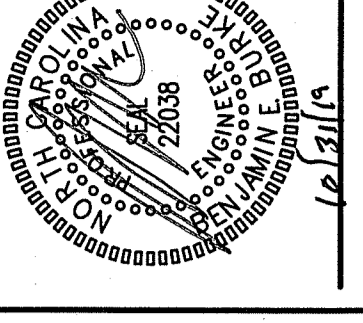


REVISIONS	BY

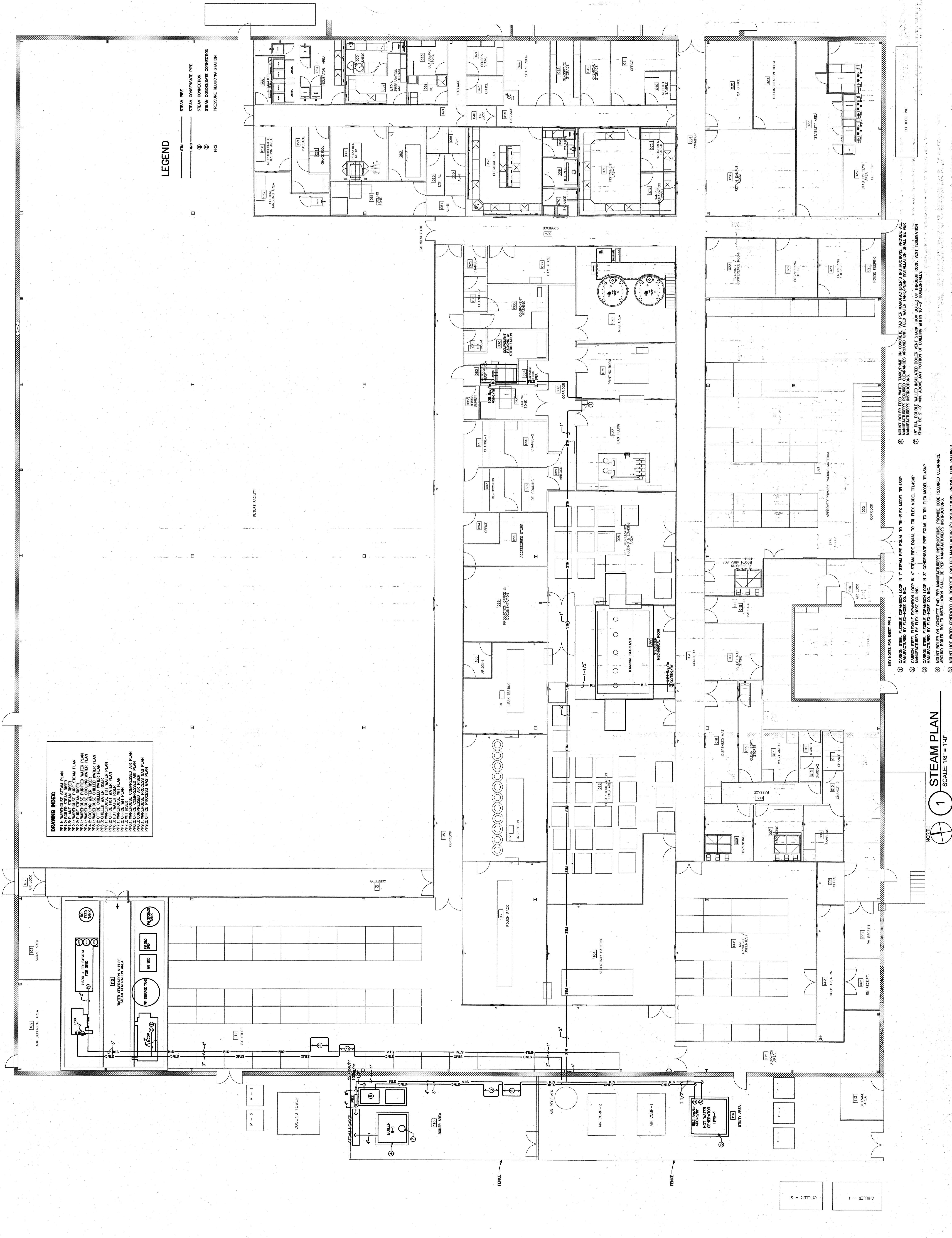
BURKE DESIGN GROUP, PA
 3305-109 DURHAM DRIVE
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 PHONE: (919) 771-1916
 FAX: (919) 779-0826
 email: benburke@bcrr.com



KRIGEN PHARMACEUTICALS LLC
 800 EDWARDS DR
 LILLINGTON, NC 27546

NO.	DATE	BY	APP.
1	10/17/2018		
2			
3			
4			

PP1.1

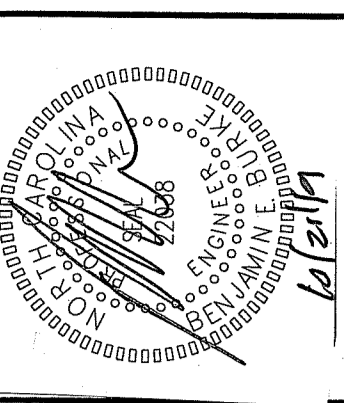


DRAWING INDEX

- PP1.1: MANUFACTURE STEAM PLAN
- PP1.2: BOILER STEAM RISER
- PP1.3: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.4: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.5: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.6: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.7: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.8: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.9: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.10: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.11: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.12: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.13: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.14: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.15: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.16: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.17: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.18: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.19: MANUFACTURE FLEXIBLE EXPANSION LOOP
- PP1.20: MANUFACTURE FLEXIBLE EXPANSION LOOP

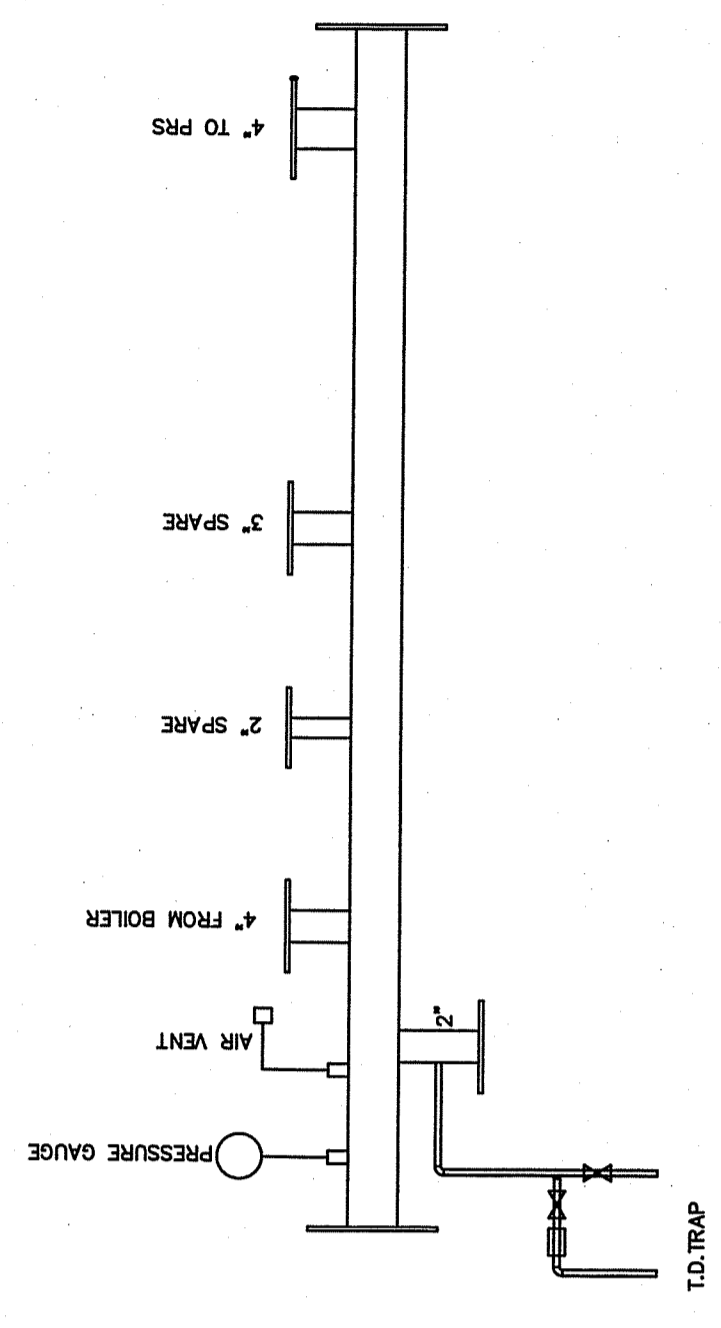
- ① CARBON STEEL FLEXIBLE EXPANSION LOOP IN 1" STEAM PIPE EQUAL TO TR-FLEX MODEL TL-ASP
- ② CARBON STEEL FLEXIBLE EXPANSION LOOP IN 4" STEAM PIPE EQUAL TO TR-FLEX MODEL TL-ASP
- ③ CARBON STEEL FLEXIBLE EXPANSION LOOP IN 2" CONDENSATE PIPE EQUAL TO TR-FLEX MODEL TL-ASP
- ④ CARBON STEEL FLEXIBLE EXPANSION LOOP IN 2" CONDENSATE PIPE EQUAL TO TR-FLEX MODEL TL-ASP
- ⑤ MOUNT HOT WATER GENERATOR ON CONCRETE PAD PER MANUFACTURER'S INSTRUCTIONS. PROVIDE CODE REQUIRED CLEARANCE AROUND UNIT. HOT WATER GENERATOR INSTALLATION SHALL BE PER MANUFACTURER'S INSTRUCTIONS.
- ⑥ MOUNT HOT WATER GENERATOR ON CONCRETE PAD PER MANUFACTURER'S INSTRUCTIONS. PROVIDE CODE REQUIRED CLEARANCE AROUND UNIT. HOT WATER GENERATOR INSTALLATION SHALL BE PER MANUFACTURER'S INSTRUCTIONS.

1 STEAM PLAN
 SCALE: 1/8" = 1'-0"



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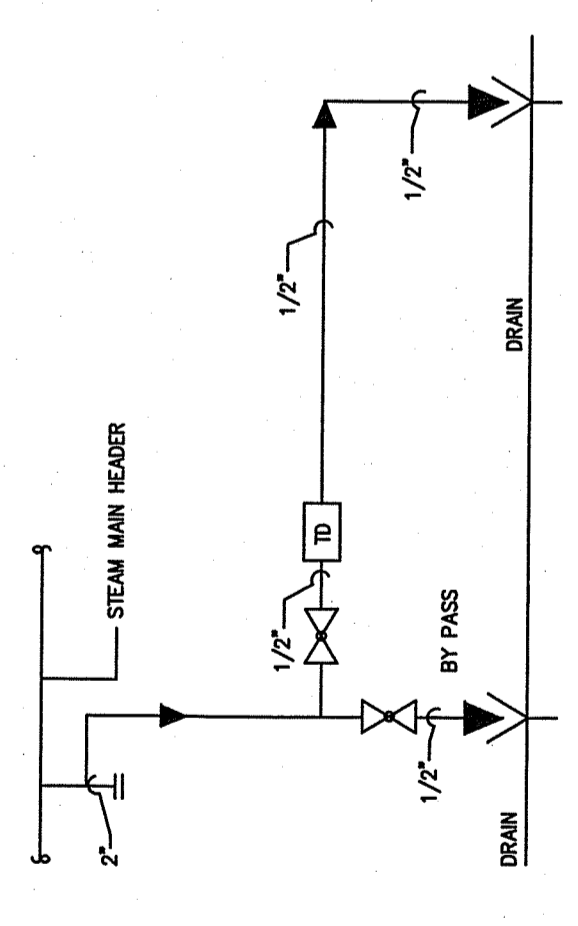
REVISIONS	BY



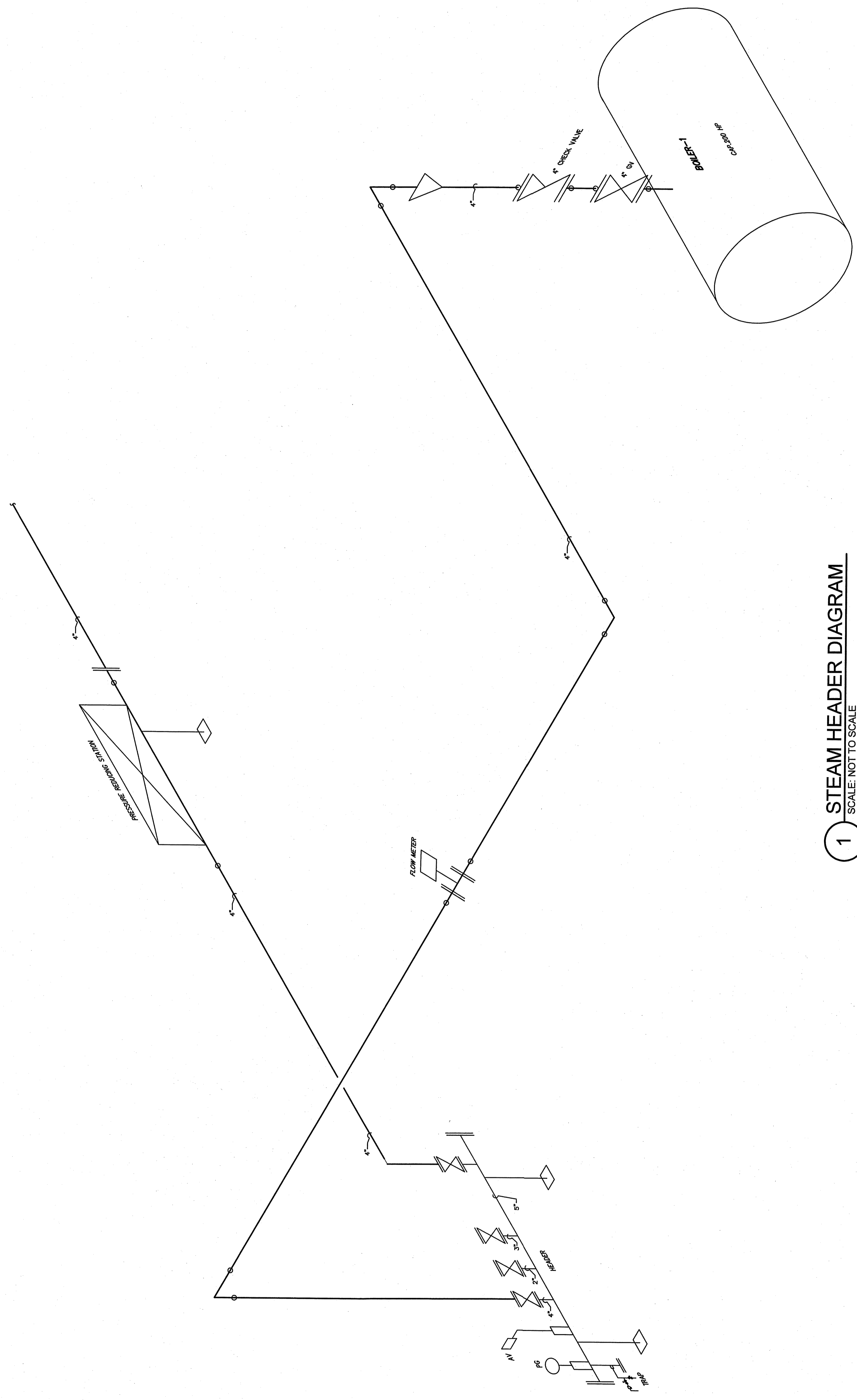
2 STEAM MAIN HEADER 5" DIA.
 SCALE: NOT TO SCALE

1. PIPE
 CARBON STEEL BLACK PIPE DESIGNED TO ASTM-A106 Gr.B OR BS 4820(20)3
 SCH. 40, THK. TO SIFT ANS B 36.10
 FLANGES
 CARBON STEEL FORGED FLANGES OF ASTM-A105 SUP ON UNDRATED FINISH RAISED FACE
 DIMENSIONAL STABILITY TO ANS B 16.5
 FLANGE TO SIFT ANS 150# PRESSURE RATING
2. FLANGES BF
3. CARBON STEEL FORGED FLANGES OF ASTM-A105 DIMENSIONAL STABILITY TO ANS B 16.5
 FLANGE TO SIFT ANS 150# PRESSURE RATING SOOF
 DIMENSIONAL STABILITY TO ANS B 16.5
 FLANGE TO SIFT ANS 150# PRESSURE RATING
4. CARBON STEEL GR. ELBOWS MATERIAL TO ANS GR. 10200
 WRSCHLAGUNG TYPE SERATED FINISH, RAISED FACE
 DIMENSIONAL STABILITY TO ANS B 16.5
 DIMS TO SIFT ANS 150# PRESSURE RATING
5. PRESSURE GAUGE
 BOURNEN TYPE, 100mm DIAL, 0-200 PSI
 AIR PURGE, 1/2" COCK
 ASTM A 105 BODY, ASTM A 276 VALVE SEAT
 WITH INBUILT SCREEN AIR BOTTLE, SCREWED TO SIFT ANS 150# PRESSURE RATING, CLASS 150
 CS STAND PER: BS239 1/4" CLASS
6. THERMODYNAMIC STEAM TRAPS MODULE
 ASTM A 743 Gr. CA 40, WITH INBUILT STRAINER,
 INSULATED TO PREVENT CONDENSATION,
 & INTERCONNECTING SPONGE INSULATING VALVES
 END CONNECTION FLANGED TO ANS 150# ANS B 16.5
7. GASKETS
 GASKETS OF COP FORMAMITE OIL
 SUITABLE FOR INSERTION BETWEEN ANS B 16.5
 RAISED FACE ANS 150# RATED FLANGES
8. NUTS & BOLTS
 GASKETS, WASHERS, LOCKWASHERS, HEXAGONAL HEADS
 BOLT FULLY THREADED WITH HEXAGONAL NUTS &
 A PAIR OF WASHER, MATERIAL TO ASTM A193 Gr B7

- NOTES:-
- o MAX. STEAM WORKING PRESSURE - 150 PS
 - o HVO. TEST PRESSURE- 150 PS
 - o WORKING TEMPERATURE- 381 DEGREES F.
 - o ALL DIMENSION ARE IN INCHES
 - o PIPES ASTM A 106 GR. B SCH-40 BR.
 - o CS.BEND ANS B 16.11 SCH.40. BR.



3 THERMOSTATIC STEAM TRAP DRAIN ASSEMBLY
 SCALE: NOT TO SCALE



1 STEAM HEADER DIAGRAM
 SCALE: NOT TO SCALE

REVISIONS	BY

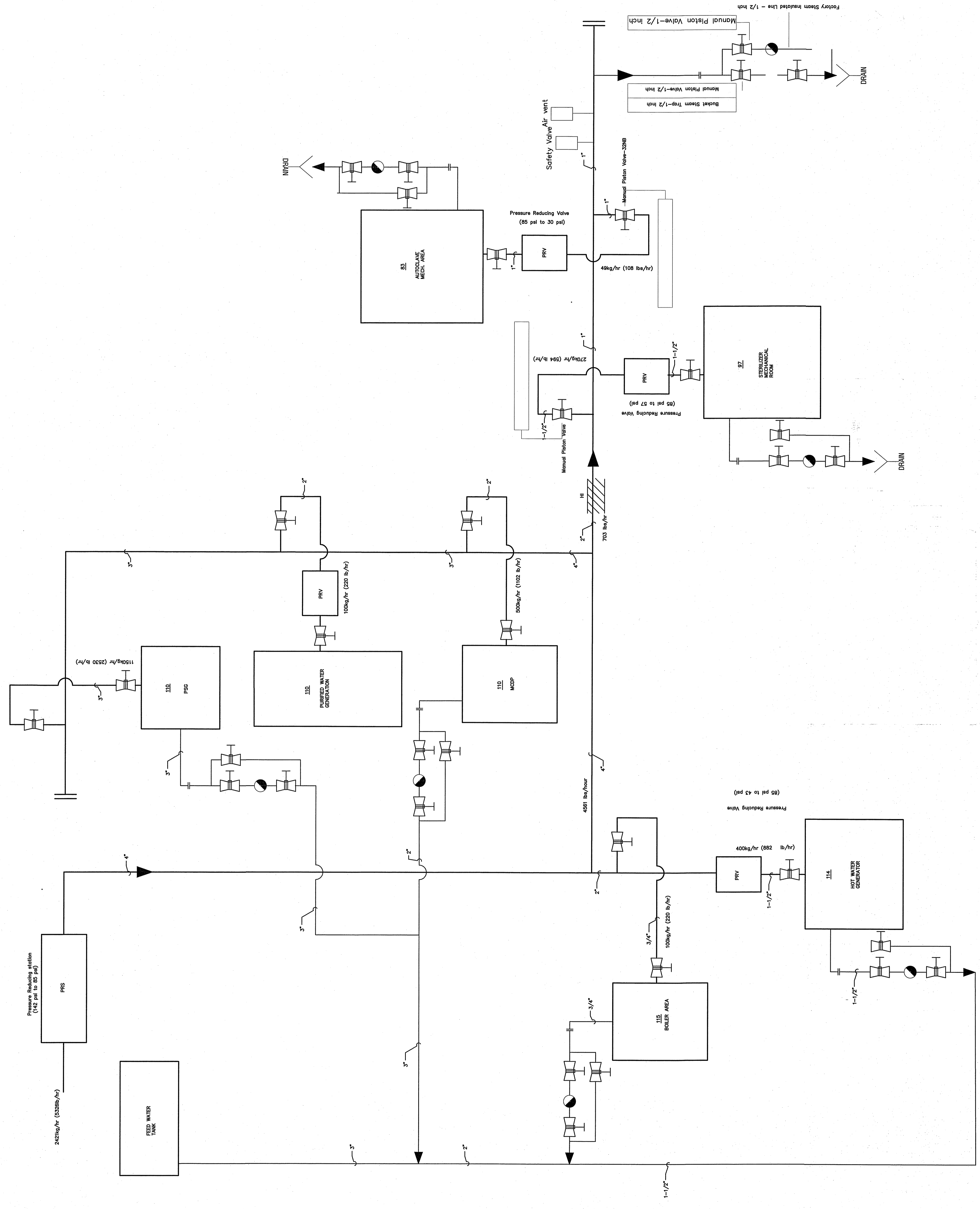
SD
BUKKE DESIGN GROUP, PA
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DATE	BY	CHKD BY	REV	DESCRIPTION
10/20/2010			1	

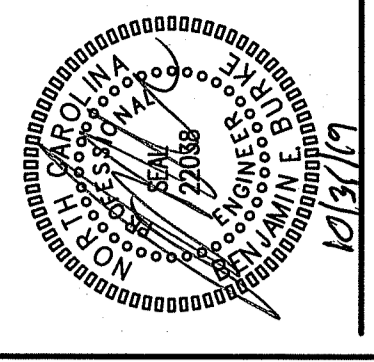
PP1.3
 SHEET



1 STEAM DIAGRAM
 SCALE: NOT TO SCALE

BY	
REVISIONS	

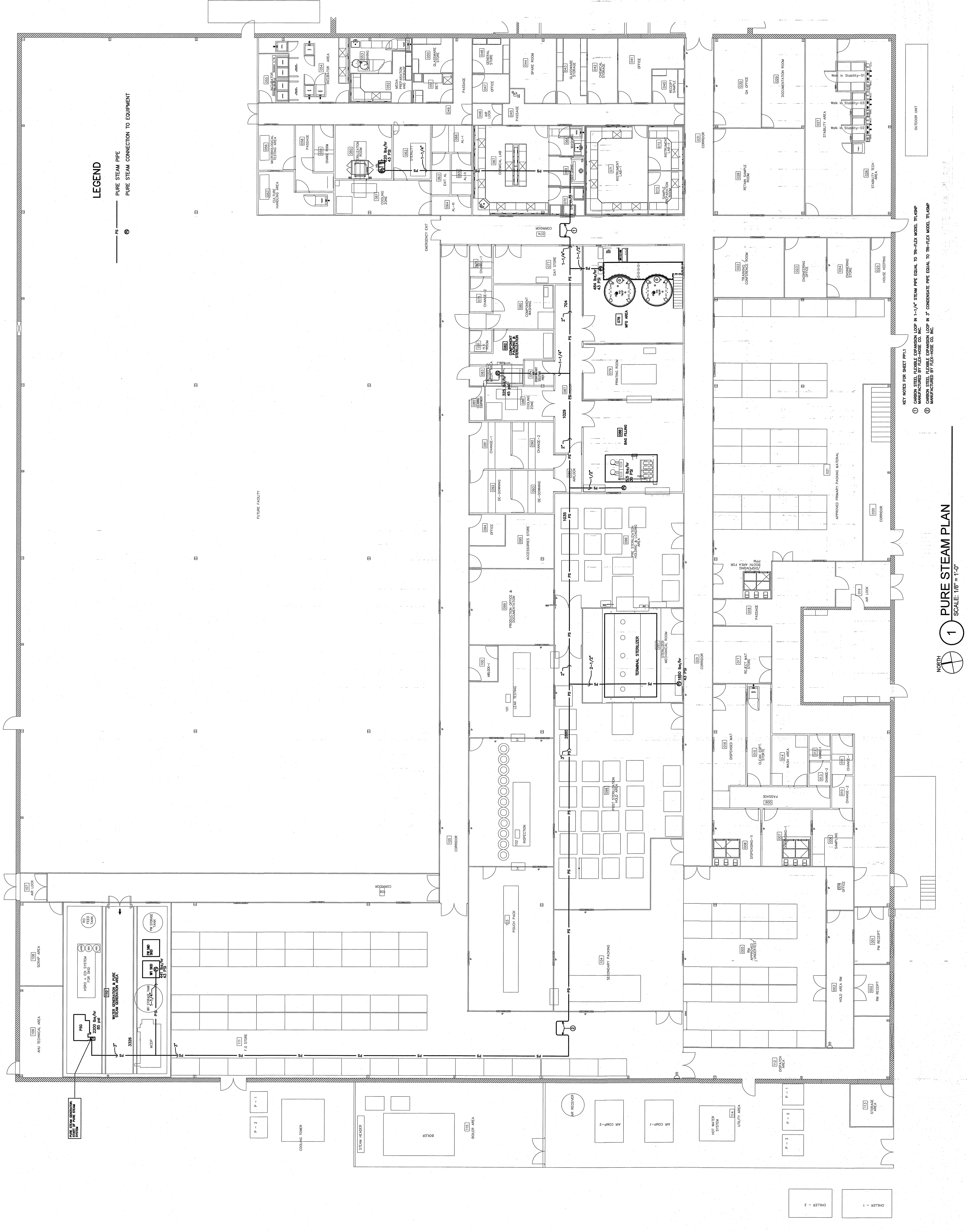
GDV
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 email: denburke@nc.rr.com



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DATE	10/29/2018
ISSUED BY	W. M. A.
DESIGNED BY	C.S.
CHECKED BY	
DATE	
ISSUED BY	
DESIGNED BY	
CHECKED BY	

PP2.1



LEGEND

— PS — PURE STEAM PIPE
 ○ PURE STEAM CONNECTION TO EQUIPMENT

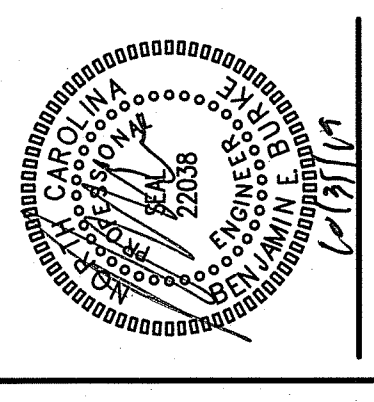
KEY NOTES FOR SHEET PP1.1
 ① CARBON STEEL FLEXIBLE EXPANSION LOOP IN 1-1/4\" STEAM PIPE EQUAL TO TRIP-FLEX MODEL TR149P
 ② CARBON STEEL FLEXIBLE EXPANSION LOOP IN 3\" CONDENSATE PIPE EQUAL TO TRIP-FLEX MODEL TR149P
 ③ MANUFACTURED BY TETRAPOLE CO. INC.

1 PURE STEAM PLAN
 SCALE: 1/8\" = 1'-0\"



REVISIONS	BY	DATE

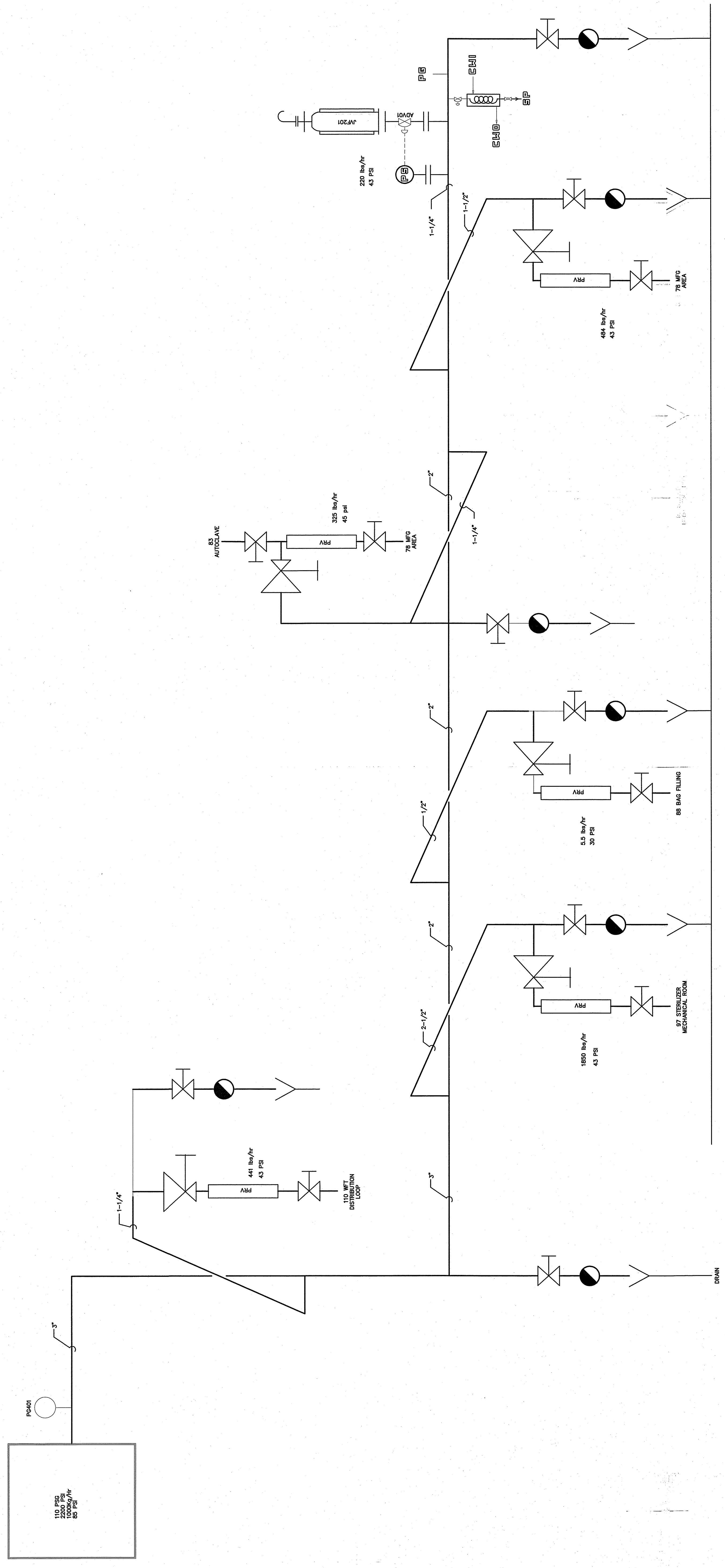
BURKE DESIGN GROUP, PA
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 LILLINGTON, NC 27546

DATE	BY	CHK
10/20/2019	CLS	CLS
1/27	CLS	CLS

PP2.2

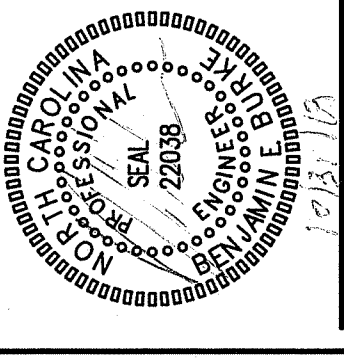


- LEGEND**
- DAMPER VALVE
 - BALL VALVE
 - FLOW DIVERTER VALVE
 - SAMPLE COOLER
 - STEAM TRAP
 - PRESSURE GAUGE
 - PRESSURE RELEASE VALVE

1 PURE STEAM DIAGRAM
 SCALE: NOT TO SCALE

REVISIONS	BY

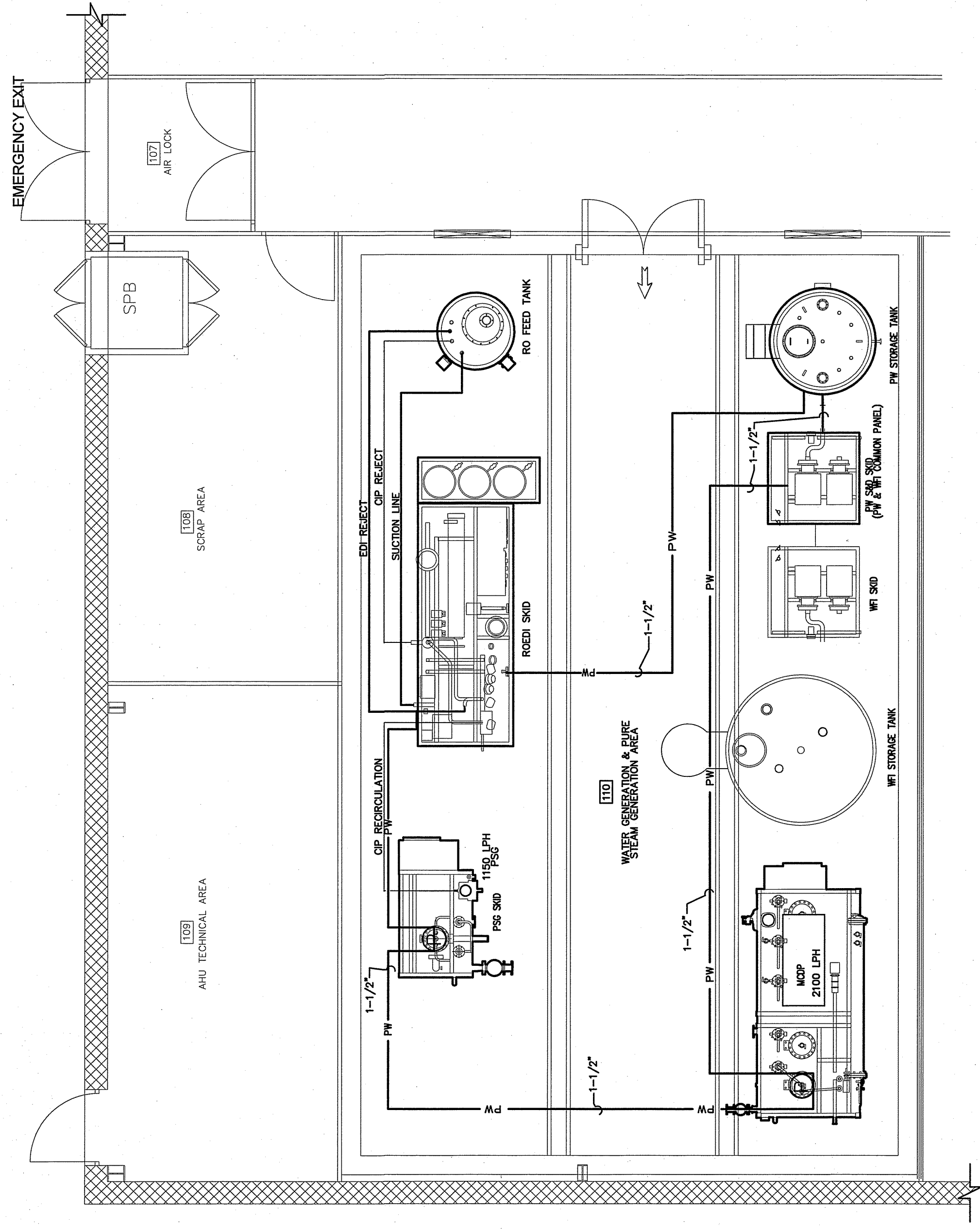
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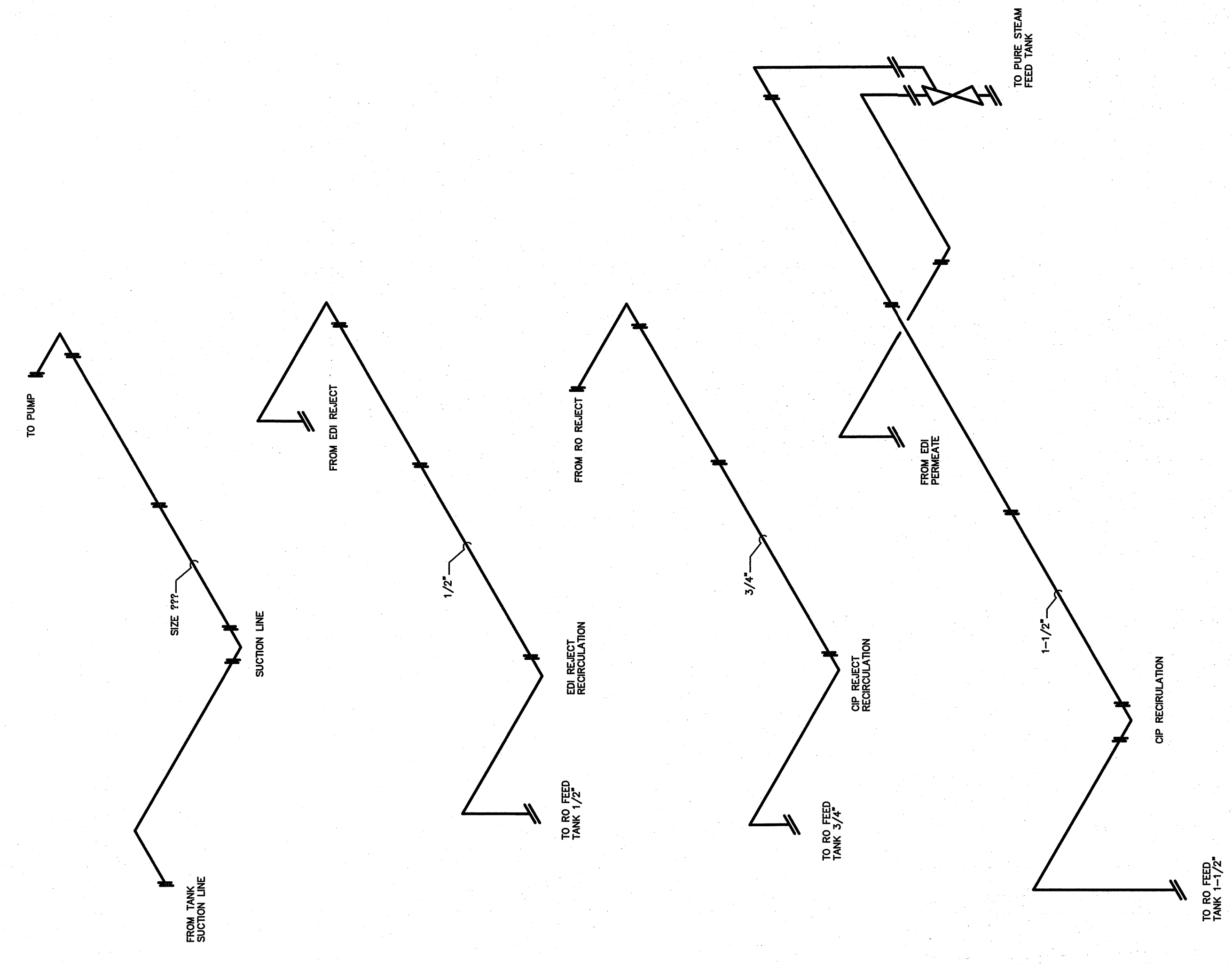
DATE BY	CLS
ISSUED BY	DES
DATE	10/27/2019
SCALE	1/4"
PROJECT	

PP3.1

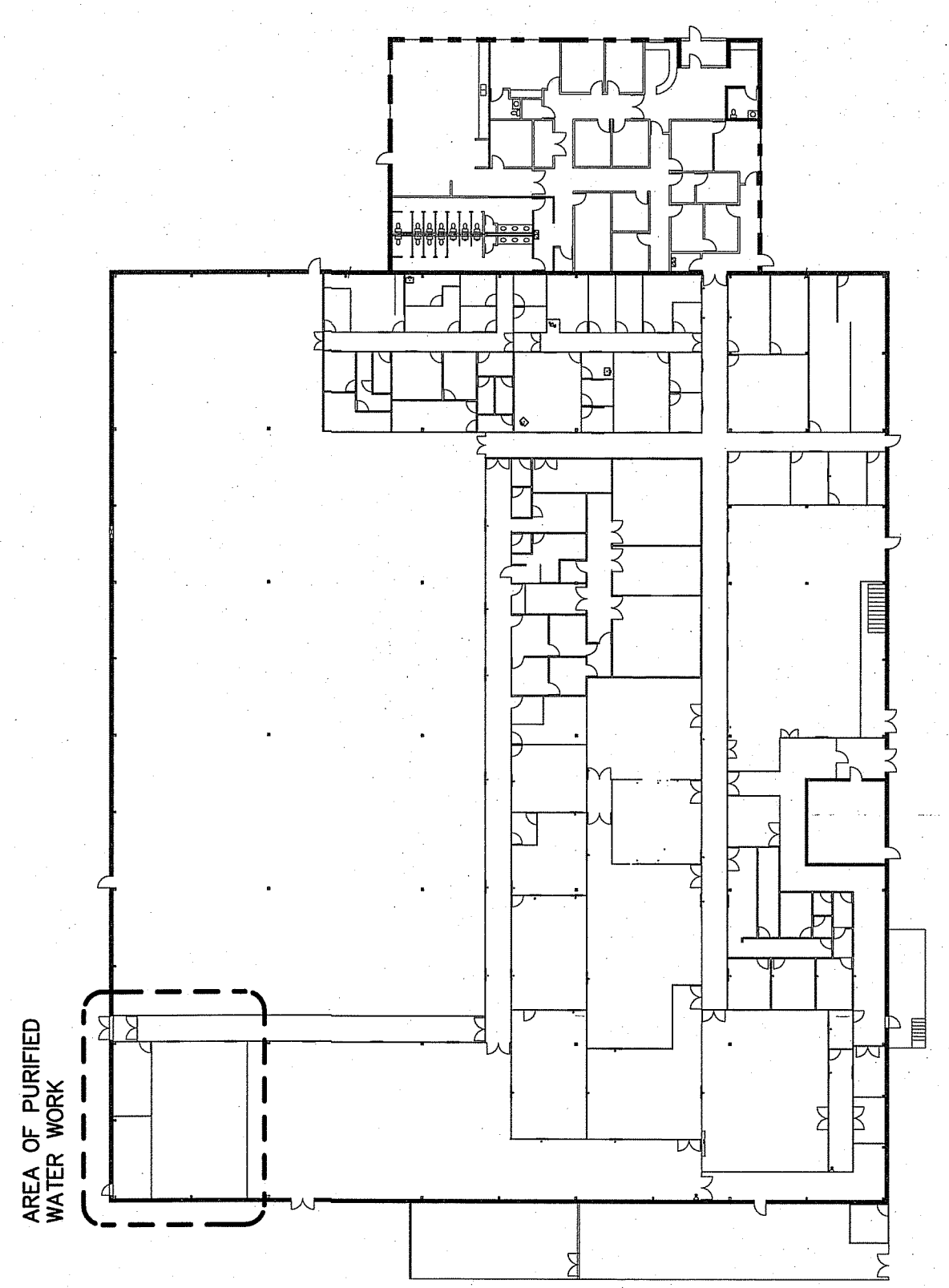


NOTE: CONSULT ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE EQUIPMENT LOCATION AND HEIGHTS WITH ALL TRADES. VERIFY REQUIREMENTS OF ALL EQUIPMENT WITH FACTORY EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.

1 PURIFIED WATER PLAN
 SCALE: 1/4" = 1'-0"



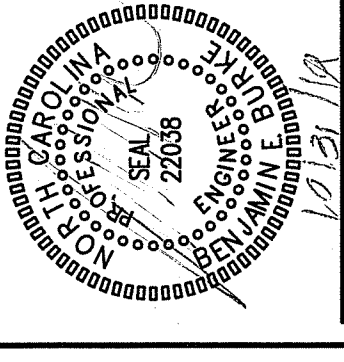
2 PURIFIED WATER RISER
 SCALE: NTS



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

REVISIONS	BY

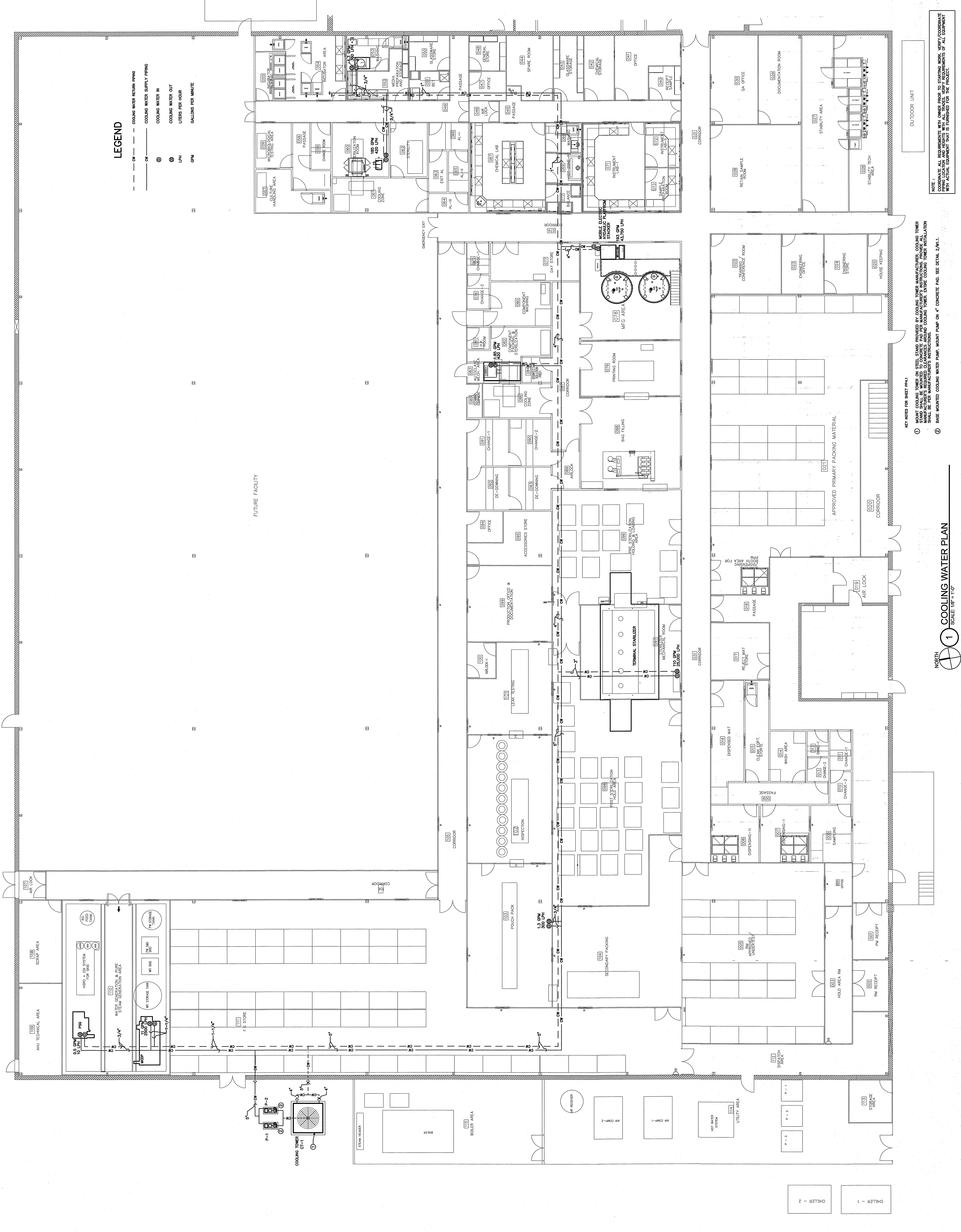
BURKE DESIGN GROUP, PA
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PP 4.1

DATE: 10/29/2019
 DRAWN BY: BBD
 CHECKED BY: BBD
 SCALE: 1/8" = 1'-0"



LEGEND

- COOLING WATER RETURN PIPING
- COOLING WATER SUPPLY PIPING
- COOLING WATER IN
- COOLING WATER OUT
- LPH
- GPM

NOTE 1:
 COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE WITH ACTUAL EQUIPMENT THAT IS PROVIDED FOR THE PROJECT.

KEY NOTES FOR SHEET P4.1

1. MOUNT COOLING TOWER ON STEEL STAND PROVIDED BY COOLING TOWER MANUFACTURER. COOLING TOWER MANUFACTURER SHALL PROVIDE ALL NECESSARY FOUNDATION AND ANCHORAGE. COOLING TOWER SHALL BE MOUNTED ON APPROVED PRIMARY PACKING MATERIAL. SHALL BE PER MANUFACTURER'S INSTRUCTIONS.
2. BASE MOUNTED COOLING WATER PUMP. MOUNT PUMP ON 4" CONCRETE PAD. SEE RETAIL 2/M/1.

1 COOLING WATER PLAN
 SCALE: 1/8" = 1'-0"

CHILLER - 1
 CHILLER - 2

REVISIONS	BY

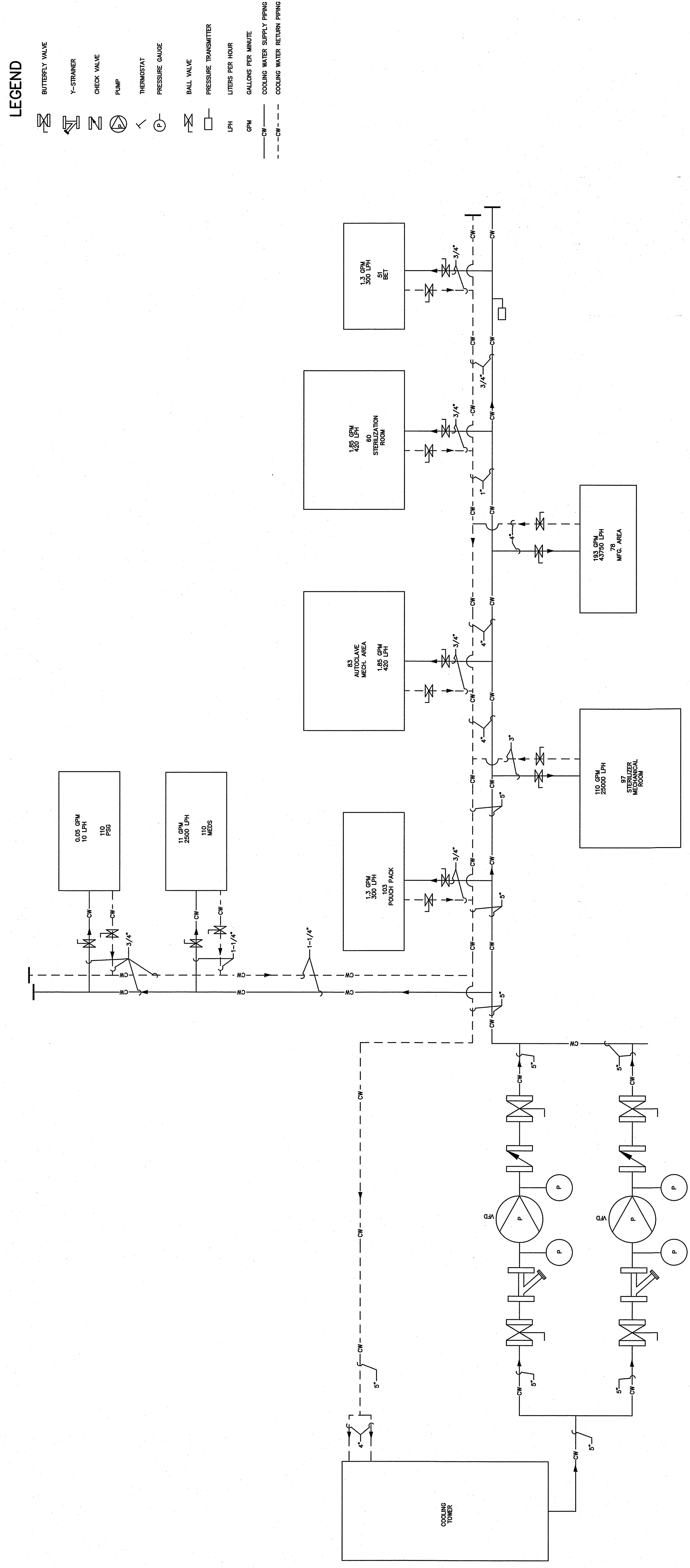
KRIGEN PHARMACEUTICALS LLC
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LILLINGTON, NC 27546

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FAX: (919) 779-0826
email: benburke@krigen.com

BURKE DESIGN GROUP, PA

NO.	DATE	REVISED BY

PP4.2



LEGEND

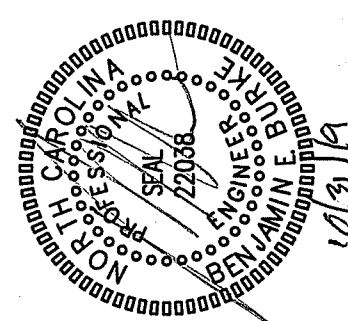
- BUTTERFLY VALVE
- Y-STRAINER
- CHECK VALVE
- PUMP
- THERMOSTAT
- PRESSURE GAUGE
- BALL VALVE
- PRESSURE TRANSMITTER
- LPH
- GPM
- COOLING WATER SUPPLY PIPING
- COOLING WATER RETURN PIPING

CONTROL NOTES:
 PRODUCE PUMP CONTROLLER WITH (VFD) VARIABLE FREQUENCY DRIVES. PUMPS WILL OPERATE IN A LEAD-LAG OPERATION WHERE THE LEAD PUMP IS SWITCHED FULL REQUIRED WATER FLOW.
LOCK:
 COOLING TOWER FAN OPERATES ON SET POINT OF THERMOSTAT.
 PUMP #10 OPERATES ON PRESSURE TRANSMITTER.

1 COOLING WATER DIAGRAM
SCALE: NOT TO SCALE

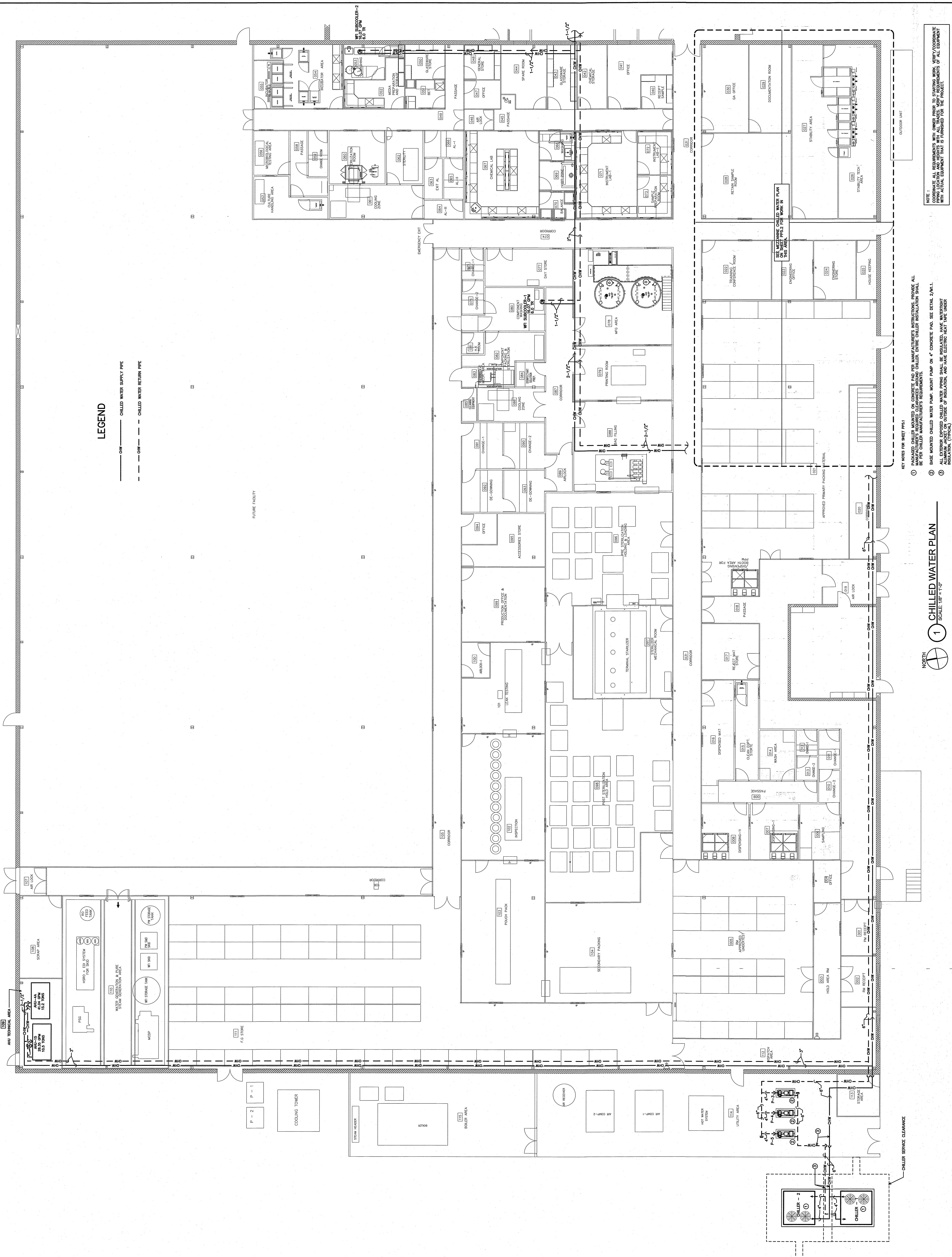
REVISIONS	BY

KRIEEN PHARMACEUTICALS LLC
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 LILLINGTON, NC 27546



BURKE DESIGN GROUP, PA
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 RALEIGH, NC 27603
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 email: benburke@nc.rr.com

PP5.1
 DATE: 10/30/2019
 DRAWN BY: JFC
 CHECKED BY: CLE
 PROJECT NO.: 19-0001



LEGEND

- CWS — CHILLED WATER SUPPLY PIPE
- - - CWR - - - CHILLED WATER RETURN PIPE

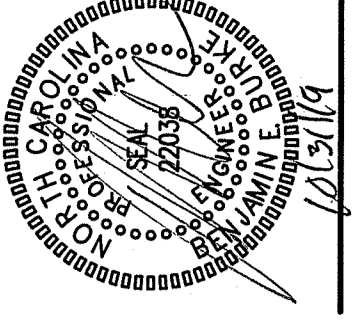
NOTE 1:
 CHILLER AND CONDENSER PIPING TO STAIRWELL WORK VENT/COORDINATE WITH MECHANICAL CONTRACTOR. ALL EQUIPMENT SHALL BE INSTALLED WITH ACTUAL EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.

- KEY NOTES FOR SHEET PPS1:
- 1 PACKAGED CHILLER MOUNTED ON CONCRETE PAD PER MANUFACTURER'S INSTRUCTIONS. PROVIDE ALL BASE MOUNTED CHILLED WATER PUMP. MOUNT PUMP ON 4" CONCRETE PAD. SEE DETAIL 2/4M.1.
 - 2 ALL CHILLER MOUNTING SHALL BE PER CHILLER MANUFACTURER'S REQUIREMENTS.
 - 3 ALL CHILLER MOUNTING SHALL BE PER CHILLER MANUFACTURER'S REQUIREMENTS.
 - 4 ALL CHILLER MOUNTING SHALL BE PER CHILLER MANUFACTURER'S REQUIREMENTS.
 - 5 ALL CHILLER MOUNTING SHALL BE PER CHILLER MANUFACTURER'S REQUIREMENTS.

1 CHILLED WATER PLAN
 SCALE: 1/8" = 1'-0"

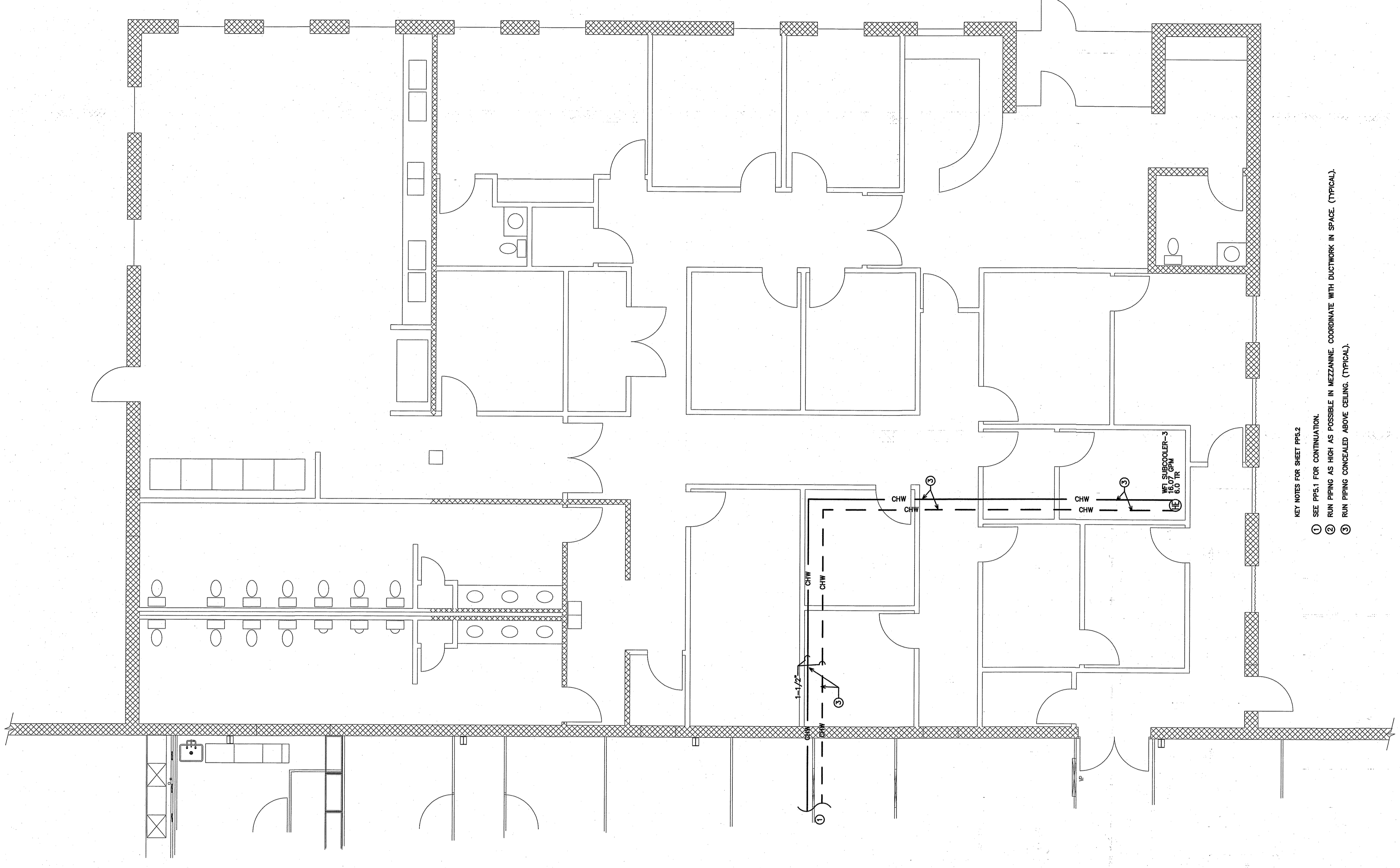
REVISIONS	BY

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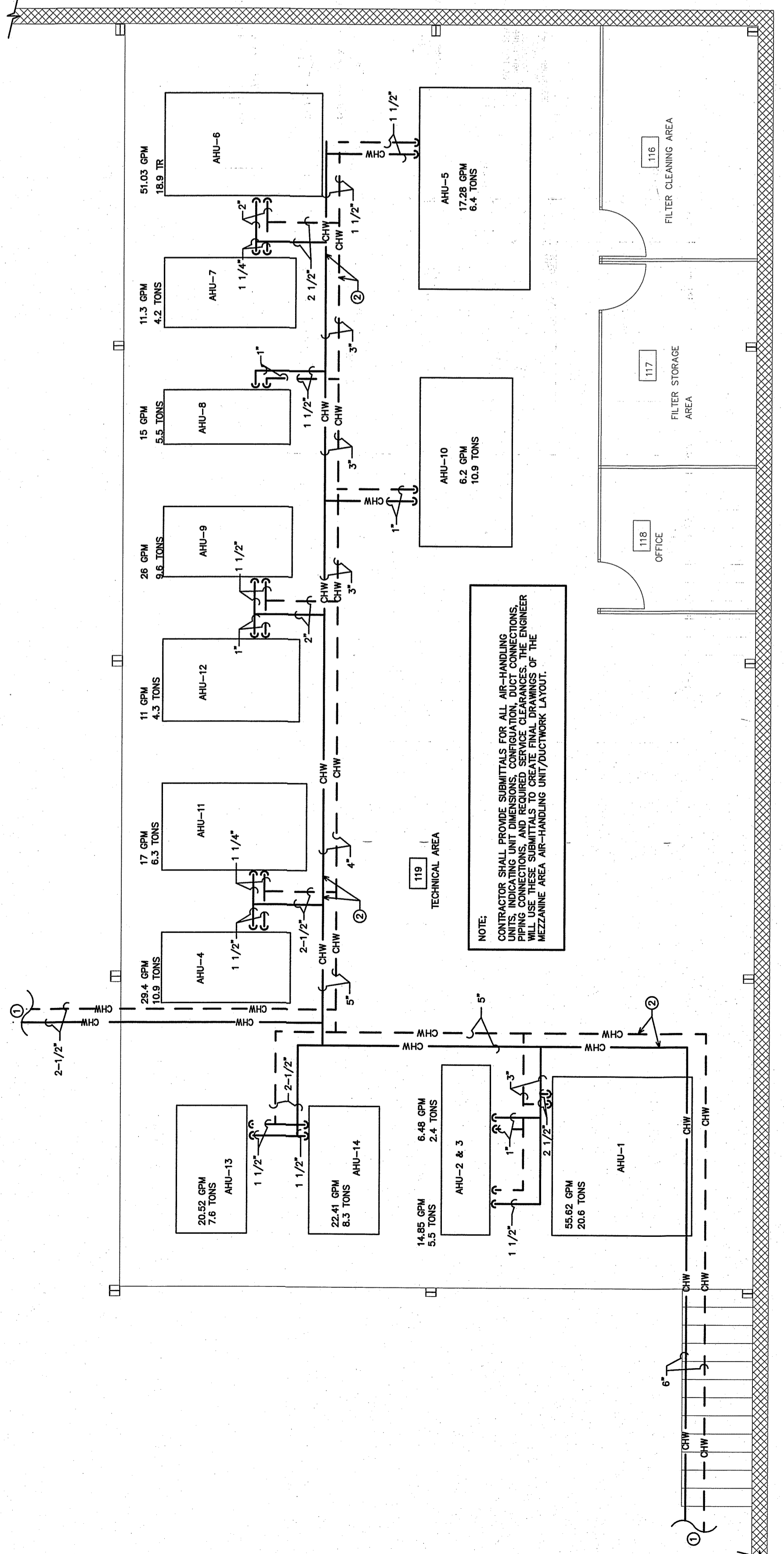
DATE	10/26/2018
ISSUED BY	SPB
DESIGNED BY	SPB
CHECKED BY	CLS
PROJECT	PP5.2



KEY NOTES FOR SHEET PP5.2
 SEE PP5.1 FOR CONTINUATION.
 RUN PIPING AS HIGH AS POSSIBLE IN MEZZANINE, COORDINATE WITH DUCTWORK IN SPACE (TYPICAL).
 RUN PIPING CONCEALED ABOVE CEILING (TYPICAL).

1 OFFICE CHILLED WATER PLAN
 SCALE: 3/16" = 1'-0"

NOTE: COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE WITH ACTUAL EQUIPMENT THAT IS PROVIDED FOR THE PROJECT.

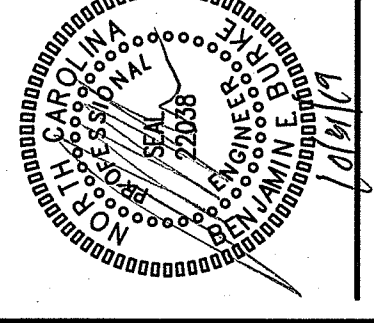


NOTE: CONTRACTOR SHALL PROVIDE SUBMITTALS FOR ALL AIR-HANDLING UNITS (AHU) INCLUDING: AIR-HANDLING UNIT (AHU) DATA SHEET, PIPING CONNECTIONS AND REQUIRED SERVICE CLEARANCE. THE ENGINEER WILL REVIEW AND APPROVE ALL SUBMITTALS. THE ENGINEER'S APPROVAL OF THE MEZZANINE AREA SUBMITTALS IS NOT A GUARANTEE OF THE ACCURACY OF THE INFORMATION PROVIDED.

2 MEZZANINE CHILLED WATER PLAN
 SCALE: 3/16" = 1'-0"

REVISIONS	BY

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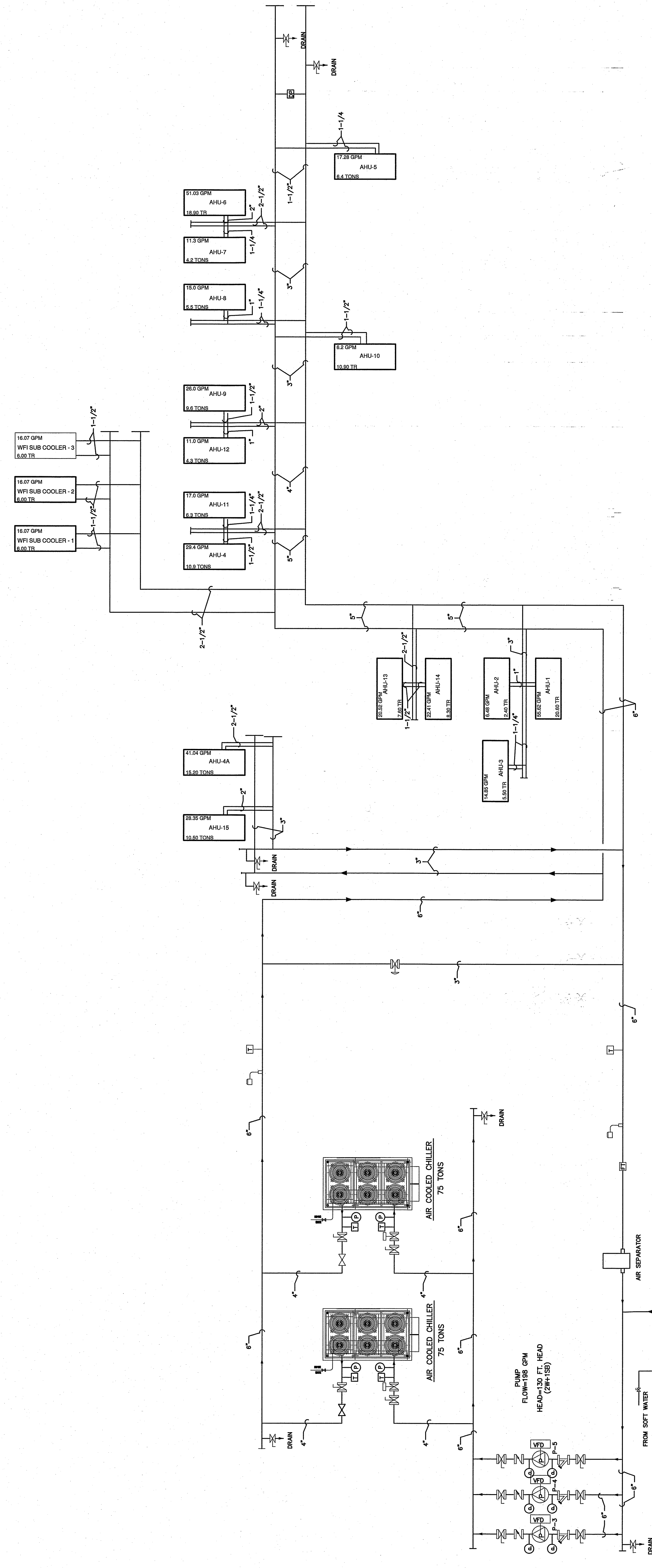


KRIGEN PHARMACEUTICALS LLC
 800 EDWARDS DR
 LILLINGTON, NC 27546

DATE	10/20/2018
BY	CSE
CHK	BBB
DATE	10/20/2018
BY	1/17
CHK	
DATE	
BY	

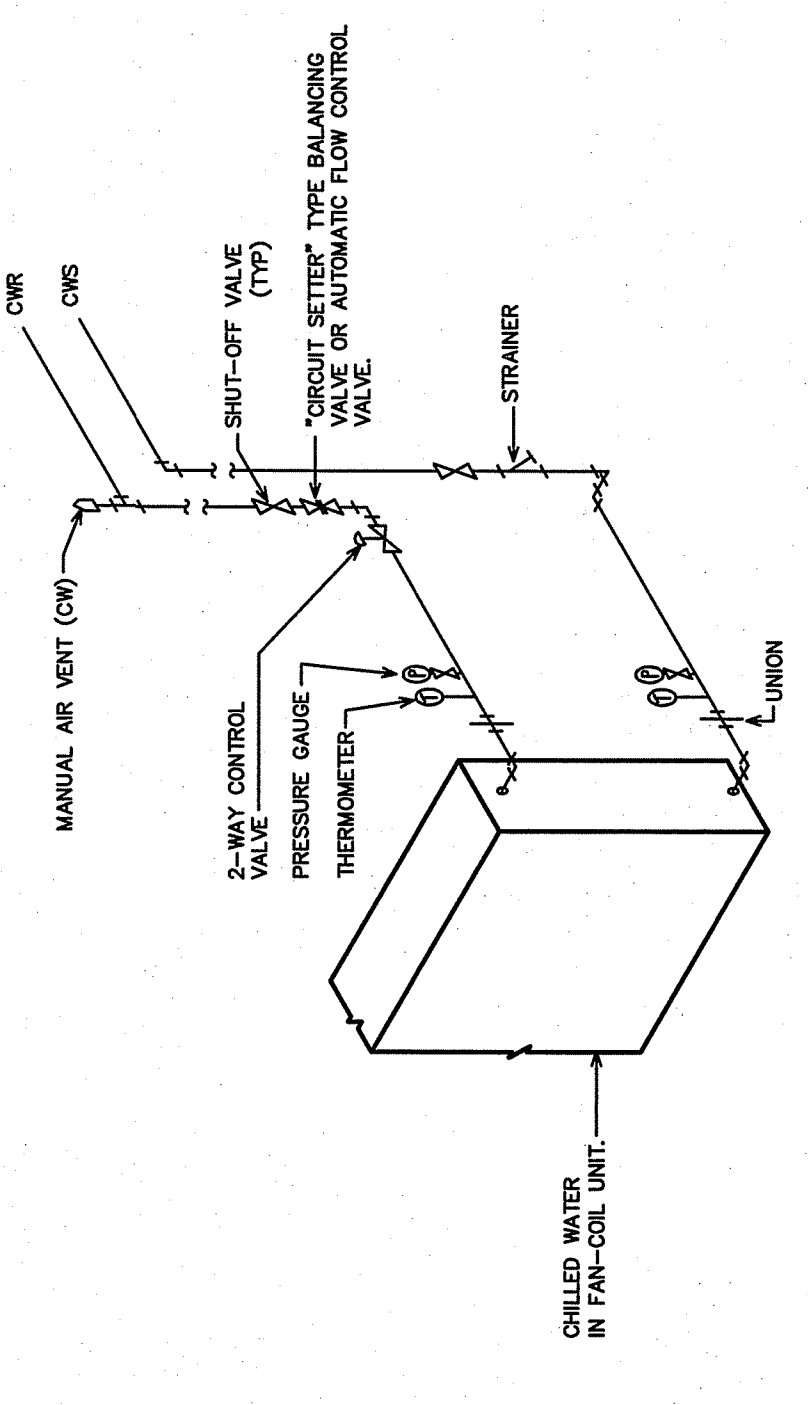
PP5.3

NOTE: ALL REQUIREMENTS WITH REGARD TO PIPING, WORK, VERIFY/COMPLY WITH PIPING LOCATION AND HEIGHTS WITH ALL TRADES. VERIFY REQUIREMENTS OF ALL EQUIPMENT WITH ACTUAL EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.



1 CHILLED WATER DIAGRAM
 SCALE: NOT TO SCALE

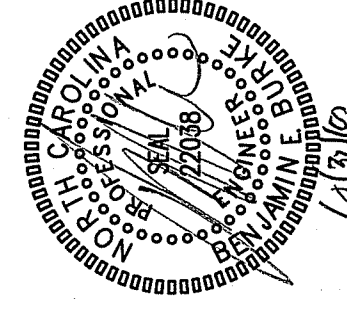
CHILLED/COOLED WATER PUMP CONTROLS:
 THE CHILLERS SHALL BE OPERATED BY THEIR ON BOARD STAND-ALONE CONTROLS. PROVIDE PUMP CONTROLS WITH (4) VARIABLE FREQUENCY DRIVES TO CONTROL PUMPS. PROVIDE PUMP CONTROLS WITH (2) 2-WAY VALVES IN CHILLED WATER BYPASS TO MAINTAIN MINIMUM FLOW THROUGH CHILLERS. PROVIDE PUMP CONTROLS WITH (2) PUMPS ARE REQUIRED TO PROVIDE FULL CHILLED WATER FLOW. ONE (1) PUMP WILL BE USED FOR STANDBY.



2 TYPICAL CHILLED WATER COIL PIPING
 SCALE: NOT TO SCALE

REVISIONS	BY	DATE

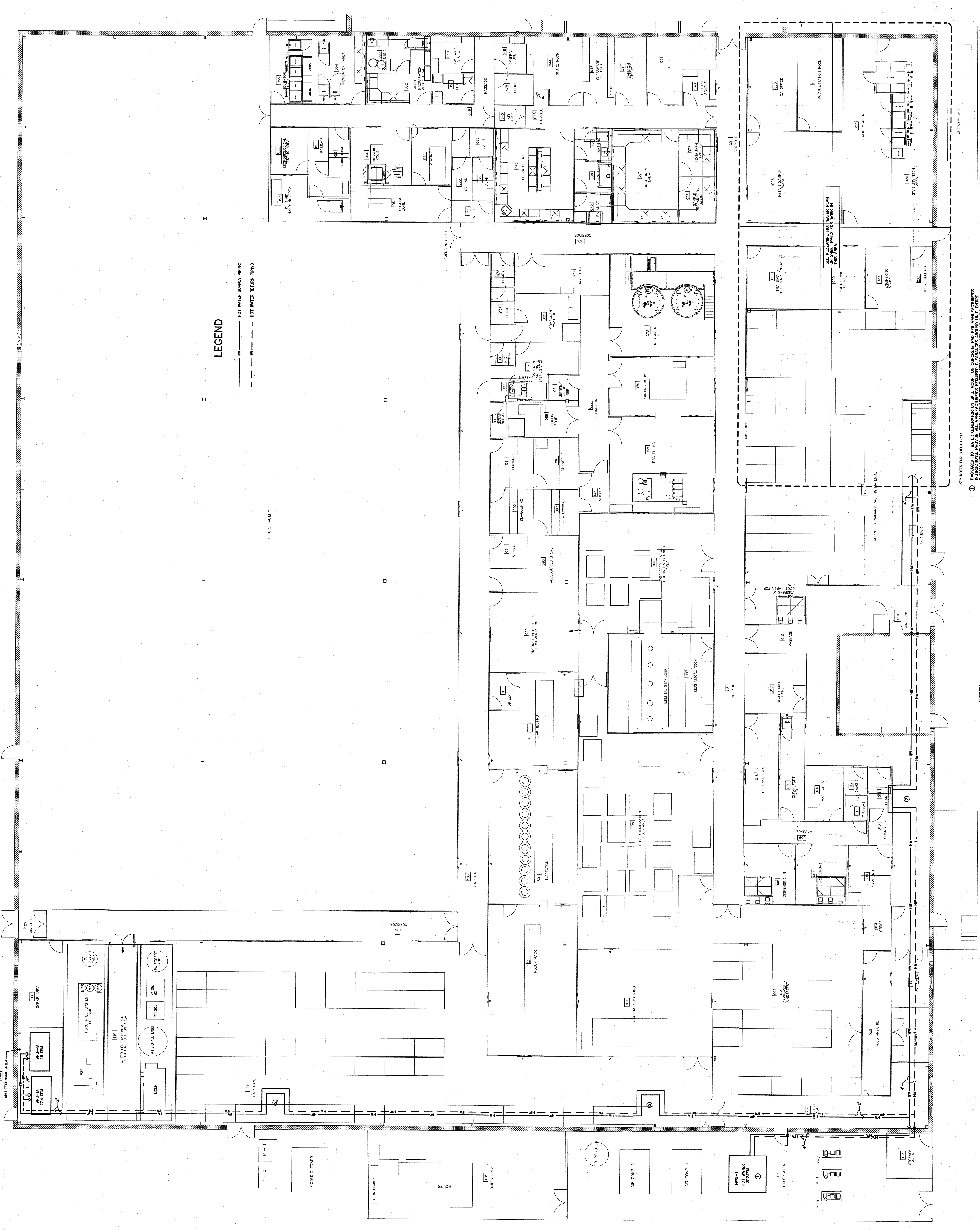
BDCA
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 email: benburke@bdca.com



KRIGEN PHARMACEUTICALS LLC
 800 EDWARDS DR
 LILLINGTON, NC 27546

NO.	DATE	BY	APP.
1	10/20/2019		

PP 9.1



LEGEND

— HOT WATER SUPPLY PIPING
 - - - HOT WATER RETURN PIPING

NOTE: ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE CONDITIONS WITH MANUFACTURER'S INSTRUCTIONS. PACKAGED HOT WATER GENERATOR WITH VFD (VARIABLE FREQUENCY DRIVE).
 ① PACKAGED HOT WATER GENERATOR ON S&B. MOUNT ON CONCRETE PAD PER MANUFACTURER'S INSTRUCTIONS. SHALL BE FOR MANUFACTURER'S INSTRUCTIONS. PACKAGED HOT WATER GENERATOR WITH VFD (VARIABLE FREQUENCY DRIVE).
 ② EXPANSION LOOPS IN HOT WATER SUPPLY AIR RETURN PIPING.

1 HOT WATER PLAN
 SCALE: 1/8" = 1'-0"
 NORTH

SEE MEZANINE HOT WATER PLAN ON SHEET PPHZ FOR WORK IN THIS AREA.

APPROVED PRIMARY PACKING MATERIAL

HOUSE KEEPING

STABILITY AREA

CA OFFICE

DOCUMENTATION ROOM

RECEPTION

CONFERENCE ROOM

ENGINEERING

STORAGE

OFFICE

OFFICE

OFFICE

OFFICE

OFFICE

OFFICE

OFFICE

OFFICE

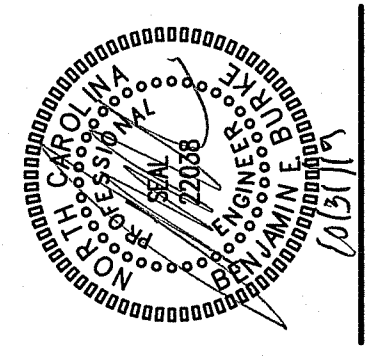
OFFICE

OFFICE

OFFICE

DATE	10/22/2019
BY	BBB
CHKD BY	
APP'D BY	

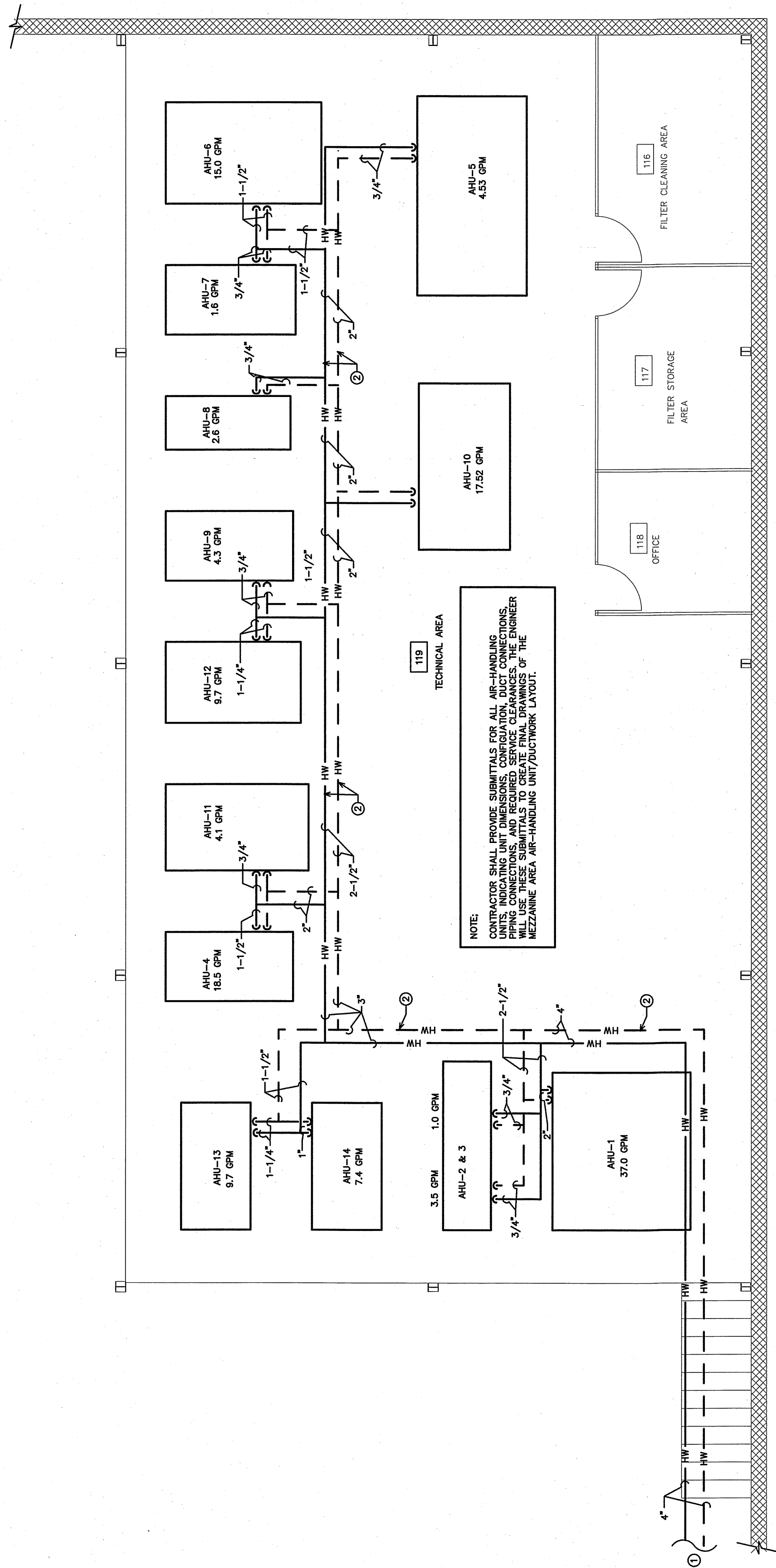
KRIGEN PHARMACEUTICALS LLC
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REVISIONS	BY

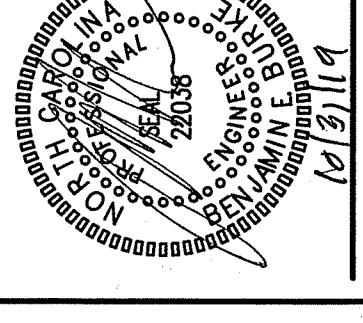
NOTE: COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE ALL INFORMATION AND REQUIREMENTS OF ALL EQUIPMENT WITH ACTUAL EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.



- KEY NOTES FOR SHEET PP-6.2
- ① SEE PP-6.1 FOR CONTINUATION.
 - ② RUN PIPING AS HIGH AS POSSIBLE IN MEZZANINE. COORDINATE WITH DUCTWORK IN SPACE. (TYPICAL).

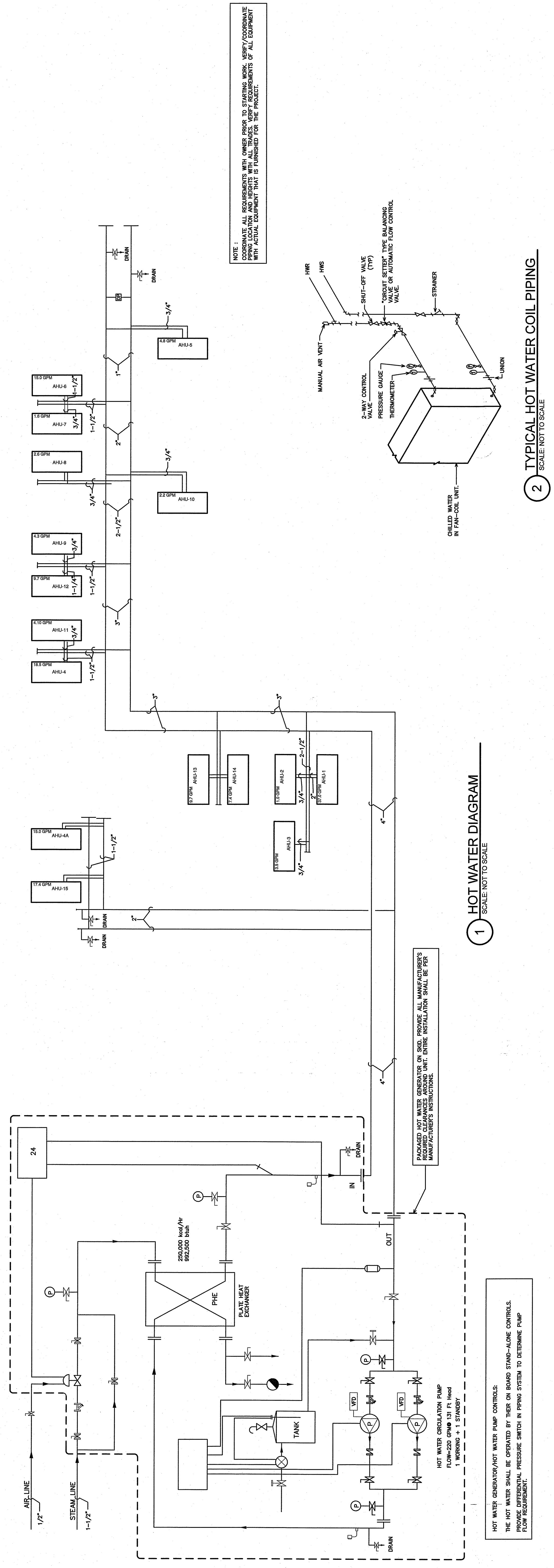
REVISIONS	BY

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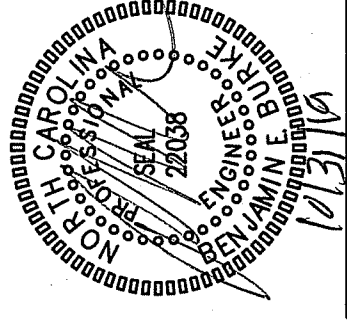
KRIGEN PHARMACEUTICALS LLC
 800 EDWARDS DR
 LILLINGTON, NC 27546

DATE	10/27/2018
BY	EB
NO. OF SHEETS	1
TITLE	PP 6.B



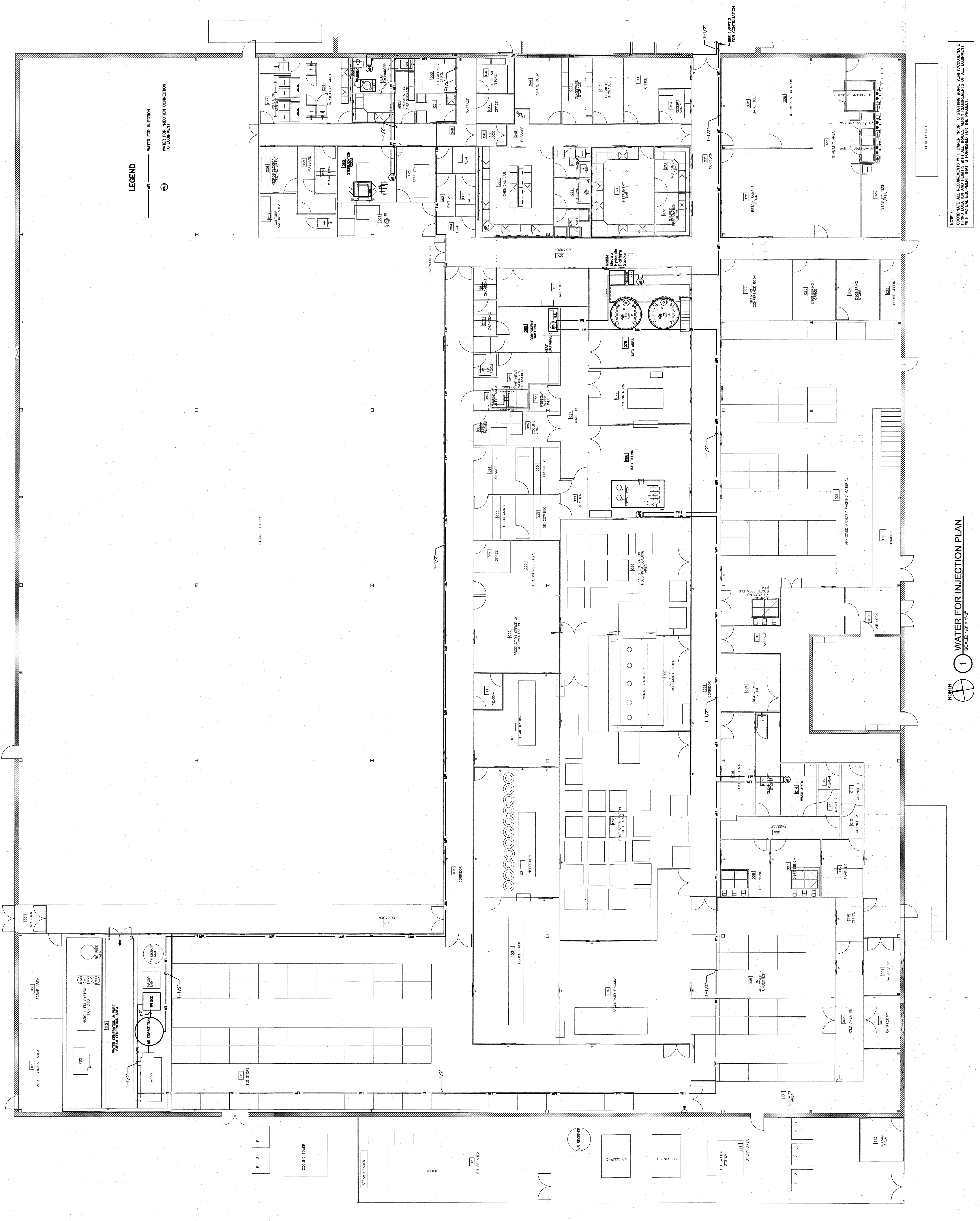
NO.	DATE	BY	REVISIONS

KRIGEN PHARMACEUTICALS LLC
 800 EDWARDS DR
 LILLINGTON, NC 27546

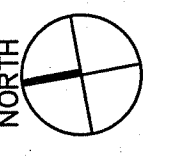


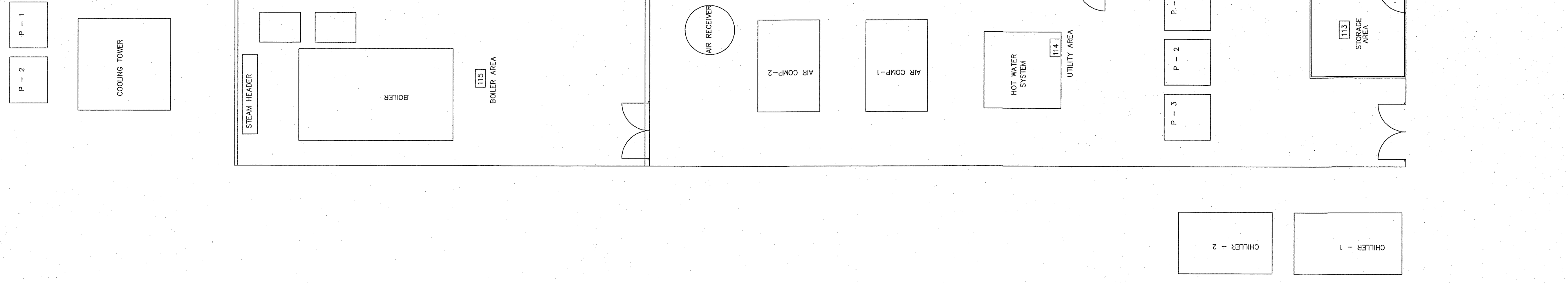
GDW
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PP7.1
 SHEET NO.
 DATE: 10/25/2016
 SCALE: 1/8" = 1'-0"



NOTE: 1. COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE WITH ACTUAL EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.


1 WATER FOR INJECTION PLAN
 SCALE: 1/8" = 1'-0"



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 LILLINGTON, NC 27546

DATE	03/23/2016
DESIGNER	BBB
CHECKER	
DATE	04/27/2016
DATE	3/1/16
DATE	
DATE	
DATE	

PP7.2

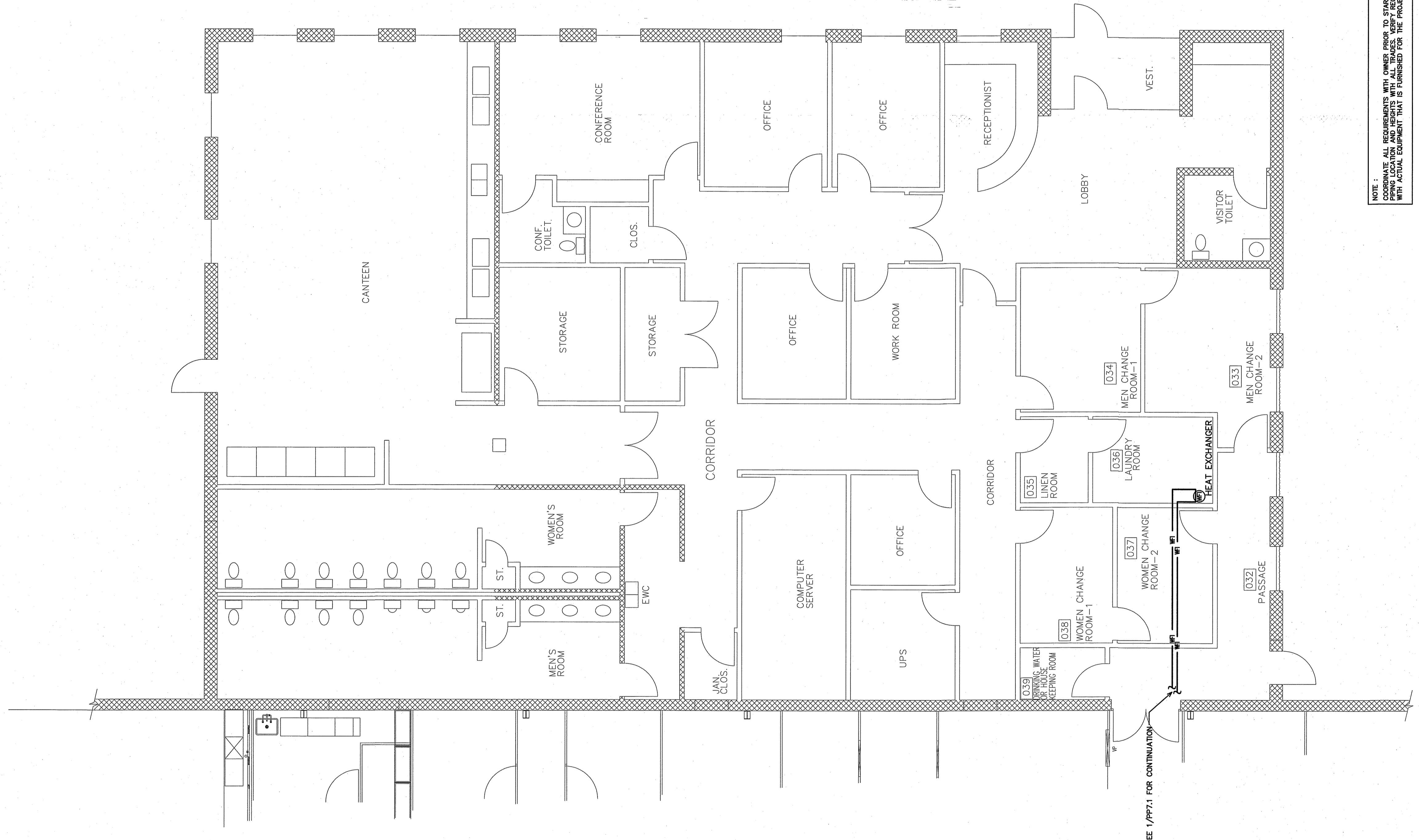
NOTE: ALL REQUIREMENTS WITH OWNER SHALL BE STARTING WORK. VERIFY/COORDINATE CONTINUOUS ALL REQUIREMENTS WITH ALL CONTRACTORS OF ALL EQUIPMENT WITH ACTUAL EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.

NOTE: 1 OFFICE AREA - WATER FOR INJECTION PLAN
 SCALE: 3/16" = 1'-0"

LEGEND

WT — WATER FOR INJECTION

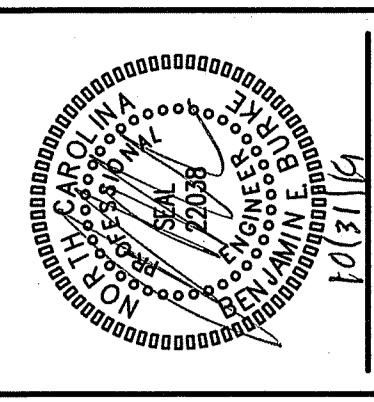
WT — WATER FOR INJECTION CONNECTION TO EQUIPMENT



SEE 1/PP7.1 FOR CONTINUATION

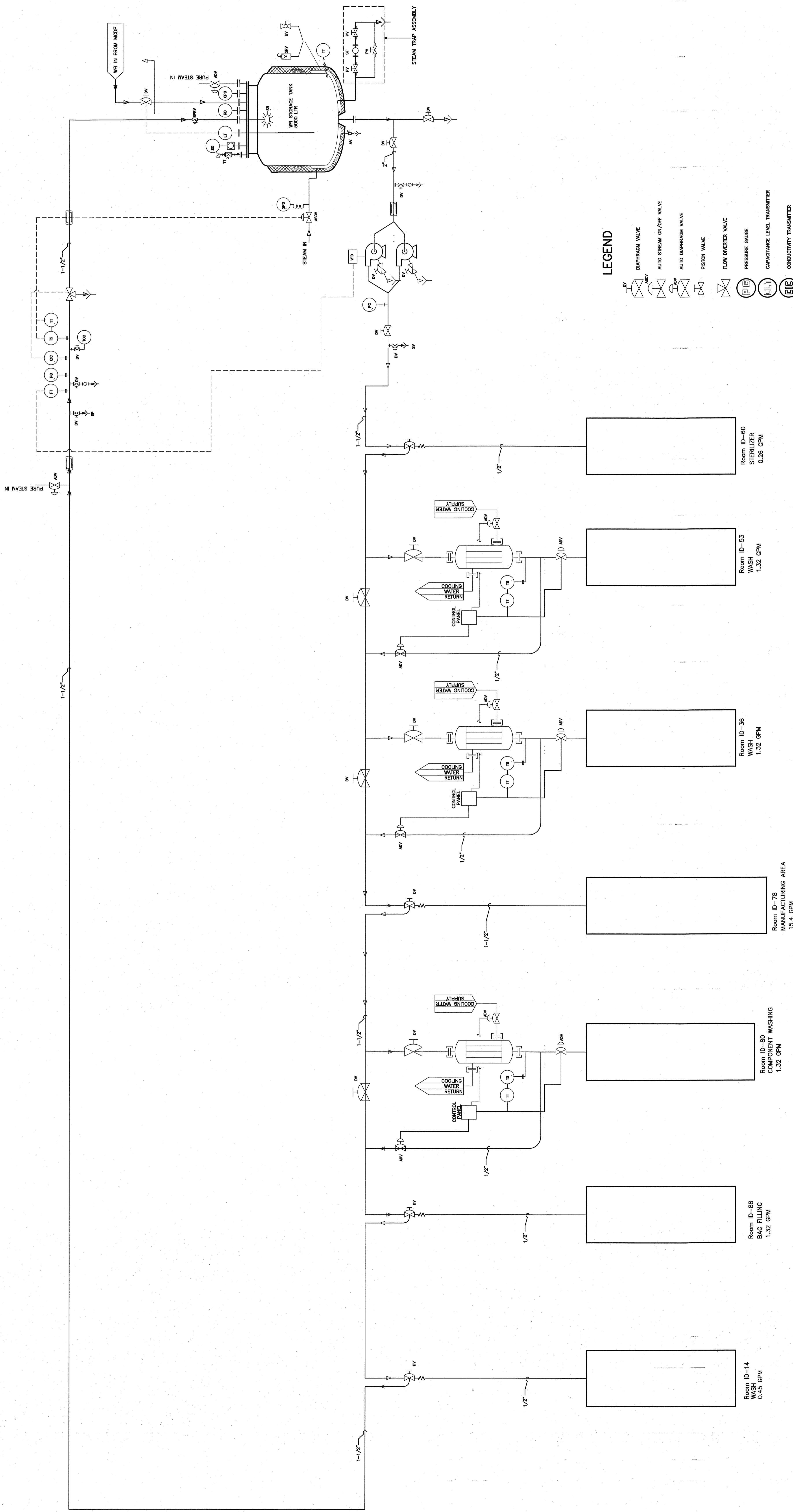
DATE	10/20/2019
BY	CLS
REVISED BY	
REVISED DATE	
REVISED BY	
REVISED DATE	

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REVISIONS	BY



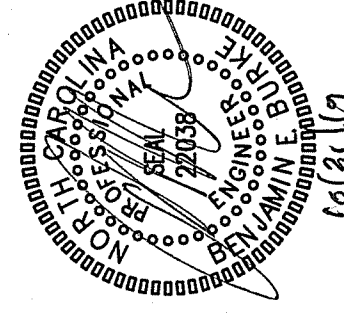
- LEGEND**
- DIAPHRAGM VALVE
 - AUTO STREAM ON/OFF VALVE
 - AUTO DIAPHRAGM VALVE
 - PISTON VALVE
 - FLOW DIVERTER VALVE
 - PRESSURE GAUGE
 - CAPACITANCE LEVEL TRANSMITTER
 - CONDUCTIVITY TRANSMITTER
 - TEMP. SENSOR WITH TRANSMITTER
 - SAMPLING VALVE
 - FLOW TRANSMITTER
 - WFI DIST. PUMP
 - VENT FILTER
 - SAMPLING POINT
 - SPRAY BALL
 - COMPOUND PRESSURE GAUGE
 - AUTO ANGLE VALVE
 - SAFETY RELEASE VALVE
 - BALL VALVE
 - ELECTRICAL CABLE

NOTE: COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE ALL EQUIPMENT TAGS AND IDENTIFICATION NUMBERS OF ALL EQUIPMENT WITH ACTUAL EQUIPMENT THAT IS PLANNED FOR THE PROJECT.

1 WATER FOR INJECTION DIAGRAM
 SCALE: 1/8" = 1'-0"

NO.	DATE	BY	REVISIONS

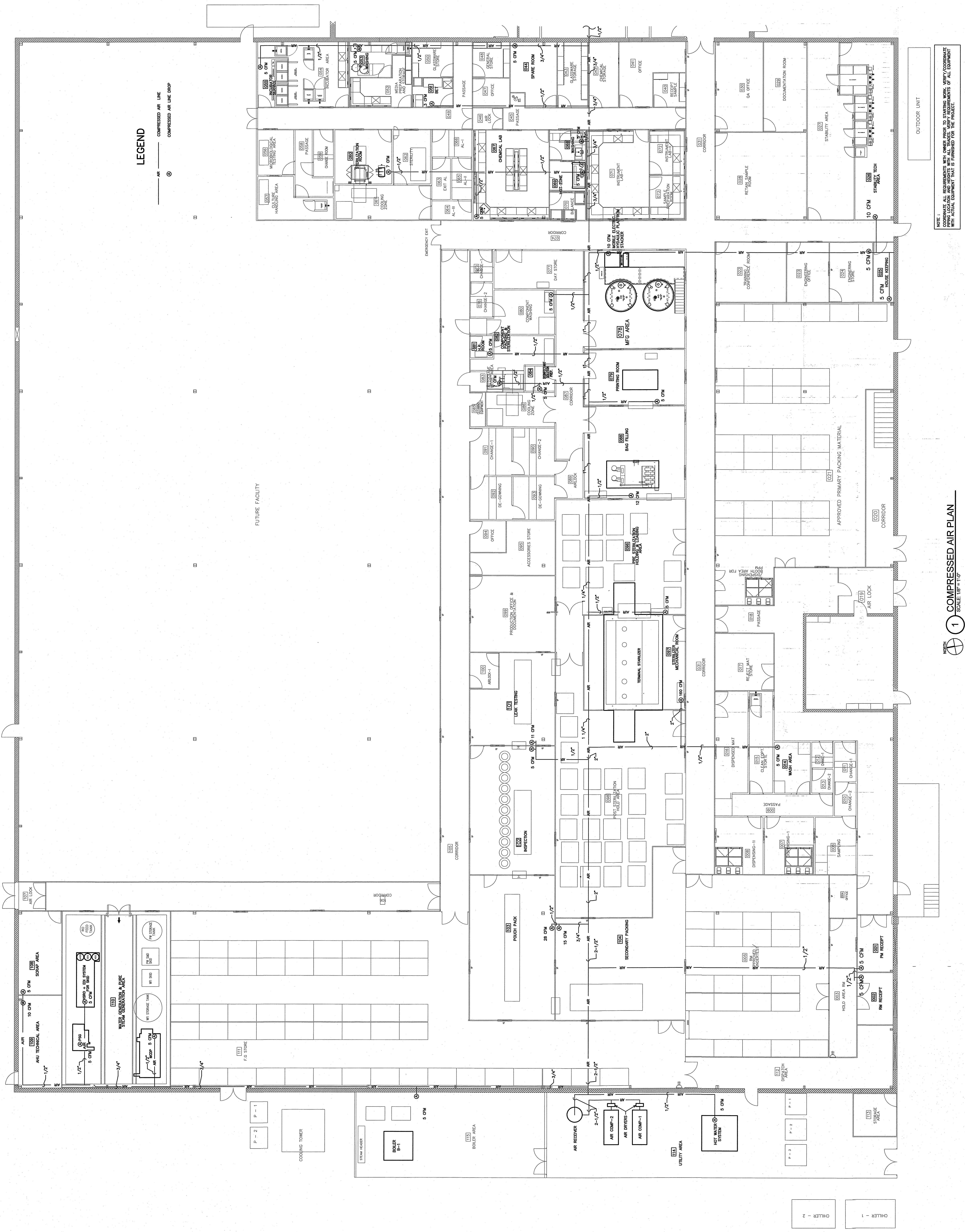
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 LILLINGTON, NC 27546

DATE:	10/20/18
SCALE:	1/8" = 1'-0"
PROJECT:	PP8.1
REVISION:	
DESIGNED BY:	
CHECKED BY:	
DATE:	

PP8.1



LEGEND

○ AIR

⊙ COMPRESSED AIR LINE

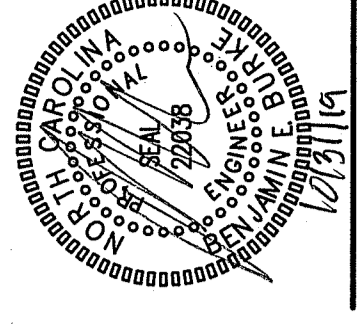
⊙ COMPRESSED AIR LINE DROP

NOTE: COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE WITH CONTRACTOR AND ARCHITECT FOR ALL REQUIREMENTS OF ALL COMPARTMENTS. VERIFY CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROJECT.

1 COMPRESSED AIR PLAN
 SCALE: 1/8" = 1'-0"

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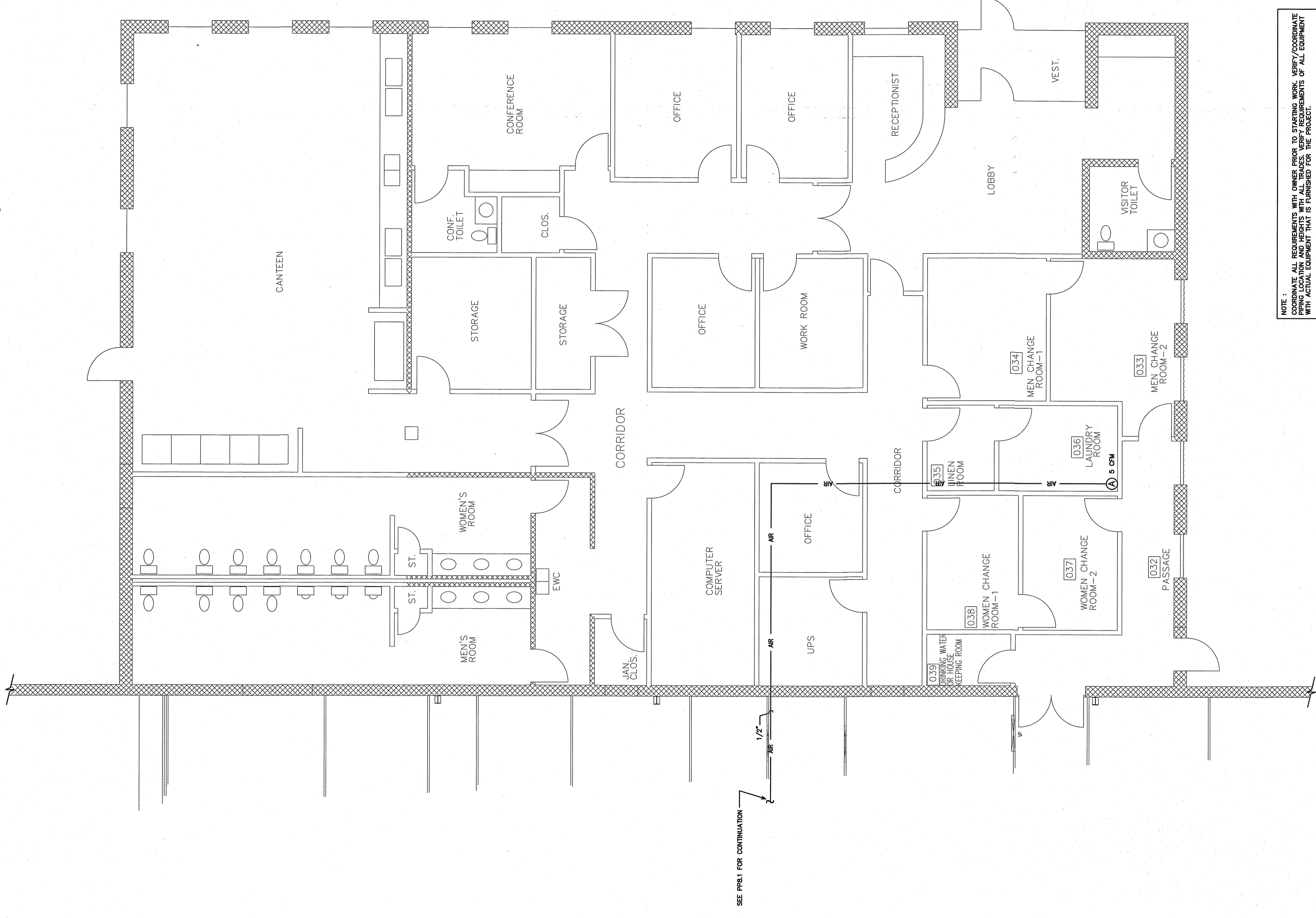
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 LILLINGTON, NC 27546

DATE	10/25/2018
DESIGN	3/7/18
REVISION	
BY	

PP8.2

LEGEND

- AIR
- COMPRESSED AIR LINE
- ⊙ COMPRESSED AIR LINE DROP

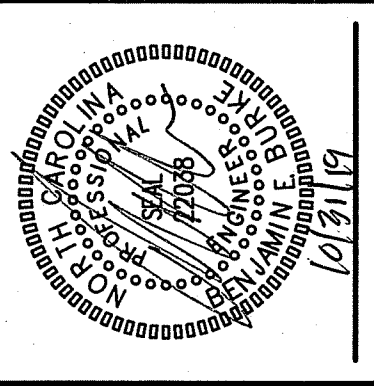


NOTE: THE ALL REQUIREMENTS WITH UNLESS OTHERWISE SPECIFIED. PROVIDE THE LOCATION AND HEIGHTS WITH ALL TRUNKS, BRANCHES, FITTINGS, AND EQUIPMENT WITH ACTUAL EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.

1 COMPRESSED AIR PLAN
 SCALE: 3/16" = 1'-0"

REVISIONS	BY

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 LILLINGTON, NC 27546

DATE	10/27/2019
SCALE	1/8" = 1'-0"
PROJECT	

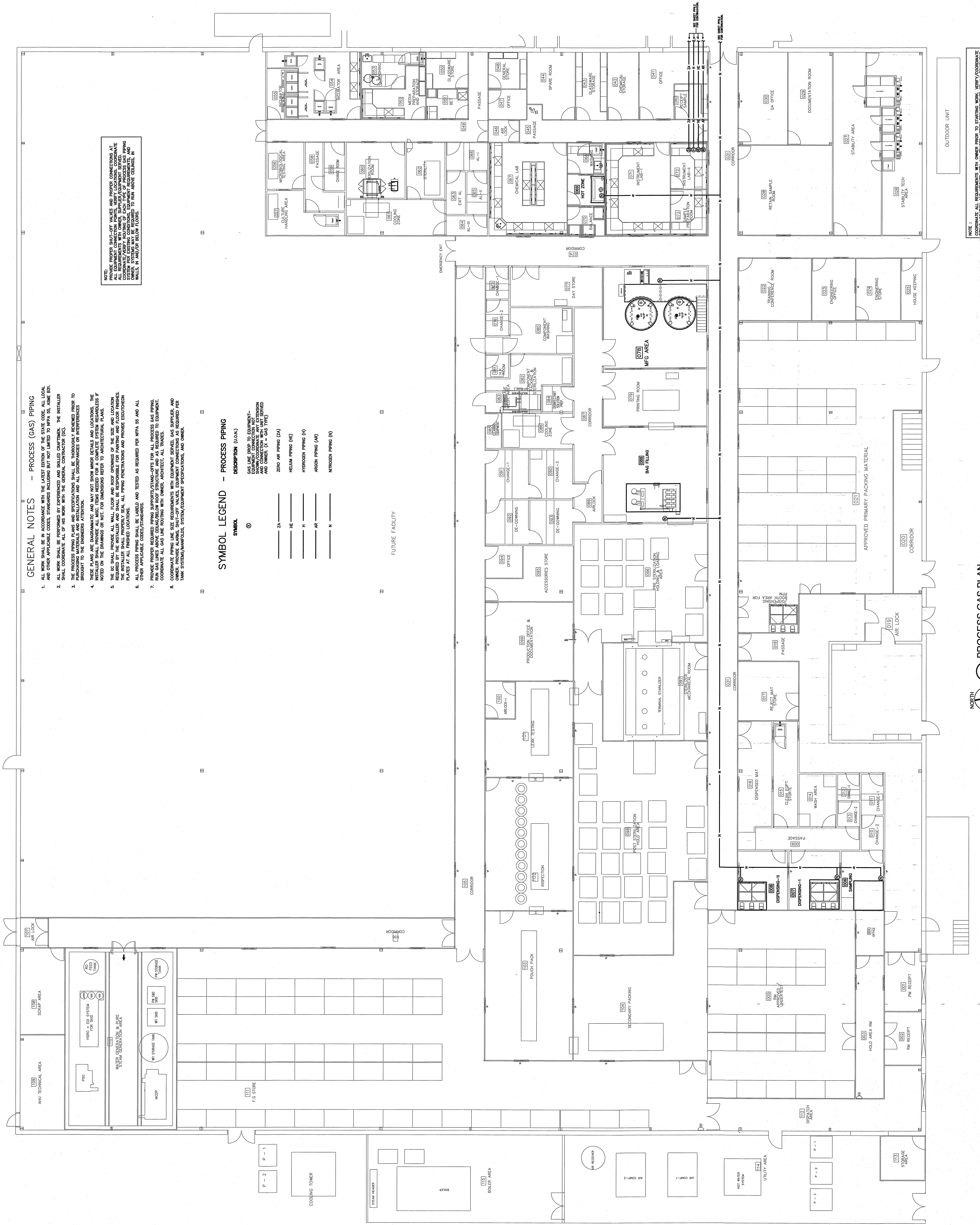
PP 6.1

- GENERAL NOTES - PROCESS (GAS) PIPING**
- ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE STATE CODE, ALL LOCAL AND OTHER APPLICABLE CODES, STANDARDS INCLUDING BUT NOT LIMITED TO NFPA 55, ASME B31.
 - ALL WORK SHALL BE PERFORMED BY EXPERIENCED AND SKILLED CRAFTSMEN. THE INSTALLER SHALL COORDINATE ALL OF HIS WORK WITH THE GENERAL CONTRACTOR (GC).
 - THE INSTALLER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR BRINGING TO THE OWNER'S ATTENTION ALL DISCREPANCIES OR INTERFERENCES.
 - THESE PLANS ARE DIAGNOSTIC AND MAY NOT SHOW MINOR DETAILS AND LOCATIONS. THE INSTALLER SHALL PROVIDE ALL WALL, FLOOR AND ROOF PENETRATIONS OF THE SIZE AND LOCATION REQUIRED BY THE INSTALLER AND SHALL BE RESPONSIBLE FOR PAINTING AND FLOOR FINISHES. THE INSTALLER SHALL PROPERLY SEAL ALL PIPING PENETRATIONS AND PROVIDE EXISTENCE OF ALL PENETRATIONS SHALL BE VERIFIED AND TESTED AS REQUIRED BY NFPA 55 AND ALL OTHER APPLICABLE CODES/STANDARDS.
 - THE GC SHALL PROVIDE ALL WALL, FLOOR AND ROOF PENETRATIONS OF THE SIZE AND LOCATION REQUIRED BY THE INSTALLER AND SHALL BE RESPONSIBLE FOR PAINTING AND FLOOR FINISHES. THE INSTALLER SHALL PROPERLY SEAL ALL PIPING PENETRATIONS AND PROVIDE EXISTENCE OF ALL PENETRATIONS SHALL BE VERIFIED AND TESTED AS REQUIRED BY NFPA 55 AND ALL OTHER APPLICABLE CODES/STANDARDS.
 - THE GC SHALL PROVIDE ALL WALL, FLOOR AND ROOF PENETRATIONS OF THE SIZE AND LOCATION REQUIRED BY THE INSTALLER AND SHALL BE RESPONSIBLE FOR PAINTING AND FLOOR FINISHES. THE INSTALLER SHALL PROPERLY SEAL ALL PIPING PENETRATIONS AND PROVIDE EXISTENCE OF ALL PENETRATIONS SHALL BE VERIFIED AND TESTED AS REQUIRED BY NFPA 55 AND ALL OTHER APPLICABLE CODES/STANDARDS.
 - PROVIDE PROPER PIPING SUPPORTS/STAND-OFFS FOR ALL PROCESS GAS PIPING. RUN GAS LINES ABOVE CEILING/BELOW ROOF STRUCTURE AND AS REQUIRED TO EQUIPMENT. COORDINATE ALL GAS LINE ROUTING WITH OWNER, ARCHITECT, ALL TRADES.
 - COORDINATE PIPING LINE SIZE REQUIREMENTS WITH EQUIPMENT SUPPLIER, GAS SUPPLIER, AND ALL OTHER TRADES. PROVIDE ALL PIPING SUPPORTS/STAND-OFFS AS REQUIRED FOR TANK SYSTEMS/ANNEALS, SYSTEM/EQUIPMENT SPECIFICATIONS, AND OWNER.

SYMBOL LEGEND - PROCESS PIPING

SYMBOL	DESCRIPTION (UNITS)
⊙	GAS LINE LOOP TO EQUIPMENT - EQUIPMENT CONNECTION TO TANK AND CONNECTION WITH LINE SERVED AND DIMENSIONS (1" - 4" GAS IN/OUT)
— ZA —	ZERO AIR PIPING (ZA)
— HE —	HELIUM PIPING (HE)
— H —	HYDROGEN PIPING (H)
— AR —	ARGON PIPING (AR)
— N —	NITROGEN PIPING (N)

NOTE: PROVIDE PROPER SHUT-OFF VALVES AND PROPER CONNECTIONS AT ALL EQUIPMENT CONNECTION POINTS. VERIFY LOCATION, COORDINATE ALL PIPING PENETRATIONS WITH ALL TRADES. VERIFY REQUIREMENTS OF ALL EQUIPMENT PIPING LOCATION AND HEIGHTS WITH ALL TRADES. VERIFY REQUIREMENTS OF ALL EQUIPMENT WITH ACTUAL EQUIPMENT THAT IS FURNISHED FOR THE PROJECT.



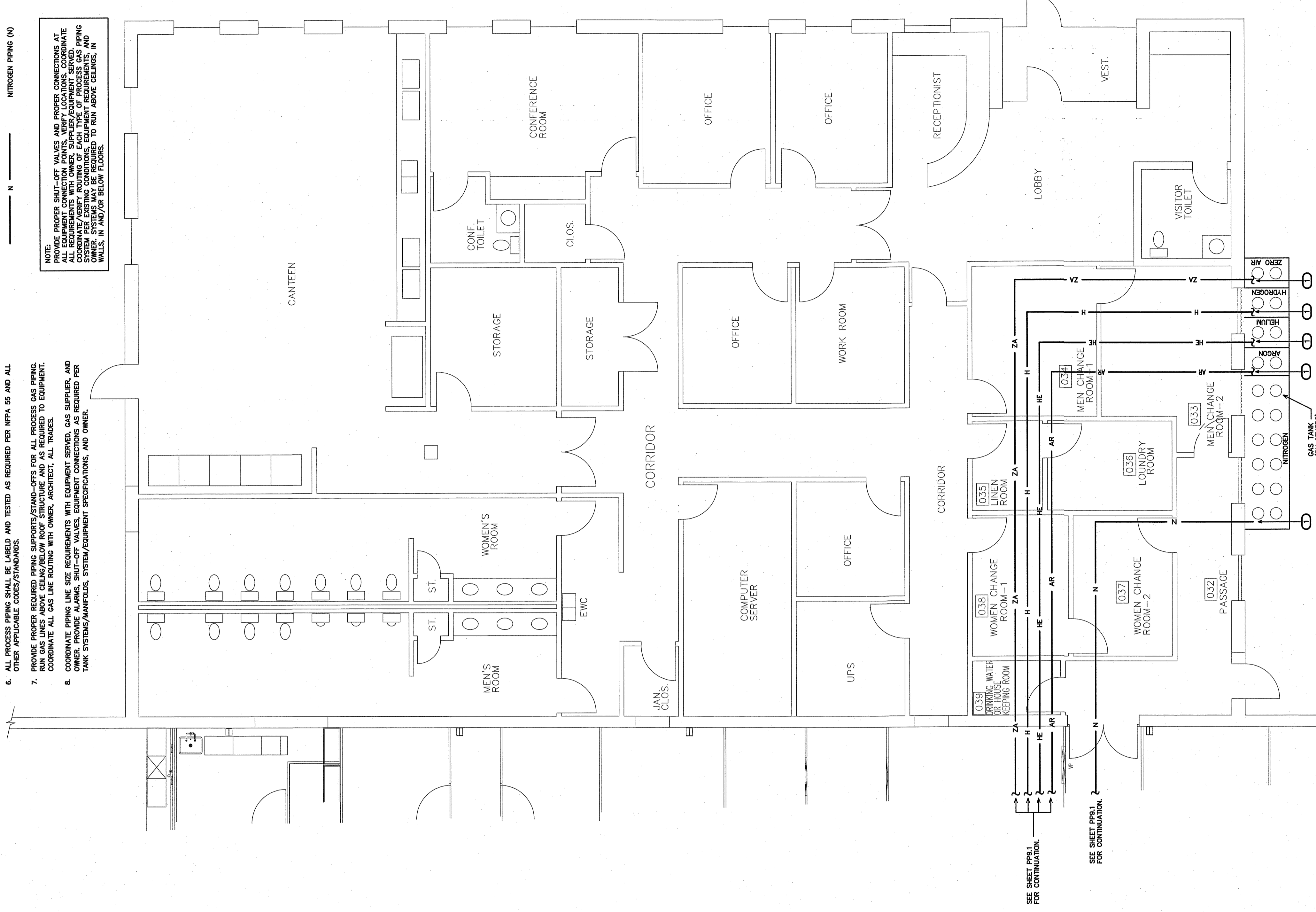
1 PROCESS GAS PLAN
 SCALE: 1/8" = 1'-0"

- GENERAL NOTES - PROCESS (GAS) PIPING**
- ALL WORK, GAS CUMBER STORAGE AND USAGE, SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) CODES AND STANDARDS INCLUDING BUT NOT LIMITED TO NFPA 55, ASH 151.
 - ALL WORK SHALL BE PERFORMED BY EXPERIENCED AND SKILLED CRAFTSMEN. THE INSTALLER SHALL COORDINATE ALL OF HIS WORK WITH THE GENERAL CONTRACTOR (GC).
 - THE PROCESS PIPING PLANS AND SPECIFICATIONS SHALL BE THOROUGHLY REVIEWED PRIOR TO COMMENCEMENT OF WORK AND ALL DISCREPANCIES OR INTERFERENCES BROUGHT TO THE ENGINEER'S ATTENTION.
 - THESE PLANS ARE DIAGNOSTIC AND MAY NOT SHOW WORK DETAILS AND LOCATIONS. THE INSTALLER SHALL PROVIDE ALL MISCELLANEOUS ITEMS NEEDED FOR A COMPLETE SYSTEM REGARDLESS IF NOTED ON THE DRAWINGS OR NOT. FOR DIMENSIONS REFER TO ARCHITECTURAL PLANS.
 - THE GC SHALL PROVIDE ALL WALL, FLOOR AND ROOF OPENINGS OF THE SIZE AND LOCATION. THE INSTALLER SHALL PROPERLY SEAL ALL PIPING PENETRATIONS AND PROVIDE ESCUTCHEON PLATES AT ALL FINISHED LOCATIONS.
 - ALL PROCESS PIPING SHALL BE LABELED AND TESTED AS REQUIRED PER NFPA 55 AND ALL OTHER APPLICABLE CODES/STANDARDS.
 - THE INSTALLER SHALL VERIFY THE WORK AREA FOR ALL PROCESS GAS PIPING. ALL GAS LINES MUST BE CLEAR OF ALL OBSTRUCTIONS AND AS REQUIRED TO EQUIPMENT.
 - COORDINATE ALL GAS LINE ROUTING WITH OWNER, ARCHITECT, ALL TRADES.
 - COORDINATE PIPING LINE SIZE REQUIREMENTS WITH EQUIPMENT SUPPLIER, GAS SUPPLIER, AND OWNER. PROVIDE ALARM, SHUT-OFF VALVES, EQUIPMENT CONNECTIONS AS REQUIRED PER THESE SPECIFICATIONS, SYSTEM/EQUIPMENT SPECIFICATIONS, AND OTHERS.

SYMBOL LEGEND - PROCESS PIPING

SYMBOL	DESCRIPTION (I.D.)
⊙	GAS LINE DROP TO EQUIPMENT - SHOW/COORDINATE ANY EXTENSION AND OWNER. (X = GAS TYPE)
— ZA	ZERO AIR PIPING (ZA)
— HE	HELIUM PIPING (HE)
— H	HYDROGEN PIPING (H)
— AR	ARGON PIPING (AR)
— N	NITROGEN PIPING (N)

NOTE: PROVIDE PROPER SHUT-OFF VALVES AND PROPER CONNECTIONS AT ALL EQUIPMENT CONNECTION POINTS. VERIFY LOCATIONS. COORDINATE ALL GAS LINE ROUTING WITH OWNER, ARCHITECT, ALL TRADES. COORDINATE/VERIFY ROUTING OF EACH TYPE OF PROCESS GAS PIPING WITH ALL OTHER TRADES. ALL PIPING SHALL BE INSTALLED ABOVE OTHER SYSTEMS MAY BE REQUIRED TO RUN ABOVE CEILING, IN WALLS, IN AND/OR BELOW FLOORS.



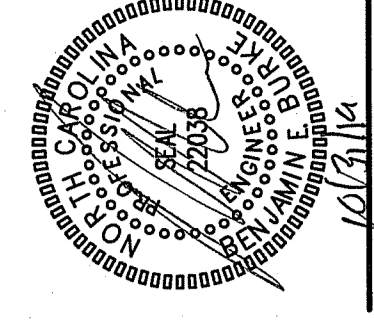
NOTE: COORDINATE ALL REQUIREMENTS WITH OWNER PRIOR TO STARTING WORK. VERIFY/COORDINATE ALL REQUIREMENTS WITH ARCHITECT PRIOR TO STARTING WORK. VERIFY/COORDINATE ALL REQUIREMENTS WITH ACTUAL EQUIPMENT PRINTS FURNISHED FOR THE PROJECT.

NET NOTE FOR SHEET PIP-2

CONNECT TO SYSTEM MANIFOLD AT GAS STATIONS. VERIFY GAS CHANGER QUANTITIES AND LOCATIONS.

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DATE	BY	CHKD BY
10/27/2018		

PP9.2