

COLORADO DEPARTMENT OF HUMAN SERVICES

Regional Center Capital Improvements, GJRC Group Home

A/C FY 17-18

SHEET LEGEND

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 M0-2 MECHANICAL PIPING AND WIRING SCHEMATICS
 M0-3 MECHANICAL PIPING AND WIRING SCHEMATICS

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E2-10 ELECTRICAL SPECIFICATIONS

STATE OF COLORADO PROJECT #2017-030P16

OCTOBER 29, 2019

100% CONSTRUCTION DOCUMENTS

CODE NOTES:

1. APPLICABLE CODES INCLUDE THE 2015 VERSIONS OF THE IBC, IMC, IECC, IPC, IFGC AND THE 2017 VERSION OF THE NEC.

GENERAL CONSTRUCTION NOTES:

1. THE SCOPE OF WORK FOR THIS PROJECT WILL INVOLVE THE RENOVATION AND UPGRADE OF THE MECHANICAL SYSTEMS IN THE GROUP HOMES.

2. DEMOLITION INCLUDES THE REMOVAL OF EXISTING FURNACES, EVAPORATIVE COOLERS, AND ELECTRICAL ASSOCIATED WITH THE MECHANICAL UPGRADE.

3. COORDINATE STAGING AREA FOR CONSTRUCTION WITH THE OWNER.

4. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL WASTE DISPOSAL FOR THIS PROJECT. COORDINATE THE LOCATION OF WASTE DUMPSTERS WITH THE OWNER.

5. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND ACCESS REQUIREMENTS FOR ALL NEW EQUIPMENT PRIOR TO ORDERING MATERIAL.6. ANY WORK THAT DISTURBS OR ALTERS THE ROOF AND ROOFING MATERIAL IS TO BE RETURNED TO PRE-CONSTRUCTION CONDITIONS AND THE

 ANY WORK THAT DISTURBS OR ALTERS THE ROOF AND ROOF MADE WEATHERTIGHT.

1. THE WORK WILL INVOLVE A NEW VARIABLE REFRIGERANT SYSTEM INCLUDING OUTDOOR HEAT PUMP CONDENSING UNIT, NEW INDOOR UNITS DUCTWORK, CONTROLS, UPGRADED ELECTRICAL, AND TESTING AND BALANCING.

2. RELOCATE EXISTING PIPING, CONDUIT, FIRE SPRINKLERS, WASTE AND VENT LINES, ETC. IN ORDER TO ACCOMMODATE THE NEW EQUIPMENT AND DUCTWORK. ALL CHANGES TO FIRE SPRINKLER PIPING AND HEADS MUST BE APPROVED BY THE AUTHORITY HAVING JURISDICTION.

PROJECT BIDDING:

SCOPE OF NEW WORK:

THE PROJECT WILL BE BID USING THE FOLLOWING BID ASSEMBLIES:

. ASSEMBLY 1: ELM GROUP HOME. 2. ASSEMBLY 2: EASTBROOK GROUP HOME.

ASSEMBLY 3: B ROAD GROUP HOME.
 ASSEMBLY 4: CEDAR STREET GROUP HOME

ASSEMBLY 5: DESERT COURT GROUP HOME.
 ASSEMBLY 6: FLORIDA STREET GROUP HOME

7. ASSEMBLY 7: F-1/4 ROAD GROUP HOME.8. ASSEMBLY 8: 29-1/4 ROAD GROUP HOME

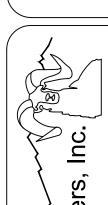
ASSEMBLY 9: 30 ROAD GROUP HOME.
 ASSEMBLY 10: REMOVAL OF EVAPORATIVE COOLERS, WATER LINES, ELECTRICAL POWER, AND CAPPING OF DUCT PENETRATION.
 ASSEMBLY 11: REMOVAL OF EXISTING GAS FIRED FURNACES, GAS PIPING, ELECTRICAL POWER, AND DUCTWORK IN THE ATTIC AND CRAWLSPACE.
 ASSEMBLY 12: REMOVAL OF ALL EXISTING FLOOR REGISTERS IN THE HOME. THIS WILL INCLUDE REMOVAL OF THE FLOOR GRILLES, AND CAPPING OF THE FLOOR PENETRATION. PATCHING OF THE SUB-FLOOR MATERIAL AND THE FLOORING SYSTEM WILL BE BY OWNER.

PROJECT ACCESS:

1. THE CONTRACTOR IS TO COORDINATE ALL BUILDING ACCESS WITH THE OWNER

- 2. START/STOP TIMES FOR WORK IN THE GROUP HOMES WILL BE 8:00AM TO 5:00PM.
- 3. GENERALLY, CLIENTS ARE OUT OF THE HOMES FROM 9:00AM UNTIL 2:30PM, BUT THIS CAN VARY GREATLY FROM HOME TO HOME AND DAY TO DAY. NOT ALL HOMES AND NOT ALL CLIENTS WILL FOLLOW THIS GENERAL SCHEDULE. TWO OF THE HOMES (DESERT COURT AND 30 RD.) WILL REQUIRE THAT MOST OF THE WORK BE DONE BETWEEN 9:00AM AND 2:30PM.
- 4. CONTRACTOR IS ADVISED TO HAVE A SECONDARY GROUP HOME SITE FOR WORK IN THE EVENT THAT ACCESS IS NOT AVAILABLE TO A PARTICULAR GROUP HOME, BUT EVERY ATTEMPT TO ACCOMMODATE CONTRACTOR WORK WILL BE MADE.
- 5. NOTICE OF LOCATIONS AND TYPE OF WORK BEING PERFORMED MUST BE GIVEN TO DFM 24 HOURS IN ADVANCE SO COORDINATION WITH REGIONAL CENTER STAFF CAN BE MADE.
- 6. ANY WORK THAT WILL INVOLVE ALTERATION OF CEILING, WALLS, ETC. IN LIVING AREAS MUST BE COMPLETED IN THE SAME DAY IN ORDER TO PROVIDE A SAFE AND HYGIENIC ENVIRONMENT FOR STAFF AND CLIENTS AT THE END OF THE WORK DAY. ANY DEBRIS, DUST, TOOLS, ETC. MUST BE REMOVED FROM LIVING AREAS BY THE END OF THE WORK DAY.
- 7. PARKING IN GROUP HOME DRIVEWAYS WILL NOT BE PERMITTED BY CONTRACTOR. USE OF DRIVEWAYS FOR MATERIAL DELIVERIES TO THE GROUP HOMES WILL BE ALLOWED UPON APPROVAL FROM DFM.

DO NOT REPRODUCE THESE DRAWINGS AND SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN



Bighorn Consulting Enginee Mechanical & Electrical Engineers 886 Indian Road Grand Junction, CO 81501

IS REGIONAL CENTER GROUP HOMES

DATE:	ISSUED FOR:
10/29/19	BID DOCUMENTS

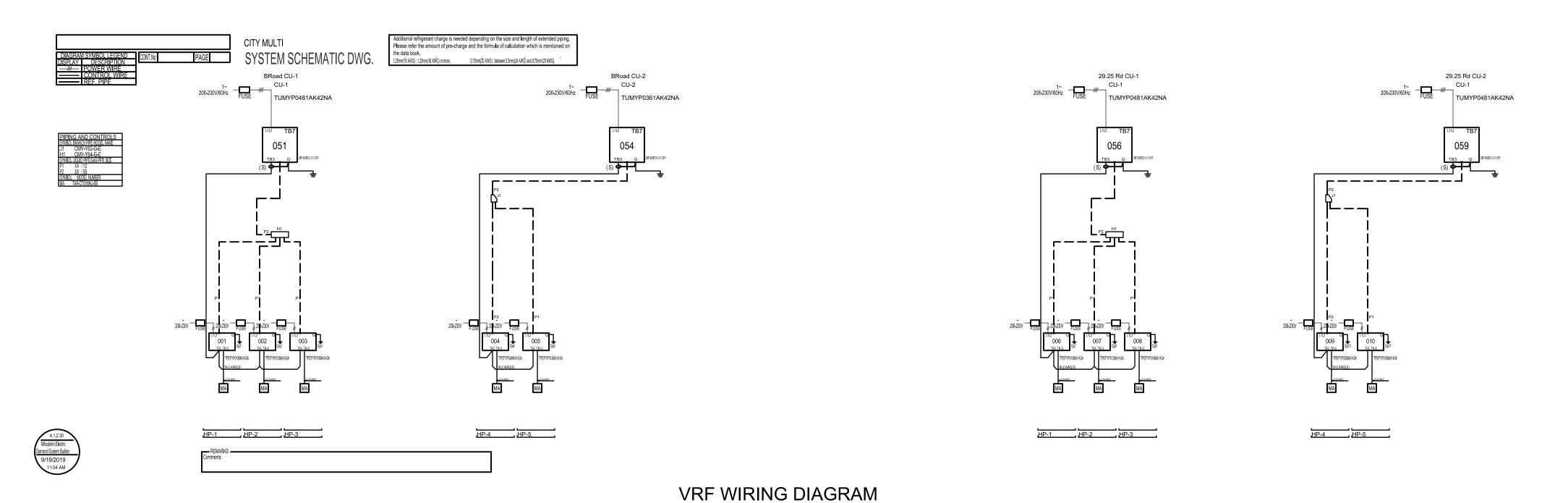
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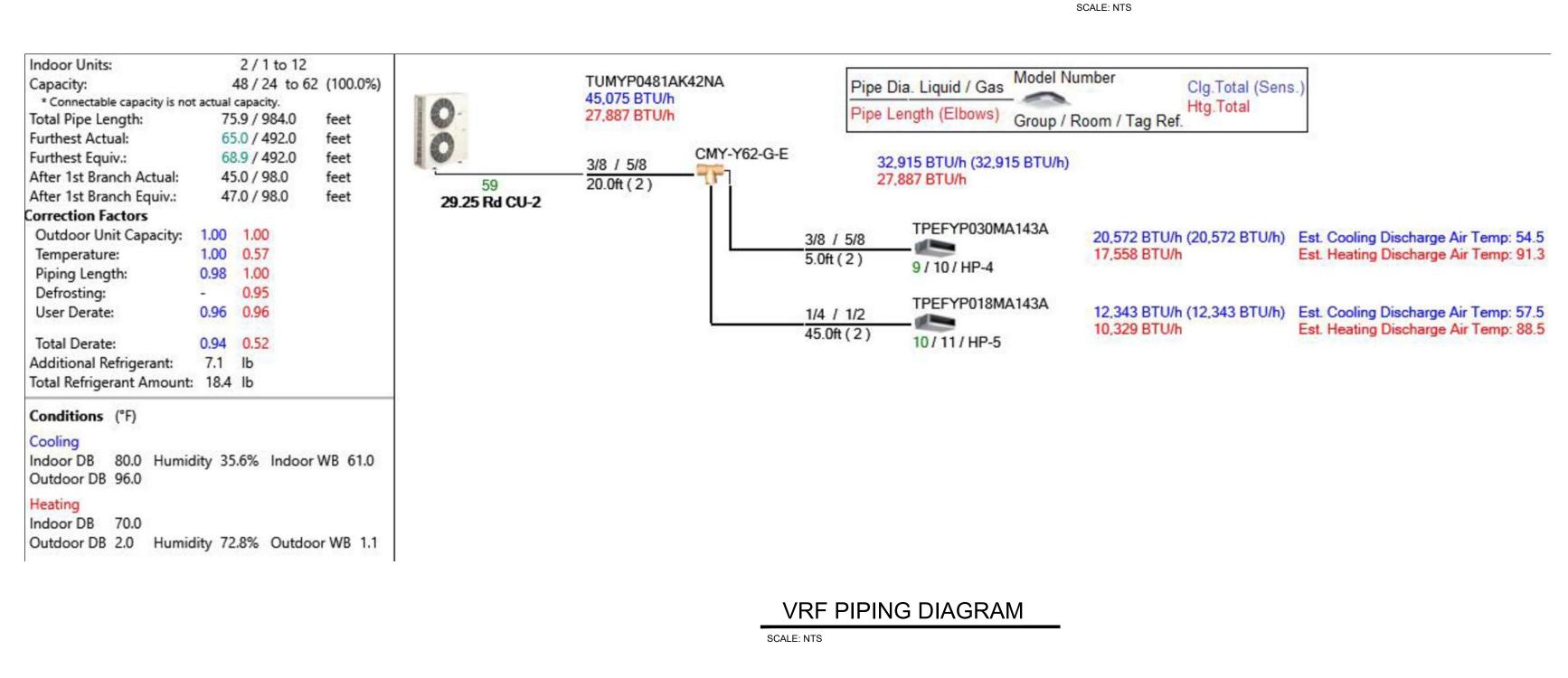
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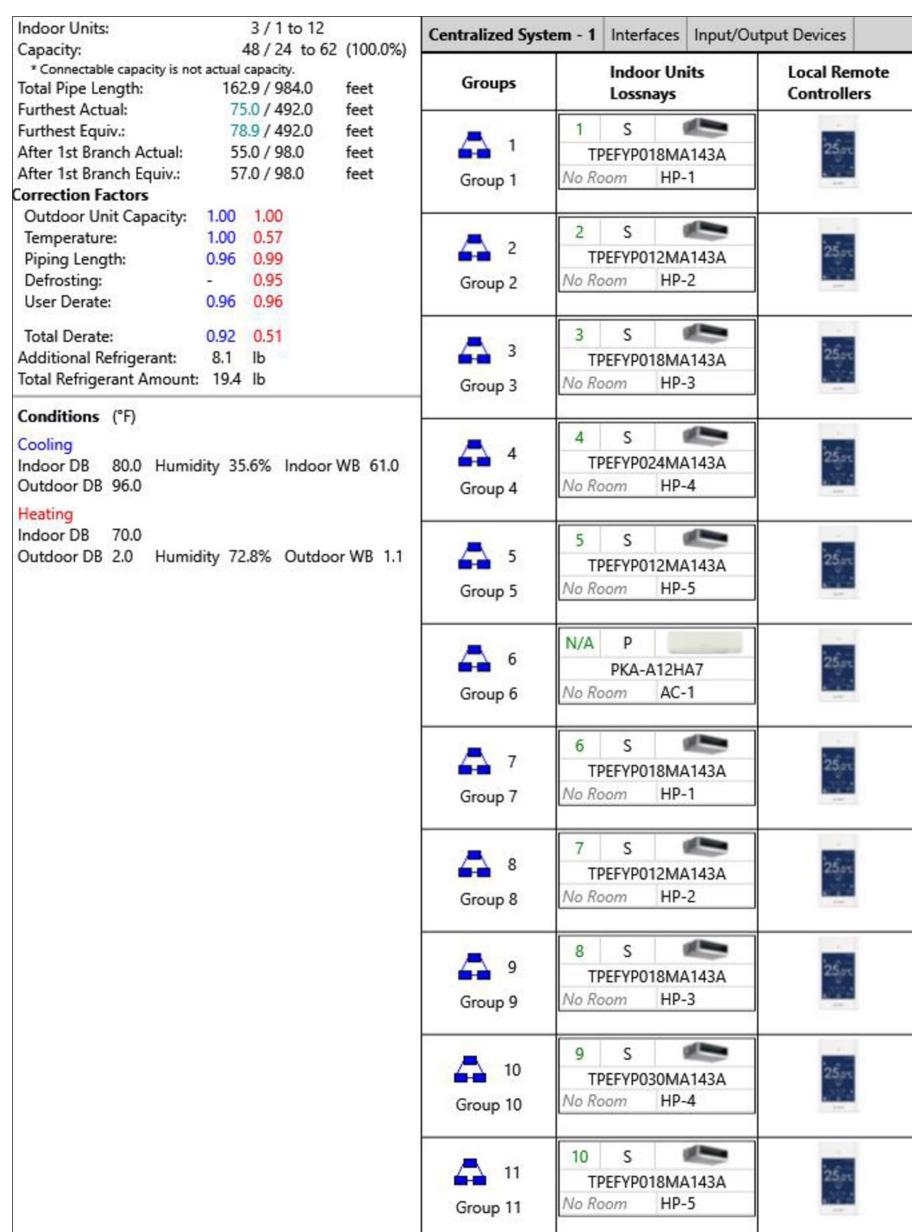
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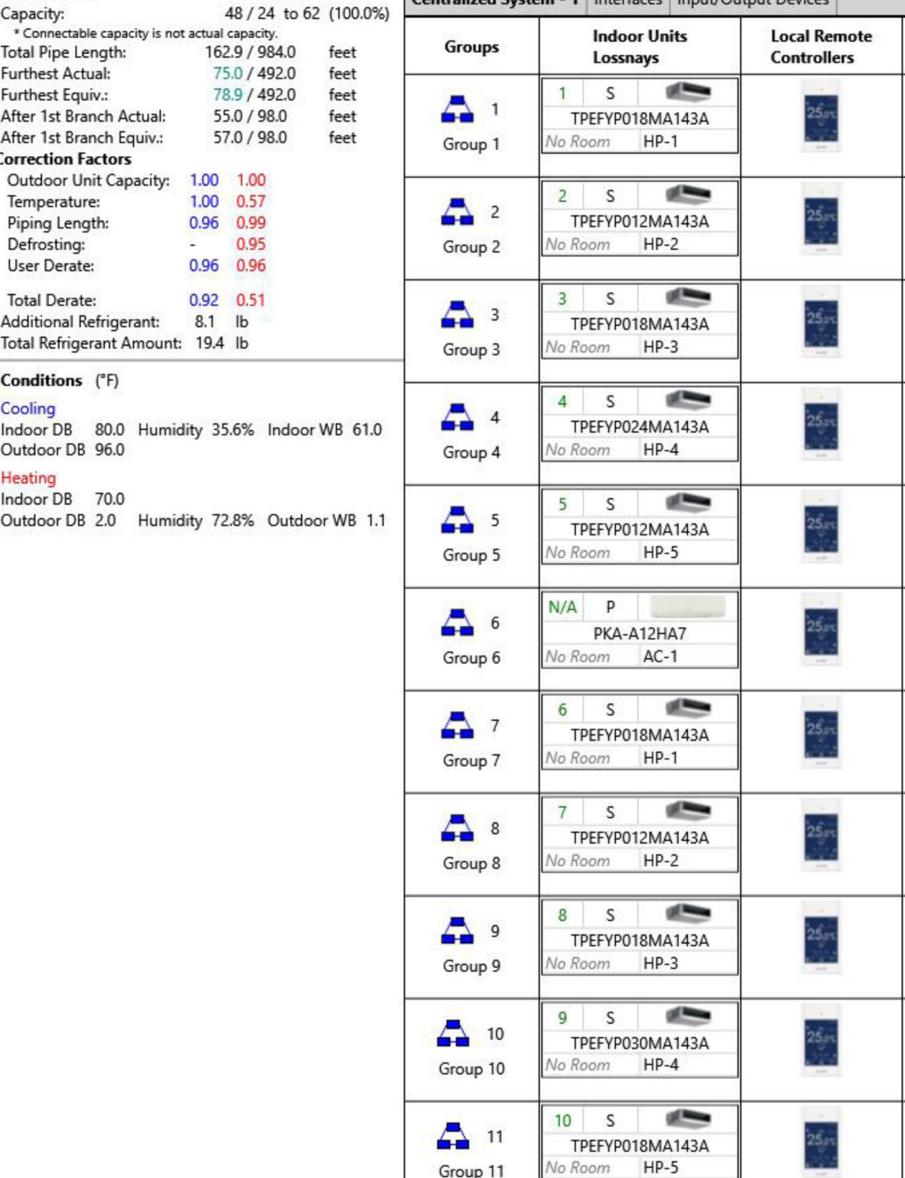
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MECHANICAL - DETAILS

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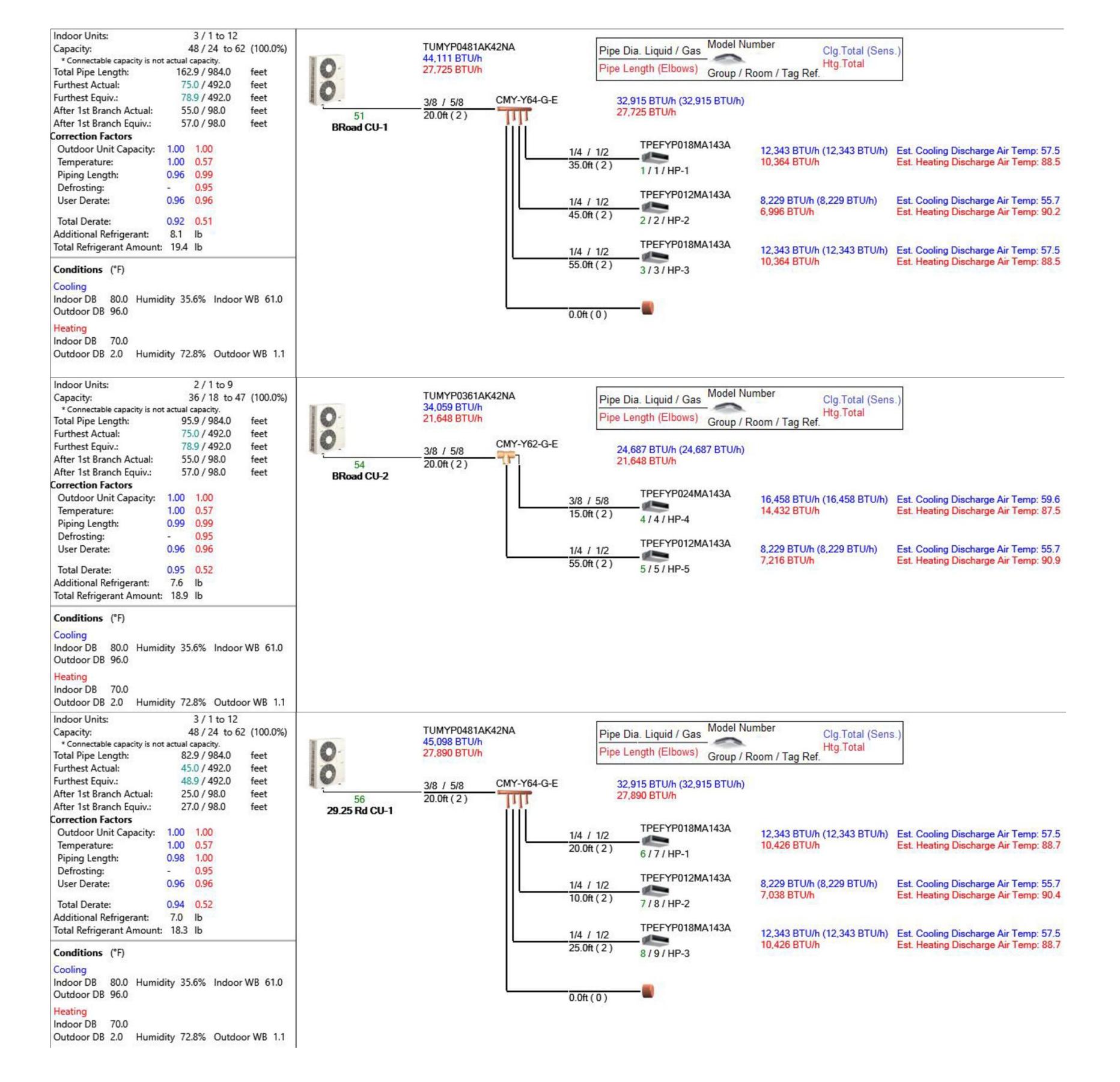
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10/29/19 BID DOCUMENTS 10/29/2019

DATE: ISSUED FOR:

M0-1 October 29, 2019 - 5:02:40pm

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1 S 78.9 / 492.0 feet Furthest Equiv.: 55.0 / 98.0 feet After 1st Branch Actual: TPEFYP018MA143A After 1st Branch Equiv.: 57.0 / 98.0 o Room HP-1 Group 1 Correction Factors Outdoor Unit Capacity: 1.00 1.00 1.00 0.57 Temperature: Piping Length: 0.99 0.99 TPEFYP012MA143A - 0.95 o Room HP-2 Defrosting: Group 2 0.96 0.96 User Derate: 0.95 0.52 Total Derate: 3 TPEFYP018MA143A Additional Refrigerant: 7.6 lb Total Refrigerant Amount: 18.9 lb o Room HP-3 Group 3 Conditions (°F) 4 S Cooling TPEFYP024MA143A Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Outdoor DB 96.0 o Room HP-4 Group 4 Indoor DB 70.0 Outdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 TPEFYP012MA143A o Room HP-5 Group 5 N/A P 4 PKA-A12HA7 lo Room AC-1 Group 6 TPEFYP018MA143A o Room HP-1 Group 7 7 S TPEFYP012MA143A Vo Room HP-2 Group 8 9 TPEFYP018MA143A Vo Room HP-3 Group 9 10 TPEFYP030MA143A Vo Room HP-4 Group 10 10 S 11 TPEFYP018MA143A Vo Room HP-5 Group 11

Groups

Centralized System - 1 Interfaces Input/Output Devices

Indoor Units

Lossnays

Local Remote

Controllers

Indoor Units:

Total Pipe Length:

Furthest Actual:

* Connectable capacity is not actual capacity.

Capacity:

2/1 to 9

95.9 / 984.0

75.0 / 492.0

36 / 18 to 47 (100.0%)

feet

feet

VRF PIPING DIAGRAM

SCALE: NTS

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JUNCTION,

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ndoor Units: 1 / 1 to 1 Capacity: 12 / 6 to 12 (100.0%)	Centralized Sys	tem - 1 Interfaces Input/Ou	tput Devices
* Connectable capacity is not actual capacity. Total Pipe Length: 52.0 / 165.0 feet	Groups	Indoor Units Lossnays	Local Remote Controllers
Orrection Factors 0.91 0.00 Temperature: 0.91 0.00 Piping Length: 0.95 0.00 Defrosting: - 0.00 User Derate: 0.96 0.96	Group 1	1 S TPEFYP018MA143A No Room HP-1	25m
Total Derate: 0.83 0.00 Additional Refrigerant: 0.0 lb Total Refrigerant Amount: 4.4 lb	Group 2	2 S TPEFYP012MA143A No Room HP-2	25.or
Conditions (°F) Cooling Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Dutdoor DB 96.0	Group 3	3 S TPEFYP018MA143A No Room HP-3	25oc
Heating ndoor DB 70.0 Dutdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1	4 Group 4	4 S TPEFYP024MA143A No Room HP-4	25m
	5 Group 5	5 S TPEFYP012MA143A No Room HP-5	25
	Group 6	N/A P PKA-A12HA7 No Room AC-1	25oc
	Group 7	6 S TPEFYP018MA143A No Room HP-1	25ox
	Group 8	7 S TPEFYP012MA143A No Room HP-2	2500
	Group 9	8 S TPEFYP018MA143A No Room HP-3	25ox
	10 Group 10	9 S TPEFYP030MA143A No Room HP-4	25m
	11 Group 11	10 S TPEFYP018MA143A No Room HP-5	25or

Indoor Units: 3 / 1 to 12	Centralized Sys	tem - 1 Interfaces Input/Ou	itput Devices
Capacity: 48 / 24 to 62 (100.0%) * Connectable capacity is not actual capacity. Total Pipe Length: 82.9 / 984.0 feet	Groups	Indoor Units Lossnays	Local Remote Controllers
Furthest Actual: 45.0 / 492.0 feet Furthest Equiv.: 48.9 / 492.0 feet After 1st Branch Actual: 25.0 / 98.0 feet After 1st Branch Equiv.: 27.0 / 98.0 feet Correction Factors	Group 1	1 S TPEFYP018MA143A No Room HP-1	25.cc
Outdoor Unit Capacity: 1.00 1.00 Temperature: 1.00 0.57 Piping Length: 0.98 1.00 Defrosting: - 0.95 User Derate: 0.96 0.96	Group 2	2 S TPEFYP012MA143A No Room HP-2	25
Total Derate: 0.94 0.52 Additional Refrigerant: 7.0 lb Total Refrigerant Amount: 18.3 lb	Group 3	3 S TPEFYP018MA143A No Room HP-3	25
Cooling Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Outdoor DB 96.0 Heating	4 Group 4	4 S TPEFYP024MA143A No Room HP-4	25 ox.
Indoor DB 70.0 Outdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1	5 Group 5	5 S TPEFYP012MA143A No Room HP-5	25,00
	Group 6	N/A P PKA-A12HA7 No Room AC-1	25,00
	Group 7	6 S TPEFYP018MA143A No Room HP-1	2500
	Group 8	7 S TPEFYP012MA143A No Room HP-2	25.
	Group 9	8 S TPEFYP018MA143A No Room HP-3	25,
	10 Group 10	9 S TPEFYP030MA143A No Room HP-4	25
	11 Group 11	10 S TPEFYP018MA143A No Room HP-5	2500

Total Pipe Length: 75.9 / 984.0 feet Furthest Actual: 65.0 / 492.0 feet After 1st Branch Actual: 45.0 / 98.0 feet After 1st Branch Equiv.: 47.0 / 98.0 feet Correction Factors Outdoor Unit Capacity: 1.00 1.00 Temperature: 1.00 0.57 Piping Length: 0.98 1.00 Defrosting: - 0.95 User Derate: 0.94 0.52 Additional Refrigerant: 7.1 lb Total Derate: 0.94 0.52 Additional Refrigerant Amount: 18.4 lb Conditions (*F) Coolling Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Outdoor DB 96.0 Heating Indoor DB 70.0 Outdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 Group 5 Total Prefront Amount: 18.4 lb Group 6 Group 6 Group 7 A TPEFRONT Amount STREET Amo	S YP012MA143A HP-2 S YP018MA143A HP-3 S YP024MA143A
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Furthest Actual: 65.0 / 492.0 feet Furthest Equiv.: 68.9 / 492.0 feet After 1st Branch Actual: 45.0 / 98.0 feet Outdoor Unit Capacity: 1.00 1.00 Temperature: 1.00 0.57 Piping Length: 0.98 1.00 Defrosting: - 0.95 User Derate: 0.94 0.52 Additional Refrigerant: 7.1 lb Total Derate: 0.94 0.52 Additional Refrigerant Amount: 18.4 lb Conditions (*F) Cooling Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Outdoor DB 96.0 Dutdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 Furthest Equiv.: 68.9 / 492.0 feet After 1st Branch Actual: 45.0 / 98.0 feet Toper To	S
After 1st Branch Actual: 45.0 / 98.0 feet After 1st Branch Equiv.: 47.0 / 98.0 feet Orrection Factors Outdoor Unit Capacity: 1.00 1.00 Temperature: 1.00 0.57 Piping Length: 0.98 1.00 Defrosting: - 0.95 User Derate: 0.96 0.96 Total Derate: 0.94 0.52 Additional Refrigerant: 7.1 lb Total Refrigerant Amount: 18.4 lb Conditions (°F) Cooling Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Dutdoor DB 70.0 Dutdoor DB 70.0 Dutdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 TPEF No Roor No Roor After 1st Branch Actual: 15	YP018MA143A HP-1 S YP012MA143A HP-2 S YP018MA143A HP-3
After 1st Branch Actual: 45.0 / 98.0 feet After 1st Branch Equiv.: 47.0 / 98.0 feet Orrection Factors Outdoor Unit Capacity: 1.00 1.00 Temperature: 1.00 0.57 Piping Length: 0.98 1.00 Defrosting: - 0.95 User Derate: 0.96 0.96 Total Derate: 0.94 0.52 Additional Refrigerant: 7.1 lb Total Refrigerant Amount: 18.4 lb Conditions (°F) Cooling Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Dutdoor DB 70.0 Dutdoor DB 70.0 Dutdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 TPEF No Roor No Roor After 1st Branch Actual: 15	HP-1 S YP012MA143A HP-2 S YP018MA143A HP-3 S YP024MA143A
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Indoor DB 80.0 Humidity 35.6% Indoor WB 61.0 Outdoor DB 96.0 Heating Indoor DB 70.0 Outdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 TPER No Roor No Roor No Roor No Roor TPER No Roor No Roor TPER No Roor	YP024MA143A
Outdoor DB 96.0 Heating Indoor DB 70.0 Outdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 Group 5 TPEF No Roor No Roor No Roor TPEF TPEF TO Rep 1 TO Rep 2 TO Rep 3 TO Rep 3 TO Rep 4 TO Rep 4 No Roor TO Rep 4 To Rep 1 To Rep 1 To Rep 1 To Rep 2 To Rep 3 To Rep 3 To Rep 4 To Rep 4 To Rep 4 To Rep 1	1PU24IVIA 143A
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Indoor DB 70.0 Outdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 Group 5 TPEF No Roor No Roor TPEF No Roor TPEF TO Roor TO	HP-4
Outdoor DB 2.0 Humidity 72.8% Outdoor WB 1.1 Group 5 TPEF No Roor TO Reserve A Company States A Company S	s e
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Group 6 N/A P N/A P No Roor TPEF	IF O IZIVIA I TOA
Group 6 No Room 7 TPEF	HP-5
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TPEF	YP012MA143A
Group 8 No Room	HP-2
8	s e
	YP018MA143A
Group 9 No Room	HP-3
9	
10	s 🖎
Group 10 No Room	0.6
Group 10	YP030MA143A
10	YP030MA143A
11 TPEF	YP030MA143A HP-4
Group 11 No Room	YP030MA143A HP-4

VRF SYSTEM DETAILS

SCALE: NTS

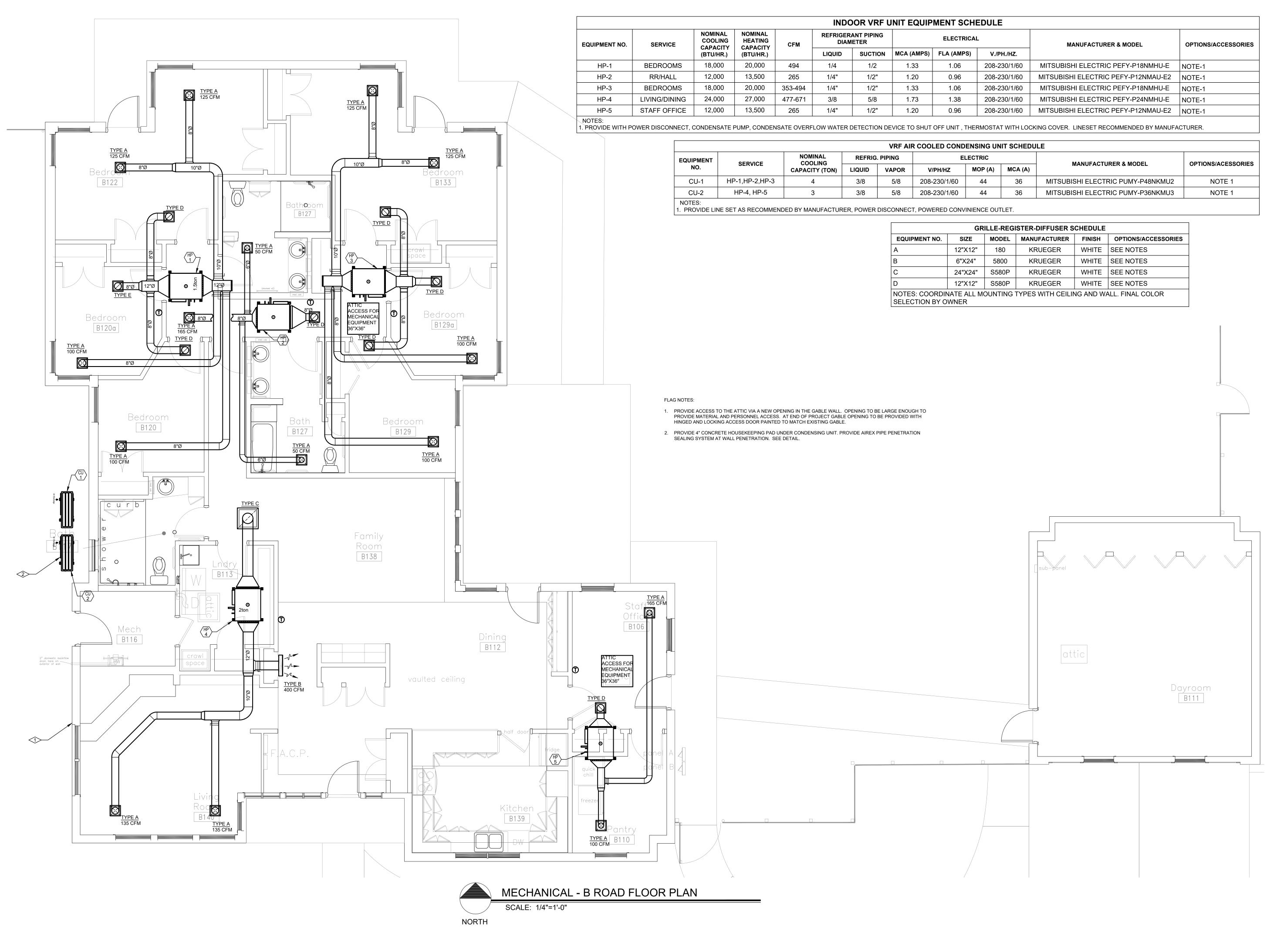
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ng Engineers, Inc.

Bighorn Consulting
Mechanical & Electrical E
386 Indian Road
Grand Junction, CO 81501

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DATE: 10/29/2019

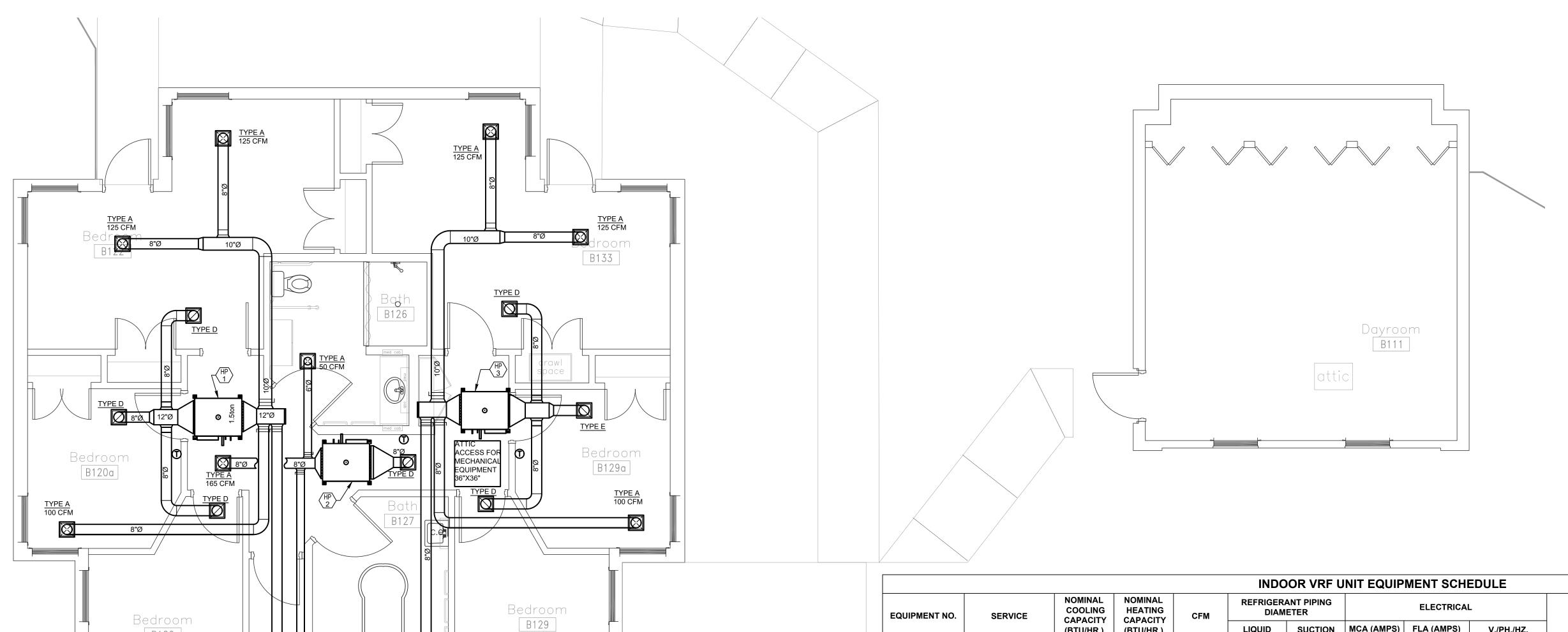
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CHECKED BY: BCE

SCALE: AS SHOWN

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B120

Family Room B138

INDOOR VRF UNIT EQUIPMENT SCHEDULE																			
EQUIPMENT NO. SERVICE	NOMINAL COOLING	COOLING	COOLING	COOLING	COOLING	COOLING	COOLING		COOLING	COOLING	NOMINAL HEATING CAPACITY	CFM		ANT PIPING IETER		ELECTRICAL	-	MANUFACTURER & MODEL	OPTIONS/ACCESSORIES
			(BTU/HR.)		LIQUID	SUCTION	MCA (AMPS)	FLA (AMPS)	V./PH./HZ.										
HP-1	BEDROOMS	18,000	20,000	494	1/4	1/2	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1								
HP-2	RR/HALL	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1								
HP-3	BEDROOMS	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1								
HP-4	LIVING/DINING	24,000	27,000	477-671	3/8	5/8	1.73	1.38	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P24NMHU-E	NOTE-1								
HP-5	STAFF OFFICE	12,000	13,500	265	1/4"	1/2"	1.20 0.96 208-230/1/60		208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1								
NOTEC	•	-	-						-										

NOTES:

1. PROVIDE WITH POWER DISCONNECT, CONDENSATE PUMP, CONDENSATE OVERFLOW WATER DETECTION DEVICE TO SHUT OFF UNIT, THERMOSTAT WITH LOCKING COVER. LINESET RECOMMENDED BY MANUFACTURER.

	VRF AIR COOLED CONDENSING UNIT SCHEDULE													
EQUIPMENT SERVICE		NOMINAL COOLING	REFRIG	. PIPING	E	LECTRIC		MANUFACTURER & MODEL	OPTIONS/ACESSORIES					
NO.	SERVICE	CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A)	MCA (A)	MANUFACTURER & MODEL	OI HONO/ACESSORIES					
CU-1	HP-1,HP-2,HP-3	4	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1					
CU-2	HP-4, HP-5	3	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P36NKMU3	NOTE 1					
NOTES:														

SELECTION BY OWNER

NOTES:
1. PROVIDE LINE SET AS RECOMMENDED BY MANUFACTURER, POWER DISCONNECT, POWERED CONVINIENCE OUTLET.

GRILLE-REGISTER-DIFFUSER SCHEDULE												
EQUIPMENT NO.	SIZE	MODEL	MANUFACTURER	FINISH	OPTIONS/ACCESSORIES							
A	12"X12"	180	KRUEGER	WHITE	SEE NOTES							
В	6"X24"	5800	KRUEGER	WHITE	SEE NOTES							
С	24"X24"	S580P	KRUEGER	WHITE	SEE NOTES							
)	12"X12"	S580P	KRUEGER	WHITE	SEE NOTES							
NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR												

FLAG NOTES:

- PROVIDE ACCESS TO THE ATTIC VIA A NEW OPENING IN THE GABLE WALL. OPENING TO BE LARGE ENOUGH TO PROVIDE MATERIAL AND PERSONNEL ACCESS. AT END OF PROJECT GABLE OPENING TO BE PROVIDED WITH HINGED AND LOCKING ACCESS DOOR PAINTED TO MATCH EXISTING GABLE.
- 2. PROVIDE 4" CONCRETE HOUSEKEEPING PAD UNDER CONDENSING UNIT. PROVIDE AIREX PIPE PENETRATION SEALING SYSTEM AT WALL PENETRATION. SEE DETAIL.



ACCESS FOR

MECHANICAL EQUIPMENT 36"X36"

Dining B112

vaulted ceiling

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ngineers, Inc.

Bighorn Consulting Engine
Mechanical & Electrical Engineers
386 Indian Road
Grand Junction, CO 81501
Phone: 970-241-8709

CDHS REGIONAL CENTER GROUP HOMES

DATE: ISSUED FOR:

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 19-07

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 BC

 CHECKED BY:
 BC

 SCALE:
 AS SHOW

 SHEET NUMBER:

October 29, 2019 - 5:02:43pm

INDOOR VRF UNIT EQUIPMENT SCHEDULE													
EQUIPMENT NO.	EQUIPMENT NO. SERVICE	NOMINAL COOLING CAPACITY	NOMINAL HEATING CAPACITY	CFM		ANT PIPING IETER		ELECTRICA	L	MANUFACTURER & MODEL	OPTIONS/ACCESSORIES		
		(BTU/HR.)	(BTU/HR.)		LIQUID	SUCTION	MCA (AMPS)	FLA (AMPS)	V./PH./HZ.				
HP-1	BEDROOMS	18,000	20,000	494	1/4	1/2	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1		
HP-2	RR/HALL	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1		
HP-3	BEDROOMS	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1		
HP-4	LIVING/DINING	24,000	27,000	477-671	3/8	5/8	1.73	1.38	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P24NMHU-E	NOTE-1		
HP-5	STAFF OFFICE	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1		

VRF AIR COOLED CONDENSING UNIT SCHEDULE

EQUIPMENT	SERVICE	NOMINAL COOLING	REFRIG	. PIPING	E	LECTRIC		MANUFACTURER & MODEL	ODTIONS/ACESSODIES	
NO.	SERVICE	CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A)	MCA (A)	MANUFACTURER & MODEL	OPTIONS/ACESSORIES	
CU-1	HP-1,HP-2,HP-3	4	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1	
CU-2	HP-4, HP-5	3	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P36NKMU3	NOTE 1	
NOTES:										

1. PROVIDE LINE SET AS RECOMMENDED BY MANUFACTURER, POWER DISCONNECT, POWERED CONVINIENCE OUTLET.

GRILLE-REGISTER-DIFFUSER SCHEDULE												
EQUIPMENT NO.	SIZE	MODEL	MANUFACTURER	FINISH	OPTIONS/ACCESSORIES							
А	12"X12"	180	KRUEGER	WHITE	SEE NOTES							
В	6"X24"	5800	KRUEGER	WHITE	SEE NOTES							
С	24"X24"	S580P	KRUEGER	WHITE	SEE NOTES							
D	12"X12"	S580P	KRUEGER	WHITE	SEE NOTES							
NOTES: COORDIN					ALL FINAL COLOD							

NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR SELECTION BY OWNER

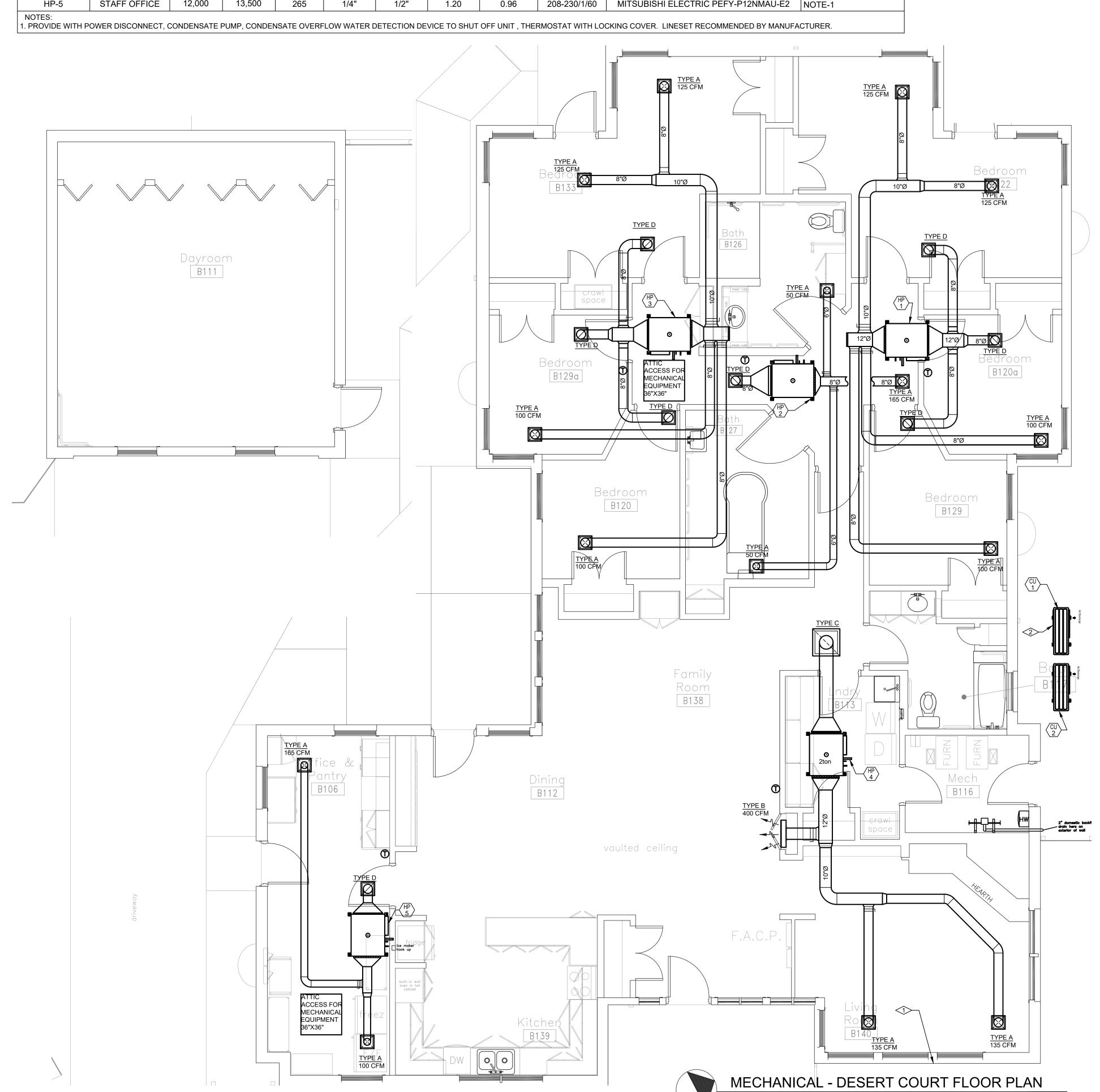
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SCALE: 1/4"=1'-0"

NORTH

FLAG NOTES:

- PROVIDE ACCESS TO THE ATTIC VIA A NEW OPENING IN THE GABLE WALL. OPENING TO BE LARGE ENOUGH TO PROVIDE MATERIAL AND PERSONNEL ACCESS. AT END OF PROJECT GABLE OPENING TO BE PROVIDED WITH HINGED AND LOCKING ACCESS DOOR PAINTED TO MATCH EXISTING GABLE.
- 2. PROVIDE 4" CONCRETE HOUSEKEEPING PAD UNDER CONDENSING UNIT. PROVIDE AIREX PIPE PENETRATION SEALING SYSTEM AT WALL PENETRATION. SEE DETAIL.

	INDOOR VRF UNIT EQUIPMENT SCHEDULE														
EQUIPMENT NO.	SERVICE	NOMINAL COOLING CAPACITY	NOMINAL HEATING CAPACITY	CFM		ANT PIPING ETER		ELECTRICA	L	MANUFACTURER & MODEL	OPTIONS/ACCESSORIES				
		(BTU/HR.)	(BTU/HR.)		LIQUID	SUCTION	MCA (AMPS)	ICA (AMPS) FLA (AMPS) V./PH./HZ.							
HP-1	BEDROOMS	18,000	20,000	494	1/4	1/2	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1				
HP-2	RR/HALL	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1				
HP-3	BEDROOMS	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1				
HP-4	LIVING/DINING	24,000	27,000	477-671	3/8	5/8	1.73	1.38	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P24NMHU-E	NOTE-1				
HP-5	STAFF OFFICE	12,000	13,500	265	1/4"	1/2"	1.20	1.20 0.96 208-230/1/6		MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1				

1. PROVIDE WITH POWER DISCONNECT, CONDENSATE PUMP, CONDENSATE OVERFLOW WATER DETECTION DEVICE TO SHUT OFF UNIT, THERMOSTAT WITH LOCKING COVER. LINESET RECOMMENDED BY MANUFACTURER. B139 vaulted ceiling ACCESS FOR MECHANICAL Dining B112 EQUIPMENT 36"X36" Room B138 TYPE C attached awning B120 8"Ø B120a B129a B126 Bedroom B122 B133 10"Ø 8"Ø TYPE A

VRF AIR COOLED CONDENSING UNIT SCHEDULE

				7111 7111			0000					
EQUIPMENT	SERVICE	NOMINAL COOLING	REFRIG	. PIPING	E	LECTRIC		MANUFACTURER & MODEL	OPTIONS/ACESSORIES			
NO.	SERVICE	CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A)	MCA (A)	MANUFACTURER & MODEL	OF HONG/ACESSORIES			
CU-1	HP-1,HP-2,HP-3	4	3/8 5/8 208-230/1/60 44 36		36	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1					
CU-2	HP-4, HP-5	3	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P36NKMU3	NOTE 1			
NOTES: 1. PROVIDE LIN	NOTES: PROVIDE LINE SET AS RECOMMENDED BY MANUFACTURER, POWER DISCONNECT, POWERED CONVINIENCE OUTLET.											

GRILLE-REGISTER-DIFFUSER SCHEDULE SIZE MODEL MANUFACTURER FINISH OPTIONS/ACCESSORIES EQUIPMENT NO. KRUEGER WHITE SEE NOTES 6"X24" 5800 KRUEGER WHITE | SEE NOTES WHITE SEE NOTES 24"X24" S580P KRUEGER 12"X12" S580P KRUEGER WHITE | SEE NOTES

NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR SELECTION BY OWNER

FLAG NOTES:

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 PROVIDE MATERIAL AND PERSONNEL ACCESS. AT END OF PROJECT GABLE OPENING TO BE PROVIDED WITH
 HINGED AND LOCKING ACCESS DOOR PAINTED TO MATCH EXISTING GABLE.
- 2. PROVIDE 4" CONCRETE HOUSEKEEPING PAD UNDER CONDENSING UNIT. PROVIDE AIREX PIPE PENETRATION SEALING SYSTEM AT WALL PENETRATION. SEE DETAIL.



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CDHS REGIONAL CENTER GROUP HOMES

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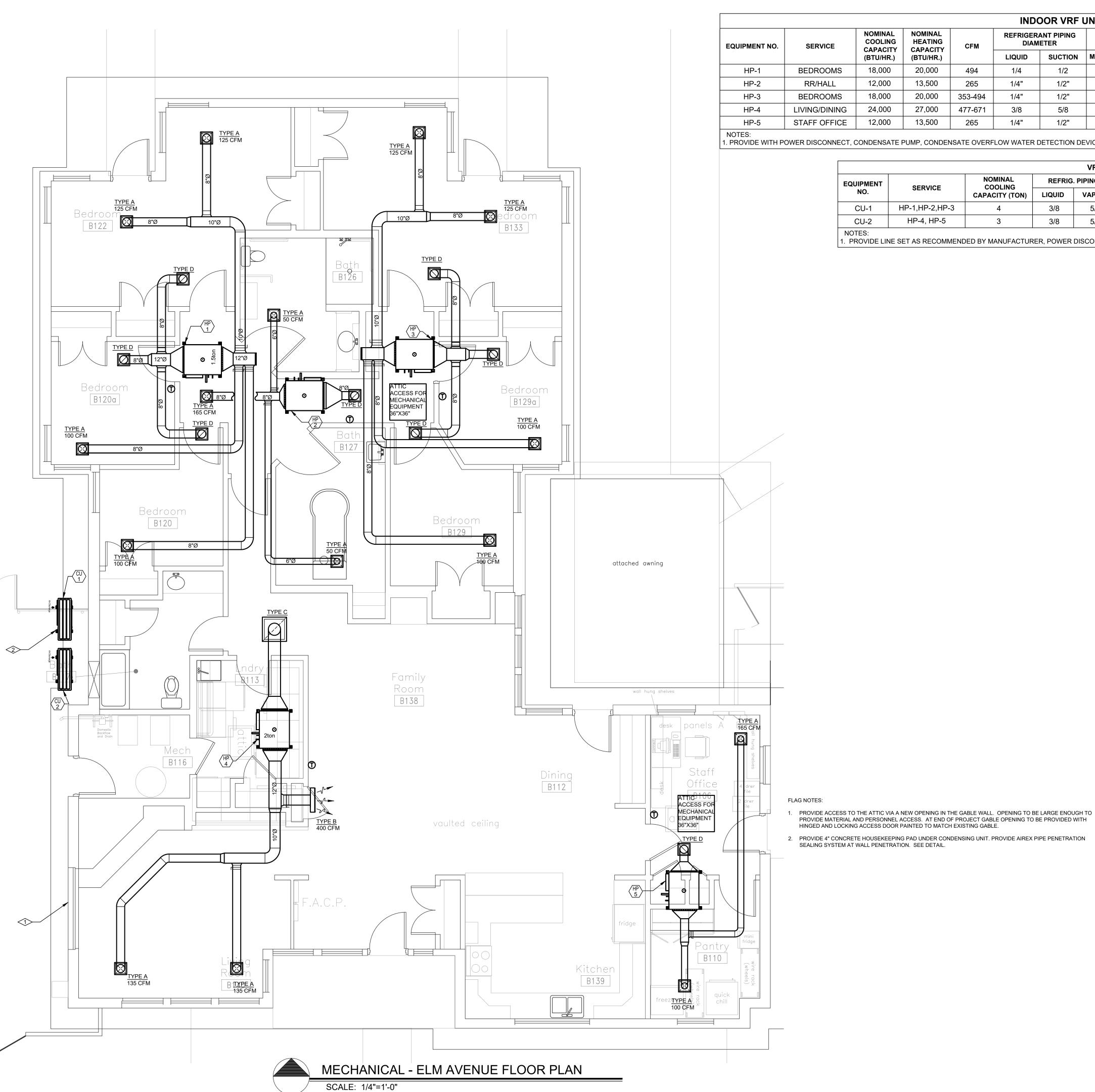
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INDOOR VRF UNIT EQUIPMENT SCHEDULE

EQUIPMENT NO.	SERVICE	NOMINAL COOLING CAPACITY	NOMINAL HEATING CAPACITY	CFM		ANT PIPING ETER		ELECTRICAL	-	MANUFACTURER & MODEL	OPTIONS/ACCESSORIES			
		(BTU/HR.)	(BTU/HR.)		LIQUID	SUCTION	MCA (AMPS)	FLA (AMPS)	V./PH./HZ.					
HP-1	BEDROOMS	18,000	20,000	494	1/4	1/2	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-2	RR/HALL	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1			
HP-3	BEDROOMS	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-4	LIVING/DINING	24,000	27,000	477-671	3/8	5/8	1.73	1.38	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P24NMHU-E	NOTE-1			
HP-5	STAFF OFFICE	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1			

1. PROVIDE WITH POWER DISCONNECT, CONDENSATE PUMP, CONDENSATE OVERFLOW WATER DETECTION DEVICE TO SHUT OFF UNIT, THERMOSTAT WITH LOCKING COVER. LINESET RECOMMENDED BY MANUFACTURER.

	VRF AIR COOLED CONDENSING UNIT SCHEDULE														
				VRF AII	R COOLED COND	ENSING UN	IIT SCHEDU	LE							
EQUIPMENT	SERVICE	NOMINAL COOLING	REFRIG. PIPING		E	LECTRIC		MANUFACTURER & MODEL	OPTIONS/ACESSORIES						
NO.		CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A)	MCA (A)	MANUFACTURER & MODEL	OI HONO/ACESSORIES						
CU-1	HP-1,HP-2,HP-3	4	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1						
CU-2	HP-4, HP-5	3	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P36NKMU3	NOTE 1						
NOTES:				•		•									

1. PROVIDE LINE SET AS RECOMMENDED BY MANUFACTURER, POWER DISCONNECT, POWERED CONVINIENCE OUTLET.

	GRILLE-REGISTER-DIFFUSER SCHEDULE												
EQUIPMENT NO.	SIZE	MODEL	MANUFACTURER	FINISH	OPTIONS/ACCESSORIES								
A	12"X12"	180	KRUEGER	WHITE	SEE NOTES								
В	6"X24"	5800	KRUEGER	WHITE	SEE NOTES								
С	24"X24"	S580P	KRUEGER	WHITE	SEE NOTES								
D	12"X12"	S580P	KRUEGER	WHITE	SEE NOTES								

NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR SELECTION BY OWNER

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PERMISSION OF THE DESIGNER.

DATE: ISSUED FOR: 10/29/19 BID DOCUMENTS DRAWN BY: CHECKED BY: SCALE:

	INDOOR VRF UNIT EQUIPMENT SCHEDULE													
EQUIPMENT NO.	SERVICE	NOMINAL COOLING CAPACITY	NOMINAL HEATING CAPACITY	CFM	REFRIGERANT PIPING DIAMETER		ELECTRICAL			MANUFACTURER & MODEL	OPTIONS/ACCESSORIES			
		(BTU/HR.)	(BTU/HR.)		LIQUID	SUCTION	MCA (AMPS)	MCA (AMPS) FLA (AMPS) V./PH./HZ						
HP-1	BEDROOMS	18,000	20,000	494	1/4	1/2	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-2	RR/HALL	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1			
HP-3	BEDROOMS	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-4	LIVING/DINING	24,000	27,000	477-671	3/8	5/8	1.73	1.38	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P24NMHU-E	NOTE-1			
HP-5	STAFF OFFICE	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1			
NOTES:	•		-			•		-	-		•			

	VRF AIR COOLED CONDENSING UNIT SCHEDULE													
EQUIPMENT	SEDVICE.	NOMINAL COOLING	REFRIG. PIPING		ELECTRIC			MANUFACTURED & MODEL	ODTIONS/ACESSORIES					
NO.	SERVICE	CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A)	MCA (A)	MANUFACTURER & MODEL	OPTIONS/ACESSORIES					
CU-1	HP-1,HP-2,HP-3	4	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1					
CU-2	HP-4, HP-5	3	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P36NKMU3	NOTE 1					

1. PROVIDE WITH POWER DISCONNECT, CONDENSATE PUMP, CONDENSATE OVERFLOW WATER DETECTION DEVICE TO SHUT OFF UNIT, THERMOSTAT WITH LOCKING COVER. LINESET RECOMMENDED BY MANUFACTURER.

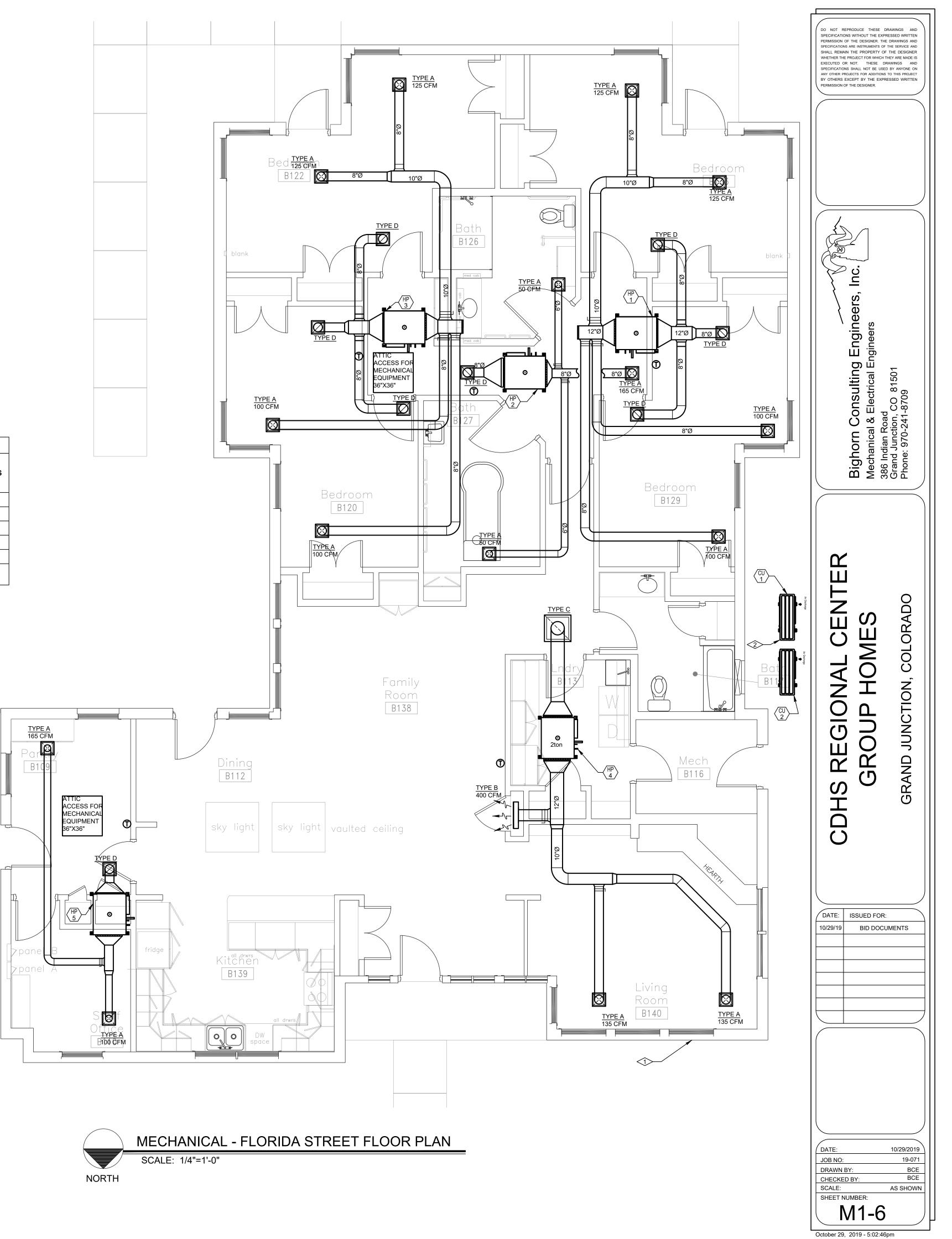
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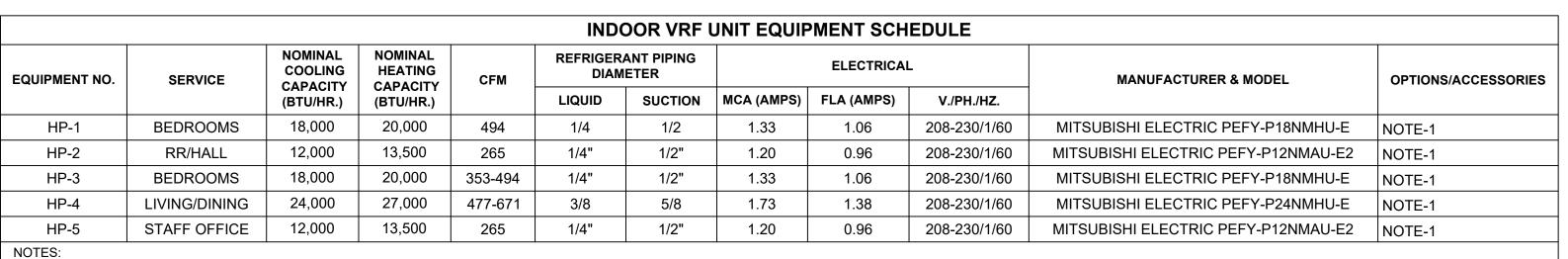
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GRILLE-REGISTER-DIFFUSER SCHEDULE												
EQUIPMENT NO. SIZE MODEL MANUFACTURER FINISH OPTIONS/ACCESSORIES												
Α	12"X12"	180	KRUEGER	WHITE	SEE NOTES							
В	6"X24"	5800	KRUEGER	WHITE	SEE NOTES							
С	24"X24"	S580P	KRUEGER	WHITE	SEE NOTES							
D 12"X12" S580P KRUEGER WHITE SEE NOTES												
NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR SELECTION BY OWNER												

FLAG NOTES:

- PROVIDE ACCESS TO THE ATTIC VIA A NEW OPENING IN THE GABLE WALL. OPENING TO BE LARGE ENOUGH TO
 PROVIDE MATERIAL AND PERSONNEL ACCESS. AT END OF PROJECT GABLE OPENING TO BE PROVIDED WITH
 HINGED AND LOCKING ACCESS DOOR PAINTED TO MATCH EXISTING GABLE.
- 2. PROVIDE 4" CONCRETE HOUSEKEEPING PAD UNDER CONDENSING UNIT. PROVIDE AIREX PIPE PENETRATION SEALING SYSTEM AT WALL PENETRATION. SEE DETAIL.



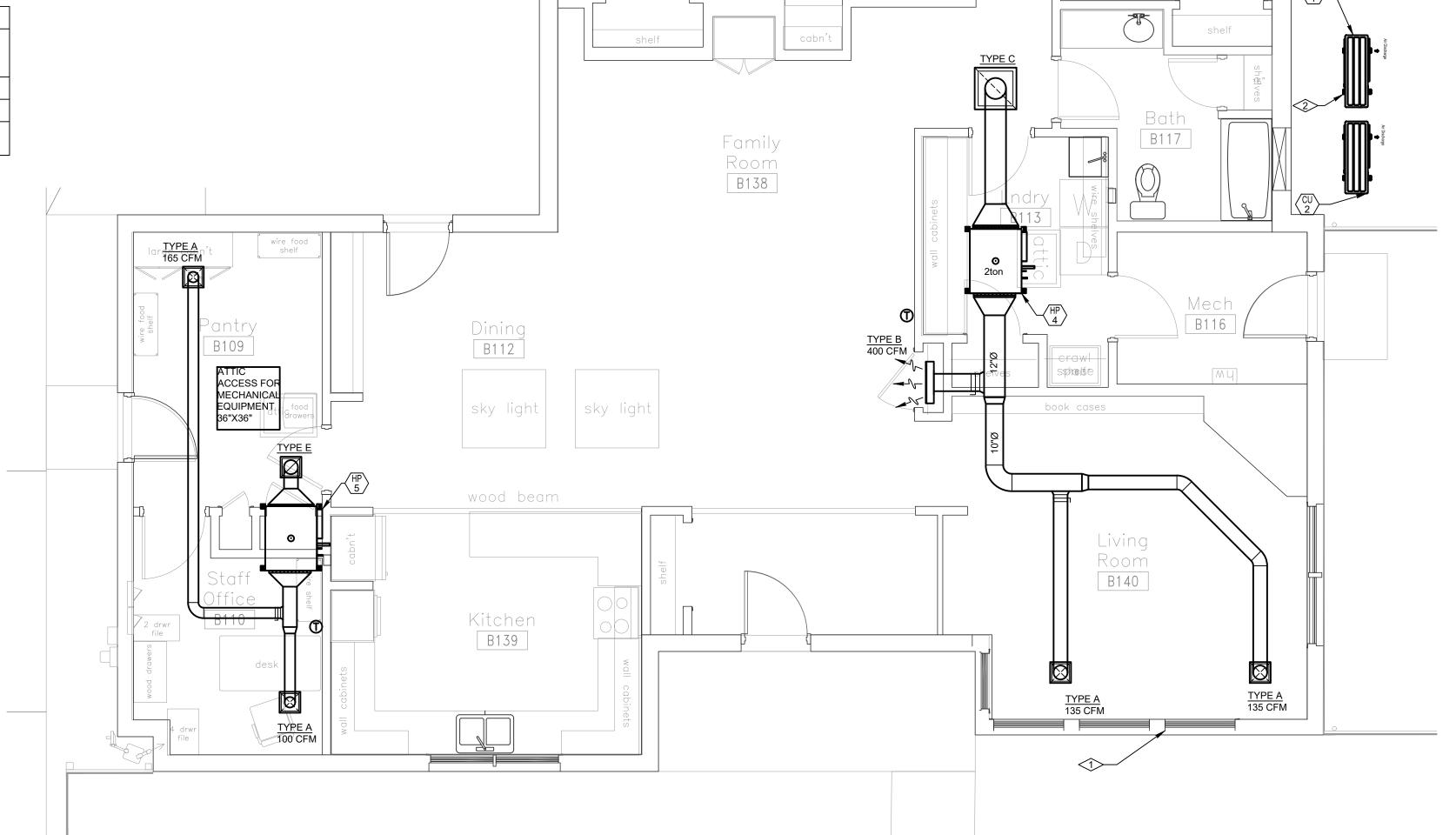


NOTES:
1. PROVIDE WITH POWER DISCONNECT, CONDENSATE PUMP, CONDENSATE OVERFLOW WATER DETECTION DEVICE TO SHUT OFF UNIT, THERMOSTAT WITH LOCKING COVER. LINESET RECOMMENDED BY MANUFACTURER.

	VRF AIR COOLED CONDENSING UNIT SCHEDULE													
EQUIPMENT	SERVICE	NOMINAL COOLING	REFRIG	. PIPING	E	LECTRIC		MANUFACTURER & MODEL	ODTIONS/ACESSODIES					
NO.	SERVICE	CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A)	MCA (A)	MANUFACTURER & MODEL	OPTIONS/ACESSORIES					
CU-1	HP-1,HP-2,HP-3	4	3/8	5/8	208-230/1/60	44	36	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1					
CU-2	CU-2 HP-4, HP-5 3 3/8 5/8 208-230/1/60 44 36 MITSUBISHI ELECTRIC PUMY-P36NKMU3 NOTE 1													
NOTES: 1. PROVIDE LIN	NOTES: 1. PROVIDE LINE SET AS RECOMMENDED BY MANUFACTURER, POWER DISCONNECT, POWERED CONVINIENCE OUTLET.													

GRILLE-REGISTER-DIFFUSER SCHEDULE FINISH OPTIONS/ACCESSORIES EQUIPMENT NO. SIZE MODEL MANUFACTURER WHITE SEE NOTES 12"X12" 180 KRUEGER WHITE SEE NOTES 6"X24" 5800 KRUEGER WHITE | SEE NOTES 24"X24" S580P KRUEGER WHITE SEE NOTES 12"X12" S580P KRUEGER NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR

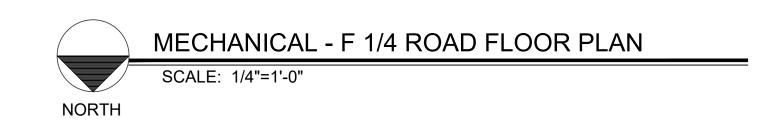
SELECTION BY OWNER



MECHANICA

Bedroom

B129



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rn Consulting Engineers, Inc.

TYPE A 100 CFM

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DATE: ISSUED FOR:

10/29/19 BID DOCUMENTS

DATE: 10/29/2019

JOB NO: 19-071

DRAWN BY: BCE

CHECKED BY: BCE

SCALE: AS SHOWN

SHEET NUMBER:

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	INDOOR VRF UNIT EQUIPMENT SCHEDULE													
EQUIPMENT NO.	SERVICE	NOMINAL COOLING CAPACITY	NOMINAL HEATING CAPACITY	CFM		ANT PIPING ETER		ELECTRICAL		MANUFACTURER & MODEL	OPTIONS/ACCESSORIES			
		(BTU/HR.)	(BTU/HR.)		LIQUID	SUCTION	MCA (AMPS)	FLA (AMPS)	V./PH./HZ.					
HP-1	BEDROOMS	18,000	20,000	494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-2	RR/HALL	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1			
HP-3	BEDROOMS	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-4	LIVING/DINING	30,000	34,000	636-883	3/8"	5/8"	2.29	1.83	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P30NMHU-E	NOTE-1			
HP-5	OFFICE/DAYROOM	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			

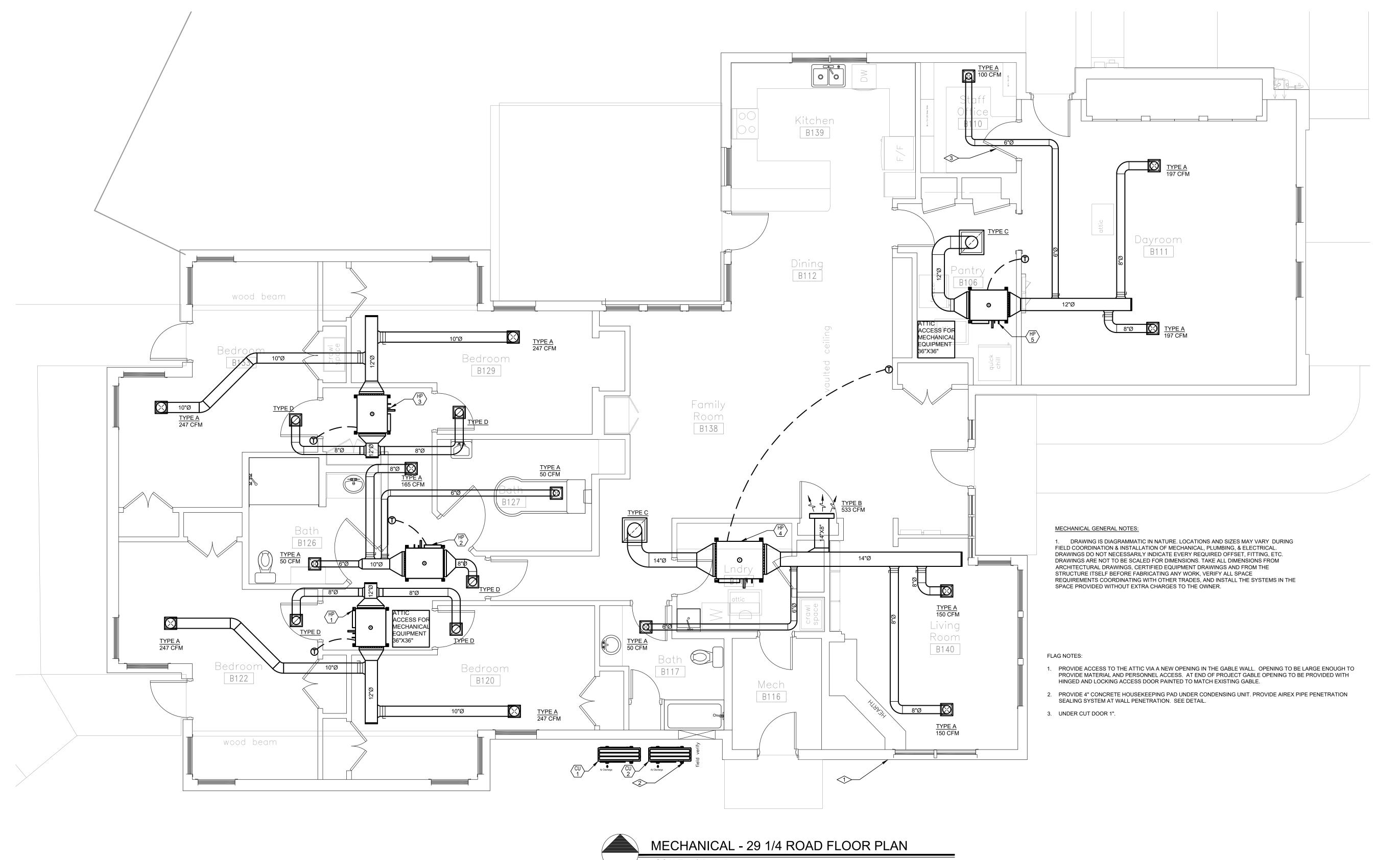
NOTES:
1. PROVIDE WITH POWER DISCONNECT, CONDENSATE PUMP, CONDENSATE OVERFLOW WATER DETECTION DEVICE TO SHUT OFF UNIT, THERMOSTAT WITH LOCKING COVERS LINESET RECOMMENDED BY MANUFACTURER.

	VRF AIR COOLED CONDENSING UNIT SCHEDULE														
EQUIPMENT SERVICE NOMINAL COOLING REFRIG. PIPING ELECTRIC MANUFACTURER & MODEL OPTIO															
NO.	SERVICE	CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A) MCA (A)		MANUFACTURER & MODEL	OPTIONS/ACESSORIES						
CU-1	HP-1,HP-2,HP-3	4	3/8	5/8	208-230/1/60	44	29	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1						
CU-2	HP-4,HP-5	4	3/8	5/8	208-230/1/60	44	29	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1						
				!		!									

NOTES:

1. PROVIDE LINE SET AS RECOMMENDED BY MANUFACTURER, POWER DISCONNECT, POWERED CONVINIENCE OUTLET.

		GRILLE-REGISTER-DIFFUSER SCHEDULE													
	EQUIPMENT NO.	SIZE	MODEL	MANUFACTURER	FINISH	OPTIONS/ACCESSORIES									
	А	SEE NOTES													
	B 6"X24" 5800 KRUEGER WHITE SEE NOTES														
C 24"X24" S580P KRUEGER WHITE SEE NOTES															
	D	12"X12"	S580P	KRUEGER	WHITE	SEE NOTES									
	NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR SELECTION BY OWNER														



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Sonsulting Engineers, Inc.

Bighorn Cons
Mechanical & Elec
386 Indian Road
Grand Junction, CO

CDHS REGIONAL CENTE GROUP HOMES

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29/19	BID DOCUMENTS	

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DATE: 10/29/2019

JOB NO: 19-071

DRAWN BY: BCE

CHECKED BY: BCE

SCALE: AS SHOWN

SHEET NUMBER:

M1-8

0.11 00 0040 5 00 47

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

	INDOOR VRF UNIT EQUIPMENT SCHEDULE													
EQUIPMENT NO. SERVICE	SERVICE	NOMINAL NOMINAL COOLING HEATING CAPACITY CAPACITY CFM		CFM	REFRIGERANT PIPING DIAMETER			ELECTRICAL		MANUFACTURER & MODEL	OPTIONS/ACCESSORIES			
		(BTU/HR.)	(BTU/HR.)		LIQUID	SUCTION	MCA (AMPS)	FLA (AMPS)	V./PH./HZ.					
HP-1	BEDROOMS	18,000	20,000	494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-2	RR/HALL	12,000	13,500	265	1/4"	1/2"	1.20	0.96	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P12NMAU-E2	NOTE-1			
HP-3	BEDROOMS	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			
HP-4	LIVING/DINING	30,000	34,000	636-883	3/8"	5/8"	2.29	1.83	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P30NMHU-E	NOTE-1			
HP-5	OFFICE/DAYROOM	18,000	20,000	353-494	1/4"	1/2"	1.33	1.06	208-230/1/60	MITSUBISHI ELECTRIC PEFY-P18NMHU-E	NOTE-1			

1. PROVIDE WITH POWER DISCONNECT, CONDENSATE PUMP, CONDENSATE OVERFLOW WATER DETECTION DEVICE TO SHUT OFF UNIT, THERMOSTAT WITH LOCKING COVERS LINESET RECOMMENDED BY MANUFACTURER.

ATTIC ACCESS FOR MECHANICAL

EQUIPMENT

Room B140

	VRF AIR COOLED CONDENSING UNIT SCHEDULE													
EQUIPMENT	SERVICE	NOMINAL COOLING	REFRIG	i. PIPING	E	ELECTRIC		ELECTRIC		ELECTRIC		MANUFACTURER & MODEL	OPTIONS/ACESSORIES	SHALL REMAIN THE PROPERTY OF THE DESIGNER WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS
NO.	SERVICE	CAPACITY (TON)	LIQUID	VAPOR	V/PH/HZ	MOP (A)	MCA (A)	WANDFACTURER & WIDDEL		EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT				
CU-1	HP-1,HP-2,HP-3	4	3/8	5/8	208-230/1/60	44	29	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1	BY OTHERS EXCEPT BY THE EXPRESSED WRITTEN PERMISSION OF THE DESIGNER.				
CU-2	HP-4,HP-5	4	3/8	5/8	208-230/1/60	44	29	MITSUBISHI ELECTRIC PUMY-P48NKMU2	NOTE 1					
NOTES:			_	_		_				7				

1. PROVIDE LINE SET AS RECOMMENDED BY MANUFACTURER, POWER DISCONNECT, POWERED CONVINIENCE OUTLET.

GRILLE-REGISTER-DIFFUSER SCHEDULE KRUEGER WHITE SEE NOTES 180 6"X24" 5800 KRUEGER WHITE | SEE NOTES KRUEGER WHITE SEE NOTES 24"X24" | S580P

EQUIPMENT NO. SIZE MODEL MANUFACTURER FINISH OPTIONS/ACCESSORIES 12"X12" | S580P | KRUEGER WHITE | SEE NOTES NOTES: COORDINATE ALL MOUNTING TYPES WITH CEILING AND WALL. FINAL COLOR SELECTION BY OWNER

Bedroom
B109

B129 Family Room B138 Bedroom B120 B116 FLAG NOTES: 1. PROVIDE ACCESS TO THE ATTIC VIA A NEW OPENING IN THE GABLE WALL. OPENING TO BE LARGE ENOUGH TO PROVIDE MATERIAL AND PERSONNEL ACCESS. AT END OF PROJECT GABLE OPENING TO BE PROVIDED WITH HINGED AND LOCKING ACCESS DOOR PAINTED TO MATCH EXISTING GABLE. 2. PROVIDE 4" CONCRETE HOUSEKEEPING PAD UNDER CONDENSING UNIT. PROVIDE AIREX PIPE PENETRATION SEALING SYSTEM AT WALL PENETRATION. SEE DETAIL. MECHANICAL - 30 ROAD FLOOR PLAN

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

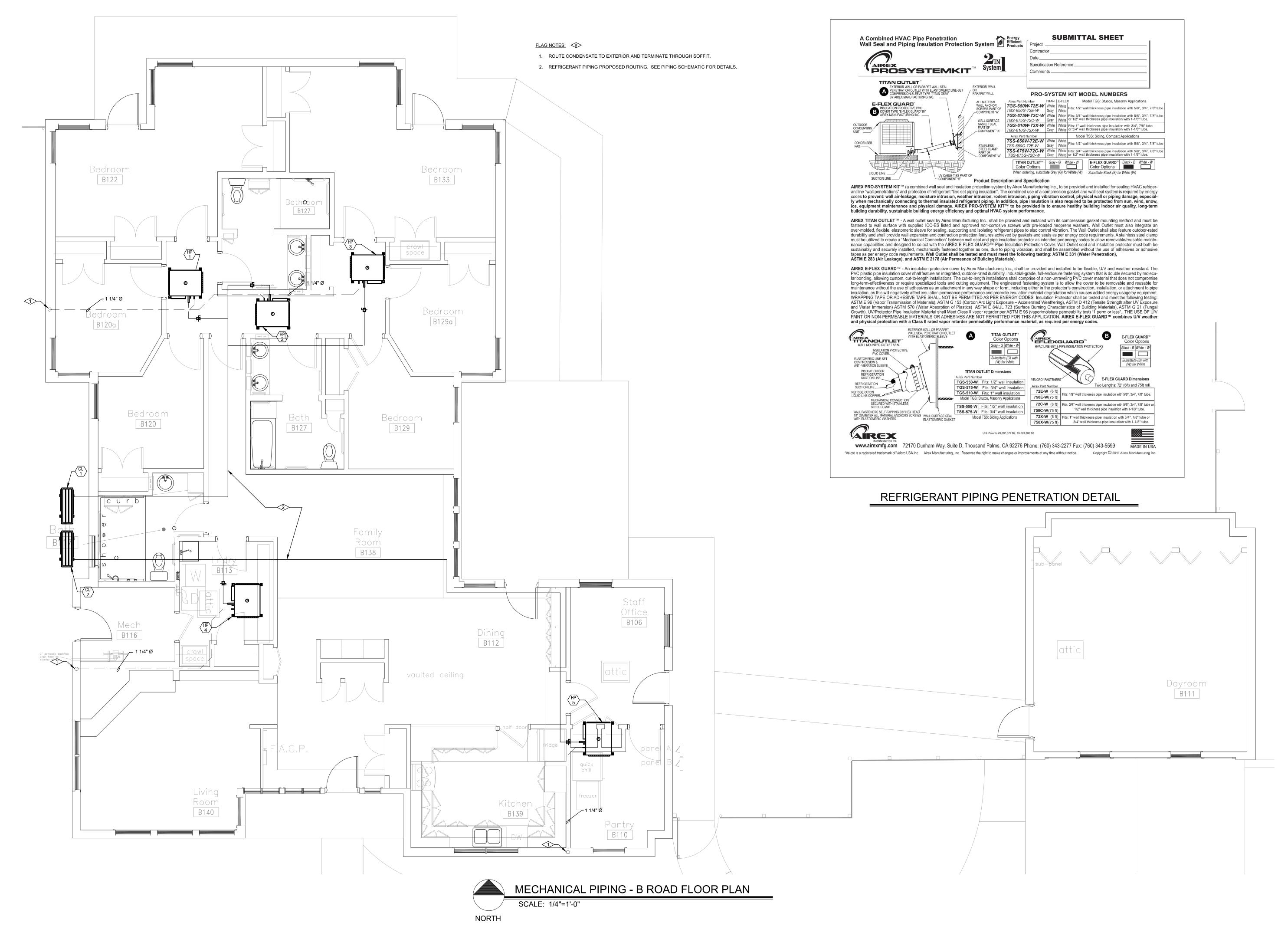
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DATE: ISSUED FOR: 10/29/19 BID DOCUMENTS

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October 29, 2019 - 5:02:48pm



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GRAND JUNCTION,

DATE: ISSUED FOR:

10/29/19 BID DOCUMENTS

DATE: 10/29/2019

JOB NO: 19-071

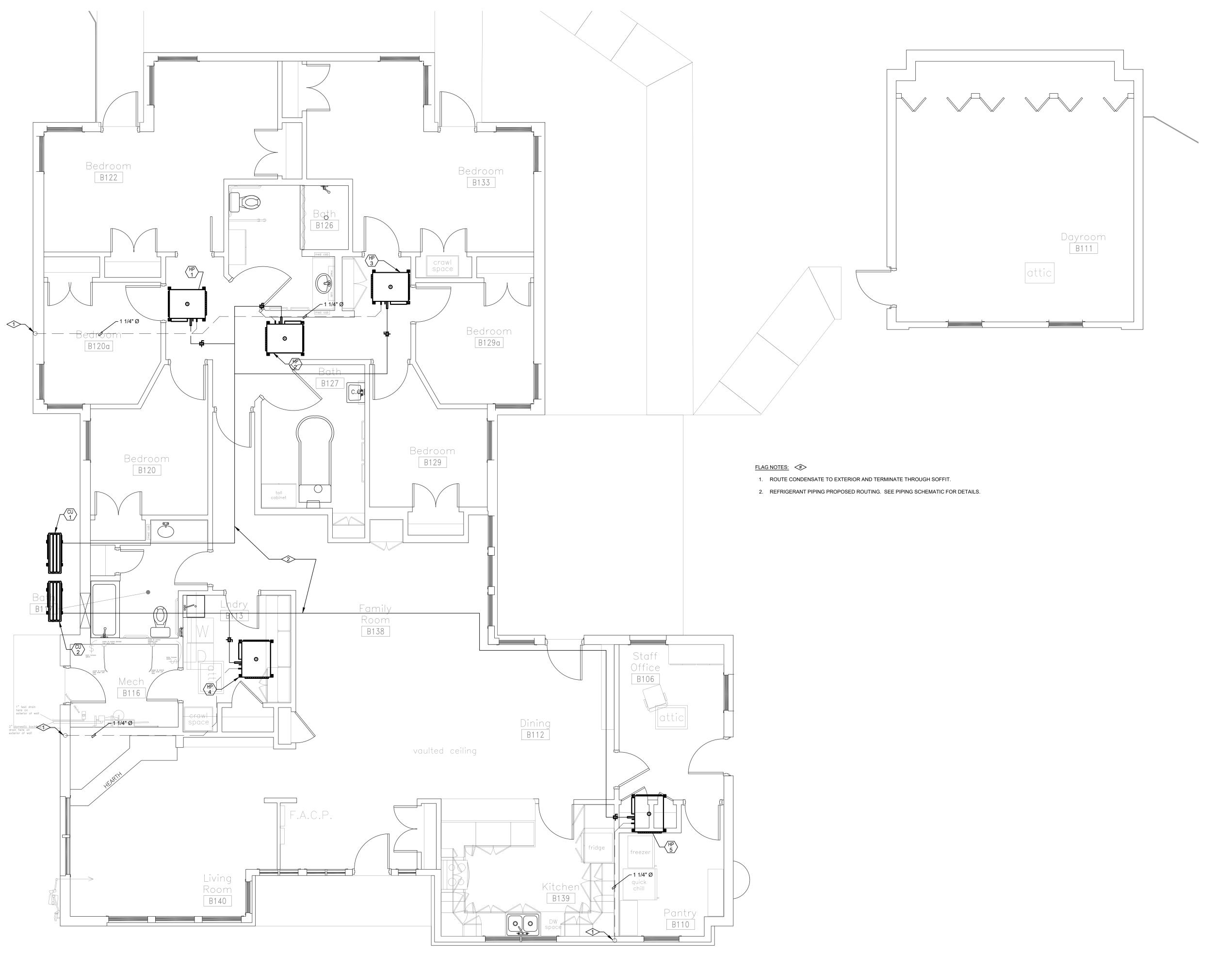
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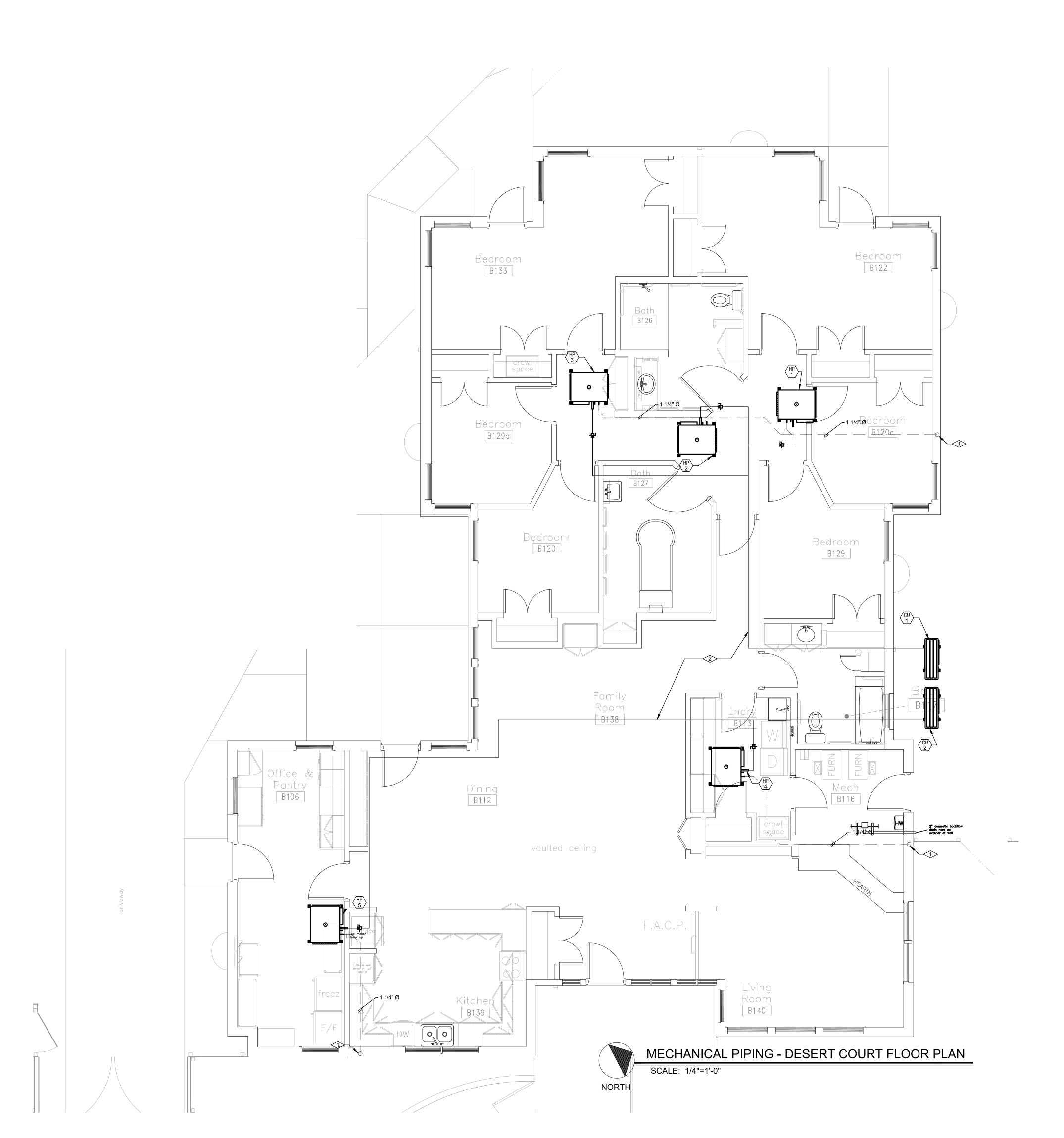
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GRAND JUNCTION, COL



- FLAG NOTES: (#> 1. ROUTE CONDENSATE TO EXTERIOR AND TERMINATE THROUGH SOFFIT.
- 2. REFRIGERANT PIPING PROPOSED ROUTING. SEE PIPING SCHEMATIC FOR DETAILS.

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GRAND JUNCTION,

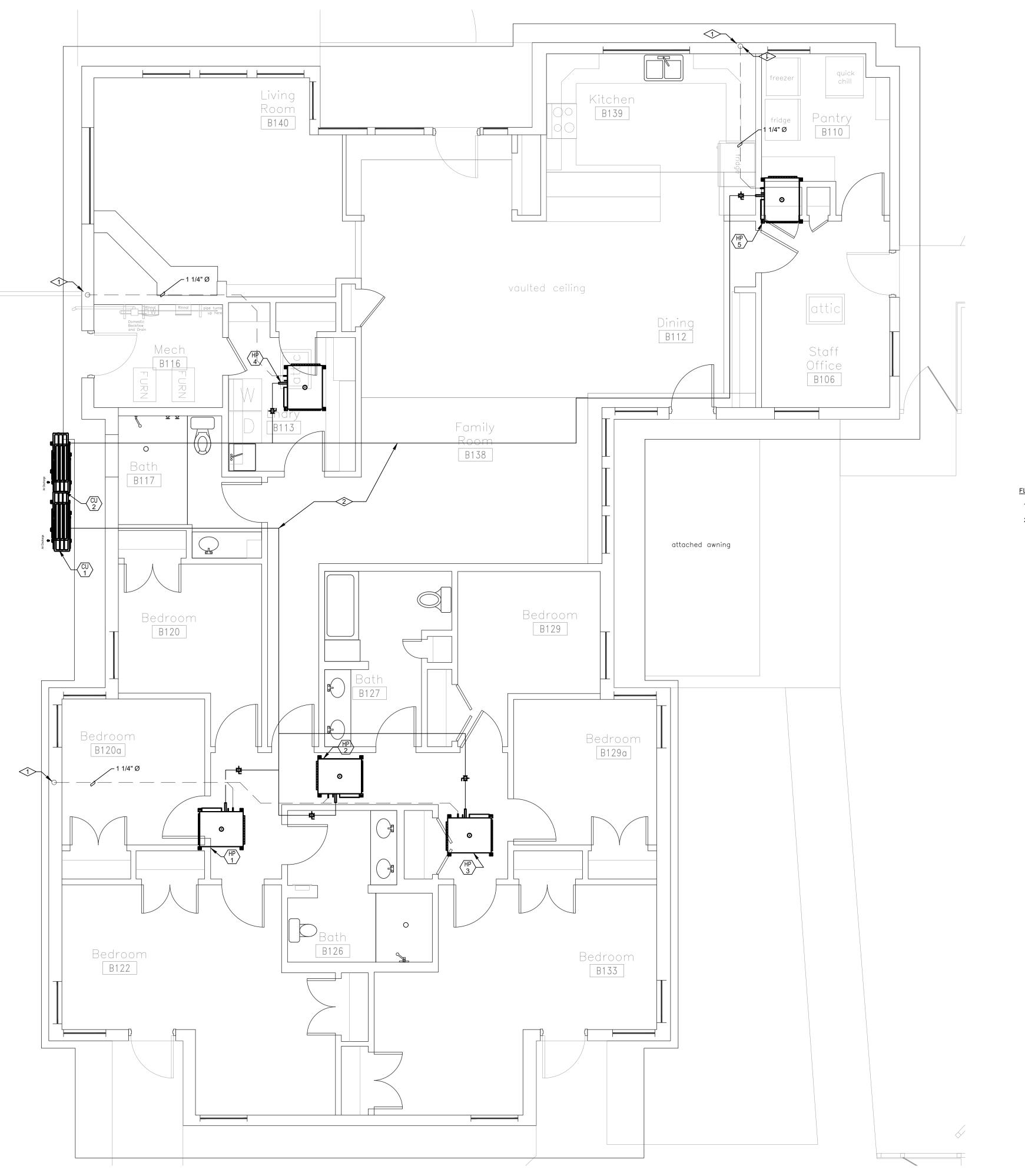
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SCALE: BCE BCE AS SHOWN SHEET NUMBER:

M2-3October 29, 2019 - 5:02:51pm



FLAG NOTES: (#>

- 1. ROUTE CONDENSATE TO EXTERIOR AND TERMINATE THROUGH SOFFIT.
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GRAND JUNCTION, COL

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PERMISSION OF THE DESIGNER. THE DRAWINGS AND
SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND
SHALL REMAIN THE PROPERTY OF THE DESIGNER

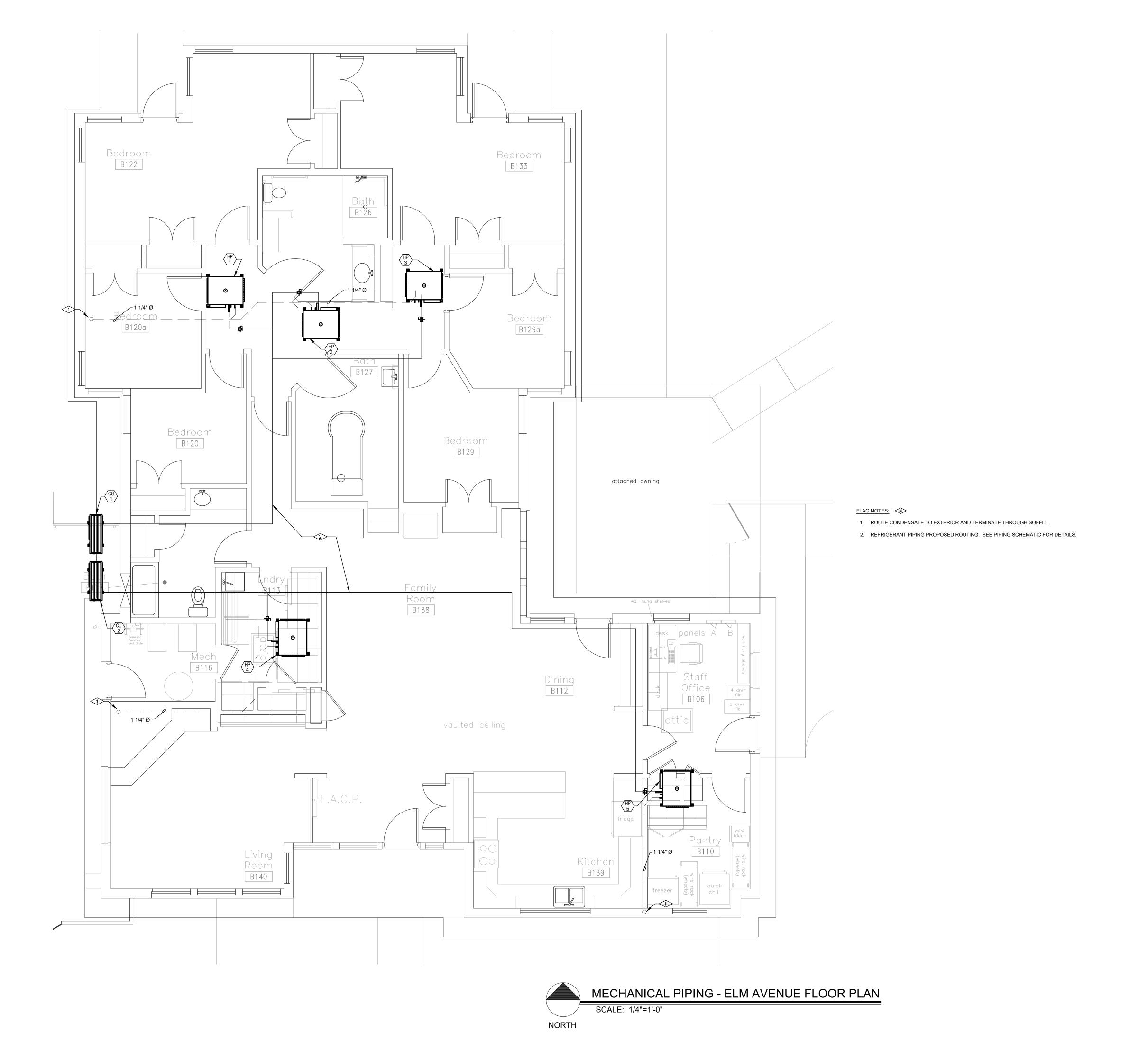
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MECHANICAL PIPING - EASTBROOK STREET FLOOR PLAN SCALE: 1/4"=1'-0" NORTH



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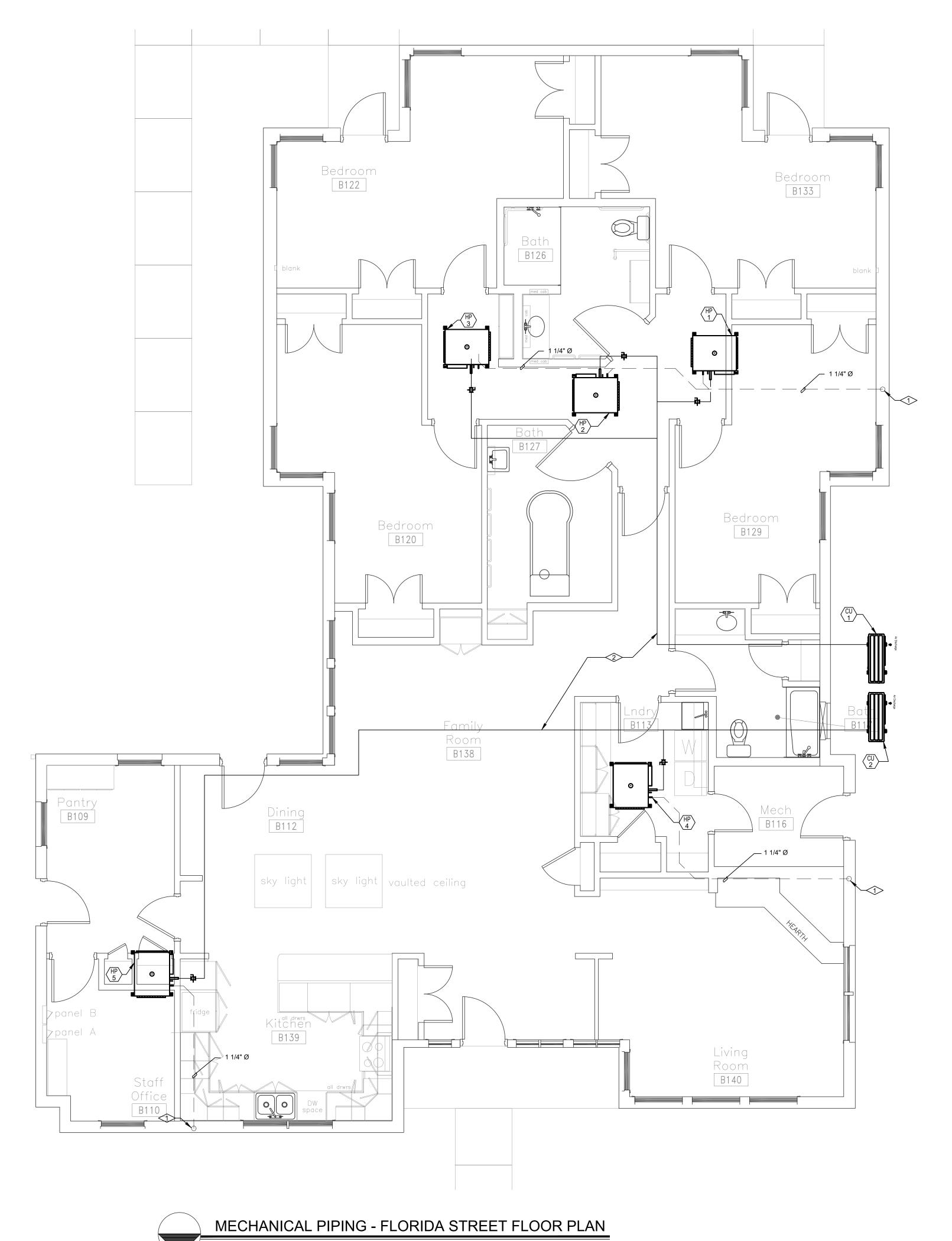
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- 2. REFRIGERANT PIPING PROPOSED ROUTING. SEE PIPING SCHEMATIC FOR DETAILS.

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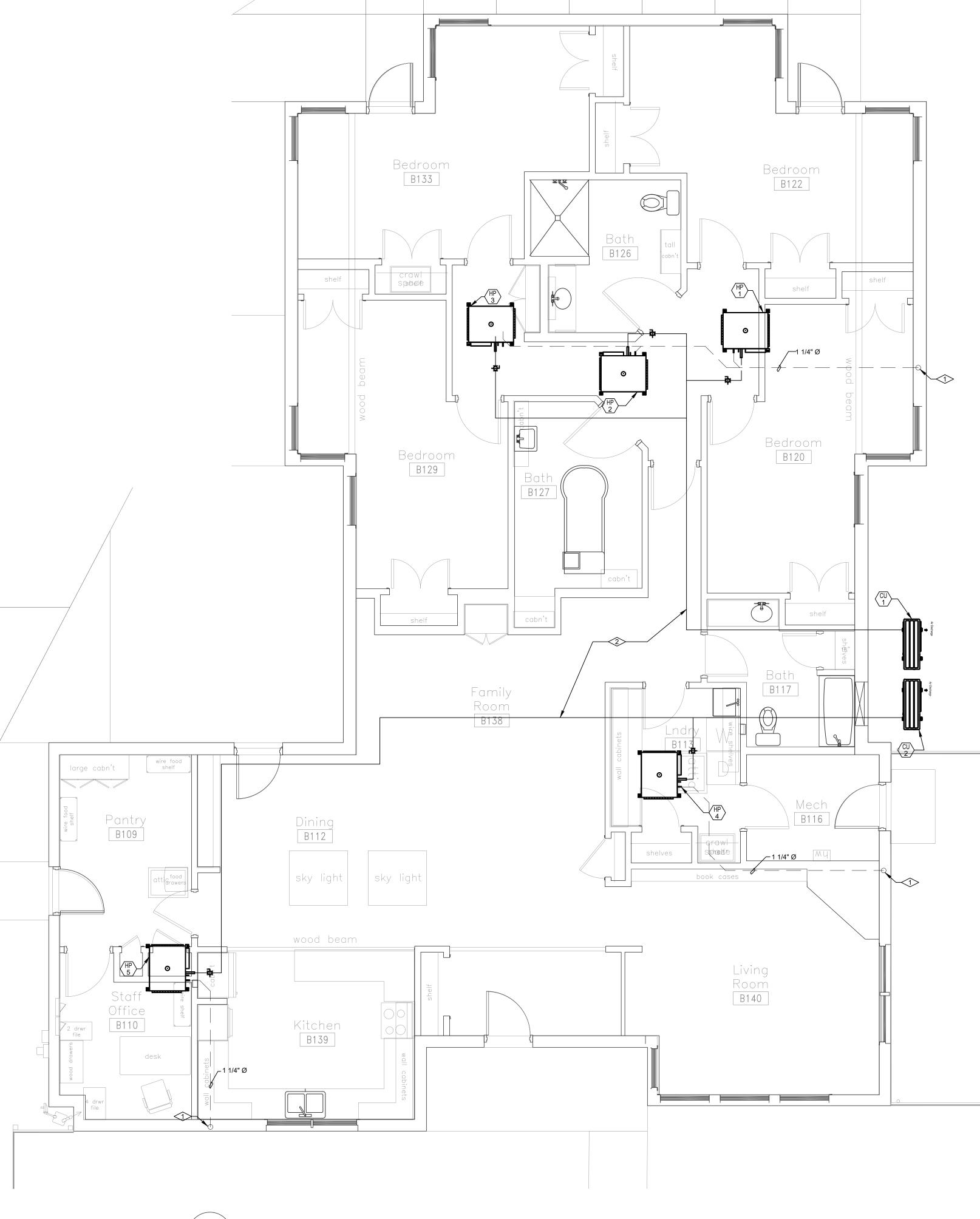
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GRAND JUNCTION, COL

M2-6

SHEET NUMBER:

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





- 1. ROUTE CONDENSATE TO EXTERIOR AND TERMINATE THROUGH SOFFIT.
- 2. REFRIGERANT PIPING PROPOSED ROUTING. SEE PIPING SCHEMATIC FOR DETA



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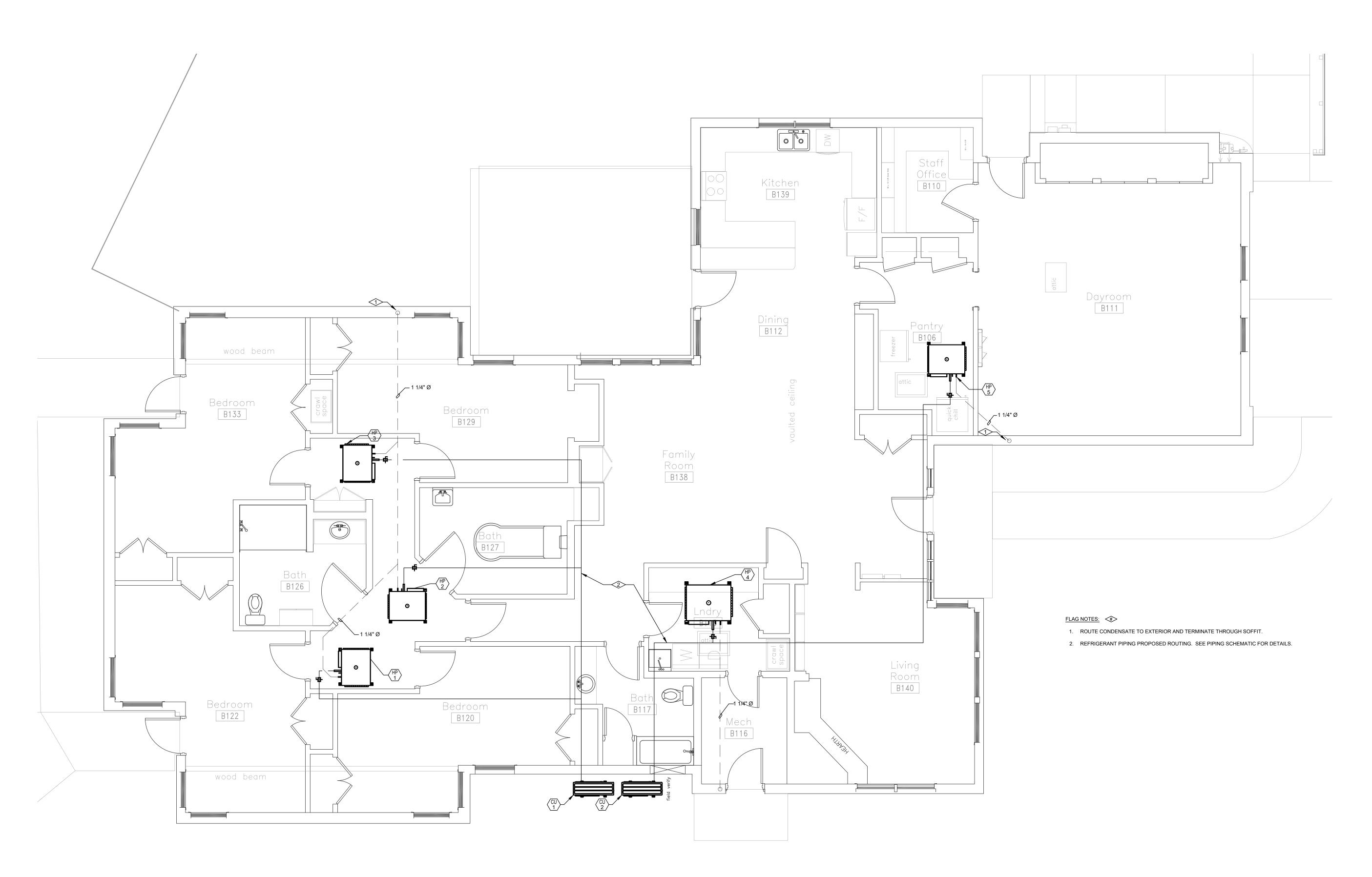
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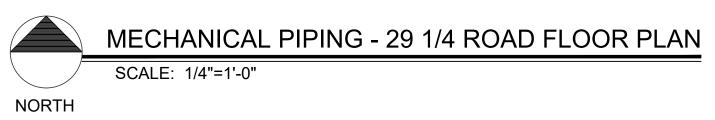
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JOB NO: 19-071

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DATE: ISSUED FOR:

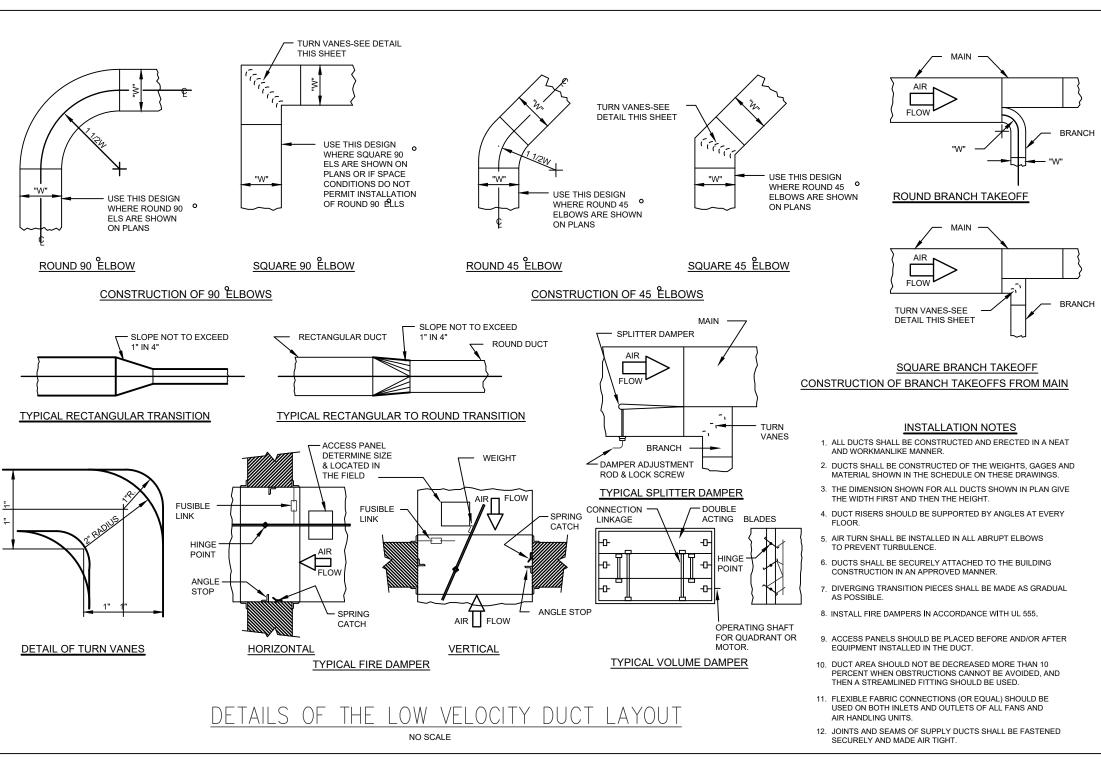
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CDHS

DATE: ISSUED FOR: 10/29/19 BID DOCUMENTS





Project Information

Energy Code Project Title: Location: Climate Zone Project Type: 2018 IECC Colorado State Group Homes Grand Junction, Colorado

Construction Site: Owner/Agent: Designer/Contractor

Alteration

Mechanical Systems List

Quantity System Type & Description 1 CU-1 (Single Zone):

- VRF Condensing Unit, Air Cooled Heat Pump Heating Mode: Capacity = 48 kBtu/h,
- No minimum efficiency requirement applies Cooling Mode: Capacity = 48 kBtu/h,
- No minimum efficiency requirement applies Fan System: Unspecified
- 1 HP-1 (Single Zone):

Cooling: 1 each - VRF Zone Fan Unit, Capacity = 18 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP method): Passes

FAN 1 Supply, Constant Volume, 494 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

1 HP-2 (Single Zone):

Cooling: 1 each - VRF Zone Fan Unit, Capacity = 12 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 2 -- Compliance (Motor nameplate HP method): Passes

FAN 2 Supply, Constant Volume, 265 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

1 HP-3 (Single Zone): Cooling: 1 each - VRF Zone Fan Unit, Capacity = 18 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 3 -- Compliance (Motor nameplate HP method): Passes

FAN 7 Supply, Constant Volume, 494 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

CU-2 (Single Zone):

VRF Condensing Unit, Air Cooled Heat Pump Heating Mode: Capacity = 36 kBtu/h, No minimum efficiency requirement applies

Cooling Mode: Capacity = 36 kBtu/h, No minimum efficiency requirement applies Fan System: Unspecified

1 HP-4 (Single Zone):

Cooling: 1 each - VRF Zone Fan Unit, Capacity = 24 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 4 -- Compliance (Motor nameplate HP method): Passes

FAN 8 Supply, Constant Volume, 671 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

Cooling: 1 each - VRF Zone Fan Unit, Capacity = 12 kBtu/h, No Economizer, Economizer exception: None

No minimum efficiency requirement applies Fan System: FAN SYSTEM 5 -- Compliance (Motor nameplate HP method): Passes

FAN 9 Supply, Constant Volume, 265 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.1.0 and to comply with any applicable mandatory requirements listed in the Inspection Checklist

10/04/2019

Project Title: Colorado State Group Homes Data filename: Untitled.cck



Project Information

Energy Code: Project Title: Location: Climate Zone: STATE OF COLORADO GROUP HOMES Grand Junction, Colorado

Designer/Contractor:

Project Type: Alteration

Construction Site

Mechanical Systems List

Quantity System Type & Description

2 HVAC System 1 (Single Zone): VRF Condensing Unit, Air Cooled Heat Pump Heating Mode: Capacity = 48 kBtu/h, No minimum efficiency requirement applies Cooling Mode: Capacity = 48 kBtu/h,

No minimum efficiency requirement applies Fan System: Unspecified

HP-1 (Single Zone):

Cooling: 1 each - VRF Zone Fan Unit, Capacity = 18 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 1 -- Compliance (Motor nameplate HP method): Passes

FAN 1 Supply, Constant Volume, 464 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

1 HP-2 (Single Zone): Cooling: 1 each - VRF Zone Fan Unit, Capacity = 12 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 2 -- Compliance (Motor nameplate HP method): Passes

FAN 11 Supply, Constant Volume, 265 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

Cooling: 1 each - VRF Zone Fan Unit, Capacity = 18 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 3 -- Compliance (Motor nameplate HP method): Passes

FAN 12 Supply, Constant Volume, 494 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

HP-4 (Single Zone):

Cooling: 1 each - VRF Zone Fan Unit, Capacity = 30 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 4 -- Compliance (Motor nameplate HP method): Passes

FAN 13 Supply, Constant Volume, 883 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

1 HP-5 (Single Zone): Cooling: 1 each - VRF Zone Fan Unit, Capacity = 18 kBtu/h, No Economizer, Economizer exception: None No minimum efficiency requirement applies Fan System: FAN SYSTEM 5 -- Compliance (Motor nameplate HP method): Passes

FAN 14 Supply, Constant Volume, 494 CFM, 0.3 motor nameplate hp, 0.0 fan efficiency grade

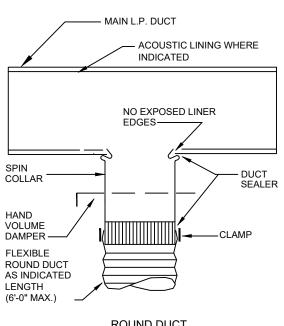
Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have beer designed to meet the 2018 IECC requirements in COMcheck Version 4.1.1.0 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

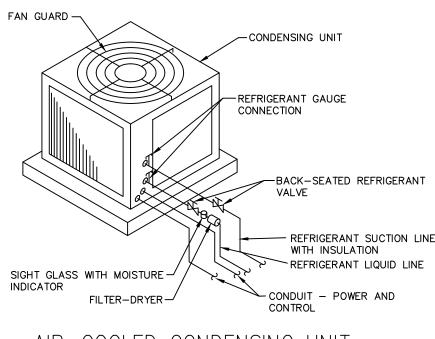
Gregory Waldorf - Engineer Name - Title

STATE OF COLORADO GROUP HOMES

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ROUND DUCT TYPICAL LOW PRESSURE NOT TO SCALE



PLUMBING SPECIFICATION

1. SCOPE OF WORK

A. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED. B. ALL WORK IS TO BE PREFORMED IN STRICT COMPLIANCE WITH THE

INTERNATIONAL PLUMBING CODE (LATEST EDITION), ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK OF THIS NATURE.

C. THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY AFFECT THE WORK. NO ALLOWANCE SHALL BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS.

D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED AS EQUAL" BY THE ENGINEER OR ARCHITECT.

PERMITS

A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.

3. SHOP DRAWINGS

A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ARCHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.

4. DOMESTIC WATER SUPPLY PIPING A. UNDERGROUND: PROVIDE TYPE "K" SOFT DRAWN COPPER TUBING WITH BRAZED

B. ABOVE GROUND: PROVIDE TYPE "L" HARD DRAWN COPPER TUBING WITH 125 PSI SOLDER JOINTS, COPPER OR BRASS FITTINGS. ALL SOLDER TO BE "NO LEAD" TYPE. C. ALL HOT WATER PIPING TO BE INSULATED WITH 1" FIBERGLASS INSULATION.

D. ALL COLD WATER PIPING TO BE INSULATED WITH $\frac{1}{2}$ " FOAM INSULATION.

5. SANITARY/STORM DRAINAGE AND VENT PIPING

A. ABOVE GRADE:

CONNECTIONS.

-2" BELOW: SCHEDULE 40 GALV. STEEL PIPE WITH SCREWED ENDS OR SCHEDULE 40 PVC WITH SOLVENT JOINTS OR DWV COPPER WITH SOLDER JOINTS. ALL SOLDER TO BE "NO LEAD" TYPE.

-3" AND ABOVE: SERVICE WT. CAST IRON WITH NO-HUB OR BELL AND SPIGOT JOINTS; OR SCHEDULE 40 PVC WITH SOLVENT JOINTS.

B. BELOW GRAD: SERVICE WT. CAST IRON WITH NO-HUB OR BELL AND SPIGOT JOINTS; OR SCHEDULE 40 PVC WITH SOLVENT JOINTS.

PVC PIPING SHALL NOT BE USED IN AIR PLENUM CEILINGS AND SHALL NOT CROSS FIRE RATED WALLS, CEILINGS, OR FLOORS. D. DRAINAGE PIPING SHALL BE RUN AS STRAIGHT AS POSSIBLE AND SHALL HAVE

LONG TURN FITTINGS. E. DRAINAGE PIPING 3" SIZE AND SMALLER SHALL RUN AT A UNIFORM GRADE OF AT LEAST $\frac{1}{4}$ " PER FOOT. AND PIPING LARGER THAN 3" SHALL BE RUN AT A GRADE OF NO LESS THAN 1 PER FOOT.

F. ALL VENT PIPING SHALL BE SLOPED TO DRAIN BACK TO FIXTURES. G. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER FLASHING OF THE VENT PIPING RUN THROUGH THE ROOF.

7. PIPE SUPPORTS

A. ABOVE GRADE: ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE AND PERFORATED METAL TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL BE A S SPECIFIED IN INTERNATIONAL PLUMBING CODE (LATEST EDITION). B. BELOW GRADE: EARTH SHALL BE EXCAVATED TO A MINIMUM DEPTH WITH AN

EVEN SURFACE TO INSURE SOLID BEARING OF PIPE FOR ITS ENTIRE LENGTH.

-INTERIOR: THE PIPE SHALL BE INSTALLED (UNLESS OTHERWISE SPECIFIED) A MINIMUM OF 4 INCHES BELOW THE BOTTOM OF THE SLAB AND SHALL NOT BE IN ANY DIRECT CONTACT WITH THE CONCRETE AT ANY POINT.

-EXTERIOR: THE WATER PIPE SHALL HAVE A MINIMUM OF 60" OF COVER AND THE SANITARY WASTE PIPE SHALL HAVE A MINIMUM OF 24" OF COVER.

8. MISCELLANEOUS

A. COORDINATE INSTALLATION OF ALL ROOFS FLASHING AT ROOF PENETRATIONS.

B. DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS. VERIFY ALL FIGURES, CONDITIONS AND DIMENSIONS AT THE JOB SITE.

C. THE PLUMBING PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION. THE EXACT DIMENSIONS OR ALL THE DETAILS OF THE EQUIPMENT. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT THE AVAILABLE

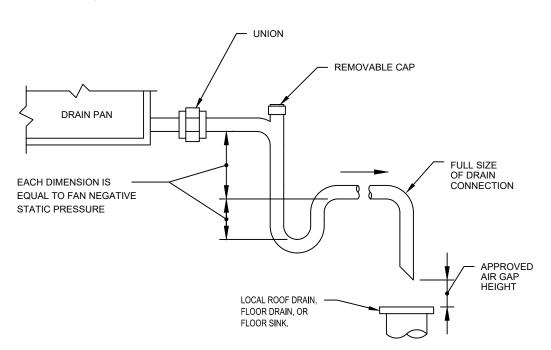
9. TESTING

A. PLUMBING SYSTEM SHALL BE FLOW AND PRESSURE TESTED IN ACCORDANCE WITH THE INTERNATIONAL PLUMBING CODE (LATEST EDITION).

10 GUARANTEE

A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTORS EXPENSE.

B. FOR THE SAME PERIOD THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.



CONDENSATE DRAIN DETAIL

MECHANICAL PROVISIONS

1. SCOPE OF WORK

A. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS. AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM WHETHER

SPECIFIED OR IMPLIED. B. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH ALL LOCAL CODES AND ALL OTHER REGULATION GOVERNING WORK

OF THIS NATURE C. THE CONTRACTOR SHALL, BEFORE SUBMITTING ANY PROPOSAL, EXAMINE THE PROPOSED SITE AND SHALL DETERMINE FOR HIMSELF THE CONDITIONS THAT MAY EFFECT THE WORK. NO ALLOWANCE SHALL

BE MADE IF THE CONTRACTOR FAILS TO MAKE SUCH EXAMINATIONS. D. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED EQUAL" BY THE ENGINEER OR ARCHITECT.

A. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES.

3. SHOP DRAWINGS

A. SUBMIT MATERIAL LIST AND SHOP DRAWINGS FOR MAJOR EQUIPMENT TO THE ACHITECT/ENGINEER FOR APPROVAL. THE CONTRACTOR SHALL SUBMIT FIVE SETS OF SHOP DRAWINGS AND THEY SHALL BE CLEARLY LABELED.

4. FLEXIBLE DUCT WORK

RATING NOT EXCEEDING 50.

A. FLEXIBLE TYPE DUCT SHALL BE OF TWO ELEMENT SPIRAL CONSTRUCTION COMPOSED OF A CORROSION RESISTANT METAL SUPPORTING SPIRAL AND COATED FABRIC WITH A MINERIAL BASE, FLEXIBLE DUCT CONNECTORS SHALL BE LISTED BY U.L., CLASS 1 DUCTS, AND SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED

B. USE OF FLEXIBLE DUCTWORK SHALL BE LIMITED TO NO MORE THAN $\,$ 6 LINEAR FEET PER RUN. C. CONTRACTOR SHALL BE CAREFUL SO AS NOT TO KINK OR COLLAPSE FLEXIBLE DUCT.

A. PIPING CONTRACTOR SHALL PROVIDE AND INSTALL REFRIGERANT PIPING IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN SUCH A WAY AS TO BE INCONSPICIOUS AND FREE FROM ANY

POSSIBLE CONDENSATION. B. INSULATE REFRIGERANT LINES WITH ARMOUR-FLEX TYPE INSULATION, SHALL BE TYPE "K" COPPER TUBING, WITH WROUGHT COPPER SOLDER TYPE FITTINGS SUITABLE FOR CONNECTION WITH SILVER SOLDER.

6. DUCTWORK

A. THE DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE

WITH THE "SMACNA" APPLICABLE MANUALS. B. ALL DUCTWORK SHALL BE THE LOW VELOCITY TYPE, UNLESS SPECIFIED OTHERWISE. C. CONTRACTOR SHALL PROVIDE AND INSTALL APPROVED FIRE DAMPERS AND ACCESS PANELS IN ANY AND ALL DUCTWORK WHICH

PENETRATES A HORIZONTAL OR VERTICAL FIRE PARTITION, OR AS OTHERWISE SHOWN ON DRAWINGS D. ALL BRANCH DUCTS TO HAVE VOLUME DAMPERS, SMOOTH TURN RADIUS DUCTWORK OR TURNING VANES SHALL BE USED THROUGHOUT WHERE FLOW

EXCEEDS 150 CFM. E. ALL DUCT JOINTS TO BE SEALED IN ACCORDANCE WITH "SMACNA"

STANDARDS AND ACCEPTED GOOD PRACTICE. F. ALL DUCT DIMENSIONS SHOWN ARE NET INSIDE VALUES.DIMENSIONS MAY BE CHANGED SO LONG AS THE NET FREE FACE AREA IS MAINTAINED. G. ALL CONCEALED DUCTWORK SHALL BE INSULATED WITH 1-1/2"

FIBERGLASS INSULATING BLANKET WITH ALUMINUM FOIL FACING H. ALL SUPPLY AND RETURN DUCTWORK 15 FEET DOWNSTREAM OF THE HVAC UNIT SHALL BE INTERNALLY LINED WITH A 1/2" ACOUSTICAL DUCT LINER

UNLESS OTHERWISE NOTED ON THE DRAWINGS.

A. (CONDENSATE) SHALL BE SCHEDULE 40 PVC PIPE WITH SOLVENT JOINTS. PITCH HORIZONTAL LINES 1" IN 10'-0" CONDENSATE DRAINS SHALL BE ROUTED TO FLOOR DRAIN, ROOF DRAIN OR INDIRECT WASTE DRAIN.

8. HVAC CONTROLS

A. CONTRACTOR TO SUPPLY AND INSTALL ALL CONTROL WIRING AND THERMOSTATS AS REQUIRED.

9. ELECTRICAL A. CONTRACTOR TO COORDINATE WITH ELECTRICAL CONTRACTOR FOR

LOCATION OF WIRING FOR EACH HVAC UNIT. 10. PIPE SUPPORTS A. ALL PIPE SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN A

NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAP TO SUPPORT PIPES WILL NOT BE PERMITTED. SPACING OF PIPE SUPPORTS SHALL NOT EXCEED 8 FEET FOR ALL PIPING. PLASTIC PIPING TO BE SUPPORTED EVERY 4 FEET. 11. GAS PIPING

A. PIPING SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH MALLEABLE IRON

WHERE GAS PIPE CONNECTS TO EQUIPMENT, IT SHALL BE PROVIDED WITH A DRIP LEG THE FULL SIZE OF THE RUNOUT, A 100% SHUT-OFF VALVE AND A UNION. GAS PIPING CONTAINING PRESSURE GREATER THAN 9" W.G. SHALL BE SCHEDULE 40 BLACK STEEL PIPE WITH WELDED JOINTS.

12. MISCELLANEOUS

A. ALL EXTERIOR OPENINGS TO BE PROPERLY CAULKED AND SEALED WITH A SEALANT OF HIGH QUALITY AND LONG LIFE, TO PREVENT INFILTRATION OF OUTSIDE AIR INTO CONDITIONED SPACE. COORDINATE INSTALLATION OF ALL ROOF FLASHING AT ROOF PENETRATION.

B. DO NOT SCALE THIS DRAWING FOR EXACT DIMENSIONS. VERIFY ALL FIGURES, CONDITIONS, AND DIMENSIONS AT THE JOB SITE. D. THE MECHANICAL PLANS ARE INTENDED TO BE DIAGRAMMATIC AND ARE BASED ON ONE MANUFACTURE'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY

ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL THE DETAILS OF THE EQUIPMENT E. THE CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT PROPOSED TO ENSURE THAT THE EQUIPMENT WILL FIT IN THE AVAILABLE

PEX TUBING, IF PEX TUBING IS USED AS AN APPROVED ALTERNATE FOR APPLICATIONS WHERE METALLIC PIPING IS THE BASIS OF DESIGN. THE PEX MANUFACTURER SHALL SUBMIT SHOP DRAWINGS CLEARLY INDICATING THAT THE DESIGN HAS BEEN ANALYZED. AND MODIFIED, AS REQUIRED TO MAINTAIN SCHEDULED HYDRONIC SYSTEM PARAMETERS. ANY DESIGN RESULTING IN INCREASED SYSTEM PRESSURE DROP AS A RESULT OF IMPROPER PEX SIZING OR DESIGN SHALL NOT BE PERMITTED.

13. TESTING AND BALANCING

A. THE HVAC SYSTEM SHALL BE TESTED AND AND BALANCED BY AN INDEPENDENT AGENCY, UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. A SEALED TYPE WRITTEN REPORT SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL.

14. GUARANTEE

A. MATERIALS, EQUIPMENT AND INSTALLATION SHALL BE GUARANTEED FOR A PERIOD OF ONE(1) YEAR FROM DATE OF ACCEPTANCE. DEFECTS WHICH

FOR ANY DAMAGE TO PREMISES CAUSED BY DEFECTS IN WORKMANSHIP OR IN THE

APPEAR DURING THAT PERIOD SHALL BE CORRECTED AT THIS CONTRACTOR'S B. FOR THE SAME PERIOD, THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE

WORK OR EQUIPMENT FURNISHED AND/OR INSTALLED BY HIM.

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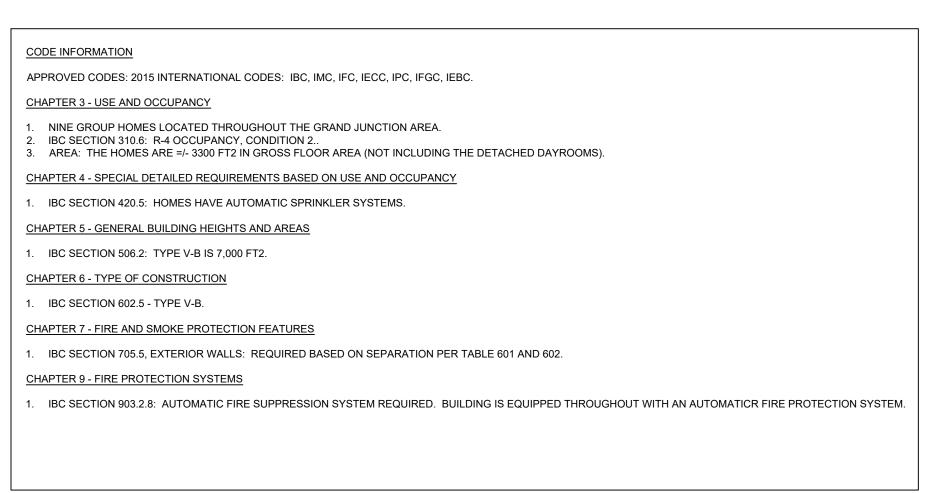
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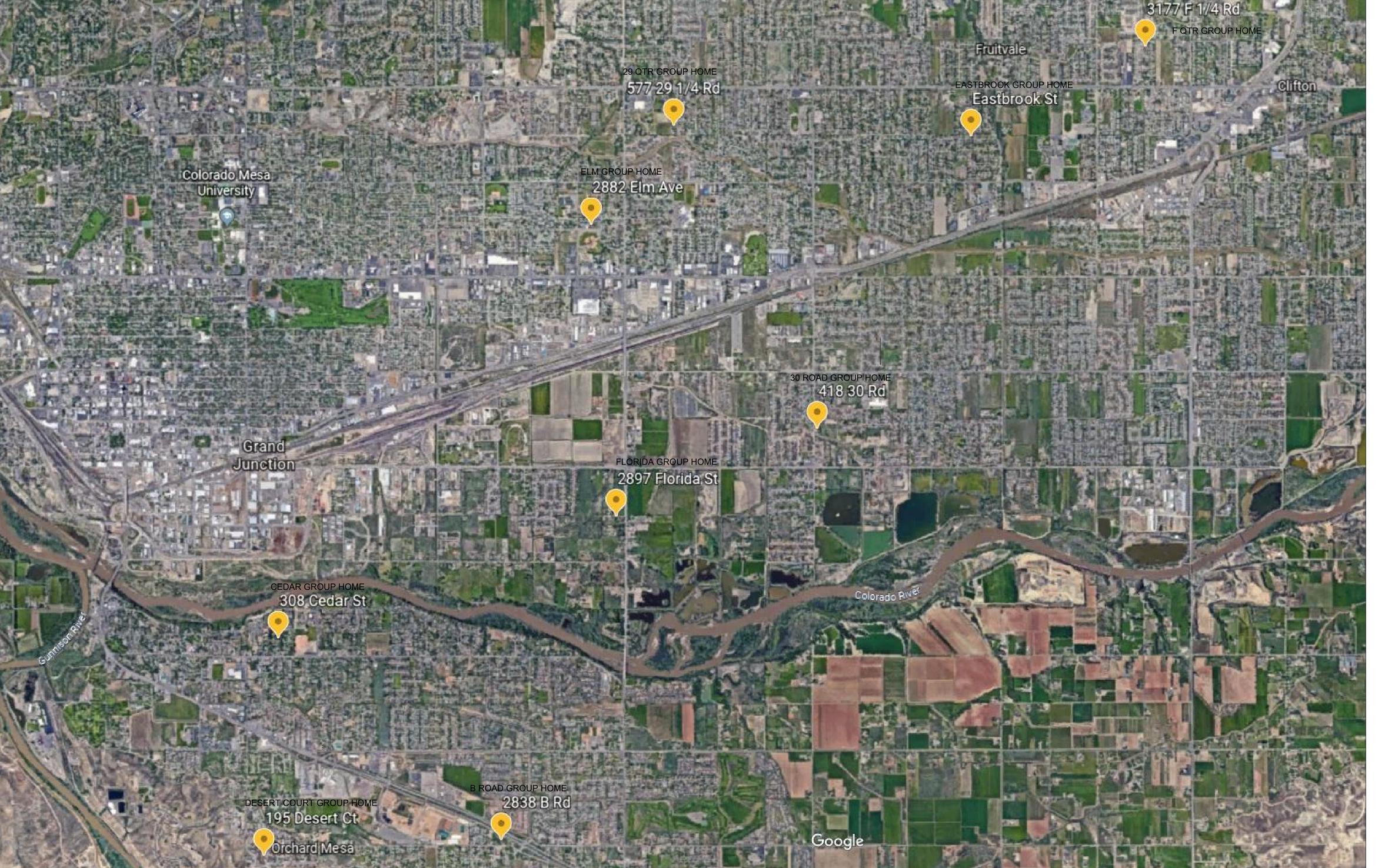
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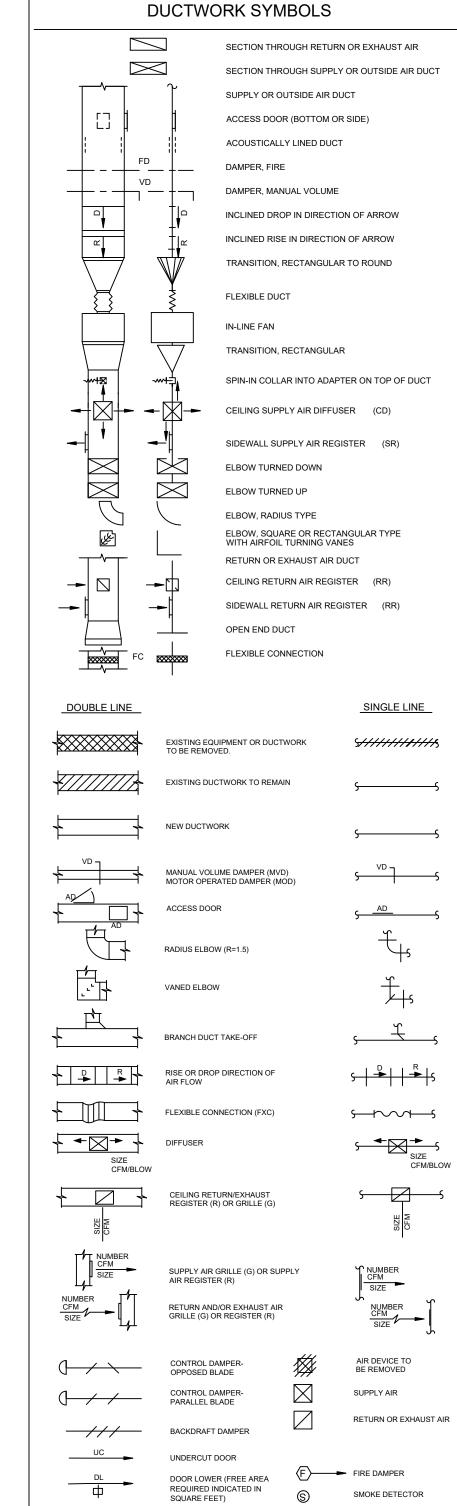
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MECHANICAL SPECIFICATIONS AND DETAILS



CODE ANALYSIS





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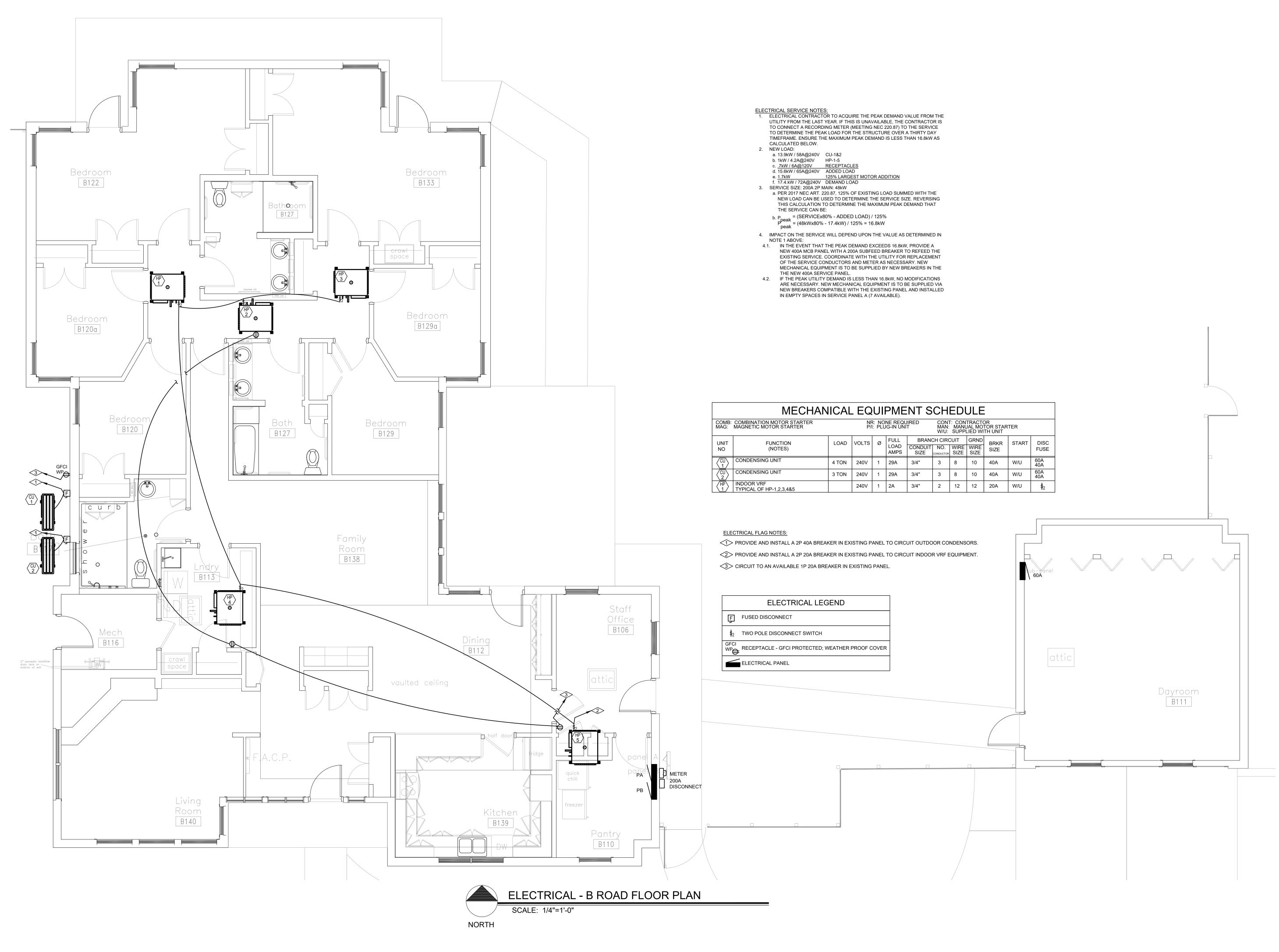
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PROJECT VICINITY MAP

N.T.S.

CODE INFORMATION AND OTHER INFORMATION

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rs, Inc.

Bighorn Consulting Engineer

Mechanical & Electrical Engineers

386 Indian Road
Grand Junction, CO 81501

CDHS REGIONAL CENTER GROUP HOMES

GRAND JUNCTION,

DATE: ISSUED FOR:
10/29/19 BID DOCUMENTS

DATE: 10/29/20

DATE: 10/29/2019

JOB NO: 19-071

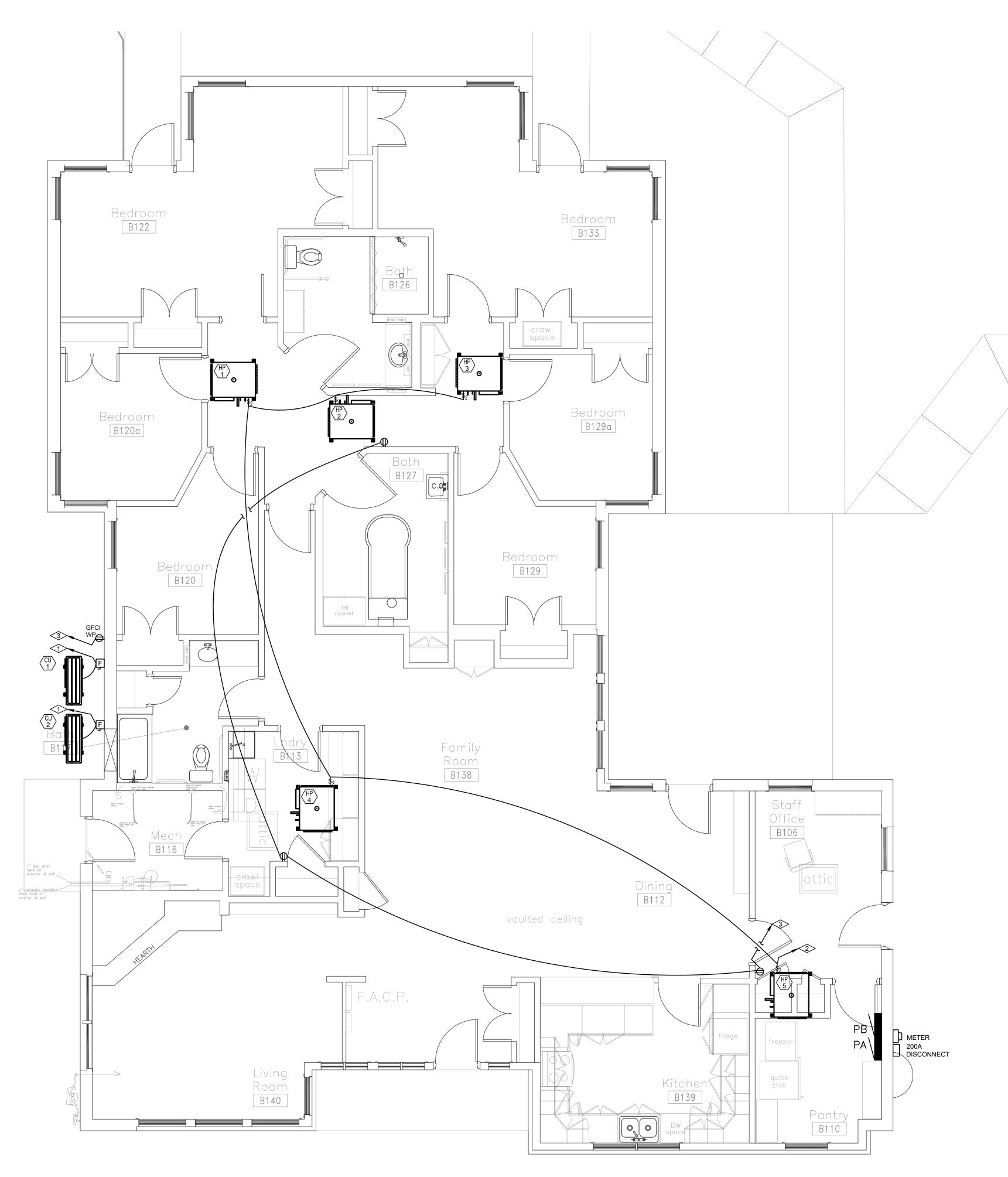
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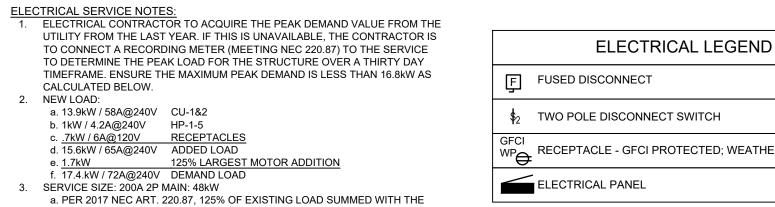
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- b. P_{peak} = (SERVICEx80% ADDED LOAD) / 125% P_{peak} = (48kWx80% 17.4kW) / 125% = 16.8kW 4. IMPACT ON THE SERVICE WILL DEPEND UPON THE VALUE AS DETERMINED IN
- NOTE 1 ABOVE: 4.1. IN THE EVENT THAT THE PEAK DEMAND EXCEEDS 16.8kW, PROVIDE A NEW 400A MCB PANEL WITH A 200A SUBFEED BREAKER TO REFEED THE EXISTING SERVICE. COORDINATE WITH THE UTILITY FOR REPLACEMENT OF THE SERVICE CONDUCTORS AND METER AS NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED BY NEW BREAKERS IN THE

NEW LOAD CAN BE USED TO DETERMINE THE SERVICE SIZE. REVERSING THIS CALCULATION TO DETERMINE THE MAXIMUM PEAK DEMAND THAT

THE SERVICE CAN BE:

THE NEW 400A SERVICE PANEL. 4.2. IF THE PEAK UTILITY DEMAND IS LESS THAN 16.8kW, NO MODIFICATIONS ARE NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED VIA NEW BREAKERS COMPATIBLE WITH THE EXISTING PANEL AND INSTALLED IN EMPTY SPACES IN SERVICE PANEL A (12 AVAILABLE).

	ELECTRICAL LEGEND
Ę	FUSED DISCONNECT
\$ ₂	TWO POLE DISCONNECT SWITCH
GFCI WP	RECEPTACLE - GFCI PROTECTED; WEATHER PROOF COVER
	ELECTRICAL PANEL

ELECTRICAL FLAG NOTES:

Dayroom B111

- PROVIDE AND INSTALL A 2P 40A BREAKER IN EXISTING PANEL TO CIRCUIT OUTDOOR CONDENSORS.
- PROVIDE AND INSTALL A 2P 20A BREAKER IN EXISTING PANEL TO CIRCUIT INDOOR VRF EQUIPMENT.
- 3 CIRCUIT TO AN AVAILABLE 1P 20A BREAKER IN EXISTING PANEL.

	MECHANICAL EQUIPMENT SCHEDULE											
COMB: MAG:	COMB: COMBINATION MOTOR STARTER NR: NONE REQUIRED CONT: CONTRACTOR MAG: MAGNETIC MOTOR STARTER P/I: PLUG-IN UNIT MAN: MANUAL MOTOR STARTER W/U: SUPPLIED WITH UNIT											
UNIT	FUNCTION	LOAD	VOLTS	Ø	FULL	BRANG	CH CIRC	CUIT	GRND	BRKR	START	DISC
NO	(NOTES)			,	LOAD AMPS	CONDUIT SIZE	NO.	WIRE SIZE	WIRE SIZE	SIZE		FUSE
(CU)	CONDENSING UNIT	4 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
(CU) 2	CONDENSING UNIT	3 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
HP 1	INDOOR VRF TYPICAL OF HP-1,2,3,4&5		240V	1	2A	3/4"	2	12	12	20A	W/U	\$ ₂



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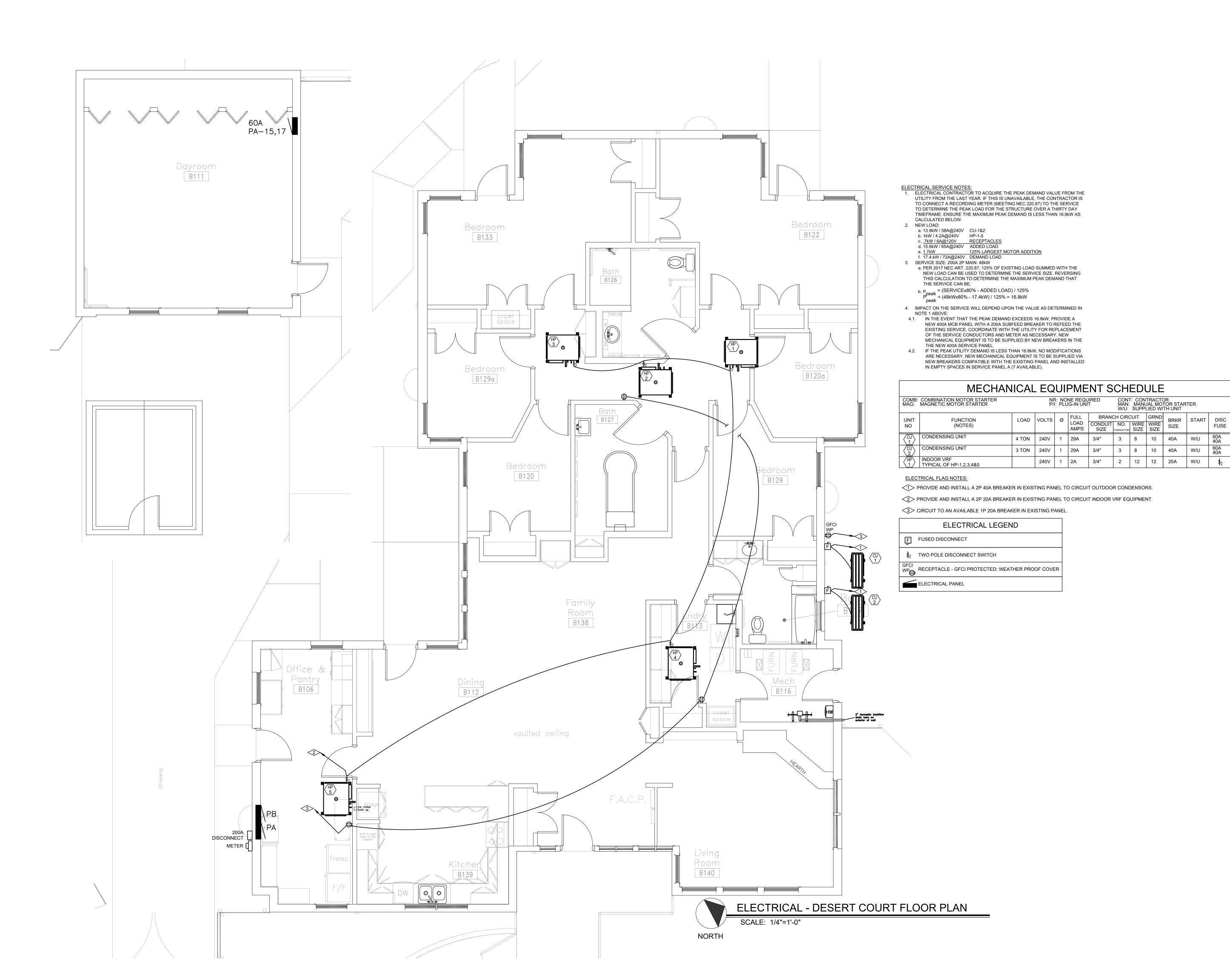
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gineers, Inc.

Bighorn Consulting Engineers
Mechanical & Electrical Engineers
386 Indian Road
Grand Junction, CO 81501
Phone: 970-241-8709

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DATE: 10/29/2019

JOB NO: 19-071

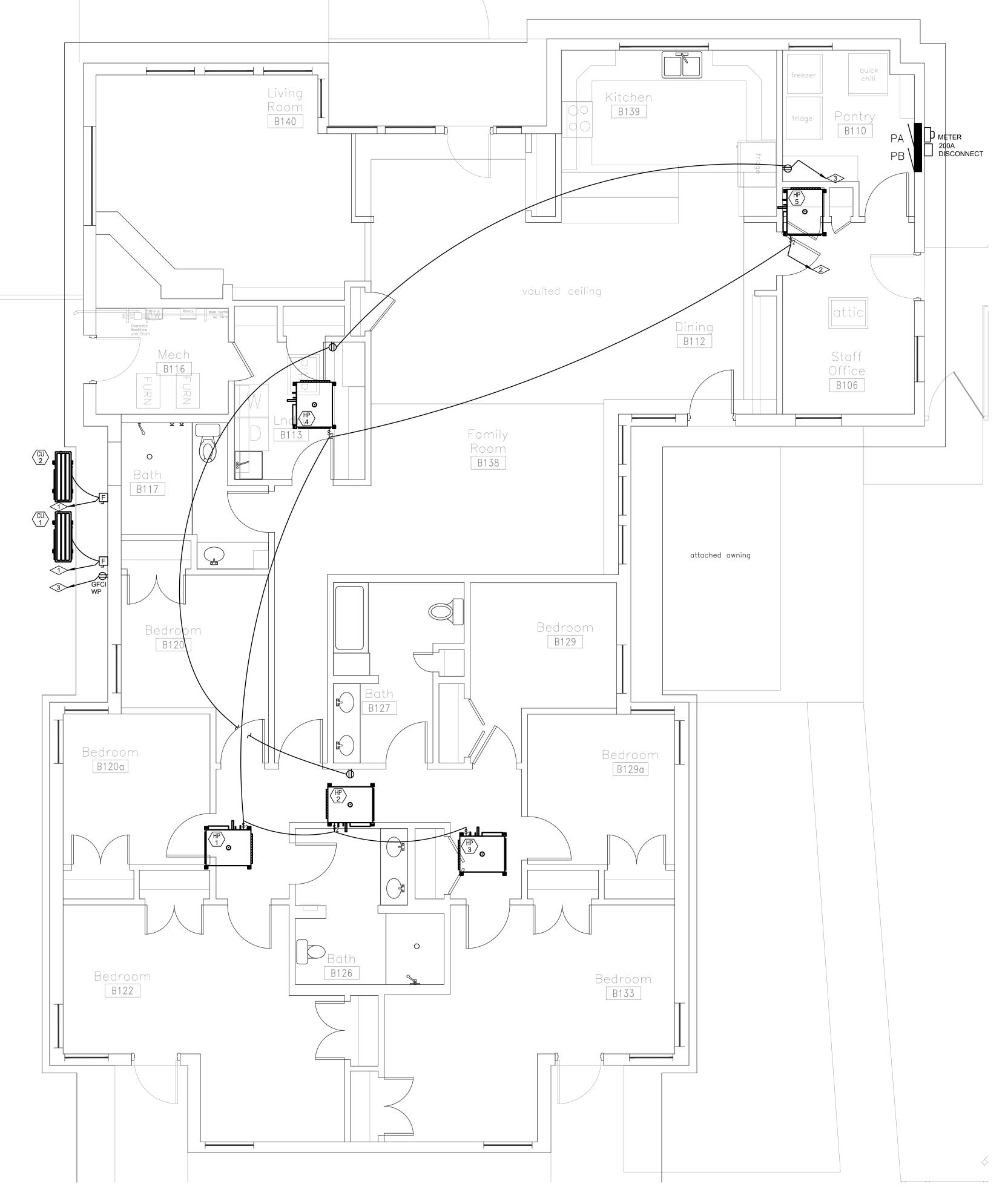
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ELECTRICAL SERVICE NOTES:

1. ELECTRICAL CONTRACTOR TO ACQUIRE THE PEAK DEMAND VALUE FROM THE UTILITY FROM THE LAST YEAR. IF THIS IS UNAVAILABLE, THE CONTRACTOR IS TO CONNECT A RECORDING METER (MEETING NEC 220.87) TO THE SERVICE TO DETERMINE THE PEAK LOAD FOR THE STRUCTURE OVER A THIRTY DAY TIMEFRAME. ENSURE THE MAXIMUM PEAK DEMAND IS LESS THAN 16.8kW AS CALCULATED BELOW.

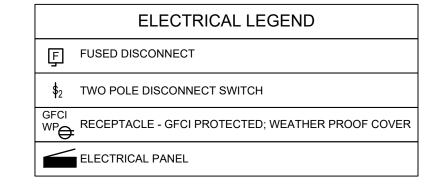
- NEW LOAD:
- new LOAD:
 a. 13.9kW / 58A@240V CU-1&2
 b. 1kW / 4.2A@240V HP-1-5
 c. _7kW / 6A@120V RECEPTACLES
 d. 15.6kW / 65A@240V ADDED LOAD
 e. _1.7kW 125% LARGEST MOTOR ADDITION
 f. _17.4.kW / 72A@240V DEMAND LOAD
 SEPVICE SIZE: 200A 2P MAIN: 48kW
- 3. SERVICE SIZE: 200A 2P MAIN: 48kW a. PER 2017 NEC ART. 220.87, 125% OF EXISTING LOAD SUMMED WITH THE NEW LOAD CAN BE USED TO DETERMINE THE SERVICE SIZE. REVERSING THIS CALCULATION TO DETERMINE THE MAXIMUM PEAK DEMAND THAT THE SERVICE CAN BE:
- b. P = (SERVICEx80% ADDED LOAD) / 125%
 P = (48kWx80% 17.4kW) / 125% = 16.8kW
- 4. IMPACT ON THE SERVICE WILL DEPEND UPON THE VALUE AS DETERMINED IN
- 4.1. IN THE EVENT THAT THE PEAK DEMAND EXCEEDS 16.8kW, PROVIDE A NEW 400A MCB PANEL WITH A 200A SUBFEED BREAKER TO REFEED THE EXISTING SERVICE. COORDINATE WITH THE UTILITY FOR REPLACEMENT OF THE SERVICE CONDUCTORS AND METER AS NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED BY NEW BREAKERS IN THE
- THE NEW 400A SERVICE PANEL. 4.2. IF THE PEAK UTILITY DEMAND IS LESS THAN 16.8kW, NO MODIFICATIONS ARE NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED VIA NEW BREAKERS COMPATIBLE WITH THE EXISTING PANEL AND INSTALLED

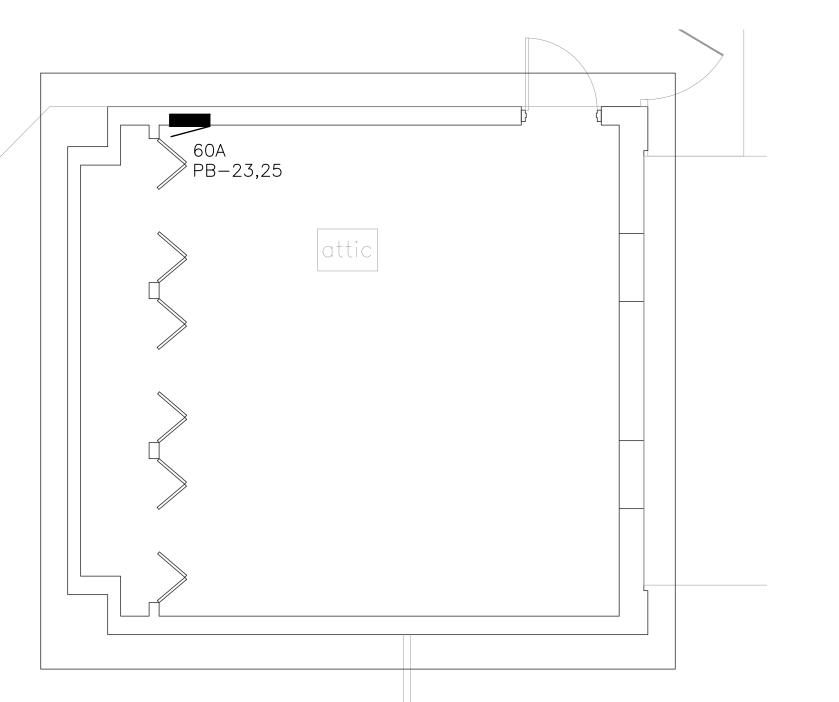
IN EMPTY SPACES IN SERVICE PANEL A (7 AVAILABLE).

	MECHANICAL EQUIPMENT SCHEDULE												
COMB: MAG:	COMB: COMBINATION MOTOR STARTER NR: NONE REQUIRED CONT: CONTRACTOR MAG: MAGNETIC MOTOR STARTER P/I: PLUG-IN UNIT MAN: MANUAL MOTOR STARTER W/U: SUPPLIED WITH UNIT												
UNIT NO	FUNCTION (NOTES)	LOAD	VOLTS	Ø	FULL LOAD AMPS	CONDUIT	CONDUIT NO. WIRE		GRND WIRE SIZE	BRKR SIZE	START	DISC FUSE	
(CU)	CONDENSING UNIT	4 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A	
CU 2	CONDENSING UNIT	3 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A	
HP 1	INDOOR VRF TYPICAL OF HP-1,2,3,4&5		240V	1	2A	3/4"	2	12	12	20A	W/U	\$ ₂	

ELECTRICAL FLAG NOTES:

- PROVIDE AND INSTALL A 2P 40A BREAKER IN EXISTING PANEL TO CIRCUIT OUTDOOR CONDENSORS.
- 2> PROVIDE AND INSTALL A 2P 20A BREAKER IN EXISTING PANEL TO CIRCUIT INDOOR VRF EQUIPMENT.
- 3 CIRCUIT TO AN AVAILABLE 1P 20A BREAKER IN EXISTING PANEL.





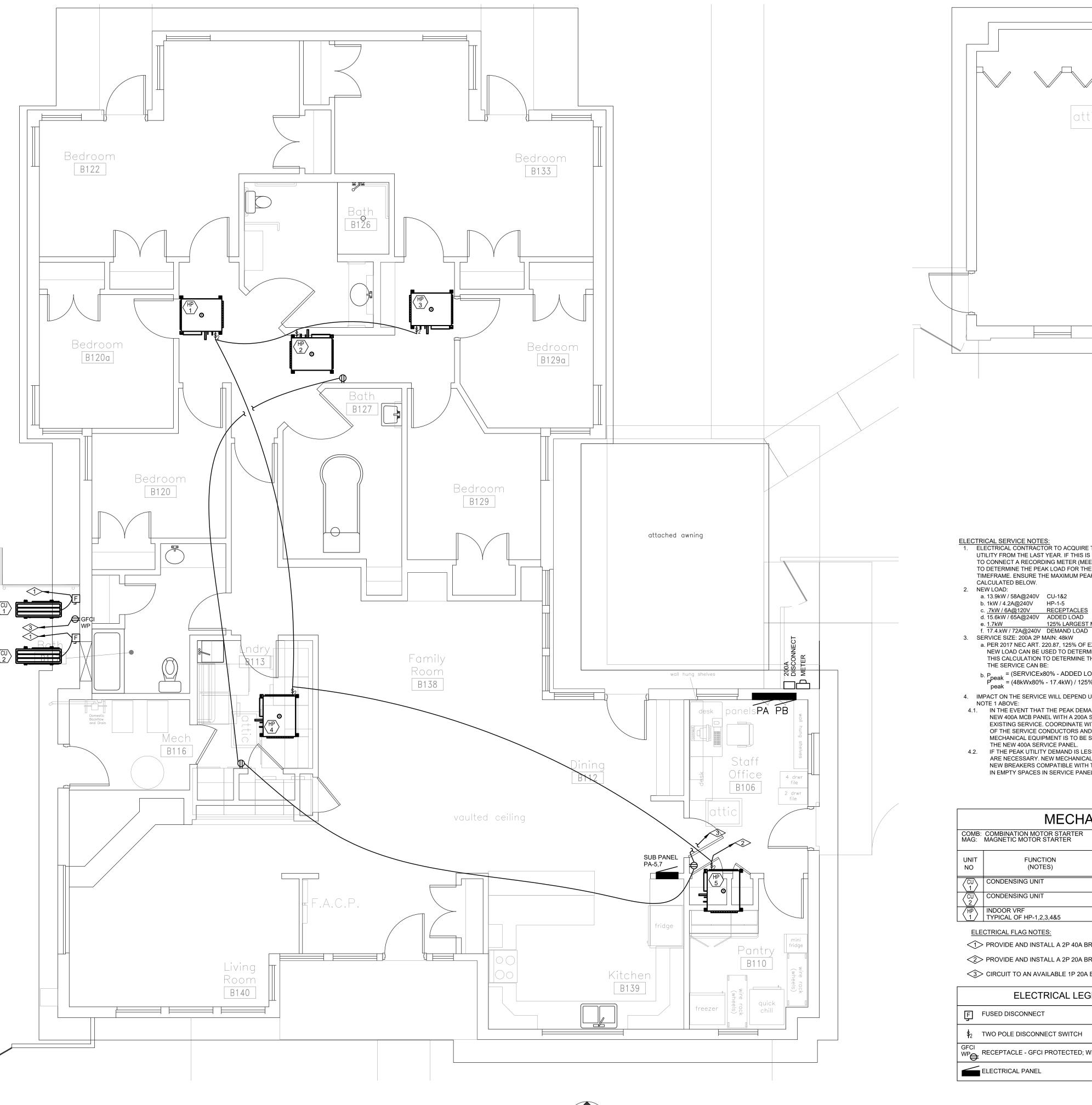


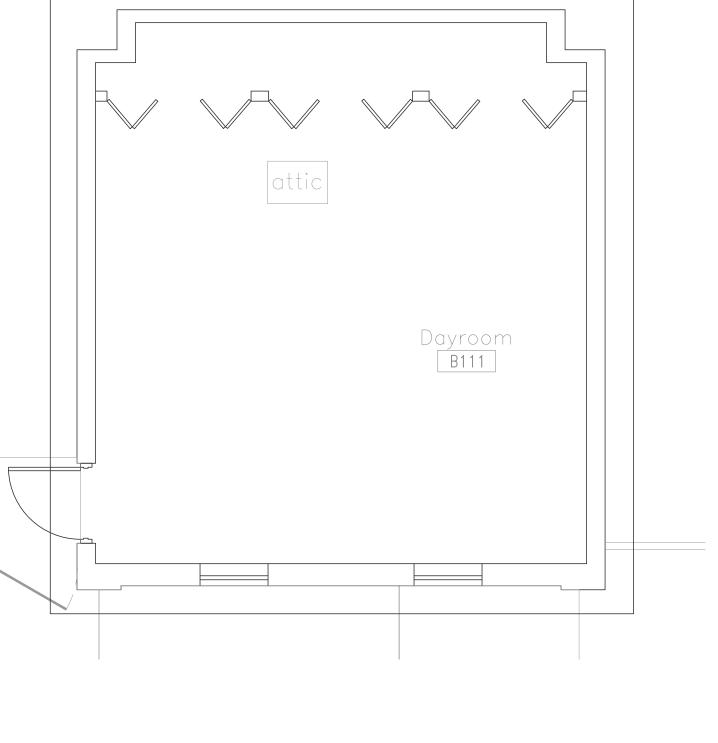
PERMISSION OF THE DESIGNER. THE DRAWINGS AND PERMISSION OF THE DESIGNER. THE DRAWINGS AND SPECIFICATIONS ARE INSTRUMENTS OF THE SERVICE AND SHALL REMAIN THE PROPERTY OF THE DESIGNER WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS EXECUTED OR NOT. THESE DRAWINGS AND SPECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT BY OTHERS EXCEPT BY THE EXPORESSED MINISTEN. PERMISSION OF THE DESIGNER.

Engineer

REGIONAL C GRAND JUNCTION, GROUP **CDHS**

DATE: ISSUED FOR: 10/29/19 BID DOCUMENTS SHEET NUMBER:





ELECTRICAL SERVICE NOTES:

1. ELECTRICAL CONTRACTOR TO ACQUIRE THE PEAK DEMAND VALUE FROM THE UTILITY FROM THE LAST YEAR. IF THIS IS UNAVAILABLE, THE CONTRACTOR IS TO CONNECT A RECORDING METER (MEETING NEC 220.87) TO THE SERVICE TO DETERMINE THE PEAK LOAD FOR THE STRUCTURE OVER A THIRTY DAY TIMEFRAME. ENSURE THE MAXIMUM PEAK DEMAND IS LESS THAN 16.8kW AS

- e. 1.7kW 125% LARGEST MOTOR ADDITION
 f. 17.4.kW / 72A@240V DEMAND LOAD

 3. SERVICE SIZE: 200A 2P MAIN: 48kW
 a. PER 2017 NEC ART. 220.87, 125% OF EXISTING LOAD SUMMED WITH THE NEW LOAD CAN BE USED TO DETERMINE THE SERVICE SIZE. REVERSING THIS CALCULATION TO DETERMINE THE MAXIMUM PEAK DEMAND THAT THE SERVICE CAN BE:
 - b. P = (SERVICEx80% ADDED LOAD) / 125%
 P peak = (48kWx80% 17.4kW) / 125% = 16.8kW
- 4. IMPACT ON THE SERVICE WILL DEPEND UPON THE VALUE AS DETERMINED IN NOTE 1 ABOVE:
- 4.1. IN THE EVENT THAT THE PEAK DEMAND EXCEEDS 16.8kW, PROVIDE A NEW 400A MCB PANEL WITH A 200A SUBFEED BREAKER TO REFEED THE
- EXISTING SERVICE. COORDINATE WITH THE UTILITY FOR REPLACEMENT OF THE SERVICE CONDUCTORS AND METER AS NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED BY NEW BREAKERS IN THE
- THE NEW 400A SERVICE PANEL.

 4.2. IF THE PEAK UTILITY DEMAND IS LESS THAN 16.8kW, NO MODIFICATIONS ARE NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED VIA NEW BREAKERS COMPATIBLE WITH THE EXISTING PANEL AND INSTALLED IN EMPTY SPACES IN SERVICE PANEL A (9 AVAILABLE).

	MECHANICAL EQUIPMENT SCHEDULE											
	COMBINATION MOTOR STARTER MAGNETIC MOTOR STARTER	NR: NONE REQUIRED CONT: CONTRACTOR P/I: PLUG-IN UNIT MAN: MANUAL MOTOR STARTER W/U: SUPPLIED WITH UNIT										
UNIT NO	FUNCTION (NOTES)	LOAD	VOLTS	Ø	FULL LOAD AMPS	CONDUIT	NO.	UIT WIRE SIZE	GRND WIRE SIZE	BRKR SIZE	START	DISC FUSE
(CU)	CONDENSING UNIT	4 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
CU 2	CONDENSING UNIT	3 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
(HP)	INDOOR VRF TYPICAL OF HP-1,2,3,4&5		240V	1	2A	3/4"	2	12	12	20A	W/U	\$ 2

- **ELECTRICAL FLAG NOTES:**
- PROVIDE AND INSTALL A 2P 40A BREAKER IN EXISTING PANEL TO CIRCUIT OUTDOOR CONDENSORS.
- 2> PROVIDE AND INSTALL A 2P 20A BREAKER IN EXISTING PANEL TO CIRCUIT INDOOR VRF EQUIPMENT.
- 3 CIRCUIT TO AN AVAILABLE 1P 20A BREAKER IN EXISTING PANEL.

	ELECTRICAL LEGEND
Ę	FUSED DISCONNECT
\$2	TWO POLE DISCONNECT SWITCH
GFCI WP	RECEPTACLE - GFCI PROTECTED; WEATHER PROOF COVER
	ELECTRICAL PANEL

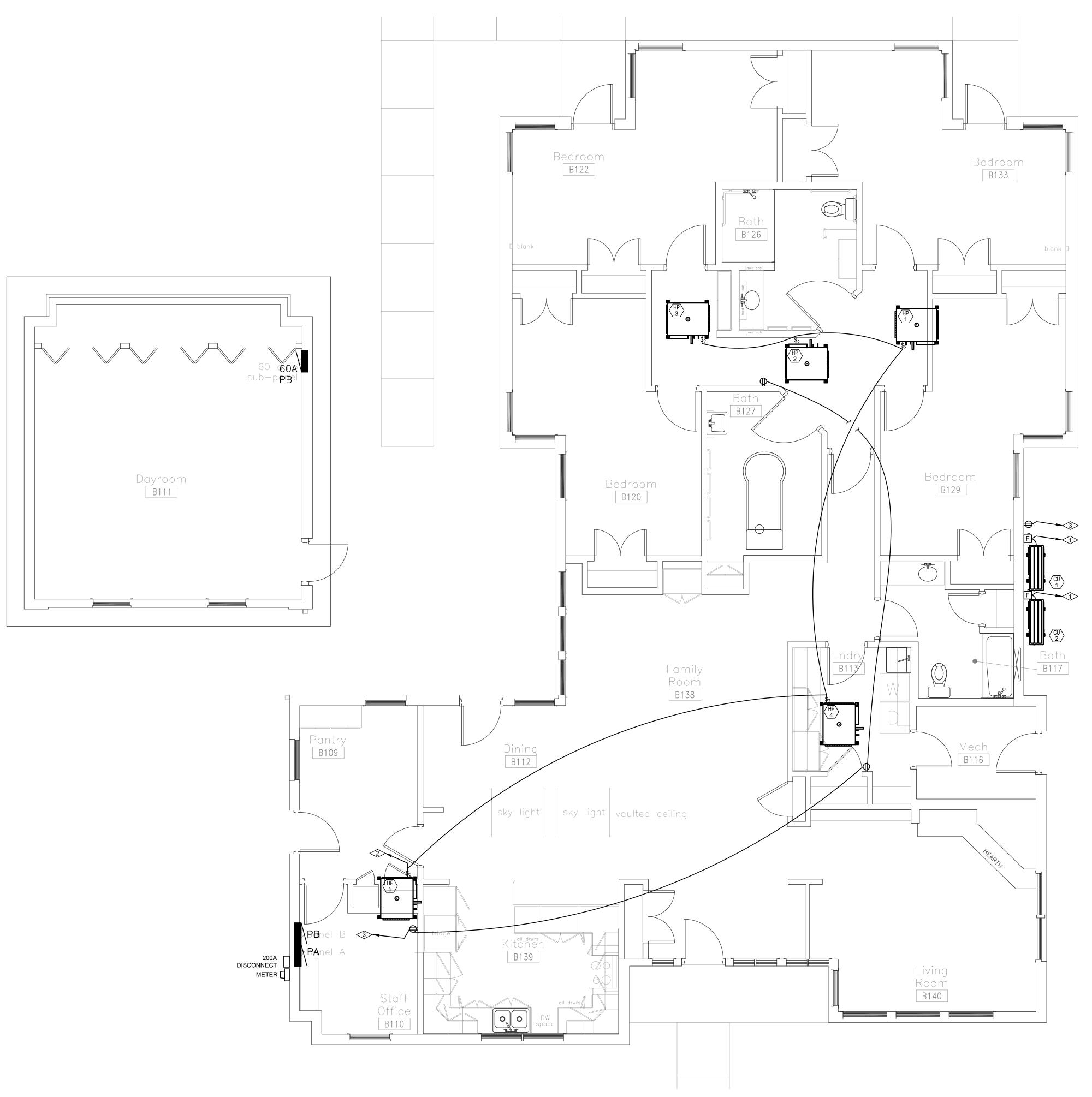


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CENTER REGIONAL CDH

DATE: ISSUED FOR: 10/29/19 BID DOCUMENTS DRAWN BY: CHECKED BY: SCALE: SHEET NUMBER:

October 29, 2019 - 5:03:01pm



ELECTRICAL - FLORIDA STREET FLOOR PLAN SCALE: 1/4"=1'-0"

ELECTRICAL SERVICE NOTES:

1. ELECTRICAL CONTRACTOR TO ACQUIRE THE PEAK DEMAND VALUE FROM THE UTILITY FROM THE LAST YEAR. IF THIS IS UNAVAILABLE, THE CONTRACTOR IS TO CONNECT A RECORDING METER (MEETING NEC 220.87) TO THE SERVICE TO DETERMINE THE PEAK LOAD FOR THE STRUCTURE OVER A THIRTY DAY TIMEFRAME. ENSURE THE MAXIMUM PEAK DEMAND IS LESS THAN 16.8kW AS CALCULATED BELOW.

NEW LOAD:

a. 13.9kW / 58A@240V CU-1&2 b. 1kW / 4.2A@240V HP-1-5 c. _7kW / 6A@120V RECEPTACLES d. 15.6kW / 65A@240V ADDED LOAD

e. 1.7kW 125% LARGEST MOTOR ADDITION
f. 17.4.kW / 72A@240V DEMAND LOAD

3. SERVICE SIZE: 200A 2P MAIN: 48kW
a. PER 2017 NEC ART. 220.87, 125% OF EXISTING LOAD SUMMED WITH THE NEW LOAD CAN BE USED TO DETERMINE THE SERVICE SIZE. REVERSING THIS CALCULATION TO DETERMINE THE MAXIMUM PEAK DEMAND THAT THE SERVICE CAN BE: THE SERVICE CAN BE:

b. P = (SERVICEx80% - ADDED LOAD) / 125%
Ppeak = (48kWx80% - 17.4kW) / 125% = 16.8kW

4. IMPACT ON THE SERVICE WILL DEPEND UPON THE VALUE AS DETERMINED IN

4.1. IN THE EVENT THAT THE PEAK DEMAND EXCEEDS 16.8kW, PROVIDE A NEW 400A MCB PANEL WITH A 200A SUBFEED BREAKER TO REFEED THE EXISTING SERVICE. COORDINATE WITH THE UTILITY FOR REPLACEMENT OF THE SERVICE CONDUCTORS AND METER AS NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED BY NEW BREAKERS IN THE

THE NEW 400A SERVICE PANEL. 4.2. IF THE PEAK UTILITY DEMAND IS LESS THAN 16.8kW, NO MODIFICATIONS ARE NECESSARY. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED VIA NEW BREAKERS COMPATIBLE WITH THE EXISTING PANEL AND INSTALLED IN EMPTY SPACES IN SERVICE PANEL A (10 AVAILABLE).

MECHANICAL EQUIPMENT SCHEDULE												
COMB: COMBINATION MOTOR STARTER MAG: MAGNETIC MOTOR STARTER NR: NONE REQUIRED P/I: PLUG-IN UNIT MAN: MANUAL MOTOR STARTER W/U: SUPPLIED WITH UNIT												
UNIT NO	FUNCTION (NOTES)	LOAD	VOLTS	Ø	FULL LOAD AMPS	BRANG CONDUIT SIZE	NO.	OUIT WIRE SIZE	GRND WIRE SIZE	BRKR SIZE	START	DISC FUSE
CU 1	CONDENSING UNIT	4 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
$\begin{pmatrix} CU \\ 2 \end{pmatrix}$	CONDENSING UNIT	3 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
(HP)	INDOOR VRF TYPICAL OF HP-1 2 3 4&5		240V	1	2A	3/4"	2	12	12	20A	W/U	\$ 2

ELECTRICAL FLAG NOTES:

PROVIDE AND INSTALL A 2P 40A BREAKER IN EXISTING PANEL TO CIRCUIT OUTDOOR CONDENSORS.

2> PROVIDE AND INSTALL A 2P 20A BREAKER IN EXISTING PANEL TO CIRCUIT INDOOR VRF EQUIPMENT. 3 CIRCUIT TO AN AVAILABLE 1P 20A BREAKER IN EXISTING PANEL.

ELECTRICAL LEGEND
F FUSED DISCONNECT
\$2 TWO POLE DISCONNECT SWITCH
GFCI WP RECEPTACLE - GFCI PROTECTED; WEATHER PROOF COVER
ELECTRICAL PANEL

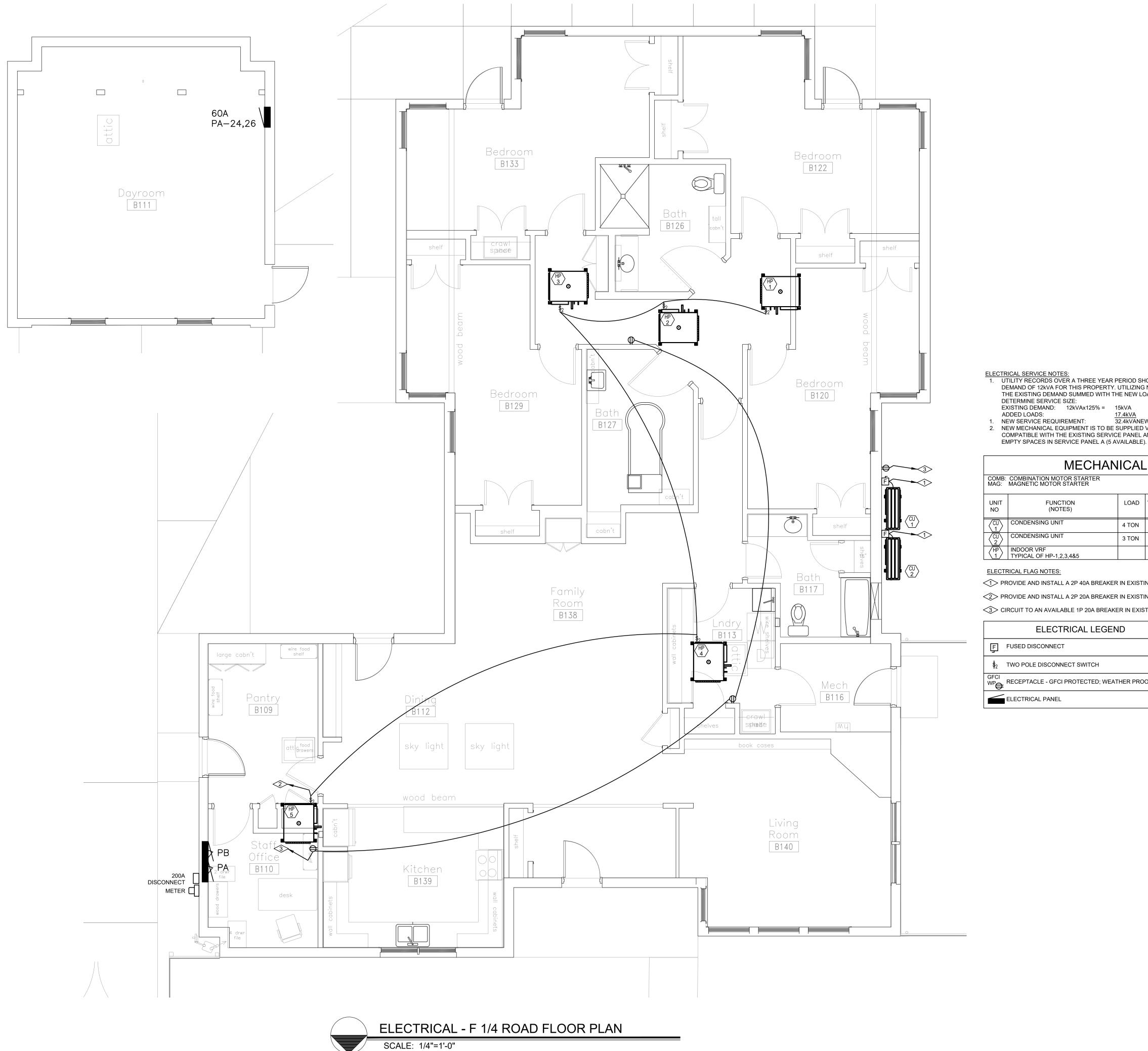
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CENTER REGIONAL GROUP **CDHS**

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NORTH

ELECTRICAL SERVICE NOTES:

1. UTILITY RECORDS OVER A THREE YEAR PERIOD SHOWED A PEAK DEMAND OF 12kVA FOR THIS PROPERTY. UTILIZING NEC 220.87 125% OF THE EXISTING DEMAND SUMMED WITH THE NEW LOAD CAN BE USED TO DETERMINE SERVICE SIZE:

EXISTING DEMAND: 12kVAx125% = 15kVA ADDED LOADS: 17.4kVA

1. NEW SERVICE REQUIREMENT: 32.4kVANEW LOAD:

2. NEW MECHANICAL EQUIPMENT IS TO BE SUPPLIED VIA NEW BREAKERS COMPATIBLE WITH THE EXISTING SERVICE PANEL AND INSTALLED IN

	MECHANICAL EQUIPMENT SCHEDULE											
	COMB: COMBINATION MOTOR STARTER NR: NONE REQUIRED CONT: CONTRACTOR MAG: MAGNETIC MOTOR STARTER P/I: PLUG-IN UNIT MAN: MANUAL MOTOR STARTER W/U: SUPPLIED WITH UNIT											
UNIT NO	FUNCTION (NOTES)	LOAD	VOLTS	Ø	FULL LOAD AMPS	BRANG CONDUIT SIZE	NO.	WIRE	GRND WIRE SIZE	BRKR SIZE	START	DISC FUSE
(CU)	CONDENSING UNIT	4 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
CU 2	CONDENSING UNIT	3 TON	240V	1	29A	3/4"	3	8	10	40A	W/U	60A 40A
(HP)	INDOOR VRF TYPICAL OF HP-1,2,3,4&5		240V	1	2A	3/4"	2	12	12	20A	W/U	\$ 2

ELECTRICAL FLAG NOTES:

PROVIDE AND INSTALL A 2P 40A BREAKER IN EXISTING PANEL TO CIRCUIT OUTDOOR CONDENSORS.

2> PROVIDE AND INSTALL A 2P 20A BREAKER IN EXISTING PANEL TO CIRCUIT INDOOR VRF EQUIPMENT.

3 CIRCUIT TO AN AVAILABLE 1P 20A BREAKER IN EXISTING PANEL.

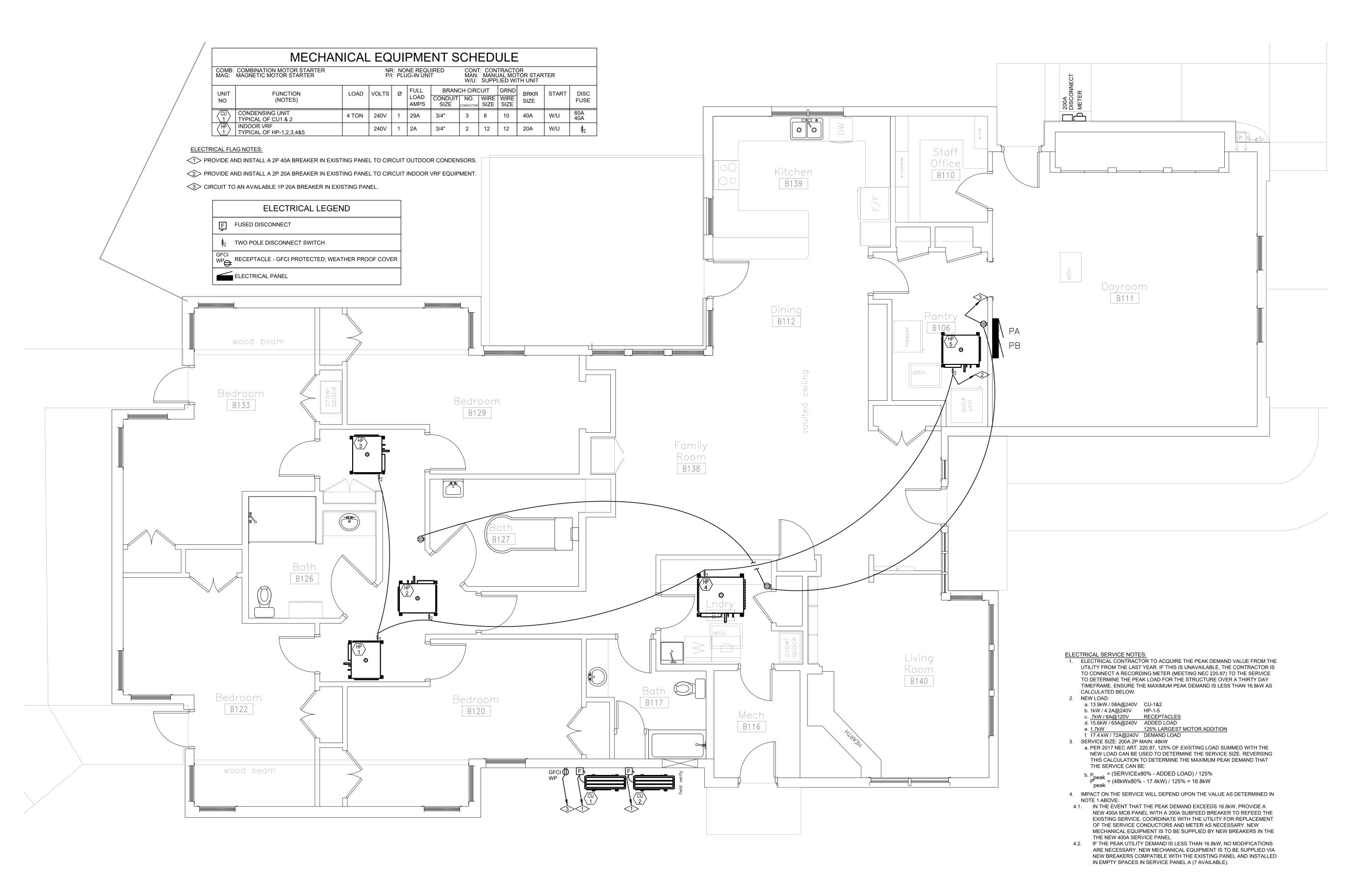
	ELECTRICAL LEGEND
Ę	FUSED DISCONNECT
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GFCI WP	RECEPTACLE - GFCI PROTECTED; WEATHER PROOF COVER
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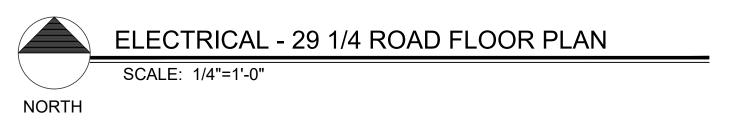
SPECIFICATIONS WITHOUT THE EXPRESSED WRITTEN
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S REGIONAL C **CDHS**

GRAND JUNCTION,

DATE: ISSUED FOR: 10/29/19 BID DOCUMENTS





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Consulting Engineers, Inc. Soad

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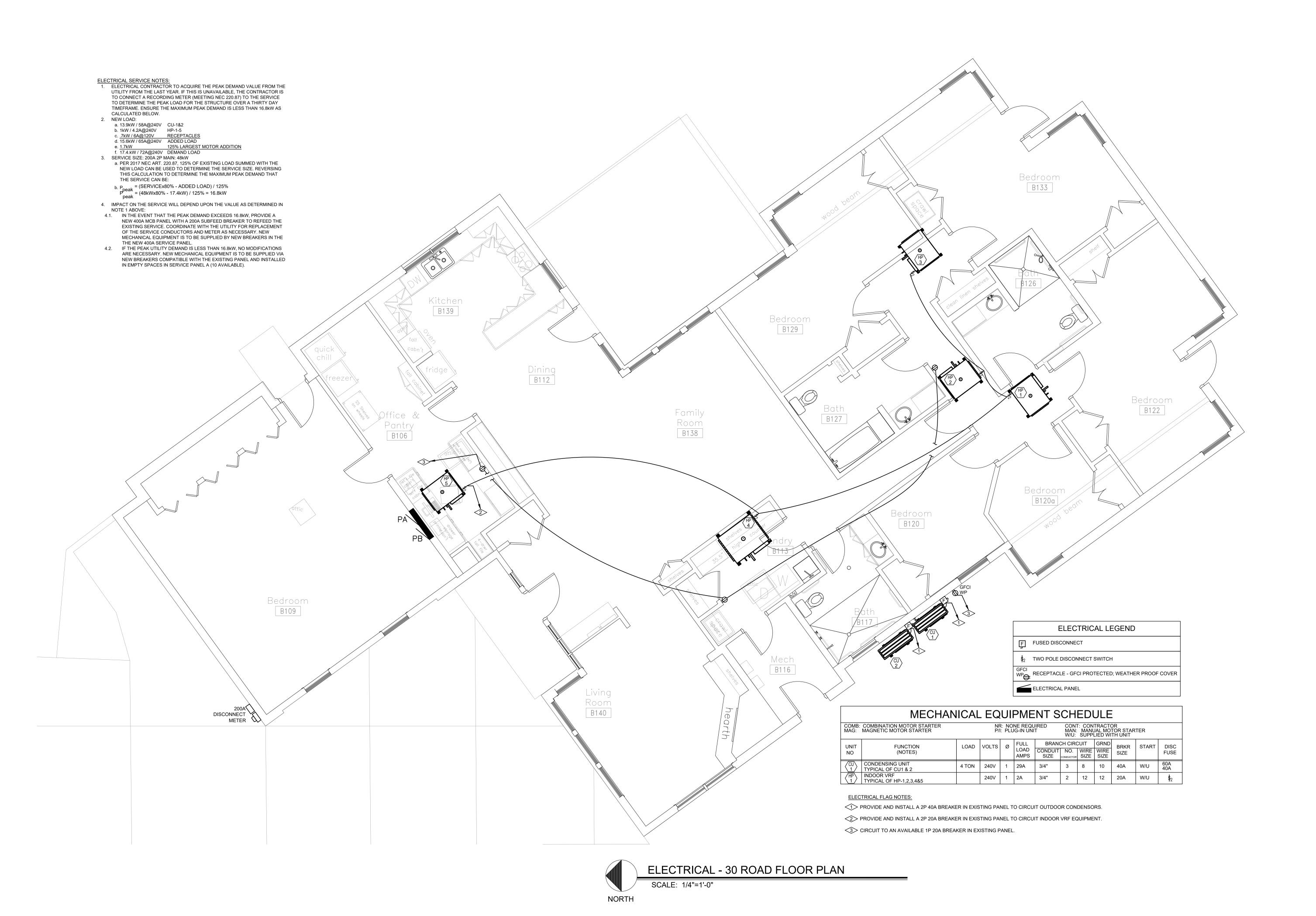
10/29/19 BID DOCUMENTS

DATE: 10/29/2019

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WHETHER THE PROJECT FOR WHICH THEY ARE MADE IS
EXECUTED OR NOT. THESE DRAWINGS AND
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Engineer

REGIONAL GROUP CDH

DATE: ISSUED FOR: 10/29/19 BID DOCUMENTS

CHECKED BY:

SECTION 16010

- GENERAL PROVISIONS A.THE ARCHITECTURAL GENERAL AND SPECIAL CONDITIONS FOR THE CONSTRUCTION OF THIS PROJECT SHALL BE A PART OF THE ELECTRICAL SPECIFICATIONS. THE ELECTRICAL CONTRACTOR SHALL EXAMINE THE GENERAL AND SPECIAL CONDITIONS BEFORE SUBMITTING
- B. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK INCLUDED IN THIS SECTION AND THE DELEGATION OF WORK TO THE ELECTRICAL CONTRACTOR, SHALL NOT RELIEVE HIM OF THIS RESPONSIBILITY. THE ELECTRICAL CONTRACTOR AND HIS SUBCONTRACTORS WHO PERFORM WORK UNDER THIS SECTION SHALL BE RESPONSIBLE TO
- THE GENERAL CONTRACTOR C. WHERE ITEMS OF THE GENERAL CONDITIONS OR OF THE SPECIAL CONDITIONS ARE REPEATED IN THIS SECTION OF THE SPECIFICATIONS, IT IS INTENDED TO RE-ENFORCE OR QUALIFY THEM; IT IS NOT INTENDED THAT ANY OTHER PARTS OF THE GENERAL CONDITIONS OR SPECIAL
- CONDITIONS SHALL BE ASSUMED TO BE OMITTED IF NOT REPEATED HEREIN. D. THE NAMING OF A CERTAIN BRAND OR MAKE OR MANUFACTURER IN THE SPECIFICATIONS IS TO ESTABLISH A QUALITY STANDARD FOR THE ARTICLE DESIRED. THE CONTRACTOR IS NOT RESTRICTED TO THE USE OF THE SPECIFIC BRAND OF THE MANUFACTURER NAMED UNLESS SO INDICATED IN THE SPECIFICATIONS.
- E. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND PRESENT FIVE (5) COPIES OF SHOP DRAWINGS OR BROCHURES FOR ALL FIXTURES, EQUIPMENT, AND ACCESSORIES TO THE ENGINEER FOR THE ENGINEER'S APPROVAL. CHECKING IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE SHOWN IS SUBJECT TO THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR: DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE; FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATION OF HIS WORK WITH THAT OF ALL OTHER TRADES AND THE SATISFACTORY PERFORMANCE OF HIS WORK. F. THE ELECTRICAL CONTRACTOR SHALL EXAMINE DRAWINGS RELATING TO WORK OF ALL TRADES AND BECOME FULLY INFORMED AS TO EXTENT AND CHARACTER OF WORK REQUIRED AND ITS
- G.BEFORE SUBMITTING A BID. THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE ALL ADJOINING EXISTING BUILDINGS, EQUIPMENT AND SPACE CONDITIONS ON WHICH HIS WORK IS IN ANY WAY DEPENDENT FOR THE BEST WORKMANSHIP AND OPERATION ACCORDING TO THE INTENT OF SPECIFICATIONS AND DRAWINGS. HE SHALL REPORT TO THE ARCHITECT ANY CONDITION WHICH MIGHT PREVENT HIM FROM INSTALLING HIS EQUIPMENT IN THE MANNER
- H.NO CONSIDERATION OR ALLOWANCE WILL BE GRANTED FOR FAILURE TO VISIT SITE, OR FOR ANY ALLEGED MISUNDERSTANDING OF MATERIALS TO BE FURNISHED OR WORK TO BE DONE. I. EXISTING CONDUITS, PIPES, EQUIPMENT, ETC.: REFER TO DIVISION I FOR ADDITIONAL REQUIREMENTS. EXISTING CONDUITS, PIPES, UTILITY LINES, TANKS, EQUIPMENT, OR OTHER OBSTRUCTIONS, WHETHER UNDERGROUND, CONCEALED, OR EXPOSED, ARE NOT IN GENERAL INDICATED ON DRAWINGS. PRIOR TO START OF WORK, HAVE EXISTING UTILITY OBSTRUCTIONS CLEARLY MARKED BY UTILITIES LOCATOR SERVICE. PLAN WORK SO AS TO ROUTE AND LOCATE ALL NEW WORK TO AVOID THESE OBSTRUCTIONS. REPAIR OR REPLACE, AT NO COST TO OWNER, EXISTING INSTALLATIONS WHERE DAMAGED, THAT OCCURRED DURING THE COURSE OF

END OF SECTION 16010

ELECTRICAL DRAWINGS AND REFERENCE SYMBOLS

RELATION TO ALL OTHER WORK IN THE PROJECT.

- A. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERALLY THE LOCATIONS OF MATERIAL AND EQUIPMENT. THESE DRAWINGS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE WORK UNDER THIS SECTION WITH THE ARCHITECTURAL, STRUCTURAL, PLUMBING, HEATING AND AIR CONDITIONING, AND THE DRAWINGS OF OTHER TRADES FOR EXACT DIMENSIONS, CLEARANCES AND ROUGHING-IN LOCATIONS: THIS CONTRACTOR SHALL COOPERATE WITH ALL OTHER TRADES IN ORDER TO MAKE MINOR FIELD ADJUSTMENTS TO ACCOMMODATE THE WORK OF OTHERS. DO NOT RELY ON THE SCALE OF THE DRAWINGS FOR ROUGH-IN MEASUREMENTS, NOR USE THEM AS SHOP
- B. THE DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY, EACH TO THE OTHER, AND THE WORK REQUIRED BY EITHER SHALL BE INCLUDED IN THE CONTRACT AS IF CALLED FOR BY BOTH. C.IF DIRECTED BY THE ARCHITECT, THE CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OF OTHER TRADES OR FOR PROPER EXECUTION OF THE WORK. D.ELECTRICAL SYMBOLS USED ON THIS PROJECT ARE SHOWN IN A SYMBOL LIST ON THE
- ACCOMPANYING WORKING DRAWINGS. THIS LIST SHOWS STANDARD SYMBOLS AND ALL MAY NOT APPEAR ON THE PROJECT DRAWINGS; HOWEVER, WHEREVER THE SYMBOL ON PROJECT DRAWINGS OCCURS, THE ITEM SHALL BE PROVIDED AND INSTALLED. END OF SECTION 16015

- A. THE SCOPE OF THE WORK CONSISTS OF ELECTRICAL INSTALLATION AND MODIFICATION AT CDHS GROUP HOMES IN GRAND JUNCTION. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO; MODIFICATION OF THE HVAC SYSTEMS IN EACH RESIDENCE; AND OTHER ITEMS AS CALLED OUT ON THE DRAWINGS FOR THE HVAC REQUIREMENTS. THIS WORK WILL ALSO INCLUDE: ELECTRICAL DISTRIBUTION INSTALLATION; POWERING OF MECHANICAL EQUIPMENT; AND OTHER ITEMS AS CALLED OUT ON THE DRAWINGS FOR THE REMODEL CONSTRUCTION. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL SUPERVISION, LABOR, MATERIALS, EQUIPMENT, MACHINERY, AND ANY AND ALL OTHER ITEMS NECESSARY TO COMPLETE THE SYSTEMS. THE ELECTRICAL CONTRACTOR SHALL NOTE THAT ALL ITEMS OF EQUIPMENT ARE SPECIFIED IN THE SINGULAR; HOWEVER, THE CONTRACTOR SHALL PROVIDE AND INSTALL THE NUMBER OF ITEMS OF EQUIPMENT AS INDICATED ON THE DRAWINGS AND AS REQUIRED FOR COMPLETE SYSTEMS. B.IT IS THE INTENTION OF THE SPECIFICATIONS AND DRAWINGS TO CALL FOR FINISHED WORK,
- TESTED AND READY FOR OPERATION. C ANY APPARATUS APPLIANCE MATERIAL OR WORK NOT SHOWN ON DRAWINGS BUT MENTIONED IN THE SPECIFICATIONS, OR VICE VERSA, OR ANY INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE WORK COMPLETE AND PERFECT IN ALL RESPECTS AND READY FOR OPERATION, EVEN IF NOT PARTICULARLY SPECIFIED. SHALL BE FURNISHED. DELIVERED AND INSTALLED BY THE CONTRACTOR WITHOUT ADDITIONAL EXPENSE TO THE OWNER. WITH SUBMISSION OF BID, THE ELECTRICAL CONTRACTOR SHALL GIVE WRITTEN NOTICE TO THE ARCHITECT: ANY MATERIALS OR APPARATUS BELIEVED INADEQUATE OR UNSUITABLE. IN VIOLATION OF LAWS. ORDINANCES OR RULES; ANY NECESSARY ITEMS OR WORK OMITTED. IN THE ABSENCE OF SUCH WRITTEN NOTICE, IT IS MUTUALLY AGREED THE CONTRACTOR HAS INCLUDED THE COST OF ALL REQUIRED ITEMS IN HIS PROPOSAL, AND THAT HE WILL BE RESPONSIBLE FOR THE APPROVED SATISFACTORY FUNCTIONING OF THE ENTIRE SYSTEM WITHOUT EXTRA COMPENSATION.

END OF SECTION 16020

SECTION 16030 CODES AND FEES

- A. ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH ALL APPLICABLE CODES.
- SPECIFICATIONS, LOCAL ORDINANCES, INDUSTRY STANDARDS. UTILITY COMPANY AND FIRE INSURANCE CARRIER'S REQUIREMENTS. CONTACT PROPER AUTHORITIES, OBTAIN AND PAY FOR REQUIRED PERMITS, INSPECTIONS AND UTILITY SERVICE CONNECTIONS. DO NOT INCLUDE ANY UTILITY COMPANY CHARGES THAT CAN BE BILLED DIRECTLY TO THE OWNER. B.IN CASE OF DIFFERENCE BETWEEN THE BUILDING CODES, SPECIFICATIONS, STATE LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS, UTILITY COMPANY REGULATIONS, FIRE INSURANCE
- CARRIER'S REQUIREMENTS, AND THE CONTRACT DOCUMENTS, THE MOST STRINGENT SHALL GOVERN. THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ARCHITECT IN WRITING OF ANY SUCH DIFFERENCE C.NONCOMPLIANCE: SHOULD THE CONTRACTOR PERFORM ANY WORK THAT DOES NOT COMPLY
- WITH THE REQUIREMENTS OF THE APPLICABLE BUILDING CODES, STATE LAWS, LOCAL ORDINANCES, INDUSTRY STANDARDS, FIRE INSURANCE CARRIER'S REQUIREMENTS, AND UTILITY COMPANY REGULATIONS, HE SHALL BEAR THE COST ARISING IN CORRECTING ANY SUCH DEFICIENCY.

END OF SECTION 16030

SECTION 16100 BASIC METHODS AND MATERIALS

SECTION 16101

- A.PROTECTION: ALL WORK, MATERIALS AND EQUIPMENT SHALL BE COMPLETELY AND ADEQUATELY PROTECTED AT ALL TIMES. PAY FOR ALL DAMAGE, INJURY OR LOSS, EXCEPT SUCH AS MAY BE DIRECTLY DUE TO ERRORS IN THE CONTRACT DOCUMENTS OR BE CAUSED BY AGENTS OR EMPLOYEES OF THE OWNER. POST EFFECTIVE DANGER SIGNS WARNING AGAINST HAZARDS CREATED BY THE WORK.
- B. TRENCHING AND BACKFILLING: PERFORM ALL TRENCHING AND BACKFILL REQUIRED BY WORK UNDER THIS DIVISION OF THE SPECIFICATIONS. TRENCHING AND BACKFILLING SHALL BE DONE IN ACCORDANCE WITH THE "SITE WORK" DIVISION OF THE SPECIFICATIONS AND AS HEREIN SPECIFIED. THIS PORTION OF THE WORK SHALL BE EXECUTED UNDER THE DIRECT SUPERVISION OF THE GENERAL CONTRACTOR. TRENCHES SHALL BE EXCAVATED TO THE DEPTH REQUIRED FOR THE UTILITIES INVOLVED. THE TRENCH BOTTOM SHALL BE GRADED TRUE
- AND FREE FROM DEBRIS, STONES AND SOFT SPOTS. WHERE DIRECT BURIAL CABLES ARE USED FOUR INCHES OF FINE SAND SHALL BE PLACED IN THE BOTTOM OF THE TRENCH PRIOR TO CABLE PLACEMENT. C.EQUIPMENT. MATERIALS. INSTALLATION:
- 1. ALL EQUIPMENT, ACCESSORIES AND SPECIALTIES CONNECTED TO EQUIPMENT AND ALL ITEMS OF MATERIAL SHALL BE INSTALLED AS RECOMMENDED BY THEIR MANUFACTURERS UNLESS

SPECIFICALLY STATED OTHERWISE 2. PROVIDE PROPER SUPPORTS, MOUNTS, ETC., AS REQUIRED.

3. COORDINATE WITH THE GENERAL CONTRACTOR. 4. OBTAIN INSTRUCTIONS FROM THE ARCHITECT FOR INSTALLATION OF ITEMS NOT COMPLETELY COVERED BY CONTRACT DOCUMENTS OR PUBLISHED MANUFACTURER'S RECOMMENDATIONS. D.EQUIPMENT FINISH: ALL ELECTRICAL EQUIPMENT SHALL BE FURNISHED FACTORY PAINTED OR FINISHED WITH TWO COATS OF HIGH GRADE ENAMEL AND IN THE MANUFACTURER'S STANDARD COLORS UNLESS OTHERWISE SPECIFIED.

- CLEANED AND PRIMED TO BE PAINTED BY THE PAINTING CONTRACTOR IN ACCORDANCE WITH
- THE PAINTING SECTION OF THESE SPECIFICATIONS 2. THE COLORS OF ALL EXPOSED ELECTRICAL MATERIAL AND APPARATUS SHALL BE AS SELECTED BY THE OWNER.
- E. CHASES, SLEEVES, CUTTING, PATCHING 1. PROVIDE FOR NECESSARY CHASES, HOLES, SLEEVES, BOXES, INSERTS AND HANGERS BY ARRANGEMENT WITH CONTRACTORS OF THE OTHER APPROPRIATE TRADES. PROVIDE
- THROUGH RATED WALLS. FLOORS AND CEILINGS. 2. PROVIDE FOR ALL CUTTING AND PATCHING OF HOLES, OPENINGS, AND NOTCHES. OBTAIN WRITTEN APPROVAL OF THE ARCHITECT BEFORE NOTCHING, BORING, CHIPPING, BURNING, DRILLING, WELDING TO STRUCTURAL MEMBERS.

"FLAMESEAL" OR OF THE APPROVED FIRESTOPPING MATERIAL AT ALL PENETRATIONS

- 1. ALL WORK AND MATERIALS COVERED BY DRAWINGS AND SPECIFICATIONS SHALL BE SUBJECT TO INSPECTION AT ANY AND ALL TIMES BY REPRESENTATIVES OF THE ARCHITECT AND OWNER. IF ANY MATERIAL OR INSTALLATION DOES NOT CONFORM TO THE DRAWINGS AND SPECIFICATIONS, WITHIN THREE DAYS AFTER BEING NOTIFIED BY THE ARCHITECT, REMOVE THE MATERIALS FROM THE PREMISES AND CORRECT THE INSTALLATION TO THE SATISFACTION OF THE ARCHITECT. ASSUME THE ENTIRE COST OF REMOVING AND REPLACING OUTLET BOXES
- THE MATERIAL AND CORRECTING THE INSTALLATION, INCLUDING CUTTING AND PATCHING 2. WORK SHALL NOT BE CLOSED IN NOR COVERED BEFORE INSPECTION AND APPROVAL BY THE ARCHITECT. PROVIDE FOR UNCOVERING AND MAKING REPAIRS, AT NO EXTRA COST, WHEN UNINSPECTED WORK HAS BEEN CLOSED IN. NOTIFY THE ARCHITECT WHEN WORK IS READY
- FOR INSPECTION. 3. NOTIFY PROPER AUTHORITIES WHEN WORK IS READY FOR ANY INSPECTIONS REQUIRED BY APPLICABLE CODES, RULES AND REGULATIONS, ALLOWING SUFFICIENT TIME FOR INSPECTIONS TO BE MADE WITHOUT HINDERING PROGRESS OF THE WORK, AND FURNISH THE OWNER, WITHOUT ADDITIONAL COSTS, PROPER CERTIFICATES OF ACCEPTANCE FROM SUCH
- 4. UPON COMPLETION OF ALL WORK AND ADJUSTMENT OF ALL EQUIPMENT, FINAL INSPECTION SHALL BE MADE UNDER DIRECTION OF THE ARCHITECT. TEST AND OPERATE ALL DEVICES, EQUIPMENT AND SYSTEMS TO DEMONSTRATE THAT THE ELECTRICAL SYSTEM IS COMPLETE AND FUNCTIONAL IN THE MANNER REQUIRED.
- 1. DURING THE COURSE OF THE WORK REMOVE ANY MATERIALS NOT INSTALLED IN THE WORK WHICH CONFLICT WITH THE WORK OF OTHERS IF SO DIRECTED BY THE ARCHITECT. 2. AT COMPLETION OF WORK CLEAN UP AND REMOVE FROM THE PREMISES ALL DEBRIS AND MATERIALS NOT INSTALLED IN THE WORK SO THE PREMISES WILL BE LEFT CLEAN. WASH AND WIPE CLEAN ALL LIGHTING FIXTURES AND LAMPS WHICH MAY HAVE BECOME SOILED DURING
- H.RECORD DRAWINGS: AT COMPLETION OF THE WORK FURNISH TO THE ARCHITECT TWO COMPLETE SETS OF ELECTRICAL PRINTS MARKED TO SHOW THE WORK "AS-BUILT". MAINTENANCE AND OPERATING PROCEDURES: UPON COMPLETION OF ALL WORK AND ADJUSTMENT OF ALL EQUIPMENT, INSTRUCT THE OWNER ON THE CORRECT OPERATION AND MAINTENANCE PROCEDURE FOR THE ELECTRICAL SYSTEM IN TOTAL. FURNISH 3 SETS OF TYPED MAINTENANCE MANUALS CONTAINING CUT SHEETS ON ALL EQUIPMENT, TABLES OF FUSES AND FOR WHAT EQUIPMENT, TABLE OF LAMPS AND BALLASTS AND FOR WHAT FIXTURES. INCLUDE A LIST OF CONTACTS WITH PHONE NUMBERS FOR ALL SYSTEMS FOR OWNERS' USE, IN THE EVENT THE ELECTRICAL SYSTEM REQUIRES SERVICE WORK WITHIN THE WARRANTY PERIOD. J. GUARANTEE: GUARANTEE THAT ALL WORK GOVERNED BY THIS DIVISION SHALL BE NEW AND FREE OF DEFECTIVE WORK, MATERIALS, AND COMPONENTS FOR A PERIOD OF ONE YEAR AFTER WRITTEN ACCEPTANCE. REPAIR, REVISE AND REPLACE DEFECTS AS DIRECTED, WITH NO ADDITIONAL COST TO THE OWNER. (INCANDESCENT LAMPS, FUSES AND ANY EXISTING EQUIPMENT ARE EXEMPT)

END OF SECTION 16101

END OF SECTION 16111

- A.PVC CONDUIT SHALL BE USED FOR ALL UNDERGROUND FEEDERS AND BRANCH CIRCUITS UNLESS OTHERWISE DIRECTED ON PLANS OR AS APPROVED BY NEC. ALL CONDUIT SHALL BE UL
- B. CONDUIT SIZES SHALL BE AS INDICATED ON THE DRAWINGS, OR MINIMUM IN ACCORDANCE WITH THE NEC, INCLUDING PROVISION FOR GREEN EQUIPMENT GROUNDING CONDUCTOR USING 3/4 INCH MINIMUM CONDUIT. THE USE OF 1/2 INCH CONDUIT ELSEWHERE MAY BE APPROVED IF CONDITIONS WARRANT
- C.SPECIAL CONDUIT FITTINGS SHALL BE APPROPRIATE FOR EACH APPLICATION AND SHALL BE MANUFACTURED BY T & B OR APPROVED EQUAL. D. CONDUIT SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE
- NEC AND SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER. E. THE ENTIRE CONDUIT SYSTEM SHALL BE INSTALLED TO PROVIDE A CONTINUOUS BOND THROUGHOUT THE SYSTEM.
- F. ELECTRICAL METALLIC TUBING (EMT) MAY BE USED FOR BRANCH CIRCUITS AND RACEWAYS OTHER THAN FOR SERVICE ENTRANCE AND MAIN FEEDERS UNLESS PROHIBITED BY THE NEC OR LOCAL ORDINANCES. EMT SHALL BE UL APPROVED, GALVANIZED INSIDE AND OUTSIDE, COMPLYING WITH ANSI C-80.3 FOR ZINC COATED EMT WITH FITTINGS OF THE SAME TYPE MATERIAL AND FINISH, OF THE PRESSURE CONNECTED TYPE FOR EXTERIOR INSTALLATION AND OF THE SET SCREW TYPE FOR INTERIOR INSTALLATION.
- G.ALL CONDUIT JOINTS SHALL BE CUT SQUARE, REAMED SMOOTH, AND DRAWN UP TIGHT. BENDS OR OFFSETS SHALL BE MADE WITH AN APPROVED BENDER OR HICKEY, OR HUB-TYPE CONDUIT FITTINGS. NUMBER OF BENDS PER RUN SHALL CONFORM TO THE NEC LIMITATIONS. H. CONCEALED CONDUITS SHALL BE RUN IN A DIRECT LINE WITH LONG SWEEP BENDS AND OFFSETS. EXPOSED CONDUITS SHALL BE PARALLEL TO AND AT RIGHT ANGLES TO BUILDING
- LINES, USING CONDUIT FITTINGS FOR ALL TURNS AND OFFSETS. I TRANSITIONS BETWEEN NONMETALLIC CONDUITS AND CONDUITS OF OTHER MATERIALS SHALL BE MADE WITH THE MANUFACTURER'S STANDARD ADAPTERS DESIGNED FOR SUCH PURPOSE. J. EXPOSED CONDUITS SHALL BE SECURELY FASTENED IN PLACE ON MAXIMUM 10 FOOT INTERVALS; AND HANGERS, SUPPORTS OR FASTENERS SHALL BE PROVIDED AT EACH ELBOW AND AT THE END OF EACH STRAIGHT RUN TERMINATING AT A BOX OR CABINET.

SECTION 16120 WIRES AND CABLES

- A. WIRE AND CABLE SHALL MEET ALL STANDARDS AND SPECIFICATIONS APPLICABLE, AND SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE NEC. INSULATED WIRE AND CABLE SHALL HAVE SIZE, TYPE OF INSULATION, VOLTAGE AND MANUFACTURER'S NAME PERMANENTLY MARKED ON OUTER COVERING AT REGULAR INTERVALS NOT EXCEEDING FOUR FEET. WIRE AND CABLE SHALL BE DELIVERED IN COMPLETE COILS OR REELS WITH IDENTIFYING TAGS, STATING
- SIZE, TYPE OF INSULATION, ETC. B. WIRE AND CABLE SHALL BE SUITABLY PROTECTED FROM WEATHER AND OTHER DAMAGE DURING STORAGE AND HANDLING, AND SHALL BE IN FIRST CLASS CONDITION AFTER INSTALLATION
- C. WIRE AND CABLE SHALL BE FACTORY COLOR CODED WITH A SEPARATE COLOR FOR EACH PHASE AND NEUTRAL USED CONSISTENTLY THROUGHOUT THE SYSTEM. COLOR CODING SHALL BE AS REQUIRED BY THE NEC. D. ALL CONDUCTORS SHALL BE RATED 600 VOLTS, UNLESS OTHERWISE SPECIFIED OR SHOWN ON
- THE DRAWINGS, OR FOR ELECTRONIC OR COMMUNICATION USE. E. WIRE AND CABLE FOR VARIOUS APPLICATIONS SHALL BE AS FOLLOWS UNLESS OTHERWISE DESIGNATED:
- 1. WIRE #10 AND SMALLER SHALL BE SOLID; WIRE #8 AND LARGER SHALL BE STRANDED. 2. #12 THRU #6 DRY LOCATIONS: TYPE THHN, 90 DEGREES C.
- 3. #12 THRU #6 IN SLABS, UNDERGROUND, OR WET LOCATIONS: TYPE THWN OR TYPE XHHW, 75 DEGREES C. 4. #4 AND LARGER: TYPE XHHW OR TYPE THWN 75 DEGREES C. F. WIRE AND CABLE SHALL BE AS MANUFACTURED BY GENERAL ELECTRIC, ANACONDA WIRE &
- CABLE, ROME CABLE, TRIANGLE CONDUIT & CABLE, OR APPROVED EQUAL. SUBSTITUTION OF WIRE AND CABLE MANUFACTURER SHALL BE ONLY WITH THE APPROVAL OF THE ARCHITECT/ENGINEER
- G.FOR ANY SPECIFIC USE NOT COVERED HERE ABOVE, COMPLY WITH THE NEC IN CONDUCTOR
- H. ALL CIRCUITS SHALL BE 2#12 CU + G CU UNLESS OTHERWISE NOTED ON DRAWINGS OR IN I. ALL 15 AND 20 AMP CIRCUITS WITH LENGTHS OVER 150 FT. SHALL HAVE THEIR CONDUCTOR SIZE INCREASED TO #10 FOR VOLTAGE DROP.

SECTION 16121 WIRE CONNECTIONS

END OF SECTION 16120

- A. JOINTS ON BRANCH CIRCUITS SHALL OCCUR ONLY WHERE SUCH CIRCUIT DIVIDE AS INDICATED ON PLANS AND SHALL CONSIST OF ONE THROUGH CIRCUIT TO WHICH SHALL BE SPLICED THE BRANCH FROM THE CIRCUIT. IN NO CASE SHALL JOINTS IN BRANCH CIRCUITS BE LEFT FOR THE FIXTURE HANGER TO MAKE. NO SPLICES SHALL BE MADE IN CONDUCTOR EXCEPT AT OUTLET
- BOXES, JUNCTION BOXES, OR SPLICE BOXES. B. ALL JOINTS OR SPLICES FOR #10 AWG OR SMALLER SHALL BE MADE WITH UL APPROVED WIRE NUTS OR COMPRESSION TYPE CONNECTORS. C.ALL JOINTS OR SPLICES FOR #8 AWG OR LARGER SHALL BE MADE WITH A MECHANICAL
- COMPRESSION CONNECTOR. AFTER THE CONDUCTORS HAVE BEEN MADE MECHANICALLY AND ELECTRICALLY SECURE, THE ENTIRE JOINT OR SPLICE SHALL BE COVERED WITH SCOTCH #33 TAPE OR APPROVED EQUAL TO MAKE THE INSULATION OF THE JOINT OR SPLICE EQUAL TO THE INSULATION OF THE CONDUCTORS. THE CONNECTOR SHALL BE UL APPROVED. END OF SECTION 16121

SECTION 16125

- A.INSTALL CONDUCTORS IN ALL RACEWAYS AS REQUIRED, UNLESS OTHERWISE NOTED, IN A NEAT AND WORKMANLIKE MANNER. ALL EMPTY CONDUITS SHALL HAVE A #14 GALVANIZED PULL WIRE OR NYLON PULLCORD LEFT IN PLACE FOR FUTURE USE.
- B. CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH THE NEC. MAINS, FEEDERS, SUBFEEDERS SHALL BE TAGGED IN ALL PULL, JUNCTION, AND OUTLET BOXES AND IN THE GUTTER OF PANELS WITH APPROVED CODE TYPE WIRE MARKERS.

- 1. UNPAINTED EQUIPMENT AND MATERIALS, EXCEPT CONDUIT IN CONCEALED SPACES, SHALL BE C.NO LUBRICANT OTHER THAN POWDERED SOAPSTONE OR APPROVED PULLING COMPOUND MAY BE USED TO PULL CONDUCTORS.
 - D. AT LEAST EIGHT (8) INCHES OF SLACK WIRE SHALL BE LEFT IN EVERY OUTLET BOX WHETHER IT BE IN USE OR LEFT FOR FUTURE USE. E. ALL CONDUCTORS AND CONNECTIONS SHALL TEST FREE OF GROUNDS, SHORTS AND OPENS
 - BEFORE TURNING THE JOB OVER TO THE OWNER. F. PULL BOXES SHALL BE REQUIRED IN RUNS OVER 100 FEET OR WHEN MORE THAN THREE 90-DEGREE BENDS ARE USED, OR AS INDICATED ON THE DRAWINGS.

G.FEEDERS ARE TO BE RUN ABOVE GROUND TO ALL POWER PANELS AND LIGHTING PANELS,

- UNLESS INDICATED OTHERWISE ON DRAWINGS. H. WHERE MOTORS HAVE CONDUIT TERMINAL BOXES, FEEDERS SHALL BE CONNECTED TO SAME BY FLEXIBLE MEANS
- I. ALL MOTORS WITH SLIDING BASE MOUNTINGS SHALL HAVE NOT LESS THAN 18 INCHES NOR MORE THAN 6 FEET OF CONDUIT CONNECTING RIGID CONDUIT FEED TO MOTOR TERMINAL BOX. J. CONDUCTOR SPLICES SHALL BE MADE ONLY IN JUNCTION BOXES, TERMINAL BOXES, OR PULL BOXES.

END OF SECTION 16125

END OF SECTION 16133

SECTION 16133

- ALL OUTLET BOXES FOR CONCEALED WIRING SHALL BE SHEET METAL, A.GALVANIZED OR CADMIUM PLATED, AT LEAST 1 INCHES DEEP, SINGLE OR GANGED, OF SIZE TO ACCOMMODATE DEVICES AND NUMBER OF CONDUCTORS NOTED. BOXES SHALL BE EQUIPPED
- BY STEEL CITY OR APPROVED EQUAL B. BOXES FOR EXPOSED WIRING SHALL BE MALLEABLE IRON, CADMIUM FINISH, OR CAST ALUMINUM ALLOY, AS MANUFACTURED BY STEEL CITY, AND SHALL NOT BE LESS THAN 4 INCHES SQUARE BY 1 INCHES DEEP UNLESS OTHERWISE NOTED. C.FIXTURE OUTLET BOXES SHALL BE MINIMUM 4 INCH OCTAGONAL AND, WHERE REQUIRED AS

OUTLET AND JUNCTION BOXES, THEY SHALL BE 4 11/16 INCHES BY 2 1/8 INCHES DEEP.

WITH PLASTER RING OR COVER AS NECESSARY. ALL OUTLET BOXES SHALL BE MANUFACTURED

SUPPORTING DEVICES A. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL METALLIC SUPPORTS AS REQUIRED FOR THE PROPER INSTALLATION OF RACEWAY SYSTEMS AND ALL OTHER EQUIPMENT INSTALLED UNDER THIS DIVISION OF THE CONTRACT CONFORMING TO THE LATEST EDITION OF

B. CONDUIT SHALL BE SUPPORTED ON APPROVED TYPES OF WALL BRACKETS, CEILING TRAPEZES,

- STRAP HANGERS OR PIPE SUPPORTS, SECURED BY MEANS OF TOGGLE BOLTS IN HOLLOW MASONRY WALLS OR UNITS. EXPANSION BOLTS WILL BE USED IN CONCRETE OR BLOCK, MACHINE SCREWS ON METAL SURFACES, AND WOOD SCREWS ON WOOD CONSTRUCTION. C.CONDUIT SHALL BE SECURELY FASTENED TO ALL SHEET METAL OUTLETS, JUNCTION AND PULL BOXES WITH TWO GALVANIZED LOCKNUTS AND BUSHING, CARE BEING TAKEN TO SEE THAT THE FULL NUMBER OF THREADS PROJECT THROUGH TO PERMIT THE BUSHING TO BE DRAWN TIGHT AGAINST THE END OF THE CONDUIT, AFTER WHICH THE LOCKNUTS SHALL BE MADE TIGHT SUFFICIENTLY TO DRAW THEM INTO FIRM ELECTRICAL CONTACT WITH THE OUTLET BOX. INSTALL A PLASTIC BUSHING ON END OF PIPE THREADS PROTRUDING INTO JUNCTION BOXES
- AND OTHER ENCLOSURES TO PROTECT CABLING. D. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SUPPORTS REQUIRED FOR THE ELECTRICAL EQUIPMENT AND CONDUIT. END OF SECTION 16190

SECTION 16195

- A. THE ELECTRICAL CONTRACTOR SHALL MAINTAIN ACCURATE RECORDS OF ALL DEVIATIONS IN WORK AS ACTUALLY INSTALLED FROM WORK INDICATED ON THE DRAWINGS. UPON COMPLETION OF THE PROJECT, TWO (2) COMPLETE SETS OF MARKED-UP PRINTS SHALL BE DELIVERED TO THE ARCHITECT.
- **B. IDENTIFICATION OF EQUIPMENT** 1. PROVIDE AND INSTALL LAMINATED BLACK AND WHITE LAMACOID NAMEPLATES FOR ALL SERVICE SWITCHES, DISTRIBUTION SWITCHES, DISTRIBUTION SWITCHBOARDS, BRANCH CIRCUIT PANELBOARDS, SAFETY SWITCHES, CABINETS, STARTERS, AND OTHER EQUIPMENT WITH THEIR CORRECT DESIGNATION. LABEL EQUIPMENT IN AREAS ACCESSIBLE TO THE PUBLIC ON INSIDE OF ENCLOSURE ONLY. NAMEPLATES SHALL BE FIRMLY SECURED TO FRONT
- COVER OR DOOR WITH TWO PROPERLY SIZED POP RIVETS. 2. MOUNT A TYPEWRITTEN DIRECTORY BEHIND PLASTIC ON THE INSIDE OF EACH BRANCH CIRCUIT PANEL DOOR, GIVING THE NUMBER, DESCRIPTION AND LOCATION OF THE CIRCUIT CONTROLLED BY EACH CIRCUIT BREAKER. REVISE EXISTING DIRECTORIES TO REFLECT
- CIRCUIT MODIFICATIONS UNDER THIS CONTRACT 3. ALL FUSED SAFETY SWITCHES AND FUSED SWITCH UNITS IN SWITCHBOARDS SHALL INDIVIDUALLY BEAR A FUSE LABEL SHOWING PROPER SIZE AND TYPE OF FUSE TO BE USED. 4. INSTALL WIRING DIAGRAMS ON THE INSIDE COVER OF ALL STARTERS, SWITCHES AND OTHER
- SUCH EQUIPMENT. SUCH DIAGRAMS SHALL NOT BE HANDWRITTEN. 5. ALL JUNCTION BOXES WITH BLANK COVERS SHALL HAVE CIRCUITS CONTAINED THEREIN IDENTIFIED BY MEANS OF PERMANENT BLACK "MAGIC MARKER" ON THE COVER. END OF SECTION 16195

- ELECTRONIC EQUIPMENT A.THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND CONNECTION OF A PROPER POWER SUPPLY TO ALL ELECTRONIC EQUIPMENT FURNISHED BY OTHERS. HE SHALL VERIFY ALL VOLTAGE, FREQUENCY, ETC., REQUIREMENTS PRIOR TO ENERGIZING THE CIRCUIT. THOSE INSTALLING THE EQUIPMENT WILL BE RESPONSIBLE FOR THE PROPER OPERATION OF THE EQUIPMENT PROVIDED THE PROPER POWER SUPPLY CIRCUIT IS INSTALLED BY THE ELECTRICAL CONTRACTOR.
- B. PROVIDE TELEPHONE LINES TO EQUIPMENT CONTROL PANELS WITH MODEM ACCESS. COORDINATE WITH MECHANICAL CONTRACTOR. END OF SECTION 16199

SECTION 16400 SERVICE AND DISTRIBUTION

SECTION 16401 GENERAL

- A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL RELATED DISTRIBUTION EQUIPMENT AS INDICATED ON THE FLOOR PLAN, DIAGRAMS, SCHEDULES, AND NOTES. ALL EQUIPMENT SHALL BE NEW AND UL LISTED.
 - B. RELATED DOCUMENTS: DRAWINGS AND GENERAL PROVISIONS OF THE CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION 1 SPECIFICATIONS SECTION, APPLY TO WORK OF THIS SECTION. END OF SECTION 16401

SECTION 16440

- DISCONNECT SWITCHES A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL SAFETY SWITCHES AS INDICATED ON THE DRAWINGS OR AS REQUIRED. ALL
- SAFETY SWITCHES SHALL BE UL LISTED. 1. THE SWITCHES SHALL BE FUSED SAFETY SWITCHES (FSS) OR NON-FUSED SAFETY SWITCHES (NFSS) AS SHOWN ON THE DRAWINGS OR REQUIRED AND SHALL BE MANUFACTURED BY SIEMENS, SQUARE D. OR APPROVED FQUAL
- 2. SWITCHES SHALL HAVE A QUICK-MAKE AND QUICK-BREAK OPERATING HANDLE AND MECHANISM WHICH SHALL BE AN INTEGRAL PART OF THE BOX. PADLOCKING PROVISIONS SHALL BE PROVIDED FOR PADLOCKING IN THE OFF POSITION WITH AT LEAST THREE PADLOCKS. SWITCHES SHALL BE HORSEPOWER RATED FOR 250 VOLTS AC OR DC OR 600 VOLTS AC AS REQUIRED. LUGS SHALL BE UL LISTED FOR COPPER AND ALUMINUM CABLE.

3. SWITCHES SHALL BE FURNISHED IN NEMA I GENERAL PURPOSE ENCLOSURES WITH

- KNOCKOUTS UNLESS OTHERWISE NOTED OR REQUIRED. SWITCHES LOCATED ON THE EXTERIOR OF THE BUILDING OR IN "WET" LOCATIONS SHALL HAVE NEMA 3R ENCLOSURES 4. THE SAFETY SWITCHES SHALL BE SECURELY MOUNTED IN ACCORDANCE WITH THE NEC. THE CONTRACTOR SHALL PROVIDE ALL MOUNTING MATERIALS AND INSTALL FUSES IN THE FSS.
- THE FUSES SHALL BE DUAL ELEMENT ON MOTOR CIRCUITS. **END OF SECTION 16440**

SECTION 16450 GROUNDING

- A. THE CONDUIT SYSTEMS AND NEUTRAL CONDUCTOR FOR THE WIRING SYSTEM, AND THE TELEPHONE SYSTEM SHALL BE SECURELY GROUNDED. THE GROUNDS SHALL BE NEC GROUNDS
- IN EACH CASE B. A GROUND SHALL BE ESTABLISHED AND TESTS CARRIED OUT TO INDICATE THAT SATISFACTORY GROUND HAS BEEN ESTABLISHED IN ACCORDANCE WITH THE NEC. C.WRITTEN RESULTS OF THIS TEST SHALL BE FORWARDED TO THE ENGINEER BEFORE

CONNECTION TO THE SERVICE. END OF SECTION 16450

SECTION 16470 PANELBOARDS

- A.FURNISH AND INSTALL DISTRIBUTION AND POWER PANELBOARDS AS INDICATED IN THE PANELBOARD SCHEDULE AND WHERE SHOWN ON THE DRAWINGS. PANELBOARDS SHALL BE DEAD-FRONT SAFETY TYPE, EQUIPPED WITH QUICK-MAKE, QUICK-BREAK FUSIBLE BRANCH SWITCHES AND APPROVED FOR SERVICE ENTRANCE. THE ACCEPTABLE MANUFACTURERS OF THE PANELBOARD ARE SIEMENS, SQUARE D, AND GE, PROVIDED THEY ARE FULLY EQUAL TO THE TYPE LISTED ON THE DRAWINGS. THE PANELBOARD SHALL BE UL LISTED AND BEAR THE UL
- B. ALL FUSIBLE BRANCH SWITCHES SHALL BE QUICK-MAKE, QUICK BREAK, WITH VISIBLE BLADES AND DUAL HORSEPOWER RATINGS SWITCH HANDLES SHALL PHYSICALLY INDICATE ON AND OFF POSITIONS. SUCH HANDLES SHALL ALSO BE ABLE TO ACCEPT THREE PADLOCKS HAVING HEAVY-DUTY INDUSTRIAL TYPE SHACKLES. COVERS SHALL BE INTERLOCKED WITH THE SWITCH HANDLES TO PREVENT OPENING IN THE ON POSITION. A MEANS SHALL BE PROVIDED TO ALLOW AUTHORIZED PERSONNEL TO RELEASE THE INTERLOCK FOR INSPECTION PURPOSES WHEN A

- SWITCH IS ON. A CARDHOLDER, PROVIDING CIRCUIT IDENTIFICATION, SHALL BE MOUNTED ON EACH BRANCH SWITCH. SWITCHES SHALL BE PROVIDED WITH FUSES OR AS NOTED ON THE
- C.PANELBOARD BUS STRUCTURE AND MAIN LUGS OR MAIN SWITCH SHALL HAVE CURRENT RATINGS AS SHOWN ON THE PANELBOARD SCHEDULE. THE BUS STRUCTURE SHALL ACCOMMODATE PLUG-ON OR BOLTED BRANCH SWITCHES AND MOTOR STARTERS AS INDICATED IN THE PANELBOARD SCHEDULE WITHOUT MODIFICATION TO THE BUS ASSEMBLY. PROVIDE

E. PANELBOARD ASSEMBLY SHALL BE ENCLOSED IN A STEEL CABINET. THE RIGIDITY AND GAUGE

- SOLID NEUTRAL ASSEMBLY (S/N). D. SWITCHES AND PANELBOARD BUS STRUCTURE SHALL SAFELY AND WITHOUT FAILURE WITHSTAND SHORT CIRCUITS ON THE SYSTEMS CAPABLE OF DELIVERING UP TO 100,000 AMPERES RMS SYMMETRICAL, UNLESS OTHERWISE NOTED.
- OF STEEL TO BE AS SPECIFIED IN UL STANDARD FOR CABINETS. THE SIZE OF WIRING GUTTERS SHALL BE IN ACCORDANCE WITH UL STANDARD. CABINETS SHALL BE EQUIPPED WITH A FRONT DOOR AND HAVE FULLY CONCEALED, SELF-ALIGNING TRIM CLAMPS. FRONTS SHALL BE FULL-FINISHED STEEL WITH RUST INHIBITING PRIMER AND BAKED ENAMEL FINISH. F. TERMINALS FOR FEEDER CONDUCTORS TO THE PANELBOARD MAINS AND NEUTRAL SHALL BE SUITABLE FOR THE TYPE OF CONDUCTOR SPECIFIED. TERMINALS FOR BRANCH CIRCUIT WIRING, BOTH BREAKER AND NEUTRAL, SHALL BE SUITABLE FOR THE TYPE OF CONDUCTOR SPECIFIED. G. BEFORE INSTALLING PANELBOARDS CHECK ALL OF THE ARCHITECTURAL DRAWINGS FOR POSSIBLE CONFLICT OF SPACE AND ADJUST THE LOCATION OF THE PANELBOARD TO PREVENT SUCH CONFLICT WITH OTHER ITEMS.
- H. THE PANELBOARDS SHALL BE MOUNTED IN ACCORDANCE WITH THE NEC. THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL MATERIAL FOR MOUNTING THE PANELBOARDS. END OF SECTION 16470

- A.POWER AND LIGHTING PANELS SHALL BE OF THE DEAD-FRONT, SAFETY TYPE, WITH THERMAL MAGNETIC, QUICK-MAKE, QUICK-BREAK, TRIP FREE, BOLTED-TYPE MOLDED CASE CIRCUIT BREAKERS. VOLTAGE RATINGS, NUMBER OF POLES, FRAME SIZE, TRIP RATINGS, MAIN BREAKER OR LUGS, NEUTRAL BUS, AND GROUND BUS ARE ALL AS SHOWN ON THE DRAWINGS. BUS BARS SHALL BE RECTANGULAR, SOLID COPPER, SECURELY MOUNTED AND BRACED. ALL CONNECTIONS TO BUS BARS SHALL BE SECURELY BOLTED. CABINET BOXES SHALL BE CONSTRUCTED OF CODE GRADE GALVANIZED STEEL, SIZED TO PROVIDE MINIMUM 4-INCH WIDE WIRING GUTTERS ON SIDES, TOP AND BOTTOM. FRONTS SHALL BE CONSTRUCTED OF CODE GRADE STEEL, ADJUSTABLE INDICATING TRIM CLAMPS AND WITH DOOR PROVIDED WITH CONCEALED HINGES AND CYLINDER TYPE LOCK AND CATCH. TWO KEYS PER PANEL SHALL BE FURNISHED, AND ALL LOCKS KEYED ALIKE. FRONT SHALL BE FINISH PAINTED BLUE-GRAY. B. POWER PANELS SHALL BE SIEMENS, TYPE S1, S2, S3, SE, OR ENGINEER APPROVED EQUAL, WITH BRANCH BREAKERS, MAIN BREAKERS OR LUGS, NEUTRAL AND GROUND BUSES, ETC., ALL AS SHOWN ON THE DRAWINGS
- C. POWER AND LIGHTING PANEL CONSTRUCTION DETAILS SHALL BE IN ACCORDANCE WITH UL STANDARDS AND SHALL CONFORM TO NEMA STANDARDS. THEY SHALL BEAR THE UL LABEL. PANELS SHALL MEET FEDERAL SPECIFICATIONS W-P-115A, TYPE 1, CLASS I. D. ALL PANEL DIRECTORIES SHALL BE TYPED AND TERMINOLOGY APPROVED BY THE OWNER.
- END OF SECTION 16471

OVERCURRENT PROTECTIVE DEVICES

- A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL WHERE INDICATED ON THE DRAWINGS OR AS REQUIRED BY THE NEC MOLDED CASE CIRCUIT BREAKERS IN A NEMA TYPE 1 ENCLOSURE. BREAKERS SHALL BE MANUALLY OPERATED, TRIP-FREE AND DESIGNED SO THAT ALL POLES OPEN SIMULTANEOUSLY. TRIPPING MECHANISM SHALL BE (THERMALLY, MAGNETICALLY) OPERATED, SHALL OPEN INSTANTANEOUSLY ON SHORT CIRCUITS AND HAVE TIME DELAY ON OVERLOADS, AND HAVE EFFECTIVE SCALING AGAINST TAMPERING. BREAKERS SHALL BE AS CALLED FOR ON THE DRAWINGS OR IN THE PANELBOARD SCHEDULE AND AS MANUFACTURED BY SIEMENS, SQUARE D, OR APPROVED EQUAL
- B. FUSES, UNLESS INDICATED OTHERWISE, SHALL BE DUAL ELEMENT, TIME LAG, CARTRIDGE TYPE AS MANUFACTURED BY BUSSMAN. FUSES FOR MOTOR CIRCUITS SHALL BE SIZED IN ACCORDANCE WITH THE NEC. LABELS INDICATING THE SIZE AND TYPE OF REPLACEMENT FUSES SHALL BE GLUED TO INSIDE OF DOOR ON ALL FUSIBLE SWITCHES AND PANELBOARDS. C. ALL FUSES SHALL BE OF THE CURRENT AND VOLTAGE RATING AS REQUIRED OR INDICATED. D. SPARES: SPARE FUSES AMOUNTING TO 10% (MINIMUM THREE) OF EACH TYPE AND RATING SHALL BE SUPPLIED BY THE ELECTRICAL CONTRACTOR. THESE SHALL BE TURNED OVER TO THE

END OF SECTION 16475

CONTROLS AND INSTRUMENTATION

OWNER UPON PROJECT COMPLETION.

- A. ALL EQUIPMENT AND MATERIALS USED IN RELATION TO CONTROL WORK FOR THE PROJECT SHALL BE NEW AND SHALL BEAR THE MANUFACTURER'S NAME AND TRADE NAME. THE EQUIPMENT AND MATERIAL SHALL BE ESSENTIALLY THE STANDARD PRODUCT OF A MANUFACTURER REGULARLY ENGAGED IN THE PRODUCTION OF THE REQUIRED TYPE OF EQUIPMENT AND SHALL BE THE MANUFACTURER'S LATEST APPROVED DESIGN. B. THE ELECTRICAL CONTRACTOR SHALL RECEIVE AND PROPERLY STORE THE EQUIPMENT AND MATERIAL PERTAINING TO THE ELECTRICAL WORK. THE EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT, WATER, CHEMICAL OR MECHANICAL INJURY AND THEFT. THE MANUFACTURER'S DIRECTIONS SHALL BE FOLLOWED COMPLETELY IN THE DELIVERY, STORAGE, PROTECTION AND INSTALLATION OF ALL EQUIPMENT AND MATERIALS. C. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL ITEMS NECESSARY FOR THE COMPLETE INSTALLATION OF THE EQUIPMENT AS RECOMMENDED OR AS REQUIRED BY THE
- MANUFACTURER OF THE EQUIPMENT OR REQUIRED BY CODE WITHOUT ADDITIONAL COST TO THE OWNER, REGARDLESS OF WHETHER THE ITEMS ARE SHOWN ON THE PLANS OR COVERED IN D.IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO CLEAN THE ELECTRICAL EQUIPMENT. MAKE NECESSARY ADJUSTMENTS AND PLACE THE EQUIPMENT INTO OPERATION BEFORE TURNING EQUIPMENT OVER TO OWNER. ANY PAINT THAT WAS SCRATCHED DURING CONSTRUCTION SHALL BE "TOUCHED-UP" WITH FACTORY COLOR PAINT TO THE SATISFACTION OF THE ARCHITECT. ANY ITEMS THAT WERE DAMAGED DURING CONSTRUCTION SHALL BE
- E. GENERAL 1. UNLESS OTHERWISE INDICATED ALL HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, AND OTHER MECHANICAL EQUIPMENT, MOTORS, AND CONTROLS SHALL BE FURNISHED, SET IN PLACE AND WIRED AS FOLLOWS:

RESPONSIBLE DIVISION

NESFONSIBLE DIVIS	OIV				
ITEM	FUR	RNISHED	SET	POWER- WIRED	CONTROL- WIRED
EQUIPMENT		23	23	26	
COMBINATION MAGNETIC MOTOR STARTERS, MAGNETIC MOTOR STARTERS AND CONTACTORS		23	26	26	23
FUSED AND UNFUSED DISCONNECT SWITCHES, THERMAL OVERLOAD SWITCHES AND HEATERS, MANUAL MOTOR STARTERS		26(1)	26(1)	26	
MANUAL-OPERATING AND MULTI-SPEED SWITCHES .		23	26	26	26
CONTROLS, RELAYS, TRANSFORMERS		23	23	26	23
THERMOSTATS (LOW VOLTAGE) AND TIME SWITCHES	·	23	23	26	23
THERMOSTATS (LINE VOLTAGE)		23	23	26	26
TEMPERATURE CONTROL PANELS	S.	23	23	26	23
MOTOR AND SOLENOID VALVES, DAMPER MOTORS, PE & EP SWITCHES		23	23(2)		23(2)
PUSH-BUTTON STATIONS AND PILOT LIGHTS		23	23(2)		23(2)
HEATING, COOLING, VENTILATION AND AIR CONDITIONING CONTROL		23	23	26	23
EXHAUST FAN SWITCHES .	-	23	26	26	23(2)

- SUBSCRIPT FOOTNOTES: 1) UNDER DIVISION 23 IF FURNISHED FACTORY-WIRED AS PART OF EQUIPMENT OR IF FURNISHED WITH COMBINATION
- IF ITEM IS FOR LINE VOLTAGE, SET IN PLACE AND CONNECT UNDER DIVISION 26. WHERE FACTORY MOUNTED ON EQUIPMENT OR ATTACHED TO PIPING OR DUCTS AND USING LINE VOLTAGE FURNISH AND SET UNDER DIVISION 23, CONNECT UNDER

DIVISION 26.

- 2. VERIFY LOCATION AND NAMEPLATE DATA OF ALL MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO INSTALLING ELECTRICAL FACILITIES. BE RESPONSIBLE FOR COORDINATION OF REVISIONS AND MODIFICATIONS NECESSARY TO PROPERLY SUPPLY ELECTRICAL FACILITIES TO HEATING, VENTILATING, AIR CONDITIONING, PUMPS, MOTORS, CONTROLS, AND OTHER MECHANICAL EQUIPMENT INSTALLED IN PLACE OF EQUIPMENT SPECIFIED. REQUIRED ELECTRICAL FACILITIES CHANGES SHALL BE CONSIDERED TO BE A PART OF THE MECHANICAL CONTRACT
- 3. PROVIDE EACH MOTOR WITH A HORSEPOWER RATED DISCONNECT SWITCH AND MOTOR RUNNING OVERCURRENT PROTECTION PER N.E.C. 430-37. TO FACILITATE EASE AND SAFETY OF OPERATION AND MAINTENANCE OF MECHANICAL EQUIPMENT. LOCATE THE DISCONNECT SWITCH IMMEDIATELY ADJACENT TO THE MOTOR, UNLESS OTHERWISE INDICATED. SIZE THERMAL OVERLOAD HEATER UNITS FOR APPROXIMATELY 115% OF FULL LOAD MOTOR CURRENT. SIZE FUSES IN ACCORDANCE WITH THE ACTUAL MOTOR NAMEPLATE RATING AND AS RECOMMENDED BY THE BUSSMAN MFG. CO. CHECK AND COORDINATE ALL STARTERS, FUSES, AND OTHER MOTOR-RUNNING PROTECTIVE DEVICES WITH THE EQUIPMENT THEY CONTROL, AND PROVIDE AND INSTALL THE CORRECT SIZE PROTECTIVE ELEMENTS AS
- 4. DO NOT CONNECT MOTORS WHICH ARE OF A VOLTAGE RATING DIFFERENT THAN SUPPLY VOLTAGE. REPORT SAME TO THE ARCHITECT IN WRITING AND OBTAIN WRITTEN INSTRUCTIONS FOR RESOLUTION.
- 5. USE FLEXIBLE CONDUIT FOR ALL CONNECTIONS TO DEVICES DIRECTLY ATTACHED TO DUCTS, PIPING AND MECHANICAL EQUIPMENT. END OF SECTION 16901

SECTION 16950

- A. AS SOON AS ELECTRIC POWER IS AVAILABLE AND CONNECTED TO SERVE THE EQUIPMENT IN THE BUILDING. AND EVERYTHING IS READY FOR FINAL TESTING AND PLACING IN SERVICE, A COMPLETE OPERATIONAL TEST SHALL BE MADE. THE CONTRACTOR SHALL FURNISH ALL NECESSARY INSTRUMENTS AND EQUIPMENT AND MAKE ALL TESTS, ADJUSTMENTS, AND TRIAL OPERATIONS REQUIRED TO PLACE THE SYSTEM IN BALANCED AND SATISFACTORY OPERATING CONDITION; FURNISH ALL NECESSARY ASSISTANCE AND INSTRUCTIONS TO PROPERLY INSTRUCT THE OWNER'S AUTHORIZED PERSONNEL IN THE OPERATION AND CARE OF THE
- B. PRIOR TO TESTING THE SYSTEM, THE FEEDERS AND BRANCH CIRCUITS SHALL BE CONTINUOUS FROM MAIN FEEDERS TO MAIN PANELS, TO SUBPANELS, TO OUTLETS, WITH ALL BREAKERS AND FUSES IN PLACE. THE SYSTEM SHALL BE TESTED FREE FROM SHORTS AND GROUNDS. SUCH TESTS SHALL BE MADE IN THE PRESENCE OF THE ENGINEER'S REPRESENTATIVE.
- C. NO CIRCUITS SHALL BE ENERGIZED WITHOUT THE OWNER'S APPROVAL D. THE RIGHT IS RESERVED TO INSPECT AND TEST ANY PORTION OF THE EQUIPMENT AND/OR MATERIALS DURING THE PROGRESS OF ITS ERECTION. THE CONTRACTOR SHALL FURTHER TEST ALL WIRING AND CONNECTIONS FOR CONTINUITY AND GROUNDS BEFORE CONNECTING
- ANY FIXTURES OR EQUIPMENT. E. THE CONTRACTOR SHALL TEST THE ENTIRE SYSTEM IN THE PRESENCE OF THE ARCHITECT OR HIS ENGINEER WHEN THE SYSTEM IS FINALLY COMPLETED TO INSURE THAT ALL PORTIONS ARE FREE FROM SHORT CIRCUITS OR GROUND FAULTS. END OF SECTION 16950

- DEMONSTRATION OF ELECTRICAL EQUIPMENT A.THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE ARCHITECT WITH CERTIFICATION OF THE INSPECTION AND APPROVAL OF AN ACTIVE MEMBER OF THE INTERNATIONAL ASSOCIATION OF ELECTRICAL INSPECTORS OF ALL WORK COMPLETED AND INCLUDED IN THE SECTION, IF REQUIRED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE INSPECTOR WHEN WORK REACHES INSPECTION STAGE.
- HAVING JURISDICTION IN ORDER THAT LOCAL INSPECTION MAY BE CARRIED OUT AT THE C. THE ELECTRICAL CONTRACTOR SHALL PAY FOR ALL PERMITS, INSPECTION FEES, AND INSTALLATION FEES AS REQUIRED TO COMPLETE THE WORK UNDER THIS SECTION OF THE

B. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE LOCAL AUTHORITY

D. THIS CONTRACTOR SHALL GUARANTEE THE MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWELVE (12) MONTHS FROM THE TIME THE INSTALLATION IS ACCEPTED BY THE OWNER. IF, DURING THIS TIME, ANY DEFECTS SHOULD SHOW UP DUE TO ANY DEFECTIVE MATERIALS, WORKMANSHIP, NEGLIGENCE OR WANT OF PROPER CARE ON THE PART OF THIS CONTRACTOR. HE SHALL FURNISH ANY NEW MATERIALS AS NECESSARY, REPAIR SAID DEFECTS, AND PUT THE SYSTEM IN ORDER AT HIS OWN EXPENSE ON RECEIPT OF NOTICE OF SUCH DEFECTS FROM THE ARCHITECT. THIS SPECIFICATION IS NOT INTENDED TO IMPLY THAT THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR NEGLIGENCE OF THE OWNER.

END OF SECTION 16980 END OF DIVISION

PERMISSION OF THE DESIGNER. THE DRAWINGS AND SHALL REMAIN THE PROPERTY OF THE DESIGNED EXECUTED OR NOT. THESE DRAWINGS AN ECIFICATIONS SHALL NOT BE USED BY ANYONE ON ANY OTHER PROJECTS FOR ADDITIONS TO THIS PROJECT PERMISSION OF THE DESIGNER.

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