



CHECKSHEET #1	RESPONSES #1	DATE
CHECKSHEET #2	RESPONSES #2	02.22.2021
CHECKSHEET #3	RESPONSES #3	06.25.2021
CHECKSHEET #4	RESPONSES #4	05.12.2022
DATE	06.08.2021	
Proj No:	997	
Drawn By:	MGA	
Chkd By:	MGA	
DSGN By:	MGA	
Acad File:		

**ANALOG PDX**  
**1871 N FLINT AVE**  
**GROUND LEVEL - MECH PLAN**  
 PORTLAND OREGON 97227

CONSTRUCTION DOCUMENTS  
 09.22.2020



Consulting Engineers  
 2007 S.E. Ash St.  
 Portland, OR 97214  
 PHN: (503) 234-0548  
 FAX: (503) 234-0677  
 WWW.MFA-ENG.COM

SHEET

M2.01

- KEY NOTES:**
- ① S&P TD-125 INLINE FAN, PROVIDE NON RATED ACCESS PANEL. KITCHEN AREA 35 CFM, EACH BEDROOM 33 CFM WITH 1/2" DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. INSULATE FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
  - ② 6" HOOD DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT ASSEMBLY. HOOD FAN NOT USED.
  - ③ 1.5KW WALL HEATER QMARK AWH4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
  - ④ LG PTHP (PACKAGED TERMINAL HEAT PUMP) WITH FACTORY WALL SLEEVE, CONDENSATE DRAIN KIT, AND 42X16 ALUMINUM ARCHITECTURAL GRILLE AT EXTERIOR. INSTALL GRAVITY CONDENSATE DRAIN KIT, PLUMBING CONTRACTOR TO MAKE CONNECTION AT DRAIN KIT AND CONTINUE DRAIN LINE TO AN APPROVED LOCATION.
  - ⑤ SUPPLY AIR OR RETURN GRILLE, SIZED FOR BOTH FREE AREA AND FOR ACTUATOR ACCESS. SEE ① FOR GRILLE INSTALLATION, AND SEE ② FOR TYPICAL F/S INSTALLATION.
  - ⑥ EXTERIOR EXHAUST PLENUM - SEE ④ MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
  - ⑦ 4" DRYER EXHAUST TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. DRYER DUCT MATERIAL SHALL HAVE A SMOOTH INTERIOR FINISH. BE CONSTRUCTED OF 28 GA SHEET METAL, SUPPORTED AT 4 FOOT INTERVALS, NIKOT OR SCREW PENETRATIONS THROUGH THE DUCT WALL ARE NOT ACCEPTABLE. IDENTIFY TOTAL EQUIVALENT LENGTH OF DRYER VENT WITH PERMANENT LABEL WITHIN 6FT OF DRYER CONNECTION. CLEAN-OUT TO BE PROVIDED FOR ALL VERTICAL RISERS. SEE ③.
  - ⑧ SUPPLY DUCT FROM ROOF TO 2ND FLOOR CEILING - TRANSITION TO SMALLER DUCT AFTER SUPPLY BRANCH TAKE OFF. SEE CHART BELOW.
  - ⑨ LEVEL 7 DRYERS VENT DIRECTLY THROUGH ROOF.
  - ⑩ 1" OUTSIDE AIR TO FAN COIL. PROVIDE WITH 2-POSITION DAMPER TO OPEN WHENEVER FAN COIL OPERATES. DAMPER TO BE LOW LEAK CLASS 1 DAMPER.
  - ⑪ NOT USED.
  - ⑫ ROOM TO ROOM TRANSFER FAN. TIERNOLD AS-1 WITH WALL MOUNTED SWITCH. BLOWER FAN MOUNTED LOW IN LIVING ROOM WITH HIGH DISCHARGE IN BEDROOM. SET APPROXIMATELY 8" AFF, AND 8" BELOW CEILING. SET BOTH INTAKE AND SUPPLY ABOVE DOOR ON UNITS LOCATED ABOVE ENTRY DOOR.
  - ⑬ FOR 4" AND 6" FIRE PENETRATION DETAILS, PLEASE SEE ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯, ⑰, ⑱, ⑲, ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟, ㊱, ㊲, ㊳, ㊴, ㊵, ㊶, ㊷, ㊸, ㊹, ㊺.
  - ⑭ (2) 4" AND (1) 6" EXHAUST DUCTS TO MEZZANINE ABOVE.
  - ⑮ REFRIGERANT LINES FROM HEAT PUMPS ON ROOF TO FAN COILS ON FLOORS 1 TO 7.
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**SHAFT DUCT SIZES**

FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 16	1200	NA	0	RTU-1
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**VENTILATION CALCULATIONS:**

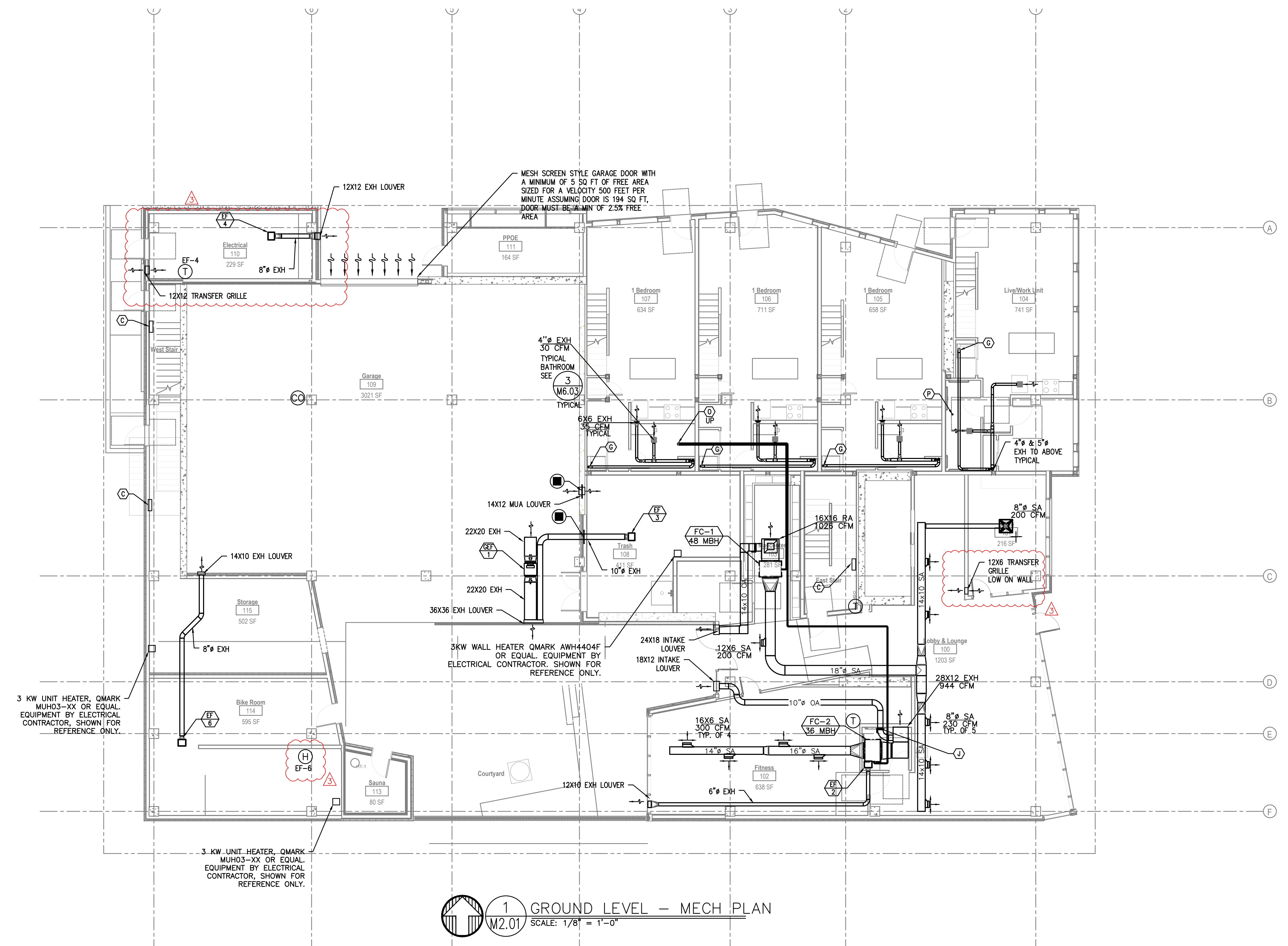
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COMMON SPACES AND HALLWAYS ARE VENTILATED BY RTU'S SIZED TO EXCEED THE MINIMUM 0.06 CFM/SQ FT REQUIREMENT

SEE VENTILATION SCHEDULES FOR OTHER UNITS

**GARAGE EXHAUST CALCULATIONS:**

3,351 sq ft x 0.05 cfm/sq ft = 168 CFM  
 3,351 sq ft x 0.75 cfm/sq ft = 2,513 CFM



**1 GROUND LEVEL - MECH PLAN**  
 SCALE: 1/8" = 1'-0"

- GENERAL NOTES:**
1. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL ALL UNITS.
  2. ALL EXHAUST DISCHARGE FROM THE UNITS SHALL BE MINIMUM 3' FROM THE PROPERTY LINE AND 3' FROM ANY OPENINGS.





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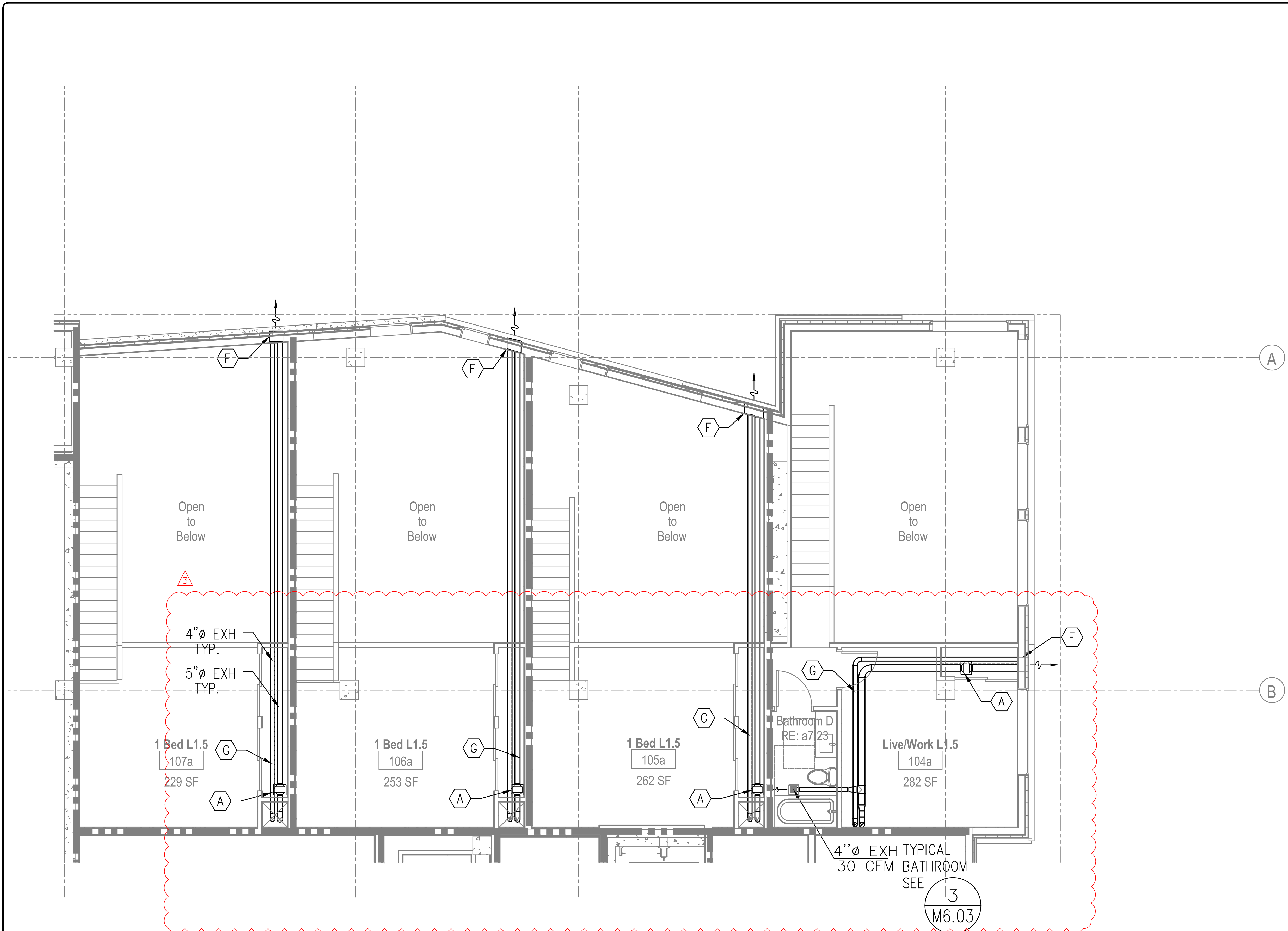
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 SCALE: 1/4" = 1'-0"  
 M2.01M

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**ANALOG PDX**  
 1871 N FLINT AVE  
 PORTLAND OREGON 97227

**LEVEL 1.5 - MECH PLAN**

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SHEET

**M2.015**





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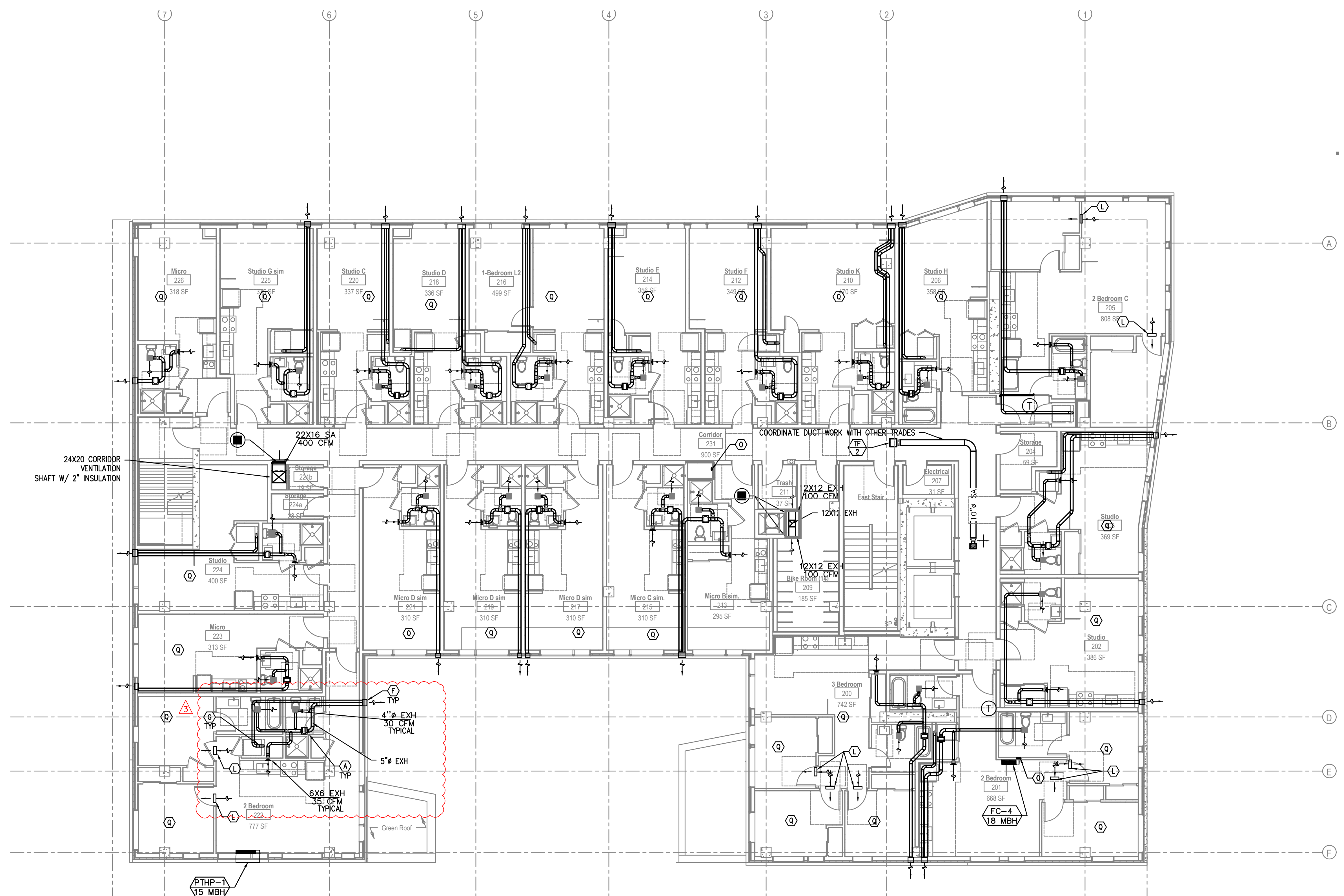
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**1 LEVEL 2 - MECH PLAN**  
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SHEET

**M2.02**





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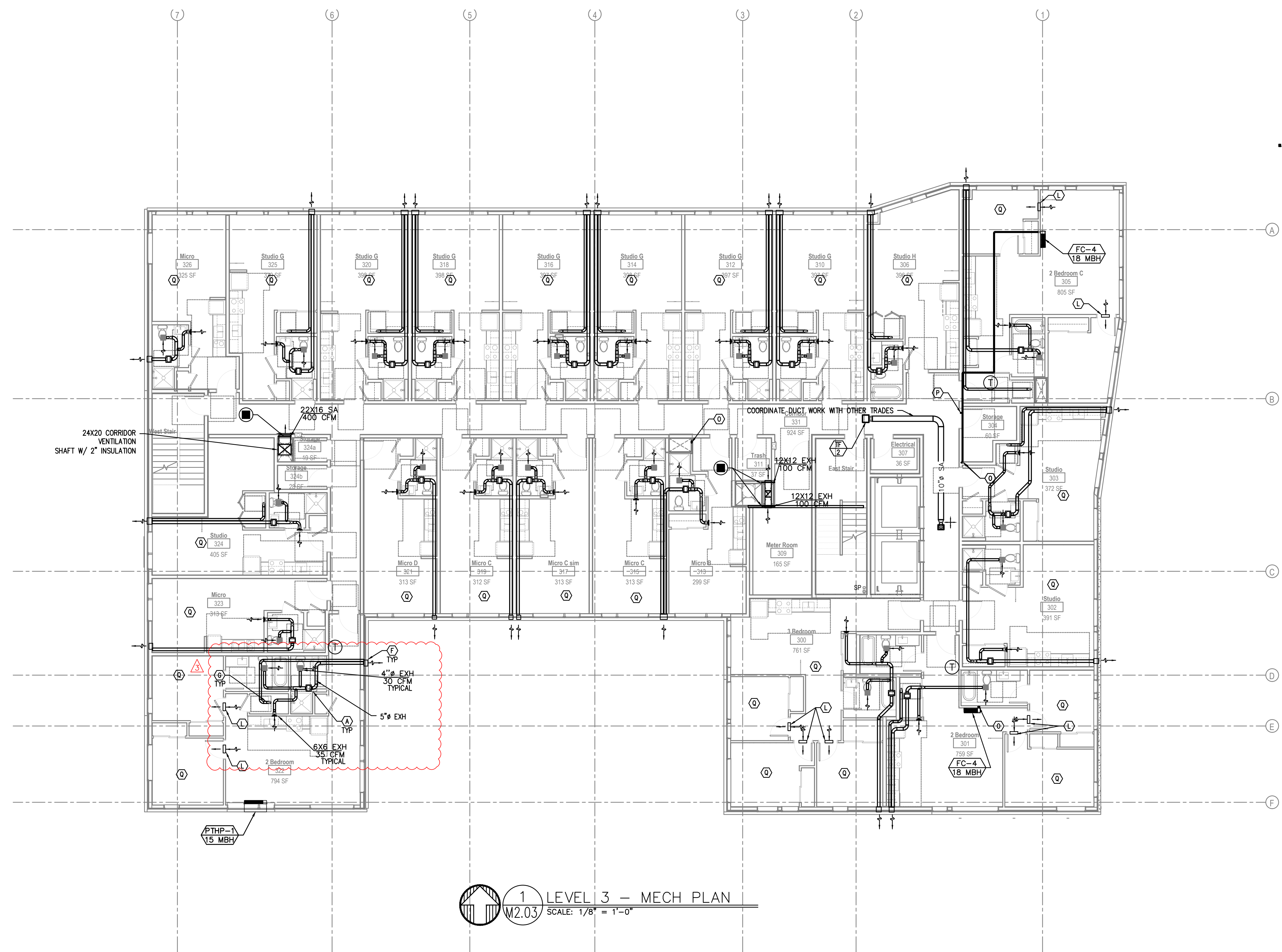
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SHEET

**M2.03**



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CHECKSHEET #1	02.22.2021	06.08.2021	Date:	06.08.2021
CHECKSHEET #2	06.25.2021	09.07	Proj No:	997
CHECKSHEET #3	05.12.2022	MGA	Drawn By:	MGA
		MRD	Chkd By:	MRD
		MGA	DSN By:	MGA
			Acad File:	

**ANALOG PDX**  
 1871 N FLINT AVE  
 PORTLAND OREGON 97227  
**LEVEL 4 - MECH PLAN**

CONSTRUCTION DOCUMENTS  
 09.22.2020



Consulting Engineers  
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 Portland, OR 97214  
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SHEET

**M2.04**

- KEY NOTES:**
- ① S&P TD-125 INLINE FAN, PROVIDE NON RATED ACCESS PANEL. KITCHEN AREA 35 CFM, EACH BEDROOM 33 CFM WITH 5" DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. INSULATE FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
  - ② 6" HOOD DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT ASSEMBLY. HOOD FAN SHALL NOT PENETRATE RATED ASSEMBLY. HOOD FAN SHALL NOT PENETRATE RATED ASSEMBLY.
  - ③ 1.5KW WALL HEATER QMARK AHM4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
  - ④ LG PTHP (PACKAGED TERMINAL HEAT PUMP) WITH FACTORY WALL SLEEVE, CONDENSATE DRAIN KIT, AND 42X16 ALUMINUM ARCHITECTURAL GRILLE AT EXTERIOR. INSTALL GRAVITY CONDENSATE DRAIN KIT, PLUMBING CONTRACTOR TO MAKE CONNECTION AT DRAIN KIT AND CONTINUE DRAIN LINE TO AN APPROVED LOCATION.
  - ⑤ SUPPLY AIR OR RETURN GRILLE, SIZED FOR BOTH FREE AREA AND FOR ACTUATOR ACCESS. SEE ① FOR GRILLE INSTALLATION, AND SEE ② FOR TYPICAL F/S INSTALLATION, AND SEE ③ AND ④.
  - ⑥ EXTERIOR EXHAUST PLENUM - SEE ④ MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
  - ⑦ 4" DRYER EXHAUST TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. DRYER DUCT MATERIAL SHALL HAVE A SMOOTH INTERIOR FINISH, BE CONSTRUCTED OF 28 GA SHEET METAL, SUPPORTED AT 4 FOOT INTERVALS, RIGID OR SCREW PENETRATIONS THROUGH THE DUCT WALL ARE NOT ACCEPTABLE. IDENTIFY TOTAL EQUIVALENT LENGTH OF DRYER VENT WITH PERMANENT LABEL, WITHIN 6FT OF DRYER CONNECTION. CLEAN-OUT TO BE PROVIDED FOR ALL VERTICAL RISERS. SEE ⑧.
  - ⑧ SUPPLY DUCT FROM ROOF TO 2ND FLOOR CEILING - TRANSITION TO SMALLER DUCT AFTER SUPPLY BRANCH TAKE OFF. SEE CHART BELOW.
  - ⑨ LEVEL 7 DRYERS VENT DIRECTLY THROUGH ROOF.
  - ⑩ 1" OUTSIDE AIR TO FAN COIL, PROVIDE WITH 2-POSITION DAMPER TO OPEN WHENEVER FAN COIL OPERATES. DAMPER TO BE LOW LEAK CLASS 1 DAMPER.
  - ⑪ NOT USED.
  - ⑫ ROOM TO ROOM TRANSFER FAN, THERMUNID AS-1 WITH WALL MOUNTED SWITCH. SLOWER FAN MOUNTED LOW IN LIVING ROOM WITH HIGH DISCHARGE IN BEDROOM. SET APPROXIMATELY 8" AFF, AND 8" BELOW CEILING. SET BOTH INTAKE AND SUPPLY ABOVE DOOR ON UNITS LOCATED ABOVE ENTRY DOOR.
  - ⑬ FOR 4" AND 6" FIRE PENETRATION DETAILS, PLEASE SEE ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯, ⑰, ⑱, ⑲, ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟, ㊱, ㊲, ㊳, ㊴, ㊵, ㊶, ㊷, ㊸, ㊹, ㊺, ㊻, ㊼, ㊽, ㊾, ㊿.
  - ⑭ (2) 4" AND (1) 6" EXHAUST DUCTS TO MEZZANINE ABOVE.
  - ⑮ REFRIGERANT LINES FROM HEAT PUMPS ON ROOF TO FAN COILS ON FLOORS 1 TO 7.
  - ⑯ REFRIGERANT LINES CAPPED AND SEALED FOR FUTURE TI CONNECTION.
  - ⑰ 1050 W (TYPICAL BEDROOM) & 1500 W (STUDIO) COVE HEATERS, ALL LIVING AREAS TO INCLUDE ELECTRIC COVE HEATERS, IF NOT SERVED BY PTHP OR FAN COIL. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. SEE ⑱.

**SHAFT DUCT SIZES**

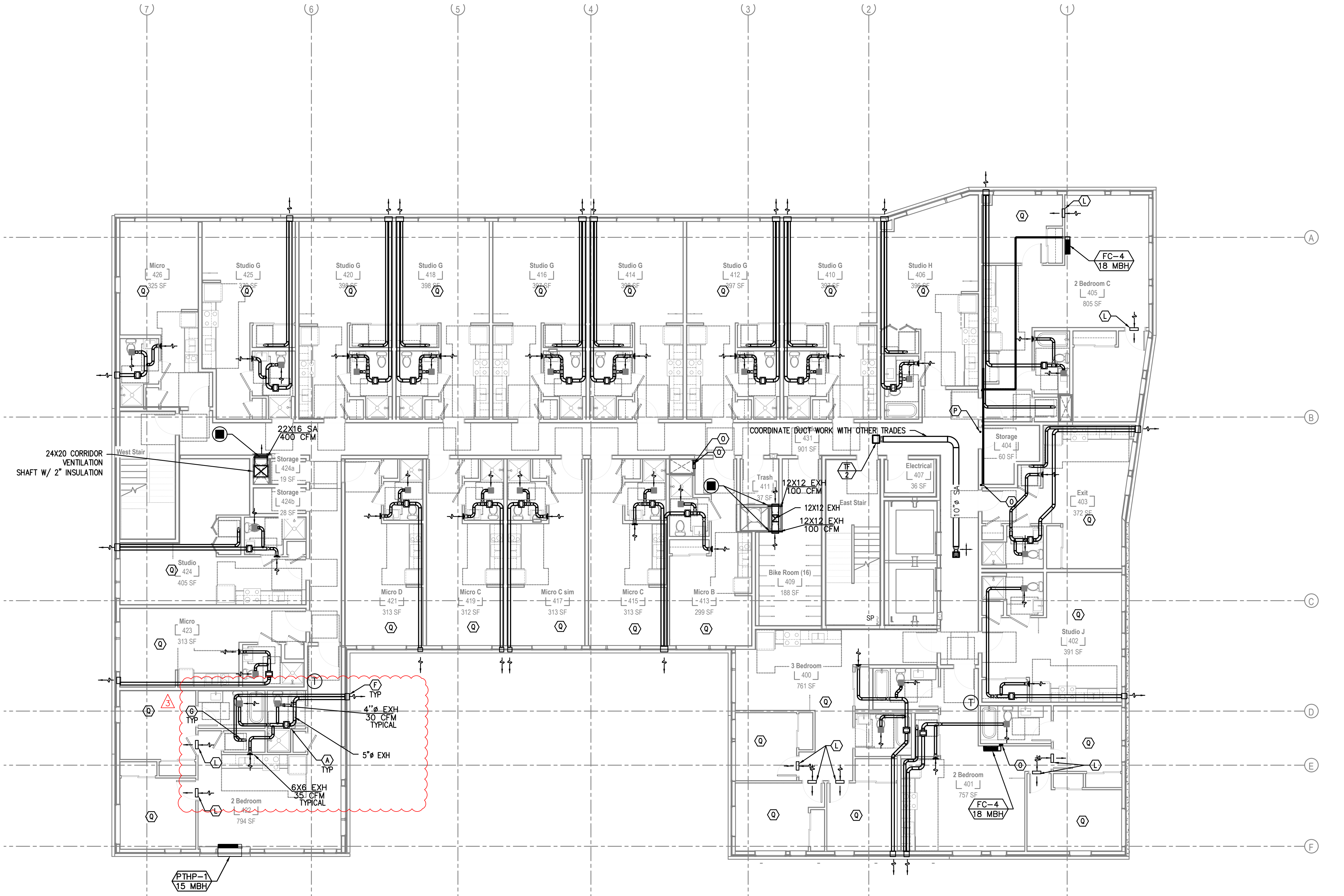
FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 16	1200	NA	0	RTU-1
2ND	18 X 16	800	NA	0	RTU-1
1ST	18 X 12	400	NA	0	RTU-1

**VENTILATION CALCULATIONS:**

ALL DWELLING UNITS ARE VENTILATED BY PTHP'S IN MAIN LIVING AREA, AND NATURAL VENTILATION WITH OPERABLE WINDOWS (NO LIMITERS), BATHROOM EXHAUST FANS RUN CONTINUOUSLY (SIZED PER ASHRAE 62.2).

COMMON SPACES AND HALLWAYS ARE VENTILATED BY RTU'S SIZED TO EXCEED THE MINIMUM 0.06 CFM/SQ FT REQUIREMENT

SEE VENTILATION SCHEDULES FOR OTHER UNITS



**1 LEVEL 4 - MECH PLAN**  
 SCALE: 1/8" = 1'-0"

- GENERAL NOTES:**
- 1. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL ALL UNITS.
  - 2. ALL EXHAUST DISCHARGE FROM THE UNITS SHALL BE MINIMUM 3' FROM THE PROPERTY LINE AND 3' FROM ANY OPENINGS.



- KEY NOTES:**
- ① S&P TD-125 INLINE FAN, PROVIDE NON RATED ACCESS PANEL. KITCHEN AREA 35 CFM, EACH BEDROOM 33 CFM WITH 5" DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. INSULATE FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
  - ② 6" HOOD DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT ASSEMBLY. HOOD FAN NOT USED. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
  - ③ 1.5KW WALL HEATER QMARK AHM4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
  - ④ LG PTHP (PACKAGED TERMINAL HEAT PUMP) WITH FACTORY WALL SLEEVE, CONDENSATE DRAIN KIT, AND 42X16 ALUMINUM ARCHITECTURAL GRILLE AT EXTERIOR. INSTALL GRAVITY CONDENSATE DRAIN KIT, PLUMBING CONTRACTOR TO MAKE CONNECTION AT DRAIN KIT AND CONTINUE DRAIN LINE TO AN APPROVED LOCATION.
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  - ⑥ EXTERIOR EXHAUST PLENUM - SEE ④ MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
  - ⑦ 4" DRYER EXHAUST TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. DRYER DUCT MATERIAL SHALL HAVE A SMOOTH INTERIOR FINISH, BE CONSTRUCTED OF 28 GA SHEET METAL, SUPPORTED AT 4 FOOT INTERVALS, BUILT OR SCREW PENETRATIONS THROUGH THE DUCT WALL ARE NOT ACCEPTABLE. IDENTIFY TOTAL EQUIVALENT LENGTH OF DRYER VENT WITH PERMANENT LABEL WITHIN 6FT OF DRYER CONNECTION. CLEAN-OUT TO BE PROVIDED FOR ALL VERTICAL RISERS. SEE ③.
  - ⑧ SUPPLY DUCT FROM ROOF TO 2ND FLOOR CEILING - TRANSITION TO SMALLER DUCT AFTER SUPPLY BRANCH TAKE OFF. SEE CHART BELOW.
  - ⑨ LEVEL 7 DRYERS VENT DIRECTLY THROUGH ROOF.
  - ⑩ 2" OUTSIDE AIR TO FAN COIL, PROVIDE WITH 2-POSITION DAMPER TO OPEN WHENEVER FAN COIL OPERATES. DAMPER TO BE LOW LEAK CLASS 1 DAMPER.
  - ⑪ NOT USED.
  - ⑫ ROOM TO ROOM TRANSFER FAN. TIERNUNLD AS-1 WITH WALL MOUNTED SWITCH. SLOWER FAN MOUNTED LOW IN LIVING ROOM WITH HIGH DISCHARGE IN BEDROOM. SET APPROXIMATELY 8" AFF, AND 8" BELOW CEILING. SET BOTH INTAKE AND SUPPLY ABOVE DOOR ON UNITS LOCATED ABOVE ENTRY DOOR.
  - ⑬ FOR 4" AND 6" FIRE PENETRATION DETAILS, PLEASE SEE ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯, ⑰, ⑱, ⑲, ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟, ㊱, ㊲, ㊳, ㊴, ㊵, ㊶, ㊷, ㊸, ㊹, ㊺, ㊻, ㊼, ㊽, ㊾, ㊿.
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  - ⑯ REFRIGERANT LINES CAPPED AND SEALED FOR FUTURE TI CONNECTION.
  - ⑰ 1050 W (TYPICAL BEDROOM) & 1500 W (STUDIO) COVE HEATERS, ALL LIVING AREAS TO INCLUDE ELECTRIC COVE HEATERS, IF NOT SERVED BY PTHP OR FAN COIL. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. SEE ③.

CHECKSHEET RESPONSES #1  
 CHECKSHEET RESPONSES #2  
 CHECKSHEET RESPONSES #3

02.22.2021  
 06.25.2021  
 05.12.2022

06.08.2021  
 997  
 MGA  
 MGA  
 MGA  
 MGA

Date: 06.08.2021  
 Proj No: 997  
 Drawn By: MGA  
 Chkd By: MRD  
 DSN By: MGA  
 Acad File:

**SHAFT DUCT SIZES**

FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 16	1200	NA	0	RTU-1
2ND	18 X 16	800	NA	0	RTU-1
1ST	18 X 12	400	NA	0	RTU-1

**VENTILATION CALCULATIONS:**

ALL DWELLING UNITS ARE VENTILATED BY PTHP'S IN MAIN LIVING AREA, AND NATURAL VENTILATION WITH OPERABLE WINDOWS (NO LIMITERS), BATHROOM EXHAUST FANS RUN CONTINUOUSLY (SIZED PER ASHRAE 62.2).

COMMON SPACES AND HALLWAYS ARE VENTILATED BY RTU'S SIZED TO EXCEED THE MINIMUM 0.06 CFM/SQ FT REQUIREMENT

SEE VENTILATION SCHEDULES FOR OTHER UNITS

**ANALOG PDX**  
 1871 N FLINT AVE  
 PORTLAND OREGON 97227

**LEVEL 5 - MECH PLAN**

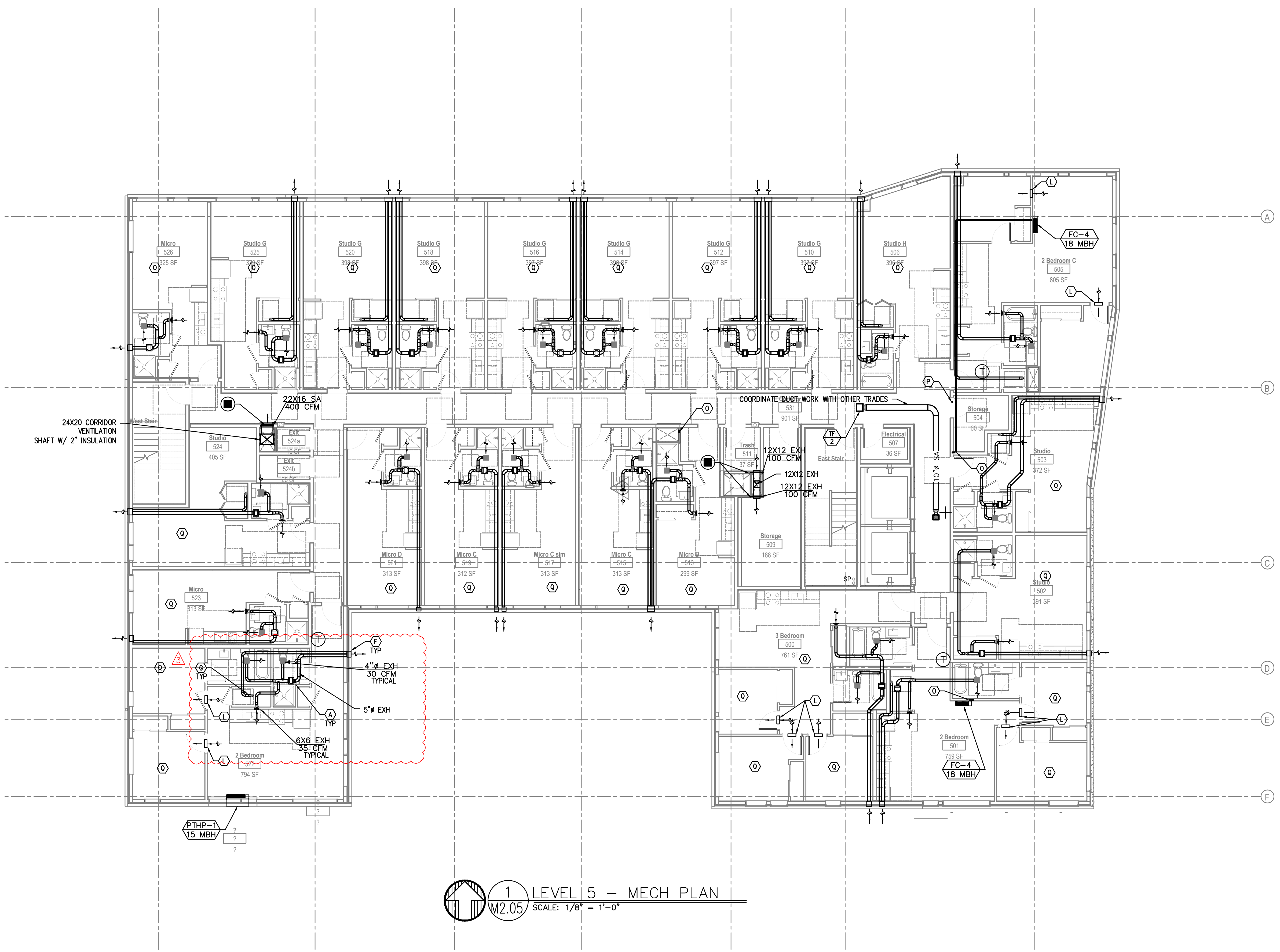
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SHEET

**M2.05**



**1 LEVEL 5 - MECH PLAN**  
 M2.05 SCALE: 1/8" = 1'-0"

- GENERAL NOTES:**
1. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL ALL UNITS.
  2. ALL EXHAUST DISCHARGE FROM THE UNITS SHALL BE MINIMUM 3' FROM THE PROPERTY LINE AND 3' FROM ANY OPENINGS.



CHECKSHEET #1	02.22.2021	06.08.2021	06.08.2021	06.08.2021
RESPONSES #1				
CHECKSHEET #2	06.25.2021	09.17.2021	09.17.2021	09.17.2021
RESPONSES #2				
CHECKSHEET #3	05.12.2022			
RESPONSES #3				
Date:	06.08.2021	09.17.2021	09.17.2021	09.17.2021
Proj No:	997	MGA	MGA	MGA
Drawn By:	MGA	MRD	MRD	MRD
Chkd By:	MGA	MGA	MGA	MGA
DSGN By:	MGA	MGA	MGA	MGA
Acad File:				

- KEY NOTES:**
- S&P TD-125 INLINE FAN, PROVIDE NON RATED ACCESS PANEL. KITCHEN AREA 35 CFM, EACH BEDROOM 30 CFM WITH 5" DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. INSULATE FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
  - 6" HOOD DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT ASSEMBLY. HOOD FAN NOT USED. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
  - 1.5KW WALL HEATER QMARK AHW4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
  - LG PTHP (PACKAGED TERMINAL HEAT PUMP) WITH FACTORY WALL SLEEVE, CONDENSATE DRAIN KIT, AND 42X16 ALUMINUM ARCHITECTURAL GRILLE AT EXTERIOR. INSTALL GRAVITY CONDENSATE DRAIN KIT, PLUMBING CONTRACTOR TO MAKE CONNECTION AT DRAIN KIT AND CONTINUE DRAIN LINE TO AN APPROVED LOCATION.
  - SUPPLY AIR OR RETURN GRILLE, SIZED FOR BOTH FREE AREA AND FOR ACTUATOR ACCESS. SEE 1 FOR GRILLE INSTALLATION, AND SEE 2 FOR TYPICAL F/S INSTALLATION.
  - EXTERIOR EXHAUST PLENUM - SEE 1 MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
  - 4" DRYER EXHAUST TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. DRYER DUCT MATERIAL SHALL HAVE A SMOOTH INTERIOR FINISH, BE CONSTRUCTED OF 28 GA SHEET METAL, SUPPORTED AT 4 FOOT INTERVALS, BRICK OR SCREW PENETRATIONS THROUGH THE DUCT WALL ARE NOT ACCEPTABLE. IDENTIFY TOTAL EQUIVALENT LENGTH OF DRYER VENT WITH PERMANENT LABEL WITHIN 6FT OF DRYER CONNECTION. CLEAN-OUT TO BE PROVIDED FOR ALL VERTICAL RISERS. SEE 2.
  - SUPPLY DUCT FROM ROOF TO 2ND FLOOR CEILING - TRANSITION TO SMALLER DUCT AFTER SUPPLY BRANCH TAKE OFF. SEE CHART BELOW.
  - LEVEL 7 DRYERS VENT DIRECTLY THROUGH ROOF.
  - 4" OUTSIDE AIR TO FAN COIL, PROVIDE WITH 2-POSITION DAMPER TO OPEN WHENEVER FAN COIL OPERATES. DAMPER TO BE LOW LEAK CLASS 1 DAMPER.
  - NOT USED.
  - ROOM TO ROOM TRANSFER FAN. TURNLUND AS-1 WITH WALL MOUNTED SWITCH. SLOWER FAN MOUNTED LOW IN LIVING ROOM WITH HIGH DISCHARGE IN BEDROOM. SET APPROXIMATELY 8" AFF, AND 8" BELOW CEILING. SET BOTH INTAKE AND SUPPLY ABOVE DOOR ON UNITS LOCATED ABOVE ENTRY DOOR.
  - FOR 4" AND 6" FIRE PENETRATION DETAILS, PLEASE SEE 1 AND 2.
  - (2) 4" AND (1) 6" EXHAUST DUCTS TO MEZZANINE ABOVE.
  - REFRIGERANT LINES FROM HEAT PUMPS ON ROOF TO FAN COILS ON FLOORS 1 TO 7.
  - REFRIGERANT LINES CAPPED AND SEALED FOR FUTURE TI CONNECTION.
  - 1500 W (TYPICAL BEDROOM) & 1500 W (STUDIO) COVE HEATERS, ALL LIVING AREAS TO INCLUDE ELECTRIC COVE HEATERS, IF NOT SERVED BY PTHP OR FAN COIL. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. SEE 8.

**SHAFT DUCT SIZES**

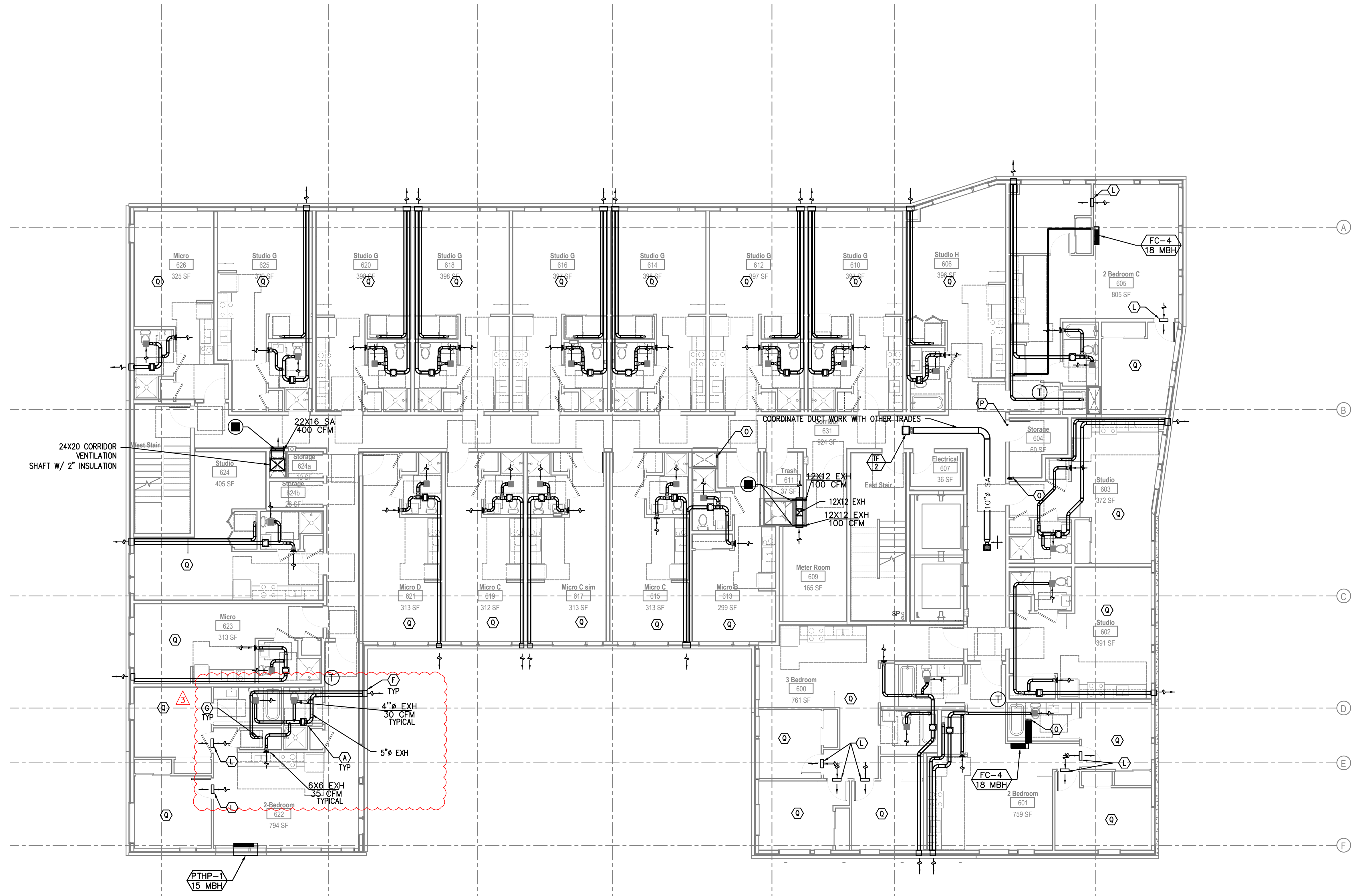
FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 16	1200	NA	0	RTU-1
2ND	18 X 16	800	NA	0	RTU-1
1ST	18 X 12	400	NA	0	RTU-1

**VENTILATION CALCULATIONS:**

ALL DWELLING UNITS ARE VENTILATED BY PTHP'S IN MAIN LIVING AREA, AND NATURAL VENTILATION WITH OPERABLE WINDOWS (NO LIMITERS), BATHROOM EXHAUST FANS RUN CONTINUOUSLY (SIZED PER ASHRAE 62.2).

COMMON SPACES AND HALLWAYS ARE VENTILATED BY RTU'S SIZED TO EXCEED THE MINIMUM 0.06 CFM/SQ FT REQUIREMENT

SEE VENTILATION SCHEDULES FOR OTHER UNITS



1 LEVEL 6 - MECH PLAN  
 M2.06 SCALE: 1/8" = 1'-0"

**GENERAL NOTES:**

- ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL ALL UNITS.
- ALL EXHAUST DISCHARGE FROM THE UNITS SHALL BE MINIMUM 3' FROM THE PROPERTY LINE AND 3' FROM ANY OPENINGS.

**ANALOG PDX**  
 1871 N FLINT AVE  
 PORTLAND OREGON 97227

**LEVEL 6 - MECH PLAN**

CONSTRUCTION DOCUMENTS  
 09.22.2020



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SHEET

**M2.06**



CHECKSHEET #1	02.22.2021	06.08.2021	06.08.2021	06.08.2021
RESPONSES #1				
CHECKSHEET #2	06.25.2021	09.07.2021	09.07.2021	09.07.2021
RESPONSES #2				
CHECKSHEET #3	05.12.2022	MGA	MGA	MGA
RESPONSES #3				

Date: 06.08.2021  
 Proj No: 997  
 Drawn By: MGA  
 Chkd By: MRD  
 DSN By: MGA  
 Acad File:

**ANALOG PDX**  
 1871 N FLINT AVE  
 PORTLAND OREGON 97227

**LEVEL 7 - MECH PLAN**

CONSTRUCTION DOCUMENTS  
 09.22.2020



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SHEET

**M2.07**

- KEY NOTES:**
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  - ⑨ LEVEL 7 DRYERS VENT DIRECTLY THROUGH ROOF.
  - ⑩ 2" OUTSIDE AIR TO FAN COIL. PROVIDE WITH 2-POSITION DAMPER TO OPEN WHENEVER FAN COIL OPERATES. DAMPER TO BE LOW LEAK CLASS 1 DAMPER.
  - ⑪ NOT USED.
  - ⑫ ROOM TO ROOM TRANSFER FAN. TURNING AS-1 WITH WALL MOUNTED SWITCH. BLOWER FAN MOUNTED LOW IN LIVING ROOM WITH HIGH DISCHARGE IN BEDROOM. SET APPROXIMATELY 8" AFF, AND 8" BELOW CEILING. SET BOTH INTAKE AND SUPPLY ABOVE DOOR ON UNITS LOCATED ABOVE ENTRY DOOR.
  - ⑬ FOR 4" AND 6" FIRE PENETRATION DETAILS, PLEASE SEE ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯, ⑰, ⑱, ⑲, ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟, ㊱, ㊲, ㊳, ㊴, ㊵, ㊶, ㊷, ㊸, ㊹, ㊺, ㊻, ㊼, ㊽, ㊾, ㊿.
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**SHAFT DUCT SIZES**

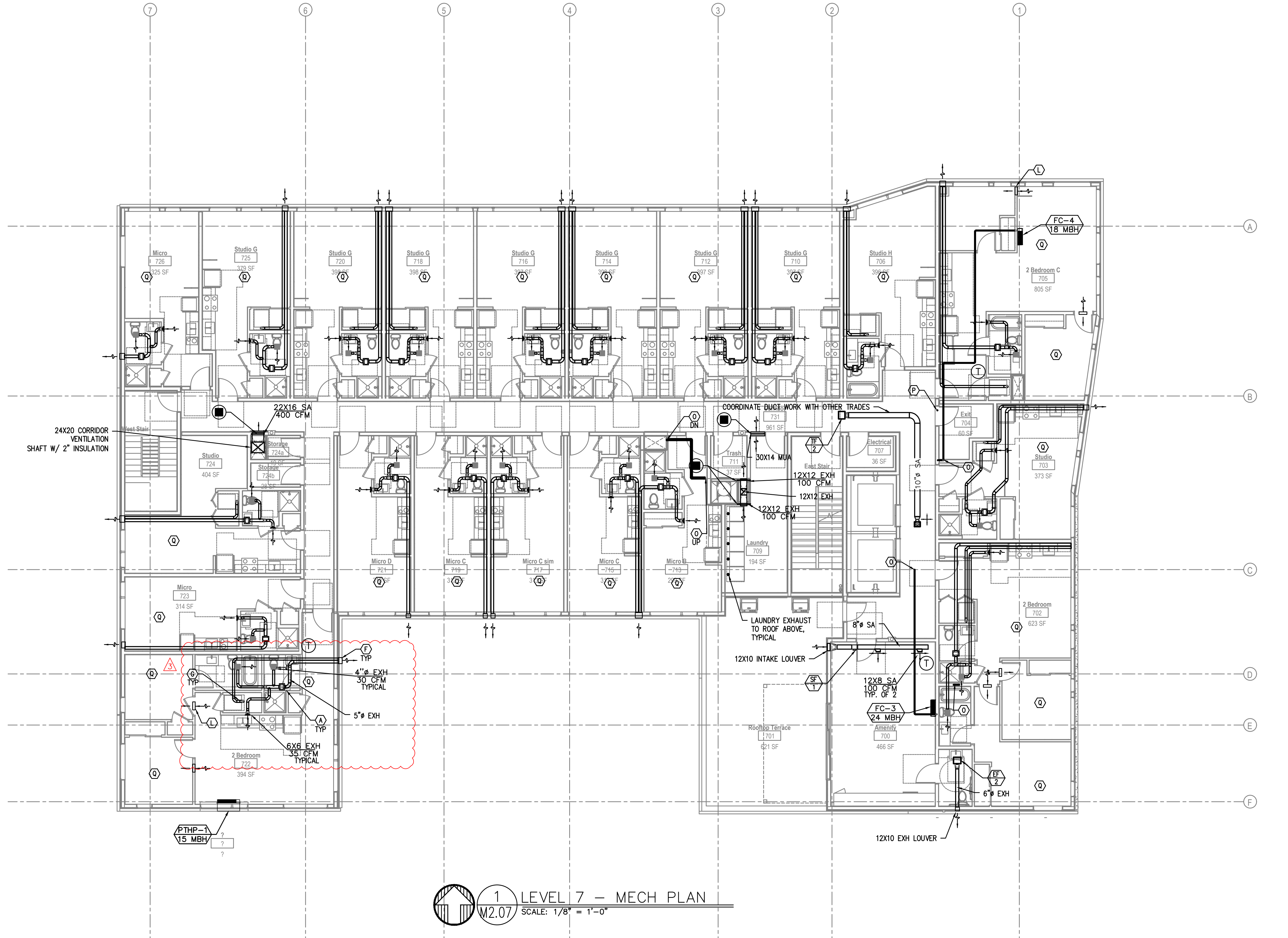
FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 18	1200	NA	0	RTU-1
2ND	18 X 16	800	NA	0	RTU-1
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**VENTILATION CALCULATIONS:**

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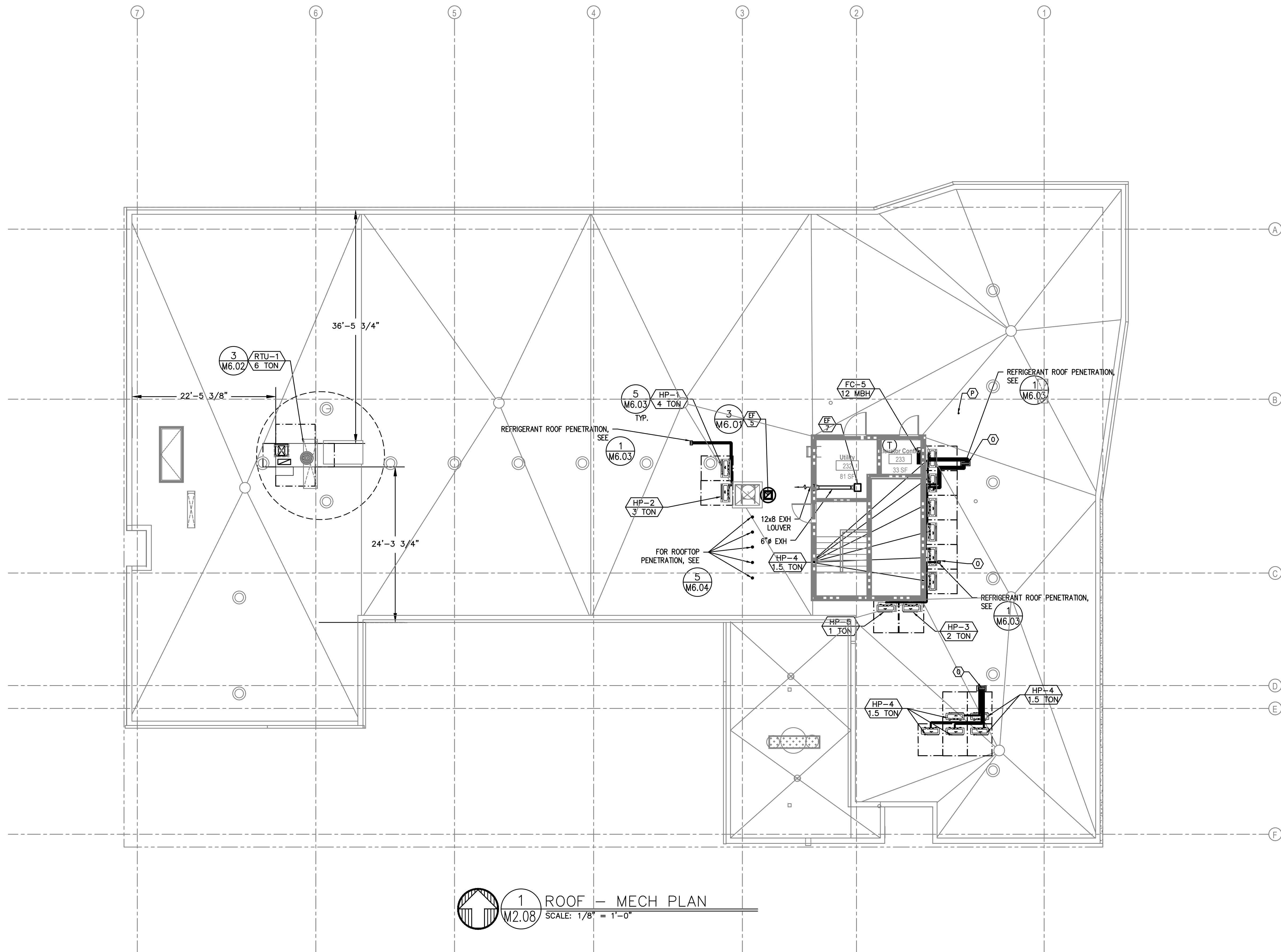
SEE VENTILATION SCHEDULES FOR OTHER UNITS



**1 LEVEL 7 - MECH PLAN**  
 M2.07 SCALE: 1/8" = 1'-0"

- GENERAL NOTES:**
1. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL ALL UNITS.
  2. ALL EXHAUST DISCHARGE FROM THE UNITS SHALL BE MINIMUM 3' FROM THE PROPERTY LINE AND 3' FROM ANY OPENINGS.





1 ROOF - MECH PLAN  
 M2.08 SCALE: 1/8" = 1'-0"

- KEY NOTES:**
- ① S&P TD-125 INLINE FAN, PROVIDE NON RATED ACCESS PANEL. KITCHEN AREA 35 CFM, EACH BEDROOM 33 CFM WITH 5" DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. INSULATE FINAL 5' OF DUCTWORK. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
  - ② 6" HOOD DUCT TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. BACK DRAFT VALVE SHALL BE PROVIDED. HOOD FAN SHALL NOT PENETRATE RATED ASSEMBLY. HOOD FAN SHALL NOT PENETRATE RATED ASSEMBLY.
  - ③ 1.5KW WALL HEATER QMARK AHM4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
  - ④ LG PTHP (PACKAGED TERMINAL HEAT PUMP) WITH FACTORY WALL SLEEVE, CONDENSATE DRAIN KIT, AND 42X16 ALUMINUM ARCHITECTURAL GRILLE AT EXTERIOR. INSTALL GRAVITY CONDENSATE DRAIN KIT, PLUMBING CONTRACTOR TO MAKE CONNECTION AT DRAIN KIT AND CONTINUE DRAIN LINE TO AN APPROVED LOCATION.
  - ⑤ SUPPLY AIR OR RETURN GRILLE, SIZED FOR BOTH FREE AREA AND FOR ACTUATOR ACCESS. SEE ① FOR GRILLE INSTALLATION, AND SEE ② FOR TYPICAL F/S INSTALLATION.
  - ⑥ EXTERIOR EXHAUST PLENUM - SEE ④ MAINTAIN 36" CLEAR TO OPERABLE WINDOWS AND DOORS.
  - ⑦ 4" DRYER EXHAUST TO EXTERIOR WALL TERMINATION VIA SOFFIT(S) PROVIDED. DRYER DUCT MATERIAL SHALL HAVE A SMOOTH INTERIOR FINISH, BE CONSTRUCTED OF 28 GA SHEET METAL, SUPPORTED AT 4 FOOT INTERVALS, BRICK OR SCREW PENETRATIONS THROUGH THE DUCT WALL ARE NOT ACCEPTABLE. IDENTIFY TOTAL EQUIVALENT LENGTH OF DRYER VENT WITH PERMANENT LABEL, WITHIN 6FT OF DRYER CONNECTION. CLEAN-OUT TO BE PROVIDED FOR ALL VERTICAL RISERS. SEE ③.
  - ⑧ SUPPLY DUCT FROM ROOF TO 2ND FLOOR CEILING - TRANSITION TO SMALLER DUCT AFTER SUPPLY BRANCH TAKE OFF. SEE CHART BELOW.
  - ⑨ LEVEL 7 DRYERS VENT DIRECTLY THROUGH ROOF.
  - ⑩ 2" OUTSIDE AIR TO FAN COIL, PROVIDE WITH 2-POSITION DAMPER TO OPEN WHENEVER FAN COIL OPERATES. DAMPER TO BE LOW LEAK CLASS 1 DAMPER.
  - ⑪ NOT USED.
  - ⑫ ROOM TO ROOM TRANSFER FAN, THERMAL AS-1 WITH WALL MOUNTED SWITCH. SLOWER FAN MOUNTED LOW IN LIVING ROOM WITH HIGH DISCHARGE IN BEDROOM. SET APPROXIMATELY 8" AFF, AND 8" BELOW CEILING. SET BOTH INTAKE AND SUPPLY ABOVE DOOR ON UNITS LOCATED ABOVE ENTRY DOOR.
  - ⑬ FOR 4" AND 6" FIRE PENETRATION DETAILS, PLEASE SEE ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, ⑪, ⑫, ⑬, ⑭, ⑮, ⑯, ⑰, ⑱, ⑲, ⑳, ㉑, ㉒, ㉓, ㉔, ㉕, ㉖, ㉗, ㉘, ㉙, ㉚, ㉛, ㉜, ㉝, ㉞, ㉟, ㊱, ㊲, ㊳, ㊴, ㊵, ㊶, ㊷, ㊸, ㊹, ㊺, ㊻, ㊼, ㊽, ㊾, ㊿.
  - ⑭ (2) 4" AND (1) 6" EXHAUST DUCTS TO MEZZANINE ABOVE.
  - ⑮ REFRIGERANT LINES FROM HEAT PUMPS ON ROOF TO FAN COILS ON FLOORS 1 TO 7.
  - ⑯ REFRIGERANT LINES CAPPED AND SEALED FOR FUTURE TI CONNECTION.
  - ⑰ 1050 W (TYPICAL BEDROOM) & 1500 W (STUDIO) COVE HEATERS, ALL LIVING AREAS TO INCLUDE ELECTRIC COVE HEATERS, IF NOT SERVED BY PTHP OR FAN COIL. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. SEE ⑧.

**SHAFT DUCT SIZES**

FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 16	1200	NA	0	RTU-1
2ND	18 X 16	800	NA	0	RTU-1
1ST	18 X 12	400	NA	0	RTU-1

**VENTILATION CALCULATIONS:**

ALL DWELLING UNITS ARE VENTILATED BY PTHP'S IN MAIN LIVING AREA, AND NATURAL VENTILATION WITH OPERABLE WINDOWS (NO LIMITERS), BATHROOM EXHAUST FANS RUN CONTINUOUSLY (SIZED PER ASHRAE 62.2).

COMMON SPACES AND HALLWAYS ARE VENTILATED BY RTU'S SIZED TO EXCEED THE MINIMUM 0.06 CFM/SQ FT REQUIREMENT

SEE VENTILATION SCHEDULES FOR OTHER UNITS

- GENERAL NOTES:**
- 1. ALL ELECTRIC HEATERS PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR. TYPICAL ALL UNITS.
  - 2. ALL EXHAUST DISCHARGE FROM THE UNITS SHALL BE MINIMUM 3' FROM THE PROPERTY LINE AND 3' FROM ANY OPENINGS.

CHECKSHEET RESPONSES #1

RESPONSES #1	RESPONSES #2	RESPONSES #3
02.22.2021	06.25.2021	05.12.2022
06.08.2021	09.07	MRD
Proj No:	997	MGA
Drawn By:		MRD
Chkd By:		MGA
DSGN By:		MGA
Acad File:		

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**ROOF - MECH PLAN**



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SHEET

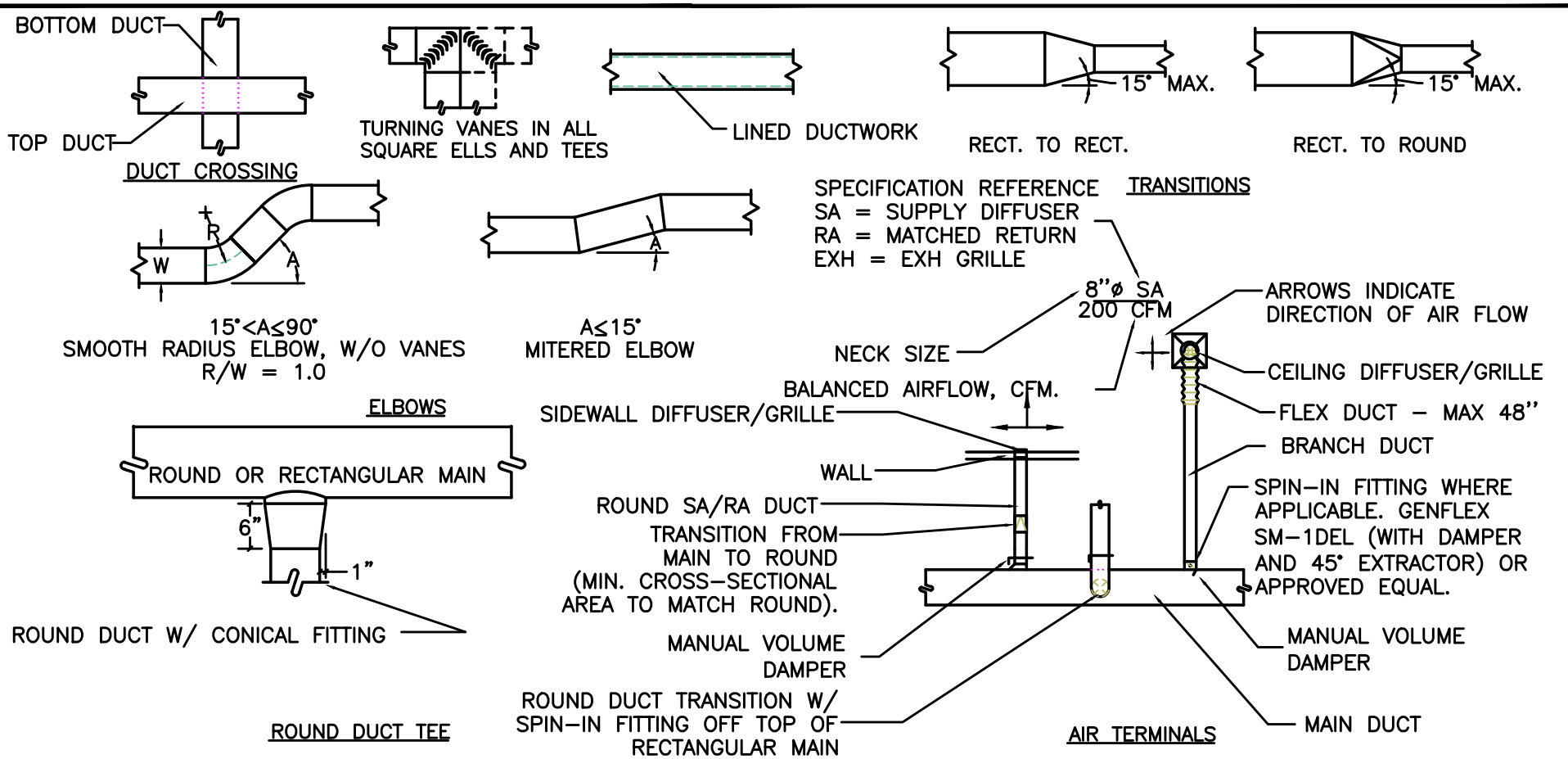
**M2.08**



# MECHANICAL LEGEND

	SUPPLY AIR DIFFUSER	AFF	ABOVE FINISH FLOOR
	RETURN AIR GRILLE	AHU	AIR HANDLING UNIT
	EXHAUST AIR GRILLE	B.D.	BOTTOM OF DUCT
	PERFORATED RETURN AIR PANEL	BHP	BRAKE HORSEPOWER
	DIRECTIONAL AIR FLOW	BTU	BRITISH THERMAL UNITS
	MANUAL VOLUME DAMPER	CFM	CUBIC FEET PER MINUTE
	SUPPLY OR OUTSIDE AIR DUCT UP & DOWN	CONN.	CONNECTION
	RETURN AIR DUCT UP & DOWN	CONT.	CONTINUATION
	EXHAUST AIR DUCT UP & DOWN	CW	DOMESTIC COLD WATER
	VAV TERMINAL UNIT	DB	DRY BULB
	WT TERMINAL UNIT	DIA.	DIAMETER
	EXISTING	DIST.	DISTRIBUTION
	CONNECT TO EXISTING	EA	EXHAUST AIR
	THERMOSTAT OR TEMP. SENSOR	EDB	ENTERING DRY BULB TEMPERATURE
	NOTE	EWT	ENTERING WATER TEMPERATURE
	EQUIPMENT DESIGNATOR	FF	FINISH FLOOR
	BALL VALVE	FKT.	FIXTURE
	GATE VALVE	FPM	FEET PER MINUTE
	CHECK VALVE	FPS	FEET PER SECOND
	BALANCING VALVE	FT.	FEET / FOOT
	THERMOMETER	GA.	GAUGE
	DIRECTION OF FLOW	GPM	GALLONS PER MINUTE
	PUMP	H	HEIGHT
	STRAINER	HP	HORSEPOWER
	PRESSURE GAUGE	I.D.	INSIDE DIAMETER
	PETE'S PLUG	IN.	INCHES
	DOUBLE CHECK ASSEMBLY	L	LENGTH
	PRESSURE REDUCING VALVE	LBS.	POUNDS
	UNION	LDB	LEAVING DRY BULB
	2-WAY CONTROL VALVE	LWB	LEAVING WET BULB
	3-WAY CONTROL VALVE	LWT	LEAVING WATER TEMPERATURE
	CAP	MAX.	MAXIMUM
	SMOKE DETECTOR	MBH	THOUSANDS OF BTUs PER HOUR
	MOTORIZED DAMPER	MIN.	MINIMUM
		NC	NOISE CRITERIA
		N.C.	NORMALLY CLOSED
		N.I.M.	NOT IN MECHANICAL
		NO.	NUMBER
		N.O.	NORMALLY OPEN
		O.A.	OUTSIDE AIR
		P	PERSON
		PSI	POUNDS PER SQUARE INCH
		P/T	PRESSURE / TEMPERATURE
		R.A.	RETURN AIR
		RECT.	RECTANGULAR
		REQ'D	REQUIRED
		S.A.	SUPPLY AIR
		S.P.	STATIC PRESSURE
		SQ.	SQUARE
		TEMP.	TEMPERATURE
		TYP.	TYPICAL
		VAV	VARIABLE AIR VOLUME
		W	WIDTH
		WB	WET BULB
		WPD	WATER PRESSURE DROP
		Ø	DIAMETER
			(E) EXISTING
			(D) DEMOLISH
			NEW WORK
			HWS (HWS) HEATING WATER SUPPLY
			HWR (HWR) HEATING WATER RETURN
			FIRE DAMPER
			FIRE / SMOKE DAMPER
			SMOKE DAMPER
			SEISMIC BRACING
			LATERAL BRACING
			LONGITUDINAL BRACING
			LONGITUDINAL & LATERAL BRACING

# AIR DISTRIBUTION DETAILS



# ROOFTOP HVAC UNITS

MARK NUMBER	RTU-1 6 TON
SYSTEM	CORRIDOR
TYPE	C.V.
DISCHARGE	VERTICAL
TOTAL CFM	2400
ECONOMIZER	NO
MIN. OSA	2400 - 100%
MAX OSA (FULL OCCUPANCY)	NA
CO2 CONTROL	NA
EXTERNAL SP. ("H2O)	0.75
TOTAL SP. ("H2O)	---
RPM	731
WHEEL TYPE/ SIZE	F.C. --- (DIRECT)
MOTOR HP.	1.32 BHP
POWER EXH FAN/ACCESSORY	NONE
MIN FILTER SIZE	4-16X20
FILTER TYPE	2"- 30%
GAS INPUT/OUTPUT (MBH)	150/120
EFF. (AFUE)	80.0%
STAGES/TYPE	2-S.S. HIGH HEAT
TOTAL CLG. (TONS)	6.0
SENSIBLE CLG. (MBH)	65.48
ENT. EVAP AIR TEMP (DB/WB.)	90/67
LVG. EVAP AIR TEMP (DB/WB.)	55/54
AMBIENT AIR (°F)	95
EER/IERR	12/14
REFRIGERANT	410A
REFRIGERANT CHARGE	14 LBS
DESIGN WEIGHT (LBS.)	1000
SMOKE DETECTOR (RETURN DUCT)	NO
SPRING ISOLATION ROOF CURB	YES
CONVENIENCE OUTLET - ALWAYS POWERED	NO
VOLTAGE/PHASE - ***	208/3
MCA/MOCP - ***	34/50 AMPS
BASIS OF DESIGN - CARRIER MODEL	48HCTD07A2A5

\*\*\* - ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

# PACKAGED TERMINAL HEAT PUMP

MARK NUMBER	PTH-1 15 MBH
TYPE	THRU-THE-WALL HEAT PUMP
SYSTEM	2-BEDROOM
NOMINAL COOLING CAPACITY (BTUH)	14,000
HEATING CAPACITY (BTUH)	13,800
47°F OUTDOOR AIR TEMP	
ELECTRIC HEATING CAPACITY (KW)	5.0
CFM (HI/LOW) (WET COIL)	340/314
MIN OSA (CFM)	65 CFM
LVG. AIR TEMP (°F)	55°F
REMOTE THERMOSTAT	YES
EFFICIENCY (EER)	9.6
EFFICIENCY (COP)	2.9
ARCHITECTURAL GRILLE 42x16	YES
DESIGN WT. (LBS)	130
ELECT (VOLTS/PHASE/HTZ) - ***	230/1/60
TOTAL AMPS - ***	15.5
MCA/MOP - ***	19.5/20
REFRIGERANT	410a
REFRIGERANT CHARGE	1.95 LBS
CONDENSATE DRAIN KIT *	YES - *
BASIS OF DESIGN: AMANA	PTH153EG50A

\* - CONDENSATE DRAIN KIT PROVIDED BY MECHANICAL CONTRACTOR, ALL CONDENSATE PIPING TO BE PROVIDED AND INSTALLED BY PLUMBING CONTRACTOR FROM PTHP TO HUB DRAINS PROVIDED BY PLUMBING CONTRACTOR.  
 \*\*\* - ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS

# GARAGE EXHAUST FANS

MARK NUMBER	GEF-1
TYPE	SQ IN-LINE BELT DRIVE
SYSTEM	GARAGE
CFM	2,513
TOTAL SP. (IN H2O)	0.25
RPM	1,414
TIP SPEED (FPM)	5,391
MOTOR WATTS OR HP	3/4 HP
CONTROLLED BY	CO/NO2
INTERLOCK WITH	NONE
FAN SPEED CONTROLLER	NO
WHEEL TYPE	BI
BACK DRAFT DAMPER	NONE
ISOLATION	SPRING
DESIGN WEIGHT (LBS)	90
MAX. SONES OR dBA	13.9 SONES
MAX AMPS - ***	10.6 FLA
POWER (VOLTS/PHASE/HZ) - ***	208/60/1
BASIS OF DESIGN:	GREENHECK SQ-140-VG

\*\*\* - ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS. ELECTRICAL CONTRACTOR RESPONSIBLE FOR SIZING ALL CONDUCTORS & OVERCURRENT PROTECTION. VERIFY WITH EQUIPMENT SUBMITTALS FOR EQUIPMENT ELECTRICAL REQUIREMENTS

# INDOOR UNITS - \*

MARK NUMBER	FC-1 48 MBH	FC-2 36 MBH	FC-3 24 MBH	FC-4 18 MBH	FC-5 12 MBH
SYSTEM	LOBBY/MAIL/OFFICE	FITNESS	AMENITY	2 BEDROOM	ELEVATOR MACHINE ROOM
TYPE	DUCTED	DUCTED	WALL MOUNTED	WALL MOUNTED	WALL HUNG
EFFICIENCY	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT	SEE OUTDOOR UNIT
NOMINAL COOLING CAPACITY	48,000 BTUH	36,000 BTUH	24,000 BTUH	18,000 BTUH	12,000 BTUH
HEATING CAPACITY	48,000 BTUH	36,000 BTUH	24,000 BTUH	18,000 BTUH	12,000 BTUH
TOTAL SUPPLY CFM	1600	1200	640	550	380
OSA CFM	-	-	-	-	-
EXTERNAL SP. ("H2O)	0.25	0.25	0.25	0.25	0.25
VOLTS/PHASE	-	-	-	-	-
MCA/MOP	3.2/-	2.4/-	0.45/-	0.4/-	-
WEIGHT	120	106	106	106	20
BASIS OF DESIGN	CARRIER 40MBDQ48---3	CARRIER 40MBDQ36---3	CARRIER 40MHHC24---3	CARRIER 40MHHC18---3	CARRIER 40MAQB12B
OUTDOOR UNIT	HP-1 4 TON	HP-2 3 TON	HP-3 2 TON	HP-4 1.5 TON	HP-5 1 TON

\* - PROVIDE ALL UNITS THAT CANNOT BE DRAINED BY GRAVITY WITH CONDENSATE PUMP, ROUTE ALL CONDENSATE LINES HIDDEN WITHIN STRUCTURE TO AN APPROVED LOCATION PROVIDED BY THE PLUMBER.

# OUTDOOR UNITS - SPLIT SYSTEM HP

MARK NUMBER	HP-1 4 TON	HP-2 3 TON	HP-3 2 TON	HP-4 1.5 TON	HP-5 1 TON
SYSTEM	LOBBY/MAIL/OFFICE	FITNESS	AMENITY	2 BEDROOM	ELEVATOR MACHINE ROOM
TYPE	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP	1-PORT HEAT PUMP
NORMAL COOLING CAPACITY	48000 BTUH	36,000 BTUH	24000 BTUH	18,000 BTUH	12,000 BTUH
NORMAL HEATING CAPACITY	48000 BTUH	36,000 BTUH	24,000 BTUH	18,000 BTUH	12,000 BTUH
EFFICIENCY SEER/EER	17.4/9.2	16.5/9	17.3/9.7	19/11.2	21.5/13
EFFICIENCY HSPF/COP	10.3/3.6	11.5/3	9.6/3.13	10.6/3.26	10/3.36
REFRIGERANT	410 A	410 A	410 A	410 A	410 A
REFRIGERANT CHARGE	9.26 LBS	6.72 LBS	3.97 LBS	2.82 LBS	X LBS
MAX OPERATING TEMPS	122/-22	122/-22	122/-17	122/-17	122/-4
MAX PIPING LENGTH	213 FT	213 FT	164 FT	98 FT	82 FT
MAX PIPING HEIGHT	98 FT	98 FT	66 FT	66 FT	32 FT
VOLTS-PHASE - **	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE	208/230-1 PHASE
MCA/MOP - **	35/50 AMPS	30/50 AMPS	18/25 AMPS	15/20 AMPS	15/15 AMPS
COMPRESSOR	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED	VARIABLE SPEED
WEIGHT	217 LBS	136 LBS	114 LBS	80 LBS	85 LBS
BASIS OF DESIGN	CARRIER 38MBRQ48A---3	CARRIER 38MBRQ36A---3	CARRIER 38MHRBQ24AA3	CARRIER 38MHRBQ24AA3	CARRIER 38MAQB12-3

\*\* - ELECTRICAL DATA LISTED FOR REFERENCE ONLY, COORDINATE WITH ELECTRICAL DESIGN BUILD CONTRACTOR FOR VOLTAGE AND PHASE REQUIREMENTS



CHECKSHEET #1	02.22.2021
CHECKSHEET #2	06.25.2021
CHECKSHEET #3	05.12.2022
Date:	06.08.2021
Proj No:	997
Drawn By:	MGA
Chkd By:	MRD
DSN By:	MGA
Acad File:	

ANALOG PDX  
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 MECHANICAL SCHEDULES  
 PORTLAND OREGON 97227

CONSTRUCTION DOCUMENTS  
 09.22.2020



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SHEET

M6.00



EXHAUST FANS

MARK NUMBER	EF 1	EF 2	EF 3	EF 4	EF 5	EF 6	EF 7	TF 1	TF 2
TYPE	IN-LINE 5"Ø	CEILING CABINET	CEILING CABINET	CEILING CABINET	ROOF DIRECT DRIVE	CEILING CABINET	CEILING CABINET	DIRECT DRIVE	CEILING CABINET
SYSTEM	1-BEDROOM	RESTROOM	TRASH 108	ELECTRICAL	TRASH 711-211 BIKE/METER 709-209	BIKE ROOM 120	UTILITY	BEDROOM	CORRIDOR
CFM	65/95	100	300	200	1300	200	100	60	300
TOTAL SP. (IN H2O)	0.375	0.125	0.25	0.125	0.75	0.125	0.125	---	0.125
RPM	2146	1250	940	740	1568	740	1250	FIXED	2500
TIP SPEED (FPM)	NA	---	---	---	5362	---	---	---	---
MOTOR WATTS OR HP	38 W	100 W	212 W	127 W	1/2 HP	127 W	100 W	20 W	135 W
CONTROLLED BY	CONTINUOUS	LIGHTS	CONTINUOUS	T-STAT	CONTINUOUS	HUMIDISTAT	CONTINUOUS	CONTINUOUS	CONTINUOUS
INTERLOCK WITH	NA	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
FAN SPEED CONTROLLER	YES- ****	NO	YES	YES	NO	YES	NO	NO	YES
WHEEL TYPE	BI	FC	BI	BI	FC	BI	FC	BI	BI
BACK DRAFT DAMPER	YES	GRAVITY	GRAVITY	GRAVITY	GRAVITY	GRAVITY	GRAVITY	---	GRAVITY
ISOLATION	NONE	RUBBER	RUBBER	RUBBER	RUBBER	RUBBER	RUBBER	---	RUBBER
DESIGN WEIGHT (LBS)	10	25	25	23	50	23	25	25	25
MAX. SONES	3.0	1.5	3.3	1.7	13.8	1.7	1.5	1.2	4.5
MAX AMPS - ***	---	1.3	2.6	1.8	6.4	1.8	1.3	---	1.34
POWER (VOLTS/PHASE/HZ) - ***	120/1/60	120/60/1	120/60/1	120/60/1	120/60/1	120/60/1	120/60/1	120/60/1	120/60/1
BASIS OF DESIGN:	S & P TD-125	BROAN L100	BROAN L300	BROAN L200	GREENHECK G-123-VG	BROAN L200	BROAN L100	TJERNLUND AS1	GREENHECK SP-A390

\* - FAN TO RUN AT LOW SPEED CONTINUOUSLY, AND INCREASE TO HIGH SPEED UPON ACTIVATION OF THE MOTION SENSOR.

VENTILATION AIR SCHEDULE - FC-1

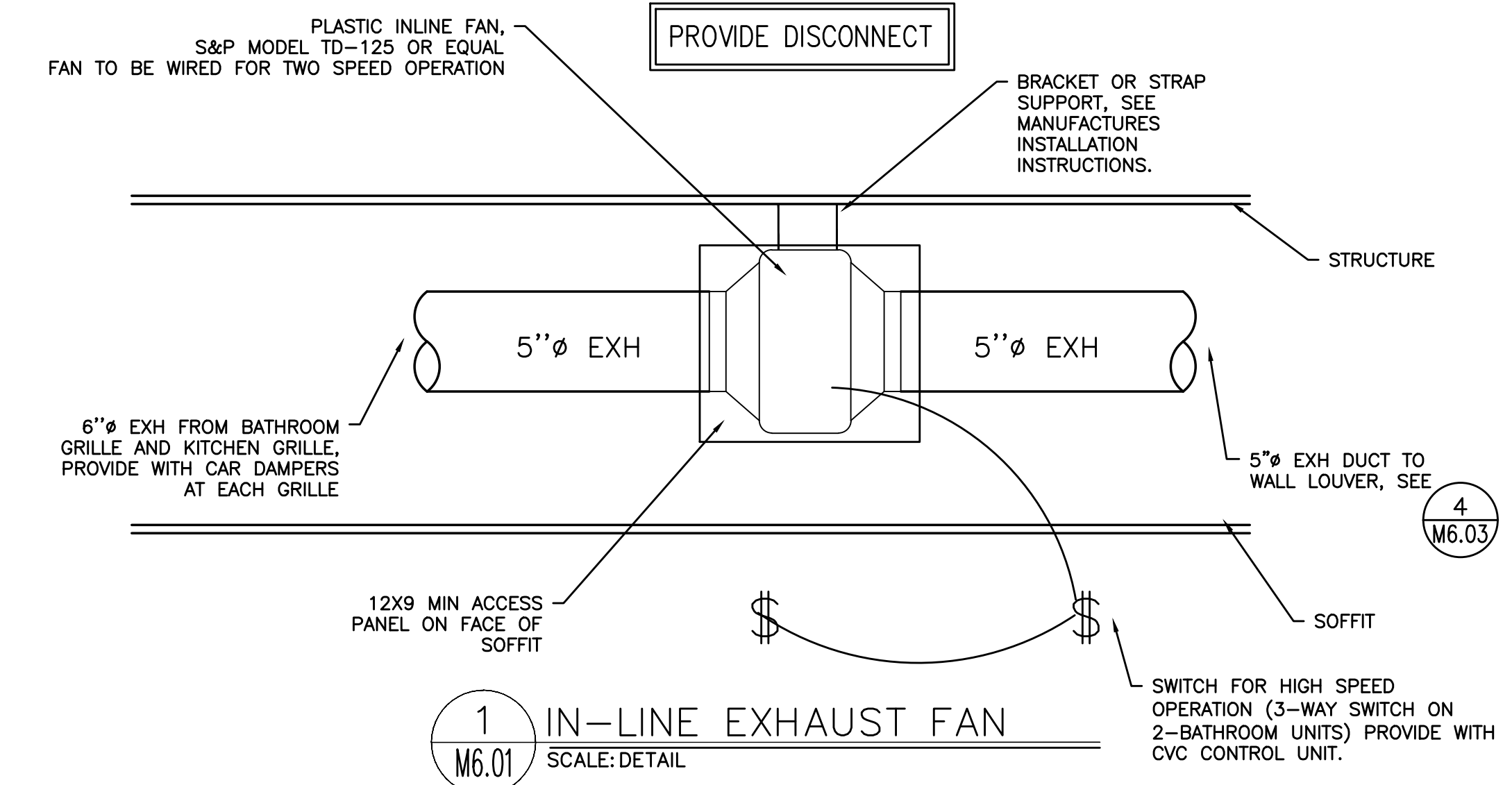
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ. FT.)	OUTSIDE AIR REQUIRED (CFM)	ZONE OSA (CFM)							Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
							Az	Pz	Rp	Ra	Vbz	Ez	Voz			
MAIL 106	306	0	0	0	0.12	37	0.8	46	200	0.23	1026	0	1.11	48.67	FC-1	
LOBBY/LOUNGE 100	1326	30	40	7.5	0.06	380	0.8	474	1200	0.40	0	0	0.94	503.06	FC-1	
OFFICE 101	200	5	1	5	0.06	17	0.8	21	200	0.11	0	0	1.23	22.53	FC-1	
<b>TOTAL</b>	<b>1832</b>		<b>41</b>			<b>433</b>		<b>542</b>	<b>1600</b>		<b>1026</b>	<b>0</b>	<b>0.94</b>	<b>574</b>		
<b>CORRECTED TOTAL OUTDOOR AIR FLOW RATE</b>							<b>574</b>	<b>CFM</b>	<b>Corrected OSA Fraction</b>	<b>Zs =</b>	<b>0.36</b>					

VENTILATION AIR SCHEDULE - FC-2

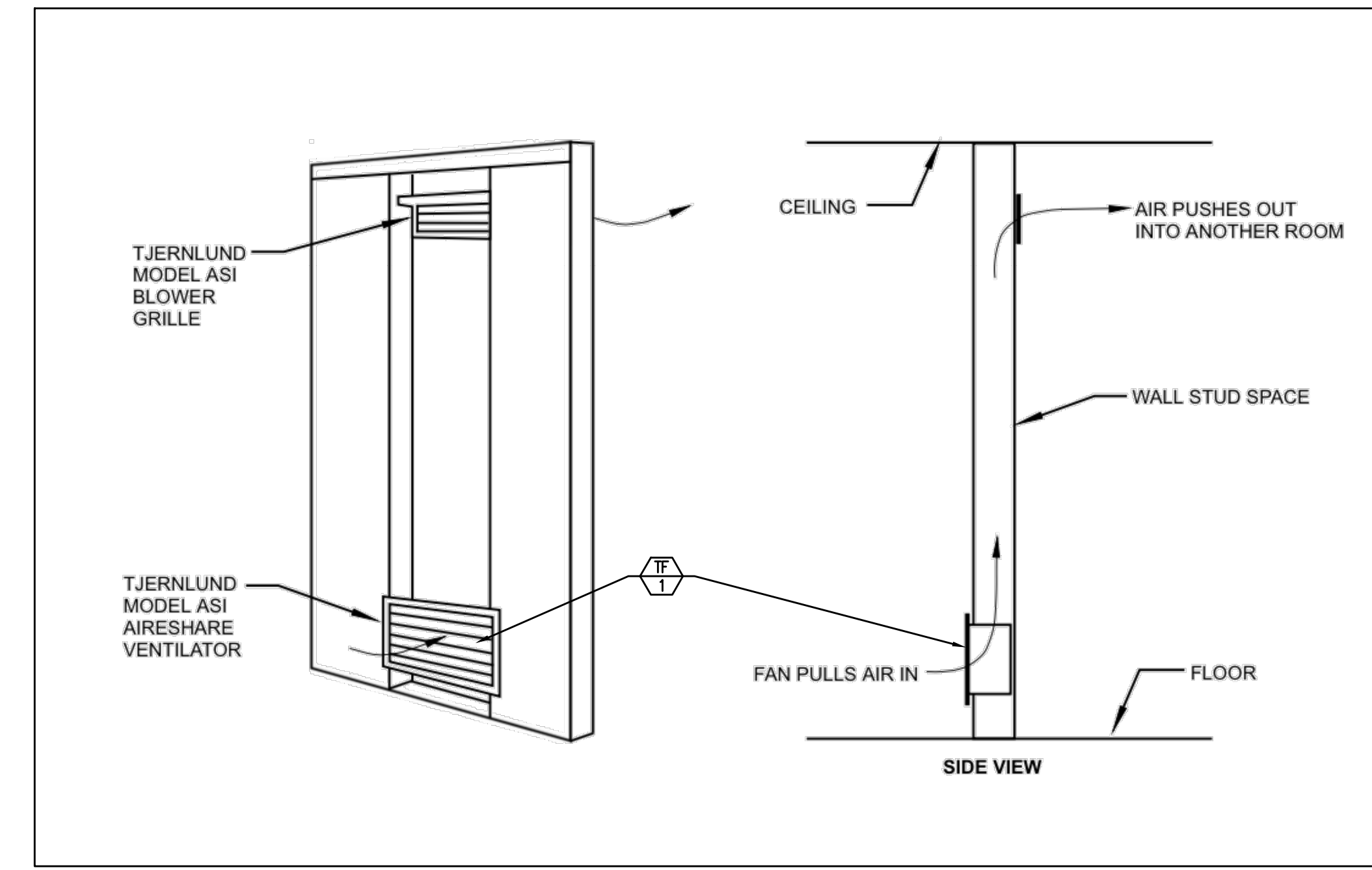
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ. FT.)	OUTSIDE AIR REQUIRED (CFM)	ZONE OSA (CFM)							Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
							Az	Pz	Rp	Ra	Vbz	Ez	Voz			
FITNESS 115	750	10	8	20	0.06	205	0.8	256	1200	0.21	944	0	1.00	256.25	FC-2	
<b>TOTAL</b>	<b>750</b>		<b>8</b>			<b>205</b>		<b>256</b>	<b>1200</b>		<b>944</b>	<b>0</b>	<b>1.00</b>	<b>256</b>		
<b>CORRECTED TOTAL OUTDOOR AIR FLOW RATE</b>							<b>256</b>	<b>CFM</b>	<b>Corrected OSA Fraction</b>	<b>Zs =</b>	<b>0.21</b>					

VENTILATION AIR SCHEDULE - FC-3

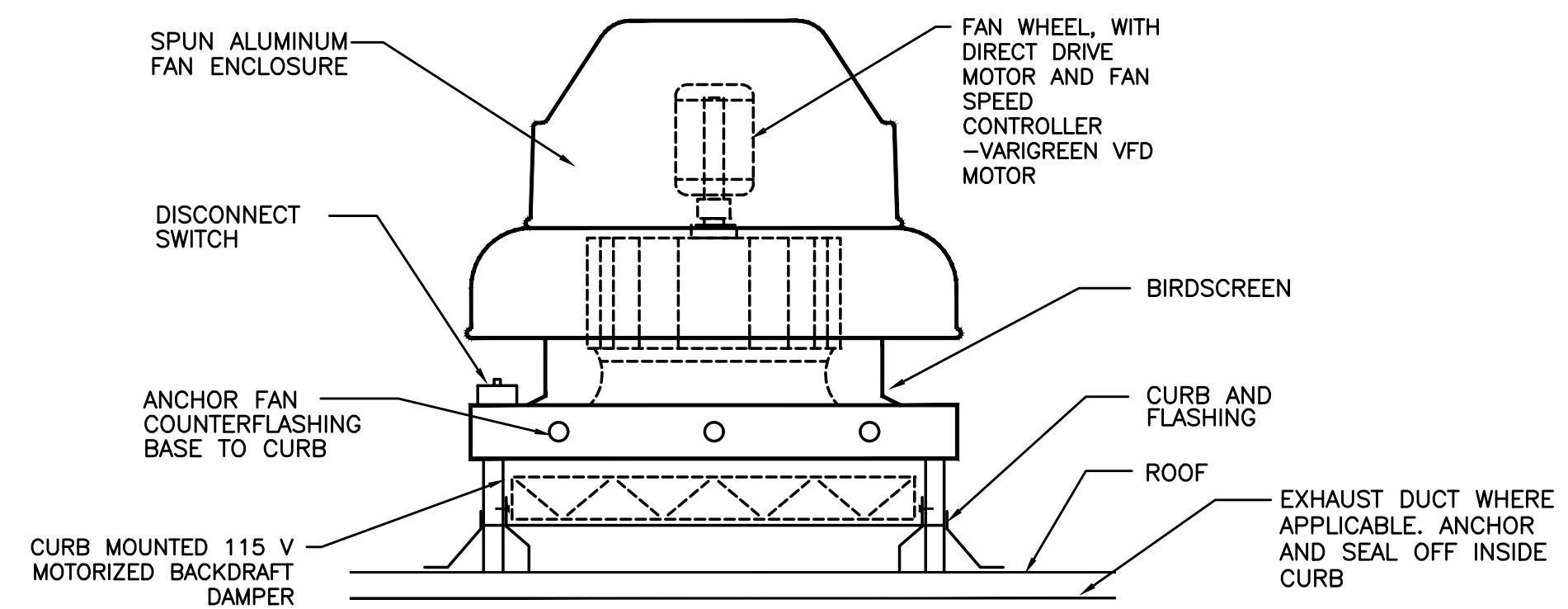
ROOM NUMBER AND NAME	AREA (SQ. FT.)	OCCUPANT LOAD (#/1000 SQ. FT.)	NUMBER OF OCCUPANTS	OUTSIDE AIR REQUIREMENT (CFM/P)	OUTSIDE AIR REQUIREMENT (CFM/SQ. FT.)	OUTSIDE AIR REQUIRED (CFM)	ZONE OSA (CFM)							Zone Ventilation Efficiency	Corrected OSA CFM	AIR SYSTEMS
							Az	Pz	Rp	Ra	Vbz	Ez	Voz			
AMENITY 700	510	30	16	7.5	0.06	151	0.8	188	210	0.90	0	0	1.00	188.25	FC-3	
<b>TOTAL</b>	<b>510</b>		<b>16</b>			<b>151</b>		<b>188</b>	<b>210</b>		<b>0</b>	<b>0</b>	<b>1.00</b>	<b>188</b>		
<b>CORRECTED TOTAL OUTDOOR AIR FLOW RATE</b>							<b>188</b>	<b>CFM</b>	<b>Corrected OSA Fraction</b>	<b>Zs =</b>	<b>0.90</b>					



1 IN-LINE EXHAUST FAN  
SCALE: DETAIL



2 ROOM TRANSFER FAN  
SCALE: DETAIL



3 ROOF EXHAUST FAN  
SCALE: DETAIL



CHECKSHEET #1	02.22.2021	RESPONSES	06.08.2021	997	MGA	MRD	MGA	Acad File:
CHECKSHEET #2	06.25.2021	RESPONSES	09.07.2021	997	MGA	MRD	MGA	
CHECKSHEET #3	05.12.2022	RESPONSES						

ANALOG PDX  
1871 N FLINT AVE  
MECHANICAL SCHEDULES/DETAILS  
PORTLAND  
OREGON 97227

CONSTRUCTION DOCUMENTS  
09.22.2020



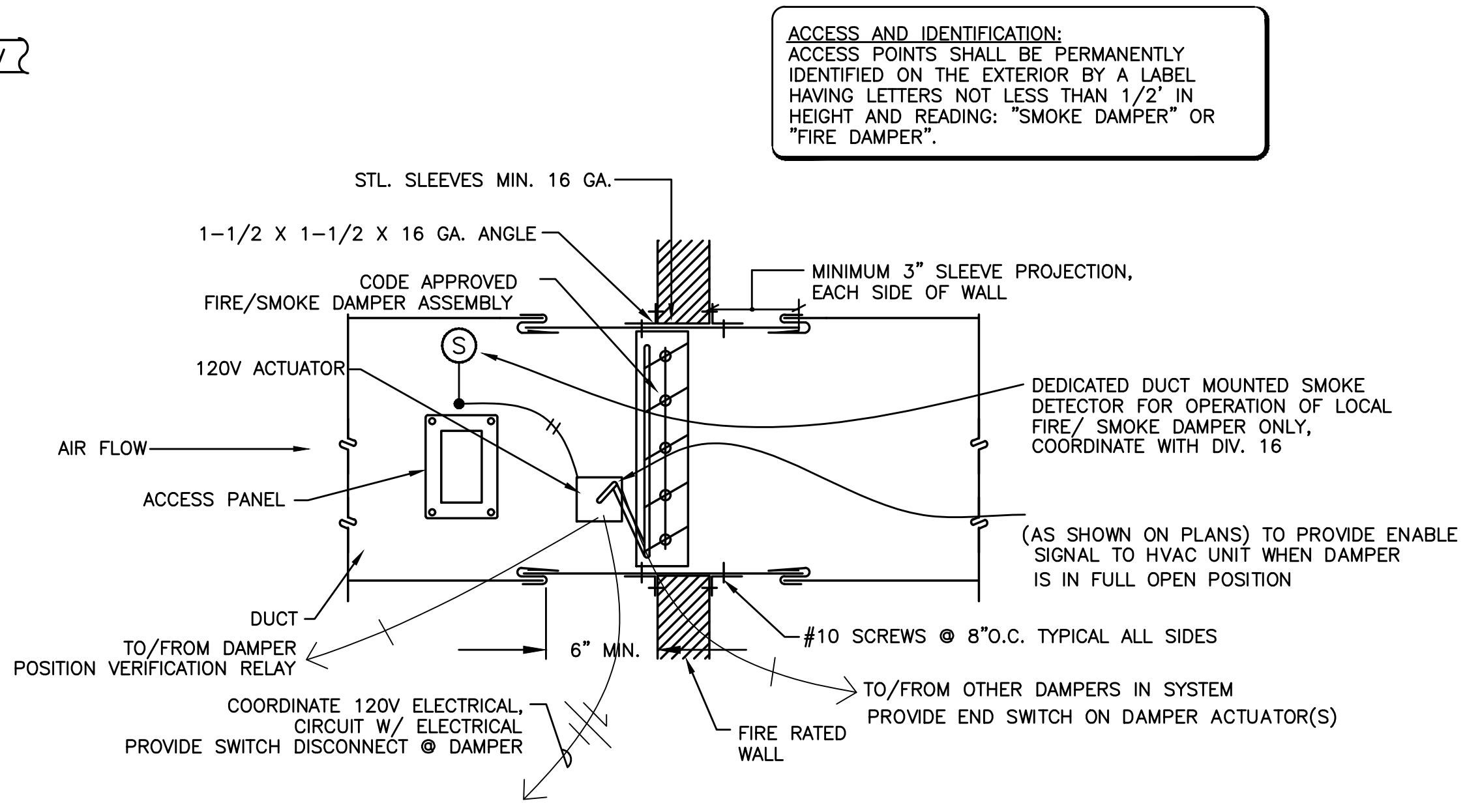
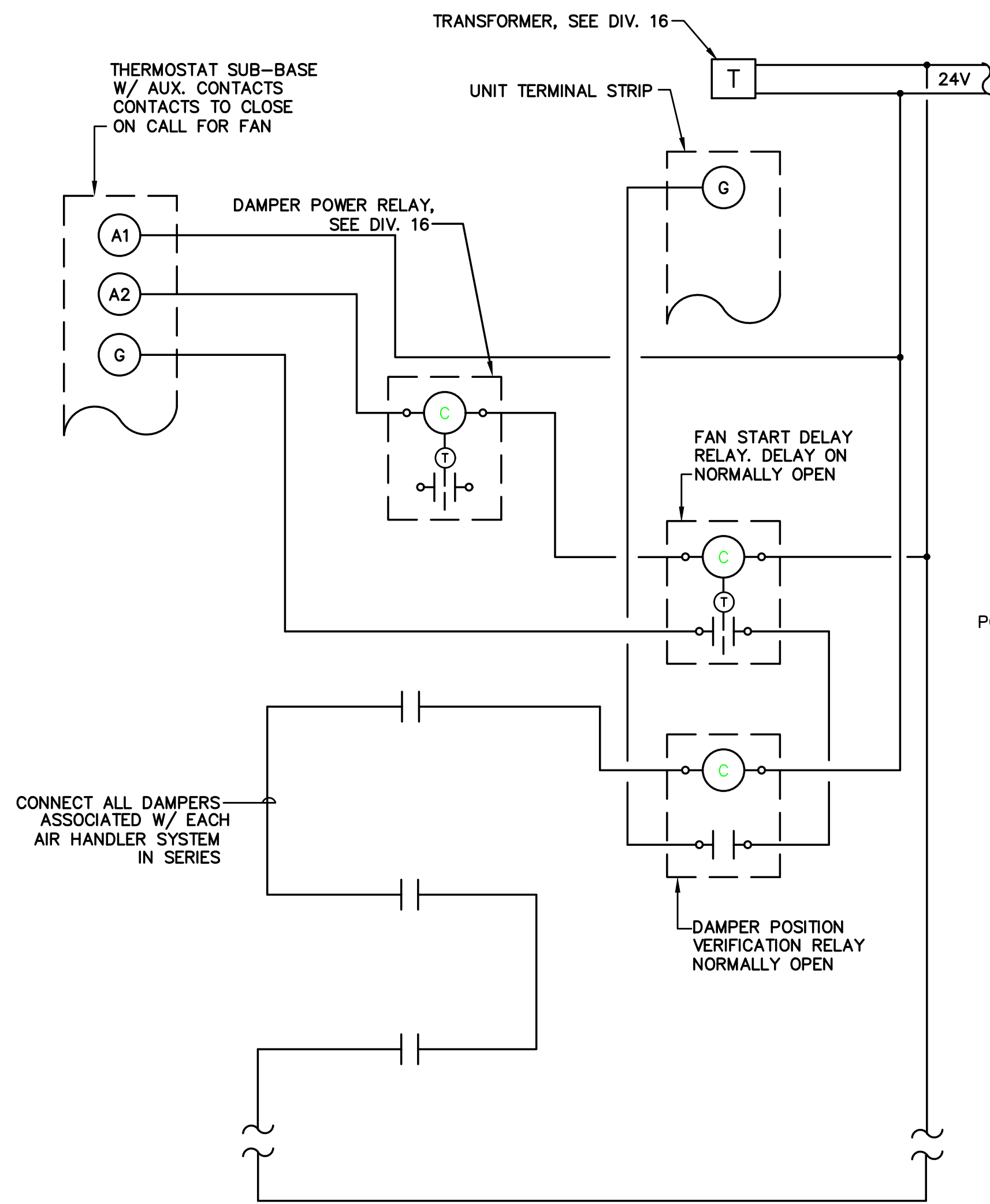
Consulting Engineers  
2007 S.E. Ash St.  
Portland, OR 97214  
PHN: (503) 234-0548  
FAX: (503) 234-0677  
WWW.MFIA-ENG.COM

SHEET

M6.01



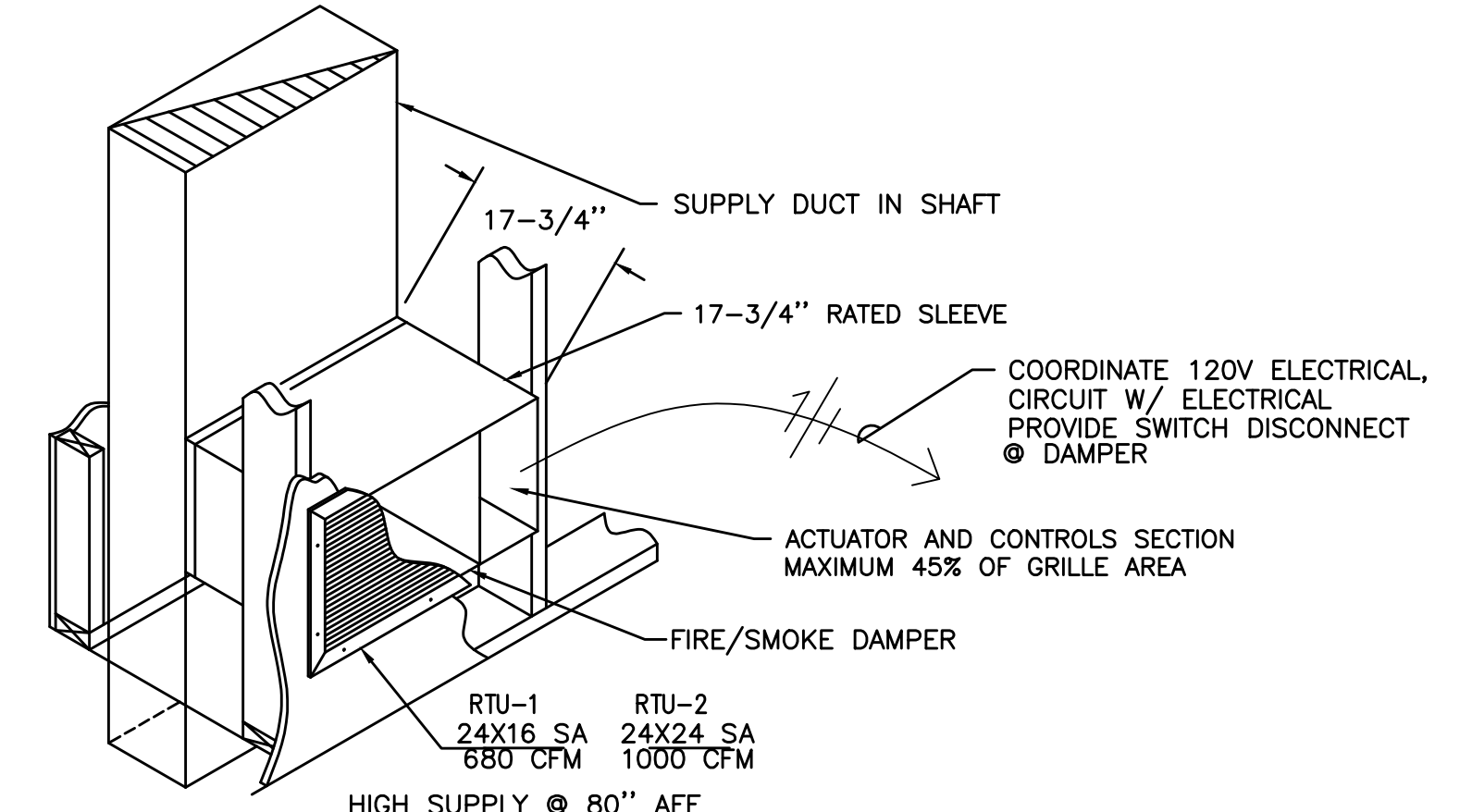
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02.22.2021	06.25.2021	05.12.2022
06.08.2021	097	MGA
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Drawn By:	MGA	MRD
Chkd By:	MGA	MRD
DSGN By:	MGA	MRD
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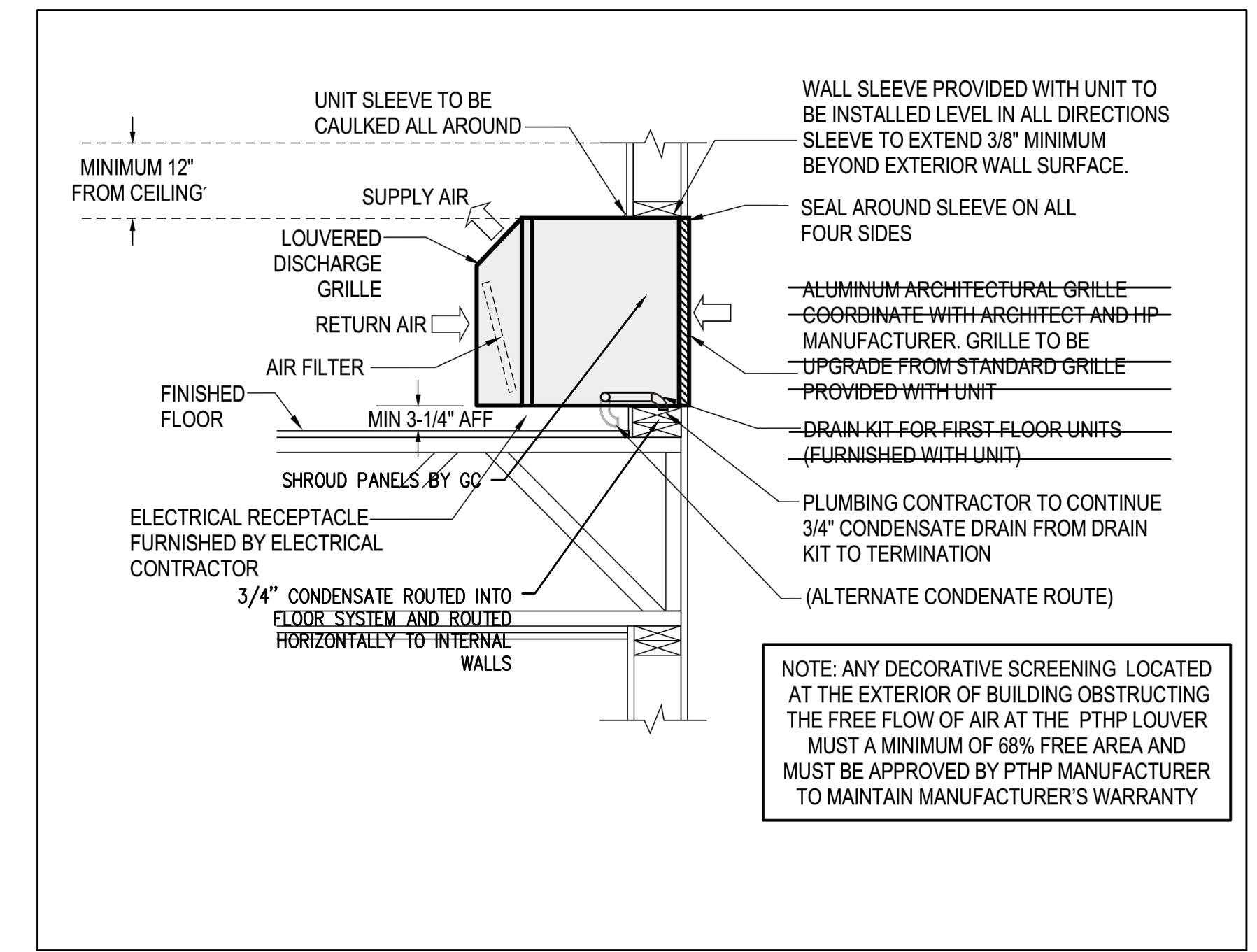
1 FIRE/SMOKE DAMPER W/SMOKE DETECTOR  
 M6.02 NOT TO SCALE

**NOTE:**  
 PROVIDE ALL REQUIRED CONTROL WIRING TO ACCOMPLISH:  
 FIRE/SMOKE DAMPER - FIRE/SMOKE DAMPER TO CLOSE UPON ACTIVATION OF LOCAL SMOKE DETECTOR  
 EXHAUST DUCTS/FANS - FIRE/SMOKE DAMPER TO CLOSE UPON SHUTDOWN OF ASSOCIATED EXHAUST FAN.  
 SUPPLY OR RETURN DUCTS/FANS - FIRE/SMOKE DAMPER TO CLOSE UPON SHUTDOWN OF ASSOCIATED AIR HANDLING UNIT.

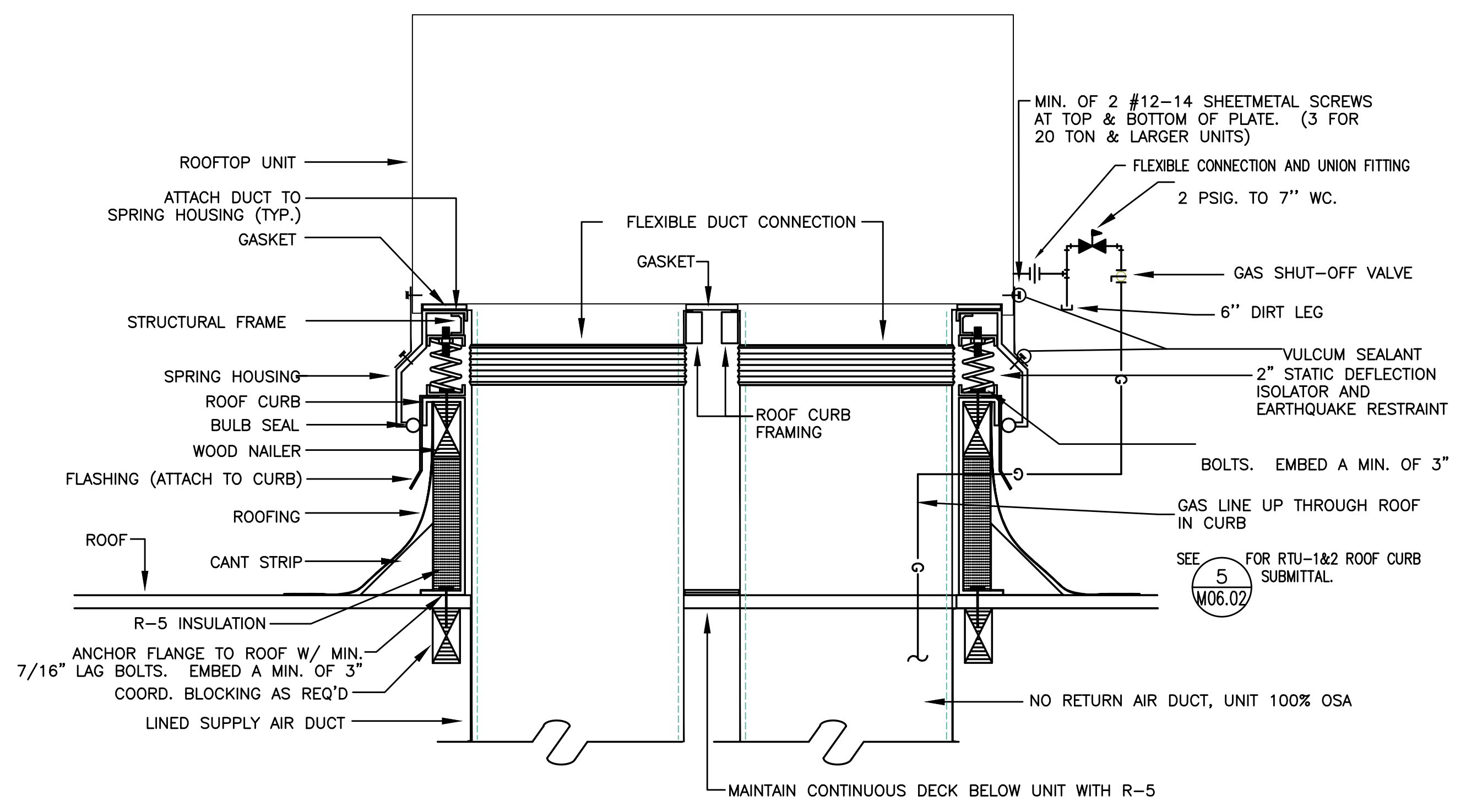
**GENERAL NOTES:**  
 PROVIDE ACCESS IN CEILING OR WALL FOR DAMPER AND SMOKE DETECTOR  
 SEE ELECTRICAL DRAWINGS FOR WIRING INSTALLATION



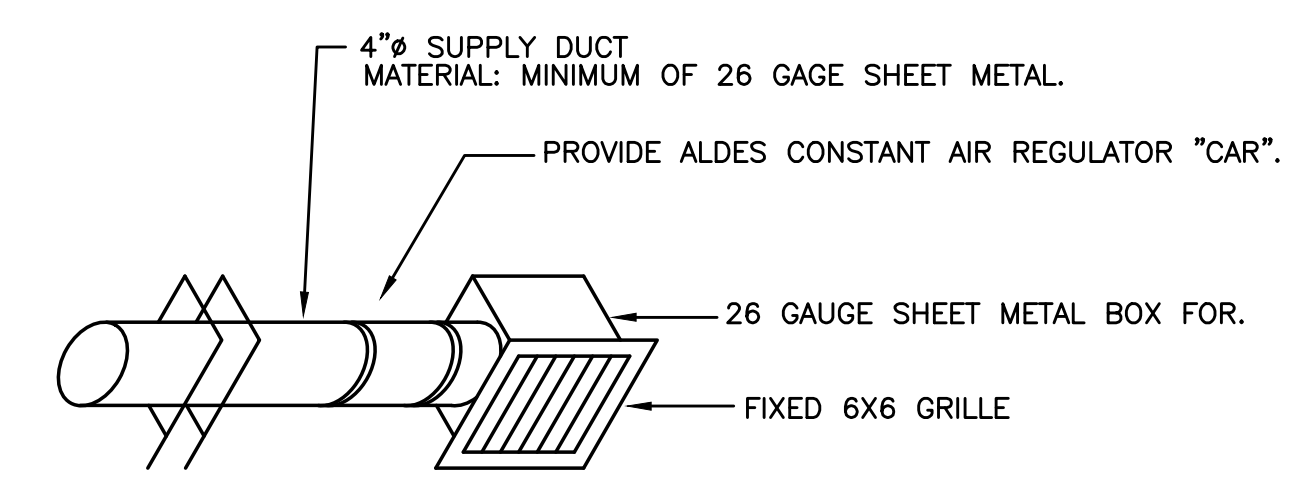
2 HIGH SUPPLY W/ FIRE/SMOKE DAMPER  
 M6.02 SCALE: DETAIL



4 PTHP AT EXTERIOR WALL  
 M6.02 NOT TO SCALE



3 ROOF TOP UNIT W/ VIBRATION ISOLATION CURB  
 M6.02 SCALE: DETAIL



5 CONSTANT AIR REGULATOR (CAR) - CEILING  
 M6.02 NOT TO SCALE

ANALOG PDX  
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SHEET

M6.02







**System No. W-L-7016**  
September 07, 2004  
F Rating — 2 Hr  
T Rating — 0 Hr

**SECTION A-A**

- Wall Assembly** — The 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:
  - Studs** — Wall framing shall consist of either wood or steel studs. Wood studs to consist of nom 2 by 4 in. lumber spaced max 16 in. OC. Steel studs to be min 3-1/2 in. wide and spaced max 24 in. OC.
  - Gypsum Board** — Thickness, type, number of layers and fasteners as required in the individual Wall and Partition Design. Max diam of opening is 5 in.
- Steel Vent Duct** — Nom 4 in. diam (or smaller) No. 28 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (point contact) to max 1 in. is required within the firestop system. Duct to be rigidly supported on both sides of wall assembly.
- Firestop System** — The details of the firestop system shall be as follows:
  - Packing Material (Optional)** — Polyethylene backer rod, mineral wool batt insulation or fiberglass batt insulation friction-fit into annular space and recessed from both surfaces of wall to accommodate the required thickness of fill material (Item 3B).
  - Fill, Void or Cavity Material** — Caulk or Sealant — Min 1/2 in. thickness of fill material applied within annulus, flush with both surfaces of wall assembly. At the point contact location between duct and wallboard, a min 1/2 in. diam bead of sealant shall be applied at the wallboard/duct interface on both surfaces of wall assembly.

\*Bearing the UL Classification Marking

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. January 27, 2015

**Hilti Firestop Systems**

Product Support Line: 1-800-328-1487  
Circle options 4 for UL OR 204040

**1 FIRE PENETRATION DETAIL — 4" DUCTS**  
M6.04 DETAIL

**System No. W-L-7018**

ANSI/UL1479 (ASTM E814)	CANULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 1/2 Hr	FT Rating — 1-1/2 Hr
	FH Rating — 2 Hr
	FTH Rating — 1-1/2 Hr

**SECTION A-A**

- Wall Assembly** — The 2 hr fire-rated gypsum wallboard/stud wall assembly shall be constructed of the materials and in the manner specified in the individual U300, U400, V400 or W400 Series Wall and Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
  - Studs** — Wall framing may consist of either wood studs or steel channel studs. Wood studs to consist of nom 2 in. (51 by 102 mm) lumber spaced 16 in. (408 mm) OC. Steel studs to be min 2-1/2 in. (64 mm) wide and spaced max 24 in. (610 mm) OC.
  - Gypsum Board** — Two layers of nom 5/8 in. (16 mm) thick gypsum wallboard as specified in the individual Wall and Partition Design No. Max diam of opening is 9 in. (229 mm).
- Metallic Sleeve** — Cylindrical sleeve fabricated from min 0.016 in. (0.40 mm) thick (No. 28 gauge) galv steel sheet steel and having a min 2 in. (51 mm) lip along the longitudinal seam. Length of sleeve to be 18 in. (3 mm) less than thickness of wall. Sleeve to be installed by coiling the sheet metal to a diam smaller than the through opening, inserting the coil through the openings and releasing the coil to let it uncoil against the circular cutouts in the gypsum wallboard layers.

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**Hilti Firestop Systems**

Product Support Line: 1-800-328-1487  
Circle options 4 for UL OR 204040

**2 FIRE PENETRATION DETAIL — 5" or 6" DUCTS**  
M6.04 DETAIL

**System No. W-L-7159**  
F Rating — 1 or 2 Hr (See item 1)  
T Rating — 1/2 Hr

**SECTION A-A**

- Wall Assembly** — The 1 or 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U300 or U400 Series Wall or Partition Design in the UL Fire Resistance Directory and shall include the following construction features:
  - Studs** — Wall framing to consist of min 3-1/2 in. (89 mm) wide steel channel studs, fabricated from 25 MSG galv steel, spaced max 24 in. (610 mm) OC.
  - Gypsum Board** — One or two layers of nom 5/8 in. (16 mm) thick gypsum board, as specified in the individual Wall and Partition Design. Max area of opening is 144 sq in. (903 cm<sup>2</sup>) with max dimension of 12 in. (306 mm).
- Steel Duct** — Nom 10 in. by 10 in. (254 by 254 mm) (or smaller) No. 28 gauge (or heavier) galv steel duct to be installed either concentrically or eccentrically within the firestop system. The annular space shall be min 1/4 in. to max 1 in. Duct to be rigidly supported on both sides of the wall assembly.
- Fill, Void or Cavity Material - Sealant** — Min 5/8 in. (16mm) thickness of fill material applied within annular space, flush with both surfaces of wall.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE Sealant  
\*Bearing the UL Classification Marking

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. May 24, 2007

**Hilti Firestop Systems**

**3 FIRE PENETRATION DETAIL — 10X6 DUCTS**  
M6.04 DETAIL

**SECTION A-A**

The total length of the vent system including straight vent, elbow(s), transitions and wall or roof caps must not exceed the equivalent of 140 ft (42.7 m) for either type of vent. See "Recommended Standard Fittings" section for equivalent lengths.

Pressure Drop	# of Elbows	Length (FT)	Pressure Drop
6" Elbow =	0.012	5	0.06
6" Duct =	0.17/100	50	0.085
			<b>TOTAL PD = 0.145</b>

\* — PRESSURE LOSS OF 0.145 IS LESS THAN 0.35 AS INDICATED ON RANGE HOOD CUT SHEET.

**4 ELEVATOR SHAFT RELIEF VENT**  
M6.04 SCALE: DETAIL

**System No. W-L-7018**

- Steel Duct — Nom 6 in. (152 mm) diam (or smaller) No. 28 gauge (or heavier) galv steel duct to be installed concentrically within the firestop system. Duct to be rigidly supported on both sides of the wall assembly.
- Pipe Covering — Nom 1 in. (25 mm) thick hollow cylindrical heavy density (3.5 pf or 56 kg/m<sup>3</sup>) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with but tape supplied with the product. The annular space between the insulated pipe and the steel sleeve shall be min 0 in. (point contact) to max 1 in. (25 mm).
- See Pipe Equipment Covering — Materials — (BRGL) Category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.
- Fill, Void or Cavity Material — Sealant — Min 1-1/4 in. (32 mm) depth of sealant applied within the annulus, flush with each surface of the wall assembly. At the point contact location between insulated pipe and wall, a min 1/2 in. (13 mm) diam bead of sealant shall be applied on both surfaces of wall, lapping 1/4 in. (6 mm) beyond the periphery of the opening.

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**

**8 COVE HEATER SUBMITTAL**  
M6.04 NOT TO SCALE

Specifications: **WhisperCeiling DC FV-0511VQ1**

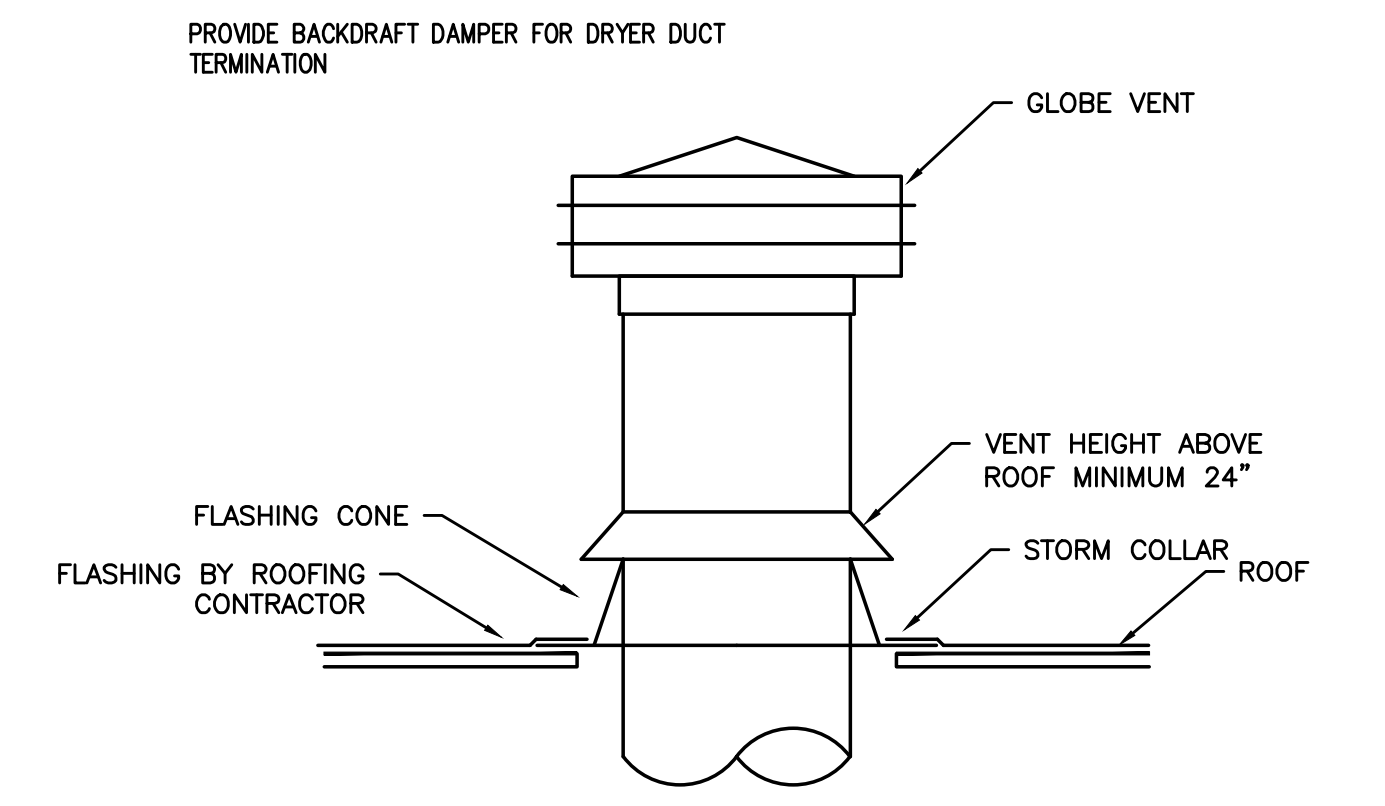
	4"	4"	4"
Static Pressure in inches w.g.	0.1	0.25	0.1
Air Volume (CFM)	110	111	80
Noise (sones)	<0.3	0.9	<0.3
Power Consumption (watts)	10.6	16.4	5.9
Energy Efficiency (CFM/Watt)	10.6	6.9	13.6
Speed (RPM)	967	1239	821
Current (amps)	0.18	0.26	0.11
MAX. Current (amps)			0.27
Power Rating (W/Hr)			120/60
ENERGY STAR rated	Yes		

0.25=Installed Performance

	EQ. Length	Pressure Drop	# of Elbows	Length (FT)	Pressure Drop
4" Elbow =	3	.4/100	5	15	0.06
4" Duct =		.4/100		35	0.14
					<b>TOTAL PD = 0.2</b>

\* — PRESSURE LOSS OF 0.2 IS LESS THAN 0.25 AS INDICATED ON EF-1 CUT SHEET.

**6 BATH EXH (EF-1) PRESSURE LOSS CALCS**  
M6.04 NOT TO SCALE



**5 GLOBE STYLE ROOF VENT**  
M6.04 NOT TO SCALE

**Cove Heater KCV Series**

**Ordering Information**

MODEL	UPC	VOLTS	COLOR	WATTS	AMPS	LENGTH	SHIP WEIGHT lbs
KCV120E	11801	120	ALMOND	250	2.1	24"	5.5
KCV120W	11802	120	WHITE	250	2.1	24"	5.5
KCV120A	11800	120	ALMOND	450	3.8	34"	6.7
KCV120B	11799	120	WHITE	450	3.8	34"	6.7
KCV120C	11803	120	ALMOND	600	5.0	47"	9.3
KCV120D	11804	120	WHITE	600	5.0	47"	9.3
KCV120F	11806	120	ALMOND	750	6.3	59"	11.2
KCV120G	11807	120	WHITE	750	6.3	59"	11.2
KCV120H	11808	120	ALMOND	900	7.5	71"	11.2
KCV120J	11809	120	WHITE	900	7.5	71"	11.2
KCV120K	11812	120	ALMOND	1050	8.8	83"	15.3
KCV120L	11813	120	WHITE	1050	8.8	83"	15.3
KCV121W	11815	120	ALMOND	1200	10.0	94"	16.8
KCV121B	11814	120	WHITE	1200	10.0	94"	16.8
KCV121S	11810	120	ALMOND	1500	12.5	118"	26.0
KCV121W	11811	120	WHITE	1500	12.5	118"	26.0
KCV200A	11816	208	ALMOND	450	2.2	34"	6.7
KCV200B	11818	208	WHITE	450	2.2	34"	6.7
KCV200C	11817	208	ALMOND	600	2.9	47"	9.3
KCV200D	11825	208	WHITE	600	2.9	47"	9.3
KCV200F	11819	208	ALMOND	750	3.6	59"	11.2
KCV200G	11826	208	WHITE	750	3.6	59"	11.2
KCV200H	11820	208	ALMOND	900	4.3	71"	11.2
KCV200J	11828	208	WHITE	900	4.3	71"	11.2
KCV2010	11821	208	ALMOND	1050	5.0	83"	15.3
KCV201W	11829	208	WHITE	1050	5.0	83"	15.3
KCV2012	11822	208	ALMOND	1200	5.8	94"	16.8
KCV201B	11823	208	WHITE	1200	5.8	94"	16.8
KCV201S	11823	208	ALMOND	1500	7.2	118"	21.2
KCV201W	11832	208	WHITE	1500	7.2	118"	21.2
KCV201B	11796	208	ALMOND	1600	8.7	118"	21.2
KCV201W	11796	208	WHITE	1600	8.7	118"	21.2

**Engineering Specifications**

**Construction:**

- Constructed of extruded aluminum with a maximum cross section thickness of .062"
- With sawtooth profile to increase radiating surface area.
- Open on top and bottom for maximum convection heating room air.
- With .52 cubic inch section box at both ends, furnished with 1/2" knockouts on back and top.
- No Chrome wire embedded in Magnesium Oxide powder enclosed and sealed in aluminum sheath.

**Accessories/Options**

MODEL	DESCRIPTION	WEIGHT lbs
KCV1R	Single Pole Right side wiring	NA
KCV1L	Single Pole Left side wiring	.25
KCV1R2	Double Pole Right side wiring	.25
KCV1L2	Double Pole Left side wiring	.25
W	Wire	NA

**Dimensional Data**

**Radiant:** Heat produced is emitted as radiant infrared invisible rays

**Warm Air:** Heat produced is also transmitted by natural convection from the top of the heater

**Cold Air:**

King Electrical Manufacturing Company | 9131 10th Avenue South, Seattle, WA 98108 | phone 206.762.0400 | fax 206.763.7738 | www.king-electric.com



CHECKSHEET RESPONSES #1

CHECKSHEET RESPONSES #2

CHECKSHEET RESPONSES #3

02.22.2021

06.25.2021

05.12.2022

Date: 06.08.2021

Proj No: 997

Drawn By: MGA

Chkd By: MGA

DSGN By: MGA

Acad File:

**ANALOG PDX**  
1871 N FLINT AVE  
**MECHANICAL DETAILS**  
PORTLAND OREGON 97227

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SHEET

**M6.04**