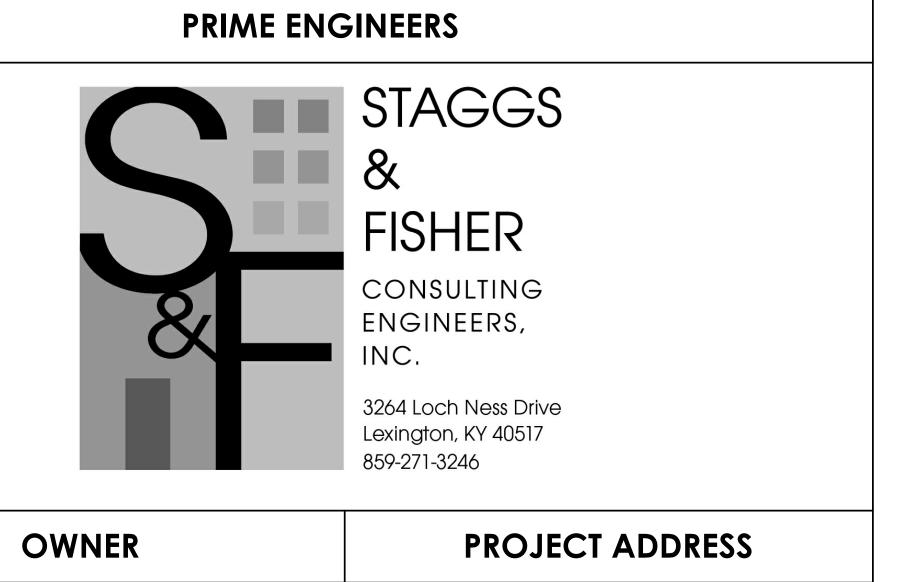
## NORSE COMMONS AND HALL MECHANICAL RENOVATION

NORTHERN KENTUCKY UNIVERSITY



PROJECT STATUS - CONTRACT SET DATE: 03-18-2021

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,	HIGHLAND HEIGHIS, KY 41099

LOCATION

NUNN DRIVE

# Northern Kentucky University

Norse Hall

**LOCATION MAP** 

**LOCATION** 

HIGHLAND HEIGHTS, KY 41099

DATE: 03/18/2021 SF JOB# 20536

DRAWN: CMR
CHECKED: GGC

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C000

### MECHANICAL LEGEND

PLUN	MBING LEGEND
⊱—s	SANITARY OR WASTE PIPING
≿ = =v= = <i>⇒</i>	VENT PIPING
⊱——кw———	KITCHEN WASTE PIPING
<b>∠</b> ——AW———	ACID WASTE PIPING
— — AWV= = <i>→</i>	ACID WASTE VENT PIPING
	ROOF LEADER PIPING
·	OVERFLOW ROOF LEADER PIPING
≥ SS = →	STORM SEWER PIPING
≥ SPD →	ELEVATOR SUMP PUMP
∠ DCW →	DISCHARGE PIPING  COLD WATER PIPING
, , , ,	
DHW ——	DOMESTIC HOT WATER PIPING  DOMESTIC HOT WATER
├──DHWR────	RECIRCULATING PIPING  DOMESTIC HOT WATER SUPPLY
⊱—DHWXXX——→	PIPING (XXX) INDICATES TEMPERATURE  DOMESTIC HOT WATER RECIRCULATING
<b>├</b> ──DHWRXXX	PIPING (XXX) INDICATES TEMPERATURE
<b>←</b> G <b>←</b> G <b>←</b>	GAS PIPING
<b>├</b> ─── A <b>──</b> ──	AIR PIPING
<b>├</b> ──VAC	VACUUM PIPING
⊱——scw——	SOFT COLD WATER
<b>├</b> ──RO ────	REVERSE OSMOSIS WATER PIPING
├──ROR	REVERSE OSMOSIS WATER RETURN PIPING
⊱—LCW——	LAB COLD WATER PIPING
⊱——LHW———	LAB HOT WATER PIPING
├──LHWR ───	LAB HOT WATER RECIRCULATING PIPING
$\bowtie$	GATE VALVE
	BALL VALVE
	CHECK VALVE
<b>├</b>	UNION
(P)	PRESSURE GAUGE
	THERMOMETER
WVR " " RISER DES.	WASTE AND VENT RISER
DWG. NO.  HCR " " RISER DES.	DOMESTIC HOT/COLD WATER RISER
DWG. NO.	DIAGRAM DESIGNATION  IG ABBREVIATIONS
CI	CAST IRON
PCO	PIPE CLEANOUT
FCO	FLOOR CLEANOUT
WCO	WALL CLEANOUT
GCO	GRADE CLEANOUT  DOMESTIC COLD WATER
DCW	DOINILOTIC COLD WATER
FD	FLOOR DRAIN
DHW	DOMESTIC HOT WATER
OHD	OPEN HUB DRAIN
OR	OPEN RECEPTACLE
PVC	POLY-VINYL CHLORIDE
RD	ROOF DRAIN
SA	SHOCK ARRESTOR
VTR	VENT-THROUGH-ROOF
	VITRIFIED CLAY PIPE
VCP	
VCP	OVERFLOW ROOF DRAIN
	OVERFLOW ROOF DRAIN WALL HYDRANT

<u>WECHANICAL LEGEND</u>										
PLUN	MBING LEGEND	HVAC /	ABBREVIATIONS	Н	VAC LEGEND	HVAC	PIPING LEGEND			
s	SANITARY OR WASTE PIPING	A.A.V.	AUTOMATIC AIR VENT	14"x8"	RECTANGULAR DUCT WIDTH X DEPTH (REFER TO PLANS FOR DUCT SIZE)	⊱——HPS——→	HIGH PRESSURE STEAM (REFER TO PLANS FOR PIPE SIZE)			
= =v= = <del>=</del>	VENT PIPING	A.D.	ACCESS DOOR		INTERNALLY LINED DUCT	├──HPR	HIGH PRESSURE CONDENSATE RETURN (REFER TO PLANS FOR PIPE SIZE)			
кw	KITCHEN WASTE PIPING	A.F.	ABOVE FLOOR	{ 14"x8" RD }	OVAL DUCT WIDTH X DEPTH	├── LPS ───	LOW PRESSURE STEAM (REFER TO PLANS FOR PIPE SIZE)			
AW	ACID WASTE PIPING	B.E.	BELLMOUTH ENTRANCE	8" RD 9		├── LPR	LOW PRESSURE CONDENSATE RETURN (REFER TO PLANS FOR PIPE SIZE)			
—awv= <i>=  ⇒</i>	ACID WASTE VENT PIPING	C.	COMMON	911111111111111111111111111111111111111	FLEXIBLE DUCT	≿——sv——	STEAM VENT (REFER TO PLANS FOR PIPE SIZE)			
— RL ——	ROOF LEADER PIPING	D.P.	DIFFUSER PLATE		RISE IN DIRECTION OF ARROW	⊱——sv v——	SAFETY RELIEF VALVE VENT (REFER TO PLANS FOR PIPE SIZE)			
—ORL——	OVERFLOW ROOF LEADER PIPING	E.A.	EXHAUST AIR	3	RECTANGULAR TO ROUND TRANSITION	├──PD	CONDENSATE PUMP DISCHARGE (REFER TO PLANS FOR PIPE SIZE)			
ss	STORM SEWER PIPING	E.M.D.	END OF MAIN DRIP	[F.]	SQUARE ELBOW WITH TURNING VANES	<b>├</b> ──FW ───	FEEDWATER (REFER TO PLANS FOR PIPE SIZE)			
SPD	ELEVATOR SUMP PUMP DISCHARGE PIPING	F.D.	FIRE DAMPER		MANUAL VOLUME/BALANCING DAMPER	≿——cws——	CHILLED WATER SUPPLY (REFER TO PLANS FOR PIPE SIZE)			
—DCW——	COLD WATER PIPING	F.M.S.	FLOW MEASURING STATION	<b>■</b> FD	FIRE DAMPER	⊱——cwr——	CHILLED WATER RETURN (REFER TO PLANS FOR PIPE SIZE)			
—DHW——	DOMESTIC HOT WATER PIPING	F.S.D.	FIRE/SMOKE DAMPER	• •	ROUND DUCT UP, DOWN	⊱——HWS——	HOT WATER SUPPLY (REFER TO PLANS FOR PIPE SIZE)			
—DHWR——	DOMESTIC HOT WATER RECIRCULATING PIPING	I.B.	INLET BELL		SUPPLY DUCT UP, DOWN	⊱——HWR——	HOT WATER RETURN (REFER TO PLANS FOR PIPE SIZE)			
=DHWXXX	DOMESTIC HOT WATER SUPPLY PIPING (XXX) INDICATES TEMPERATURE	I.S.	INLET SCREEN		RETURN DUCT UP, DOWN	≿—— CDS ——	CONDENSER WATER SUPPLY (REFER TO PLANS FOR PIPE SIZE)			
=DHWRXXX====	DOMESTIC HOT WATER RECIRCULATING PIPING (XXX) INDICATES TEMPERATURE	M.A.V.	MANUAL AIR VENT		EXHAUST DUCT UP, DOWN	≿——CDR——	CONDENSER WATER RETURN (REFER TO PLANS FOR PIPE SIZE)			
G	GAS PIPING	M.D.	MOTOR OPERATED DAMPER		FLEXIBLE CONNECTION	├───DCW	DOMESTIC COLD WATER (REFER TO PLANS FOR PIPE SIZE)			
A	AIR PIPING	M.E.	MOISTURE ELIMINATORS	M	MOTOR-OPERATED DAMPER	⊱——sw——	SOFT WATER (REFER TO PLANS FOR PIPE SIZE)			
	VACUUM PIPING	N.C.	NORMALLY CLOSED		CONTROL DAMPER	⊱——HWET ——	HOT WATER EXPANSION TANK PIPE (REFER TO PLANS FOR PIPE SIZE)			
—scw——	SOFT COLD WATER	N.O.	NORMALLY OPEN		SOUND TRAP	⊱——CWET ——	CHILLED WATER EXPANSION TANK PIPE (REFER TO PLANS FOR PIPE SIZE)			
RO	REVERSE OSMOSIS WATER PIPING	O.A.	OUTSIDE AIR		ACCESS DOOR PLAN, SIDE VEIW	<b>├ C</b> D <b> </b>	CONDENSATE DRAIN (REFER TO PLANS FOR PIPE SIZE)			
	REVERSE OSMOSIS WATER RETURN PIPING	P.A.	PRIMARY AIR	HC-1 1.0	UNIT SYMBOL, WATER FLOW(GPM)	├──REF ─────	REFRIGERATE LINE (REFER TO PLANS FOR PIPE SIZE)			
—LCW——	LAB COLD WATER PIPING	R.A.	RETURN AIR	SP	STATIC PRESSURE SENSOR IN DUCT	K—	GATE VALVE (SCREWED) - - PLAN, END VIEW			
—LHW——	LAB HOT WATER PIPING	S.A.	SUPPLY AIR	T	TEMPERATURE SENSOR		GATE VALVE (FLANGED) - - PLAN, END VIEW			
—LHWR ———	LAB HOT WATER RECIRCULATING PIPING	R.H.	RANGE HOOD	C	CO2 SENSOR	I → HP	TRIPLE OFFSET ROTARY VALVE - - PLAN, END VIEW			
$\bowtie$	GATE VALVE	S.D.	SUCTION DIFFUSER	Н	HUMIDITY SENSOR	→ ·	GLOBE VALVE (SCREWED) - - PLAN, END VIEW			
б	BALL VALVE	SM.D.	SMOKE DAMPER	F—	FLOW SENSOR		GLOBE VALVE (FLANGED) - - PLAN, END VIEW			
<u>~</u>	CHECK VALVE	T.A.V.	THERMOSTATIC AIR VENT	CSS	CURRENT SENSING SWITCH		CHECK VALVE; SILENT CHECK VALVE			
	UNION	T.C.P.	TEMPERATURE CONTROL PANEL	DPS	DIFFERENTIAL PRESSURE SWITCH		CHECK VALVE			
Р	PRESSURE GAUGE	V.B.	VACUUM BREAKER	VFD	VARIABLE FREQUENCY DRIVE		BUTTERFLY VALVE PLAN, END VIEW			
Ţ	THERMOMETER	V.D.	VOLUME DAMPER	STR	STARTER		BUTTERFLY VALVE			
R"" RISER DES.  DWG. NO.	WASTE AND VENT RISER DIAGRAM DESIGNATION			250 CFM	SUPPLY DIFFUSER TYPE, AIR QUANTITY	HP HP	HIGH PERFORMANCE BUTTERFLY VALVE - PLAN, END VIEW			
RISER DES.  DWG. NO.	DOMESTIC HOT/COLD WATER RISER DIAGRAM DESIGNATION				SUPPLY DIFFUSER ELEVATION		3-WAY CONTROL VALVE; 2-WAY CONTROL VALVE			
	IG ABBREVIATIONS			R-1 250 CFM	RETURN INLET TYPE, AIR QUANTITY	$\longrightarrow$	COMB. BALANCING SHUT-OFF VALVE - - PLAN, END VIEW			
CI	CAST IRON				SIDEWALL RETURN GRILLE ELEVATION		0.5-2" BALANCING VALVE			
PCO	PIPE CLEANOUT				SIDEWALL RETURN GRILLE PLAN		2.5-12" BALANCING VALVE			
FCO	FLOOR CLEANOUT			250 CFM	EXHAUST INLET TYPE, AIR QUANTITY		BALL VALVE			
wco	WALL CLEANOUT				EXHAUST/RETURN INLET ELEVATION		STEAM TRAP			
GCO	GRADE CLEANOUT			Х	DEMOLISH		3/4" DRAIN VALVE WITH HOSE CONNECTION			
DCW	DOMESTIC COLD WATER					S	SAFETY RELIEF VALVE			
FD	FLOOR DRAIN						Y-TYPE STRAINER WITH DRAIN VALVE			
DHW	DOMESTIC HOT WATER					₹ =	Y STRAINER			
OHD	OPEN HUB DRAIN					<b>├</b> ───	FLEXIBLE CONNECTOR			
OR	OPEN RECEPTACLE					<b>⊢</b> (P)	PRESSURE GAUGE			
PVC	POLY-VINYL CHLORIDE					<b>⊢</b> (T)	TEMPERATURE GAUGE			
RD	ROOF DRAIN					<b>├</b>	UNION			
SA	SHOCK ARRESTOR						MANUAL AIR VENT PLAN, ELEVATION			
VTR	VENT-THROUGH-ROOF					AAV AAV	AUTOMATIC AIR VENT PLAN, ELEVATION			
VCP	VITRIFIED CLAY PIPE					<i>← ← ← ←</i>	CONCENTRIC REDUCER - - PLAN, ELEVATION			

### **ELECTRICAL LEGEND**

EQUIPME	ELE	
	PANELBOARD OR TERMINAL CABINET (REFER TO PLANS AND RISER FOR SIZE)	AFF
J	JUNCTION BOX	С
	DISCONNECT SWITCH	GFI
Zi	FUSED DISCONNECT	JB
⊠h	COMBINATION MAGNETIC STARTER AND FUSED SWITCH	W
Ø	MOTOR	F
HOT GROUND		Р
NEUTRAL	WIRE / CONDUIT	СКТ
(12)	BOTTOM OF DEVICE (IN INCHES A.F.F.)	REC(S)
1)	SEE NOTE 1 THIS SHEET	AIC
#	GROUND	UON
	ES (BOTTOM 16" A.F.F.) AS NOTED OTHERWISE)	WP
-	DUPLEX CONVENIENCE OUTLET	
	QUADRAPLEX CONVENIENCE OUTLET	
GFI -	GROUND FAULT INTERRUPTING OUTLET	
$\oplus$	EQUIPMENT CONNECTION	
	HES (BOTTOM 44" A.F.F.) S NOTED OTHERWISE)	
\$	SINGLE POLE	
		1

OCCUPANCY/VACANCY SENSOR SWITCH

OUTLET BOXES, ETC., NOT REQUIRED FOR NEW ARRANGEMENT.

CIRCUITS AS SHOWN OR REQUIRED TO WORK WITH NEW SYSTEM.

DIAGRAMS OBTAINED FROM THE MANUFACTURER

ALL ITEMS SHOWN AS DASHED TO BE DEMOLISHED, INCLUDING ALL CONDUIT, WIRE, JUNCTION BOXES, ETC. REMOVE

WIRING COMPLETE BACK TO PANEL. EXISTING BREAKER IN PANEL TO REMAIN UNLESS OTHERWISE NOTED. EXISTING

TO REMAIN AND CAPPED. CONDUIT ABOVE CEILING SHALL BE REMOVED COMPLETE BACK TO PANEL.

BOXES IN EXISTING BLOCK WALLS SHALL BE PROVIDED WITH A BLANK COVER PLATE. EXISTING CONDUIT IN BLOCK WALLS

BEFORE START OF WORK, THE CONTRACTOR SHALL CHECK ALL EXISTING DEVICES AND EQUIPMENT THAT IS NOTED OR REQUIRED TO BE REUSED TO SATISFY THEMSELF THAT THEY ARE OPERATING PROPERLY. SHOULD ANY OF THE ITEMS

NOT BE OPERATING, THE CONTRACTOR SHALL REPORT SAME TO THE ENGINEER AND AWAIT DIRECTIONS. CONTRACTORS

IN EXISTING AREAS WHERE NEW WORK IS SHOWN, REMOVE ALL EXISTING EXPOSED CONDUITS, SURFACE AND FLUSH

GOOD CONDITION. EXISTING CONCEALED CONDUITS MAY BE REUSED IF IN GOOD CONDITION, CIRCUITRY SHOWN ON PLANS SHALL GOVERN. ALL OTHER MATERIALS REMOVED SHALL BE REMOVED FROM THE JOB SITE OR TURNED OVER TO

INSTALL ALL NEW WORK AS INDICATED. FLUSH OUTLET BOXES MAY BE REUSED IF AT PROPER HEIGHT, LOCATION AND IN

MAINTAIN AND RESTORE, IF INTERRUPTED BY REMOVALS OR IN PATH OF NEW CONSTRUCTION, ALL CIRCUITS, CONDUITS

WHERE ANY EXISTING OUTLET (ELECTRIC, COMMUNICATION, ETC.) IS NOTED OR REQUIRED TO BE REMOVED, THE

CONTRACTOR UNDER THIS DIVISION SHALL CONNECT CONDUIT, PULL IN NEW CONDUCTORS AND RECONNECT AS REQUIRED FOR FEED-THRU OF CIRCUITS TO ENSURE ALL CIRCUITS DOWNSTREAM FROM REMOVED OUTLETS WILL

IN GENERAL, REMOVE EXISTING WORK INDICATED. THE DRAWINGS SHOW EXISTING WORK TO THE EXTENT POSSIBLE. HOWEVER, ALL EXISTING WORK MAY NOT BE SHOWN ON THE DRAWINGS. REMOVE OR RELOCATE EXISTING MECHANICAL

DRAWINGS. TURN OVER TO OWNER REMOVED EXISTING EQUIPMENT AS INDICATED AND REMOVE OTHER REMOVED

IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO REPAIR ANY HOLES LEFT IN THE EXISTING BUILDING

ELECTRICAL CONTRACTOR SHALL REMOVE ALL ELECTRICAL CONNECTIONS TO EQUIPMENT TO BE REMOVED. EXISTING

EXPOSED CIRCUITS NOT TO BE REUSED SHALL BE REMOVED. EXISTING CONCEALED CIRCUITS NOT TO BE REUSED SHALL BE ABANDONED AFTER CONDUCTORS ARE REMOVED. CONDUITS EXPOSED BY CONSTRUCTION SHALL BE REMOVED.

DRAWINGS FOR BID PURPOSES ONLY. CONTRACTOR SHALL VERIFY EXACT ROUTING AND LOCATION FOR RECONNECTING

FLOORS, WALLS, OR CEILINGS DUE TO THE DEMOLITION OF THE EXISTING ELECTRICAL SYSTEM.

AND ELECTRICAL WORK THAT INTERFERES WITH NEW WORK EVEN IF IT IS NOT SHOWN ON THE DRAWINGS. RELOCATE EXISTING WORK THAT MUST REMAIN IN SERVICE THAT INTERFERES WITH NEW WORK EVEN IF IT IS NOT SHOWN ON THE

NOT COMPLYING WITH THE ABOVE WILL BE RESPONSIBLE FOR PROVIDING OPERATIONAL ITEMS AT HIS EXPENSE.

ELECTRICAL ABBREVIATIONS							
AFF	ABOVE FINISHED FLOOR						
С	CONDUIT						
GFI	GROUND FAULT INTERRUPTER						
JB	JUNCTION BOX						
W	WIRE						
F	FLUSH						
Р	PEDESTAL						
СКТ	CIRCUIT						
REC(S)	RECEPTACLE(S)						
AIC	AMPERE INTERRUPTING CAPACITY						
UON	UNLESS OTHERWISE NOTED						
WP	WEATHER PROOF						

### **HVAC GENERAL NOTES:**

- DUCTWORK AND PIPING IN ROOMS WITH SUSPENDED CEILINGS SHALL BE ABOVE CEILING EXCEPT IN EQUIPMENT ROOMS.
- INSTALL AIR VENTS AT HIGH POINTS IN PIPING AND DRAINS IN LOW POINTS.
- LOCATIONS OF PIPING, DUCT, AND EQUIPMENT ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. DO NOT SCALE THE DRAWINGS.
- 4. ALL OFFSETS IN DUCTS AND PIPING ARE NOT NECESSARILY SHOWN. PROVIDE ADDITIONAL OFFSETS WHERE NECESSARY.
- ALL INCREASERS AND REDUCERS IN PIPING SYSTEM ARE NOT NECESSARILY SHOWN. PROVIDE ADDITIONAL INCREASERS AND REDUCERS WHERE REQUIRED.
- COORDINATE WITH PLUMBING, SHEET METAL, FIRE PROTECTION, AND ELECTRICAL CONTRACTORS TO AVOID INTERFERENCE WITH PIPING, DUCTS, AND CONDUIT.
- INSTALL ALL PIPING, DUCTWORK, AND EQUIPMENT IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- SEAL AIRTIGHT AROUND ALL DUCT AND PIPING PENETRATIONS THROUGH WALLS AND
- 9. SEAL ALL DUCTWORK WITH DUCT SEALANT AND/OR DUCT CEMENT IN ACCORDANCE WITH
- 10. DIMENSIONS FOR DUCTS ARE INSIDE DIMENSIONS.

SPECIFICATIONS SECTION "METAL DUCTWORK."

- 11. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF GRILLES AND
- 12. DO NOT RUN ANY PIPING OR DUCTWORK OVER ANY ELECTRICAL OR ELEVATOR EQUIPMENT.
- 13. INSTALL ACCESS DOOR IN DUCT ADJACENT TO EACH MOTOR OPERATED DAMPER.
- WHERE SIZE OF DUCT PENETRATING A FIRE WALL OR PARTITION IS LESS THAN THE MINIMUM SIZE OF FACTORY-MADE FIRE DAMPER OR DUCT ACCESS DOOR, PROVIDE THE MINIMUM SIZE

FACTORY MADE DAMPER AND/OR ACCESS DOOR AVAILABLE. INCREASE DUCT SIZE AS REQUIRED TO ACCOMMODATE TRANSITIONS UPSTREAM AND DOWN STREAM OF SIZE

14. ROLL FITTINGS IN ROUND DUCT AS REQUIRED FOR PROPER CONNECTIONS TO BRANCH

- 16. ALL TRANSITIONS IN DUCTWORK ARE NOT NECESSARILY SHOWN. PROVIDE ADDITIONAL TRANSITIONS WHERE REQUIRED.
- 17. FIELD VERIFY EXISTING CONDITIONS AND ALL REQUIRED MEASUREMENTS BEFORE FABRICATING ANY PIPING, DUCTWORK, OR EQUIPMENT.
- 18. INSTALL CONTROL DEVICES (SUCH AS SENSORS, SENSING WELLS, VALVES, DAMPERS, ETC.),
- 19. PROVIDE SEISMIC BRACING FOR PIPING, DUCTWORK, AND EQUIPMENT AS REQUIRED BY KENTUCKY BUILDING CODE. SEE SPECIFICATIONS.

### **HVAC GENERAL NOTES: DEMOLITION**

- DISCONNECT, DEMOLISH, AND REMOVE EXISTING HVAC SYSTEMS, EQUIPMENT, AND COMPONENTS INDICATED TO BE REMOVEID.
- PIPING TO BE REMOVED: REMOVE PORTION OF PIPING INDICATED TO BE REMOVED AND CAP OR PLUG REMAINING PIPING WITH SAME OR COMPATIBLE PIPING MATERIAL.
- PIPING TO BE ABANDONED IN PLACE: DRAIN PIPING AND CAP OR PLUG PIPING WITH SAME OR COMPTIBLE PIPING MATERIAL.
- DUCTS TO BE REMOVED: REMOVE PORTION OF DUCTS INDICATED TO BE REMOVED AND PLUG REMAINING DUCTS WITH SAME OR COMPATIBLE DUCTWORK MATERIAL.

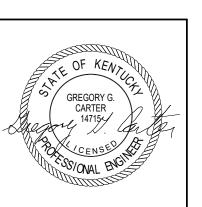
DUCTS TO BE ABANDONED IN PLACE: CAP OR PLUG DUCTS WITH SAME OR COMPATIBLE

- 6. EQUIPMENT TO BE REMOVED: DISCONNECT AND CAP SERVICES AND REMOVE EQUIPMENT.
- EQUIPMENT TO BE REMOVED AND REINSTALLED: DISCONNECT AND CAP SERVICES AND REMOVE, CLEAN AND STORE EQUIPMENT: WHEN APPROPRIATE, REINSTALL, RECONNECT AND MAKE EQUIPMENT OPERATIONAL.
- 8. EQUIPMENT TO BE REMOVED AND SALVAGED: DISCONNECT AND CAP SERVICES AND COMPLY WITH THE FOLLOWING:
  - A. CLEAN SALVAGED ITEMS OF DIRT AND DEMOLITION DEBRIS.
- B. PACK OR CRATE ITEMS AFTER CLEANING. IDENTIFY CONTENTS OF CONTAINERS.
- C. STORE ITEMS IN A SECURE AREA UNTIL DELIVERY TO OWNER. TRANSPORT ITEMS TO STORAGE AREA DESIGNATED BY OWNER.
- E. PROTECT ITEMS FROM DAMAGE DURING TRANSPORT AND STORAGE.
- F. SALVAGE TEH FOLLOWING ITEMS:
- OPERATING LIGHT-TURN OVER TO OWNER.
- ALL OTHER EXISTING HVAC WORK (SUCH AS PIPING, DUCTWORK, VALVES, ETC.) SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE JOB SITE.

HUMIDISATE-RELOCATED PER NEW WORK PLAN.

- 10. IF PIPE, INSULATION, OR EQUIPMENT TO REMAIN IS DAMAGED IN APPEARANCE OR IS UNSERVICEABLE, REMOVE DAMAGED OR UNSERVICEABLE PORTIONS AND REPLACE WITH NEW PRODUCTS OF EQUAL CAPACITY AND QUALITY.
- 11. REMOVE OR RELCATE EXISTING HVAC WORK THAT INTERFERES WITH NEW WORK OF ANY
- 12. THE DRAWINGS SHOW EXISTING WORK TO THE EXENT POSSIBLE. HOWEVER, ALL EXISTING WORK MAY NOT BE SHOWN. REMOVE OR RELOCATE ANY EXISTING WORK THAT INTERFERES WITH THAT INTERFRERES WITH NEW WORK EVEN IF IT IS NOT SHOWN ON THE DRAWINGS.
- 13 REMOVE EXSITING WORK THAT DOES NOT HAVE TO REMAIN IN SERVICE RELOCATE EXISTING WORK THAT HAS TO REMAIN IN SERVICE, AS REQUIRED TO AVOID INTERFERENCE WITH NEW
- 14. REMOVE OR RELOCATE EXISTING ELECTRICAL WORK THAT INTERFERES WITH NEW HVAC WORK, IF SUCH WORK IS NOT INDICATED TO BE REMOVED OR RELOCATED ON THE ELECTRICAL DRAWINGS. REMOVE WORK THAT DOES NOT HAVE TO REMAIN IN SERVICE. RELOCATE WORK THAT HAS TO REMAIN IN SERVICE, AS REQUIRED TO AVOID INTERFERENCE







### $\geq$

### GENE AND $\geq$

REVISIONS DESCRIPTION DATE

NKU# NK	(U-30-202
DATE: 03	/18/2021
SF JOB#	20536
DRAWN:	CMR
CHECKED:	GGC

SHEET

FLANGED CONNECTION

FLOW METER

FLOW SWITCH

TEMPERATURE SENSOR

DIFFERENTIAL PRESSURE SWITCH

PRESSURE SWITCH

BTU METER

⊱FM--

} BTU ──

NEEDLE VALVE IN GAUGE LINE

THE SYMBOLS LISTED ON THIS SHEET MAY NOT ALL BE USED ON THIS SET OF CONTRACT DRAWINGS, HOWEVER, WHEREVER A SYMBOL IS **USED THE ITEM SHALL BE FURNISHED AND** INSTALLED.

### ALL EXISTING ELECTRICAL CONNECTIONS AND DEVICES NOT SPECIFICALLY INDICATED TO REMAIN AND NOT REQUIRED FOR THE NEW ARRANGEMENT SHALL BE REMOVED UNLESS OTHERWISE NOTED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SURVEY THE SITE TO DETERMINE THE TOTAL SCOPE OF THE WORK.

EXISTING WORK FROM PROJECT SITE

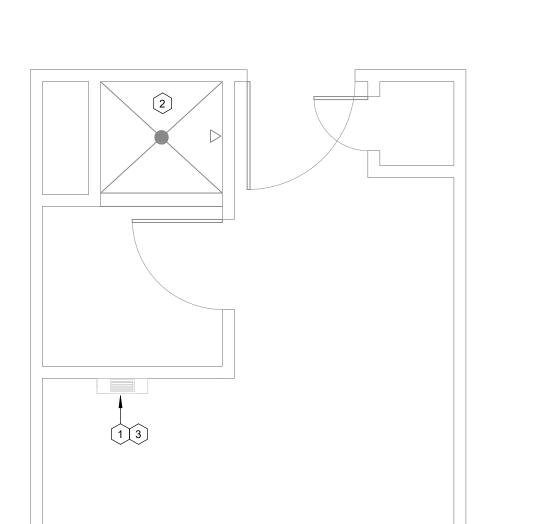
**ELECTRICAL DEMOLITION GENERAL NOTES:** 

ELECTRICAL GENERAL NOTES 1. PROVIDE SUPPORTS FOR ALL VERTICAL CONDUIT RUNS IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

11. IN RENOVATED AREAS OF EXISTING BUILDING, EXISTING CONDUIT IS SHOWN AS OBTAINED FROM ORIGINAL BUILDING

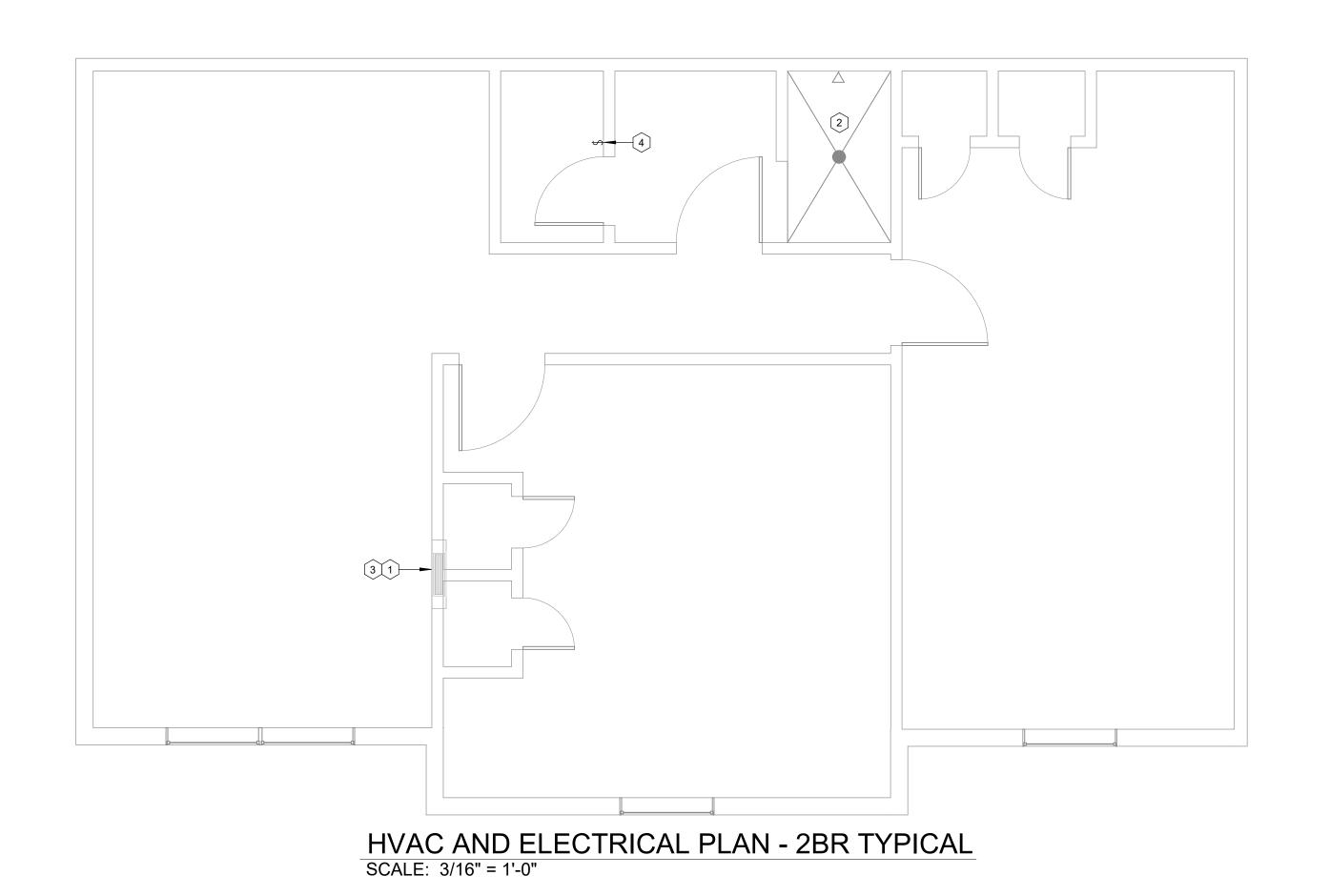
- ELECTRICAL CONTRACTOR SHALL INSTALL ALL ELECTRICAL EQUIPMENT IN ACCORDANCE WITH THE NATIONAL
- ALL CONDUIT SHALL BE CONCEALED IN EXISTING AND NEW WALLS AND CEILINGS EXCEPT MECHANICAL ROOMS. REFER
- ELECTRICAL CONTRACTOR SHALL LOCATE ALL ELECTRICAL EQUIPMENT AS REQUIRED TO INSURE MINIMUM CLEARANCES ARE PROVIDED IN ACCORDANCE WITH THE N.E.C.
- ALL SCHEMATICS ARE FOR BID PURPOSES ONLY. SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH WIRING
- ALL DEVICES SHALL BE LOCATED ON CLEAR WALL SPACES, CLEAR OF ALL SHELVING, CHALKBOARDS, TACKBOARDS, CASEWORK, ETC. OUTLETS NOT COMPLYING WITH THE ABOVE SHALL BE RELOCATED AT THE CONTRACTOR'S EXPENSE.
- ROUGH-IN FOR EQUIPMENT SHALL BE DONE IN ACCORDANCE WITH APPROVED SHOP DRAWINGS.
- THE CONTRACTOR SHALL PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL FEEDERS TO GROUND BUS IN PANELBOARDS AND IN ALL CIRCUITS TO EQUIPMENT AND RECEPTACLES. SEE SPECIFICATIONS.
- LIQUIDTITE FLEXIBLE METAL CONDUIT (LFMC) SHALL BE USED FOR FIXTURE WHIPS TO MOTORS. FLEXIBLE CONDUIT TO MOTORS SHALL BE A MINIMUM OF 3/4" AND SHALL NOT EXCEED 24" IN LENGTH.
- 10. ALL ELECTRICAL OUTLETS WITHIN 6'-0" OF A WATER SOURCE SHALL BE OF THE GFI TYPE.

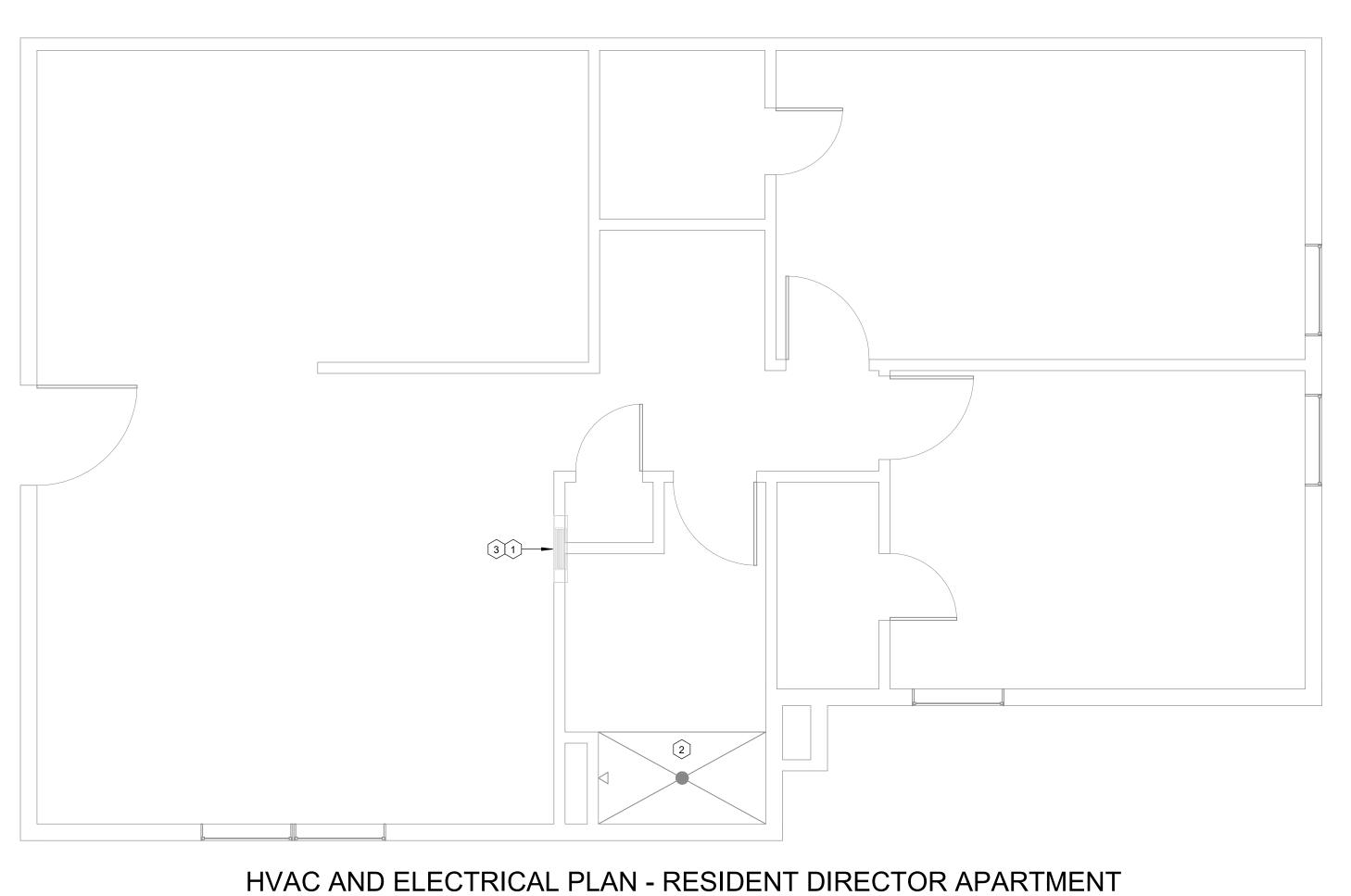
IT IS NOT INTENDED THAT THE PLANS SHOW ALL OFFSETS IN PIPES, CONDUITS, AND DUCTS REQUIRED FOR INSTALLATION OF THE WORK. DETAILS AND SECTIONS ARE INCLUDED FOR SOME AREAS TO SHOW INTENDED RELATIONSHIP OF THE WORK OF VARIOUS TRADES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SUB-CONTRACTORS TO COORDINATE INSTALLATION OF THE WORK AND TO PROVIDE THE NECESSARY OFFSETS, TRANSFORMATIONS, AND FITTINGS REQUIRED. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR CORRECTION CONFLICTS BETWEEN THE WORK OF VARIOUS TRADES. DETAILS AND SECTIONS ARE SHOWN FOR THE CONTRACTORS CONVENIENCEAND SHALL NOT BE CONSIDERED COMPLETE IN EVERY DETAIL.



HVAC AND ELECTRICAL PLAN - 1BR TYPICAL SCALE: 3/16" = 1'-0"

SCALE: 3/16" = 1'-0"





CODED NOTES:

- 1 DEMOLISH EXISTING FAN COIL UNIT.
- DEMOLISH EXISTING SHOWER DOWN TO WALL STUDS AND SUBFLOOR, CEILING TO
- DISCONNECT ELECTRICAL CONNECTION TO EXISTING FAN COIL UNIT. EXISTING ELECTRICAL CONNECTION AND DISCONNECT SWITCH WILL BE USED TO RECONNECT NEW FAN COIL UNIT. REFER TO NEW WORK PLAN FOR ADDITIONAL INFORMATION.

4 CONTRACTOR SHALL AS PART OF BASE-BID INCLUDE THE REMOVAL OF EXISTING FAN SWITCH AND PROVIDE BLANK COVER PLATE IN 45 UNITS. ADDITIONAL UNITS MAY BE ADDED FOR UNIT PRICE.

KEY PLAN

NKU # NKU-30-2021 DATE: 03/18/2021 SF JOB# 20536 DRAWN: CMR CHECKED: GGC

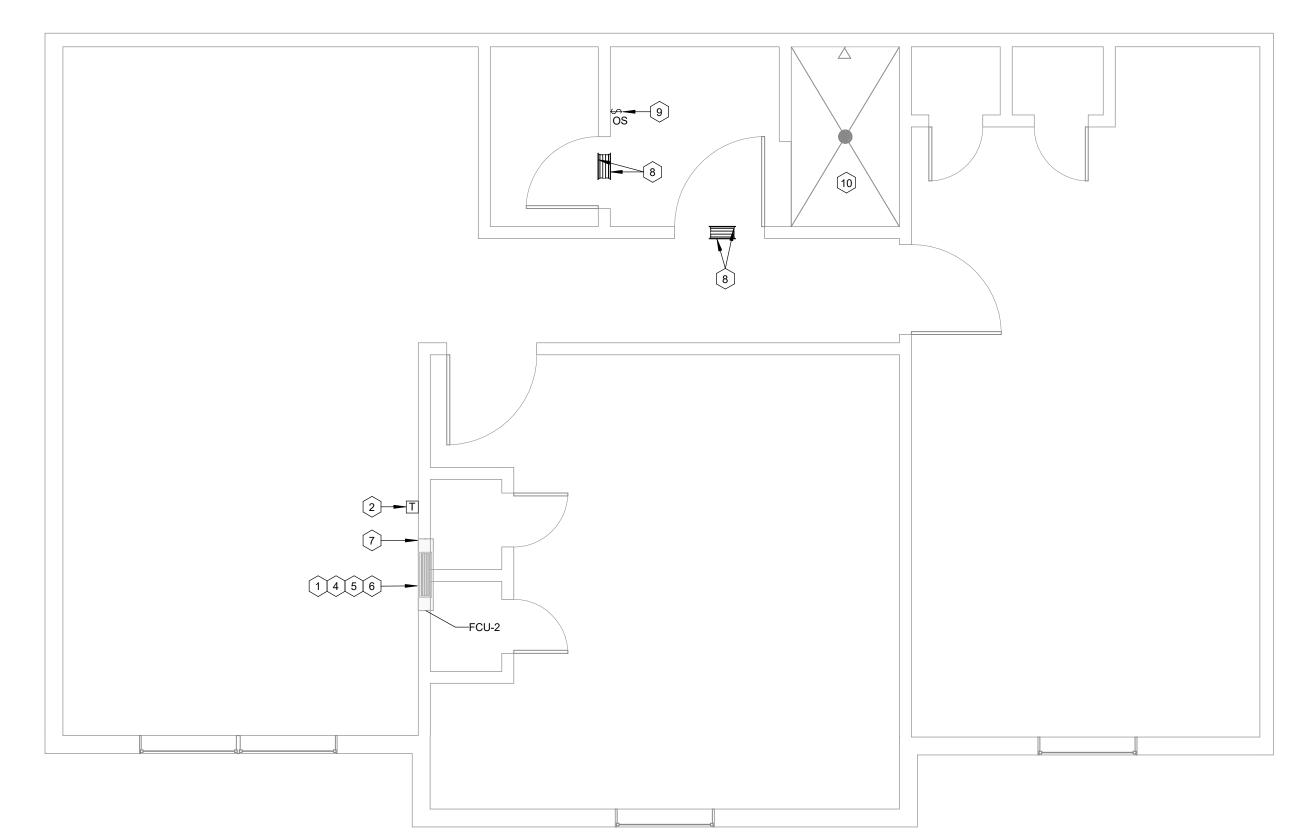
**DEMO PLAN** 

SHEET

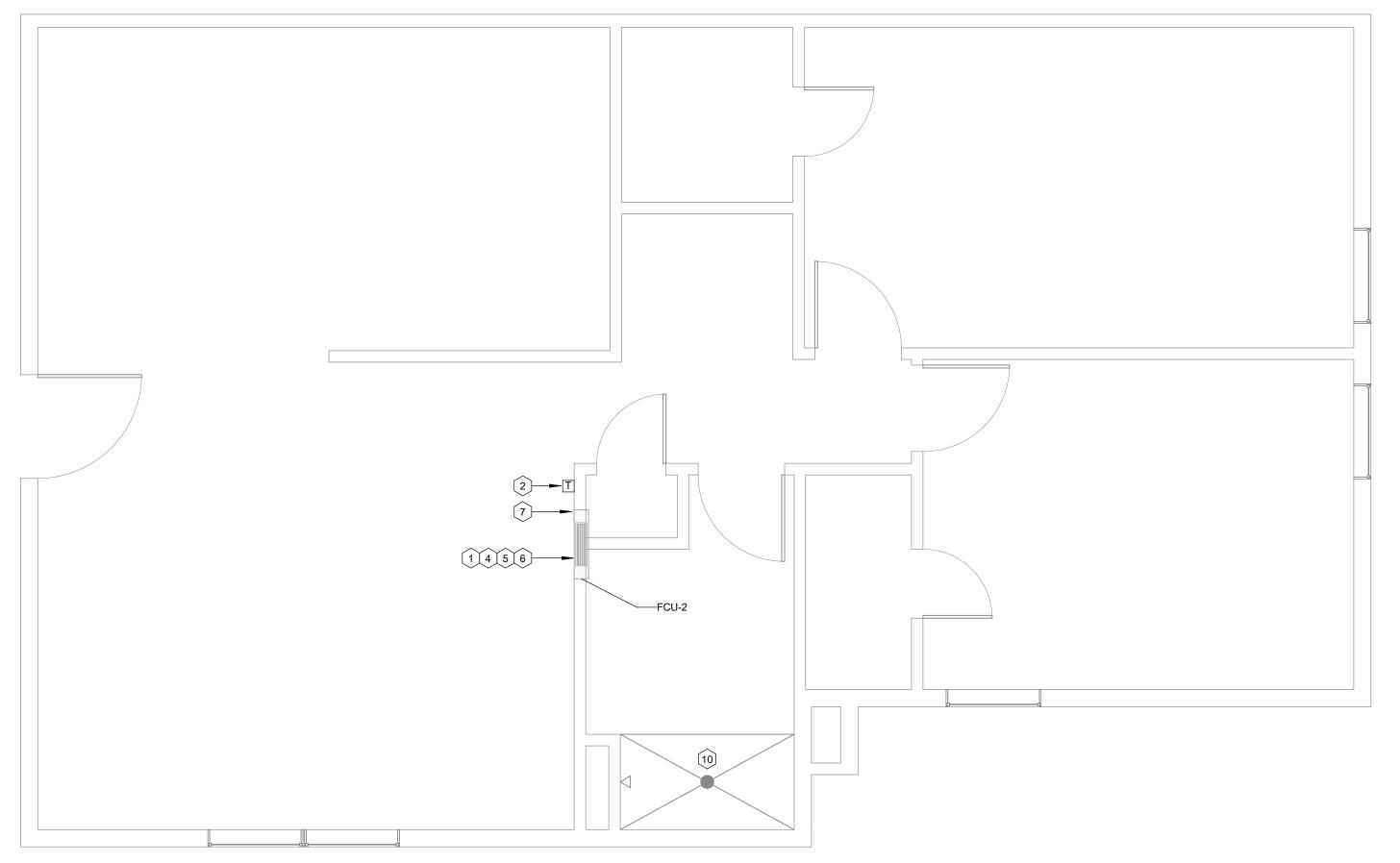
REVISIONS DESCRIPTION DATE

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HVAC AND ELECTRICAL PLAN - EFF. TYPE A SCALE: 3/16" = 1'-0"



HVAC AND ELECTRICAL PLAN - 2BR TYPICAL (TYPE B)
SCALE: 3/16" = 1'-0"



HVAC AND ELECTRICAL PLAN - RESIDENT DIRECTOR APARTMENT (TYPE C) SCALE: 3/16" = 1'-0"

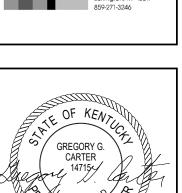


- FAN COIL UNIT TO REPLACE EXISTING UNIT. MODIFICATIONS TO EXISTING PIPING NECESSARY TO CONNECT TO NEW UNIT SHALL BE INCLUDED IN
- WALL MOUNTED THERMOSTAT TO BE MOUNTED AS INDICATED ADACENT TO UNIT. SEE DETAIL FOR MOUNTING HEIGHT.
- UNIT TO BE SURFACE MOUNTED.
- UNIT TO BE RECESSED WITHIN WALL. PROVIDE NEW TAMPER PROOF PAINTED METAL COVER PLATE WITH BOTTOM RETURN GRILL. COORDINATE COLOR WITH OWNER.
- TRANSITION EXISTING SUPPLY DUCTWORK AS NECESSARY TO CONNECT

SWITCH TO NEW FAN COIL UNIT. MAKE CONNECTION AS REQUIRED.

- DISCONNECT ELECTRICAL CONNECTION TO EXISTING FAN COIL UNIT. RECONNECT EXISTING ELECTRICAL CONNECTION AND DISCONNECT
- PATCH, REPAIR AND PAINT DRYWALL NOT CONCEALED BY COVER PLATE.
- CONTRACTOR SHALL AS PART OF BASE-BID INCLUDE THE INSTALLATION OF TG-1 TRANSFER GRILLES IN 45 BEDROOM UNITS. ADDITIONAL UNITS MAY BE ADDED FOR UNIT PRICE.
- CONTRACTOR SHALL AS PART OF BASE-BID INCLUDE OCCUPANCY SENSOR FOR EXHAUST FAN CONTROL. EXTEND CIRCUITING FROM EXISTING SWITCH LOCATION TO NEW OCCUPANCY SENSOR. MAKE CONNECTION AS REQUIRED. HUBBELL LH SERIES OR EQUAL. COLOR TO MATCH EXISTING DEVICES. IN 45 BEDROOM UNITS. ADDITIONAL UNITS MAY BE ADDED FOR UNIT PRICE.
- ALL SHOWER UNITS TO BE RENOVATED WITH THE EXCEPTION OF THE FOLLOWING PREVIOUSLY RENOVATED SHOWERS IN ROOMS: 1107, 1115, 1131, 1205, 1212, 1317, 1322, 1382, 1329. REFER TO DETAIL FOR ADDITIONAL INFORMATION.

KEY PLAN







- NEW WORK

REVISIONS

NKU # NKU-30-2021

DATE: 03/18/2021

SF JOB# 20536

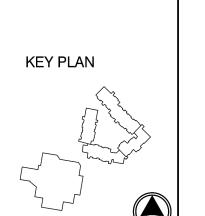
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DESCRIPTION DATE

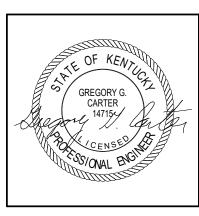
HVAC AND ELECTRICAL NORSE COMMONS - DEMO PLAN SCALE: 1/4" = 1'-0"





- DEMOLISH AND DISPOSE OF EXISTING BOILER, ASSOCIATED PIPING, ACCESSORIES, AND CONTROLS BACK TO BAS CONTROLER.
- 2 DEMOLISH AND DISPOSE OF ABANDONED EQUIPMENT
- 3 EXISTING TO REMAIN.
- DEMOLISH EXISTING BOILER FLUE, CAP AND SEAL ABANDONED PENETRATION. CONTRACTOR TO REPAIR ROOF IN A MANNER AS TO MAINTAIN ROOF WARRANTY.
- 5 DEMOLISH EXISTING PIPING, CAP AND SEAL ABANDONED PIPE.
- 6 DEMOLISH EXISITNG EQUIPMENT PADS, MAKE FLUSH WITH FLOOR.
- 7 PIPING TO LOCATION AS SHOWN, TO BE RECONNECTED IN NEW WORK.
- 8 EXISTING PANELBOARD RPG TO REMAIN.
- 9 EXISTING MOTOR CONTROL CENTER MCC-COMMONS TO REMAIN.
- 10 EXISTING BOILER TO BE REMOVED. DISCONNECT AND REMOVE ALL ELECTRICAL EQUIPMENT, ETC., REQUIRED FOR DEMOLITION, COMPLETE, BACK TO PANEL.
- 11 EXISTING BOILER FEED PUMP AND TANK TO BE REMOVED. DISCONNECT AND REMOVE ALL ELECTRICAL EQUIPMENT, ETC., REQUIRED FOR DEMOLITION, COMPLETE, BACK TO PANEL.
- 12 EXISTING PUMP TO BE REMOVED. DISCONNECT AND REMOVE ALL ELECTRICAL EQUIPMENT, ETC., REQUIRED FOR DEMOLITION, COMPLETE, BACK TO MOTOR CONTROL CENTER.
- DEMOLISH EXISTING AIR-SEPARATOR AND EXPANSION TAN. MAKEUP WATER LINE TO BE REROUTED IN NEW WORK.







PLAN

REVISIONS DESCRIPTION DATE

NKU# NK	U-30-202
DATE: 03/	18/2021
SF JOB#	20536
DRAWN:	CMR
CHECKED:	GGC

SHEET

WILL BE ALLOWED FOR CORRECTION CONFLICTS BETWEEN THE WORK OF VARIOUS TRADES. DETAILS AND SECTIONS ARE SHOWN FOR THE CONTRACTORS CONVENIENCEAND SHALL NOT BE CONSIDERED COMPLETE IN EVERY DETAIL.

**CODED NOTES:** 

CONDENSING BOILERS, SIZED FOR 100% REDUNDANCY. INSTALL PER MANUFACTURER' INSTALLATION INSTRUCTIONS / RECCOMENDATIONS. INSTALL ALL ASSOCIATED CONTROL AND PROGRAMMING COMPONENTS DESCRIBED IN THE INSTALLATION INSTRUCTIONS. INSTALL DISCHAGRE PIPING FROM SAFTEY RELIEF VALVE TO NEAREST FLOOR DRAIN.

COMBUSTION INTAKE PIPING TO TERMINATE AT EXTERIOR OF THE BUILDING. PROVIDE 45 DEGREE

COMBUSTION VENT PIPING TO ROUTE TO THE ROOF TERMINATING PER DETAIL.

4 NEW AIR SEPARATOR, TO BE PIPED TO NEAREST FLOOR DRAIN.

5 NEW PAD MOUNTED EXPANSION TANK.

6 NEW EQUIPMENT PAD, SEE DETAIL.

CONNECT TO EXISTING PIPING IN THIS LOCATION.

NEW GAS REGULATOR TO BE PIPED TO BOILER OFF OF DRIP LEG. LOCATE +8' AWAY FROM BOILER. VENT REGULATOR AT FULL SIZE TO ROOF OF BUILDING.

9 REROUTE EXISTING DOMESTIC FILL WATER TO NEW LOCATION.

PROVIDE BOILER CONDENSATE NEUTRILIZATION KIT FOR EACH BOILER. EXTEND DISCHARGE PIPNG

12 FLUSHING TEE FOR HYDRONIC LOOP PIPING, CAP PIPE ENDS.

NOT ALL COMPONENTS ARE SHOWN, REFER TO FLOW DIAGRAM FOR ALL COMPONENTS TO BE

TEMPERATURE SENSOR FOR LOOP TEMPERATURE CONTROL. TO BE INSERTED INTO EXISTING PIPING, PATCH AND REPAIR INSULATION AS NECESSARY.

DO NOT BLOCK MANUFACTURERS RECCOMENDED CLEARANCES. BOILERS TO BE SPACED 3' APART.

16 NOT ALL OFFSETS ARE SHOWN, COORDINATE ALL WORK WITH EXISTING CONDITIONS.

EXISTING PANELBOARD RPG.

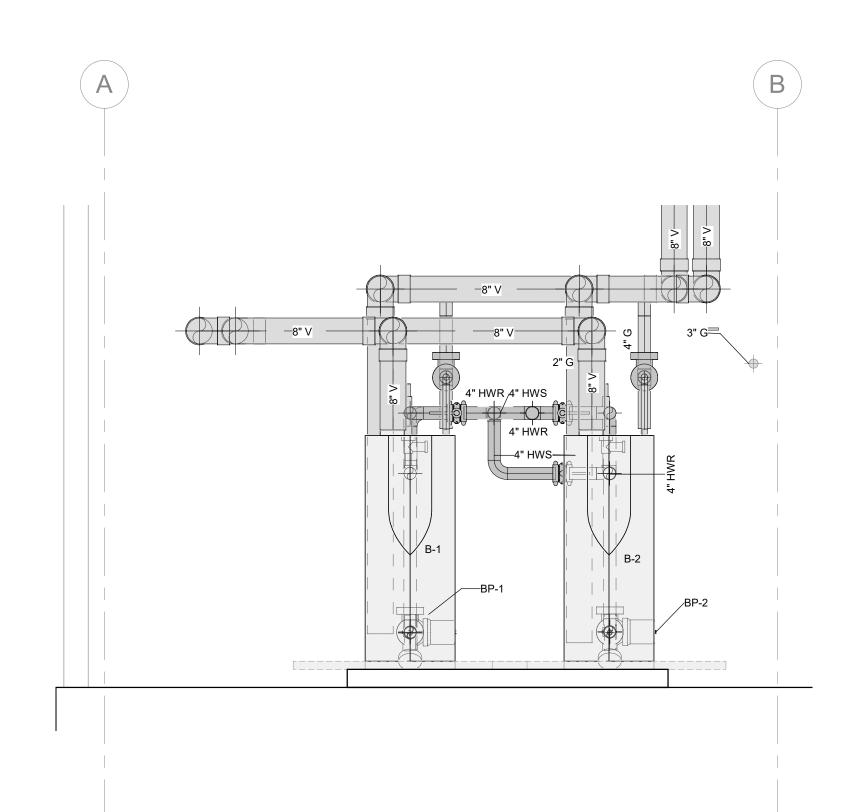
EXISTING MOTOR CONTROL CENTER MCC-COMMONS.

MAKE CONNECTION TO BOILER AND BOILER CONTROL PANEL, AS REQUIRED. PROVIDE AND INSTALL DISCONNECT SWITCH AHEAD OF CONTROL PANEL. EXTEND 2#12 + 1#12 GND TO NEW 20A/1P CIRCUIT BREAKER TO BE PROVIDED IN EXISTING SPACE OF PANEL RPG.

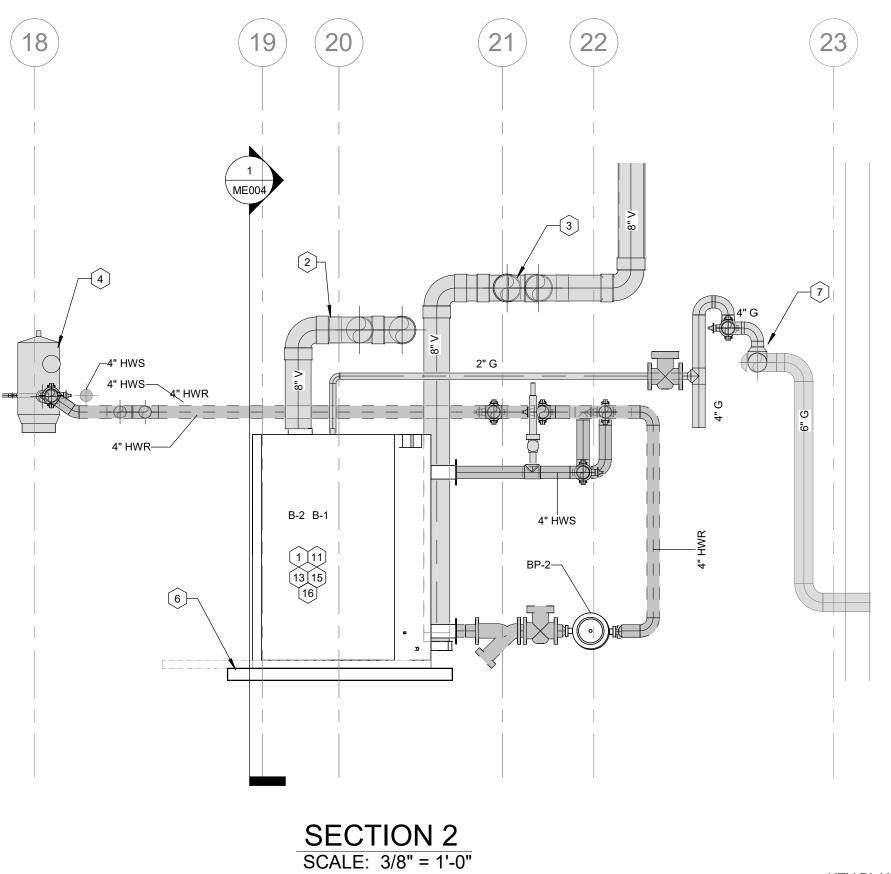
MAKE CONNECTION TO IN-LINE BOILER PUMP AND ASSOCIATED VFD, AS REQUIRED. EXTEND 2#12 + 1#12 GND TO NEW 20A/1P CIRCUIT BREAKER TO BE PROVIDED IN EXISTING SPACE OF PANEL RPG.

CONNECT EXISTING E-STOPS TO NEW BOILERS.

TWO FLUE VENTS TO ROUTE TO EXISTING ROOF PENETRATION. MAXIMIZE SPACING BETWEEN VENTS, COORDINATE ROUTING ELEVATION TO AVOID EXISING CONDITINS. PITCH ALL VENT PIPING



SECTION 1 SCALE: 3/8" = 1'-0"



NORSE COMMONS MECHANICAL ROOM - PIPING PLAN

ALL SYSTEMS PROVIDED IN THE SCOPE OF THIS PROJECT SHALL BE PROVIDED SO THAT UPON COMPLETION OF THE PROJECT ALL SYSTEMS ARE OPERATING IN A MANNER AS PER DESIGN AND MANUFACTURERS REQUIREMENTS. THIS IS TO INCLUDE ALL ACCESSORIES NEEDED TO ACHIEVE



REVISIONS DESCRIPTION

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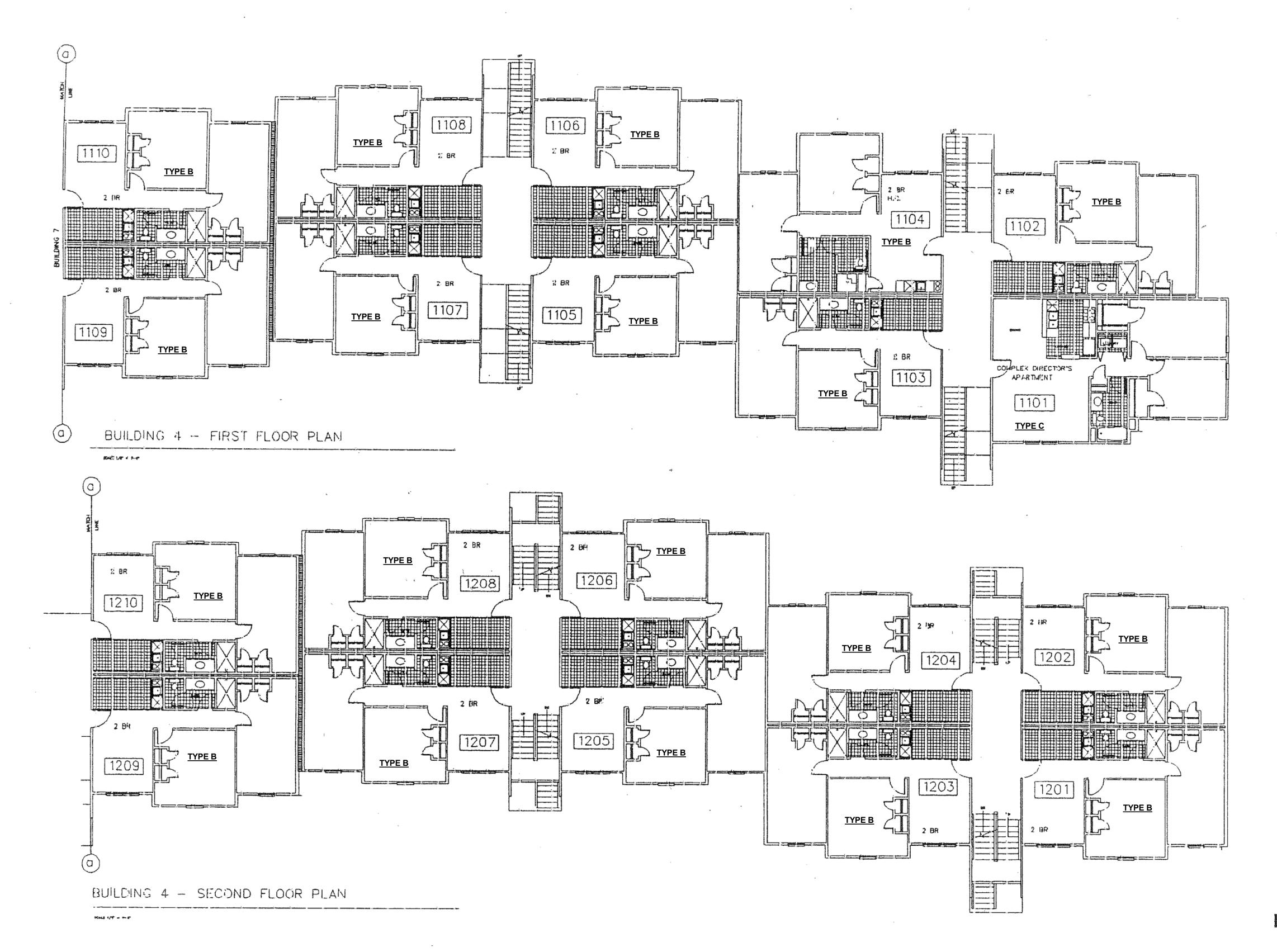
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SCALE: 1/4" = 1'-0"

BUILDING

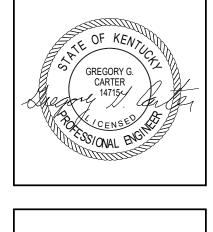
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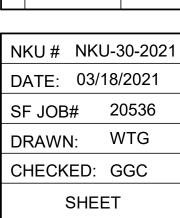
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Norse Hall

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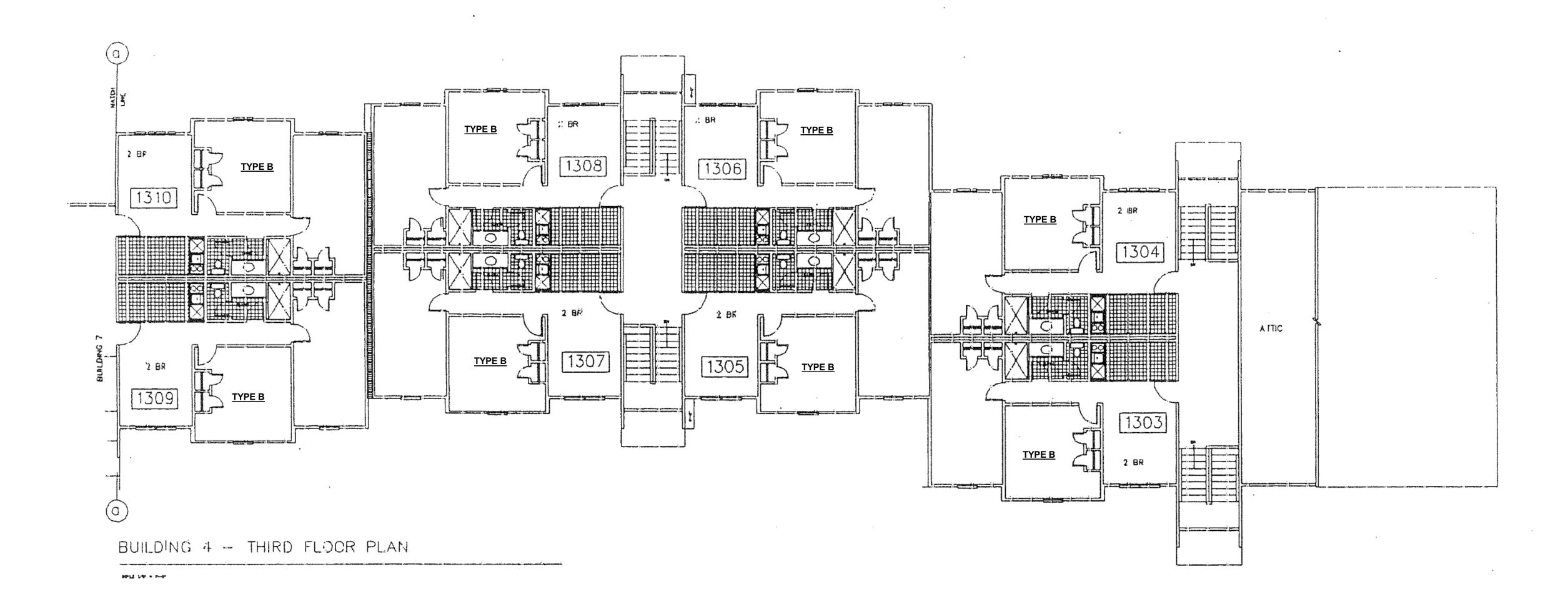


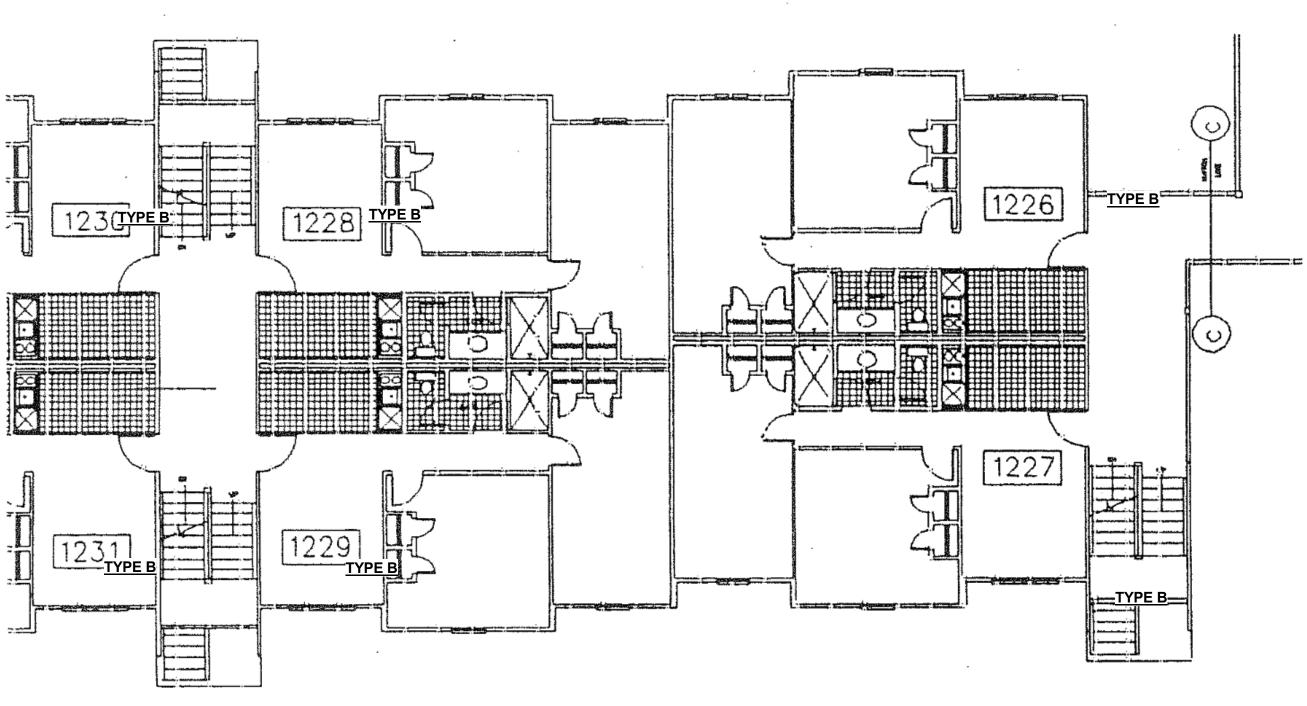
**BUILDING 4** REVISIONS

DATE: 03/18/2021

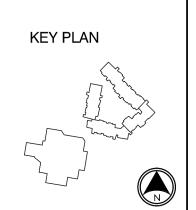
Norse Hall

SF JOB# 20536 DRAWN: WTG CHECKED: GGC





Norse Hall



FLOOR PLANS

ND AND

REVISIONS

NKU # NKU-30-2021

DATE: 03/18/2021

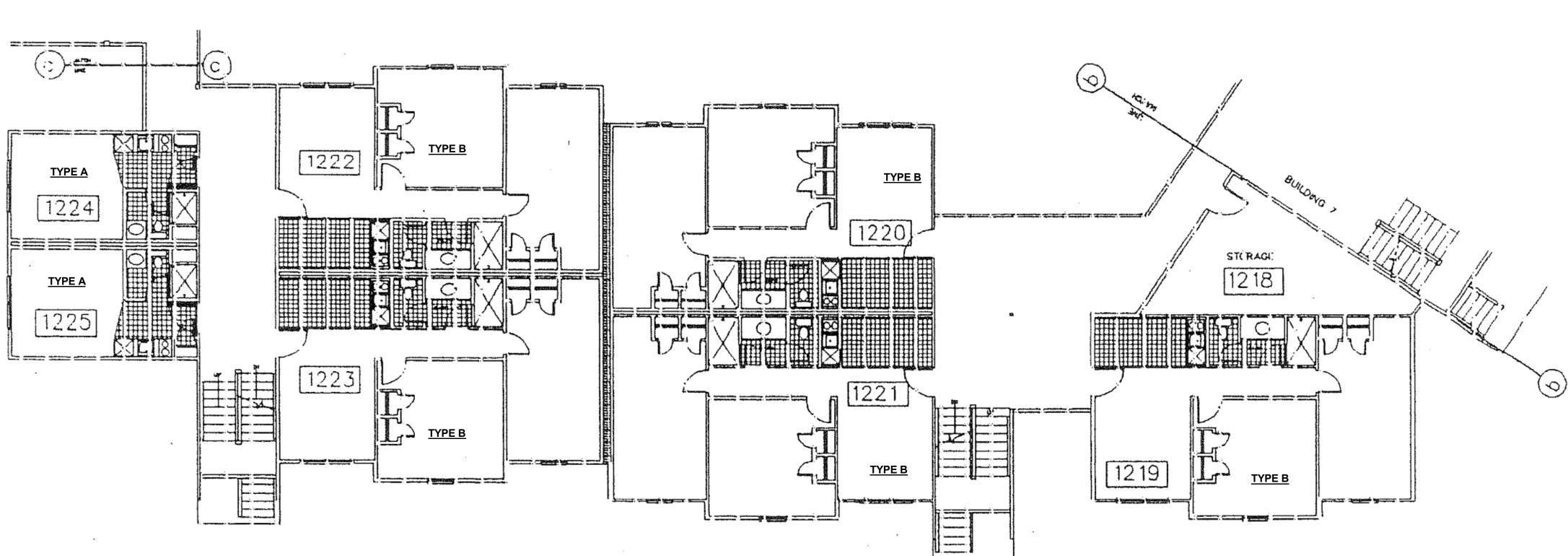
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OND FLOOR PLAN

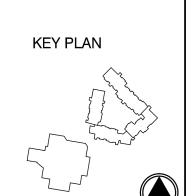
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BUILDING 6 - SECOND FLOOR PLAN

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WILL BE ALLOWED FOR CORRECTION CONFLICTS BETWEEN THE WORK OF VARIOUS TRADES. DETAILS AND SECTIONS ARE SHOWN FOR THE CONTRACTORS CONVENIENCEAND SHALL NOT BE CONSIDERED COMPLETE IN EVERY DETAIL.

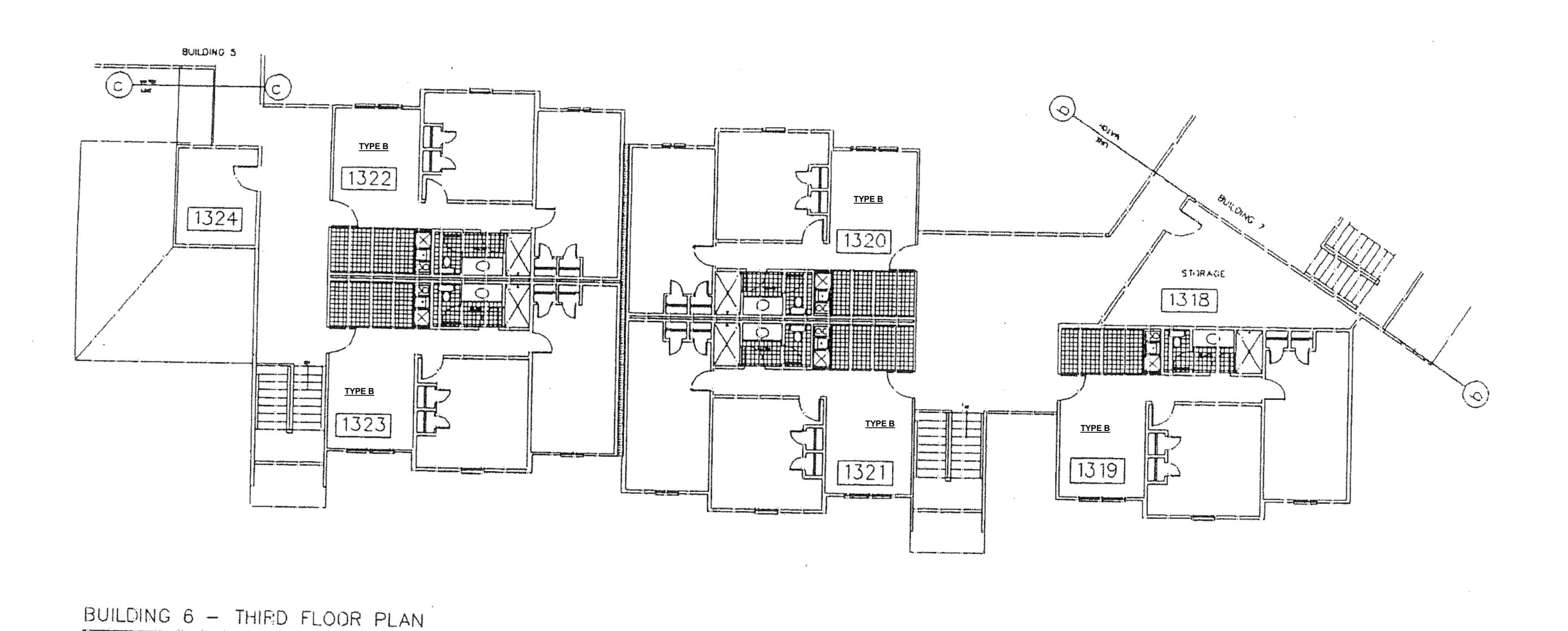


SECOND FLOOR PLANS **FIRST AN** 

BUILDING

REVISIONS DESCRIPTION DATE

NKU # NKU-30-2021 DATE: 03/18/2021 SF JOB# 20536 DRAWN: WTG CHECKED: GGC



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SCALE 1/8" = 1'-0"

REVISIONS DESCRIPTION DATE

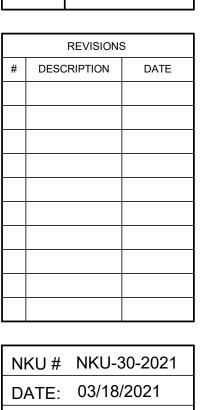
NKU# NKU-30-2021

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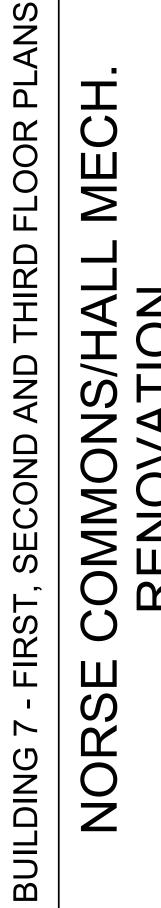
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SF JOB# 20536 DRAWN: WTG

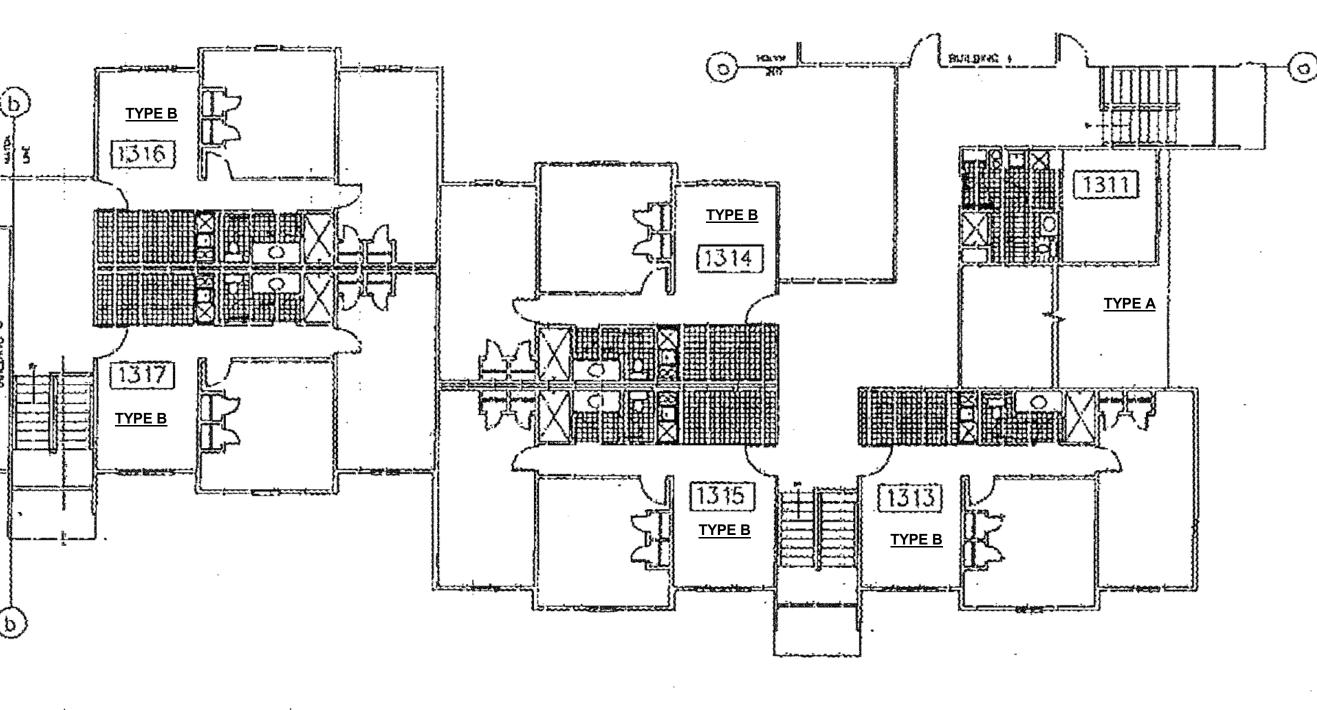
CHECKED: GGC SHEET



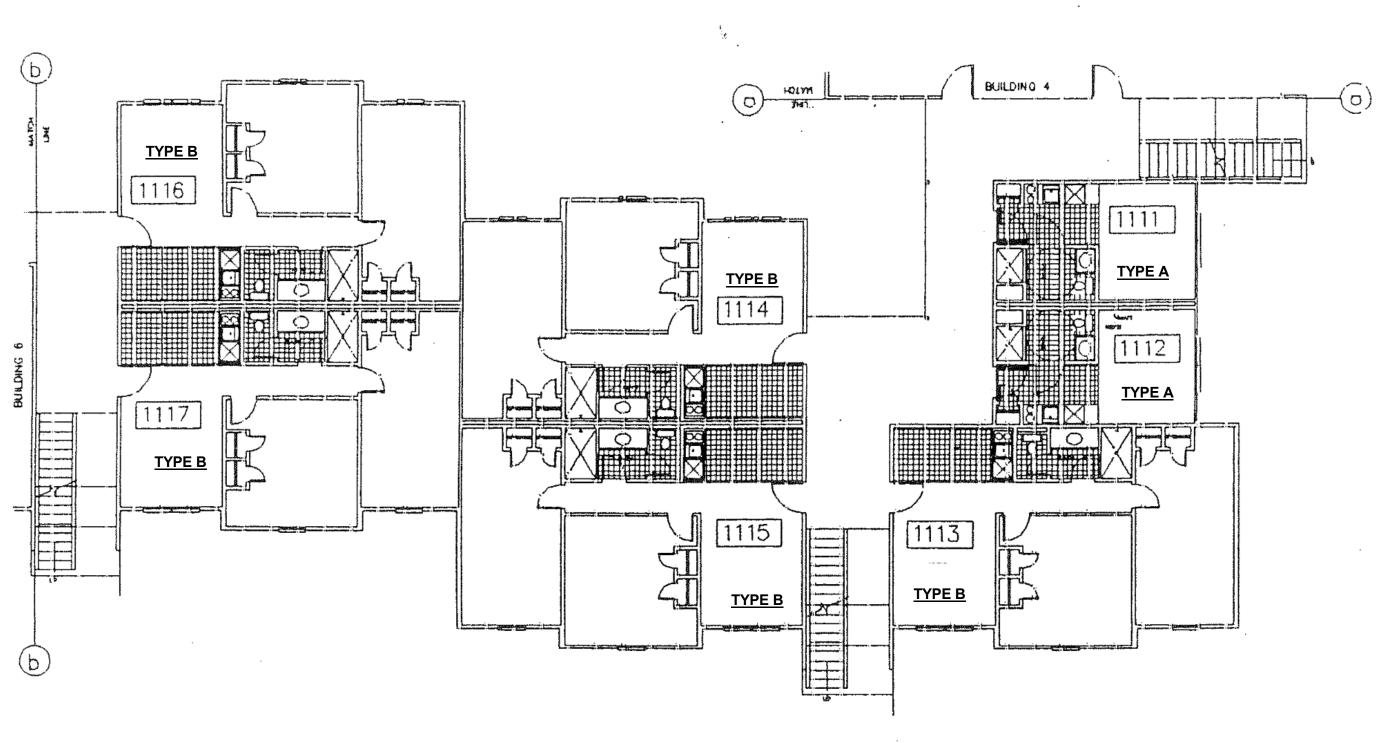




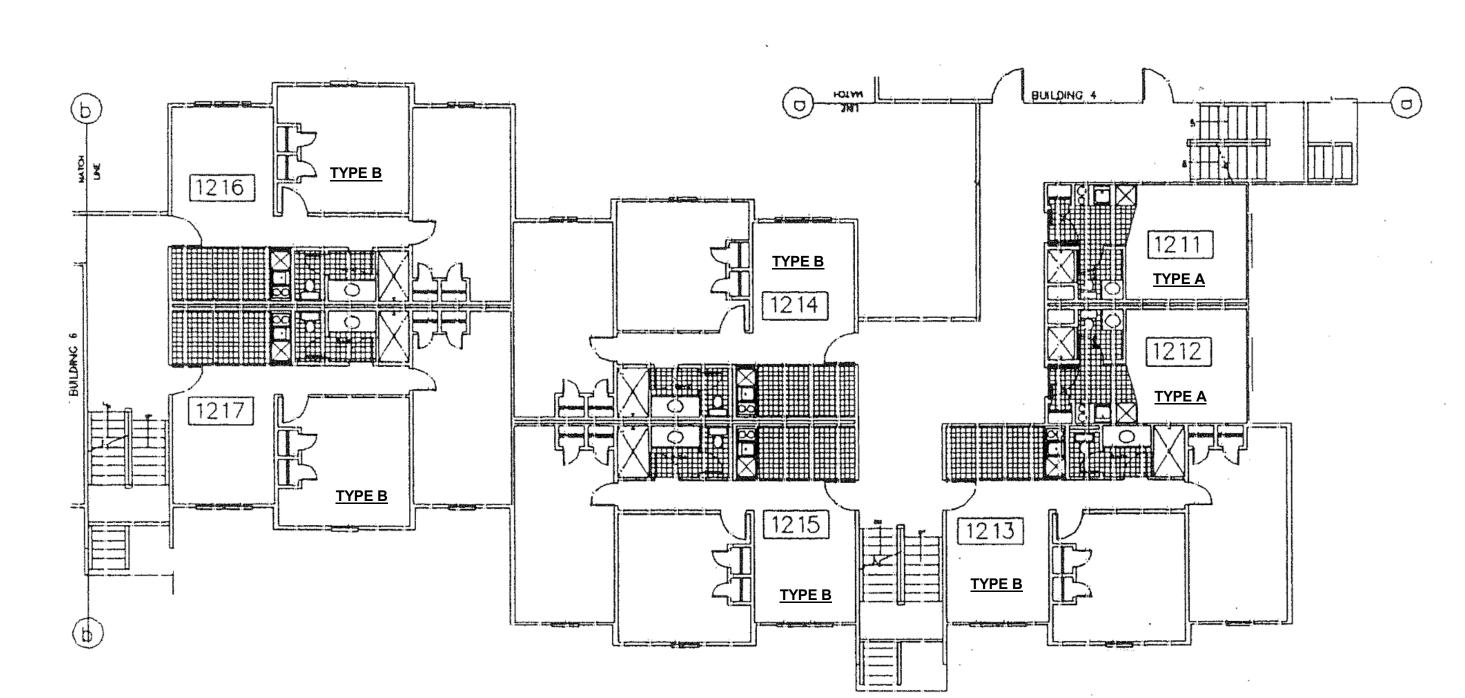
ND AND SECO BUILDING



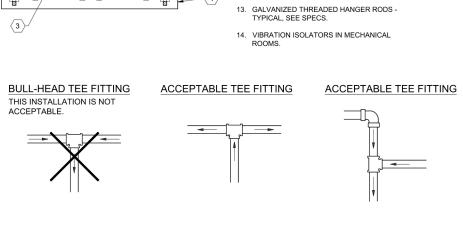
BUILDING 7 - THIRD FLOOR FLAN



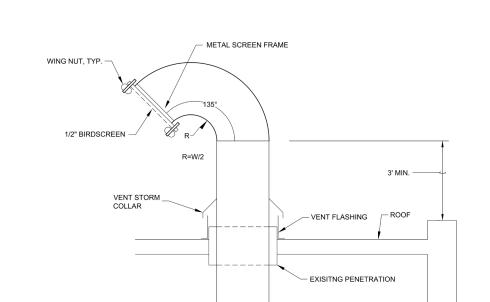




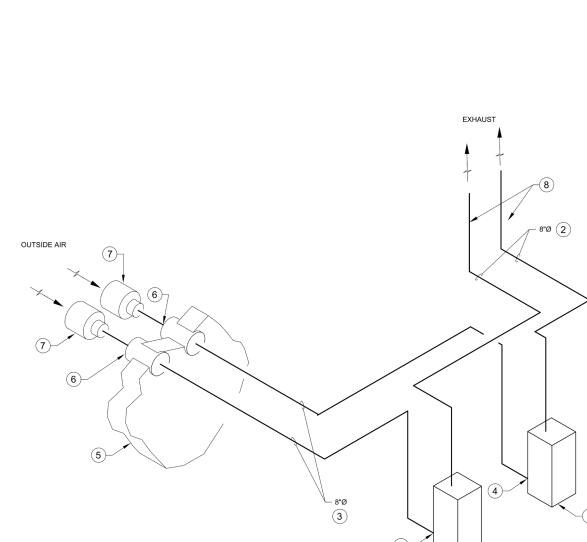
BUILDING 7 - SECOND FLOOR PLAN







BOILER DETAIL FOR PIPING THROUGH A WALL NO SCALE



CONDENSATE DRAIN TRAP DETAIL
NO SCALE

FITTINGS -- ALL FITTINGS SHALL BE FINISHED WITH CANVAS CLOTH APPLIED OVER. CONTRACTOR HAS THE OPTION OF FINISHING FITTINGS WITH P.V.C. FIRE TESTED AND RATED FITTING COVERS. SEE SPECS.

VAPOR BARRIER TAPE WITH P.V.C. FITTING COVERS

DIMESIONS:

X = TWO TIMES THE MAXIMUM STATIC PRESSURE

Y = MAXIMUM STATIC PRESSURE

OPEN TEE CLEANOUT

CONDENSATE DRAIN
 LINE OR FLOOR DRAIN

SEE SPECS.

PROVIDE SECTION OF RIGID INSULATION
BETWEEN PROTECTOR SHIELD AND PIPE TO
PREVENT CRUSHING OF INSULATION. SECTION
OF RIGID INSULATION SHALL BE FULL SIZE
(MINIMUM) OF BEARING SURFACE OF SHIELD.
CONTRACTOR'S OPTION - USE SECTION OF RIGID
INSULATION WITH FULL CIRCUMFERENCE OF
PIPE AT EACH PROTECTOR SHIELD.

TYP. PIPE SUPPORT DETAIL WITH SHIELD

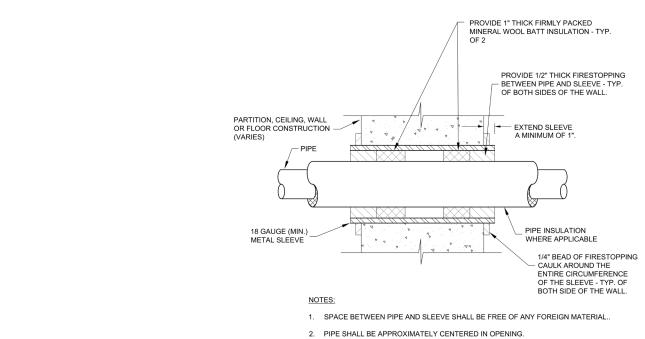
PLUGGED TEE CLEANOUT —

TYPICAL DETAIL OF INSULATION

FLARE-DOOR \_ STAPLES \_

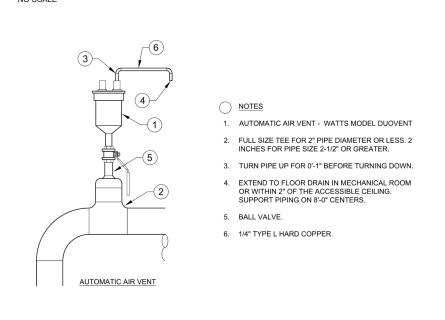
INSULATION PROTECTOR — SHIELD

AT PIPE FITTING

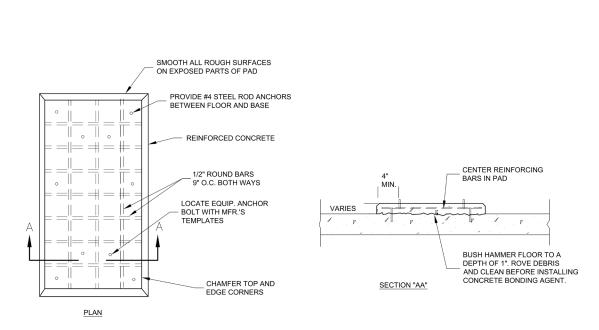


### TYPICAL DETAIL FOR PIPING THROUGH A WALL

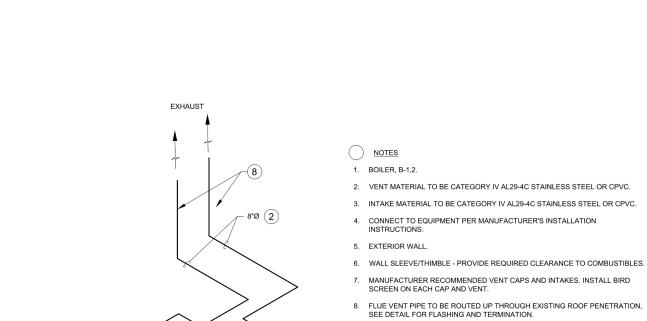
ANY OTHER METHODS OF FIRE STOPPING IS TO BE SUBMITTED AS A SHOP DRAWING WITH A DRAWING BEARING A UL LISTING AND INDICATES THE MATERIAL AND ASSEMBLY TO BE USED. ALTERNATE METHOD MUST INCLUDE A MEANS OF PROVIDING A WATER STOP.



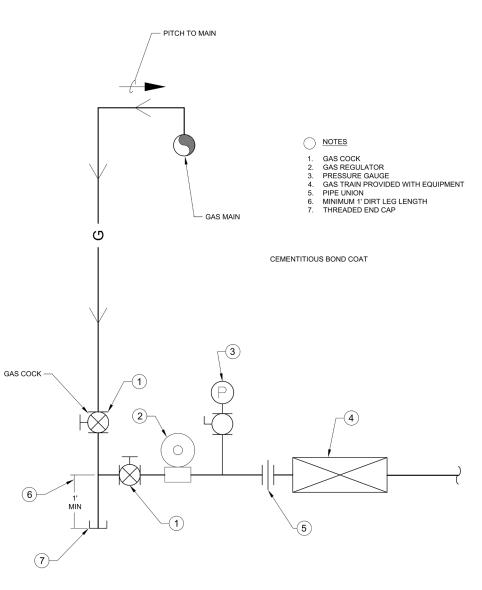
### AUTOMATIC AIR VENT DETAILS



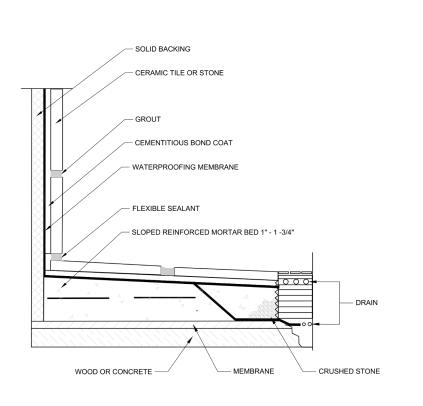
### CONCRETE PAD DETAIL NO SCALE



THE SIZES INDICATED ON THIS DETAIL ARE BASED ON THE BOILERS LISTED IN THE EQUIPMENT SCHEDULE. THESE SIZES MAY NOT COMPLY WITH THE REQUIREMENTS FROM OTHER BOILER MANUFACTURERS. IT IS THE RESPONSIBLE OF THE CONTRACTOR TO INCORPORATE (WITH NO COST) ALL MODIFICATIONS THAT MAY RESULT.



CONNECTION TO GAS FIRED EQUIPMENT NO SCALE



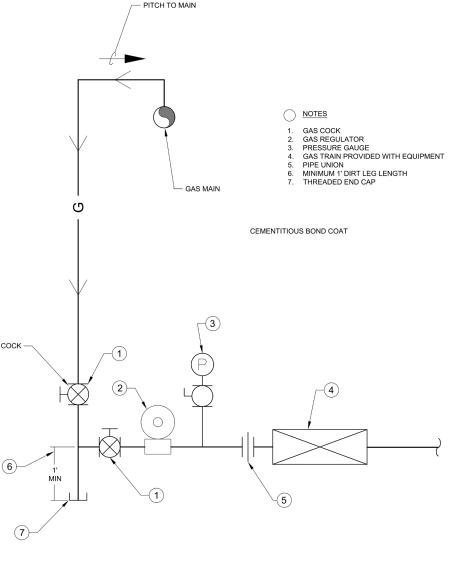
### SHOWER BED INSTALLATION DETAIL NO SCALE

FAUCET AND SHOWER HEAD
ZURN Z7300-SS-MT OR APPROVED EQUAL PRESSURE BALANCING MIXING VALVE WITH QUARTER TURN STOPS. ZURN Z7000-16 INSTITUTIONAL 2.0 GPM SHOWER HEAD WITH VOLUME CONTROL OR APPROVED EQUAL.
WALL TILE
ATLAS CONCORDE USA

SIZE: 12" X 24" TILE RUN HORIZONTAL
PATTERN: FRAY
COLOR: GRAY OR APPROVED EQUAL.
GROUT: MINIMAL GROUT JOINT 3/16" MAX; COLOR TO MATCH TILE. SUBMIT SAMPLE TO OWNER FOR APPROVAL. FLOOR TILE: ATLAS CONCORDE USA OR APPROVED EQUAL.

SIZE: MOSAIC 2X2 TILE
PATTERN: FRAY
COLOR: GRAY OR APPROVED EQUAL
GROUT: MINIMAL GROUT JOINT 3/16" MAX; COLOR TO MATCH TILE. SUBMIT SAMPLE TO OWNER FOR APPROVAL. CORIAN OR APPROVED EQUAL THRESHOLD CAP. COORDINATE COLOR WITH WALL TILE FROM STANDARD COLOR SELECTION. SUBMIT SAMPLE TO OWNER FOR APPROVAL.

SHOWER RECEPTORS: SOLID BACKING, BONDED WATERPROOF MEMBRANE, CERAMIC TILE OR STONE. SHOWER RECEPTORS, CURBS, SEATS, ETC. MUST BE PROPERLY WATERPROOFED AND INSTALLED TO AVOID WATER DAMAGE TO ADJACENT BUILDING MATERIALS.  ${\tt PROVIDE\ CONTINUOUS\ /\ SEAMLESS\ TILE\ ACROSS\ ELEVATED\ THRESHOLD.}$ 



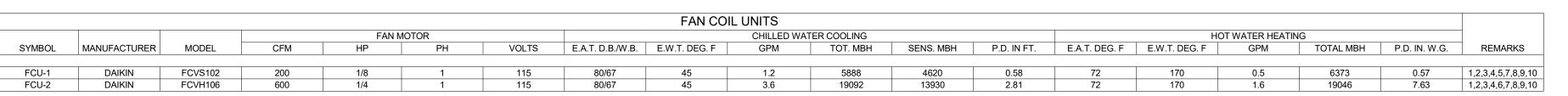
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STAGGS

REVISIONS DESCRIPTION DATE

NKU# NKU-30-2021 DATE: 03/18/2021 SF JOB# 20536 DRAWN: CMR CHECKED: GGC



- 1 UNITS TO BE PROVIDED WITH STAND-ALONE WALL MOUNTED DIGITAL THERMOSTATS WITH TEMPERATURE DISPLAY. THERMOSTATS TO BE PROVIDED WITH BACNET CARD FOR FUTURE BAS CONTROLS, PROGRAMMABLE, LOCKING FIELD SETPOINTS, LOCKING ADJUSTABLE RANGE, FULL LOCKOUT, MODULATING CONTROL VALVES AND ECM VARIABLE
- SPEED FAN. SIMILAR TO DAIKIN MIT-FA-005 OR EQUIVALENT.
- UNITS TO BE PROVIDED WITH METAL WALL PLATE WITH RETURN GRILLE TO FULLY CONCEAL UNIT IN WALL. UNIT PIPE HANDING TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO ORDERING UNITS. UNIT TO BE FACTOR PIPED WITH STRAINER, MODULATING CONTROL VALVE, AUTOMATIC BALANCING VALVE, ISOLATION BALL VALVE, UNION AT COIL CONNECTIONS.
- VERTICAL SURFACE MOUNTED UNIT.
- VERTICAL CONCEALED/DUCTED UNIT WITH WALL PLATE AND RETURN GRILLE.
  UNITS TO BE PROVIDED WITH 2 & 3 WAY MODULATING CONTROL VALVES SEE FLOW DIAGRAM FOR VALVING CONFIGURATIONS.
  UNITS TO BE PROVIDED WITH VARIABLE SPEED ECM FAN MOTORS.
- THERMOSTAT SETUP AND UNIT STARTUP TO BE INCLUDED IN PROJECT.
  PROVIDE CONDENSATE SWITCH WITH INTERLOCK, AND PROVIDE ALL ACCESSORIES NEEDED TO HAVE A PROPERLY FUNCTIONING STAND-ALONE UNIT.

### \*\*\*BOILERS AND ACCESSORIES TO BE OWNER PURCHASED CONTRACTOR INSTALLED.

									CONDENS	ING BOILERS										
						GAS (NAT.)				ELEC.	TRICAL				HY	<b>DRONIC</b>				
SYMBOL	MANUFACTURER	MODEL	CONFIGURATION	INPUT MBH	OUTPUT (HI/LO) MBH	TURNDOWN	GAS CONNECTION	MAX/MIN GAS PRESSURE IN W.C.	MCA	FLA	PH	VOLTS	E.W.T.	L.W.T.	CAP. GAL	INLET/OUTLET CONNECTION	FLOW RATE	FT. HD	MAXS. WORKING PRESS. PSI	REMARKS
B-1	LOCHINVAR	FBN-2001	CONDENSING FIRE TUBE	1,999	1,923/76	25:1	1-1/2"	14/4	16	13	1	120	140	170	111	4"	25 / 160	14.5	160	1, 2, 3, 4, 5, 6, 7 9, 10, 11, 12
B-2	LOCHINVAR	FBN-2001	CONDENSING FIRE TUBE	1,999	1,923/76	25:1	1-1/2"	14/4	16	13	1	120	140	170	111	4"	25 / 160	14.5	160	1, 2, 3, 4, 5, 6, 7 9, 10, 11, 12

- 1 UNITS TO BE PROVIDED STANDALONE CONTROL WITH CASCADE SEQUENCES AND BACnet MSTP INTERFACE, LEAD/LAG EFFICIENCY OPTIMIZATION, AND CASCADE REDUNDANCY. TOUCHSCREEN CONTROL PANEL INTEGRAL TO UNIT.
- 2 BOILER SHALL ANTICIPATE SYSTEM LOAD CHANGES VIA 0-10VDC SIGNAL FROM THE VFD AND BOILER LOW VOLTAGE CONTACTS.
- 3 PROVIDE BP-1 & 2; ECM PUMP SHALL BE PROVIDED WITH EACH BOILER AND CONTROLLED VIA A 0-10VDC(FIELD WIRE) SIGNAL TO MAINTAIN 30DEG. DELTA T. MANUFACTURER TO PROVIDE IN-LINE BOILER PUMP WITH PUMP MOUNTED VFD. SIMILAR TO LOCHINVAR MODEL MAGA 3, 50-150. 115V/5.6A; 2" CONNECTIONS.
- 4 PROVIDE PRESSURE RELIEF VALVE FOR HYDRONIC SYSTEM PRESSURE OF 60PSI.
- 5 UNIT TO DIRECT VENT BOTH COMBUSTION AIR AND FLUE. CPVC OR AL29-4C STAINLESS VENT ONLY.
- 6 PROVIDE CONDENSATE NEUTRALIZATION KIT FOR BOILER DRAINS.
- 7 BOILER MUST BE LOW NOX.
- 8 BOILER SHALL BE OF SINGLE BURNER AND SINGLE HEAT EXCHANGER DESIGN.
- 9 PROVIDE ULTRA HIGH TURNDOWN GAS REGULATOR ON EACH INCOMING BOILER GAS LINE SIZED PER NFGC. BUILDING PRESSURE 11.7" W.C.
- 10 PRIMARY-SECONDARY PIPING CONFIGURATION.
- 11 PROVIDE FACTORY TRAINED START-UP AND OWNERS TRAINING.

### MISC. SCHEDULES:

### AIR SEPARATOR:

AS-1: AMTROL AIR SEPARATOR WITH STRAINER, MODEL NO. 4-AS OR EQUAL; CENTRIFUGAL TYPE, 4" FLANGED CONNECTIONS, ASME RATED, 125PSI.

### **EXPANSION TANK:**

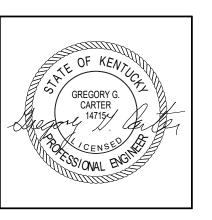
ET-1: AMTROL L-SERIES, MODEL NO. 800L OR EQUAL; 211GAL. TANK VOLUME, VERTICAL BLADDER STYLE, PRECHARGED AT 55PSI, ASME RATED.

### AUTOMATIC AIR VENTS:

AAV: WATTS SERIES DUOVENT, 1/4" OR EQUAL.

### TRANSFER GRILLES:

TG-1: PRICE; 535 OR EQUAL, 14"x8", 0.69SQFT CORE AREA, 45DEG DEFLECTION, 1/2" BLADE SPACING, STEEL CONSTRUCTION, WHITE FACTORY APPLIED PAINT.





COMMC NORSE

SCHE

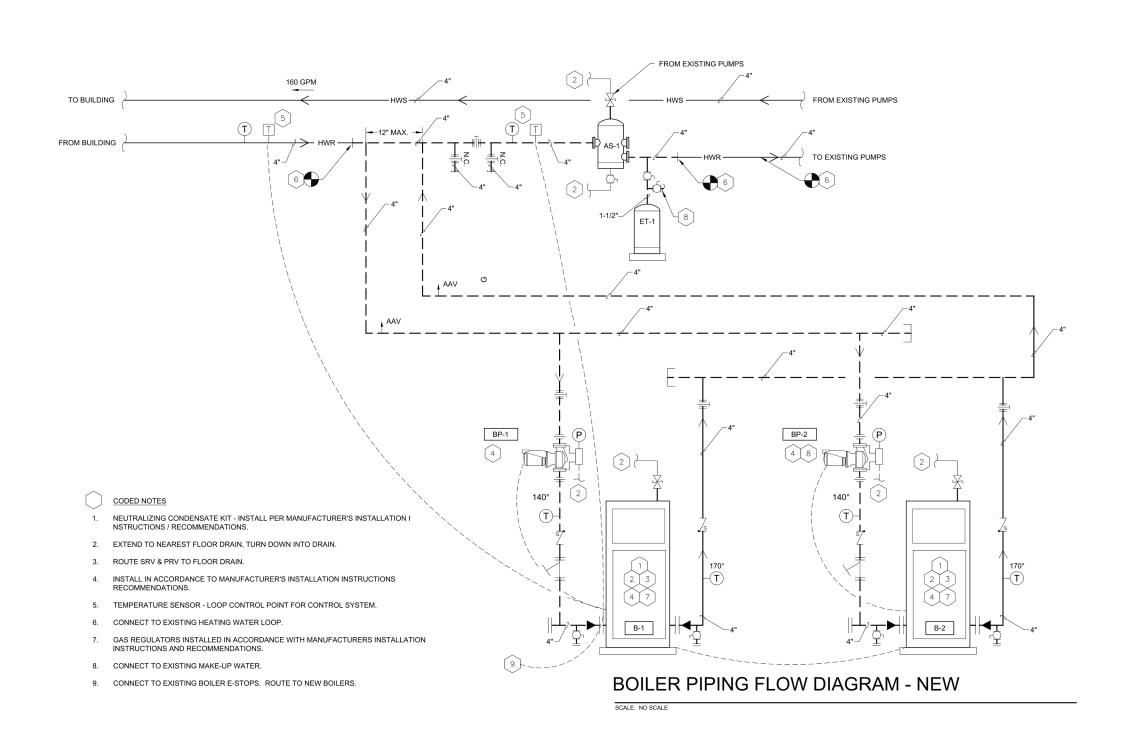
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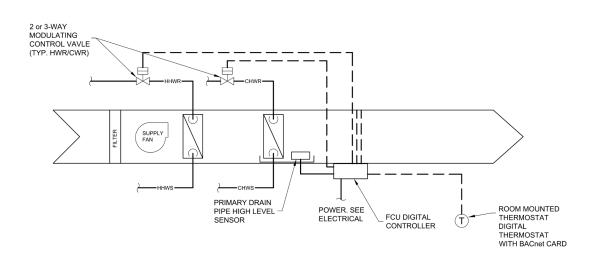
DATE: 03/18/2021 SF JOB# 20536 DRAWN: CMR CHECKED: GGC

SHEET

ME112

BOILER CONTROLS - HEATING LOOP - SCHEMATIC





### FAN COIL UNIT

### RUN CONDITIONS - SCHEDULED:

UNIT SHALL BE INDEXED ON ACCORDING TO PROGRAMABLE THERMOSTAT OCCUPIED/UNOCCUPIED SCHEDULE, AS FOLLOWS:

- UNOCCUPIED: UNIT IS INDEXED UNOCCUPIED BY SCHEDULE OR OPERATOR COMMAND. THIS STATE
  THE UNIT OPERATES TO MAINTAIN ROOM SETPOINT BETWEEN 55°F (ADJ) AND 85F (ADJ).
- OCCUPIED: UNIT IS INDEXED OCCUPIED BY SCHEDULE OR OPERATOR COMMAND. THIS STATE THE UNIT OPERATES ON THE PUSH BUTTON ON THERMOSTAT, WHICH LIMITS ROOM TEMPERATURE SETPOINT BETWEEN 68°F (ADJ) AND 75°F (ADJ). UNIT SHALL HAVE LOCK-OUT CAPABILITIES.

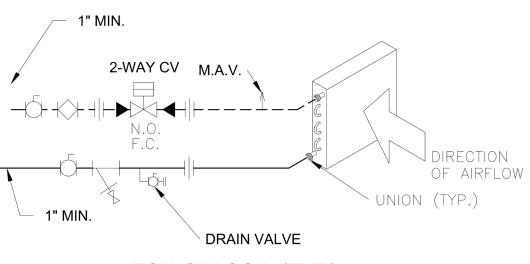
### THE UNIT SHALL RUN ACCORDING TO A THERMOSTAT PROGRAMMABLE TIME SCHEDULE IN THE FOLLOWING

- OCCUPIED MODE: THE UNIT SHALL MAINTAIN
- · COOLING MODE:
- ON MAX COOLING THE UNIT SHALL BE RUNNING AT MAX CFM AND MAINTAINING ROOM TEMPERATURE AT THERMOSTAT WITH CHILLED WATER VALVE OPEN.

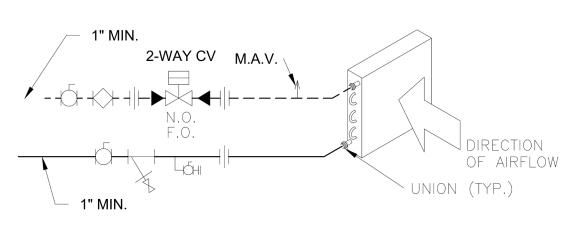
  ON DROP IN COOLING LOAD THE ECM MOTOR SHALL REDUCE SPEED DOWN TO 30% OF COOLING MAX CFM WHILE MAINTAINING ROOM TEMPERATURE AT THERMOSTAT WITH CHILLED WATER VAVLE OPEN.

  ONCE 30% COOLING MAX CFM IS REACHED AND COOLING LOAD CONTINUES TO DROP, THE COOLING COIL VALVE SHALL CYCLE BETWEEN CLOSED AND MODULATING TO ROOM TEMPERATURE AT THERMOSTAT.

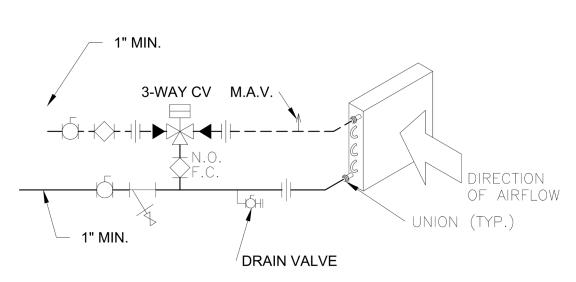
- ON MAX HEATING THE UNIT SHALL BE RUNNING AT MAX CFM AND MAINTAINING SETPOINT OFF OF ROOM TEMPERATURE AT THERMOSTAT WITH HEATING VALVE OPEN.
  ON DROP IN HEATING LOAD THE ECM MOTOR SHALL REDUCE SPEED DOWN TO 30% OF HEATING MAX CFM WHILE MAINTAINING ROOM TEMPERATURE AT THERMOSTAT WITH HEATING VAVLE OPEN.
  ONCE 30% HEATING MAX CFM IS REACHED AND HEATING LOAD CONTINUES TO DROP, THE HEATING COIL VALVE SHALL CYCLE BETWEEN CLOSED AND MODULATING TO MAINTAIN ROOM TEMPERATURE AT THERMOSTAT.
- UNOCCUPIED MODE : THE UNIT SHALL MAINTAIN
- •• A 85°F (ADJ.) COOLING SETPOINT CONTROL VALVE SHALL OPEN 100% AND FAN SHALL START AT MINIMUM CFM AND RAMP UP.
- 55°F (ADJ.) HEATING SETPOINT CONTROL VALVE SHALL START TO MODULATE OPEN WITH FAN AT MINIMUM CFM. ONCE 100% OPEN AND FAN SPEED SHALL START TO RAMP UP.



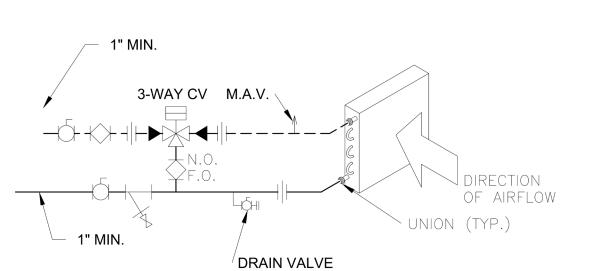




### FCU HW COIL (TYP)



### FCU CW COIL (BLDG 4 - ROOMS 1301,1302,1303,1304,1305,1306,1307,1308)



FCU HW COIL (BLDG 4 - ROOMS 1301,1302,1303,1304,1305,1306,1307,1308)

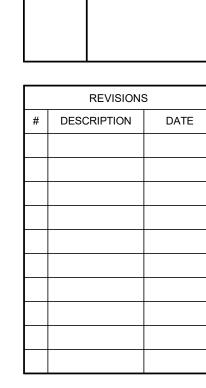


M

DIAGRAM

FLOW

STAGGS



NOR

NKU # NKU-30-2021 DATE: 03/18/2021 SF JOB# 20536 DRAWN: CMR CHECKED: GGC

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