



- 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 DOOR INSULATED ASSEMBLY. HOOD FAN NOT USED. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY.
 - ③ 1.5KW WALL HEATER QMARK AHM404F 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 FLENUM - 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 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. TIERNLIND 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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 - 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 ①.

CHECKSHEET RESPONSES #1

02.22.2021	06.08.2021
06.25.2021	09.07
05.12.2022	MGA
	MRD
	MGA
	MGA

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

SHAFT DUCT SIZES

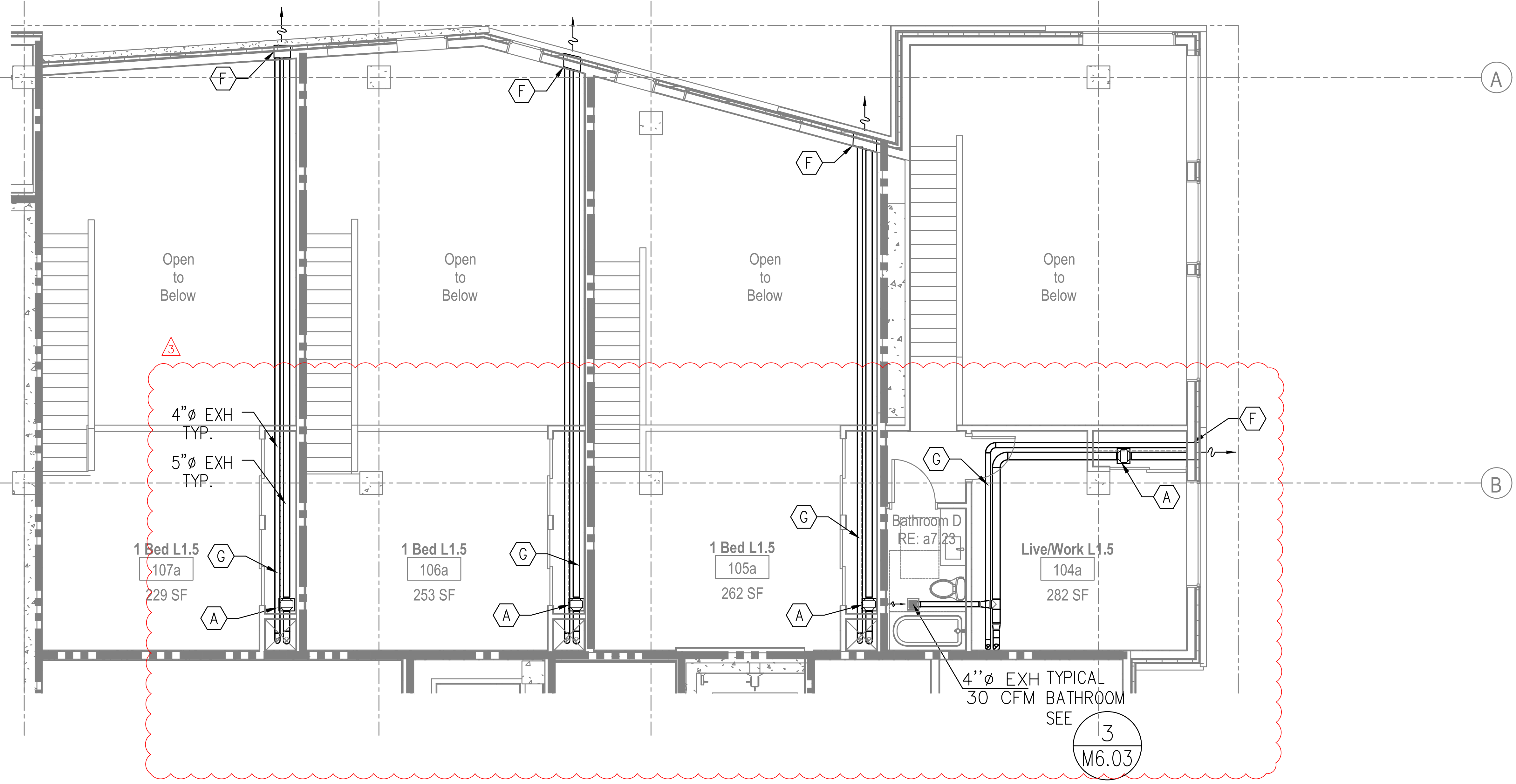
FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
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VENTILATION CALCULATIONS:

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

- GENERAL NOTES:**
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ANALOG PDX
 1871 N FLINT AVE
 PORTLAND OREGON 97227

LEVEL 1.5 - MECH PLAN

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

M2.015



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

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SHAFT DUCT SIZES

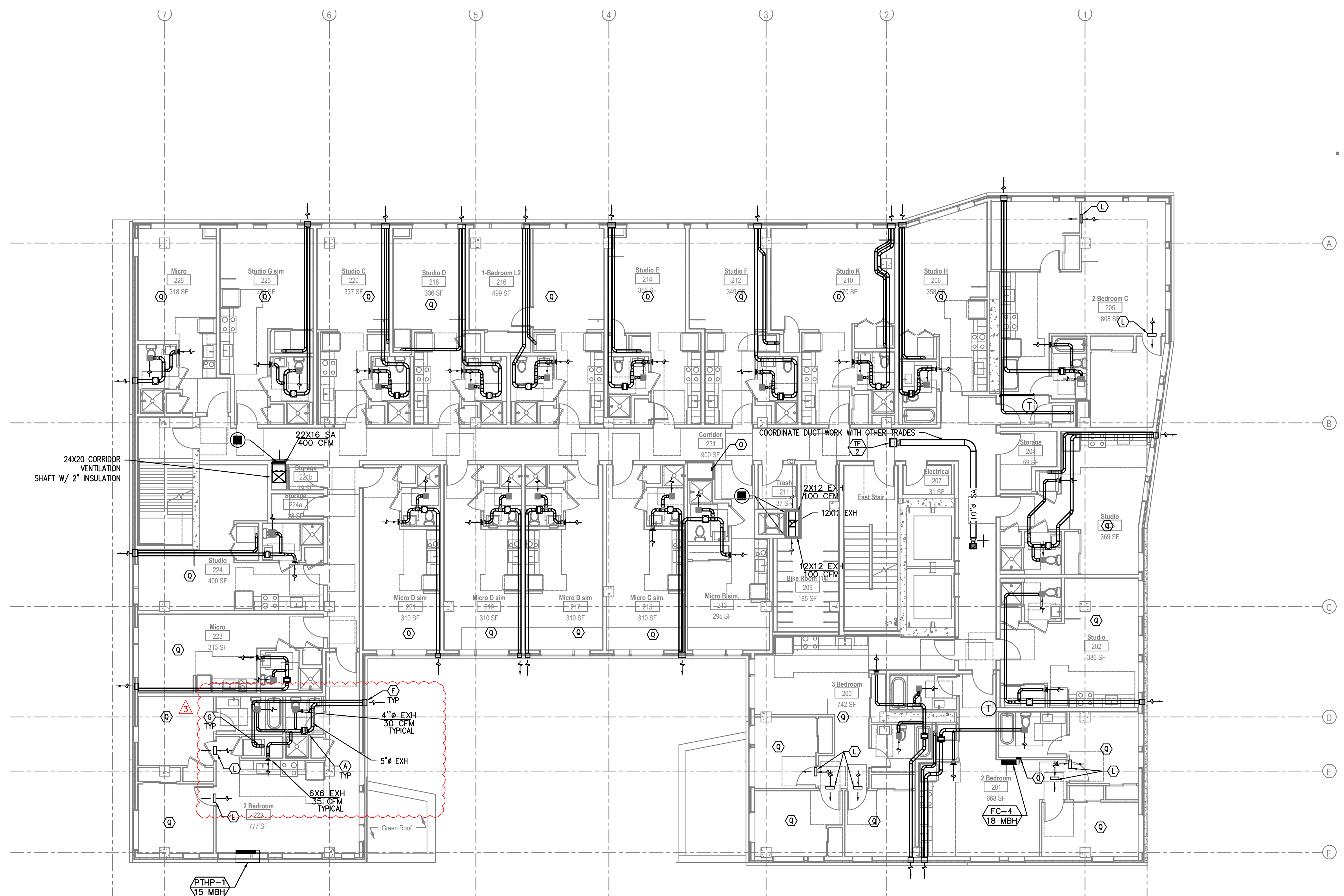
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1 LEVEL 2 - MECH PLAN
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ANALOG PDX
1871 N FLINT AVE
LEVEL 2 - MECH PLAN
PORTLAND OREGON 97227



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

SHEET

M2.02

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			
RESPONSES #3				
Date:	06.08.2021	09.07.2021	09.07.2021	09.07.2021
Proj No:	997	MGA	MRD	MGA
Drawn By:				
Chkd By:				
DSN By:				
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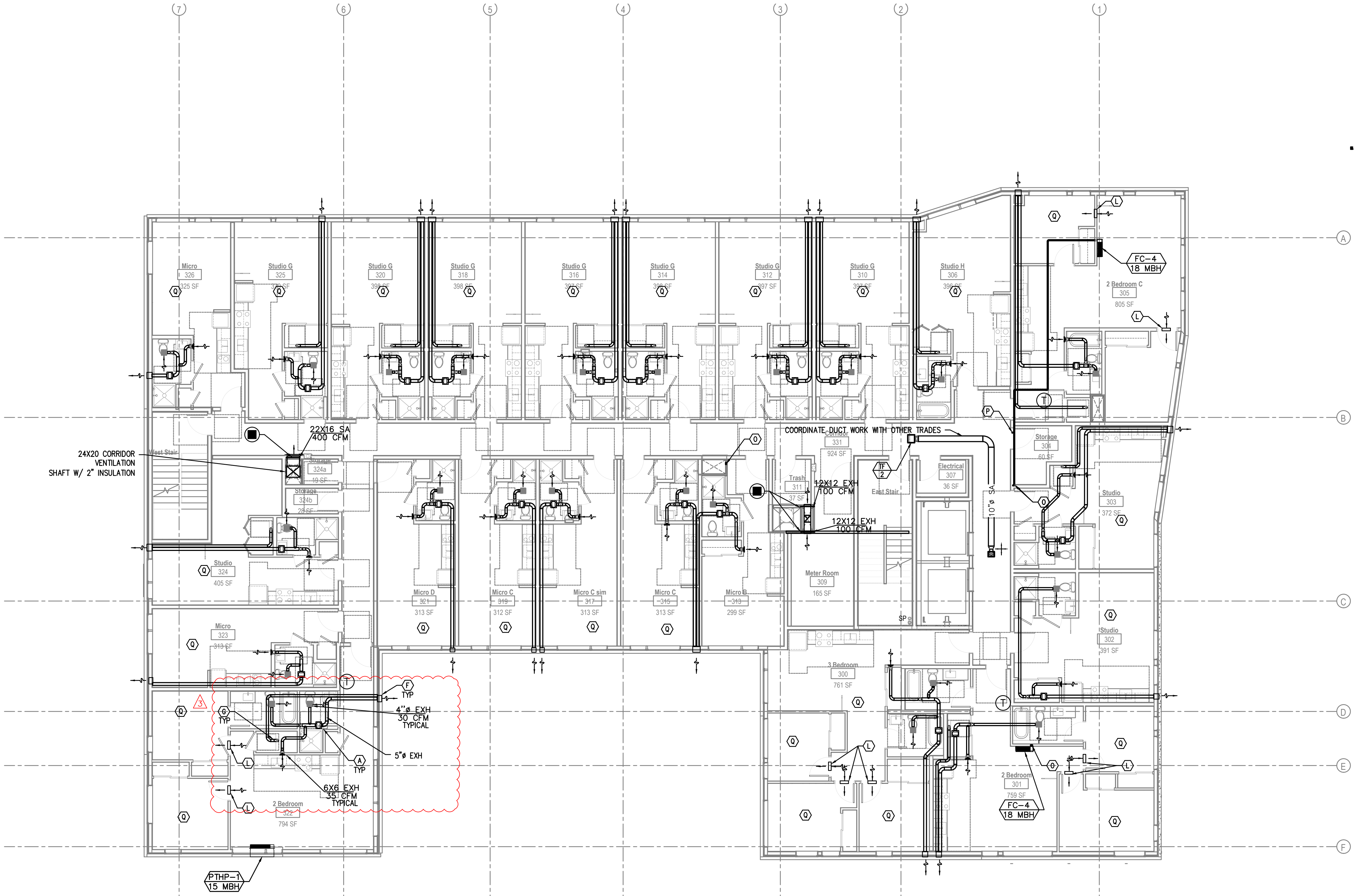
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ANALOG PDX
 1871 N FLINT AVE
LEVEL 3 - MECH PLAN
 PORTLAND OREGON 97227

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

M2.03

CHECKSHEET #1	RESPONSES #1	02.22.2021
CHECKSHEET #2	RESPONSES #2	06.25.2021
CHECKSHEET #3	RESPONSES #3	05.12.2022
Date:	06.08.2021	
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LEVEL 4 - MECH PLAN



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SHEET

M2.04

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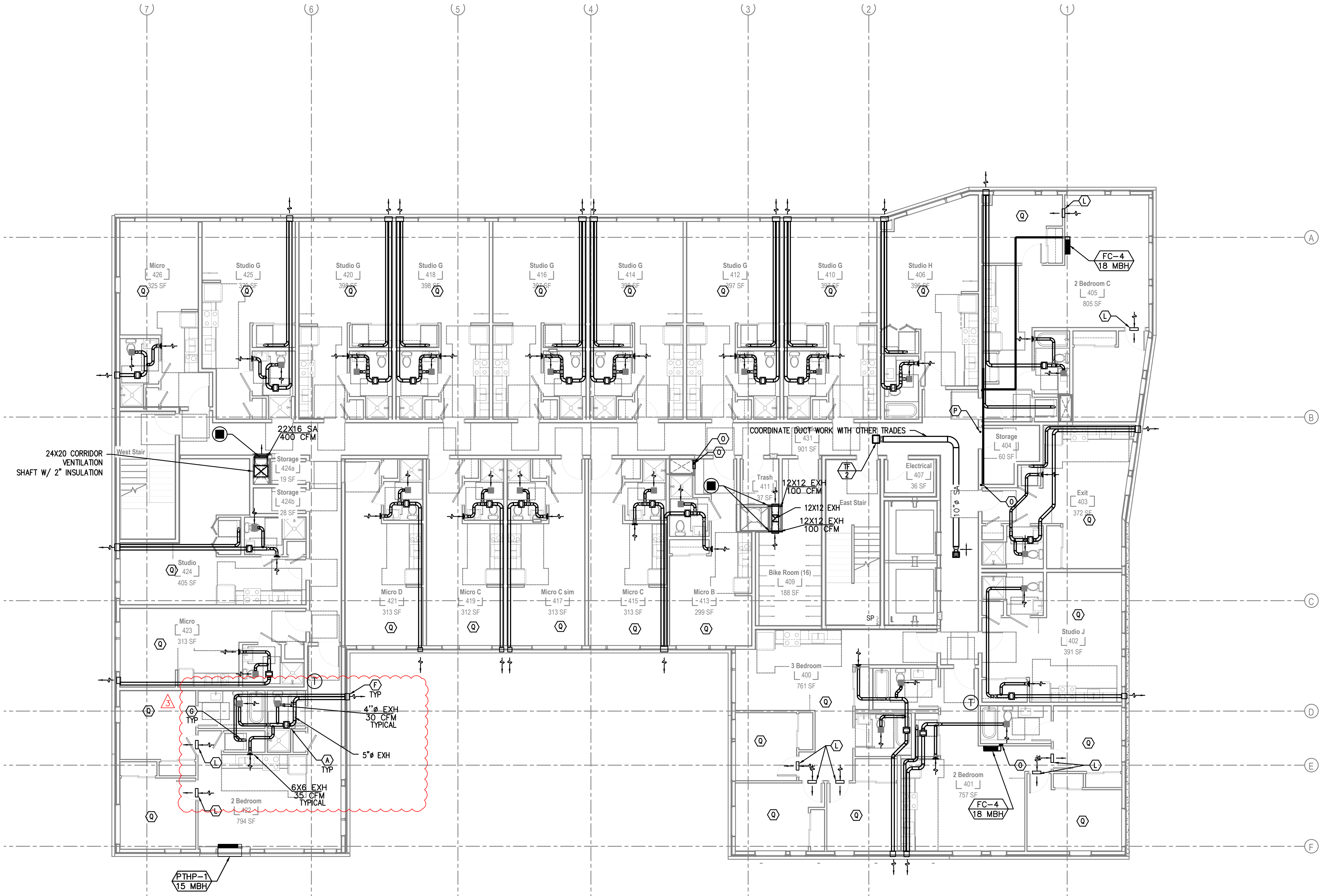
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 - ④ LG PTHP (PACKAGED TERMINAL HEAT PUMP) WITH FACTORY WALL SLEEVE, CONDENSATE DRAIN KIT, AND 42X16 ALUMINUM ARCHITECTURAL GRILLE AT EXTERIOR. INSTALL GRAVITY CONDENSATE DRAIN KIT, PLUMBING CONTRACTOR TO MAKE CONNECTION AT DRAIN KIT AND CONTINUE DRAIN 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, RIVET 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. TIERNLUND 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.

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

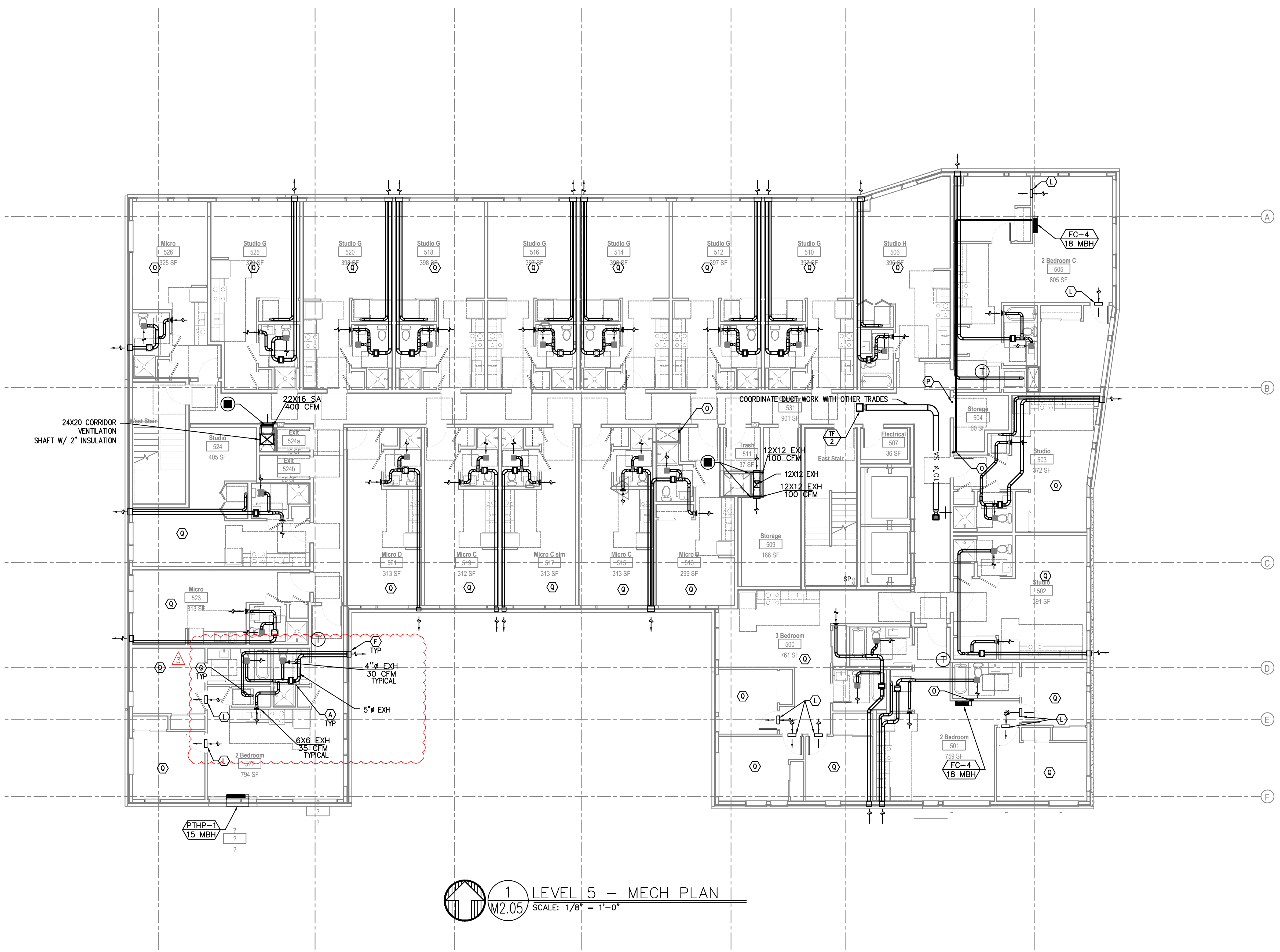
CONSTRUCTION DOCUMENTS
 09.22.2020



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

SHEET

M2.05



CHECKSHEET #1	02.22.2021	06.08.2021
CHECKSHEET #2	06.25.2021	09.17.2021
CHECKSHEET #3	05.12.2022	MGA
RESPONSES #1		MGA
RESPONSES #2		MGA
RESPONSES #3		MGA

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 6 - MECH PLAN

CONSTRUCTION DOCUMENTS
 09.22.2020
JACOBS

M F I A INC.

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

SHEET

M2.06

- 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, RIVET 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

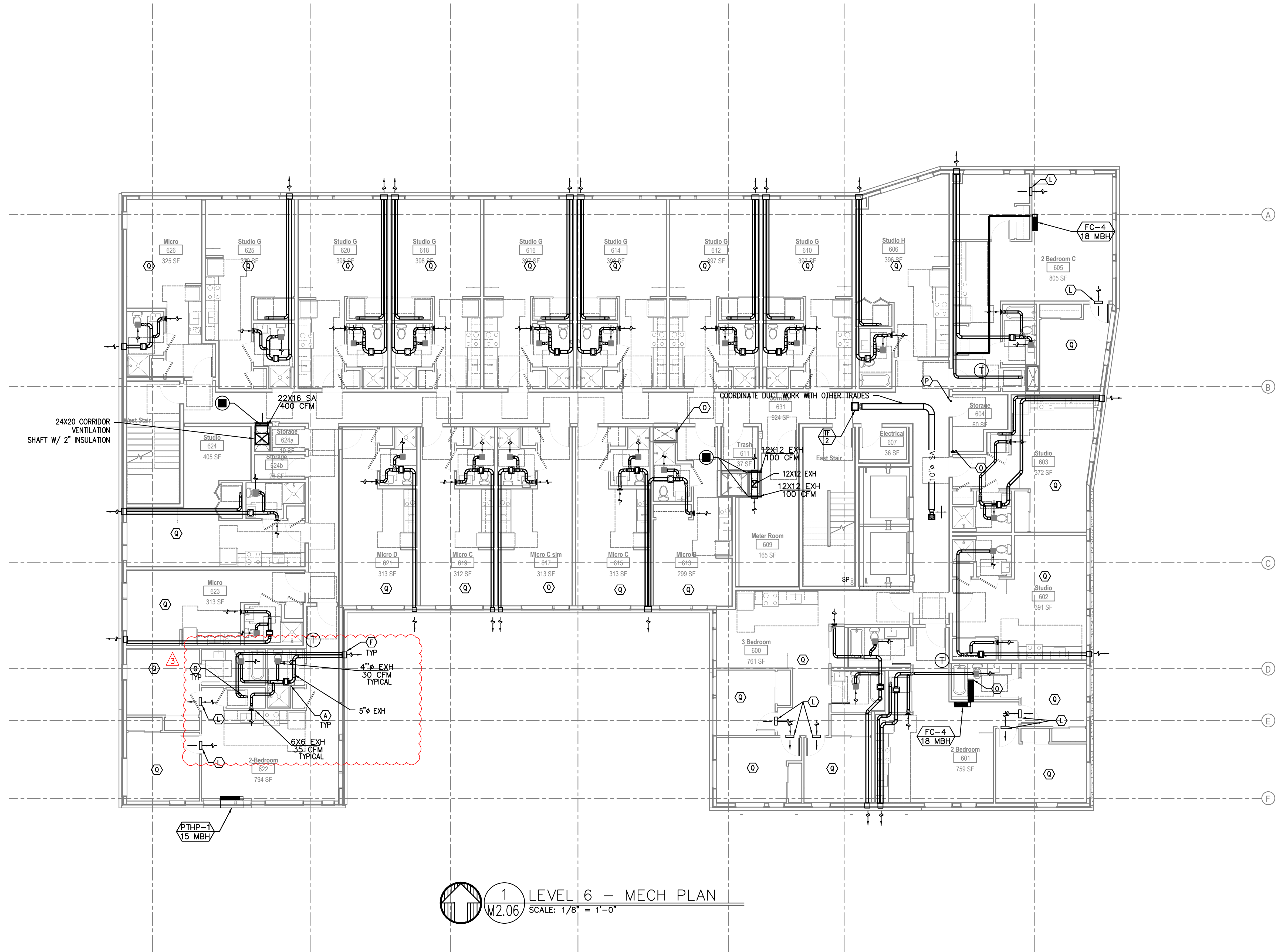
FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 16	1200	NA	0	RTU-1
2ND	18 X 16	800	NA	0	RTU-1
1ST	18 X 12	400	NA	0	RTU-1

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.

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

ANALOG PDX
 1871 N FLINT AVE
LEVEL 7 - MECH PLAN
 PORTLAND OREGON 97227



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

SHEET

M2.07

- 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 NOT USED. HOOD INSULATED. NO DUCTWORK SHALL PENETRATE RATED ASSEMBLY. HOOD FAN NOT USED.
 - ③ 1.5KW WALL HEATER QMARK AHM4404F OR EQUAL. EQUIPMENT BY ELECTRICAL CONTRACTOR. SHOWN FOR REFERENCE ONLY.
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 - ⑨ LEVEL 7 DRYERS VENT DIRECTLY THROUGH ROOF.
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 - ⑪ NOT USED.
 - ⑫ ROOM TO ROOM TRANSFER FAN. TURNING 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.
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SHAFT DUCT SIZES

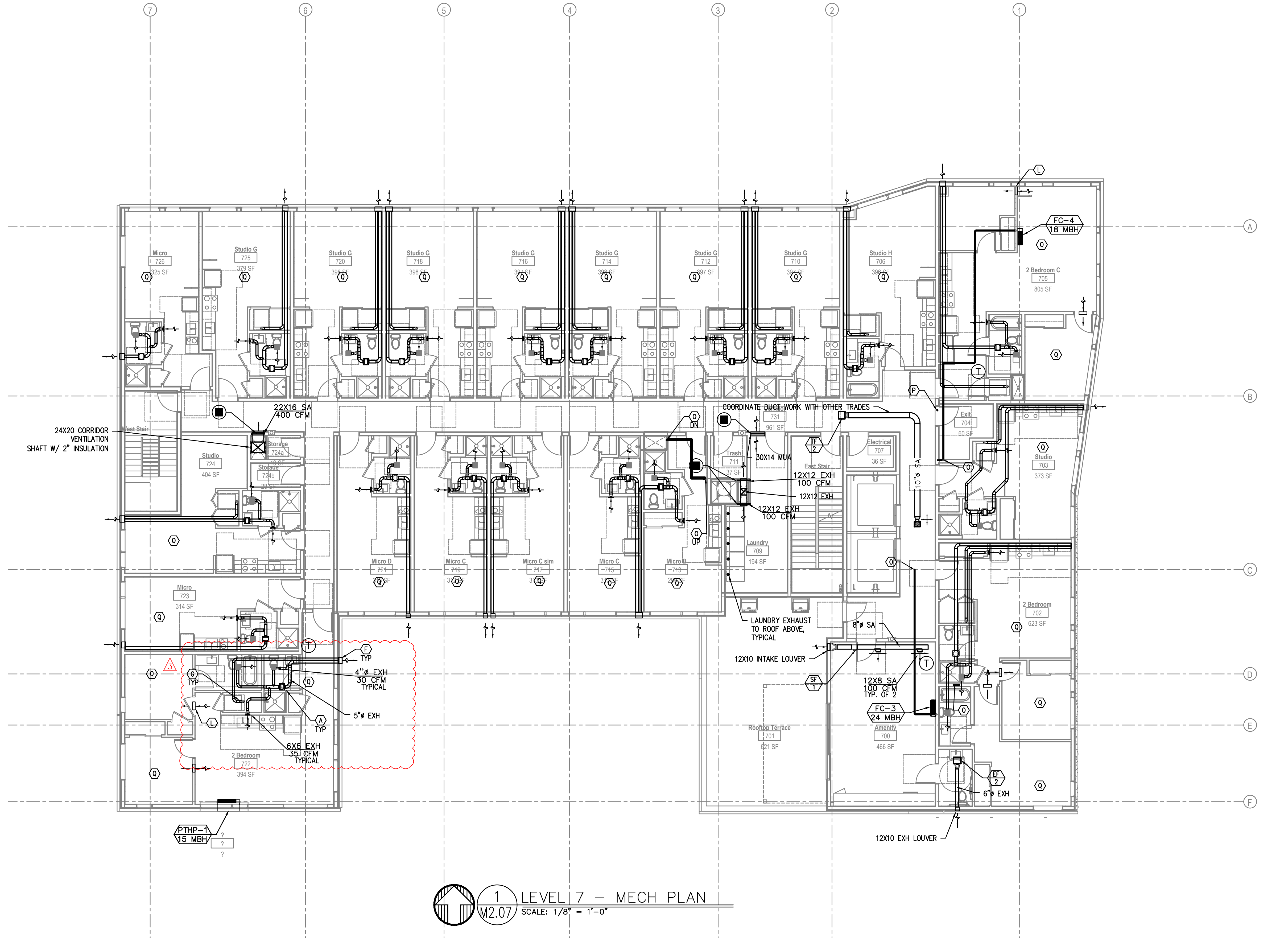
FLOOR	SUPPLY AIR	CFM	RETURN AIR	CFM	UNIT
ATTIC	18 X 18	1600	NA	0	RTU-1
4TH	18 X 18	1600	NA	0	RTU-1
3RD	18 X 18	1200	NA	0	RTU-1
2ND	18 X 16	800	NA	0	RTU-1
1ST	18 X 12	400	NA	0	RTU-1

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 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.

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 nominal 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

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 nominal 2 by 4 in. (51 by 102 mm) lumber spaced 16 in. (408 mm) OC. Steel studs to be min 3-1/2 in. (84 mm) wide and spaced max 24 in. (610 mm) OC.
 - Gypsum Board** — Two layers of nominal 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) lap 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.

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

Hilti Firestop Systems

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 nominal 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 cm²) 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

22" X 22" THROAT

33" OVERALL

BIRDSCREEN ALL AROUND

ANCHOR RELIEF HEAD COUNTER-FLASHING CAP TO CURB

ANCHOR AND SEAL DUCT RELIEF INSIDE ROOF CURB

DAMPER MOTOR DISCONNECT SWITCH (WEATHERPROOF)

CURB MOUNTED LOW LEAK BACKDRAFT DAMPER CURB AND FLASHING N.I.M.

RELIEF GRILLE OR RELIEF DUCT. SEE FLOOR PLAN FOR SPECIFIC APPLICATION

4 ELEVATOR SHAFT RELIEF VENT
M6.04 SCALE: DETAIL

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	50	0.06
6" Duct =	0.17/100			0.085
TOTAL PD = 0.145				

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

7 RANGE HOOD PRESSURE LOSS CALCS
M6.04 NOT TO SCALE

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/m³) 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

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/Hz)			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
TOTAL PD = 0.2					

* — 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

PROVIDE BACKDRAFT DAMPER FOR DRYER DUCT TERMINATION

5 GLOBE STYLE ROOF VENT
M6.04 NOT TO SCALE

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"	13.1
KCV120J	11809	120	WHITE	900	7.5	71"	13.1
KCV120K	11812	120	ALMOND	1050	8.8	83"	15.3
KCV120L	11813	120	WHITE	1050	8.8	83"	15.3
KCV120M	11814	120	ALMOND	1200	10.0	94"	16.8
KCV120N	11815	120	WHITE	1200	10.0	94"	16.8
KCV120P	11816	120	ALMOND	1500	12.5	118"	26.0
KCV120Q	11817	120	WHITE	1500	12.5	118"	26.0
KCV200A	11818	208	ALMOND	450	2.2	34"	6.7
KCV200B	11819	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
KCV200E	11819	208	ALMOND	750	3.6	59"	11.2
KCV200F	11826	208	WHITE	750	3.6	59"	11.2
KCV200G	11820	208	ALMOND	900	4.3	71"	13.1
KCV200H	11828	208	WHITE	900	4.3	71"	13.1
KCV200I	11821	208	ALMOND	1050	5.0	83"	15.3
KCV200J	11829	208	WHITE	1050	5.0	83"	15.3
KCV200K	11822	208	ALMOND	1200	5.8	94"	16.8
KCV200L	11831	208	WHITE	1200	5.8	94"	16.8
KCV200M	11823	208	ALMOND	1500	7.2	118"	21.2
KCV200N	11832	208	WHITE	1500	7.2	118"	21.2
KCV200O	11796	208	ALMOND	1600	8.7	118"	21.2
KCV200P	11796	208	WHITE	1600	8.7	118"	21.2

Engineering Specifications

Construction:

- Constructed of extruded aluminum with a maximum cross section thickness of .800"
- 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	Wires	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

8 COVE HEATER SUBMITTAL
M6.04 NOT TO SCALE



CHECKSHEET RESPONSES #1

CHECKSHEET RESPONSES #2

CHECKSHEET RESPONSES #3

Date: 06.06.2021

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

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

M6.04