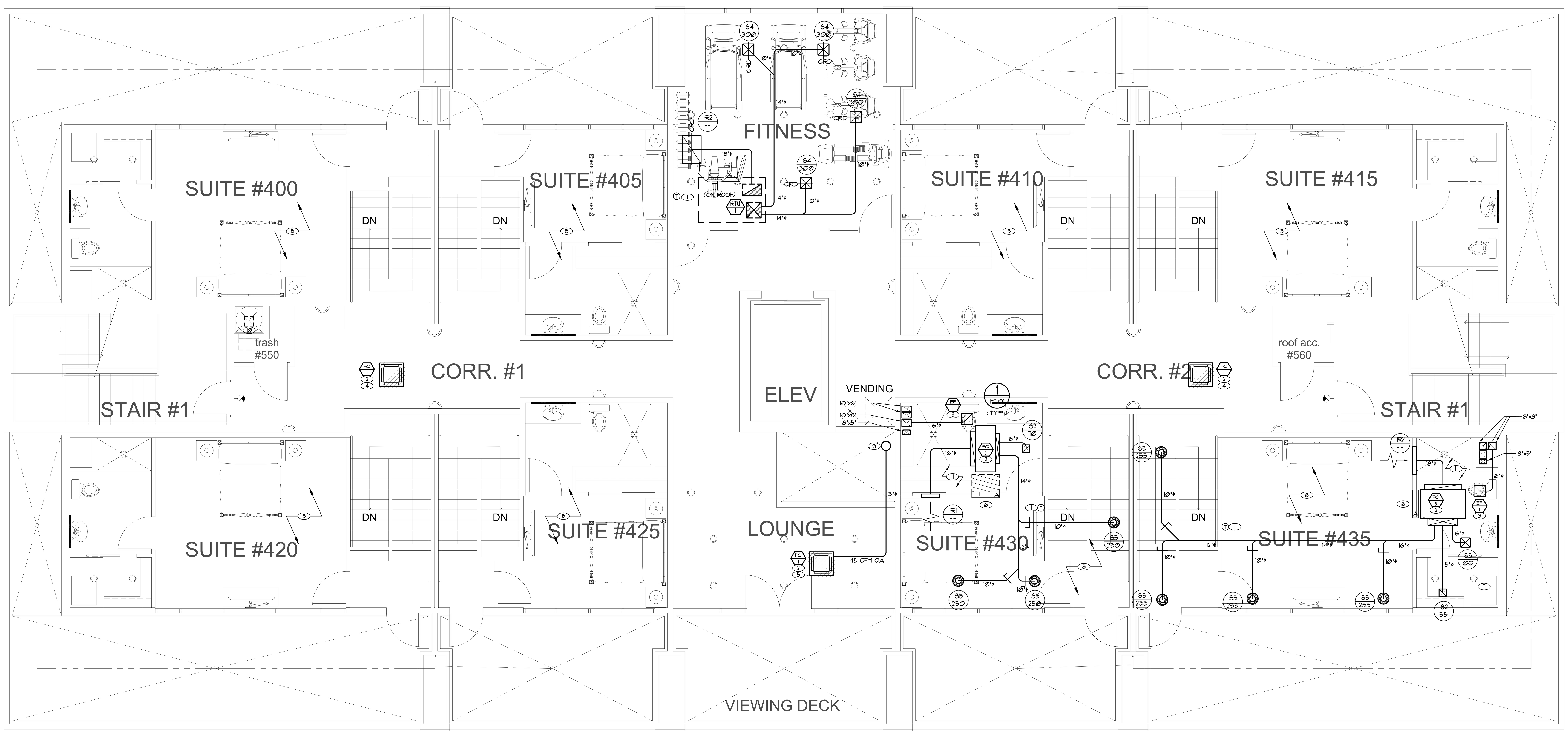
SHEET
M2.04

## NOTES:

1. PROVIDE 7 DAY PROGRAMMABLE THERMOSTAT PER 2018 IECC.
2. ROUTE PRIMARY CONDENSATE DRAIN LINE TO NEAREST LAV TAILPIECE OR OTHER CODE APPROVED PLUMBING FIXTURE. IF SECONDARY LINE IS NEEDED, ROUTE TO CONSPICUOUS PLACE OUTSIDE SUCH AS OVER WINDOW.
3. EXHAUST DUCT TO OUTSIDE AT AN APPROVED CAP. MINIMUM 10 FT FROM NEAREST AIR INTAKE.
4. PROVIDE 5 SIDED FIRE RATED BOX FOR CASSETTE TYPE FANCOIL UNIT. CONTRACTOR TO COORDINATE WITH TRUSS DESIGNER TO ALLOW FANCOIL UNIT AND 5 SIDED BOX AT THIS LOCATION.
5. SUITE TO MATCH SIMILAR EXAMPLE AS SHOWN.
6. PROVIDE ACCESS DOOR TO FANCOIL SPACE HIGH ON WALL.
7. DRYER TO BE VENTLESS / ALL-ELECTRIC TYPE.
8. PROVIDE SPIRAL DUCT IN EXPOSED CEILING AREA.
9. OA DUCT THROUGH CHASE. 10"Φ DUCT FROM ABOVE, 9"Φ DUCT TO BELOW.
10. 10"x10" EXHAUST DUCT TO ABOVE.
11. CEILING TO BE DROPPED AT THIS AREA. PLEASE SEE ARCHITECTURAL PLAN FOR MORE INFORMATION.

## GENERAL NOTES:

1. COORDINATE ALL DIFFUSER AND GRILLE LOCATIONS WITH THE ELECTRICAL LIGHTING PLAN AND ARCHITECTURAL REFLECTED CEILING PLAN.




NORTH

**5TH FLOOR - MECHANICAL PLAN**

SCALE: ¼" = 1'-0"

A / M2.05

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A NEW SHELL BUILDING IMPROVEMENT
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31 WATER STREET LLC
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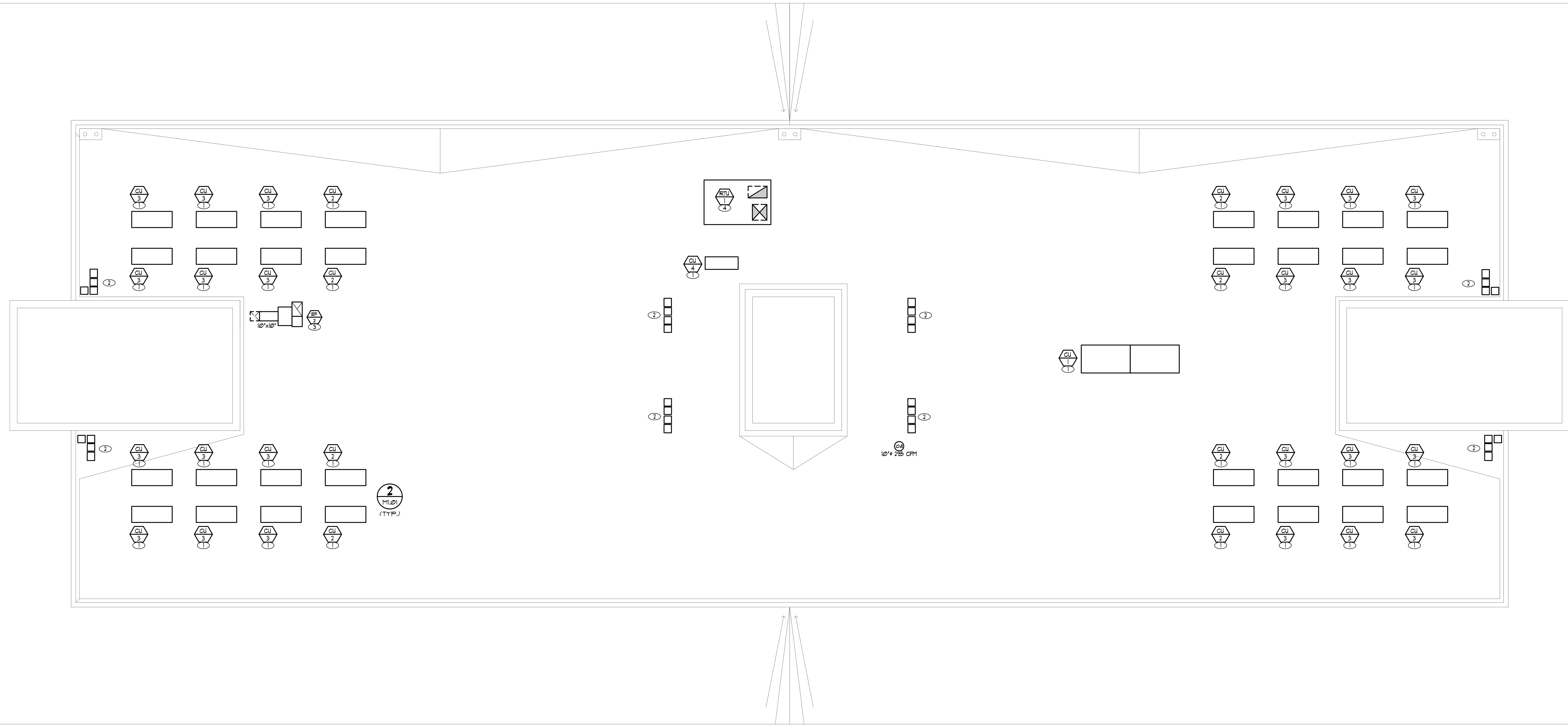
M2.05

**NOTES:**

1. PLACE CONDENSING UNIT ON BLOCK RISERS. PROVIDE AIREX (OR EQUAL) WALL OUTLET SEAL AT REFRIGERATION PIPE PENETRATION PER MANUFACTUER REQUIREMENTS.
2. CONNECT ALL EXHAUST DUCTS TO SINGLE OUTLET PLENUM WITH ROOF CAP. PROVIDE 10' CLEARANCE FROM ALL OUTSIDE AIR INTAKES TO EXHAUST OUTLETS.
3. UTILITY SET EXHAUST FAN FROM TRASH CHUTE. PROVIDE 10' CLEARANCE TO ALL OUTSIDE AIR INTAKES.
4. PROVIDE 3/4" CORZAN SCHEDULE 80 CPVC CONDENSATE DRAIN PIPE TO TERMINATE TO A LAVATORY TAILPIECE OR OTHER CODE APPROVED PLUMBING FIXTURE.

**GENERAL NOTES:**

1. COORDINATE ALL DIFFUSER AND GRILLE LOCATIONS WITH THE ELECTRICAL LIGHTING PLAN AND ARCHITECTURAL REFLECTED CEILING PLAN.
2. ALL MECHANICAL EQUIPMENT TO BE COMPLETELY SCREENED BY ARCHITECTURAL ELEMENT.




NORTH

**ROOF - MECHANICAL PLAN** A M3.01

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