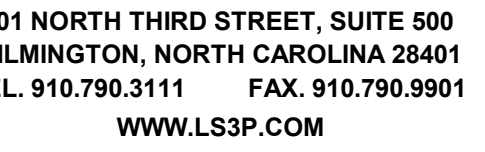


Newcomb & Boyd
CONSULTANTS and ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



NOT FOR
CONSTRUCTION

IC Government Center 7702-190810

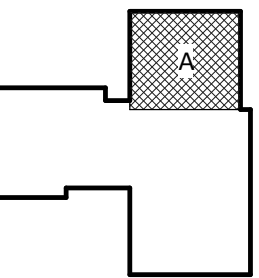
NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

KEY PLAN:



SHEET NAME:
HVAC FLOOR PLAN -
LEVEL 1 - AREA A

DATE: 2020.11.20
CURRENT: TI GMP SET

MEET:

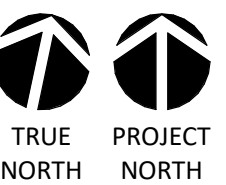
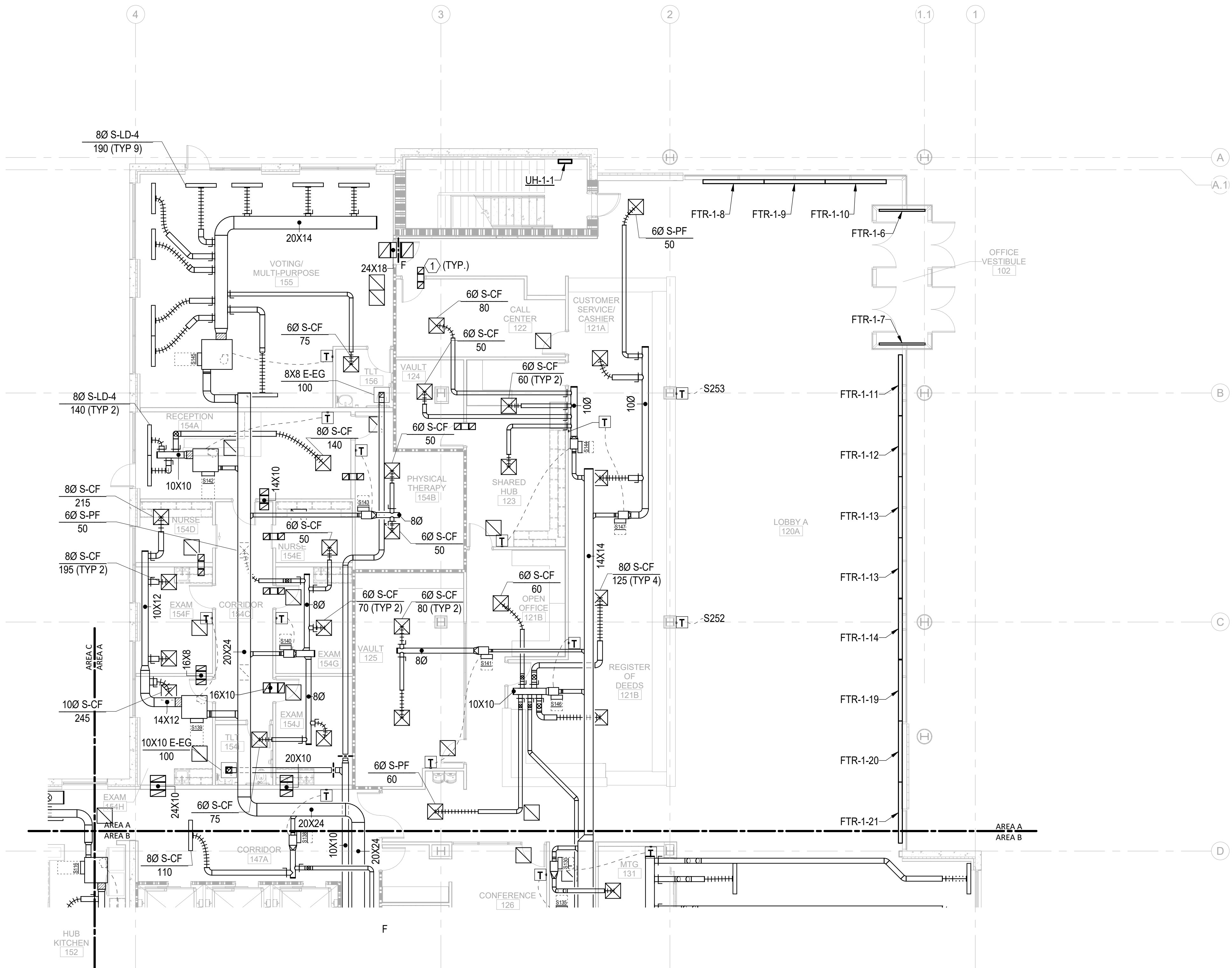
M-101A

I GMP SET

KEY NOTES:

1 10X10 TRANSFER DUCT (UNO). SEE DETAIL 4/M602.

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312


$$1/8'' = 1'-0''$$

NOT FOR
CONSTRUCTION

IC Goverment Center 7702-190810

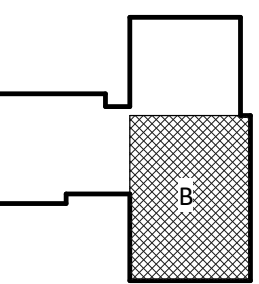
NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE

WILMINGTON, NC 28403

LS3P PROJECT: 7/02-190810

[illegible]

KEY PLAN:



SHEET NAME:
HVAC FLOOR PLAN -
LEVEL 1 - AREA B

DATE: 2020.11.20
CURRENT: TI GMP SET

MEET:

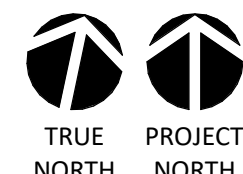
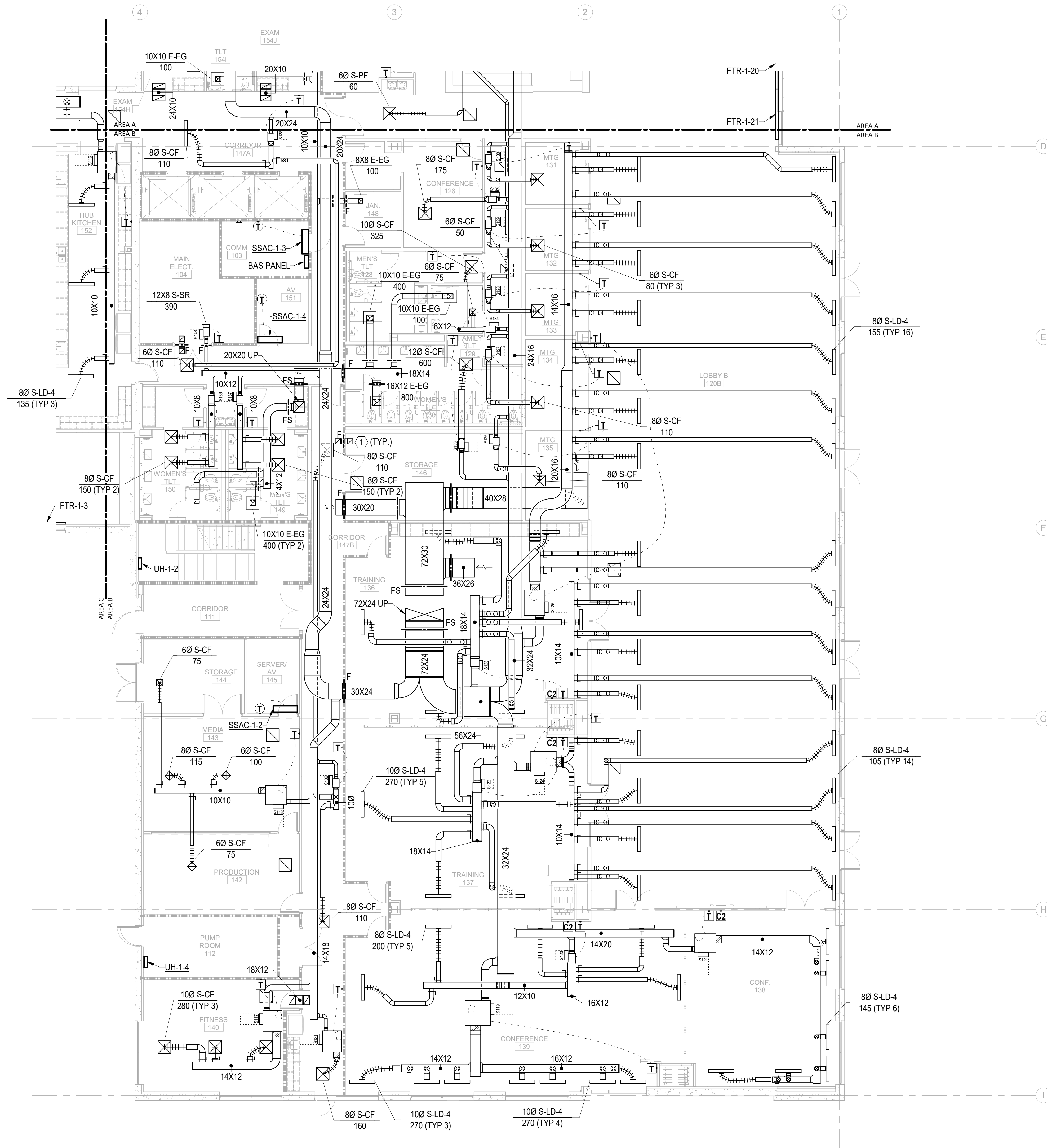
M-101B

I GMP SET

KEY NOTES:

1 10X10 TRANSFER DUCT (UNO). SEE DETAIL 4/M602.

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312


$$1/8'' = 1'-0''$$

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR
CONSTRUCTION

HC Goverment Center 7702-190810

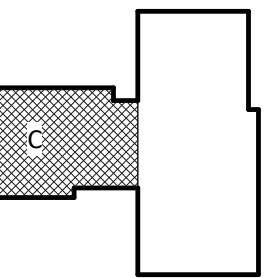
NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE

WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

Y PLAN:



HEET NAME:
HVAC FLOOR PLAN -
LEVEL 1 - AREA C

DATE: 2020.11.20
CURRENT: TI GMP SET

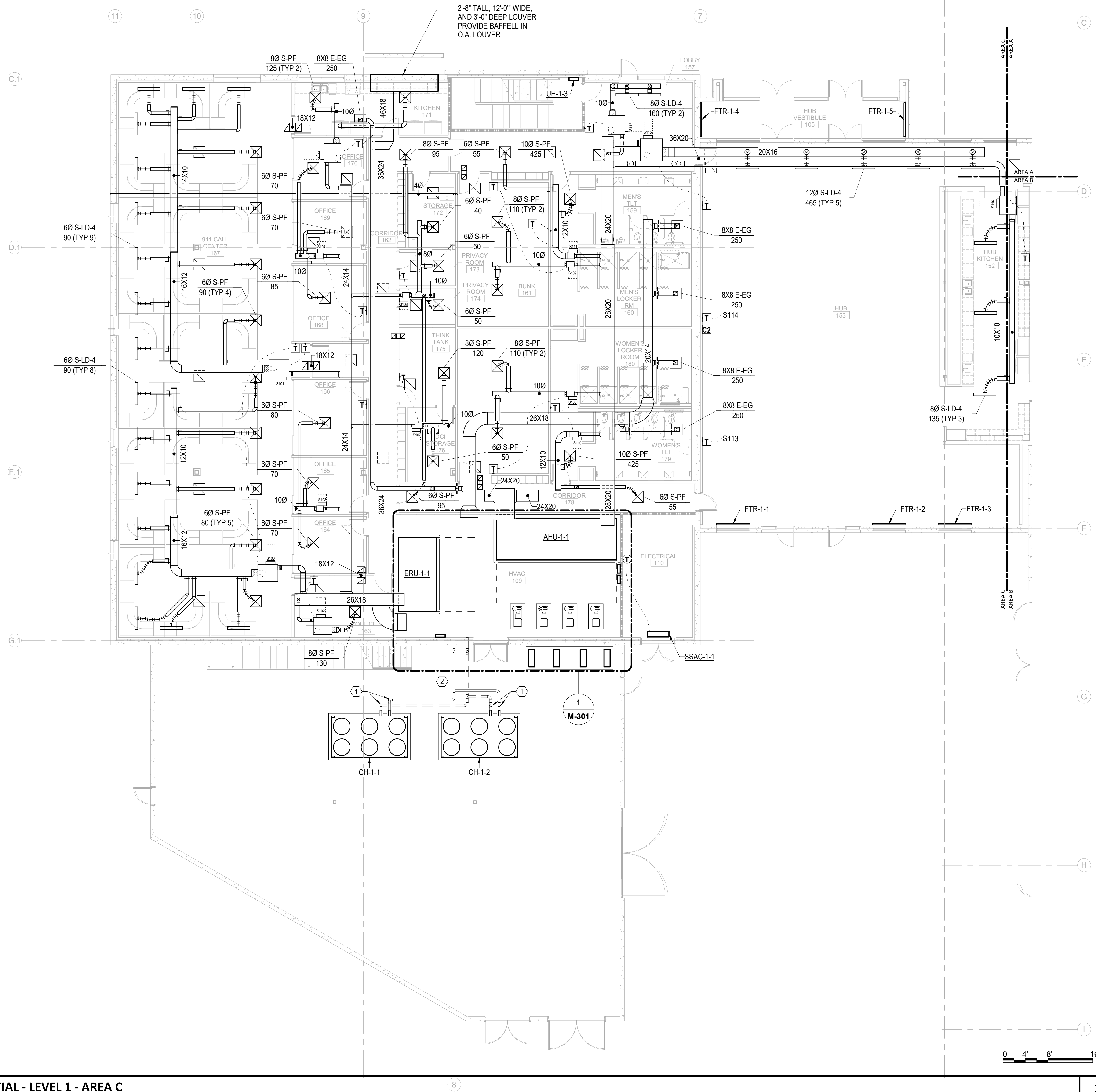
HEET: **M-101C**

TI GMP SET

KEY NOTES:

- ① SUPPLY AND RETURN CHILLED WATER PIPING DOWN 2'-0" BELOW GRADE.
- ② PROVIDE HEAT TRACING FOR EXPOSED CHILLED WATER PIPING. HEAT TRACING TO OUTPUT 3 W/FT.

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



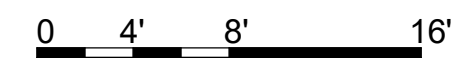
TRUE NORTH PROJECT NORTH

$1/8'' = 1'-0''$

11/19/20	1	HVAC TI FLOOR PLAN - PARTIAL - LEVEL 1 - AREA C
	M-101C	

$1/8'' = 1'-0''$

11/19/2020 3:00:22 PM



TRUE NORTH PROJECT NORTH

1/8" = 1'-0"

1 SEE DETAIL 5/M602.



LS3P

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR
CONSTRUCTION

NHC Government Center 7702-190810

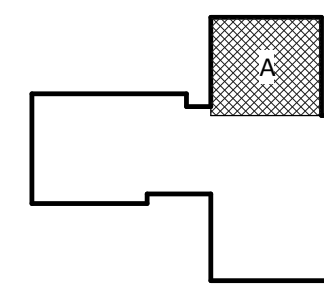
**NEW HANOVER COUNTY
GOVERNMENT CENTER**

GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

KEY PLAN:



SHEET NAME:
HVAC FLOOR PLAN -
LEVEL 2 - AREA A

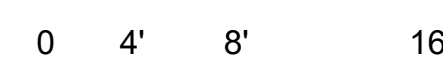
DATE: 2020.11.20
CURRENT: TI GMP SET

SHEET:

M-102A

TI GMP SET

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



TRUE NORTH PROJECT NORTH

$$1/8'' = 1'-0''$$
TI GMP SET

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

NOT FOR
CONSTRUCTION

IC Government Center 7702-190810

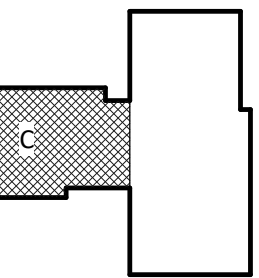
NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE

WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

KEY PLAN:



HEET NAME:
HVAC FLOOR PLAN -
LEVEL 2 - AREA C

DATE: 2020.11.20
CURRENT: TI GMP SET

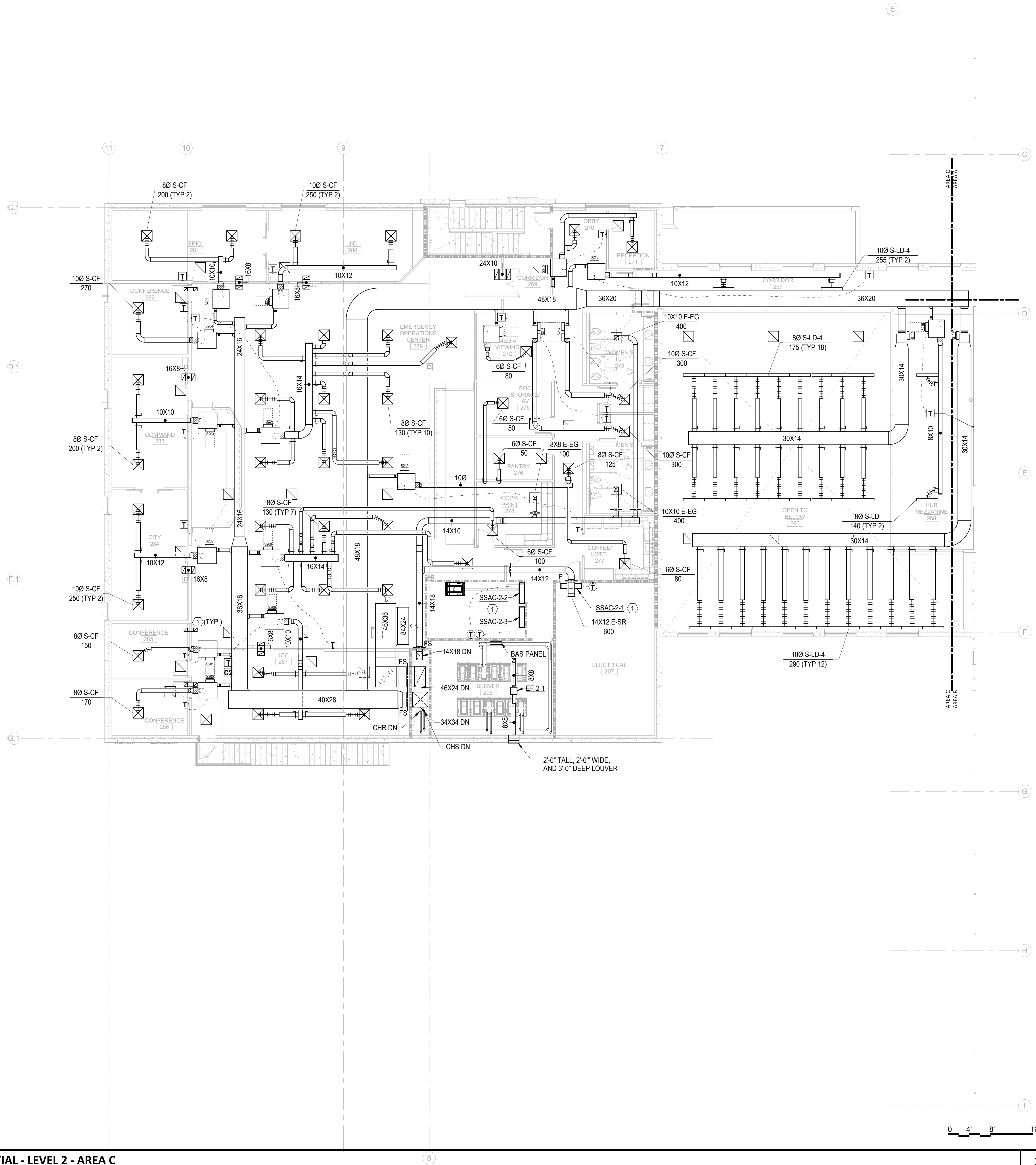
HEET:
M-102C

TI GMP SET

KEY NOTES:

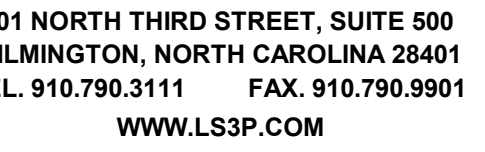
- ① ROUTE CONDENSATE TO FLOOR DRAIN IN HVAC ROOM ON 1ST FLOOR.

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



TRUE NORTH PROJECT NORTH

$$1/8'' = 1'-0''$$



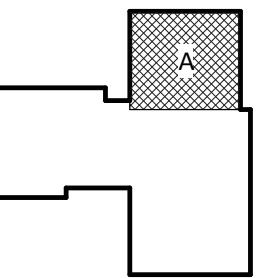
NOT FOR
CONSTRUCTION

IC Government Center 7702-190810

NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

[illegible]

KEY PLAN:



SHEET NAME:
HVAC FLOOR PLAN -
LEVEL 3 - AREA A

DATE: 2020.11.20
CURRENT: TI GMP SET

MEET:

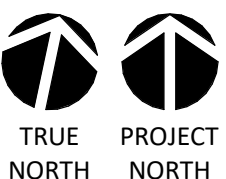
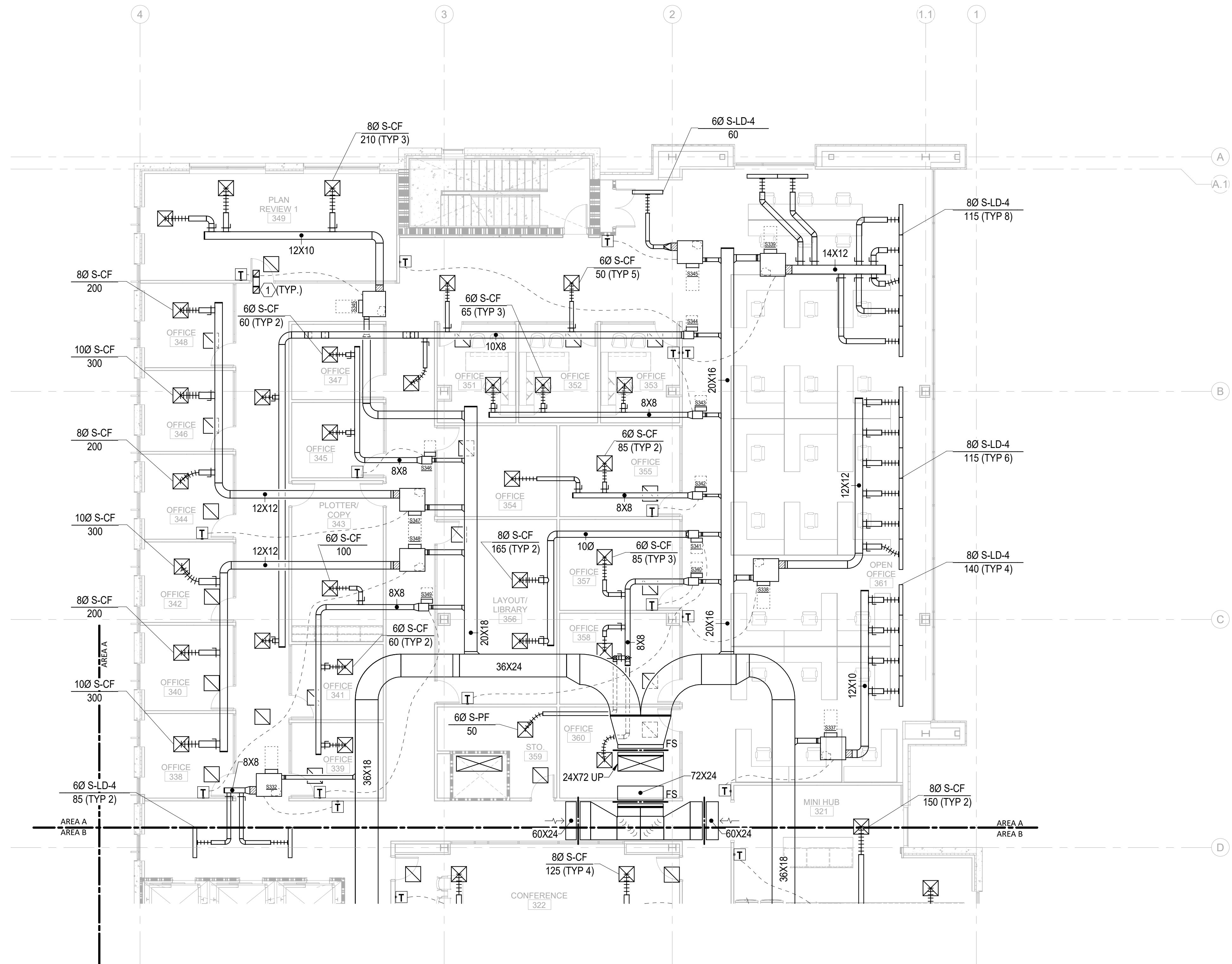
M-103A

GMP SET

KEY NOTES:

1 10X10 TRANSFER DUCT (UNO). SEE DETAIL 4/M602.

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



$1/8'' = 1'-0''$

11/19/20	1	HVAC TI FLOOR PLAN - PARTIAL - LEVEL 3 - AREA A
	M-103A	

1

2

3

4

5

6

01 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR
CONSTRUCTION

IC Goverment Center 7702-190810

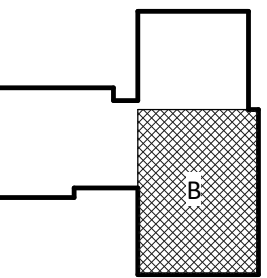
NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE

WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

KEY PLAN:



SHEET NAME:
HVAC FLOOR PLAN -
LEVEL 3 - AREA B

DATE: 2020.11.20
CURRENT: TI GMP SET

MEET:

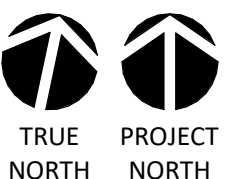
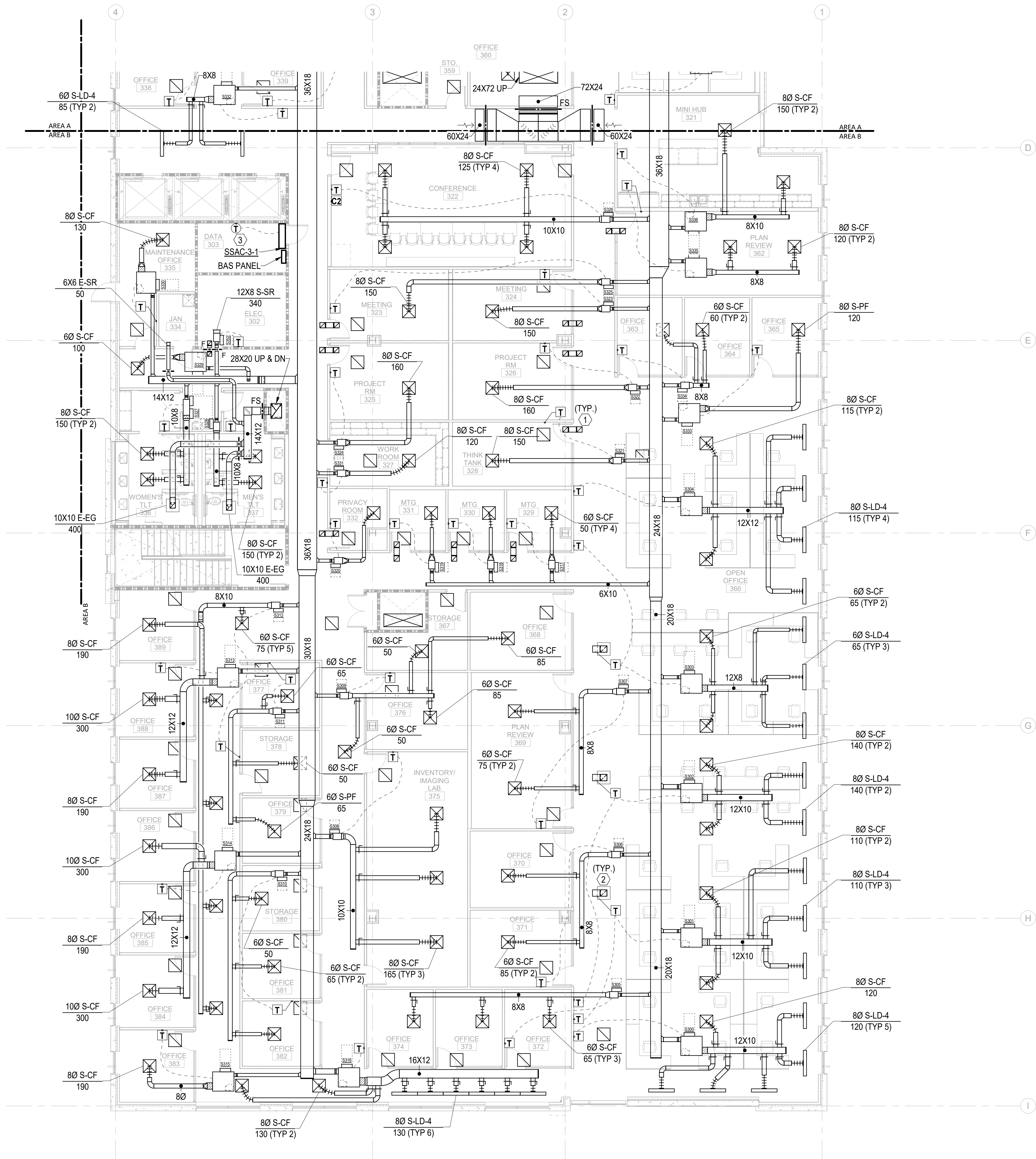
M-103B

I GMP SET

KEY NOTES:

- ① 10X10 TRANSFER DUCT (UNO). SEE DETAIL 4/M602.
- ② SEE DETAIL 5/M602.
- ③ ROUTE CONDENSATE TO MOP SINK IN JAN. ROOM.

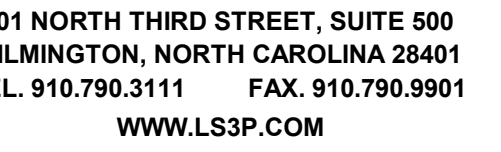
Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



$1/8'' = 1'-0''$

11/19/20	1	HVAC TI FLOOR PLAN - PARTIAL - LEVEL 3 - AREA B
	M-103B	

$1/8'' = 1'-0''$



NOT FOR
CONSTRUCTION

IC Government Center 7702-190810

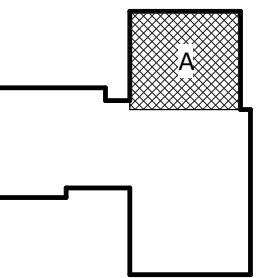
NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE

WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

KEY PLAN:



SHEET NAME:
HVAC FLOOR PLAN -
LEVEL 4 - AREA A

DATE: 2020.11.20
CURRENT: TI GMP SET

SHEET:

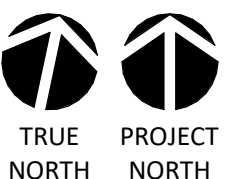
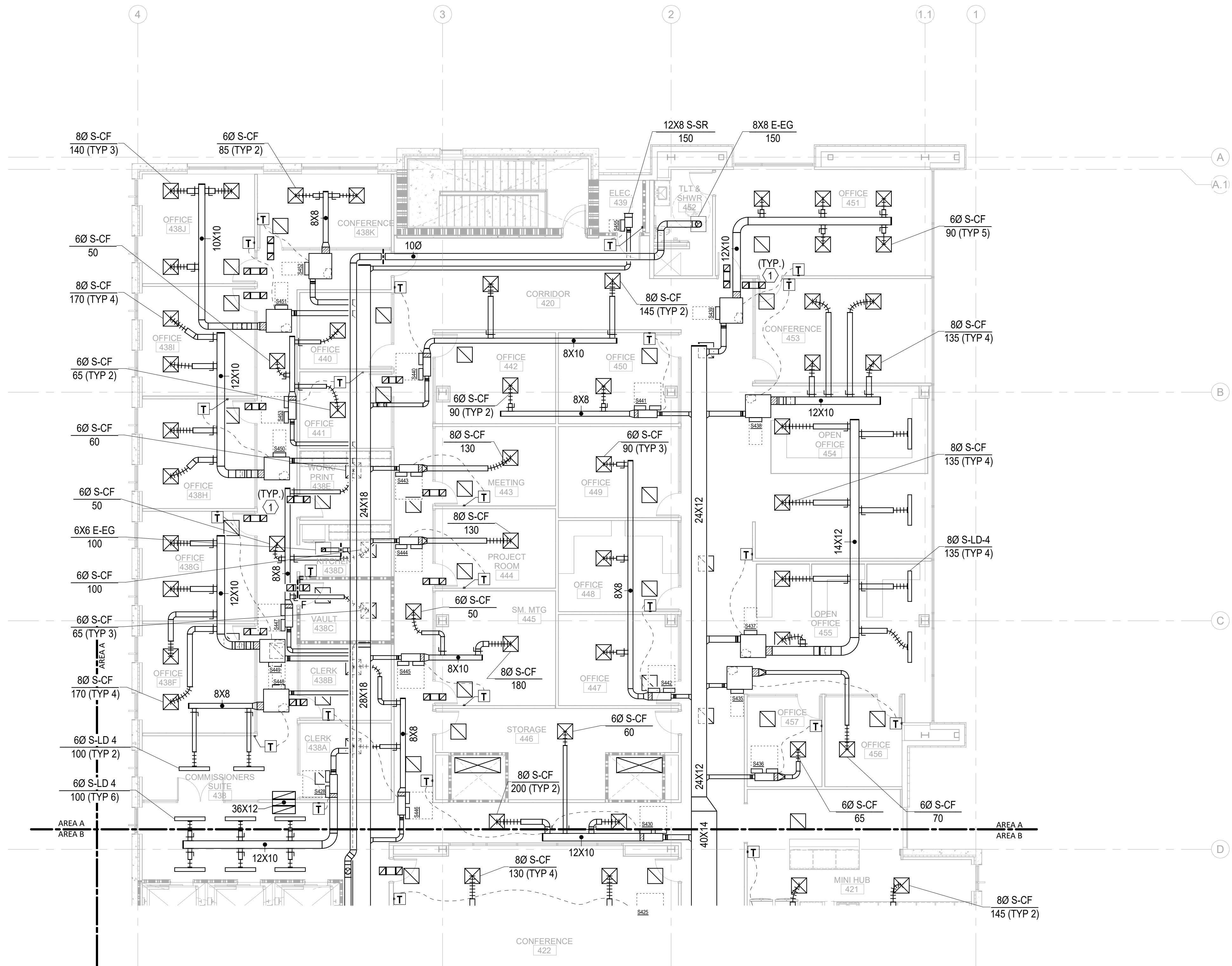
M-104A

GMP SET

KEY NOTES:

1 10X10 TRANSFER DUCT (UNO). SEE DETAIL 4/M602.

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312


$$1/8'' = 1'-0''$$

NOT FOR
CONSTRUCTION

HC Goverment Center 7702-190810

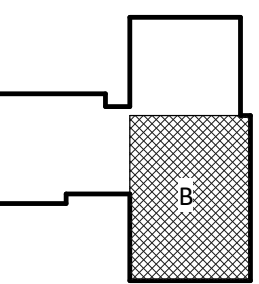
NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

Y PLAN:



HEET NAME:
HVAC FLOOR PLAN -
LEVEL 4 - AREA B

DATE: 2020.11.20
CURRENT: TI GMP SET

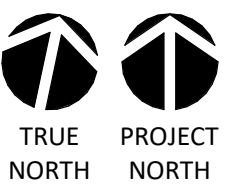
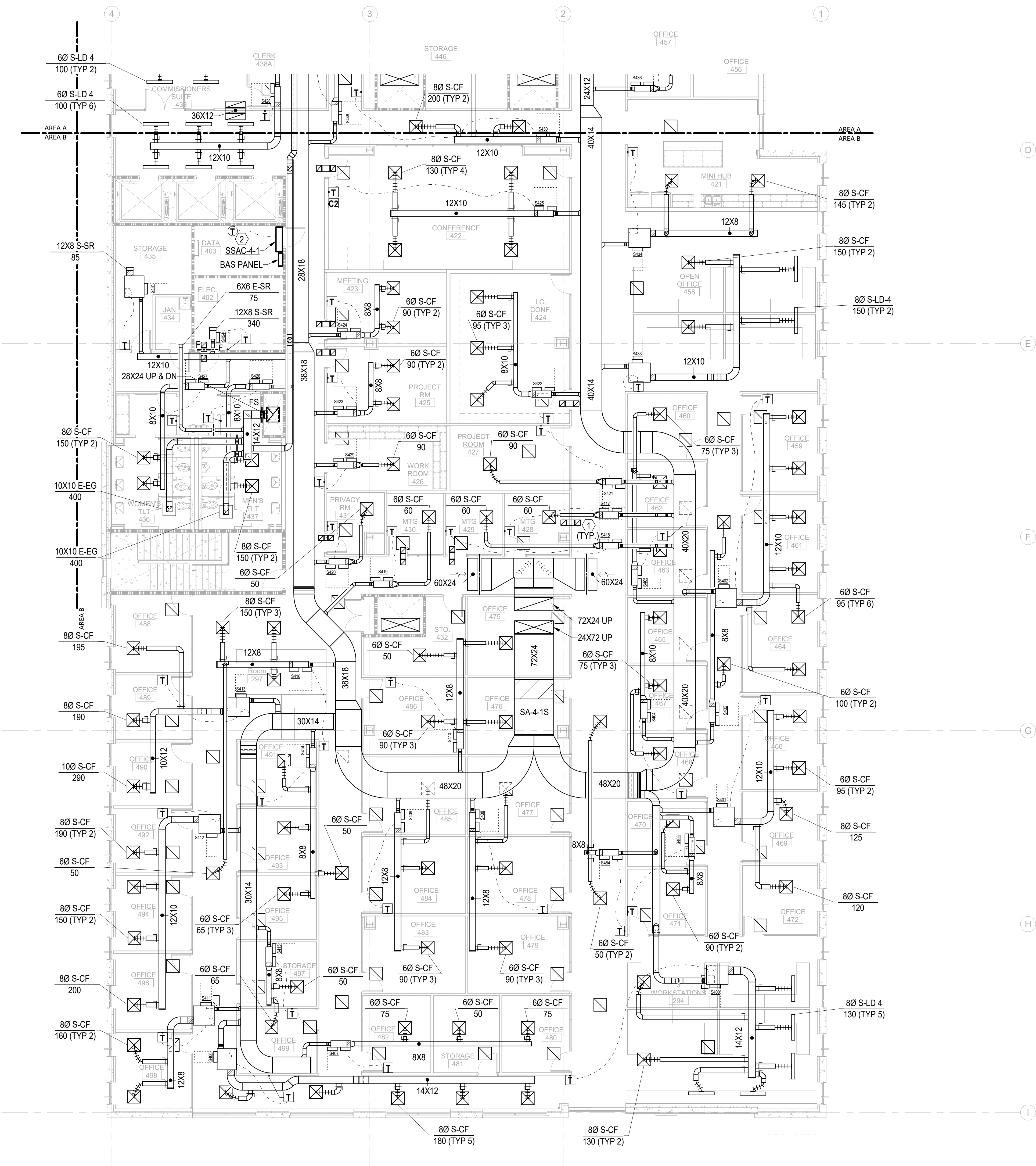
HEET: **M-104B**

GMP SET

KEY NOTES:

- 1 10X10 TRANSFER DUCT (UNO). SEE DETAIL 4/M602.
- 2 ROUTE CONDENSATE TO MOP SINK IN JAN. ROOM.

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



$1/8'' = 1'-0''$



01 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
L. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

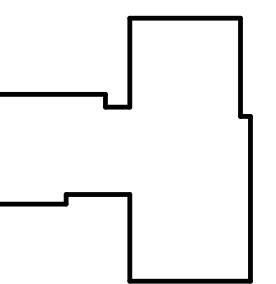
NOT FOR
CONSTRUCTION

IC Government Center 7702-190810

WILMINGTON, NC 28403

[illegible]

KEY PLAN:



SHEET NAME:
HVAC ROOF PLAN -
OVERALL

DATE: 2020.11.20
CURRENT: TI GMP SET

HEET:

M-105

I GMP SET



D

C

B

A

11/19/2020 3:01:17 PM

2	HVAC ROOF
M 10E	

1

2

3

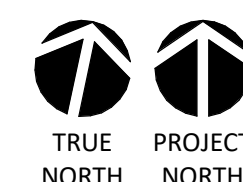
4

5

6

$$3/32'' = 1'-0''$$

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312



TRUE NORTH PROJECT
NORTH NORTH

$$3/32'' = 1'-0''$$

THE LINE SHOWN ABOVE IS
A FACILITY OVERHANGING THE
PROPERTY LINE AND IS NOT TO BE
CONSIDERED A PART OF THE
PROPERTY LINE.

E

D

C

B

A

11/19/2020 3:01:20 PM



CAPE FEAR FD STONEWATER

LS3P

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR
CONSTRUCTION

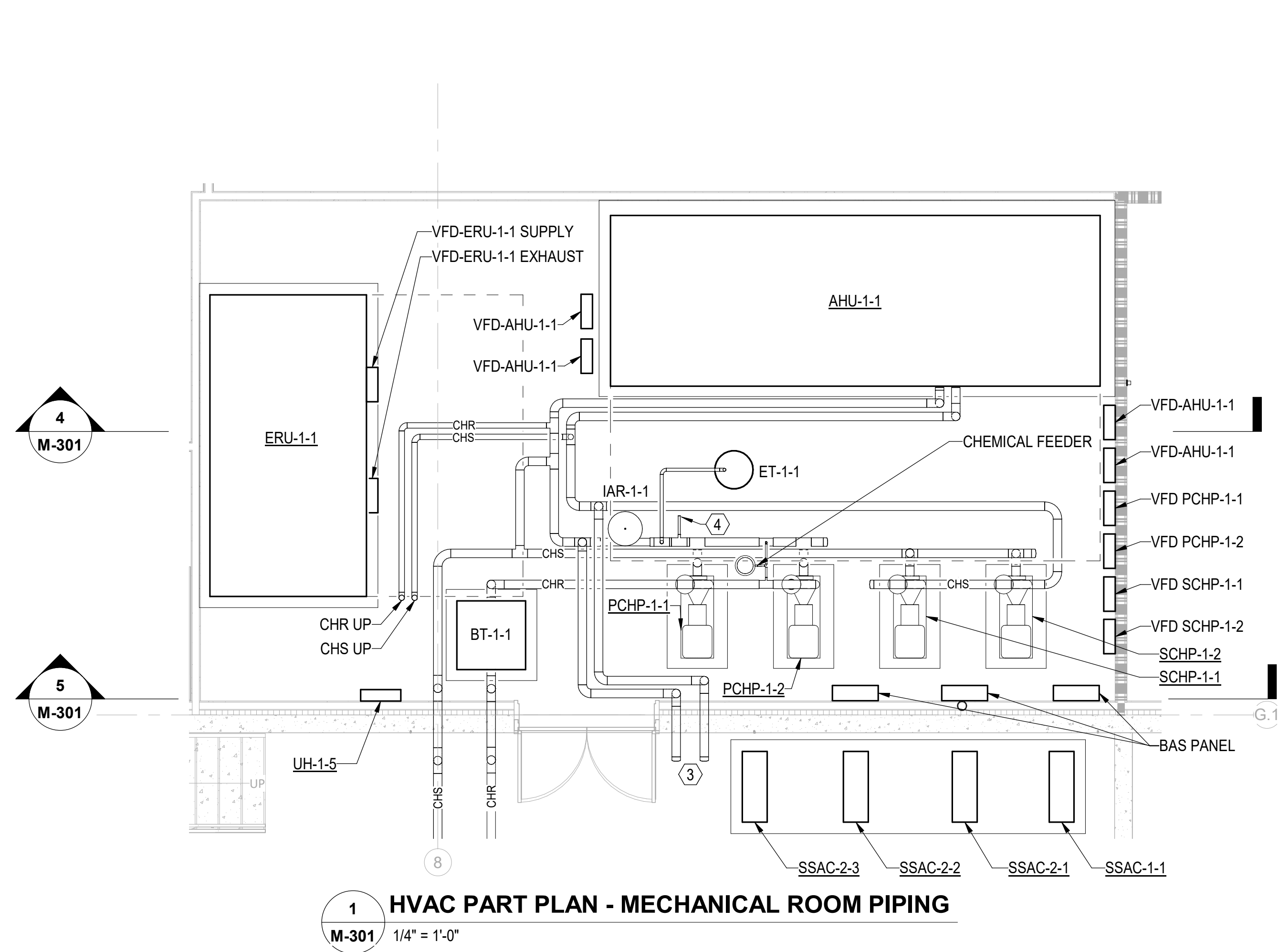
NHC Government Center 7702-190810

NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

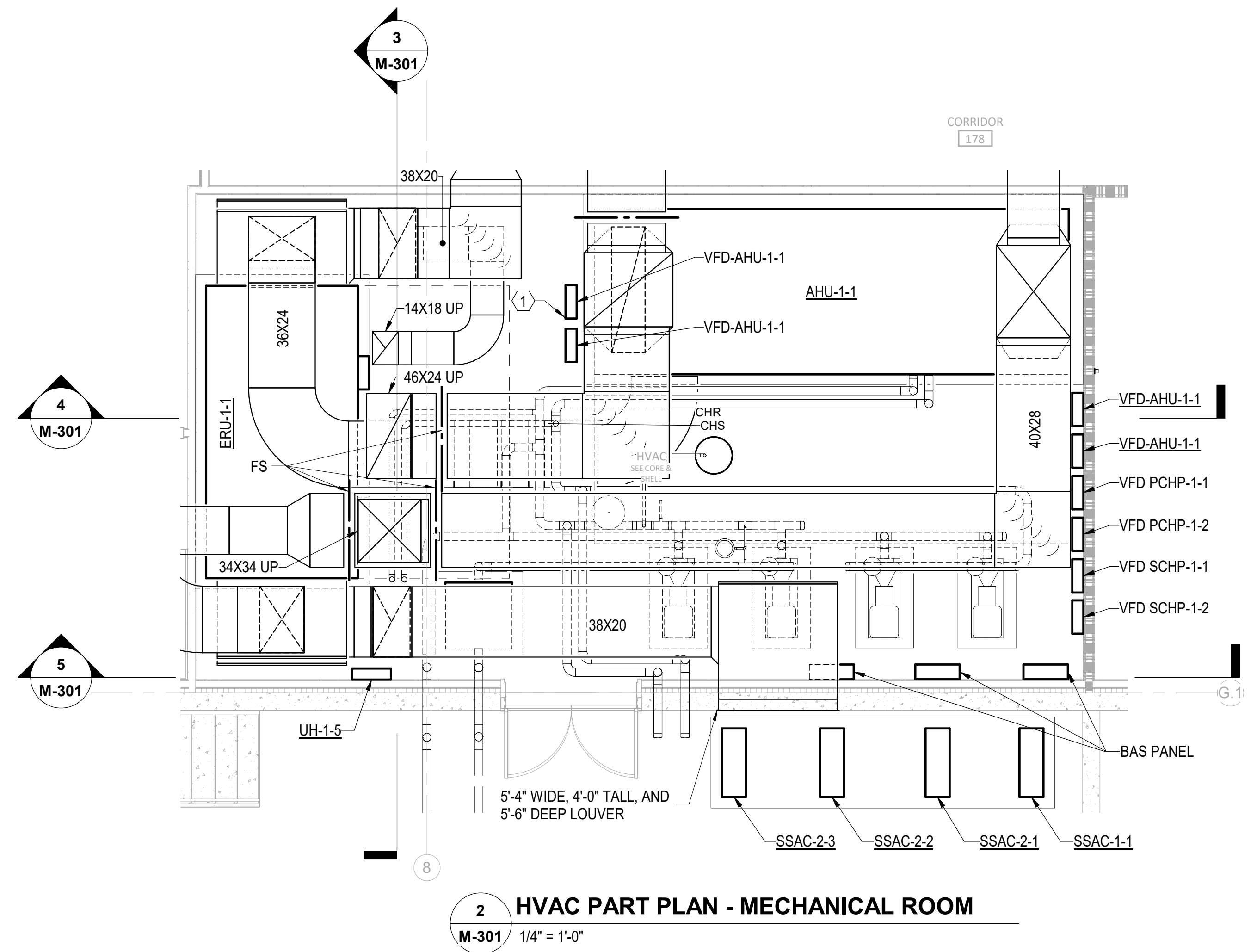
LS3P PROJECT: 7702-190810

KEY NOTES:

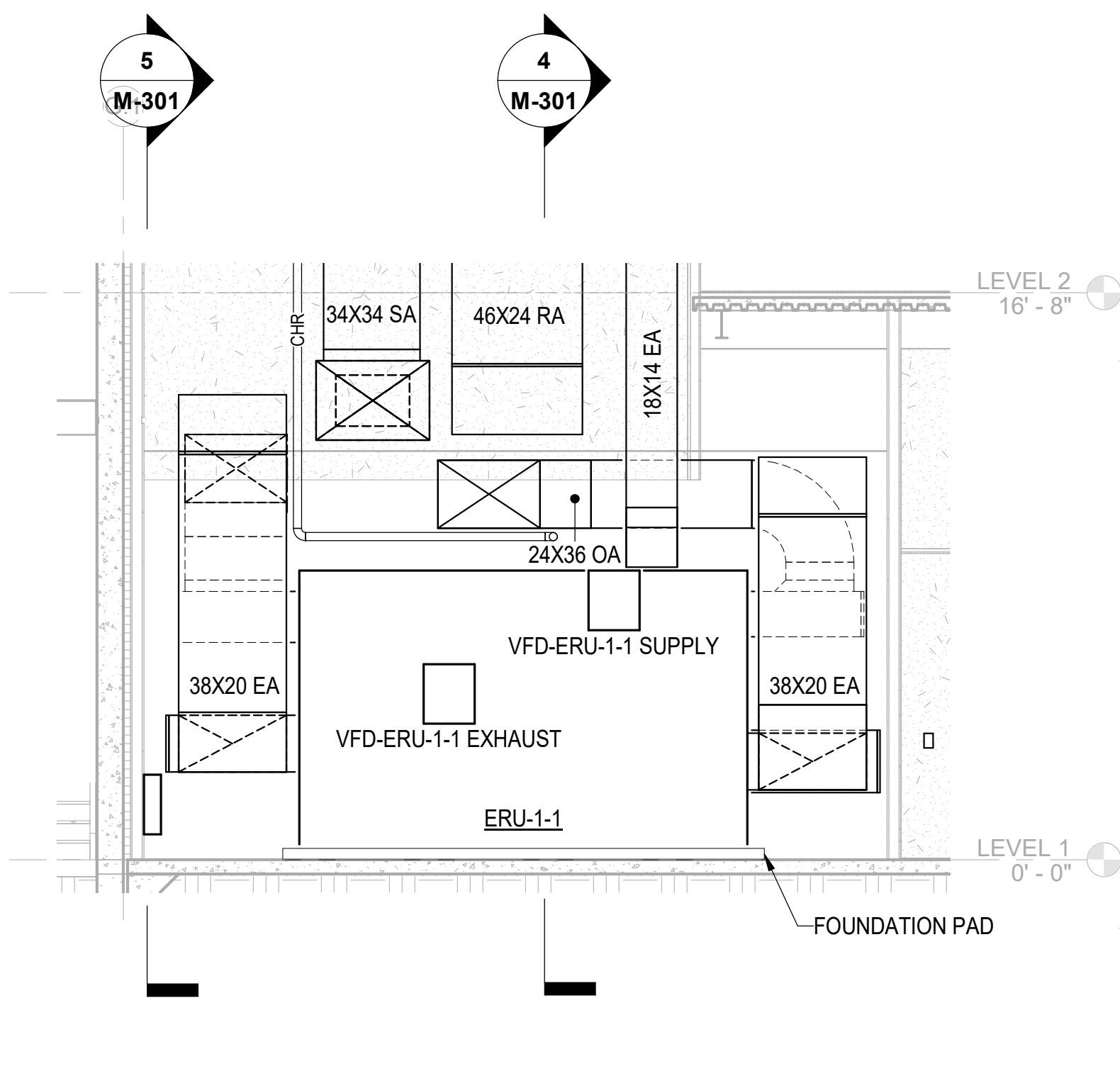
- 1 PROVIDE UNISTRUT STRUCTURE FOR BOTH AHU-1-1 VFD'S.
- 2 MAINTAIN 8'-0" CLEAR IN FRONT OF BAS PANEL.
- 3 EMERGENCY CHILLER CONNECTIONS.
- 4 1" MAKEUP WATER CONNECTION.



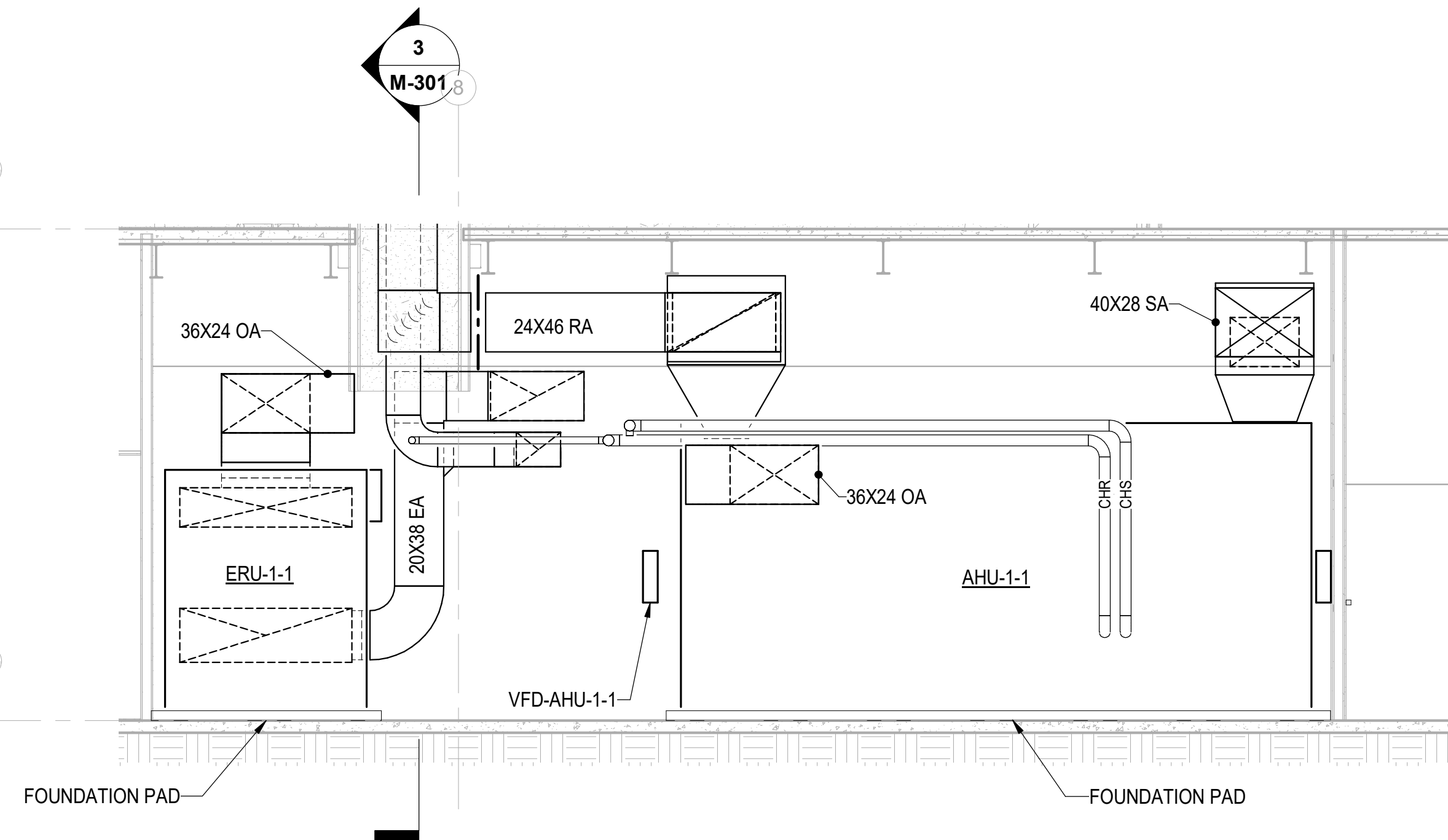
1 HVAC PART PLAN - MECHANICAL ROOM PIPING
M-301 1/4" = 1'-0"



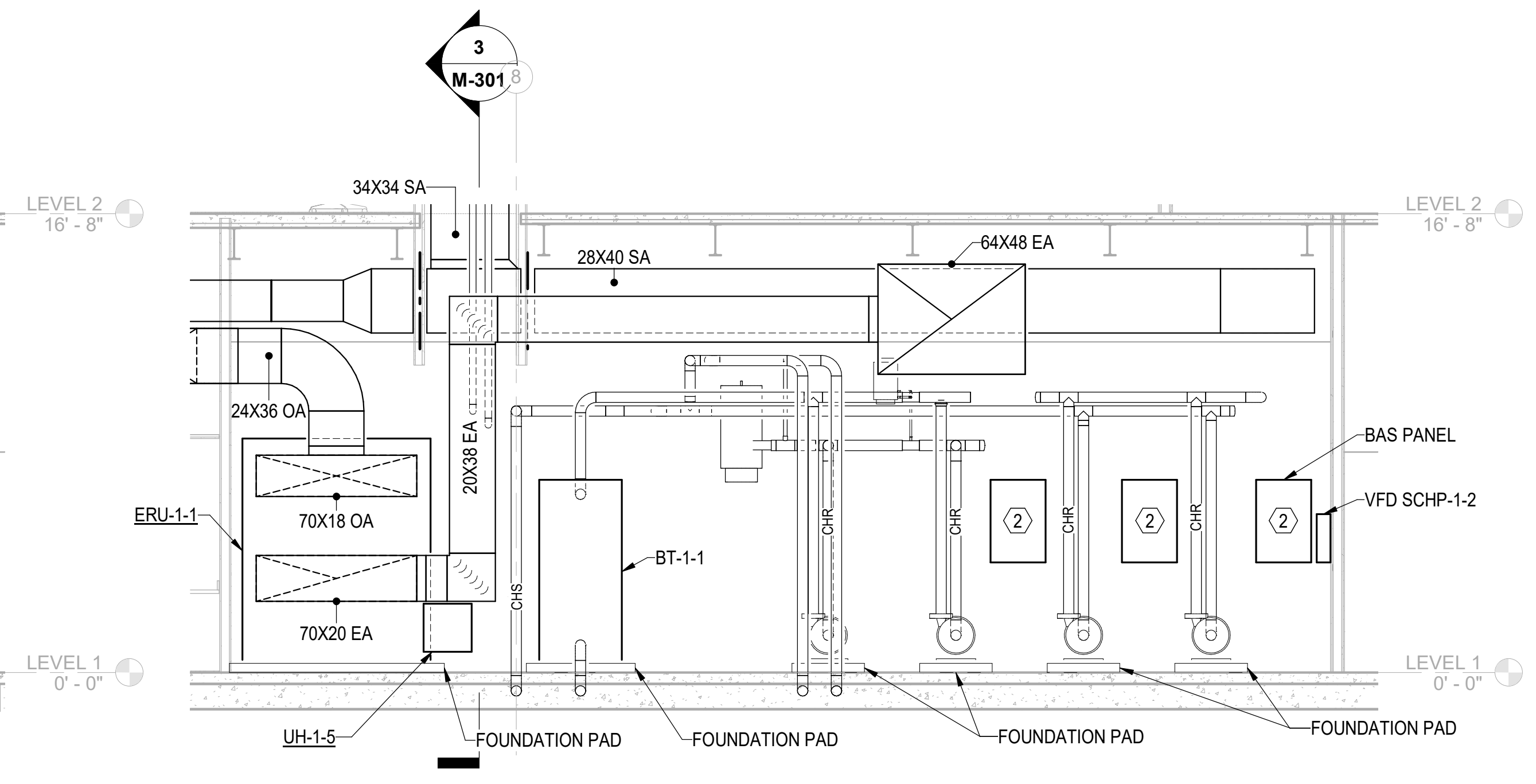
2 HVAC PART PLAN - MECHANICAL ROOM
M-301 1/4" = 1'-0"



3 HVAC PART PLAN - MECHANICAL ROOM LOOKING WEST
M-301 1/4" = 1'-0"



4 HVAC PART PLAN - MECHANICAL ROOM LOOKING NORTH 1
M-301 1/4" = 1'-0"



5 HVAC PART PLAN - MECHANICAL ROOM LOOKING NORTH 2
M-301 1/4" = 1'-0"

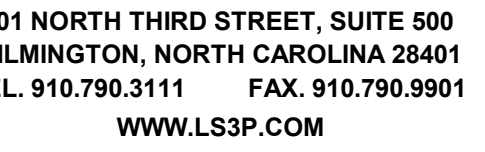
Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

SHEET NAME:
HVAC PART PLAN -
MECHANICAL PLAN

DATE:
CURRENT: 2020.11.20
TI GMP SET

SHEET:
M-301

TI GMP SET



IC Government Center 7702-190810

WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

SHEET NAME:
HVAC CHILLED WATER
FLOW SCHEMATIC
EOC

SHEET:

TI GMP SET

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

NOT FOR
CONSTRUCTION

IC Goverment Center 7702-190810

NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE

WILMINGTON, NC 28403

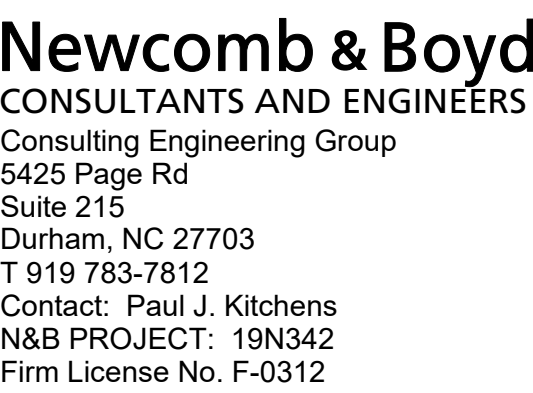
LS3P PROJECT: 7702-190810

[illegible]

HEET NAME:
VAC RISER DIAGRAM
TOWER

DATE: 2020.11.20
CURRENT: TI GMP SET

HEET: **M-402**

TI GMP SET

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

TI GMP SET

NO.	TYPE (NOTE 1)	PRIMARY AIRFLOW, CFM			FAN CFM	ELECTRIC HEATING COIL		SOUND POWER LEVEL, dB (NOTE 3)						
		MAXIMUM COOLING	MINIMUM	HEATING MAXIMUM		CAPACITY KW (NOTE 2)	NO. STEPS	OCTAVE BAND			DISCHARGE			
								2	3	4	2	3	4	
S400	FPP-R	910	230	460	460	3	6							
S401	FPP-R	435	110	220	220	2	4							
S402	FPP-R	570	140	290	290	2	4							
S403	VV-R	180	50	90		0.5	1							
S404	VV-R	225	70	110		0.5	1							
S405	VV-R	225	70	110		0.5	1							
S406	FPP-R	900	230	450	450	3	6							
S407	VV-R	200	60	100		0.5	1							
S408	VV-R	270	80	140		0.5	1							
S409	VV-R	270	80	140		0.5	1							
S410	VV-R	320	100	160		0.5	1							
S411	FPP-R	320	80	160	160	1	2							
S412	FPP-R	690	170	350	350	3	6							
S413	FPP-R	675	170	340	340	3	6							
S414	VV-R	245	70	120		0.5	1							
S415	VV-R	115	30	60		0.5	1							
S416	VV-R	500	150	250		1	2							
S417	VV-R	60	20	30		0.5	1							
S418	VV-R	60	20	30		0.5	1							
S419	VV-R	60	20	30		0.5	1							
S420	VV-R	50	20	30		0.5	1							
S421	VV-R	90	30	50		0.5	1							
S422	VV-R	285	90	140		0.5	1							
S423	VV-R	180	50	90		0.5	1							
S424	VV-R	180	50	90		0.5	1							
S425	VV-R	520	160	260		1	2							
S426	CV-R	300	90	150		0.5	1							
S427	CV-R	300	90	150		0.5	1							
S428	VV-R	600	180	300		1	2							
S429	VV-R	90	30	50		0.5	1							
S430	VV-R	460	140	230		1	2							
S431	FPP-R	85	20	40	40	1	2							
S432	VV-R	200	60	100		0.5	1							
S433	FPP-R	600	150	300	300	2	4							
S434	FPP-R	290	70	150	150	1	2							
S435	FPP-R	70	20	40	40	1	2							
S436	VV-R	65	20	30		0.5	1							
S437	FPP-R	1080	270	540	540	4	6							
S438	FPP-R	540	140	270	270	2	4							
S439	FPP-R	450	110	230	230	2	4							
S440	VV-R	290	90	150		0.5	1							
S441	VV-R	180	50	90		0.5	1							
S442	VV-R	270	80	140		0.5	1							
S443	VV-R	130	40	70		0.5	1							
S444	VV-R	130	40	70		0.5	1							
S445	VV-R	230	70	120		0.5	1							
S446	VV-R	130	40	70		0.5	1							
S447	VV-R	275	80	140		0.5	1							
S448	FPP-R	200	50	100	100	1	2							
S449	FPP-R	680	170	340	340	3	6							
S450	FPP-R	680	170	340	340	3	6							
S451	FPP-R	420	110	210	210	2	4							
S452	FPP-R	170	40	90	90	1	2							
S453	VV-R	180	50	90		0.5	1							
S454		340	100											
S454	VV-R	100	30	50		0.5	1							

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

11/19/2020 3:01:24 PM

THE LINE SHOWN INDICATES
A BACKLASH OR BACKLASH OF
THE LINE SHOWN INDICATES

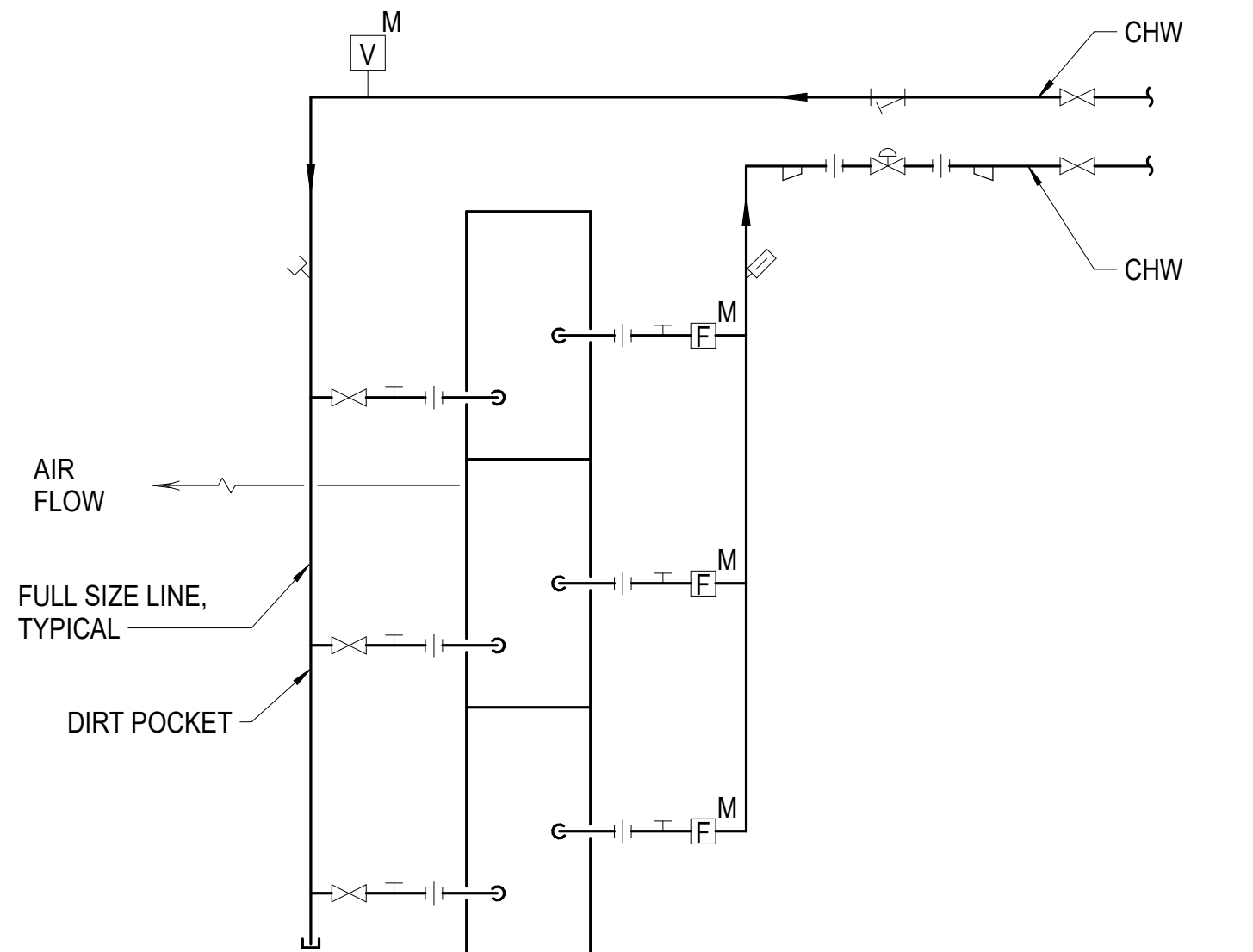
E

D

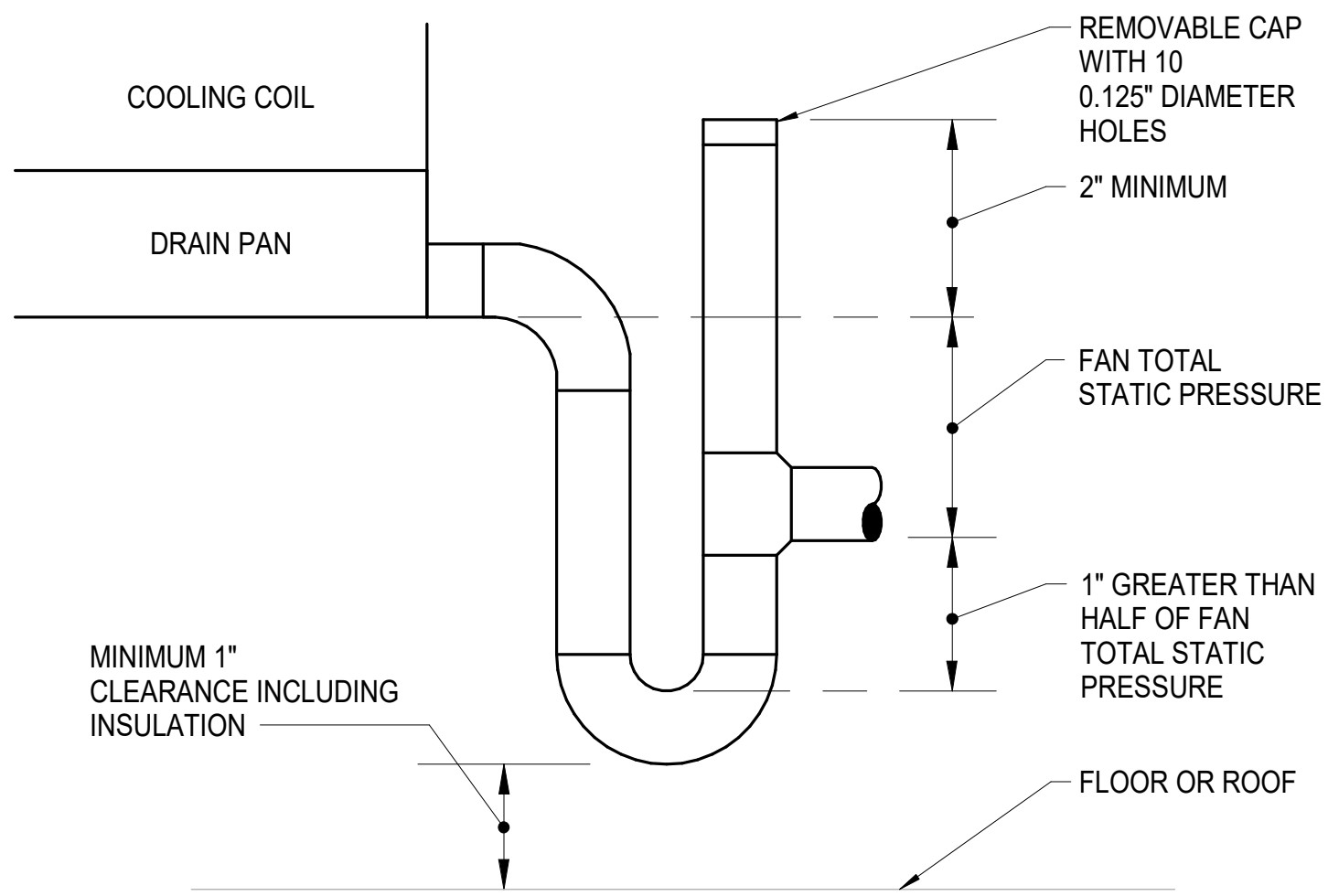
C

B

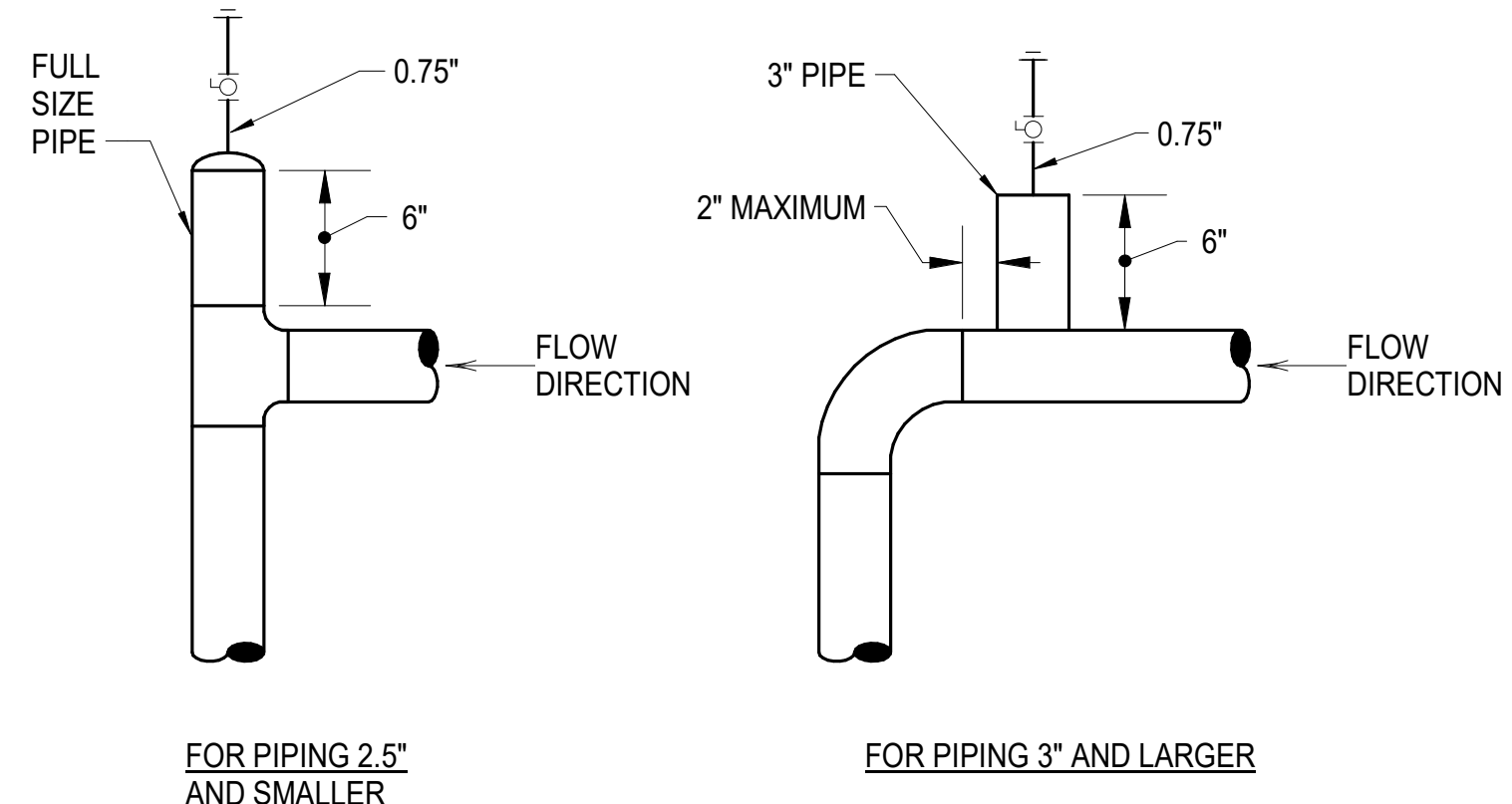
A



- NOTES:
1. COIL CONNECTIONS SHALL BE ARRANGED TO ACCOMMODATE COIL PULL AND TO ISOLATE COIL PIPING FROM SYSTEM.
 2. PROVIDE MEANS OF DRAINING AND VENTING EACH COIL.
 3. DELETE INDIVIDUAL COIL ISOLATION VALVES IN SINGLE COIL APPLICATIONS.

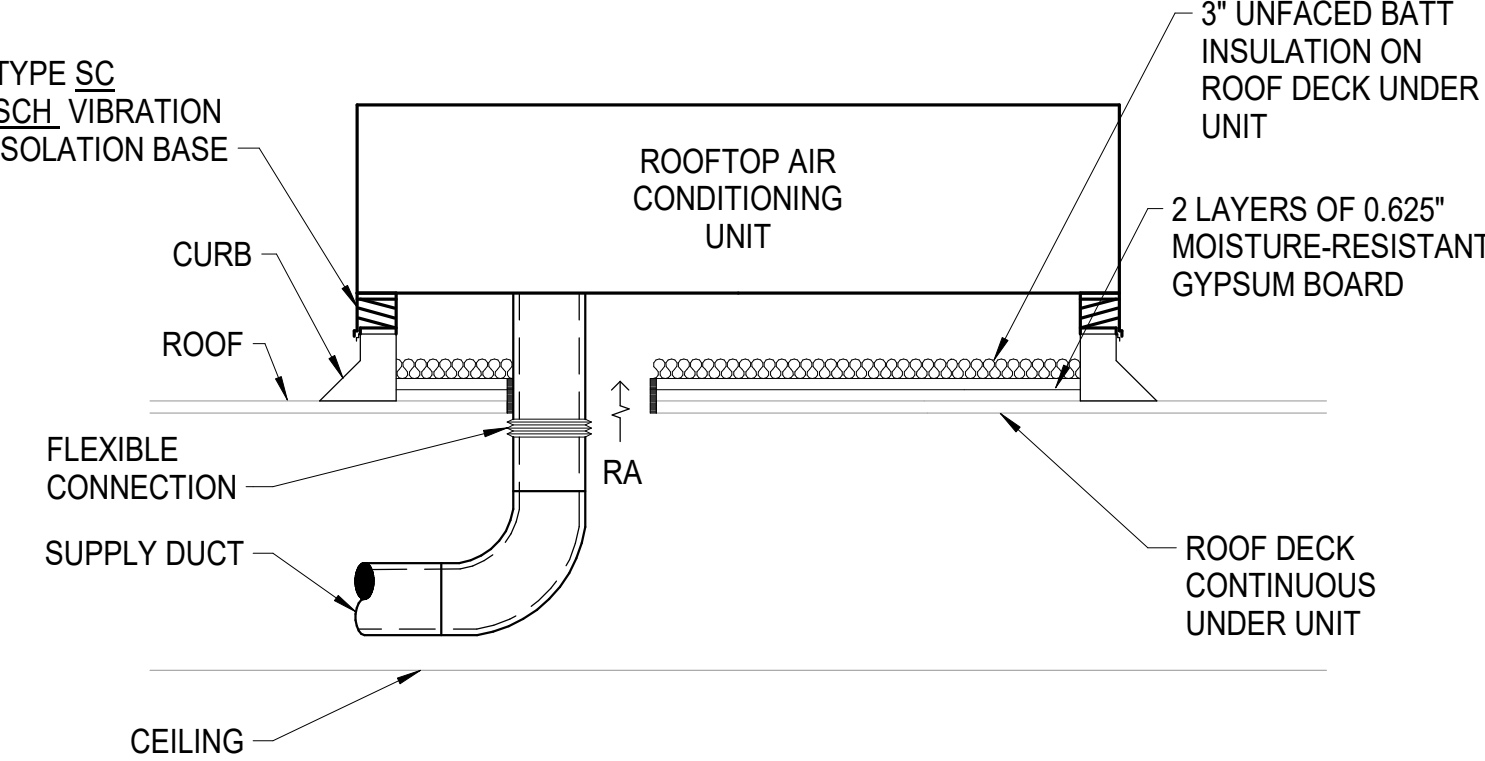
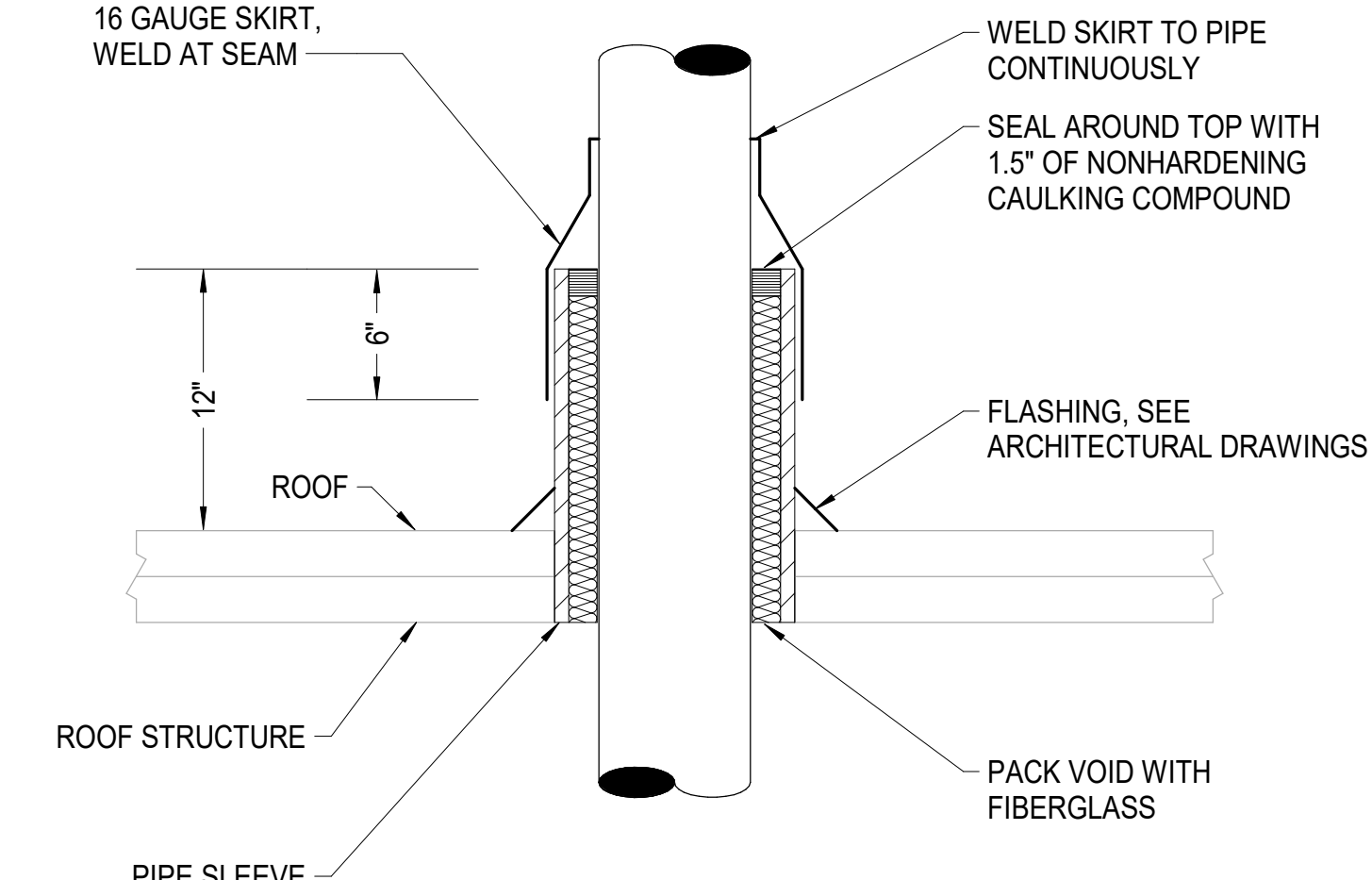


- NOTES:
1. PIPING SHALL BE FULL SIZE OF DRAIN CONNECTION.
 2. EXTEND DRAIN PIPING AS INDICATED ON THE DRAWINGS OR TO THE NEAREST INDIRECT WASTE RECEPTOR FLOOR DRAIN OR ROOF RECEPTOR ADJACENT TO EQUIPMENT.
 3. WHERE SUPPORTED, ISOLATE DRAIN PIPING FROM CLAMPS WITH TYPE PI ISOLATORS.

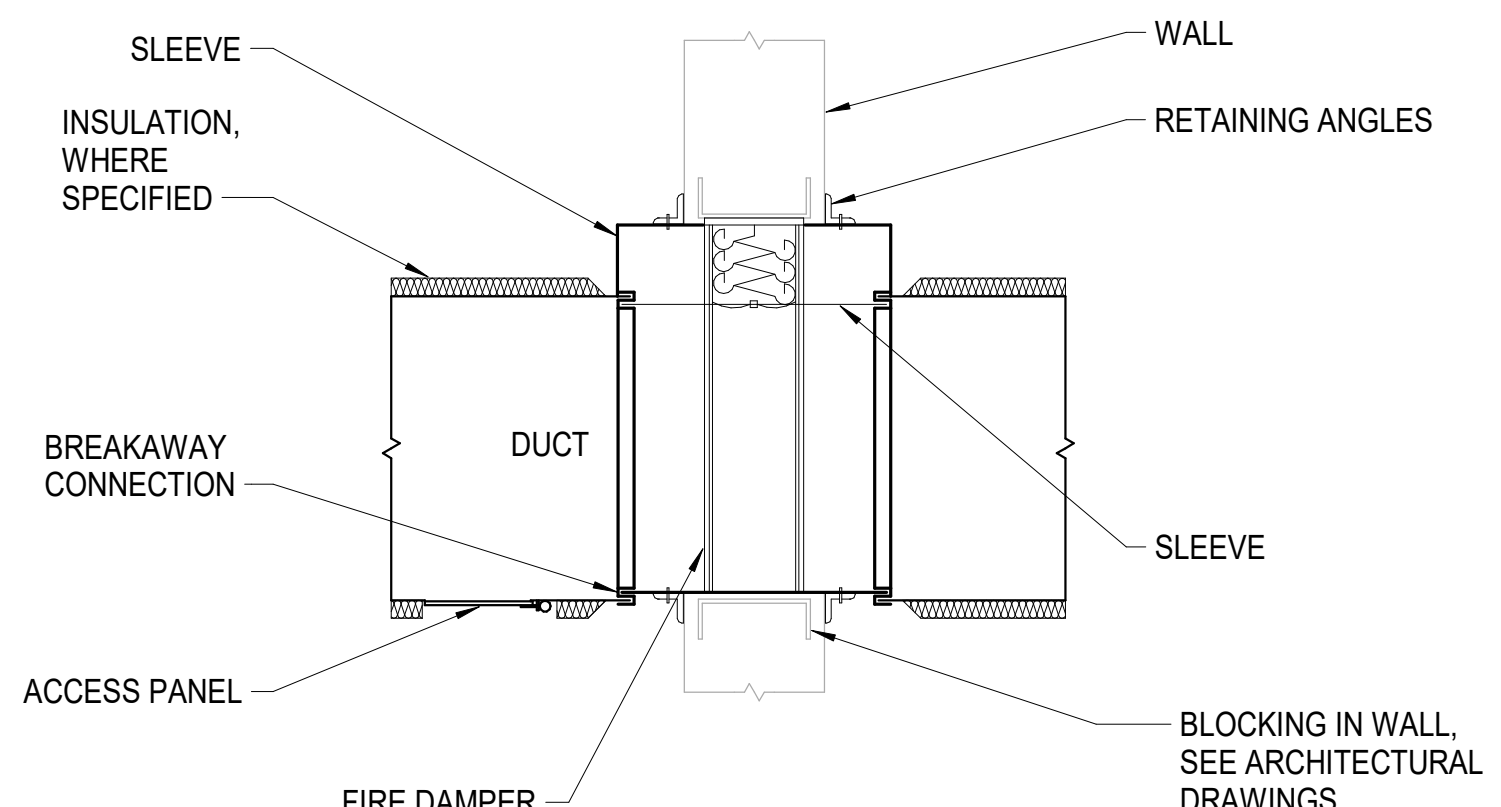
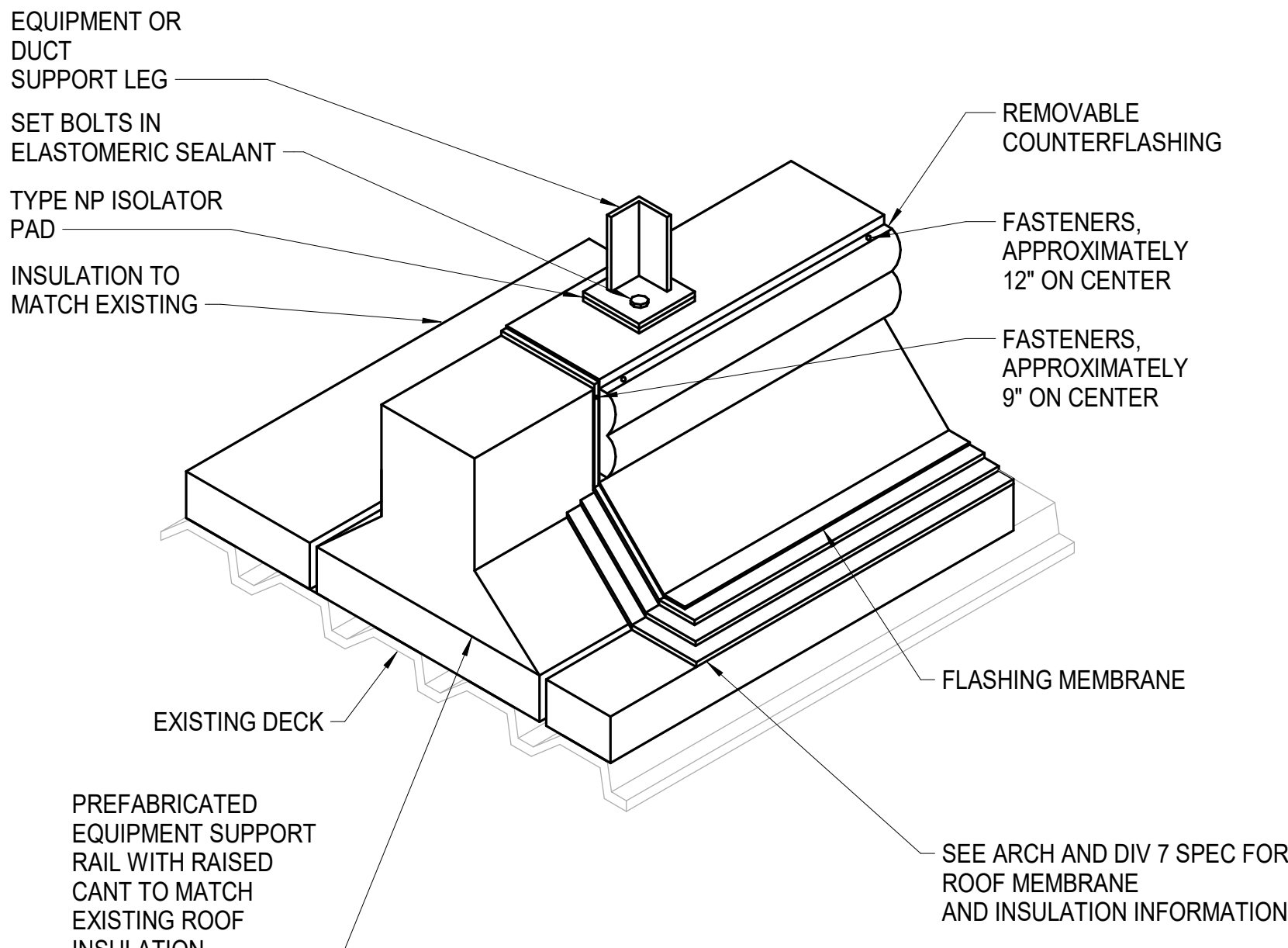


FOR PIPING 2.5" AND SMALLER

FOR PIPING 3" AND LARGER



- NOTES:
1. SEE DETAIL FOR CONDENSATE DRAIN PIPING.
 2. GYPSUM BOARD JOINTS SHALL BE STAGGERED AND TAPED AND SEALED.
 3. VENDOR TO PROVIDE CUSTOM CURB TO ALLOW RETURN PLENUM CONNECTION AS SHOWN.



- NOTES:
1. INSTALL DAMPERS IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.
 2. TAPE INSULATION TO DUCT AT BREAKAWAY CONNECTIONS. BREAKAWAY CONNECTIONS AND RETAINING ANGLES SHALL BE VISIBLE.
 3. TYPE B FIRE DAMPER SHOWN. INSTALLATION SIMILAR FOR TYPE A AND TYPE C DAMPERS.
 4. INSTALLATION SIMILAR FOR COMBINATION FIRE/SMOKE DAMPERS.
 5. SEAL BREAKAWAY CONNECTIONS.
 6. LOCATE ACCESS PANEL ON SIDE OF WALL WITH NO CEILING, OR OVER CORRIDOR CEILING, WHERE APPLICABLE.

4 M-601 PIPING ROOF PENETRATIONS

NTS

5 M-601 ROOFTOP AIR CONDITIONING UNITS

NTS

6 M-601 EQUIPMENT SUPPORT RAILS

NTS

7 M-601 DUCT WALL PENETRATIONS WITH FIRE DAMPER

NTS



CAPE FEAR FD STONEWATER

LS3P

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR CONSTRUCTION

NHC Government Center 7702-190810

NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

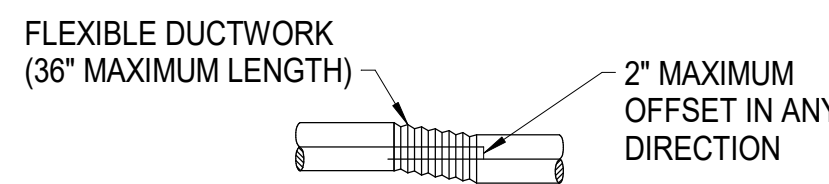
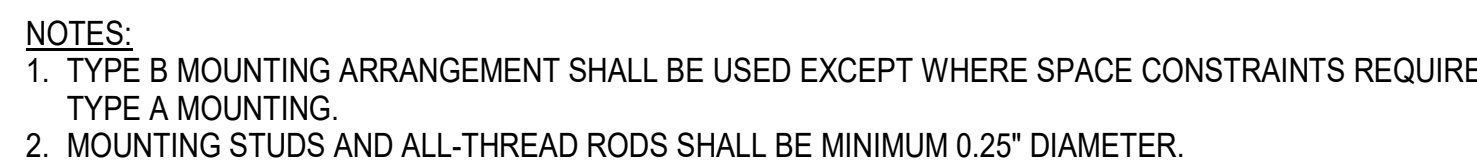
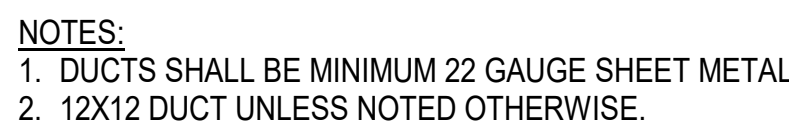
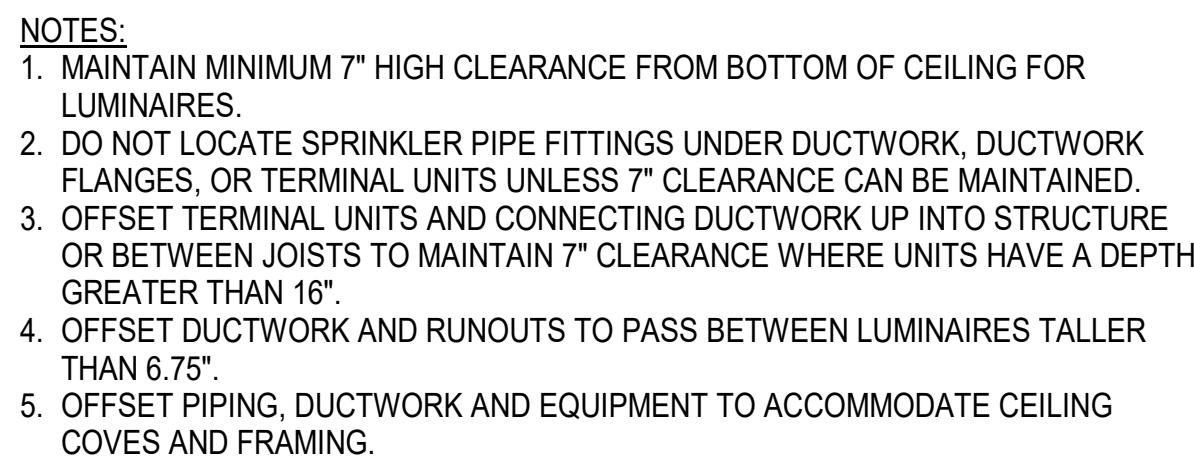
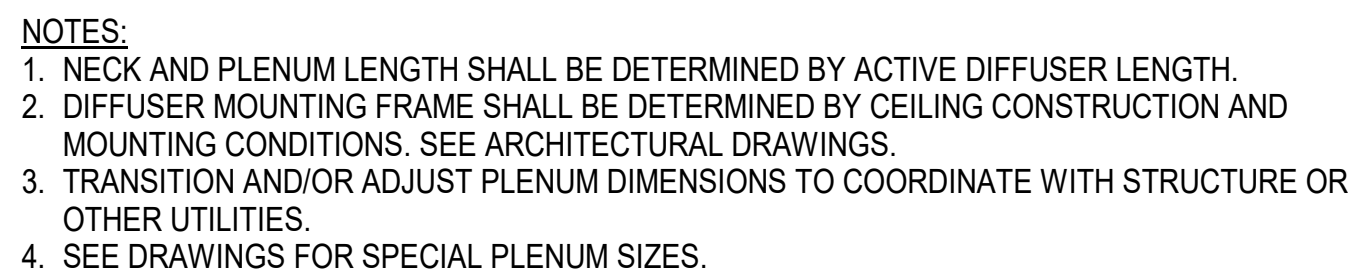
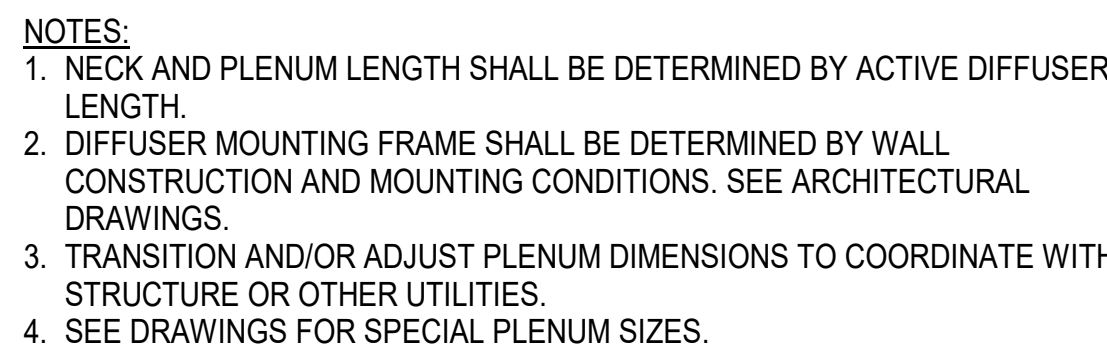
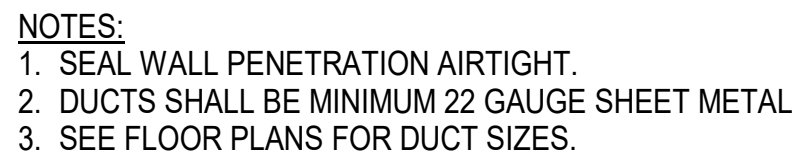
Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

SHEET NAME:
HVAC DETAILS

DATE:
CURRENT: 2020.11.20
TI GMP SET

SHEET:
M-601

TI GMP SET



NO SCALE

- NOTES:
1. ENTRY DUCT SHALL MATCH INLET COLLAR SIZE, BE INDEPENDENTLY SUPPORTED FROM THE TERMINAL UNIT, AND HAVE A TOTAL LENGTH THAT IS 3 TIMES THE DIAMETER OR WIDTH OF THE INLET COLLAR SIZE.
 2. THE RUNOUT FROM THE PRIMARY DUCT TO THE ENTRY DUCT, INCLUDING THE FLEXIBLE DUCT, SHALL BE SIZED AS FOLLOWS UNLESS NOTED OTHERWISE ON THE DRAWINGS.

INLET COLLAR AND ENTRY DUCT SIZES	RUNOUT FROM PRIMARY TO ENTRY DUCT
4"ø	8"ø
5"ø	8"ø
6"ø	10"ø
7"ø	12"ø
8"ø	12"ø
9"ø	14"ø
10"ø	14"ø
12"ø	16"ø
14"ø	18"ø
16"ø	20"ø
24"X16"	AS INDICATED ON PLANS

3. FOR ROUND TAKEOFF CONNECTIONS TO ROUND OR FLAT OVAL PRIMARY SUPPLY DUCTS, PROVIDE A CONICAL TAP IN LIEU OF A SIDE TAKEOFF FITTING.
4. FOR AIR HANDLING SYSTEMS WHERE THE PRIMARY SUPPLY DUCT DISTRIBUTION IS PROVIDE A CONICAL TAP IN LIEU OF A SIDE TAKEOFF FITTING. FITTINGS SHALL BE CONCENTRIC TYPE.

5	TERMINAL UNIT INLET	NTS
M-602		

2 M-602		LINEAR DIFFUSERS	NTS	3 M-602		SIDEWALL LINEAR DIFFUSERS	NTS	4 M-602		TRANSFER DUCTS	NTS
SLAB 1" LINING TEMPERATURE SENSOR LOCATED INSIDE DUCT 12X12 R-EG CEILING NOTES: 1. DUCTS SHALL BE MINIMUM 22 GAUGE SHEET METAL. 2. 12X12 DUCT UNLESS NOTED OTHERWISE.				MAINTAIN CLEARANCE, TYPICAL NEOPRENE ISOLATION PADS (TYPE NS VIBRATION ISOLATORS), TYPICAL EXPANSION ANCHOR, TYPICAL CONCRETE STRUCTURE 50 DUROMETER NEOPRENE WASHER AND GROMMET STEEL WASHER, TYPICAL NUT, TYPICAL MOUNTING STUD MOUNTING BRACKET ALL-THREAD ROD 1" x 1" x 0.125" ANGLE IRON OR 1" UNISTRUT TYPE NH ISOLATION HANGER FAN POWERED BOX TYPE A FAN POWERED BOX TYPE B NOTES: 1. TYPE B MOUNTING ARRANGEMENT SHALL BE USED EXCEPT WHERE SPACE CONSTRAINTS REQUIRE TYPE A MOUNTING. 2. MOUNTING STUDS AND ALL-THREAD RODS SHALL BE MINIMUM 0.25" DIAMETER.							
6 M-602		TRANSFER DUCTS	NTS	7 M-602		FAN COIL UNIT MOUNTINGS WITH VIBRATION ISOLATION	NTS				



01 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
L. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR
CONSTRUCTION

IC Government Center 7702-190810

NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

SHEET NAME:
HVAC DETAILS

DATE: 2020.11.20
CURRENT: TI GMP SET

MEET: **M-603**

M-603

I GMP SET



ALL DIMENSIONS ARE
MAXIMUM ALLOWABLE



ALL DIMENSIONS ARE
MAXIMUM ALLOWABLE

1	AIR HANDLING UNIT	NTS	2	ENERGY RECOVERY UNIT	NTS
M-603			M-603		



ALL DIMENSIONS ARE
MAXIMUM ALLOWABLE

3	ROOFTOP UNIT	NTS
M-603		

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

11/19/2020 3:01:25 PM

[illegible]

SHEET NAME:
HVAC DETAILS

DATE: 2020.11.20
CURRENT: TI GMP SET

SHEET:

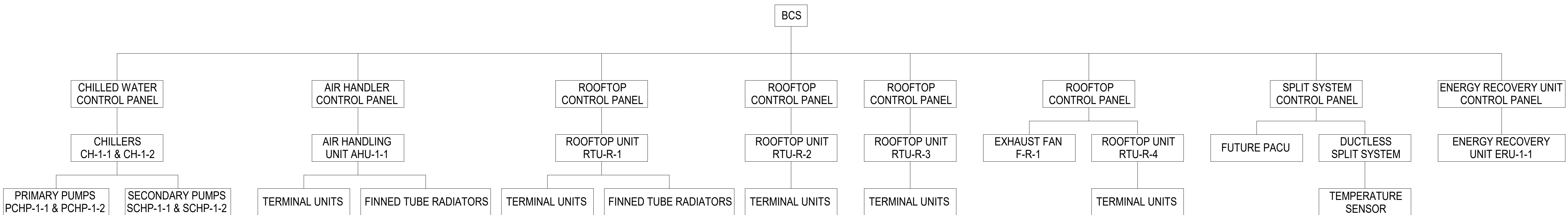
M-604

I GMP SET

HVAC CONTROLS GENERAL NOTES:

- A. VARIABLE FREQUENCY DRIVES SHALL START AT LOW SPEED. WHEN 2 OR MORE VARIABLE SPEED FANS OPERATE IN PARALLEL, THEIR SPEEDS SHALL BE SYNCHRONIZED AND CONTROLLED FROM A COMMON SIGNAL.
- B. WHEN VARIABLE SPEED PUMPS OPERATE IN PARALLEL WITH CONSTANT SPEED PUMPS, THE BCS CONTROLLER SYSTEM SHALL OPERATE AND MAINTAIN THE VARIABLE SPEED PUMPS AT FULL SPEED WHENEVER A CONSTANT SPEED PUMP IS IN OPERATION.
- C. VARIABLE FREQUENCY DRIVES SHALL NOT OPERATE BELOW THE MINIMUM SPEED SET ON ITS CONTROL PANEL. MINIMUM SPEED SETTING SHALL BE DETERMINED DURING SYSTEM COMMISSIONING AND SHALL NOT BE LOWER THAN THE MOTOR MANUFACTURER'S RECOMMENDATION.
- D. EQUIPMENT SAFETIES SHALL BE WIRED INTO VARIABLE FREQUENCY DRIVE CONTROL CIRCUITS.
2. INDICATION OF EQUIPMENT OPERATING STATUS AND ACTUATION OF CONTROL SEQUENCES SHALL BE ACCOMPLISHED BY CURRENT SENSING RELAYS UNLESS OTHERWISE INDICATED IN THE I/O SUMMARIES.
3. UPON POWER FAILURE AND RESTORATION, SYSTEMS SHALL AUTOMATICALLY RESTART AND RETURN TO THEIR NORMAL MODE OF OPERATION. ADJUSTABLE TIME DELAYS SHALL BE PROVIDED TO SEQUENTIALLY STAGE STARTING OF EQUIPMENT WITH MOTORS GREATER THAN 5 HP OR ELECTRIC HEATING LOADS GREATER THAN 4 kW.
4. HAND-OFF-AUTOMATIC SWITCHES:

 - A. SAFETY DEVICES, INCLUDING FIRE ALARM SYSTEM RELAYS AND EMERGENCY FAN SHUTDOWN STATIONS, SHALL BE WIRED IN SERIES WITH THE MOTOR CONTROLLER HOLDING COIL CIRCUIT AND SHALL BE ACTIVE IN THE HAND AND AUTOMATIC POSITIONS.
 - B. INTERLOCKING WITH OTHER FANS, EQUIPMENT, OR SYSTEMS OTHER THAN THOSE REQUIRED FOR THE OPERATION OF THE SPECIFIC EQUIPMENT SHALL BE THROUGH AUTOMATIC POSITIONS ONLY.
 - C. REMOTE CONTROL FROM THE BCS SYSTEM SHALL BE THROUGH AUTOMATIC POSITIONS.
 - D. HAND POSITION SHALL BE FOR MAINTENANCE OPERATION ONLY.
 - E. OPERATION IN HAND POSITION SHALL ENERGIZE ASSOCIATED DAMPERS AND EQUIPMENT NECESSARY TO ALLOW OPERATION.
5. CONTROLS SHALL FAIL AS SPECIFIED HEREIN, OR TO MINIMIZE POSSIBILITY OF DAMAGE ON FAILURE IF NOT SPECIFIED HEREIN.
6. CONTROL SETPOINTS SHALL BE ADJUSTABLE OVER THE RANGE OF THE SENSED MEDIA. MEANS OF ADJUSTMENT AND CURRENT SETPOINT SHALL BE IDENTIFIED. BCS SETPOINTS AND ALARM LIMITS SHALL BE PROGRAMMED AS VARIABLES, EXPRESSED IN THE APPROPRIATE ENGINEERING UNITS, WHICH CAN BE ADJUSTED THROUGH THE DIGITAL DISPLAY UNIT OR FROM A CENTRAL STATION WITHOUT REQUIRING MODIFICATION OR RELOADING OF THE BCS CONTROL PROGRAMS. CONTROL, ALARM, AND LIMIT SETPOINTS FOR EACH BCS CONTROLLER SHALL BE DISPLAYED AND SHALL BE ADJUSTABLE FROM AN APPROPRIATE PASSWORD-PROTECTED TABULAR GRAPHIC DISPLAY ASSOCIATED WITH THE APPROPRIATE EQUIPMENT. SETPOINTS OR ALARM LIMITS COMMON TO MULTIPLE CONTROL ALGORITHMS SHALL BE CONFIGURED AS A COMMON VARIABLE, REQUIRING A SINGLE ADJUSTMENT, PROVIDE AND ADJUST TIME DELAYS FOR SMOOTH AND SAFE OPERATION OF SYSTEMS.
7. CONTROL OUTPUTS SHALL PROVIDE MAXIMUM RATED ACTUATOR POWER AT EXTREMES OF ACTUATOR TRAVEL. CONTROL OUTPUT RANGE (0%-100%) SHALL CORRESPOND TO ACTUATOR TRAVEL (0%-100%).
8. WHERE SYSTEMS ARE SERVED BY EMERGENCY POWER, CONTROLS FOR OPERATION OF THOSE SYSTEMS SHALL ALSO BE SERVED BY EMERGENCY POWER.
9. WHERE DAMPERS PREVENT AIRFLOW THROUGH AN AIR HANDLING UNIT OR FAN, THOSE DAMPERS SHALL BE PROVEN OPEN PRIOR TO STARTING THE UNIT OR FAN. PROOF SHALL BE BY MECHANICAL SAFETY LIMIT SWITCH ACTIVATED BY THE DAMPER BLADE. THIS SWITCH SHALL BE WIRED IN THE AUTOMATIC AND HAND/TEST POSITIONS.



Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

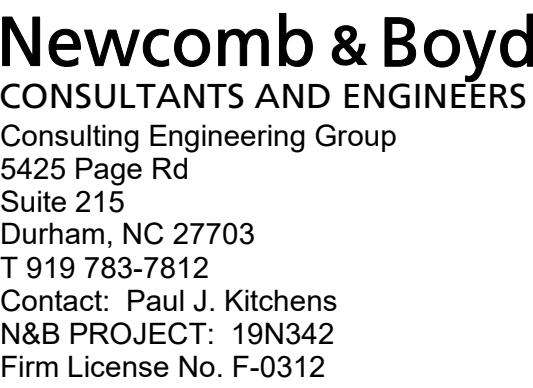
NOTES:

1. FAILURE MODE
 - O - ON OR OPEN
 - C - OFF OR CLOSE
 - L - LAST COMMAND
2. WHERE FAILURE MODE IS INDICATED, THE INDICATED POSITION SHALL OCCUR ON FAILURE OF THE BCS CONTROLLER OR ITS OUTPUT FOR ANY REASON.
3. LOCATE OUTSIDE AIR TEMPERATURE SENSOR ON A NORTH FACING WALL OUT OF DIRECT SUNLIGHT.
4. FAN SHALL FAIL TO 50% SPEED.
5. PROVIDE SCR ELECTRIC HEAT CONTROL.

THE CONTROLS FOR SYSTEM AHU-1-1 SHALL FUNCTION AS FOLLOWS:

NOTES:

1. FAILURE MODE
O - ON OR OPEN
C - OFF OR CLOSE
L - LAST COMMAND
2. WHERE FAILURE MODE IS INDICATED, THE INDICATED POSITION SHALL OCCUR ON FAILURE OF THE BCS CONTROLLER OR ITS OUTPUT FOR ANY REASON.
3. FAN SHALL FAIL TO 50% SPEED.

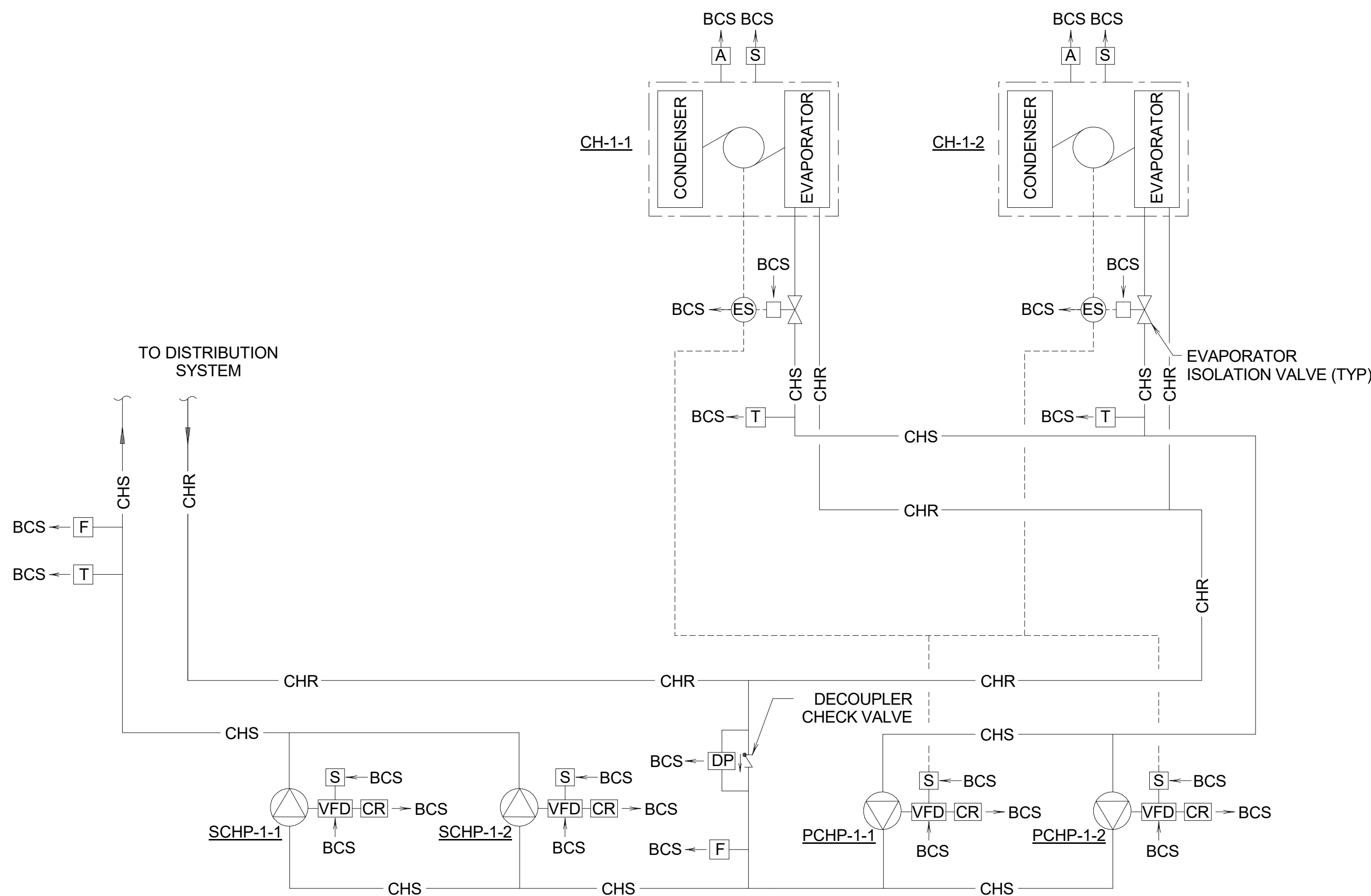


BCS CONTROLLERS
INPUT/OUTPUT
SUMMARY
PRIMARY-SECONDARY
REFRIGERATION PLANT

BCS CONTROLLERS INPUT/OUTPUT SUMMARY PRIMARY-SECONDARY REFRIGERATION PLANT		SYSTEM GRAPHIC DISPLAY	OUTPUTS		INPUTS		SOFTWARE				NOTES	
			DIGITAL	ANALOG	DIGITAL	ANALOG	ALARM	BCS	ENERGY MGMT.			
		START/STOP ENABLE/DISABLE OPEN/CLOSE SETPOINT ADJUST BCS CONTROL CURRENT SENSING RELAY DIFFERENTIAL PRESSURE SWITCH AUXILIARY CONTACT PULSE CONTACT POSITION FEEDBACK DEMAND LIMIT TEMPERATURE RELATIVE HUMIDITY FLOW PRESSURE LOAD AMPS SYSTEM LOCK HIGH/LOW LIMIT RUN TIME TOTALIZATION REFRIGERANT LEAK VIBRATION PROPORTIONAL PROPORTIONAL + INTEGRAL SCHEDULED START/STOP OPTIMUM START/STOP DAY/NIGHT SETBACK DEMAND LIMIT CYCLE RESET OPTIMIZATION ECONOMIZER										
REFRIGERANT PLANT	X											
CHILLER CH-1 ENABLE/DISABLE		X						X				3.5
CHILLER CH-1 STATUS								X				5
CHILLER CH-1 ALARM					X			X				5
CHILLER CH-1 EVAPORATOR ISOLATION VALVE		X			X					X		5
CHILLER CH-1 EVAPORATOR ISOLATION VALVE ENDSWITCH						X						5
CHILLER CH-1 LEAVING CHILLED WATER TEMPERATURE						X						5
CHILLER CH-1 RUNNING AMPERES								X				5
DECOUPLER BRIDGE CHECK VALVE DIFFERENTIAL PRESSURE								X				
DECOUPLER BRIDGE FLOW							X					
PRIMARY CHILLED WATER PUMP PCHP-1 START/STOP	X				X							6
PRIMARY CHILLED WATER PUMP PCHP-1 STATUS				X				X	X			6
PRIMARY CHILLED WATER PUMP PCHP-1 AND PCHP-2 VFD SPEED			X							X		4
SECONDARY CHILLED WATER PUMP SCHP-1 START/STOP	X											7
SECONDARY CHILLED WATER PUMP SCHP-1 STATUS				X				X				7
SECONDARY CHILLED WATER PUMP SCHP-1 AND SCHP-2 VFD SPEED			X							X		4
SECONDARY CHILLED WATER FLOW							X					
SYSTEM CHILLED WATER SUPPLY TEMPERATURE						X		X				

NOTES:

1. FAILURE MODE
 - O - ON OR OPEN
 - C - OFF OR CLOSE
 - L - LAST COMMAND
2. BCS CONTROLS AND INTERFACES SHALL BE ARRANGED SO THAT EQUIPMENT CONTROLLED BY THE BCS OPERATES AS INDICATED ON FAILURE OF THE BCS CONTROLLER FOR ANY REASON, INCLUDING LOGIC POWER SUPPLY FAILURE, CPU LOCK-UP, OR INTERPOSING RELAY FAILURE. SAFETY AND OPERATIONAL INTERLOCKS SHALL REMAIN IN EFFECT.
3. PROVIDE BACNET CONNECTION TO CHILLERS AND VSDs.
4. ACTIVE IDENTICAL EQUIPMENT SHALL BE CONTROLLED FROM A COMMON SIGNAL.
5. PROVIDE IDENTICAL POINTS FOR EACH CHILLER.
6. PROVIDE IDENTICAL POINTS FOR EACH PRIMARY CHILLED WATER PUMP.
7. PROVIDE IDENTICAL POINTS FOR EACH SECONDARY PUMP.



SEQUENCE OF OPERATION

THE CONTROLS FOR THE REFRIGERATION PLANT SHALL FUNCTION AS FOLLOWS:

1. **CHILLER ENABLE :** AFTER INTERNAL CHILLER SAFETIES ARE SATISFIED, THE CHILLER START SEQUENCE SHALL BE INITIATED. THE BCS CONTROLLER SHALL ENABLE THE LEAD CHILLER UPON A RISE IN OUTSIDE AIR TEMPERATURE ABOVE SETPOINT OR WHEN ANY AIR HANDLING UNIT IS OPERATING WITH CHILLED WATER VALVE OPEN.
2. **LEAVING CHILLED WATER TEMPERATURE SETPOINT :** THE CHILLER SHALL OPERATE UNDER INTERNAL CONTROLS TO MAINTAIN 44°F LEAVING CHILLED WATER TEMPERATURE.
3. **PUMP ENABLE :** WHEN A CHILLER IS ENABLED, THE BCS CONTROLLER SHALL START A PRIMARY CHILLED WATER PUMP. UPON PROOF OF PUMP OPERATION, BCS CONTROLLER SHALL OPEN THE 2-POSITION EVAPORATOR ISOLATION VALVE IN THE CHILLER DISCHARGE. AFTER INTERNAL SAFETIES ARE SATISFIED, THE CHILLER COMPRESSOR SHALL START AND OPERATE UNDER INTERNAL CONTROLS TO MAINTAIN 44°F DISCHARGE WATER TEMPERATURE.
4. **EVAPORATOR ISOLATION VALVE AND CONDENSER WATER VALVE ALARM :** THE BCS CONTROLLER SHALL ANNUNCIATE AN ALARM AND STOP A PRIMARY CHILLED WATER PUMP WHENEVER THE EVAPORATOR ISOLATION VALVE IS NOT PROVEN OPEN AND THE NEWLY STARTED PUMP HAS BEEN OPERATING FOR 3 MINUTES (ADJUSTABLE). THE BCS CONTROLLER SHALL ANNUNCIATE AN ALARM CONDITION.
5. **EQUIPMENT RUNTIME EQUALIZATION :** THE BCS CONTROLLER SHALL TOTALIZE RUNTIME FOR CHILLERS, COOLING TOWERS, AND PUMPS AND SHALL START OR ENABLE AND STOP OR DISABLE EQUIPMENT IN A MANNER THAT EQUALIZES EQUIPMENT RUNTIME. THE BCS CONTROLLER SHALL, AT AN OPERATOR DEFINED INTERVAL INITIALLY SET TO MONTHLY, OR UPON OPERATOR REQUEST, EVALUATE THE LEAD EQUIPMENT STATUS AND SELECT SO AS TO EQUALIZE RUNTIME. WHEN EQUIPMENT IS RATED, THE NEWLY STARTED EQUIPMENT SHALL START AND BE PROVEN OPERATING FOR 1 MINUTE PRIOR TO THE OPERATING EQUIPMENT BEING STOPPED.
6. **ADDITIONAL CHILLER ENABLE :** THE BCS CONTROLLER SHALL ENABLE AN ADDITIONAL CHILLER WHENEVER THE DIFFERENTIAL PRESSURE ACROSS THE DECOUPLER BRIDGE CHECK VALVE RISES ABOVE 2 PSIG (INDICATING ATTEMPTED REVERSE FLOW) OR BOTH THE RUNNING AMPERES FOR THE ACTIVE ELECTRIC CHILLERS EXCEEDS 95% OF THE FULL LOAD AMPERES AND THE SYSTEM CHILLED WATER SUPPLY TEMPERATURE EXCEEDS THE SETPOINT FOR A PERIOD OF 15 MINUTES. ALSO, THE BCS CONTROLLER SHALL ENABLE AN ADDITIONAL CHILLER WHENEVER SYSTEM CHILLED WATER SUPPLY TEMPERATURE EXCEEDS 48°F FOR 5 MINUTES.
7. **CHILLER DISABLE :** WHENEVER FORWARD FLOW AS MEASURED BY A FLOW METER IN THE DECOUPLER BRIDGE EXCEEDS 152 GPM FOR A PERIOD OF 30 MINUTES, THE BCS CONTROLLER SHALL DISABLE A CHILLER.
8. **LEAVING WATER TEMPERATURE RESET :** THE LEAVING WATER TEMPERATURE SETPOINT SHALL BE RESET BY A COMMON SIGNAL TO ACTIVE CHILLERS FROM THE BCS CONTROLLER. RESET THE TEMPERATURE BETWEEN 42°F AND 45°F.
9. **SECONDARY CHILLED WATER PUMP START-UP :** WHENEVER THERE ARE NO PRIMARY CHILLED WATER PUMPS PROVEN OPERATING, ACTIVE SECONDARY CHILLED WATER PUMPS SHALL STOP.
10. **HIGH TEMPERATURE ALARM :** THE BCS CONTROLLER SHALL ANNUNCIATE AN ALARM CONDITION AT THE BCS CENTRAL STATION WHENEVER A CHILLER IS ENABLED AND SYSTEM CHILLED WATER SUPPLY TEMPERATURE EXCEEDS 50°F FOR A PERIOD OF 15 MINUTES.
11. **SOFTWARE AND HARDWARE FOR RUNNING AMPERES :** THE BCS MANUFACTURER SHALL BE RESPONSIBLE FOR PROVIDING SOFTWARE AND HARDWARE TO OBTAIN RUNNING AMPERES FROM THE CHILLER CONTROL PANEL. COORDINATE WITH THE CHILLER MANUFACTURER.
12. **EQUIPMENT FAILURE ALARM :** IF AN ENABLED OR STARTED PIECE OF EQUIPMENT DOES NOT PROVE OPERATING AFTER A 15 SECOND TIME PERIOD, OR PROOF IS LOST WHILE OPERATING, AN ALARM SIGNAL SHALL BE INITIATED AT THE BCS CENTRAL STATION AND AN EQUIVALENT PIECE OF EQUIPMENT SHALL BE STARTED OR ENABLED. CHILLERS, CHILLED WATER PUMPS, SHALL BE SEQUENCED INDEPENDENTLY. UPON PROOF OF OPERATION OF THE NEWLY STARTED OR ENABLED PIECE OF EQUIPMENT, THE ARMED EQUIPMENT SHALL BE STOPPED OR DISABLED. THE ALARM MESSAGE SHALL REMAIN UNTIL MANUALLY RESET AT THE BCS CENTRAL STATION.
13. **CHILLER CONTROLS APPROVAL :** CHILLER CONTROLS SHALL BE APPROVED IN WRITING BY THE CHILLER MANUFACTURER BY NOTATION ON THE CONTROL SHOP DRAWINGS.



CAPE FEAR FD STONEWATER

LS3P

101 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
TEL. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR
CONSTRUCTION

NHC Goverment Center 7702-190810

NEW HANOVER COUNTY
GOVERNMENT CENTER
GOVERNMENT CENTER DRIVE
WILMINGTON, NC 28403

LS3P PROJECT: 7702-190810

[illegible]

SHEET NAME:
HVAC CONTROLS
CHILLERS

DATE: 2020.11.20
CURRENT: TI GMP SET

SHEET:

M-703

TI GMP SET

Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

Newcomb & Boyce
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

[illegible]

SHEET NAME:
HVAC CONTROLS
TERMINAL UNITS

DATE: 2020.11.20
CURRENT: TI GMP SET

SHEET: 1 OF 1

M-705

I GMP SET

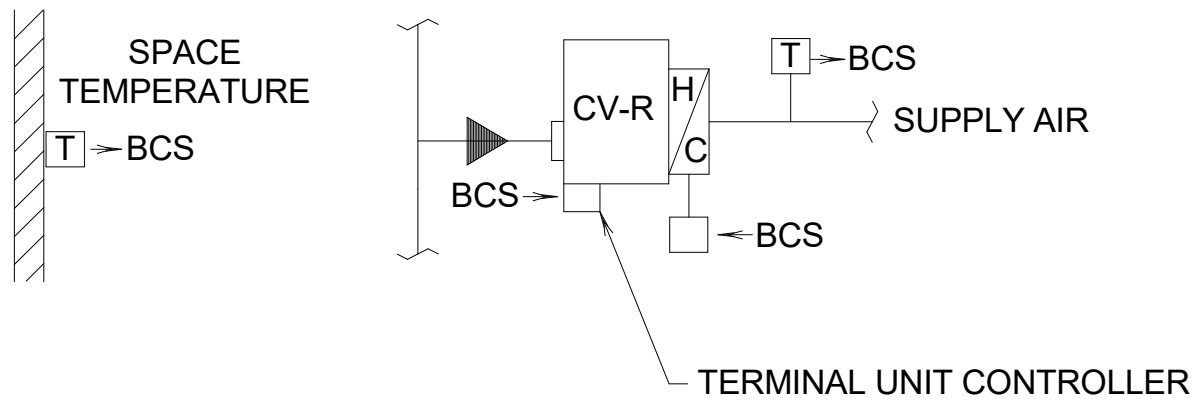
Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

NOTES:

1. FAILURE MODE: O - ON OR OPEN, C - OFF OR CLOSE, L - LAST COMMAND
2. TERMINAL UNIT CONTROLS AND INTERFACES SHALL BE ARRANGED SO THAT EQUIPMENT CONTROLLED BY THE BCS OPERATES AS INDICATED ON FAILURE OF THE TERMINAL UNIT CONTROLLER FOR ANY REASON, INCLUDING LOGIC POWER SUPPLY FAILURE, CPU LOCK-UP, OR INTERPOSING RELAY FAILURE. SAFETY AND OPERATIONAL INTERLOCKS SHALL REMAIN IN EFFECT.
3. PROVIDE TERMINAL UNIT BCS CONTROLLER WITH IDENTICAL CONTROL POINTS AND FUNCTIONS FOR EACH TERMINAL UNIT.
4. PROVIDE I/O POINT FOR EACH STEP OF ELECTRIC HEAT.

SEQUENCE OF OPERATION :

1. CONSTANT VOLUME REHEAT: EACH TERMINAL UNIT CONTROLLER SHALL MODULATE THE ELECTRIC HEATING COIL ACTIVATE THE STEPS OF ELECTRIC HEAT TO MAINTAIN SPACE TEMPERATURE SETPOINT.

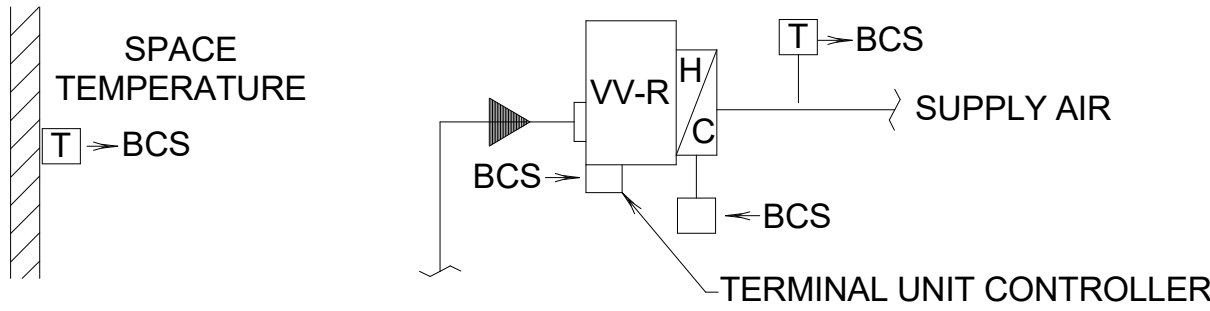


NOTES:

1. FAILURE MODE: O - ON OR OPEN, C - OFF OR CLOSE, L - LAST COMMAND
2. TERMINAL UNIT CONTROLS AND INTERFACES SHALL BE ARRANGED SO THAT EQUIPMENT CONTROLLED BY THE BCS OPERATES AS INDICATED ON FAILURE OF THE TERMINAL UNIT CONTROLLER FOR ANY REASON, INCLUDING LOGIC POWER SUPPLY FAILURE, OPERATIONAL INTERLOCKS SHALL REMAIN IN EFFECT.
3. PROVIDE TERMINAL UNIT BCS CONTROLLER WITH IDENTICAL CONTROL POINTS AND FUNCTIONS FOR EACH TERMINAL UNIT.
4. PROVIDE I/O POINT FOR EACH STEP OF ELECTRIC HEAT

SEQUENCE OF OPERATION:

1. VARIABLE VOLUME: EACH TERMINAL UNIT CONTROLLER SHALL MODULATE THE PRIMARY AIR VALVE BETWEEN THE MINIMUM AND MAXIMUM QUANTITIES INDICATED ON THE DRAWINGS TO MAINTAIN SPACE TEMPERATURE SETPOINT.



01 NORTH THIRD STREET, SUITE 500
WILMINGTON, NORTH CAROLINA 28401
L. 910.790.3111 FAX. 910.790.9901
WWW.LS3P.COM

NOT FOR
CONSTRUCTION

IC Government Center 7702-190810

LS3P PROJECT: 7702-190810

[illegible]

SHEET NAME:
HVAC CONTROLS FAN
POWERED UNITS

DATE: 2020.11.20
CURRENT: TI GMP SET

SHEET:

TI GMP SET

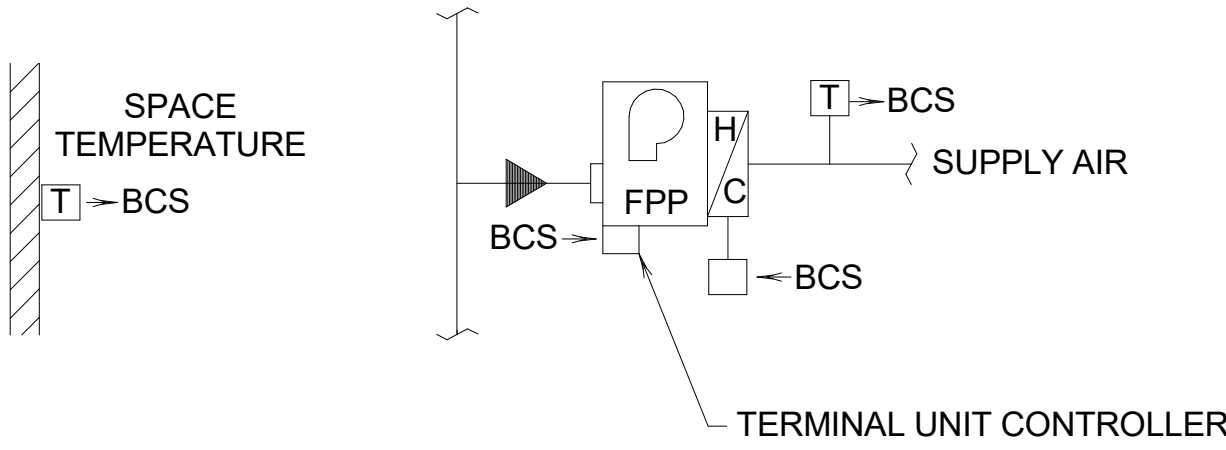
Newcomb & Boyd
CONSULTANTS AND ENGINEERS
Consulting Engineering Group
5425 Page Rd
Suite 215
Durham, NC 27703
T 919 783-7812
Contact: Paul J. Kitchens
N&B PROJECT: 19N342
Firm License No. F-0312

NOTES:

1. FAILURE MODE: O - ON OR OPEN, C - OFF OR CLOSE, L - LAST COMMAND
2. TERMINAL UNIT CONTROLS AND INTERFACES SHALL BE ARRANGED SO THAT EQUIPMENT CONTROLLED BY THE BCS OPERATES AS INDICATED ON FAILURE OF THE TERMINAL UNIT CONTROLLER FOR ANY REASON, INCLUDING LOGIC POWER SUPPLY FAILURE, OPERATIONAL INTERLOCKS SHALL REMAIN IN EFFECT.
3. PROVIDE TERMINAL UNIT BCS CONTROLLER WITH IDENTICAL CONTROL POINTS AND FUNCTIONS FOR EACH TERMINAL UNIT.
4. PROVIDE I/O POINT FOR EACH STEP OF ELECTRIC HEAT.

SEQUENCE OF OPERATION:

1. FAN-POWERED, PARALLEL TYPE. ON A DROP IN SPACE TEMPERATURE, EACH TERMINAL UNIT CONTROLLER SHALL MODULATE THE PRIMARY AIR VALVE TO THE MINIMUM FLOW.
2. IF THE SPACE TEMPERATURE FALLS THROUGH THE SPACE TEMPERATURE DEAD BAND TO THE HEATING SETPOINT, THE TERMINAL UNIT CONTROLLER SHALL START THE FAN AND MODULATE THE ELECTRIC HEATING COIL. ACTIVATE THE STEPS OF ELECTRIC HEAT TO MAINTAIN HEATING SPACE TEMPERATURE SETPOINT.



1	CONTROLS SCHEMATIC FOR PARALLEL FAN POWERED UNIT	NTS
M-706		

