



NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

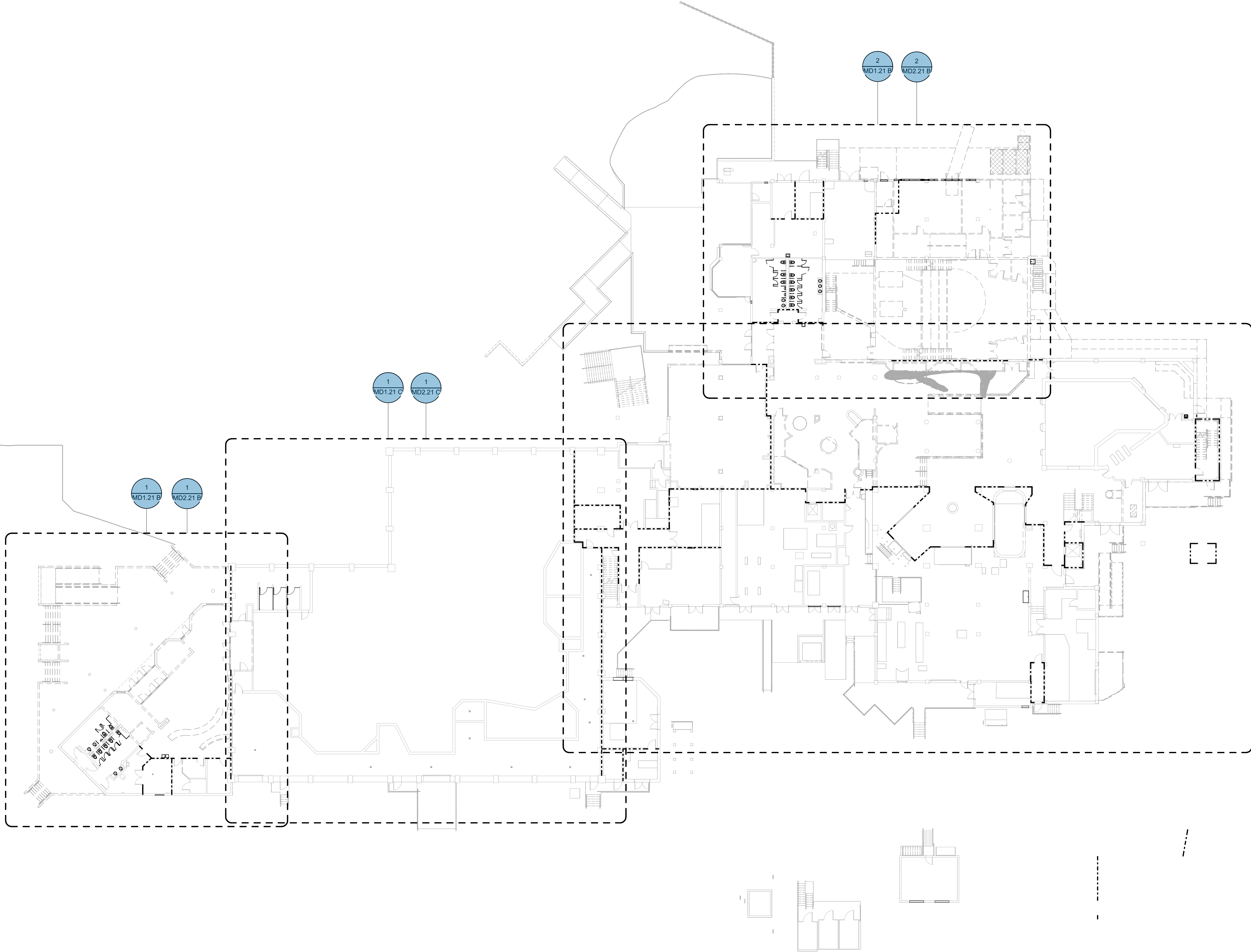
FIRST FLOOR DEMO PLAN

MD1.11

GENERAL NOTES

1. HATCHED AREAS ON DRAWINGS INDICATE EXTENT OF DEMOLITION. DEMOLITION LIMITS SHALL BE CLEARLY IDENTIFIED AND VERIFIED IN FIELD PRIOR TO WORK.
2. REFER TO HYDRONIC RISER DIAGRAMS FOR DETAILED DEMOLITION SCOPE. REMOVE PIPING, CONNECTIONS, AND TERMINATIONS AS INDICATED. COORDINATE WITH DEMOLITION OF ASSOCIATED EQUIPMENT.
3. SINGLE-LINE DUCTWORK INDICATES GENERAL ROUTING OF EXISTING SYSTEMS. FIELD-VERIFY CONDITIONS PRIOR TO DEMOLITION OR RECONNECTION.
4. REMOVE ALL ASSOCIATED HANGERS, SUPPORTS, INSULATION, SEALANTS, PIPING SPECIALTIES, CONTROLS, AND ACCESSORIES WITH DEMOLISHED HVAC EQUIPMENT, DUCTWORK, OR PIPING AS REQUIRED FOR COMPLETE REMOVAL. DO NOT REMOVE ITEMS REQUIRED FOR ACTIVE OR REUSED SYSTEMS. CONTRACTOR SHALL FIELD-VERIFY AND CONFIRM REUSE PRIOR TO REMOVAL. PATCH AND SEAL ALL PENETRATIONS IN FLOORS, WALLS, OR ROOF TO MATCH ADJACENT CONSTRUCTION.
5. WHERE PARTIAL DEMOLITION OCCURS, PREPARE SYSTEMS FOR RECONNECTION TO NEW WORK. CAP OR TEMPORARILY SUPPORT AS REQUIRED.
6. COORDINATE WITH OTHER TRADES FOR SAFE REMOVAL OF PIPING, DUCTWORK, AND EQUIPMENT.
7. PROTECT REMAINING ACTIVE SYSTEMS DURING DEMOLITION.
8. ALL EXTERIOR AND INTERIOR PENETRATIONS AFFECTED BY DEMOLITION SHALL HAVE EXISTING FLASHING, SEALANT, AND CAULKING REMOVED, SURFACES CLEANED, AND OPENINGS PREPARED FOR NEW WORK. COORDINATE WITH ARCHITECTURAL FINISHES FOR PATCHING AND REPAIR AS REQUIRED.

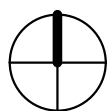
EXISTING FIRE PUMP
BUILDING
155



20' 10' 20'
SCALE: 1" = 20'-0"

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OVERALL 1ST FLOOR - DEMO - HVAC

SCALE: 1" = 20'-0"

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
KURE BEACH, NC 28449

NORTH CAROLINA DEPT. OF
NATURAL & CULTURAL RESOURCES

SZOSTAK DESIGN, INC.

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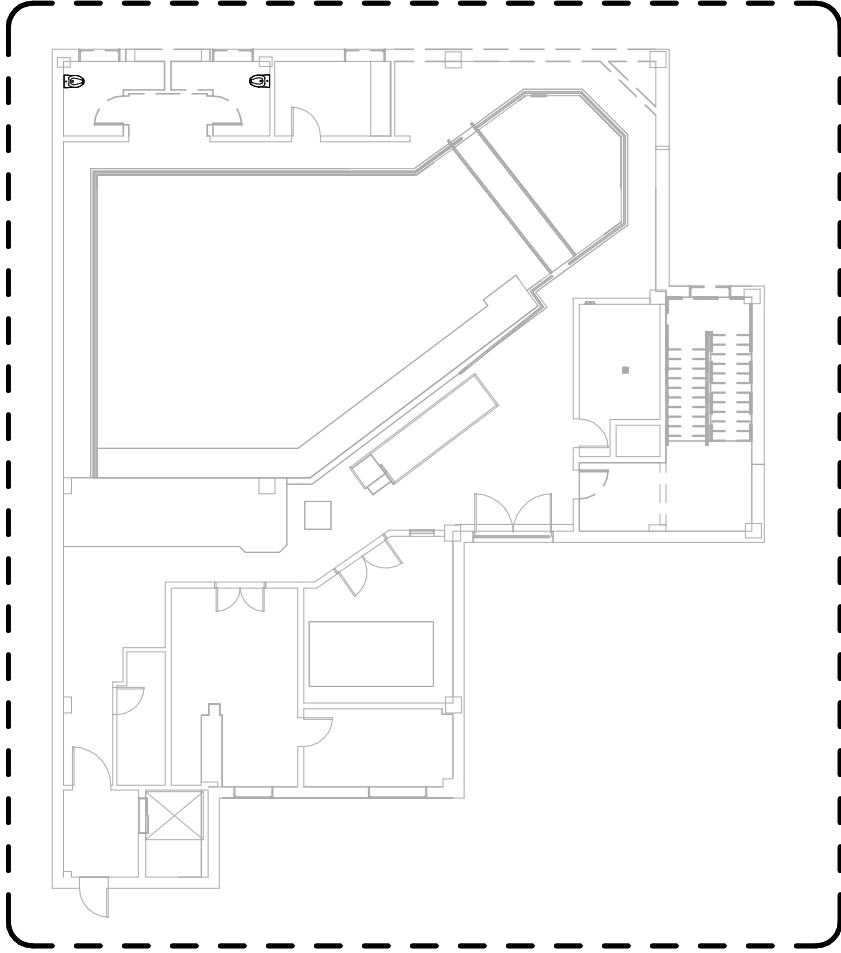
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

SECOND AND THIRD
FLOOR DEMO PLAN

MD1.12

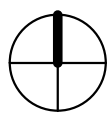
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1
MD2.23 B

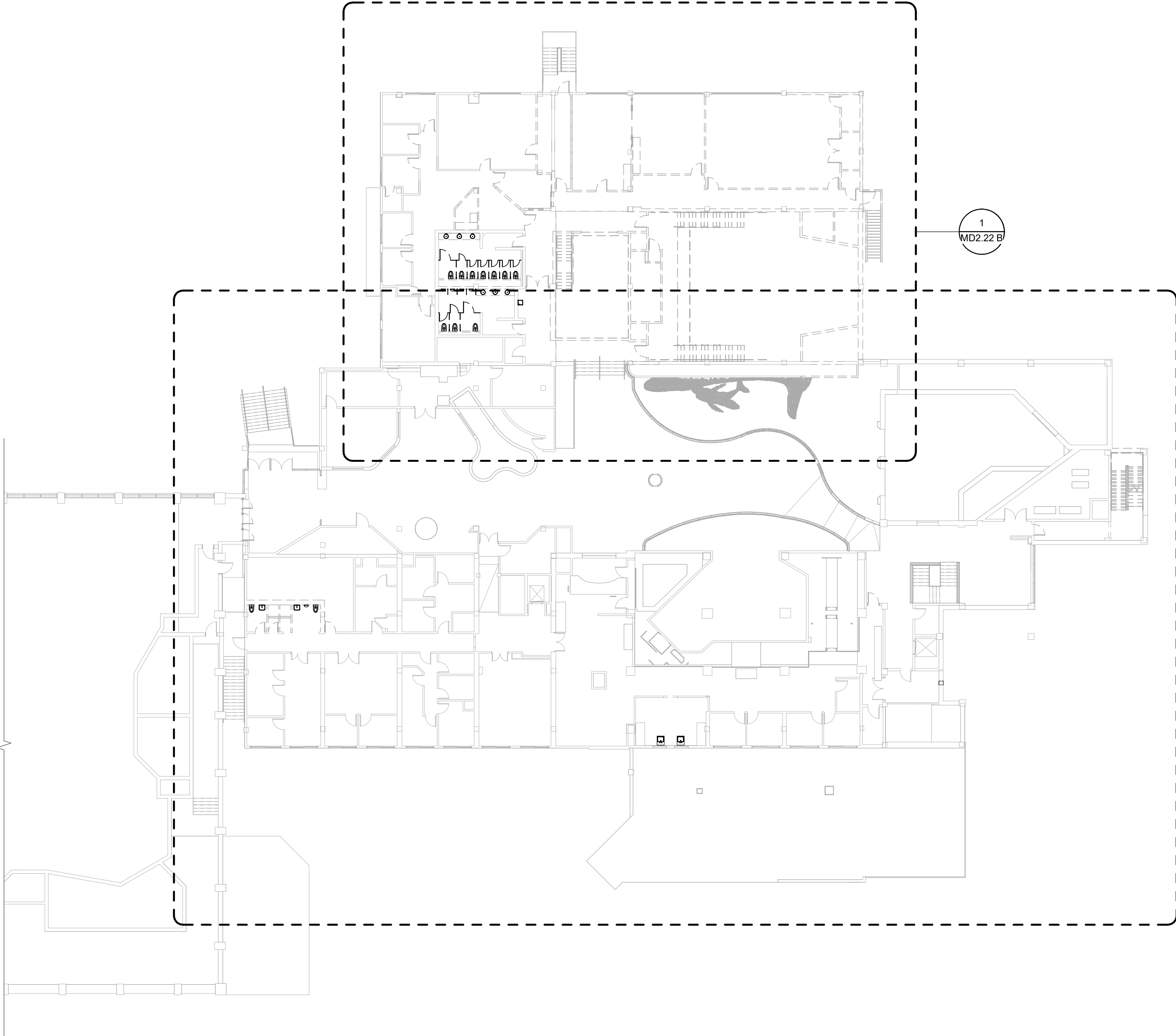
20' 10' 20'
SCALE : 1" = 20'-0"



OVERALL 3RD FLOOR - DEMO - HVAC

SCALE : 1" = 20'-0"

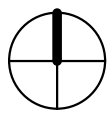
2



1
MD2.22 B

1
MD2.22 A

20' 10' 20'
SCALE : 1" = 20'-0"



OVERALL 2ND FLOOR - DEMO - HVAC

SCALE : 1" = 20'-0"

1

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IRN 002
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FIRST FLOOR DEMO PLAN -
CAPE FEAR - HVAC

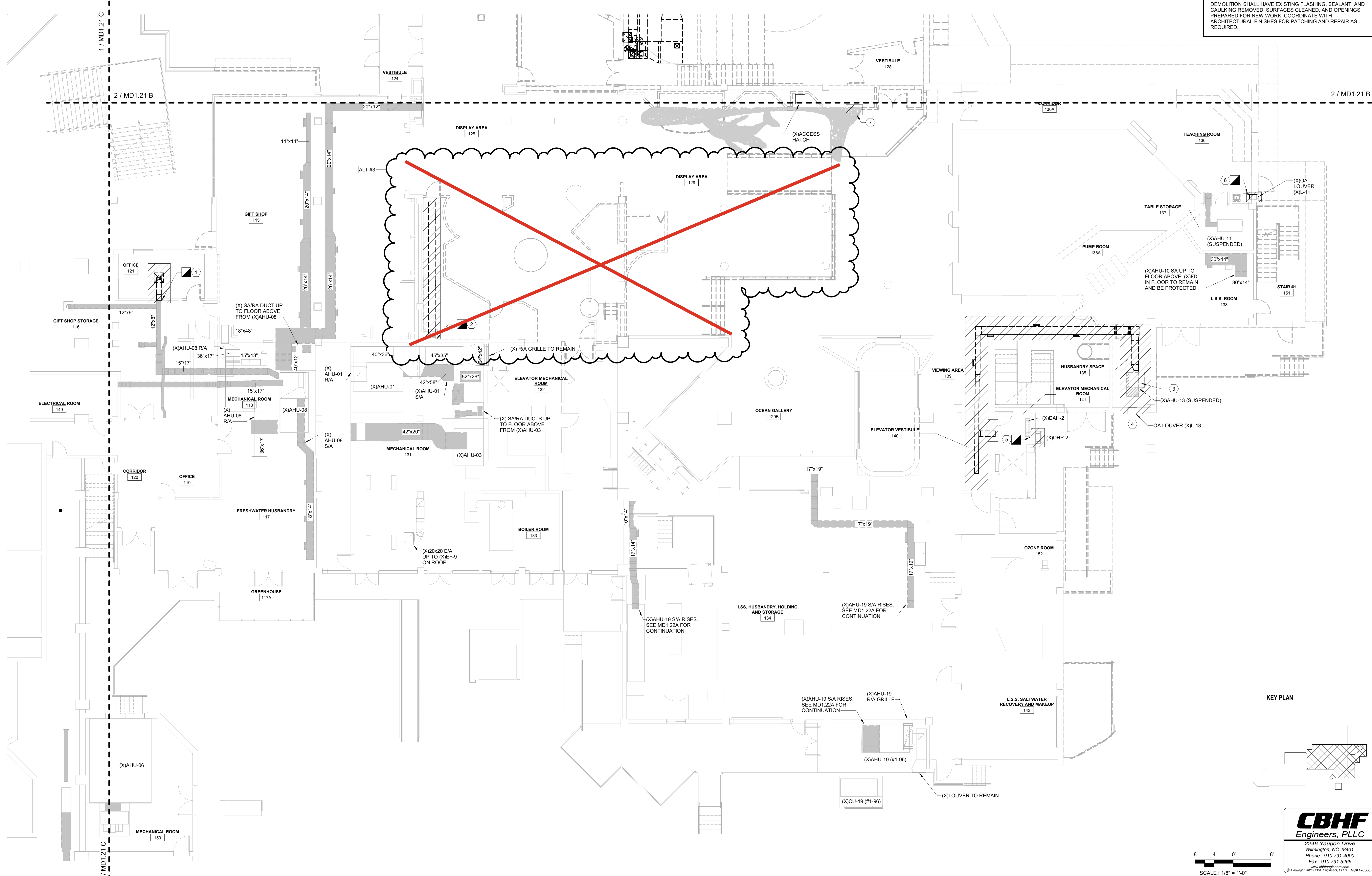
MD1.21 A

DEMOLITION KEYED NOTES

1. REMOVE EXISTING (X)AHU-08 DUCTWORK, DIFFUSERS, GRILLES, AND RELATED COMPONENTS BACK TO EXTENT INDICATED ON PLANS. CAP OR PREPARE DUCT ENDS FOR CONNECTION TO NEW WORK. COORDINATE WITH OTHER TRADES AS REQUIRED.
2. REMOVE EXISTING (X)AHU-01 DUCTWORK, DIFFUSERS, GRILLES, AND RELATED COMPONENTS BACK TO EXTENT INDICATED ON PLANS. CAP OR PREPARE DUCT ENDS FOR CONNECTION TO NEW WORK. COORDINATE WITH OTHER TRADES AS REQUIRED.
3. DEMOLISH EXISTING (X)AHU-13 SYSTEM IN ITS ENTIRETY, INCLUDING ALL DUCTWORK, SUPPORTS, CONTROLS, AND ASSOCIATED MECHANICAL INFRASTRUCTURE. SAFELY DISCONNECT, VERIFY, AND CAP ALL UTILITIES AS REQUIRED. COORDINATE DEMOLITION WITH PROJECT PHASING, SITE SAFETY REQUIREMENTS, AND OTHER TRADES.
4. REMOVE EXISTING (X)L-13 OA LOUVER AND INFILL WALL TO MATCH ADJACENT CONSTRUCTION PER ARCHITECTURAL PLANS. REMOVE ASSOCIATED CONNECTIONS AND SUPPORTS AND SEAL PENETRATIONS AS REQUIRED.
5. DISCONNECT AND REMOVE EXISTING (X)DHP-02 OUTDOOR HEAT PUMP UNIT AND WALL MOUNT BRACKETS. RELOCATE UNIT TO ROOF PER PLANS AND PROVIDE NEW REFRIGERANT PIPING, CONDENSATE, AND ELECTRICAL CONNECTIONS AS REQUIRED. PROTECT EXISTING (X)DAH-2 INDOOR UNIT DURING WORK AND VERIFY PROPER RECONNECTION AND OPERATION AFTER INSTALLATION.
6. REMOVE EXISTING (X)L-11 LOUVER, MOTORIZED OA DAMPER, AND MANUAL BALANCE DAMPER. INFILL WALL TO MATCH ADJACENT CONSTRUCTION PER ARCHITECTURAL PLANS. REMOVE ASSOCIATED DUCT CONNECTIONS AND SUPPORTS, SEAL PENETRATIONS, AND REROUTE OA DUCTWORK TO NEW LOUVER LOCATION PER PLANS.
7. REMOVE (2) EXISTING SIDEWALL RETURN GRILLES AND RETURN DUCTWORK FOR (X)AHU-18A) AND (X)AHU-18B). INFILL WALL OPENINGS TO MATCH ADJACENT FINISH PER ARCHITECTURAL PLANS.

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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

1ST FLOOR - DEMO - CAPE FEAR - HVAC
SCALE: 1/8" = 1'-0"

SHEET DEMOLITION KEYED NOTES	
1	REMOVE EXISTING WALL CAP, INLINE EXHAUST FAN (XIEF-2, ASSOCIATED DUCTWORK, HANGERS, GRILLES, AND CONTROLS. PREPARE OPENING FOR NEW LIKE-SIZED WALL CAP.
2	DEMO 48"x24"x6" RELIEF LOUVER, INFILL OPENING TO MATCH ADJACENT FINISHES. COORDINATE WITH ARCHITECTURAL.
3	REMOVE 48"x30"x6" OUTSIDE AIR LOUVER, PREPARE OPENING FOR NEW LIKE-SIZED LOUVER.
4	DEMO INLINE 1.5 HP SUSPENDED FAN, REMOVE SUPPORTS AND CONNECTIONS.
5	REMOVE EXISTING ROOF-MOUNTED FAN, EXHAUST DUCTWORK, GRILLES, AND CONTROLS. REUSE EXISTING ROOF OPENING FOR NEW FAN. COORDINATE ROOF FLASHING AND SEALING WITH ROOFING AND ARCHITECTURAL.
6	(ALT #2 ONLY) REMOVE (XIAHU-7) AND ALL ASSOCIATED DUCTWORK, PIPING, CONTROLS, GRILLES, AND DIFFUSERS SERVING THE LAY-IN CEILING AREA. RETAIN EXISTING CONCRETE HOUSEKEEPING PAD FOR NEW UNIT. COORDINATE DEMOLITION LIMITS WITH NEW WORK PLANS AND TRADES.
7	REMOVE EXISTING EXHAUST FAN (XIEF-7A) AND (XIEF-7B), ASSOCIATED WALL CAPS, DUCTWORK, GRILLES, CONTROLS, AND SUPPORTS. PATCH WALLS AS REQUIRED.
8	REMOVE ALL SIDEWALL GRILLES SERVING RESTROOMS AND ASSOCIATED BRANCH DUCTS BACK TO MAIN. COORDINATE PATCHING OF WALLS AND CEILINGS.
9	REMOVE AND DISPOSE OF THE EXISTING HVAC SYSTEM (XIAHU-09) TO THE LIMITS SHOWN INCLUDING BUT NOT LIMITED TO, EQUIPMENT, PIPING, DUCTWORK, INSULATION, DUCTWORK, AIR DISTRIBUTION, LOUVERS, HANGERS, SUPPORTS AND CONTROLS. REPAIR DUCTWORK IN CONCESSION 147 AND PREPARE FOR CONNECTION TO NEW SYSTEM.
10	REMOVE (XJHP-15) AND MATCHING INDOOR UNITS (XIAH-15), INCLUDING BUT NOT LIMITED TO DUCTWORK, GRILLES, REFRIGERANT PIPING, CONDENSATE, CONTROLS, AND POWER CONNECTIONS. REMOVE ROOF/WALL CURBS OR SLEEVES AND PATCH AS REQUIRED.
11	REMOVE (XJHP-16) AND MATCHING INDOOR UNITS (XIAH-16), INCLUDING BUT NOT LIMITED TO DUCTWORK, GRILLES, REFRIGERANT PIPING, CONDENSATE, CONTROLS, AND POWER CONNECTIONS. REMOVE ROOF/WALL CURBS OR SLEEVES AND PATCH AS REQUIRED.
12	REMOVE AND DISPOSE OF (XIAHU-04) AND (XIAHU-02), INCLUDING ALL ASSOCIATED HVAC COMPONENTS IN THEIR ENTIRETY. THIS INCLUDES, BUT IS NOT LIMITED TO, DUCTWORK, DAMPERS, PIPING, INSULATION, FLEXIBLE DUCT, AIR DISTRIBUTION DEVICES, LOUVERS, HANGERS, SUPPORTS, CONTROLS, THERMOSTATS, AND ACCESSORIES. PROTECT ALL ITEMS TO REMAIN FROM DAMAGE.
13	REMOVE AND DISPOSE OF (X)THRU-WALL UNIT, INCLUDING ALL ASSOCIATED HVAC COMPONENTS. THIS INCLUDES, BUT IS NOT LIMITED TO, REFRIGERANT PIPING, CONDENSATE DRAIN, WALL SLEEVE, LOUVER/GRILLE, CONTROLS, AND ELECTRICAL CONNECTIONS. PATCH WALL OPENING AND FINISH SURFACES AS REQUIRED.

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SZOSTAK DESIGN

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AQUARIUM
RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
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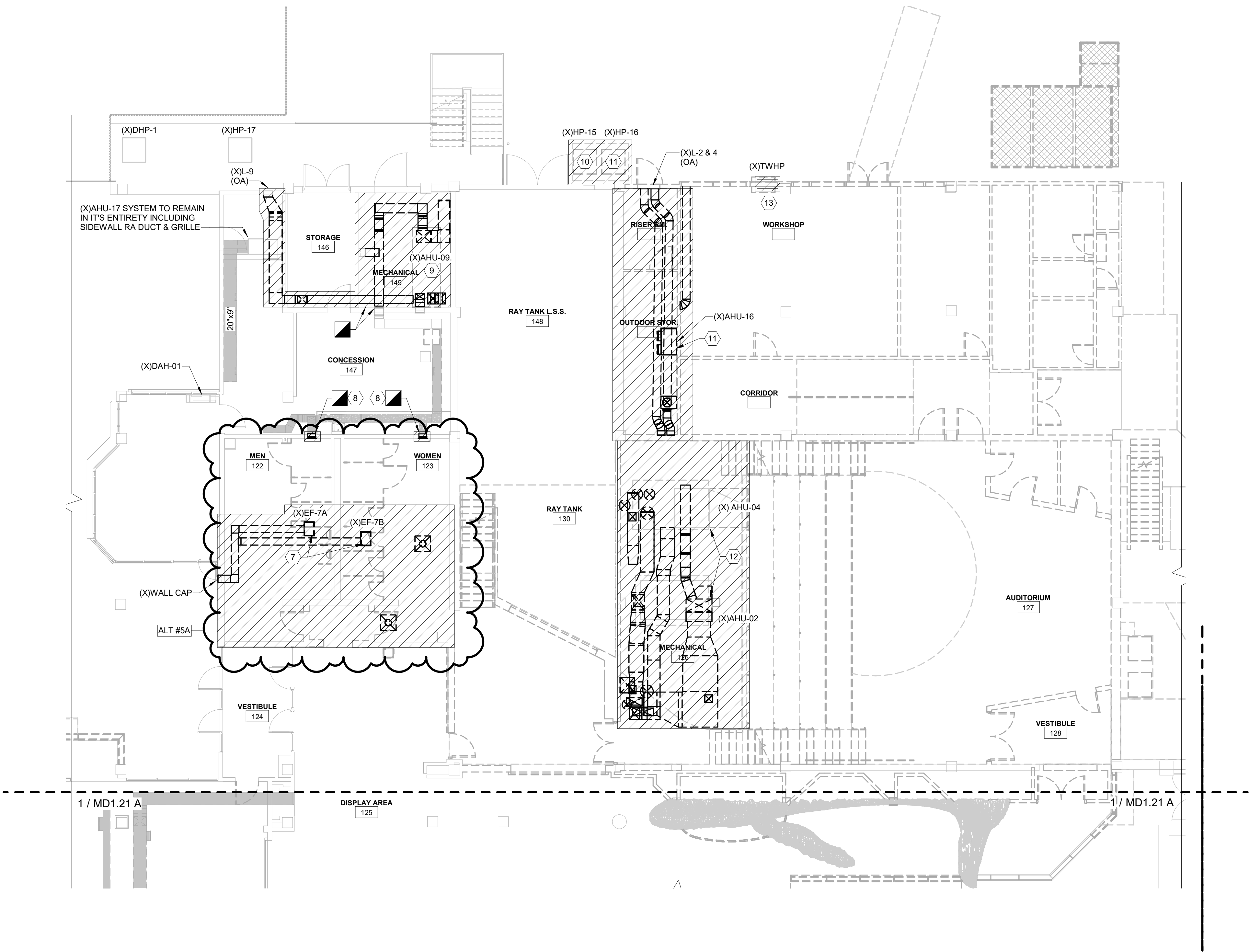
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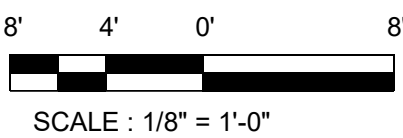
NO.	DATE	DESCRIPTION
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FIRST FLOOR DEMO PLAN -
MAIN ENTRY & TOUCH
TANK - HVAC

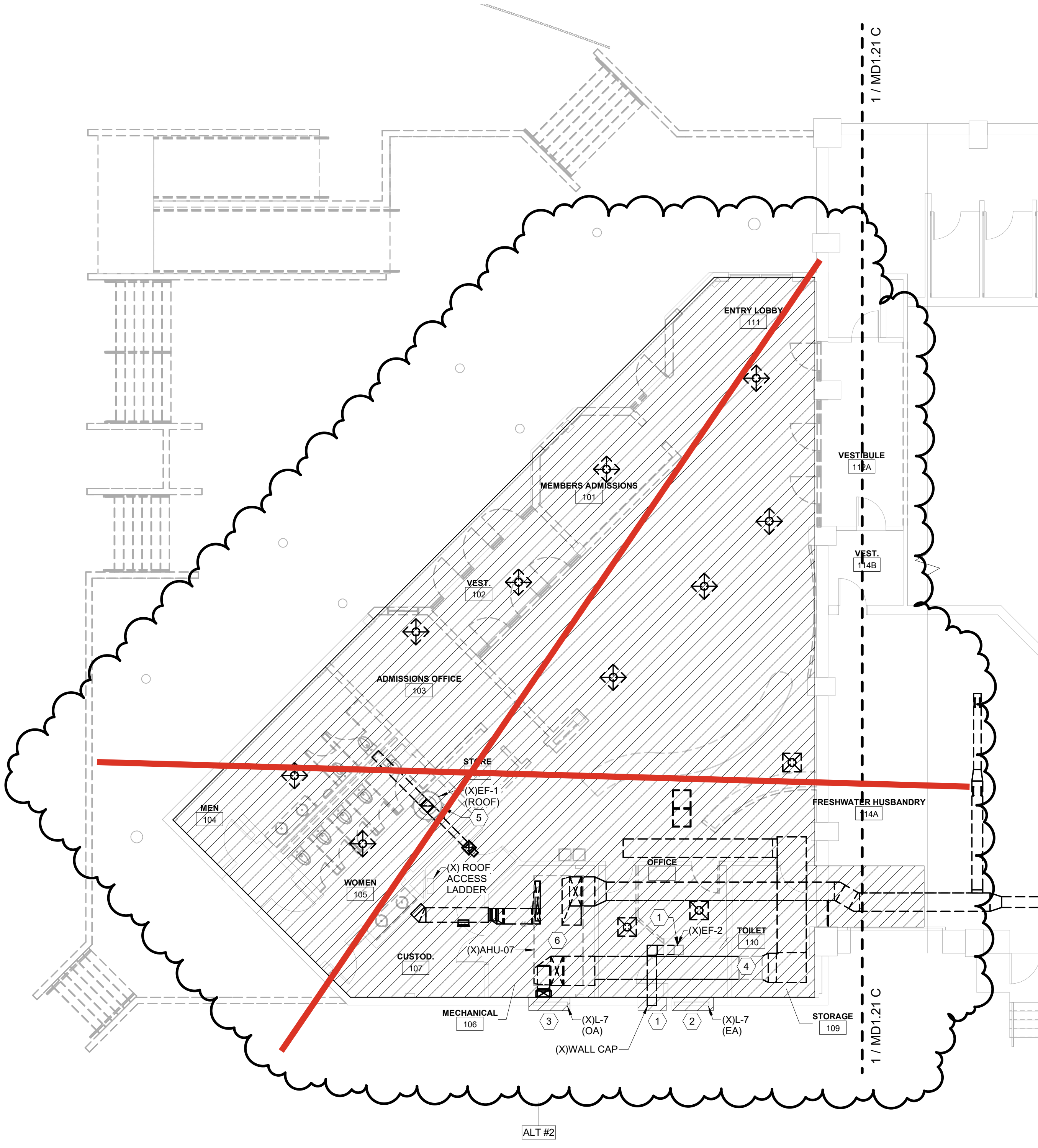
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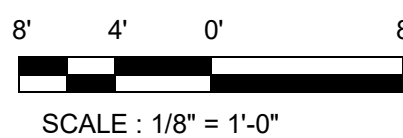
KEY PLAN



1ST FLOOR - DEMO - TOUCH AND SHARK TANK - HVAC
SCALE: 1/8" = 1'-0"



KEY PLAN



1ST FLOOR - DEMO - MAIN ENTRY - HVAC
SCALE: 1/8" = 1'-0"

REMOVE EXISTING SIDEWALL EXHAUST FAN AND ASSOCIATED ACCESSORIES. INFILL EXTERIOR WALL OPENING TO MATCH ADJACENT CONSTRUCTION. COORDINATE FINAL INFILL REQUIREMENTS WITH ARCHITECTURAL.

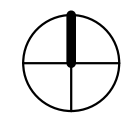
(X) FUEL OIL STORAGE TANK

(X) GENERATOR

(X) GENERATOR

(X) GENERATOR BLDG

8' 4' 0' 8'
SCALE : 1/8" = 1'-0"



1ST FLOOR - DEMO - (X) GENERATOR BUILDING - HVAC

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

3

SHEET DEMOLITION KEYED NOTES

- 1 REMOVE EXISTING WALL CAP, INLINE EXHAUST FAN (XIEF-2, ASSOCIATED DUCTWORK, HANGERS, GRILLES, AND CONTROLS. PREPARE OPENING FOR NEW LIKE-SIZED WALL CAP.
- 2 DEMO 48"x24"x6" RELIEF LOUVER; INFILL OPENING TO MATCH ADJACENT FINISHES. COORDINATE WITH ARCHITECTURAL.
- 3 REMOVE 48"x30"x6" OUTSIDE AIR LOUVER. PREPARE OPENING FOR NEW LIKE-SIZED LOUVER.
- 4 DEMO INLINE 1.5 HP SUSPENDED FAN. REMOVE SUPPORTS AND CONNECTIONS.
- 5 REMOVE EXISTING ROOF-MOUNTED FAN, EXHAUST DUCTWORK, GRILLES, AND CONTROLS. REUSE EXISTING ROOF OPENING FOR NEW FAN. COORDINATE ROOF FLASHING AND SEALING WITH ROOFING AND ARCHITECTURAL.
- 6 (ALT #2 ONLY) REMOVE (XIAHU-7) AND ALL ASSOCIATED DUCTWORK, PIPING, CONTROLS, GRILLES, AND DIFFUSERS SERVING THE LAY-IN CEILING AREA. RETAIN EXISTING CONCRETE HOUSEKEEPING PAD FOR NEW UNIT. COORDINATE DEMOLITION LIMITS WITH NEW WORK PLANS AND TRADES.
- 7 REMOVE EXISTING EXHAUST FAN (XIEF-7A) AND (XIEF-7B), ASSOCIATED WALL CAPS, DUCTWORK, GRILLES, CONTROLS, AND SUPPORTS. PATCH WALLS AS REQUIRED.
- 8 REMOVE ALL SIDEWALL GRILLES SERVING RESTROOMS AND ASSOCIATED BRANCH DUCTS BACK TO MAIN. COORDINATE PATCHING OF WALLS AND CEILINGS.
- 9 REMOVE AND DISPOSE OF THE EXISTING HVAC SYSTEM (XIAHU-09) TO THE LIMITS SHOWN INCLUDING BUT NOT LIMITED TO: EQUIPMENT, PIPING, DUCTWORK, INSULATION, DUCTWORK, AIR DISTRIBUTION, LOUVERS, HANGERS, SUPPORTS AND CONTROLS. REPAIR DUCTWORK IN CONCESSION 147 AND PREPARE FOR CONNECTION TO NEW SYSTEM.
- 10 REMOVE (XJHP-15) AND MATCHING INDOOR UNITS (XJAH-15), INCLUDING BUT NOT LIMITED TO DUCTWORK, GRILLES, REFRIGERANT PIPING, CONDENSATE, CONTROLS, AND POWER CONNECTIONS. REMOVE ROOF/WALL CURBS OR SLEEVES AND PATCH AS REQUIRED.
- 11 REMOVE (XJHP-16) AND MATCHING INDOOR UNITS (XJAH-16), INCLUDING BUT NOT LIMITED TO DUCTWORK, GRILLES, REFRIGERANT PIPING, CONDENSATE, CONTROLS, AND POWER CONNECTIONS. REMOVE ROOF/WALL CURBS OR SLEEVES AND PATCH AS REQUIRED.
- 12 REMOVE AND DISPOSE OF (XIAHU-04) AND (XIAHU-02), INCLUDING ALL ASSOCIATED HVAC COMPONENTS IN THEIR ENTIRETY. THIS INCLUDES, BUT IS NOT LIMITED TO, DUCTWORK, DAMPERS, PIPING, INSULATION, FLEXIBLE DUCT, AIR DISTRIBUTION DEVICES, LOUVERS, HANGERS, SUPPORTS, CONTROLS, THERMOSTATS, AND ACCESSORIES. PROTECT ALL ITEMS TO REMAIN FROM DAMAGE.
- 13 REMOVE AND DISPOSE OF (X)THRU-WALL UNIT, INCLUDING ALL ASSOCIATED HVAC COMPONENTS. THIS INCLUDES, BUT IS NOT LIMITED TO, REFRIGERANT PIPING, CONDENSATE DRAIN, WALL SLEEVE, LOUVER/GRILLE, CONTROLS, AND ELECTRICAL CONNECTIONS. PATCH WALL OPENING AND FINISH SURFACES AS REQUIRED.

GENERAL NOTES

- 1 HATCHED AREAS ON DRAWINGS INDICATE EXTENT OF DEMOLITION. DEMOLITION LIMITS SHALL BE CLEARLY IDENTIFIED AND VERIFIED IN FIELD PRIOR TO WORK.
- 2 REFER TO HYDRONIC RISER DIAGRAMS FOR DETAILED DEMOLITION SCOPE. REMOVE PIPING, CONNECTIONS, AND TERMINATIONS AS INDICATED. COORDINATE WITH DEMOLITION OF ASSOCIATED EQUIPMENT.
- 3 SINGLE-LINE DUCTWORK INDICATES GENERAL ROUTING OF EXISTING SYSTEMS. FIELD-VERIFY CONDITIONS PRIOR TO DEMOLITION OR RECONNECTION.
- 4 REMOVE ALL ASSOCIATED HANGERS, SUPPORTS, INSULATION, SEALANTS, PIPING SPECIALTIES, CONTROLS, AND ACCESSORIES WITH DEMOLISHED HVAC EQUIPMENT. DUCTWORK OR PIPING AS REQUIRED FOR COMPLETE REMOVAL. DO NOT REMOVE ITEMS REQUIRED FOR ACTIVE OR REUSED SYSTEMS. CONTRACTOR SHALL FIELD-VERIFY AND CONFIRM REUSE PRIOR TO REMOVAL. PATCH AND SEAL ALL PENETRATIONS IN FLOORS, WALLS, OR ROOF TO MATCH ADJACENT CONSTRUCTION.
- 5 WHERE PARTIAL DEMOLITION OCCURS, PREPARE SYSTEMS FOR RECONNECTION TO NEW WORK. CAP OR TEMPORARILY SUPPORT AS REQUIRED.
- 6 COORDINATE WITH OTHER TRADES FOR SAFE REMOVAL OF PIPING, DUCTWORK, AND EQUIPMENT.
- 7 PROTECT REMAINING ACTIVE SYSTEMS DURING DEMOLITION.
- 8 ALL EXTERIOR AND INTERIOR PENETRATIONS AFFECTED BY DEMOLITION SHALL HAVE EXISTING FLASHING, SEALANT, AND CAULKING REMOVED, SURFACES CLEANED, AND OPENINGS PREPARED FOR NEW WORK. COORDINATE WITH ARCHITECTURAL FINISHES FOR PATCHING AND REPAIR AS REQUIRED.

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
KURE BEACH, NC 28449

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06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

FIRST FLOOR DEMO PLAN -
MAIN ENTRY, TOUCH TANK
& (X) GENERATOR BLDG -
HVAC

MD1.21 B

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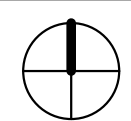
1ST FLOOR - DEMO - MAIN ENTRY - HVAC

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

1

KEY PLAN

8' 4' 0' 8'
SCALE : 1/8" = 1'-0"



1ST FLOOR - DEMO - TOUCH AND SHARK TANK - HVAC

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

2

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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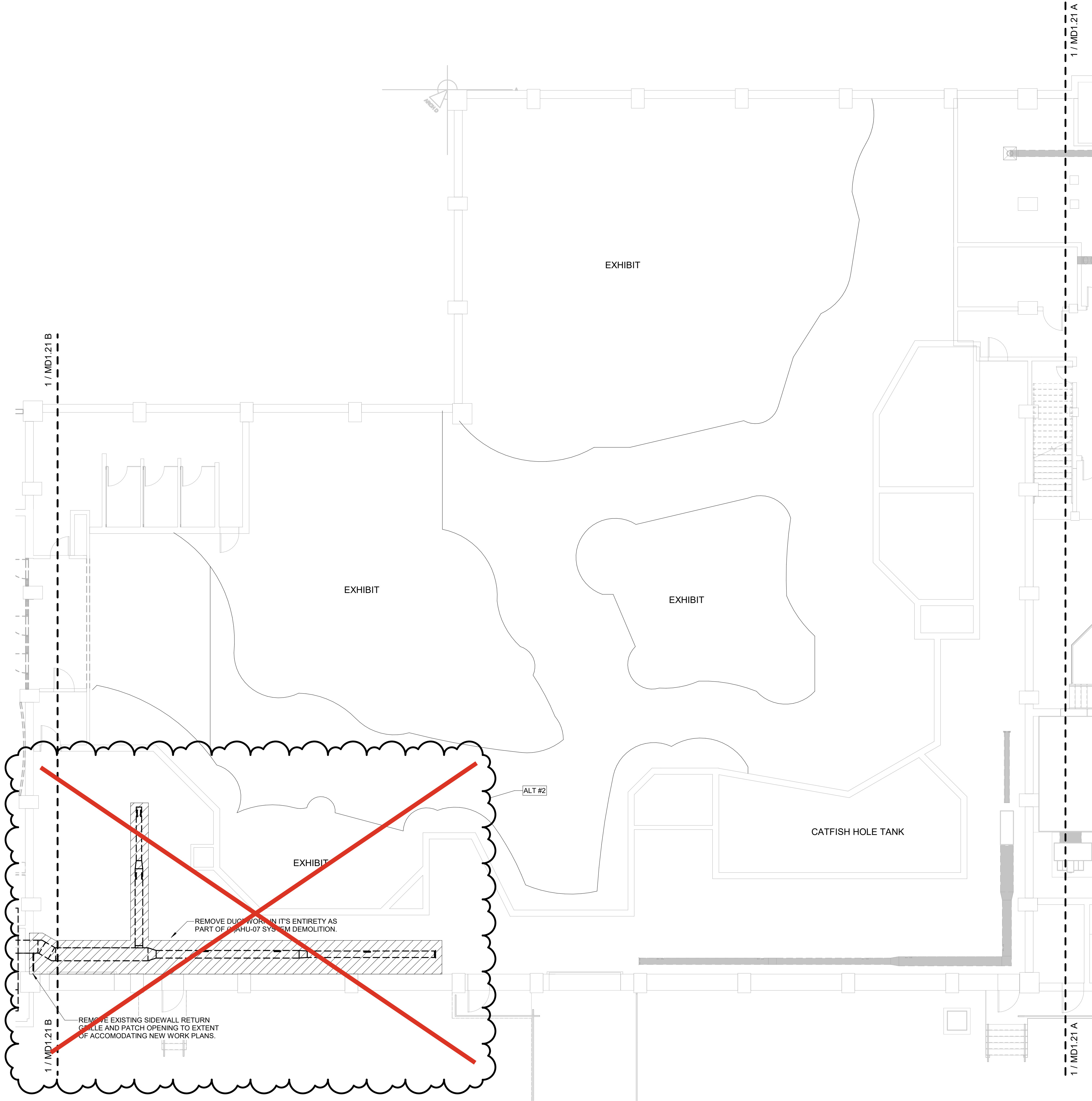
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

FIRST FLOOR DEMO PLAN -
FRESHWATER HABITAT -
HVAC

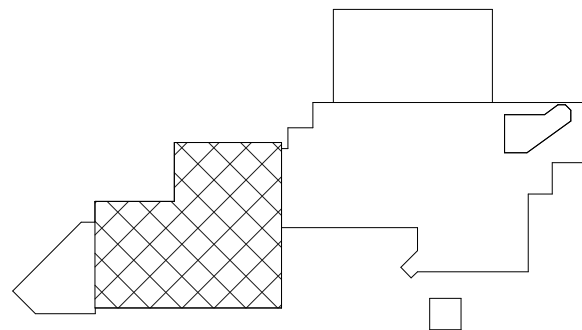
MD1.21 C

GENERAL NOTES

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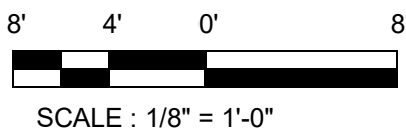


KEY PLAN



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

1ST FLOOR - DEMO - FRESHWATER HABITAT - HVAC

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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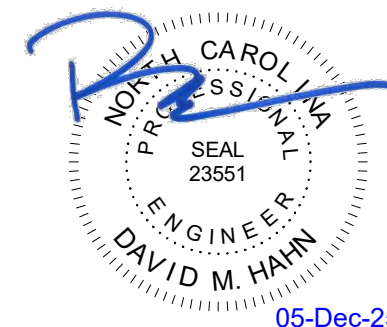
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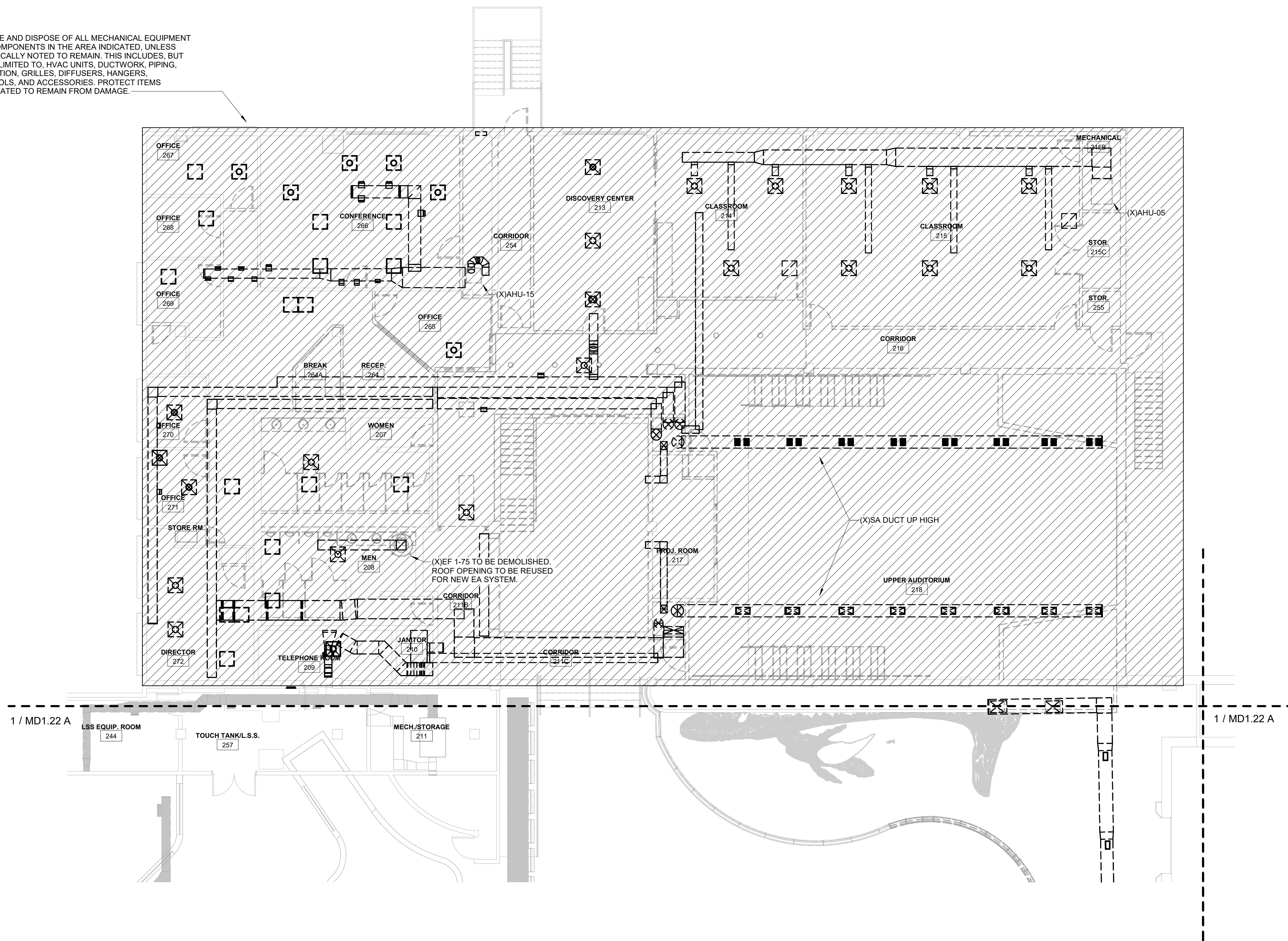


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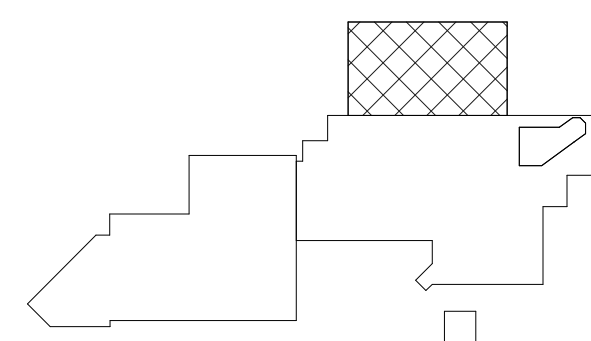
SECOND FLOOR DEMO
PLAN - TOUCH TANK -
HVAC

MD1.22 B

REMOVE AND DISPOSE OF ALL MECHANICAL EQUIPMENT
AND COMPONENTS IN THE AREA INDICATED. UNLESS
SPECIFICALLY NOTED TO REMAIN, THIS INCLUDES, BUT
IS NOT LIMITED TO, HVAC UNITS, DUCTWORK, PIPING,
INSULATION, GRILLES, DIFFUSERS, HANGERS,
CONTROLS, AND ACCESSORIES. PROTECT ITEMS
DESIGNATED TO REMAIN FROM DAMAGE.



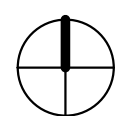
KEY PLAN



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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



2ND FLOOR - DEMO - TOUCH AND SHARK TANK - HVAC

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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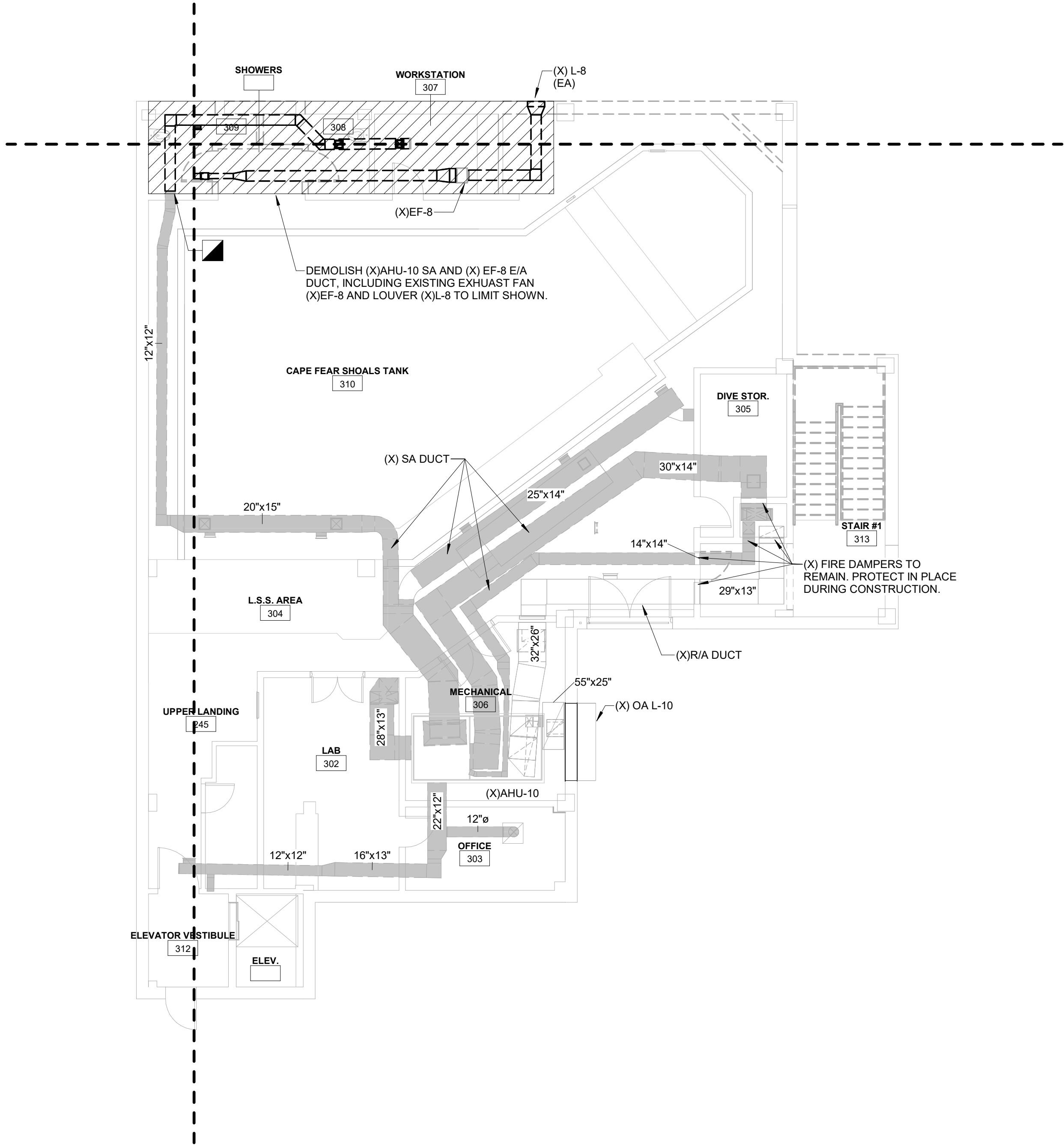
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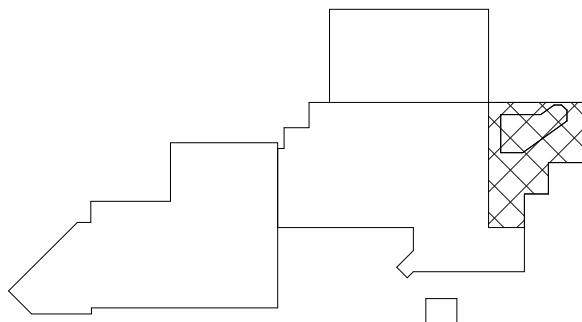
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-	12-5-25	FOR CONSTRUCTION

THIRD FLOOR DEMO PLAN
- CAPE FEAR - HVAC

MD1.23 A

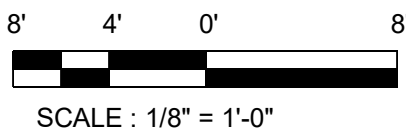


KEY PLAN

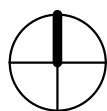


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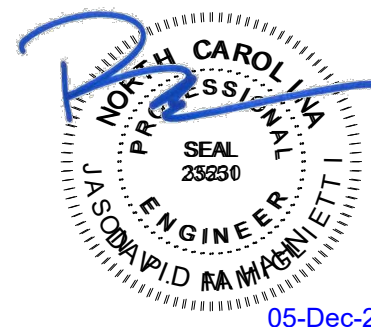


SCALE : 1/8" = 1'-0"



3RD FLOOR - DEMO - CAPE FEAR - HVAC

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



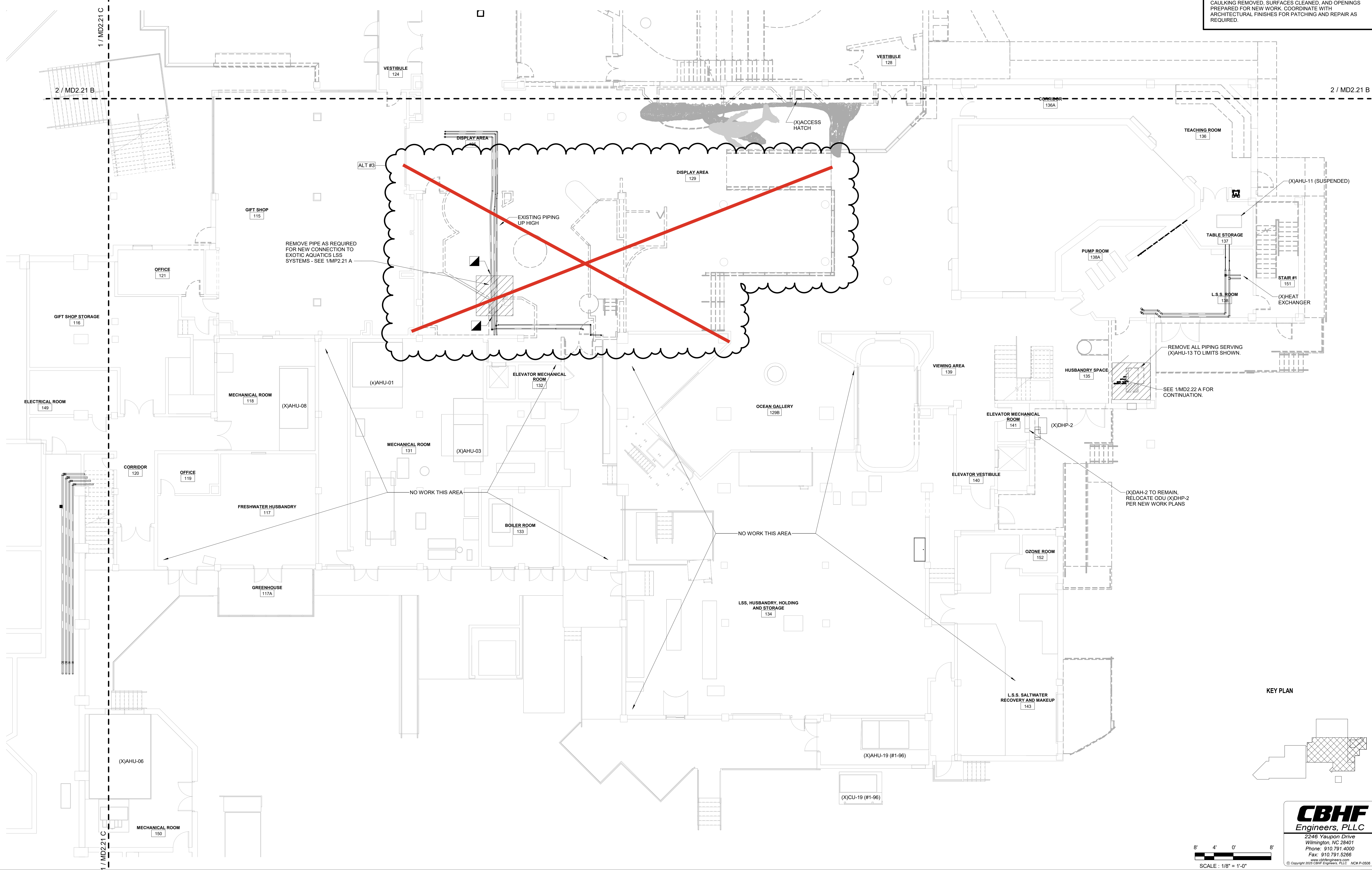
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

FIRST FLOOR DEMO PLAN -
CAPE FEAR - HYDRONICS

MD2.21 A

GENERAL NOTES

1. HATCHED AREAS ON DRAWINGS INDICATE EXTENT OF DEMOLITION. DEMOLITION LIMITS SHALL BE CLEARLY IDENTIFIED AND VERIFIED IN FIELD PRIOR TO WORK.
2. REFER TO HYDRONIC RISER DIAGRAMS FOR DETAILED DEMOLITION SCOPE. REMOVE PIPING, CONNECTIONS, AND TERMINATIONS AS INDICATED. COORDINATE WITH DEMOLITION OF ASSOCIATED EQUIPMENT.
3. SINGLE-LINE DUCTWORK INDICATES GENERAL ROUTING OF EXISTING SYSTEMS. FIELD-VERIFY CONDITIONS PRIOR TO DEMOLITION OR RECONNECTION.
4. REMOVE ALL ASSOCIATED HANGERS, SUPPORTS, INSULATION, SEALANTS, PIPING SPECIALTIES, CONTROLS, AND ACCESSORIES WITH DEMOLISHED HVAC EQUIPMENT. DUCTWORK, OR PIPING AS REQUIRED FOR COMPLETE REMOVAL. DO NOT REMOVE ITEMS REQUIRED FOR ACTIVE OR REUSED SYSTEMS. CONTRACTOR SHALL FIELD-VERIFY AND CONFIRM REUSE PRIOR TO REMOVAL. PATCH AND SEAL ALL PENETRATIONS IN FLOORS, WALLS, OR ROOF TO MATCH ADJACENT CONSTRUCTION.
5. WHERE PARTIAL DEMOLITION OCCURS, PREPARE SYSTEMS FOR RECONNECTION TO NEW WORK. CAP OR TEMPORARILY SUPPORT AS REQUIRED.
6. COORDINATE WITH OTHER TRADES FOR SAFE REMOVAL OF PIPING, DUCTWORK, AND EQUIPMENT.
7. PROTECT REMAINING ACTIVE SYSTEMS DURING DEMOLITION.
8. ALL EXTERIOR AND INTERIOR PENETRATIONS AFFECTED BY DEMOLITION SHALL HAVE EXISTING FLASHING, SEALANT, AND CAULKING REMOVED, SURFACES CLEANED, AND OPENINGS PREPARED FOR NEW WORK. COORDINATE WITH ARCHITECTURAL FINISHES FOR PATCHING AND REPAIR AS REQUIRED.



KEY PLAN

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Fax: 910.791.5266
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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

1ST FLOOR - DEMO - CAPE FEAR - HYDRONICS

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD.
KURE BEACH, NC 28449

NORTH CAROLINA DEPT. OF
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SZOSTAK DESIGN, INC.

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CHAPEL HILL, NORTH CAROLINA 27514
TEL: 919.929.5244
FAX: 919.960.7947
WWW.SZOSTAKDESIGN.COM
LICENSE # 31679

TJP ENGINEERING, INC.

LIFE SUPPORT SYSTEMS ENGINEER
56885 VENTURE LANE SUITE 205H
BEND, OR 97007
TEL: 503.432.0300
WWW.TJPEENGINEERING.COM
LICENSE # C-5505

ROTO GROUP, LLC.

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DUBLIN, OHIO 43017
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WWW.ROTO.COM

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WWW.BENNETT-PLESS.COM
LICENSE # F-1105

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1026 INDIANA COURT
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WWW.LIGHTSWITCH.NET

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FAX: 910.343.9404
WWW.TUNSTALLENGINEERS.COM
LICENSE # F-3152

SURFACE 678, PA

LANDSCAPE ARCHITECT
215 AGERS STREET SUITE 150
DURHAM, NC 27703
TEL: 919.419.1199
FAX: 919.419.1688
WWW.SURFACE678.COM
LICENSE # C-598

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FIRE PROTECTION ENGINEER
3412 ENTERPRISE DRIVE
WILMINGTON, NC 28405
TEL: 910.452.4310
WWW.CHEATHAMP.A.COM
LICENSE # C-1073

PALACIO COLLABORATIVE

COST ESTIMATOR
4819 EMPEROR BOULEVARD SUITE 400
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06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

FIRST FLOOR DEMO PLAN -
MAIN ENTRY, TOUCH TANK
& (X) GENERATOR BLDG -
HYDRONICS

MD2.21 B

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1ST FLOOR - DEMO - MAIN ENTRY - HYDRONICS

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

1

KEY PLAN

8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

1ST FLOOR - DEMO - (X) GENERATOR BUILDING - HYDRONICS

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

3

KEY PLAN

8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

1ST FLOOR - DEMO - TOUCH AND SHARK TANK - HYDRONICS

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

2

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
KURE BEACH, NC 28449

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LICENSE # 31079

TJP ENGINEERING, INC.

LIFE SUPPORT SYSTEMS ENGINEER
56880 VENTURE LANE SUITE 205N
BEND, OR 97707
TEL: 814.423.0300
WWW.TJPEENGINEERING.COM
LICENSE # C-3505

ROTO GROUP, LLC.

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DURHAM, NC 27705
TEL: 817.760.6895
WWW.ROTO.COM

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10066 INDIANA COURT
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TUNSTALL CONSULTING ENGINEERS PLLC

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WWW.TUNSTALLENGINEERS.COM
LICENSE # F-3132

SURFACE 678, PA

LANDSCAPE ARCHITECT
215 AGGERS STREET SUITE 150
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TEL: 919.419.1199
FAX: 919.419.1688
WWW.SURFACE678.COM
LICENSE # C-098

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WWW.CHEATHAMPA.COM
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WWW.PALACIOCOLLABORATIVE.COM

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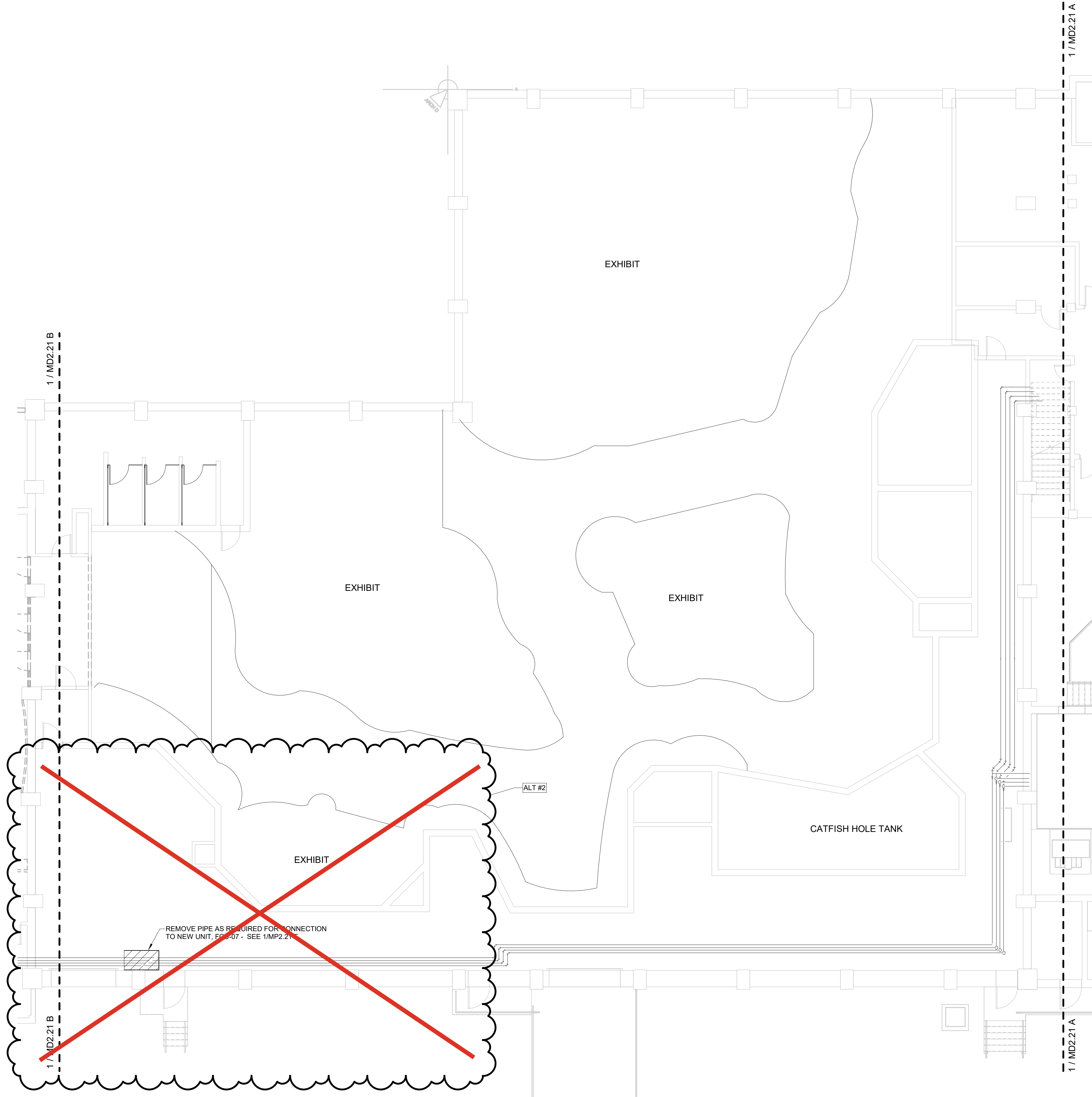
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

FIRST FLOOR DEMO PLAN -
FRESHWATER HABITAT -
HYDRONICS

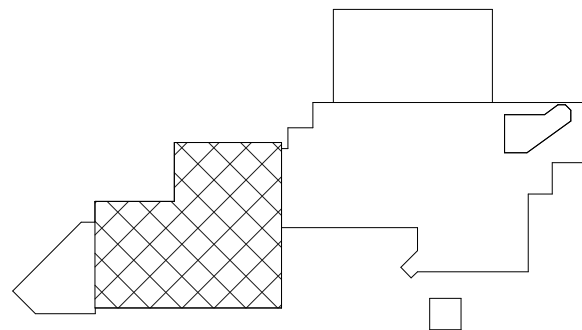
MD2.21 C

GENERAL NOTES

1. HATCHED AREAS ON DRAWINGS INDICATE EXTENT OF DEMOLITION. DEMOLITION LIMITS SHALL BE CLEARLY IDENTIFIED AND VERIFIED IN FIELD PRIOR TO WORK.
2. REFER TO HYDRONIC RISER DIAGRAMS FOR DETAILED DEMOLITION SCOPE. REMOVE PIPING, CONNECTIONS, AND TERMINATIONS AS INDICATED. COORDINATE WITH DEMOLITION OF ASSOCIATED EQUIPMENT.
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KEY PLAN



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8" 4" 0" 8"
SCALE: 1/8" = 1'-0"

1ST FLOOR - DEMO - FRESHWATER HABITAT - HYDRONICS

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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NORTH CAROLINA DEPT. OF
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TEL: 919.419.1199
FAX: 919.419.1689
WWW.SURFACE678.COM
LICENSE # C-098

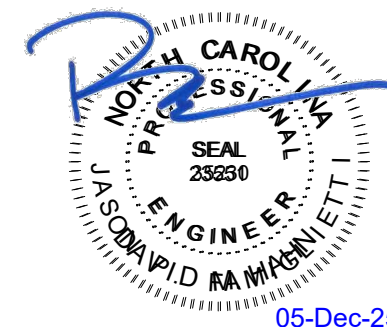
CHEATHAM & ASSOCIATES, PA

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WWW.CHEATHAMP&A.COM
LICENSE # C-1073

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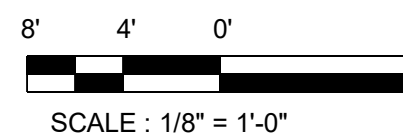
SECOND FLOOR DEMO
PLAN - CAPE FEAR -
HYDRONICS

MD2.22 A

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

2ND FLOOR - DEMO - CAPE FEAR - HYDRONICS

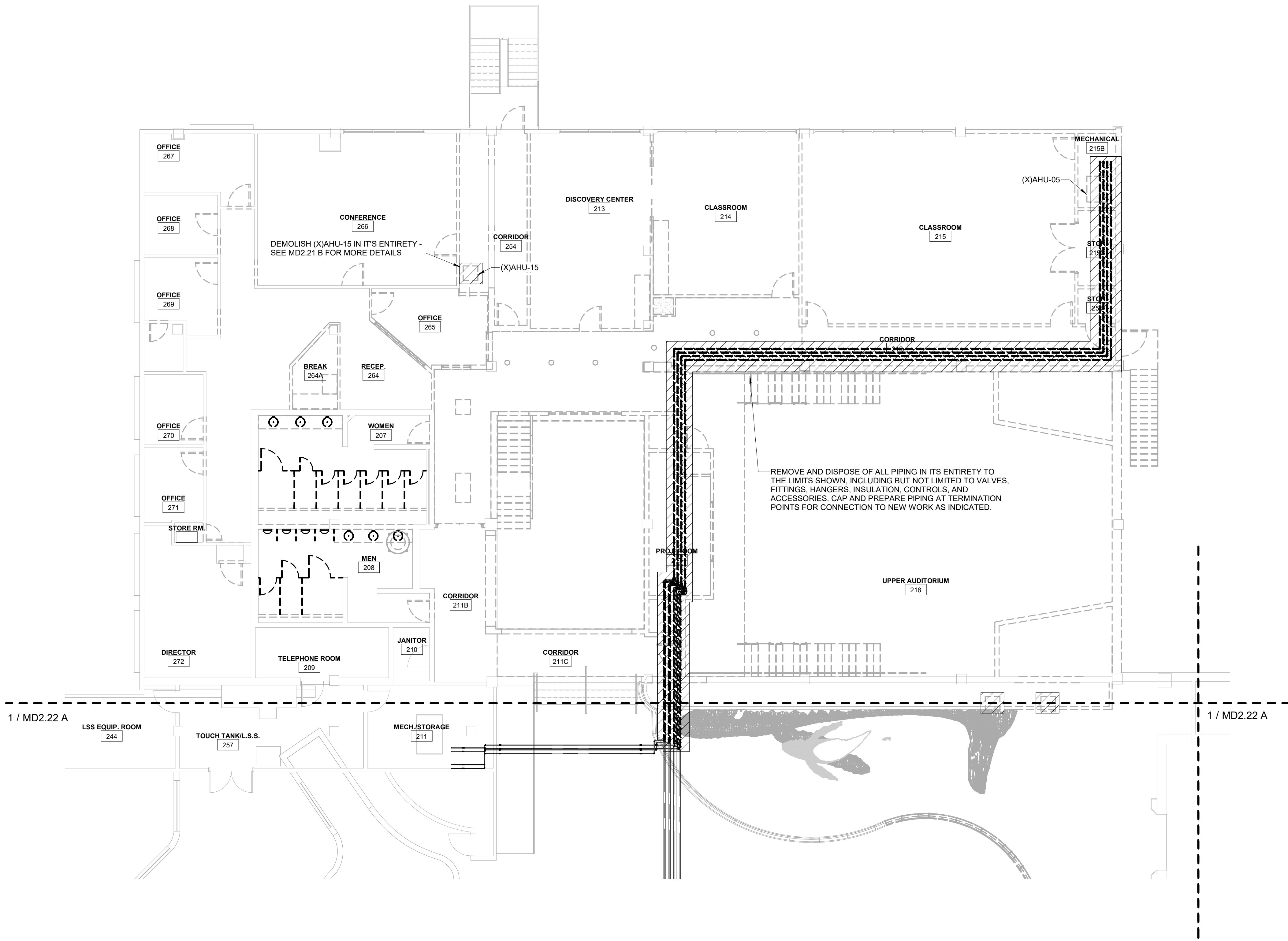
SCALE: 1/8" = 1'-0"



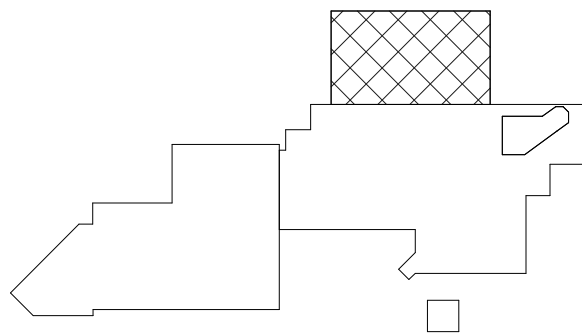
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

SECOND FLOOR DEMO
PLAN - TOUCH TANK -
HYDRONICS

MD2.22 B

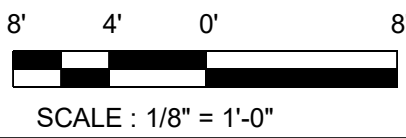


KEY PLAN



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

2ND FLOOR - DEMO - TOUCH AND SHARK TANK - HYDRONICS

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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SZOSTAK DESIGN, INC.
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LICENSE # C-3505

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LICENSE # P-6554

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10565 INDIANA COURT
RANCHO CUCAMONGA, CA 91730
TEL: 909.360.0000
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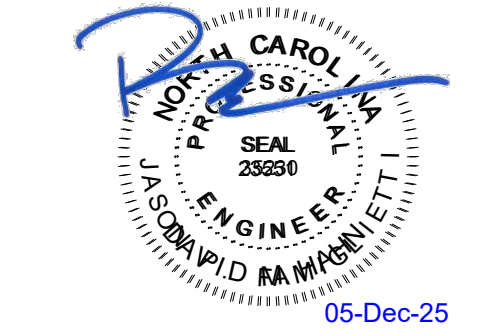
TUNSTALL CONSULTING ENGINEERS PLLC
CIVIL ENGINEER
2402 IRON GATE DRIVE SUITE 102
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4817 ENTERPRISE BOULEVARD SUITE 400
DURHAM, NC 27705
TEL: 919.403.9700
WWW.PALACIOCOLLABORATIVE.COM

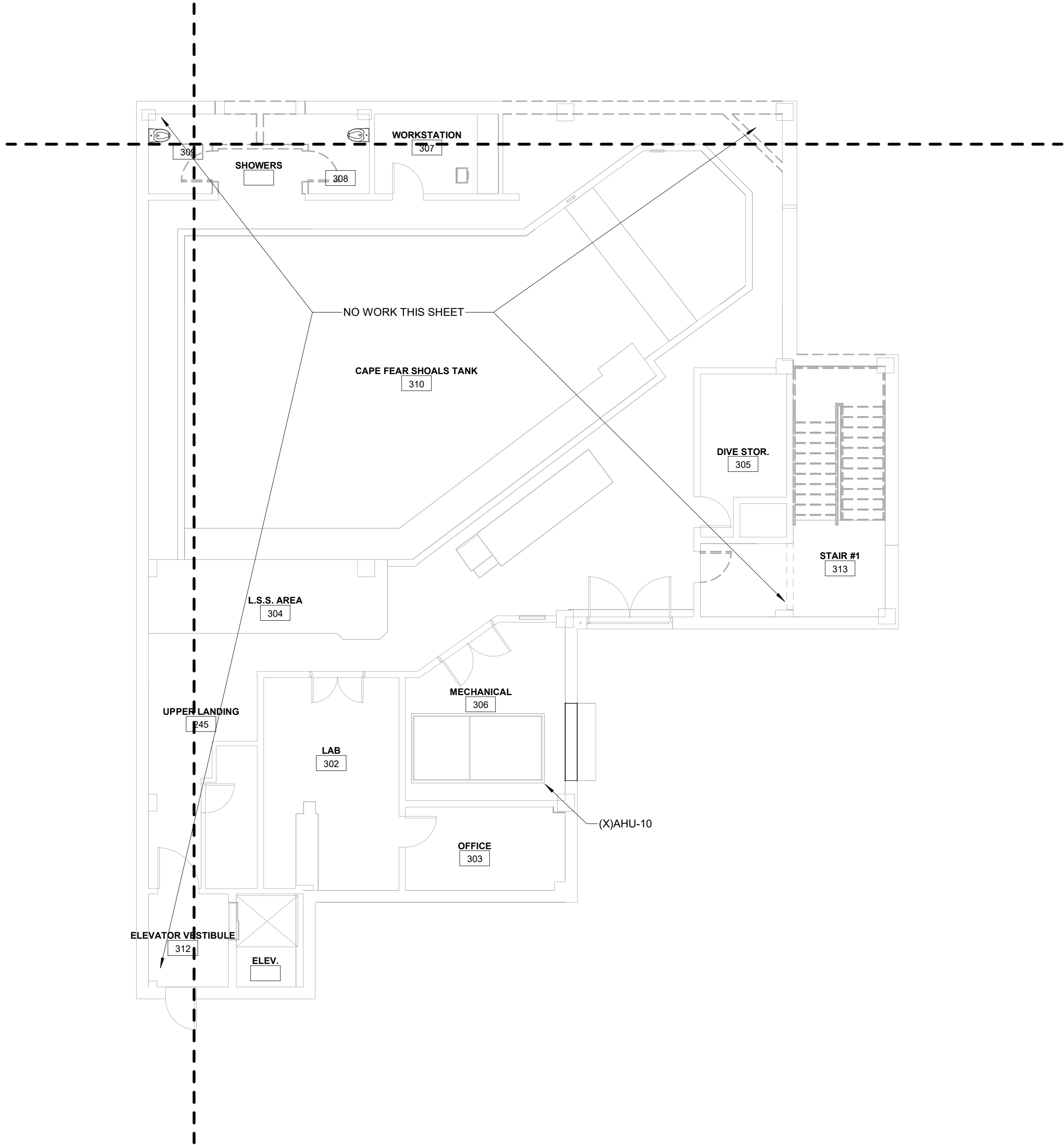
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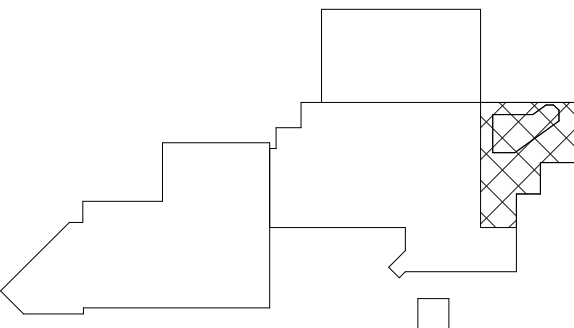
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-	12-5-25	FOR CONSTRUCTION

THIRD FLOOR DEMO PLAN
- CAPE FEAR - HYDRONICS

MD2.23 A

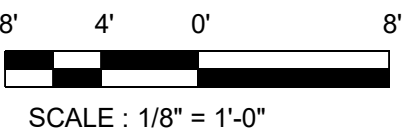


KEY PLAN



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

3RD FLOOR - DEMO - CAPE FEAR - HYDRONICS

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

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06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

FIRST FLOOR PLAN - HVAC

MH2.11

FLOOR PLAN LEGEND

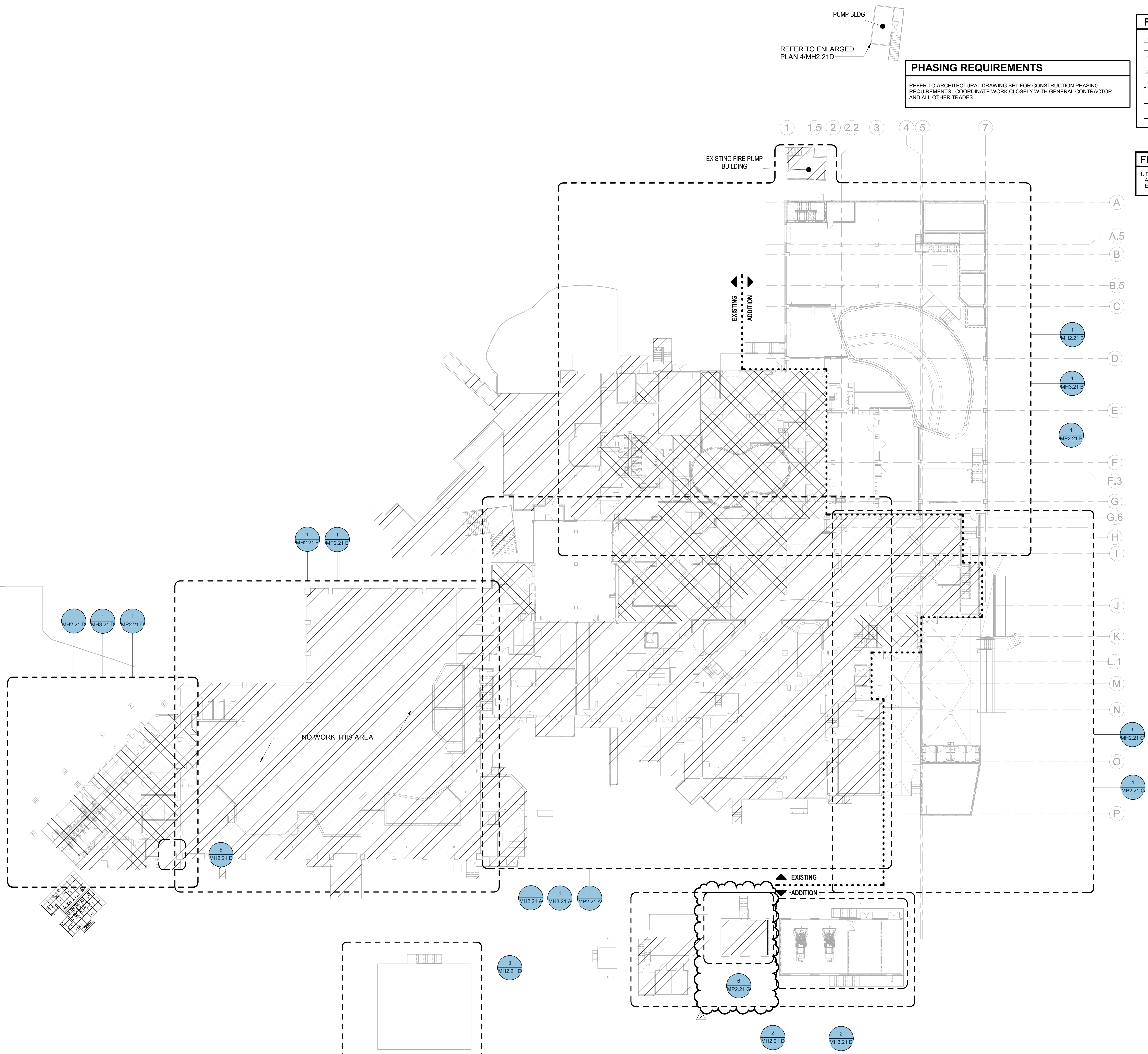
- EXISTING BUILDING
- RENOVATED AREA
- UPFIT BY OTHERS
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL

FLOOR PLAN SHEET NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED
ASSEMBLY UL NUMBERS (WALLS, FLOOR / CEILINGS,
ETC).

PHASING REQUIREMENTS

REFER TO ARCHITECTURAL DRAWING SET FOR CONSTRUCTION PHASING
REQUIREMENTS. COORDINATE WORK CLOSELY WITH GENERAL CONTRACTOR
AND ALL OTHER TRADES.



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OVERALL 1ST FLOOR PLAN - HVAC
SCALE: 1" = 20'-0"



NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

SECOND FLOOR PLAN -
HVAC

MH2.12

FLOOR PLAN LEGEND

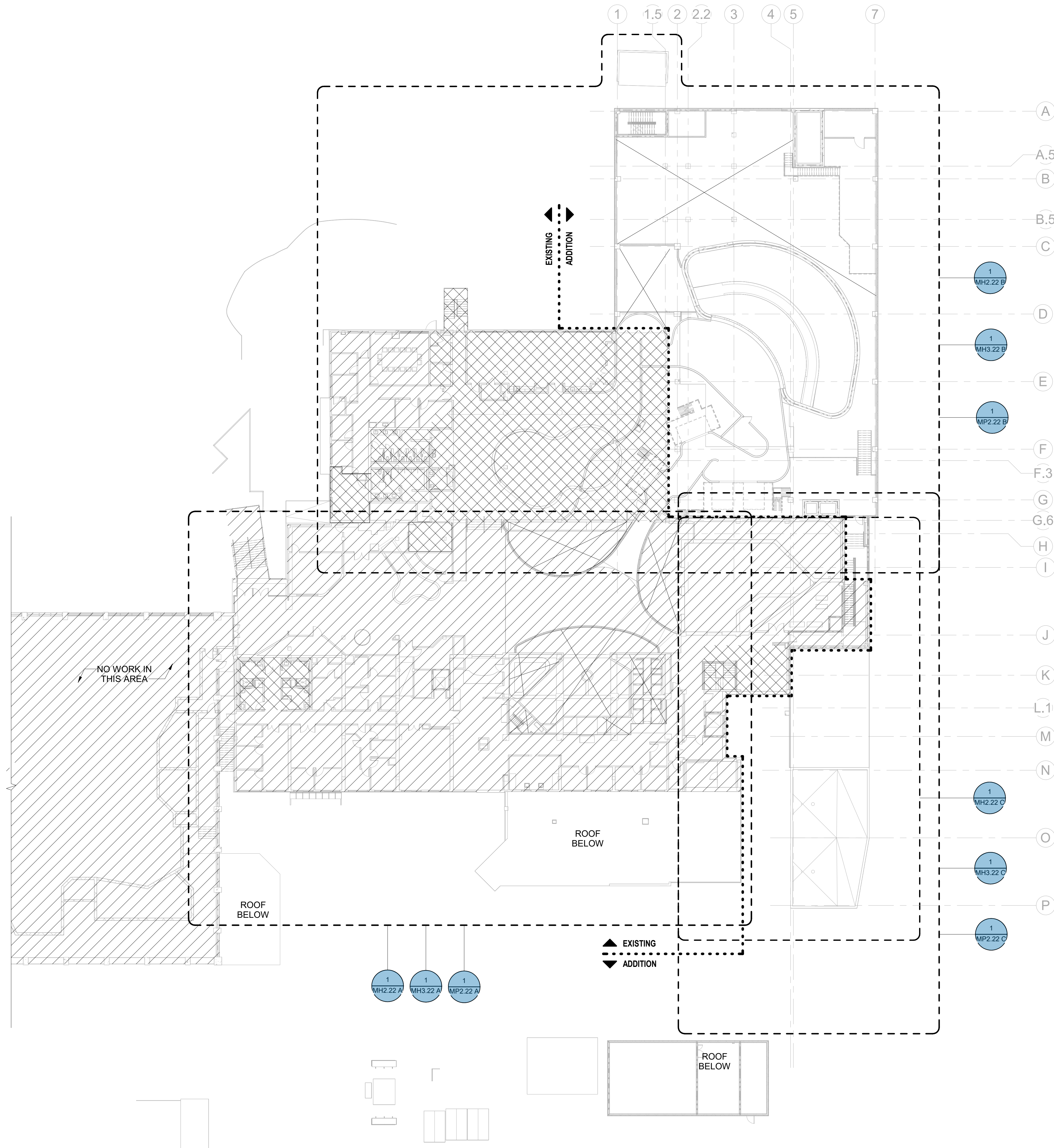
- EXISTING BUILDING
- RENOVATED AREA
- UPFIT BY OTHERS
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL

FLOOR PLAN SHEET NOTES

1. REFER TO ARCHITECTURAL DRAWING SET FOR RATED
ASSEMBLY UL NUMBERS (WALLS, FLOOR / CEILINGS,
ETC.).

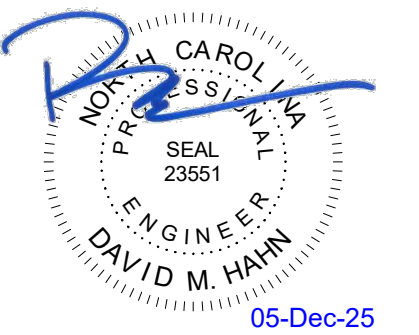
PHASING REQUIREMENTS

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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

THIRD FLOOR PLAN - HVAC

MH2.13

PHASING REQUIREMENTS

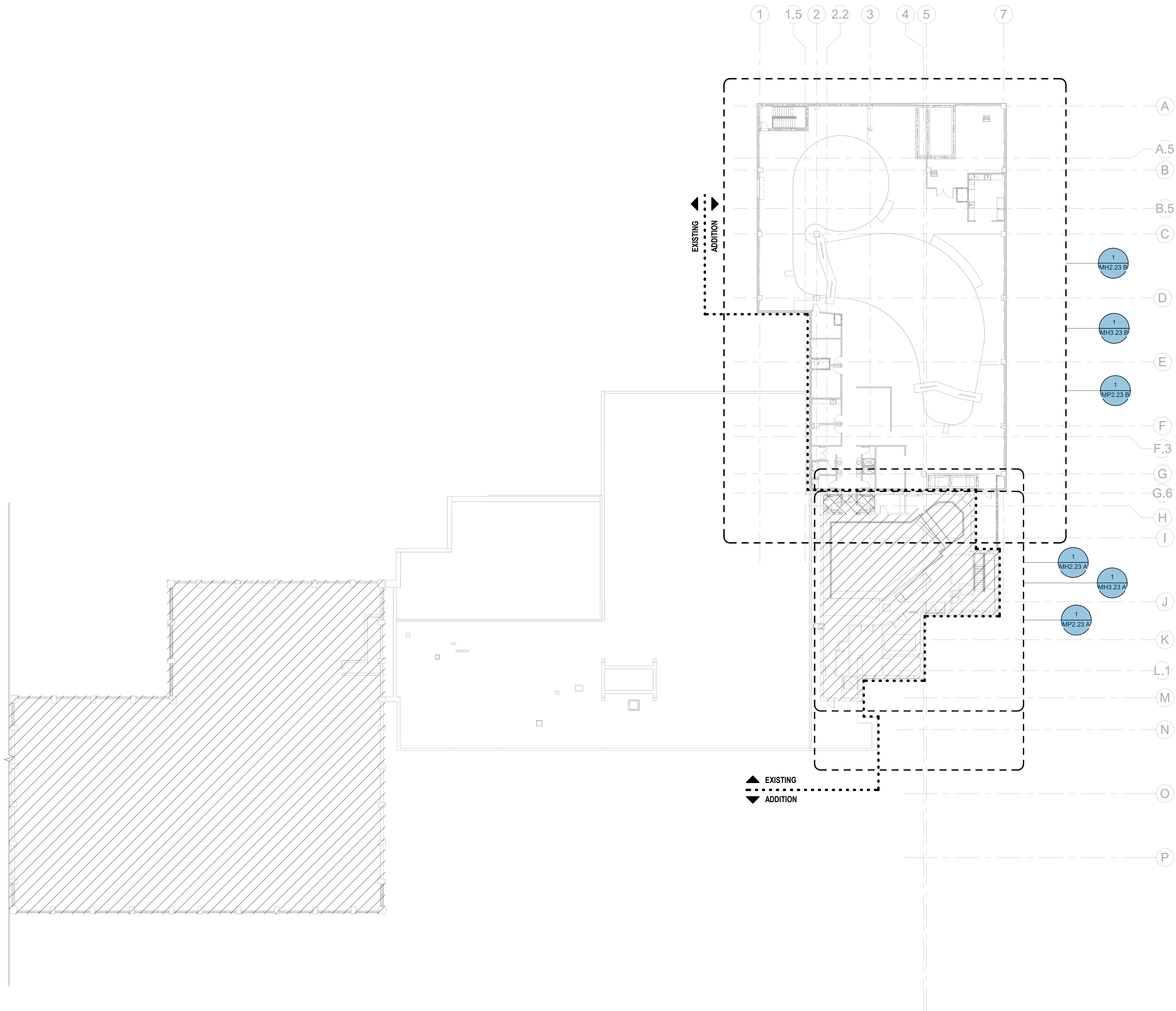
REFER TO ARCHITECTURAL DRAWING SET FOR CONSTRUCTION PHASING
REQUIREMENTS. COORDINATE WORK CLOSELY WITH GENERAL CONTRACTOR
AND ALL OTHER TRADES.

FLOOR PLAN LEGEND

- EXISTING BUILDING
- RENOVATED AREA
- UPFIT BY OTHERS
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL

FLOOR PLAN SHEET NOTES

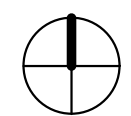
1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED
ASSEMBLY UL NUMBERS (WALLS, FLOOR / CEILINGS,
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CBHF
Engineers, PLLC

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20' 10' 20'
SCALE: 1" = 20'-0"



OVERALL 3RD FLOOR PLAN - HVAC

SCALE: 1" = 20'-0"

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TEL: 919.419.1199
FAX: 919.419.1688
WWW.SURFACE678.COM
LICENSE # C-098

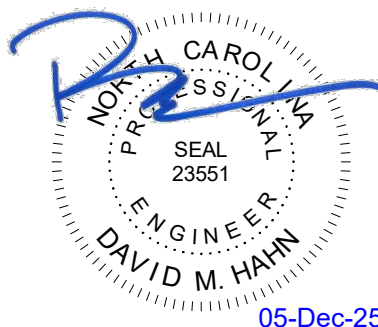
CHEATHAM & ASSOCIATES, PA

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WWW.CHEATHAMP.A.COM
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NOTE: IF THIS DRAWING IS NOT 30" X 42", IT IS A
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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

ROOF PLAN - HVAC

MH2.14

PHASING REQUIREMENTS

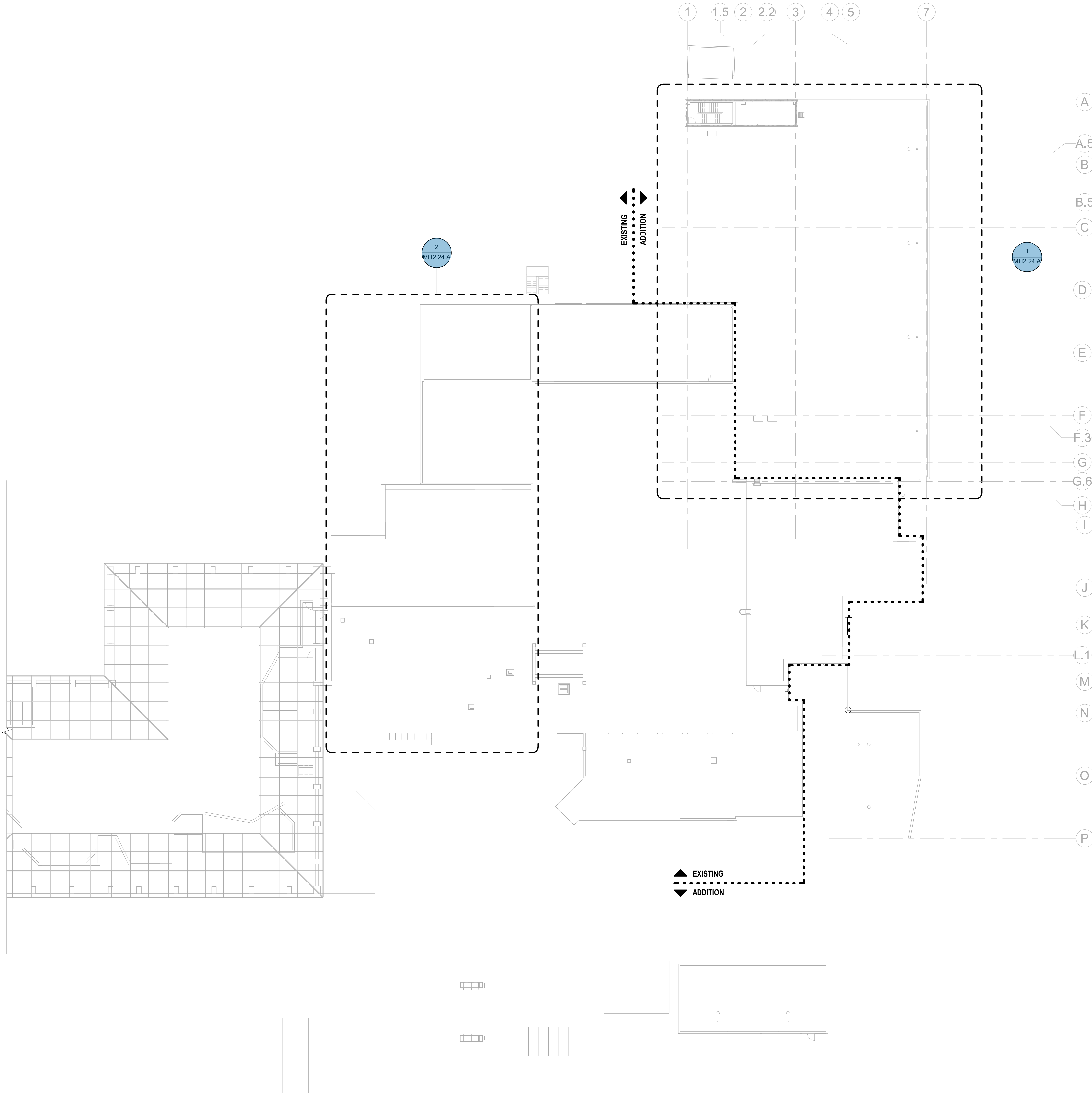
REFER TO ARCHITECTURAL DRAWING SET FOR CONSTRUCTION PHASING
REQUIREMENTS. COORDINATE WORK CLOSELY WITH GENERAL CONTRACTOR
AND ALL OTHER TRADES.

FLOOR PLAN LEGEND

- EXISTING BUILDING
- RENOVATED AREA
- UPFIT BY OTHERS
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL

ROOF PLAN SHEET NOTES

- REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.L. NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).
- REFER TO STRUCTURAL DRAWINGS FOR EQUIPMENT ROOF MOUNTING CONDITIONS.
- ALL ROOF PENETRATIONS SHALL CONFORM TO ROOF MANUFACTURER'S APPROVED METHODS.
- MAINTAIN MINIMUM 10 FOOT SEPARATION BETWEEN EXHAUST AND ANY OUTSIDE AIR INTAKES.



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OVERALL ROOF PLAN - HVAC

SCALE: 1" = 20'-0"

NEW WORK KEYED NOTES

1. INSTALL NEW SUPPLY AND RETURN AIR DIFFUSERS AND CONNECT TO EXISTING (X)AHU-08 SYSTEM. PROVIDE NEW DUCTWORK, HANGERS, AND ACCESSORIES AS REQUIRED FOR COMPLETE INSTALLATION.
2. INSTALL NEW EXPOSED SUSPENDED DUCTWORK WITH DUCT-MOUNTED SUPPLY AND RETURN GRILLES AND CONNECT TO EXISTING (X)AHU-01 SYSTEM. PROVIDE HANGERS AND ACCESSORIES AS REQUIRED FOR COMPLETE INSTALLATION.

FLOOR PLAN LEGEND

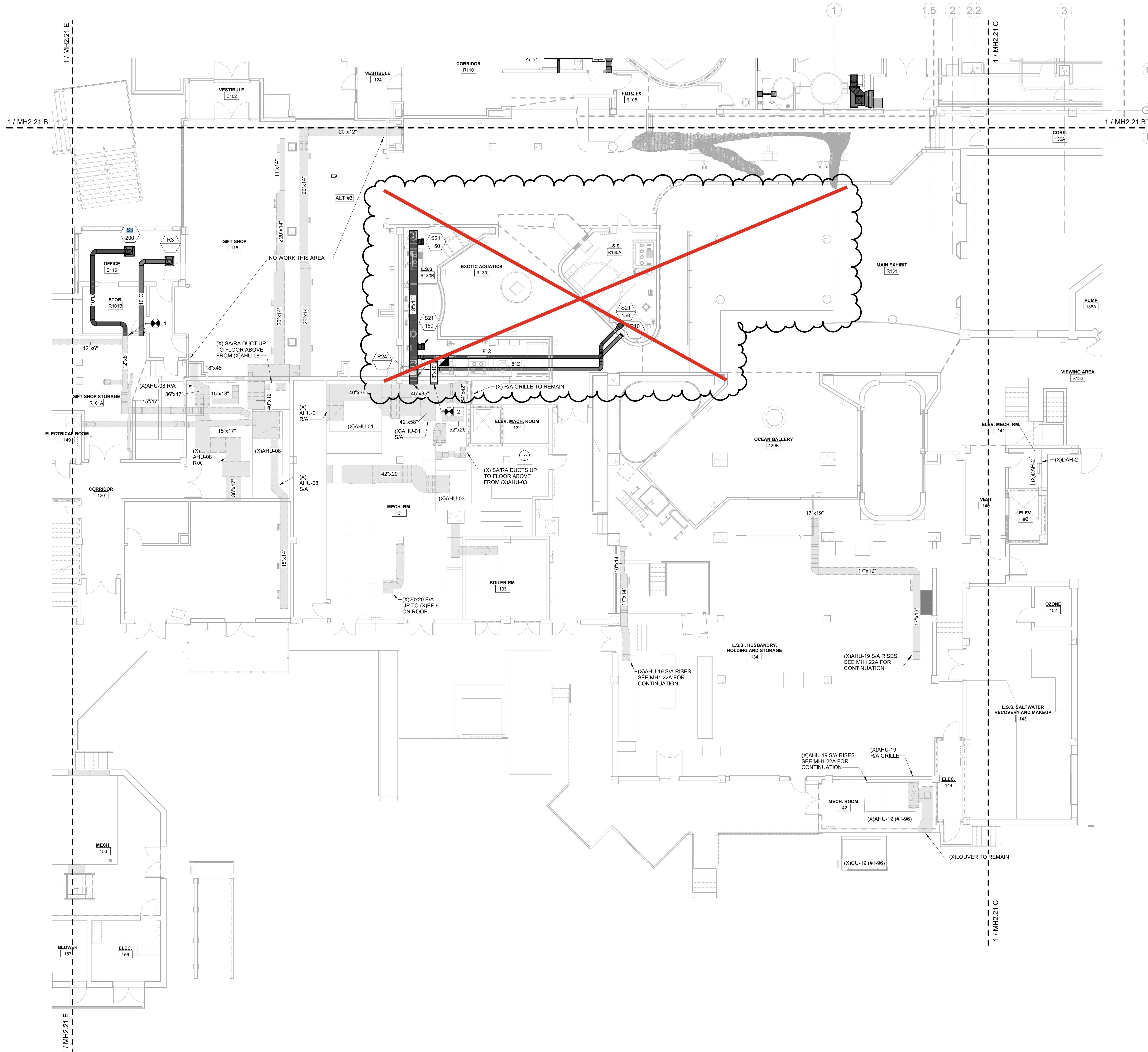
- EXISTING BUILDING
- RENOVATED AREA
- UPFIT BY OTHERS
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL

FLOOR PLAN SHEET NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.L. NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).
2. MAINTAIN CLEARANCES REQUIRED BY MANUFACTURERS AND CODE FOR ALL EQUIPMENT AND ACCESSORIES.
3. M.C. SHALL COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
4. M.C. SHALL COORDINATE ALL DUCT ROUTING WITH STRUCTURAL, ELECTRICAL, AND AQUATIC LIFE SUPPORT SYSTEMS PRIOR TO INSTALLATION.
5. M.C. SHALL COORDINATE CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR.
6. REFER TO ARCHITECTURAL PLANS FOR DETAILS ON CEILING TYPE.
7. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS AND NFPA 90A.
8. ALL DUCT PENETRATIONS THROUGH FIRE-RESISTANCE RATED FLOOR ASSEMBLIES SHALL BE PROVIDED WITH FIRE DAMPERS HAVING A RATING EQUAL TO THE REQUIRED FIRE-RESISTANCE RATING OF THE FLOOR ASSEMBLY, UNLESS THE DUCT IS LOCATED WITHIN A CODE-COMPLIANT FIRE-RATED SHAFT OR PROTECTED CHASE.
9. PROVIDE ACCESS DOORS FOR ALL DAMPERS, CONTROLS, AND EQUIPMENT REQUIRING SERVICE.
10. PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS IN AREAS SUBJECT TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.

FIRE DAMPER REQUIREMENTS - FLOORS & ROOFS

ALL FLOOR AND ROOF DUCT PENETRATIONS SHALL BE PROVIDED WITH 1- OR 2-HOUR RATED FIRE DAMPERS AS REQUIRED. REFER TO ARCHITECTURAL FIRE-RESISTANCE PLANS FOR RATING REQUIREMENTS. FIRE DAMPERS ARE OMITTED FROM THIS PLAN FOR CLARITY.

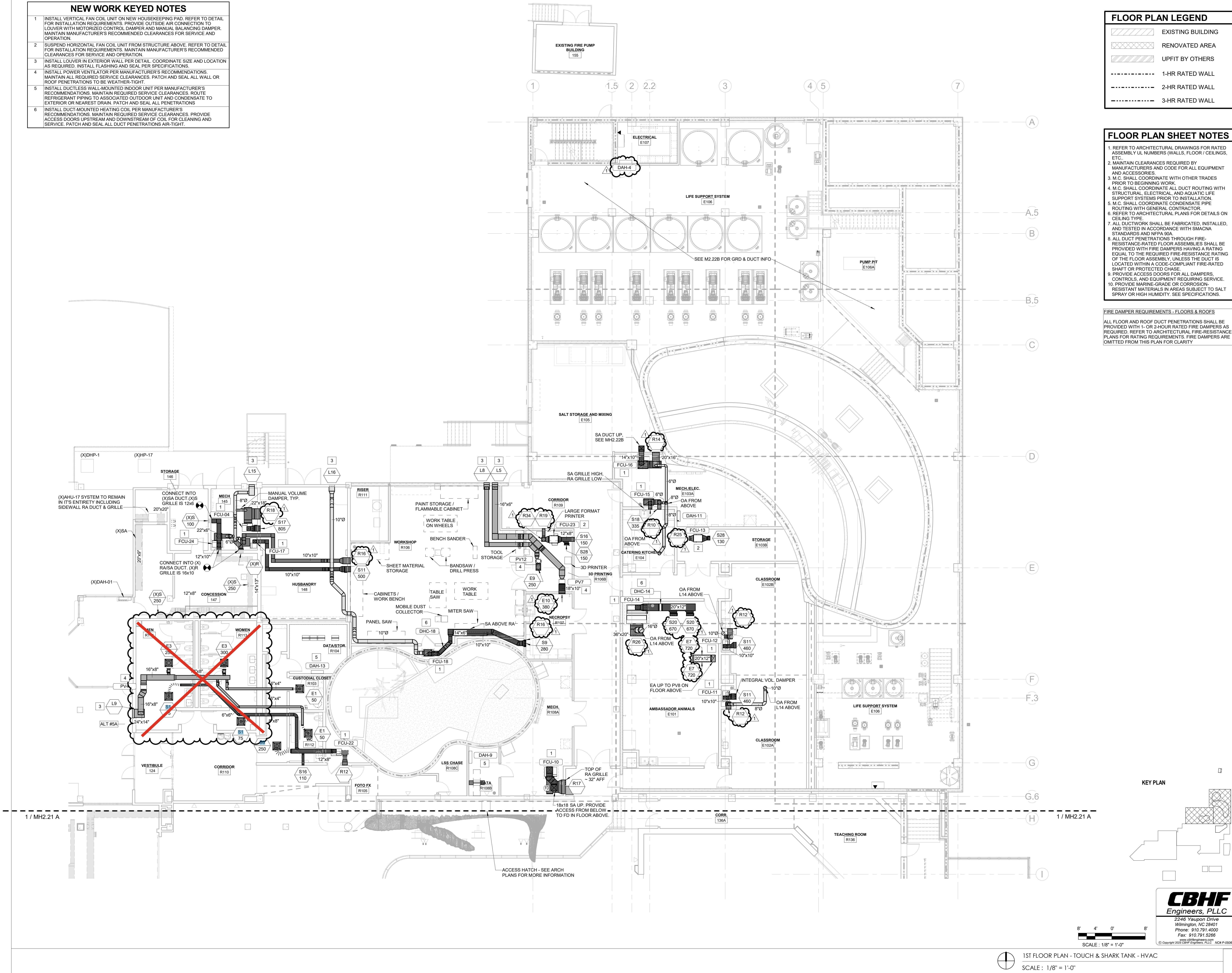


SCALE: 1/8" = 1'-0"

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NEW WORK KEYED NOTES	
1	INSTALL VERTICAL FAN COIL UNIT ON NEW HOUSEKEEPING PAD. REFER TO DETAIL FOR INSTALLATION REQUIREMENTS. PROVIDE OUTSIDE AIR CONNECTION TO LOUVER WITH MOTORIZED CONTROL DAMPER AND MANUAL BALANCING DAMPER. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND OPERATION.
2	SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAIL FOR INSTALLATION REQUIREMENTS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND OPERATION.
3	INSTALL LOUVER IN EXTERIOR WALL PER DETAIL. COORDINATE SIZE AND LOCATION AS REQUIRED. INSTALL FLASHING AND SEAL PER SPECIFICATIONS.
4	INSTALL POWER VENTILATOR PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL REQUIRED SERVICE CLEARANCES. PATCH AND SEAL ALL WALL OR ROOF PENETRATIONS TO BE WEATHER-TIGHT.
5	INSTALL DUCTLESS WALL-MOUNTED INDOOR UNIT PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN REQUIRED SERVICE CLEARANCES. ROUTE REFRIGERANT PIPING TO ASSOCIATED OUTDOOR UNIT AND CONDENSATE TO EXTERIOR OR NEAREST DRAIN. PATCH AND SEAL ALL PENETRATIONS.
6	INSTALL DUCT MOUNTED HEATING COIL PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN REQUIRED SERVICE CLEARANCES. PROVIDE ACCESS DOORS UPSTREAM AND DOWNSTREAM OF COIL FOR CLEANING AND SERVICE. PATCH AND SEAL ALL DUCT PENETRATIONS AIR-TIGHT.



FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

FLOOR PLAN SHEET NOTES	
1.	REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.L. NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).
2.	MAINTAIN CLEARANCES REQUIRED BY MANUFACTURERS AND CODE FOR ALL EQUIPMENT AND ACCESSORIES.
3.	M.C. SHALL COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
4.	M.C. SHALL COORDINATE ALL DUCT ROUTING WITH STRUCTURAL, ELECTRICAL, AND AQUATIC LIFE SUPPORT SYSTEMS PRIOR TO INSTALLATION.
5.	M.C. SHALL COORDINATE CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR.
6.	REFER TO ARCHITECTURAL PLANS FOR DETAILS ON CEILING TYPE.
7.	ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS AND NFPA 90A.
8.	ALL DUCT PENETRATIONS THROUGH FIRE-RESISTANCE-RATED FLOOR ASSEMBLIES SHALL BE PROVIDED WITH FIRE DAMPERS HAVING A RATING EQUAL TO THE REQUIRED FIRE-RESISTANCE RATING OF THE FLOOR ASSEMBLY, UNLESS THE DUCT IS LOCATED WITHIN A CODE-COMPLIANT FIRE-RATED SHAFT OR PROTECTED CHASE.
9.	PROVIDE ACCESS DOORS FOR ALL DAMPERS, CONTROLS, AND EQUIPMENT REQUIRING SERVICE.
10.	PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS IN AREAS SUBJECT TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.

FIRE DAMPER REQUIREMENTS - FLOORS & ROOFS
ALL FLOOR AND ROOF DUCT PENETRATIONS SHALL BE PROVIDED WITH 1- OR 2-HOUR RATED FIRE DAMPERS AS REQUIRED. REFER TO ARCHITECTURAL FIRE-RESISTANCE PLANS FOR RATING REQUIREMENTS. FIRE DAMPERS ARE OMITTED FROM THIS PLAN FOR CLARITY.

IRN 002
7/2/2026
RENOVATION
& EXPANSION:
PHASE 1
SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

FIRST FLOOR PLAN -
TOUCH AND SHARK TANK -
HVAC

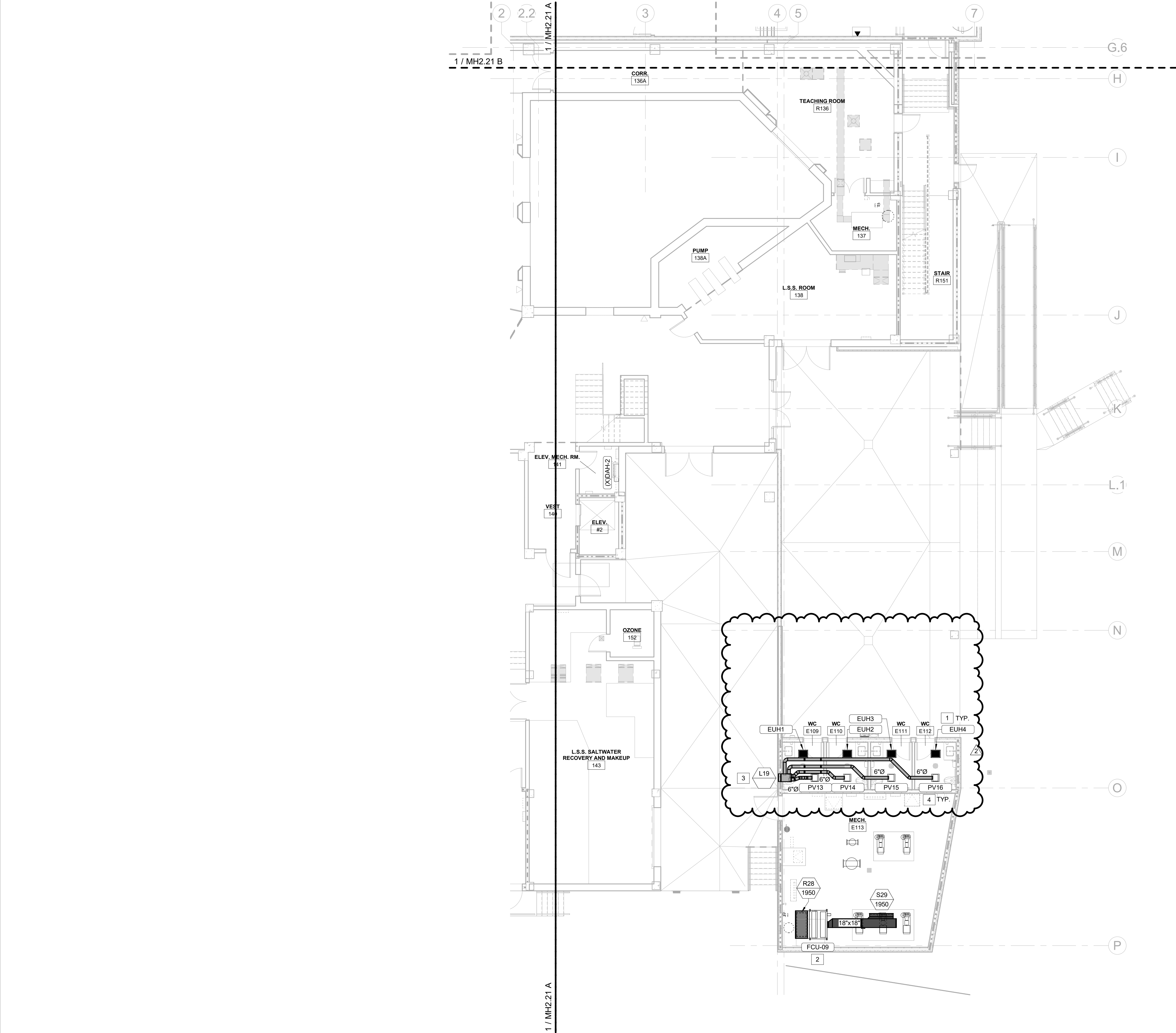
MH2.21 B

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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

1ST FLOOR PLAN - TOUCH & SHARK TANK - HVAC
SCALE: 1/8" = 1'-0"

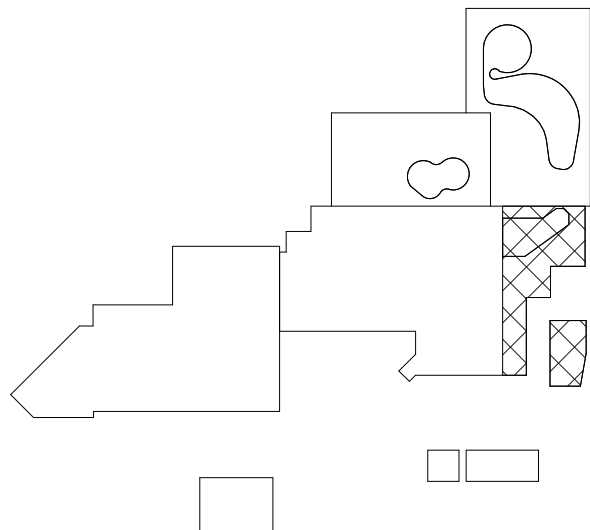


FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

- FLOOR PLAN SHEET NOTES**
1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.I. NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).
 2. MAINTAIN CLEARANCES REQUIRED BY MANUFACTURERS AND CODE FOR ALL EQUIPMENT AND ACCESSORIES.
 3. M.C. SHALL COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
 4. M.C. SHALL COORDINATE ALL DUCT ROUTING WITH STRUCTURAL, ELECTRICAL, AND AQUATIC LIFE SUPPORT SYSTEMS PRIOR TO INSTALLATION.
 5. M.C. SHALL COORDINATE CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR.
 6. REFER TO ARCHITECTURAL PLANS FOR DETAILS ON CEILING TYPE.
 7. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS AND NFPA 90A.
 8. ALL DUCT PENETRATIONS THROUGH FIRE-RESISTANCE-RATED FLOOR ASSEMBLIES SHALL BE PROVIDED WITH FIRE DAMPERS HAVING A RATING EQUAL TO THE REQUIRED FIRE-RESISTANCE RATING OF THE FLOOR ASSEMBLY, UNLESS THE DUCT IS LOCATED WITHIN A CODE-COMPLIANT FIRE-RATED SHAFT OR PROTECTED CHASE.
 9. PROVIDE ACCESS DOORS FOR ALL DAMPERS, CONTROLS, AND EQUIPMENT REQUIRING SERVICE.
 10. PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS IN AREAS SUBJECT TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.

- NEW WORK KEYED NOTES**
1. PROVIDE CEILING-MOUNTED ELECTRIC UNIT HEATER. INSTALL PER MANUFACTURER. COORDINATE WITH CEILING AND ELECTRICAL.
 2. SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAIL FOR INSTALLATION REQUIREMENTS. PROVIDE OUTSIDE AIR CONNECTION TO LOUVER WITH MOTORIZED CONTROL DAMPER AND MANUAL BALANCING DAMPER. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND OPERATION.
 3. INSTALL LOUVER IN EXTERIOR WALL PER DETAIL. COORDINATE SIZE AND LOCATION AS REQUIRED. INSTALL FLASHING AND SEAL PER SPECIFICATIONS.
 4. INSTALL POWER VENTILATOR PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL REQUIRED SERVICE CLEARANCES. PATCH AND SEAL ALL WALL OR ROOF PENETRATIONS TO BE WEATHER-TIGHT.

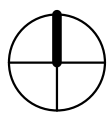
KEY PLAN



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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



1ST FLOOR PLAN - SOUTHEAST WING - HVAC

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2

FIRST FLOOR PLAN -
SOUTHEAST WING - HVAC

MH2.21 C

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2
2.1	06-03-26	BULLETIN #2.1

NEW WORK KEYED NOTES	
1	INSTALL AIR HANDLING UNIT ON EXISTING HOUSEKEEPING PAD IN MECHANICAL ROOM. REFER TO DETAIL FOR INSTALLATION REQUIREMENTS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND OPERATION. PROVIDE NEW S/A, R/A, AND O/A DUCT CONNECTIONS AS SHOWN ON PLANS.
2	INSTALL POWER VENTILATOR PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL REQUIRED SERVICE CLEARANCES. PATCH AND SEAL ALL WALL OR ROOF PENETRATIONS TO BE WEATHER-TIGHT.
3	INSTALL DUCTLESS WALL-MOUNTED INDOOR UNIT PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN REQUIRED SERVICE CLEARANCES. ROUTE REFRIGERANT PIPING TO ASSOCIATED OUTDOOR UNIT AND CONDENSATE TO EXTERIOR OR NEAREST DRAIN. PATCH AND SEAL ALL PENETRATIONS.
4	INSTALL SINGLE-DUCT VAV BOX WITH HOT WATER COIL. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND ACCESS.
5	OUTDOOR UNIT IS MOUNTED ON MANUFACTURER'S WALL BRACKETS TO ADJACENT EXTERIOR WALL ABOVE THIS AREA ON THE EXISTING ROOF. COORDINATE FINAL MOUNTING HEIGHT AND CLEARANCES WITH ARCHITECT AND GC. CONFIRM ALL EXISTING ROOF PENETRATIONS, WALL CONDITIONS, AND POTENTIAL INTERFERENCES WITH GC AND ALL AFFECTED TRADES PRIOR TO INSTALLATION TO ENSURE THE SELECTED MOUNTING LOCATION IS NOT IMPACTED BY FIELD CONDITIONS. PROVIDE ANCHORING AND RESTRAINTS SUITABLE FOR HIGH-WIND / HURRICANE REGIONS PER MANUFACTURER, STRUCTURAL, AND LOCAL CODE REQUIREMENTS.
6	INSTALL GENERATOR INTAKE AND EXHAUST LOUVERS WITH MOTORIZED DAMPERS AS SCHEDULED. REFER TO MECHANICAL SCHEDULES AND DETAILS FOR MORE INFORMATION. COORDINATE SIZE AND LOCATION WITH ARCHITECTURAL DRAWINGS. INSTALL FLASHING AND SEAL PER SPECIFICATIONS.
7	INSTALL DEHUMIDIFICATION UNIT ON CORROSION-RESISTANT WALL BRACKETS WITH SUPPORT PLATFORM. MAINTAIN MANUFACTURER CLEARANCES. ROUTE CONDENSATE TO EXTERIOR LANDSCAPE DISCHARGE LOCATION. PATCH AND SEAL WALL PENETRATIONS WEATHER-TIGHT.
8	INSTALL OUTDOOR UNIT ON MANUFACTURER'S WALL BRACKETS. MOUNT UNIT MINIMUM 14'-0" ABOVE SEA LEVEL, 2'-0" ABOVE REGULATORY FLOOD PROTECTION ELEVATION (RPFD). COORDINATE FINAL HEIGHT/CLEARANCES WITH ARCHITECT AND GC. PROVIDE HIGH-WIND/HURRICANE ANCHORAGE PER MANUFACTURER, STRUCTURAL, AND LOCAL CODE REQUIREMENTS.
9	INSTALL OUTDOOR UNIT ON SUPPORTS PROVIDED BY STRUCTURAL ENGINEER AND COORDINATED WITH WALKING PLATFORM FRAMING. COORDINATE FINAL MOUNTING LOCATION AND HEIGHT WITH STRUCTURAL, GC, AND ARCHITECT PRIOR TO PLATFORM FABRICATION OR ORDERING TO ENSURE ACCESS, CLEARANCES, AND INSTALLATION REQUIREMENTS ARE MET. PROVIDE ANCHORING AND RESTRAINTS SUITABLE FOR HIGH-WIND / HURRICANE REGIONS PER MANUFACTURER, STRUCTURAL, AND LOCAL CODE REQUIREMENTS.
10	PROVIDE (2) 10" Ø COMBUSTION AIR INTAKES. ONE DUCT PER BOILER, ROUTED THROUGH NON-RATED EXTERIOR WALL ABOVE DOOR. MAINTAIN REQUIRED CLEARANCE FROM DAH-10 AND COORDINATE FINAL ROUTING/TERMINATIONS WITH STRUCTURE AND ARCHITECTURE.
11	PROVIDE 10" Ø CATEGORY IV FLUE VENT FROM EACH BOILER ROUTED DIRECTLY THROUGH EXTERIOR WALL AT REAR OF BUILDING.

FLOOR PLAN SHEET NOTES

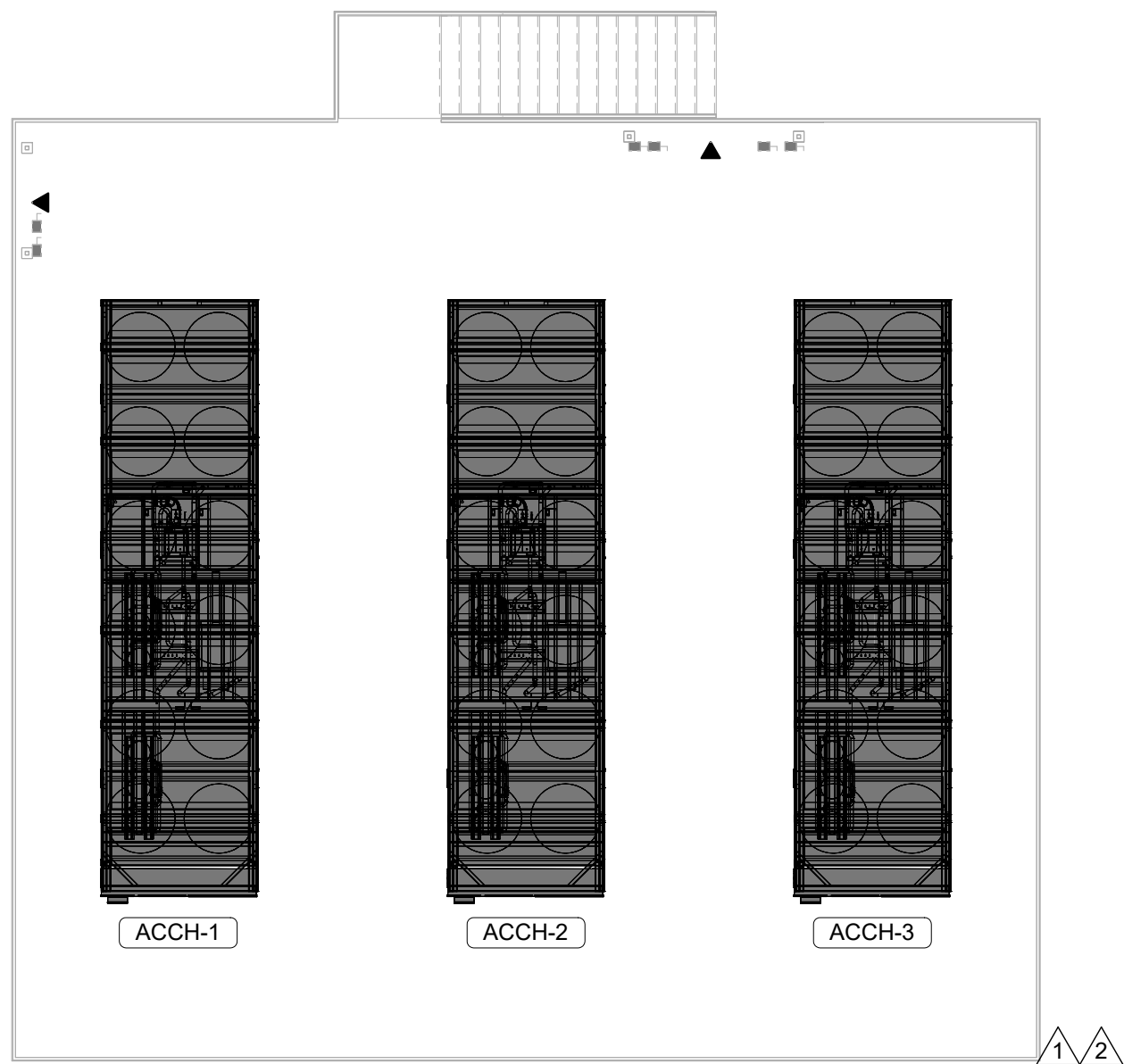
- REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U/L NUMBERS (WALLS, FLOOR / CEILINGS, ETC).
- MAINTAIN CLEARANCES REQUIRED BY MANUFACTURERS AND CODE FOR ALL EQUIPMENT AND ACCESSORIES.
- M.C. SHALL COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
- M.C. SHALL COORDINATE ALL DUCT ROUTING WITH STRUCTURAL, ELECTRICAL, AND AQUATIC LIFE SUPPORT SYSTEMS PRIOR TO INSTALLATION.
- M.C. SHALL COORDINATE CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR.
- REFER TO ARCHITECTURAL PLANS FOR DETAILS ON CEILING TYPE.
- ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS AND NFPA 90A.
- ALL DUCT PENETRATIONS THROUGH FIRE-RESISTANCE-RATED FLOOR ASSEMBLIES SHALL BE PROVIDED WITH FIRE DAMPERS HAVING A RATING EQUAL TO THE REQUIRED FIRE-RESISTANCE RATING OF THE FLOOR ASSEMBLY, UNLESS THE DUCT IS LOCATED WITHIN A CODE-COMPLIANT FIRE-RATED SHAFT OR PROTECTED CHASE.
- PROVIDE ACCESS DOORS FOR ALL DAMPERS, CONTROLS, AND EQUIPMENT REQUIRING SERVICE.
- PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS IN AREAS SUBJECT TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.

FLOOR PLAN LEGEND

- EXISTING BUILDING
- RENOVATED AREA
- UPFIT BY OTHERS
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL

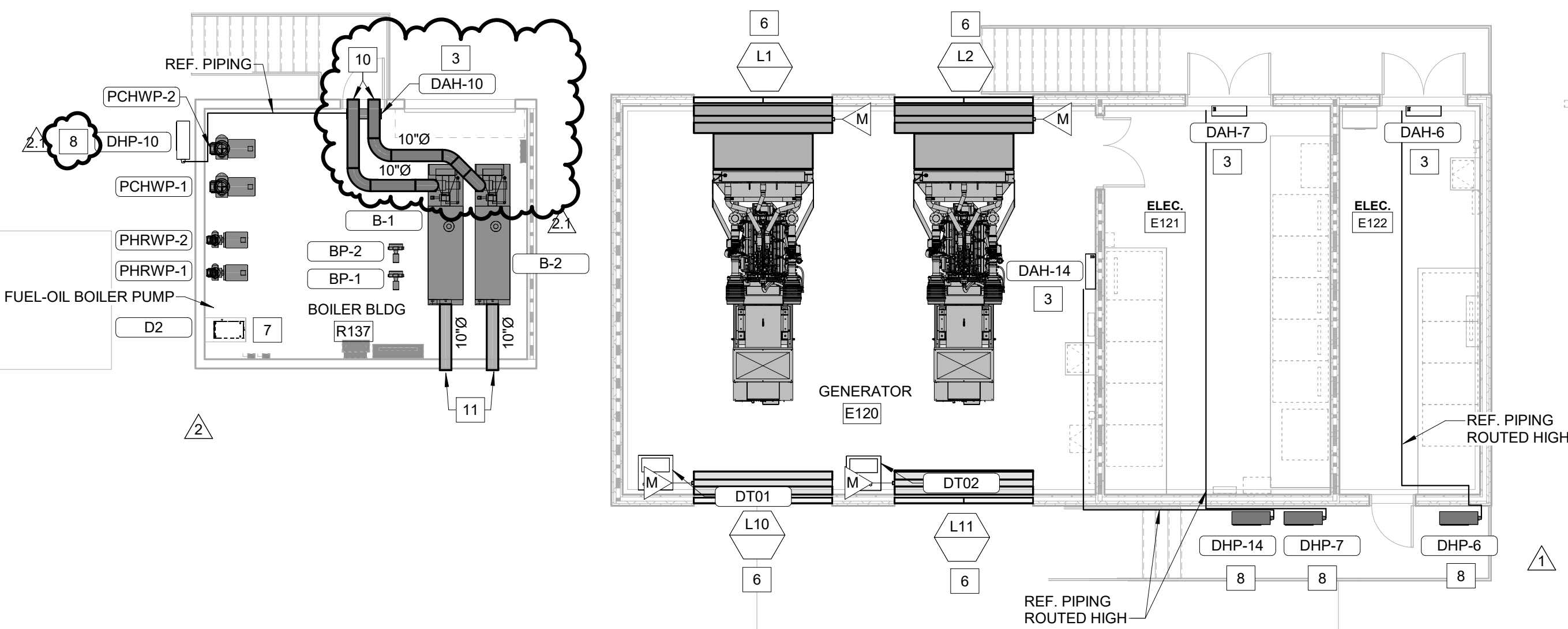
DOMESTIC WATER BOOSTER PUMP BUILDING - HVAC
SCALE : 1/4" = 1'-0"

4



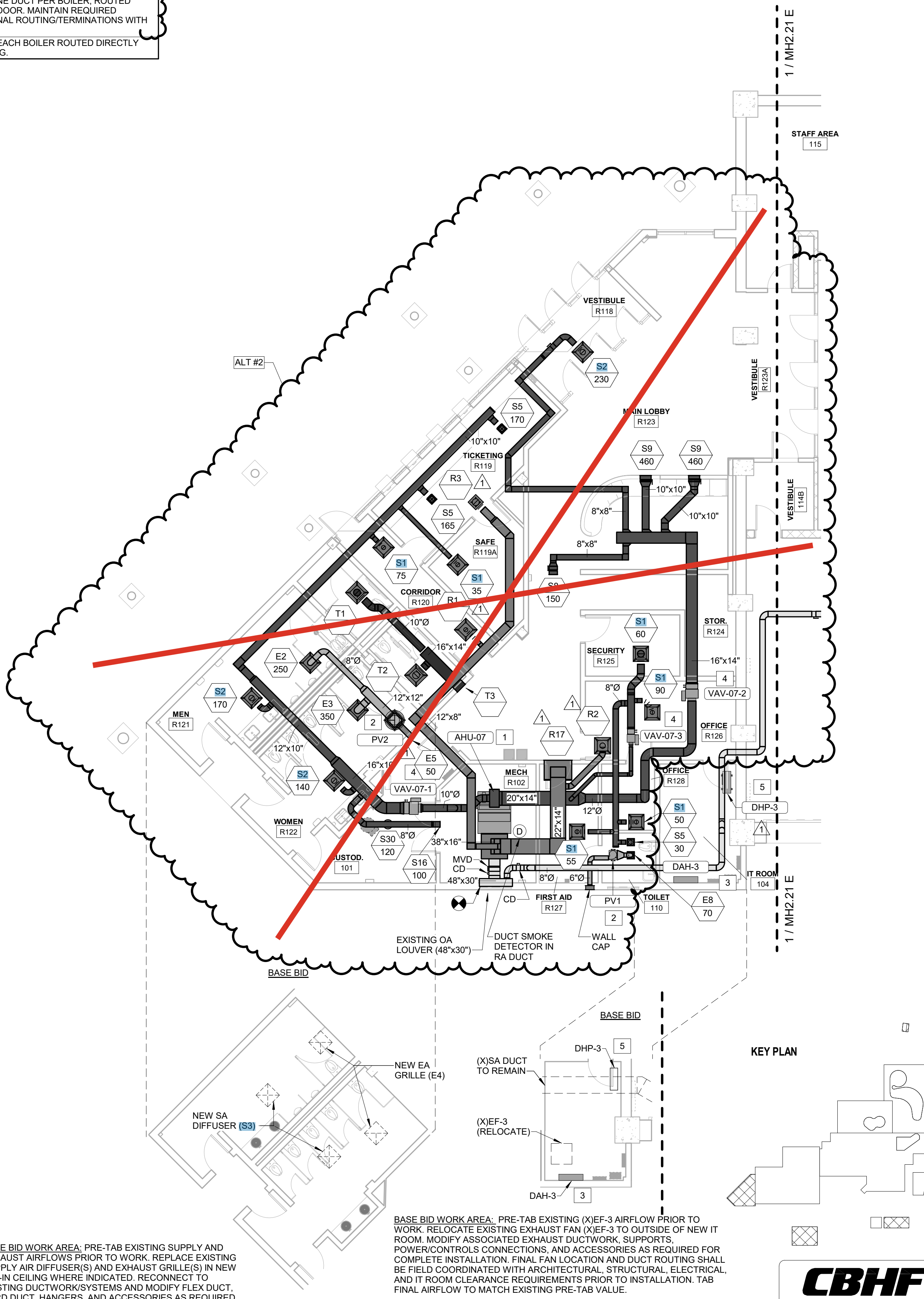
CHILLER PLATFORM HVAC PLAN
SCALE : 1/8" = 1'-0"

3



1ST FLOOR PLAN - GENERATOR & BOILER BUILDING -HVAC
SCALE : 1/8" = 1'-0"

2





NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

FIRST FLOOR PLAN -
FRESHWATER HABITAT -
HVAC

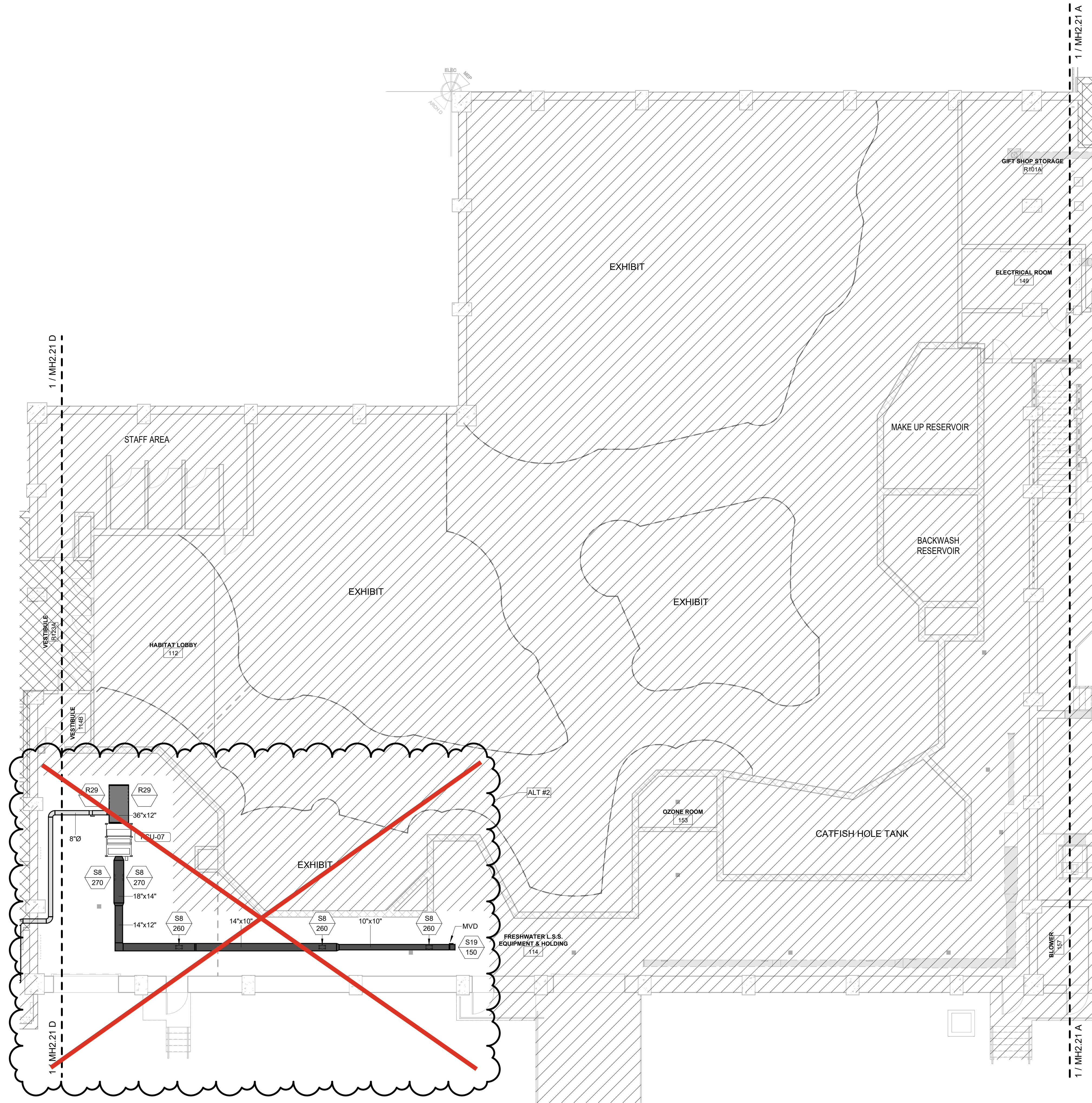
MH2.21 E

FLOOR PLAN LEGEND

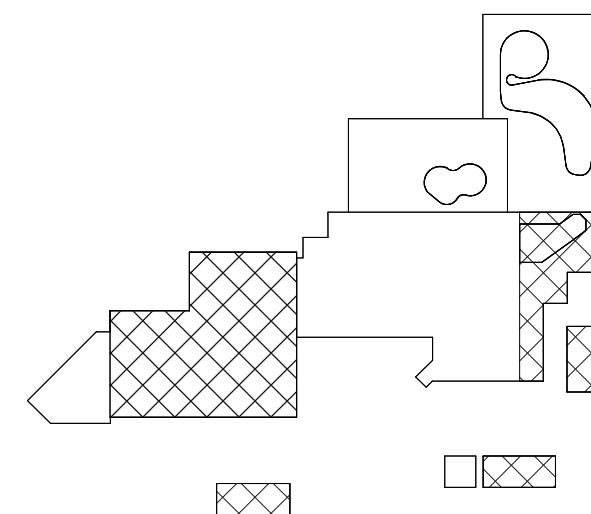
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

FLOOR PLAN SHEET NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.L. NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).
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3. M.C. SHALL COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
4. M.C. SHALL COORDINATE ALL DUCT ROUTING WITH STRUCTURAL, ELECTRICAL, AND AQUATIC LIFE SUPPORT SYSTEMS PRIOR TO INSTALLATION.
5. M.C. SHALL COORDINATE CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR.
6. REFER TO ARCHITECTURAL PLANS FOR DETAILS ON CEILING TYPE.
7. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS AND NFPA 90A.
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9. PROVIDE ACCESS DOORS FOR ALL DAMPERS, CONTROLS, AND EQUIPMENT REQUIRING SERVICE.
10. PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS IN AREAS SUBJECT TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.



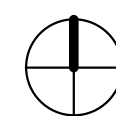
KEY PLAN



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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



1ST FLOOR PLAN - FRESHWATER HABITAT - HVAC

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

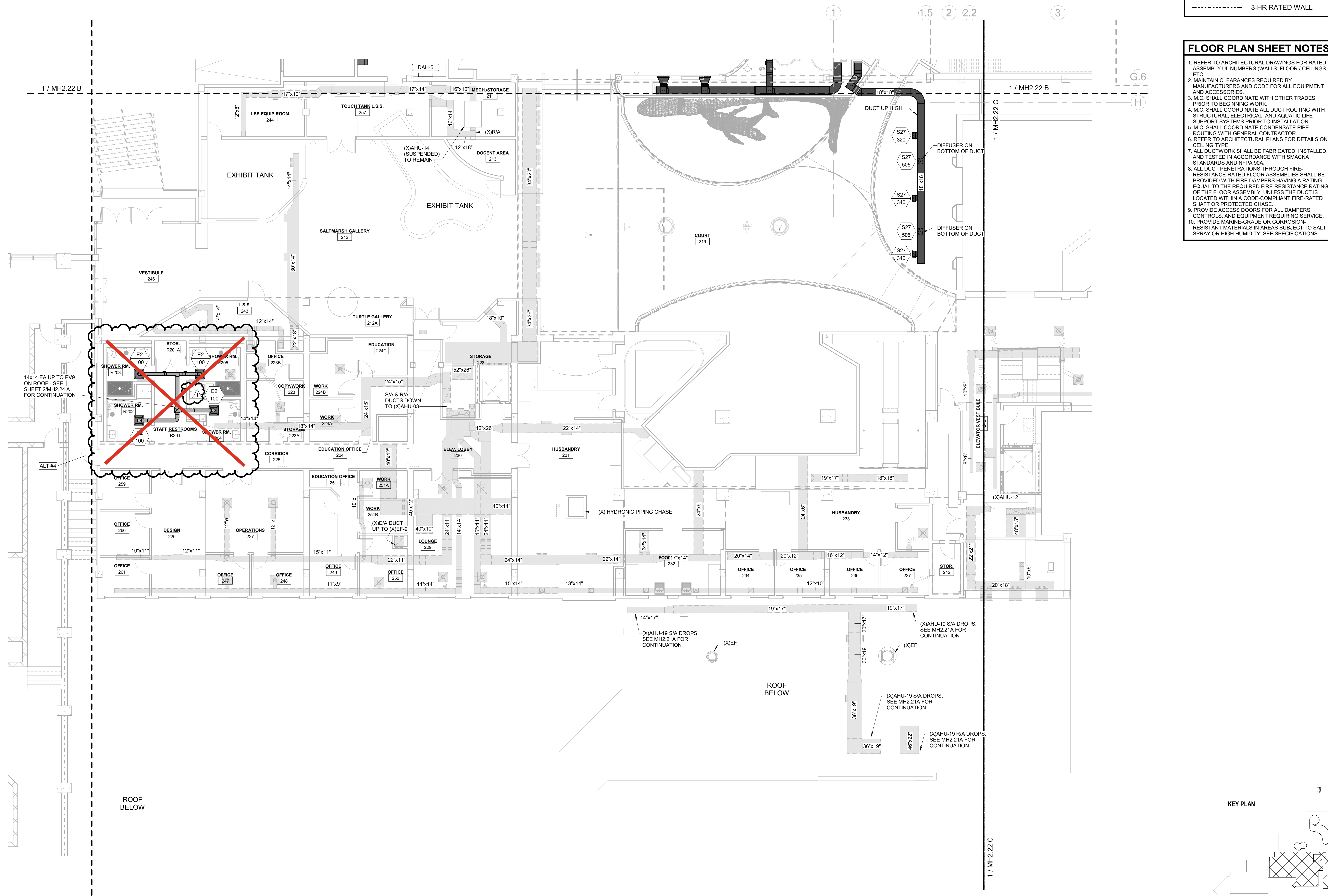
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

FLOOR PLAN LEGEND

	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

FLOOR PLAN SHEET NOTES

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10. PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS IN AREAS SUBJECT TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.

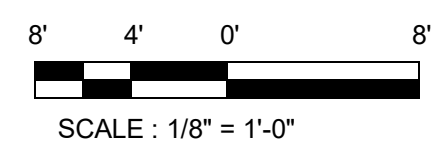


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SCALE: 1/8" = 1'-0"

1. INSTALL VERTICAL FAN COIL UNIT ON NEW HOUSEKEEPING PAD. REFER TO DETAIL FOR INSTALLATION REQUIREMENTS. PROVIDE OUTSIDE AIR CONNECTION TO EXHAUST FAN MOTOR. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND OPERATION.
2. SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAIL FOR INSTALLATION REQUIREMENTS. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES FOR SERVICE AND OPERATION.
3. INSTALL LOUVER IN EXTERIOR WALL PER DETAIL. COORDINATE SIZE AND LOCATION WITH REQUIRED INTAKE AND EXHAUST AIR FLOW AND SPECIFICATIONS.
4. INSTALL POWER VENTILATOR PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN ALL REQUIRED SERVICE CLEARANCES. PATCH AND SEAL ALL WALL OR FLOOR PENETRATIONS. PATCH AND SEAL ALL WEATHER PENETRATIONS.
5. INSTALL DUCTLESS WALL-MOUNTED INDOOR UNIT PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN REQUIRED SERVICE CLEARANCES. ROUTE CONDENSATE PIPING TO EXTERIOR OR TO DRAINAGE PLUMBING. PATCH AND SEAL TO EXTERIOR OR NEAREST DRAIN. PATCH AND SEAL ALL PENETRATIONS.



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	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U/L NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).

2. MAINTAIN CLEARANCES REQUIRED BY MANUFACTURERS AND CODE FOR ALL EQUIPMENT AND ACCESSORIES.

3. MAINTAIN COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.

4. M.C. SHALL COORDINATE ALL DUCT ROUTING WITH ELECTRICAL, PLUMBING, AND MECHANICAL SUPPORT SYSTEMS PRIOR TO INSTALLATION.

5. M.C. SHALL COORDINATE COMPENSATE PIPE PENETRATION WITH GEOTECHNICAL ENGINEER.

6. REFER TO ARCHITECTURAL PLANS FOR DETAILS ON PENETRATION.

7. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS.

8. ALL DUCT PENETRATIONS THROUGH FIRE-RESISTANCE-RATED FLOOR ASSEMBLIES SHALL BE PROTECTED WITH FIRE-RESISTANT MATERIALS EQUAL TO THE REQUIRED FIRE-RESISTANCE RATING OF THE FLOOR ASSEMBLY, UNLESS THE DUCT IS PROTECTED WITHIN A RATED PENETRATION, RATED SHAFT OR PROTECTED CHASE.

9. ALL ACCESS TO DUCTS SHALL BE THROUGH DOORS, CONTROLS, AND EQUIPMENT REQUIRING SERVICE.

10. PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS EXPOSED TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.

ALL FLOOR AND ROOF DUCT PENETRATIONS SHALL BE PROVIDED WITH 1- OR 2-HOUR RATED FIRE DAMPERS AS REQUIRED. REFER TO ARCHITECTURAL FIRE-RESISTANCE PLANS FOR RATING REQUIREMENTS. FIRE DAMPERS ARE OMITTED FROM THIS PLAN FOR CLARITY

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
KURE BEACH, NC 28449

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LICENSE # 51679

LIFE SUPPORT SYSTEMS ENGINEER
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LICENSE # C-3505

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LICENSE # F-1105

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LIGHTING DESIGNER
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RANCHO CUCAMONGA, CA 91730
TELE: 909.360.2900
WWW.LIGHTSWITCH.NET

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2602 IRON GATE DRIVE SUITE 102
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WWW.WTENGINEERS.COM
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TELE: 919.419.1199
FAX: 919.419.1669
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LSC0105-01-000

FIRE PROTECTION ENGINEER
3412 ENTERPRISE DRIVE
WILMINGTON, NC 28405
TELE: 910.452.4210
WWW.CHEATHAMPA.COM
LICENSE # C-1073

COST ESTIMATOR
4819 EMPEROR BOULEVARD SUITE 400
DURHAM, NC 27703
TELE: 919.605.8952
WWW.PALACIOCOLLABORATIVE.COM

Bulletin #1 issued solely to identify revisions to the Addendum #3 drawings within the 12/05/2025 signed and sealed set. Not all changes may be captured or shown. Contract Documents govern. Users must independently verify all information. The Engineer assumes no responsibility or liability for any reliance, costs, claims, or actions arising from use of this material.



12-Dec-25

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

SECOND FLOOR PLAN -
TOUCH AND SHARK TANK -
HVAC

MH2.22 B

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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NORTH CAROLINA DEPT. OF
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FAX: 919.960.7967
WWW.SZOSTAKDESIGN.COM
LICENSE # 31079

TJP ENGINEERING, INC.

LIFE SUPPORT SYSTEMS ENGINEER
5680 VENTURE LANE SUITE 205H
BEND, OR 97007
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WWW.TJPEENGINEERING.COM
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ROTO GROUP, LLC.

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WWW.ROTO.COM

BENNETT & PLESS

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CBHF ENGINEERS, PLLC

MFP ENGINEER
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FAX: 910.791.2546
WWW.CBHFENGINEERS.COM
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LIGHTSWITCH

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10565 INDIANA COURT
RANCHO CUCAMONGA, CA 91730
TEL: 909.360.7000
WWW.LIGHTSWITCH.NET

TUNSTALL CONSULTING ENGINEERS PLLC

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WILMINGTON, NC 28412
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FAX: 910.343.9404
WWW.TUNSTALLENGINEERS.COM
LICENSE # F-3132

SURFACE 678, PA

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215 MORRIS STREET SUITE 150
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FAX: 919.419.1669
WWW.SURFACE678.COM
LICENSE # C-096

CHEATHAM & ASSOCIATES, PA

FIRE PROTECTION ENGINEER
3412 EMBERSIDE DRIVE
WILMINGTON, NC 28405
TEL: 910.452.4510
WWW.CHEATHAMPA.COM
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PALACIO COLLABORATIVE

COST ESTIMATOR
4817 EMERSON BOULEVARD SUITE 400
DURHAM, NC 27705
TEL: 919.403.9700
WWW.PALACIOCOLLABORATIVE.COM

NOTE: IF THIS DRAWING IS NOT 30" X 42", IT IS A
REDUCED PRINT. REFER TO GRAPHIC SCALE.



NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

SECOND FLOOR PLAN -
SOUTHEAST WING - HVAC

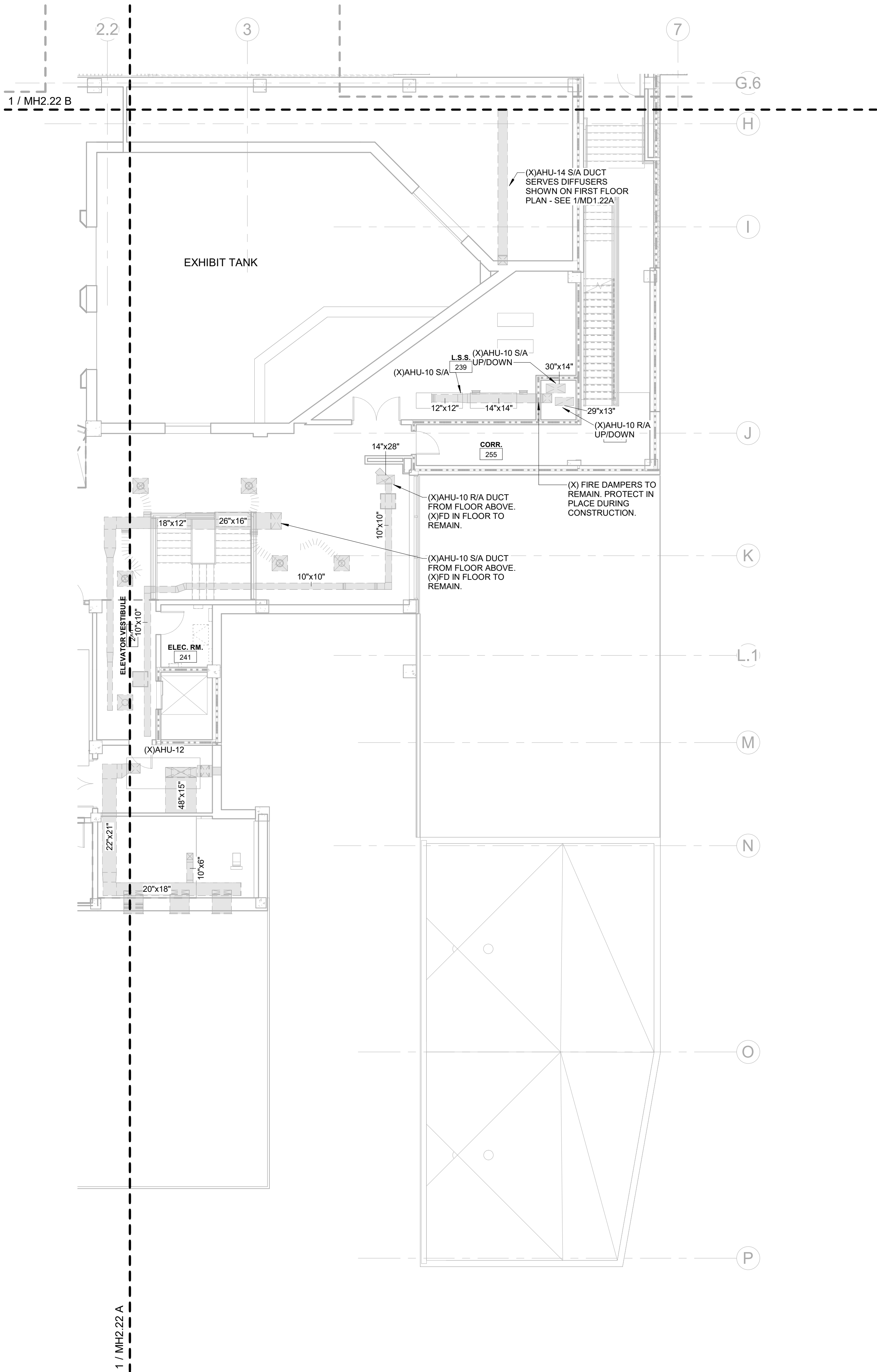
MH2.22 C

FLOOR PLAN LEGEND

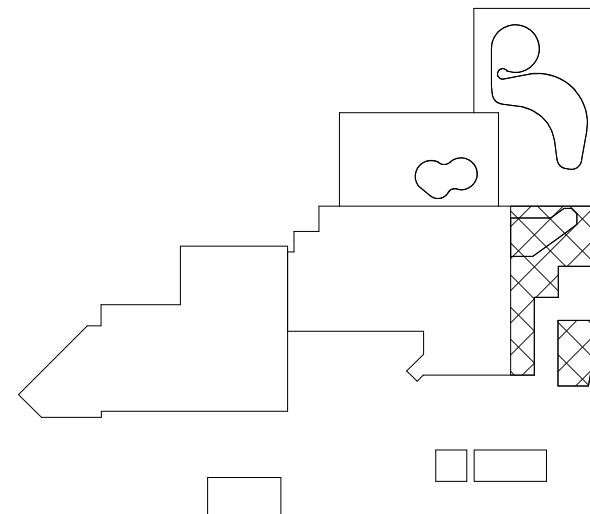
- EXISTING BUILDING
- RENOVATED AREA
- UPFIT BY OTHERS
- 1-HR RATED WALL
- 2-HR RATED WALL
- 3-HR RATED WALL

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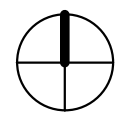
KEY PLAN



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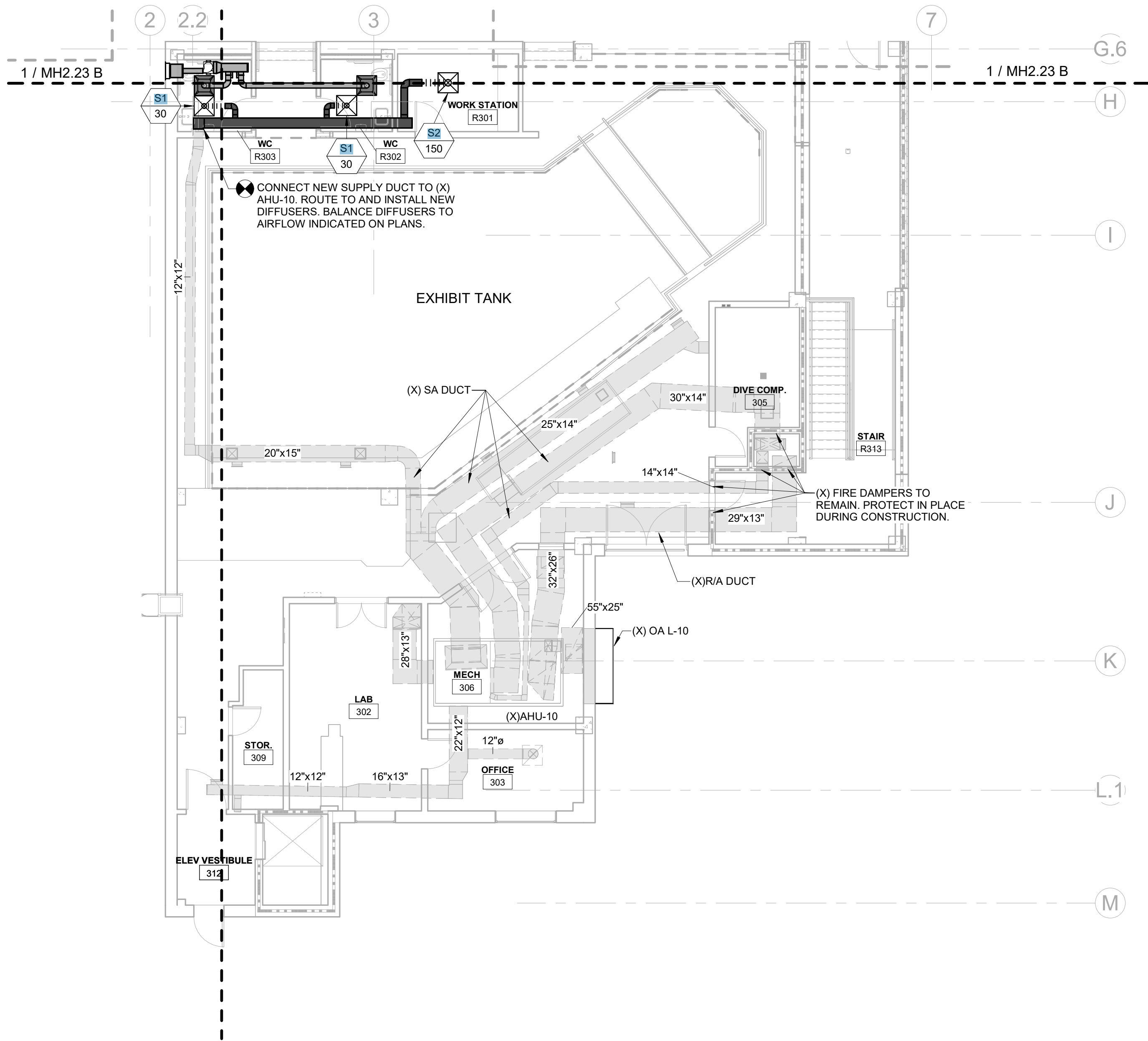
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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



2ND FLOOR PLAN - SOUTHEAST WING - HVAC

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



FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

- FLOOR PLAN SHEET NOTES**
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IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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LIGHTSWITCH

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LICENSE # C-098

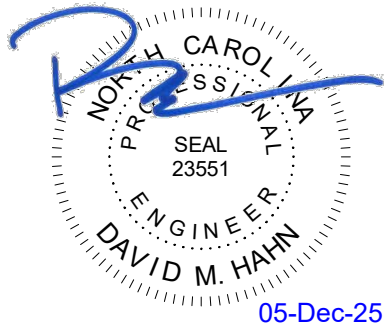
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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

THIRD FLOOR PLAN -
SOUTHEAST WING - HVAC

MH2.23 A

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3RD FLOOR PLAN - SOUTHEAST WING - HVAC
SCALE: 1/8" = 1'-0"

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

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06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2

THIRD FLOOR PLAN -
SHARK TANK - HVAC

MH2.23 B

FLOOR PLAN LEGEND

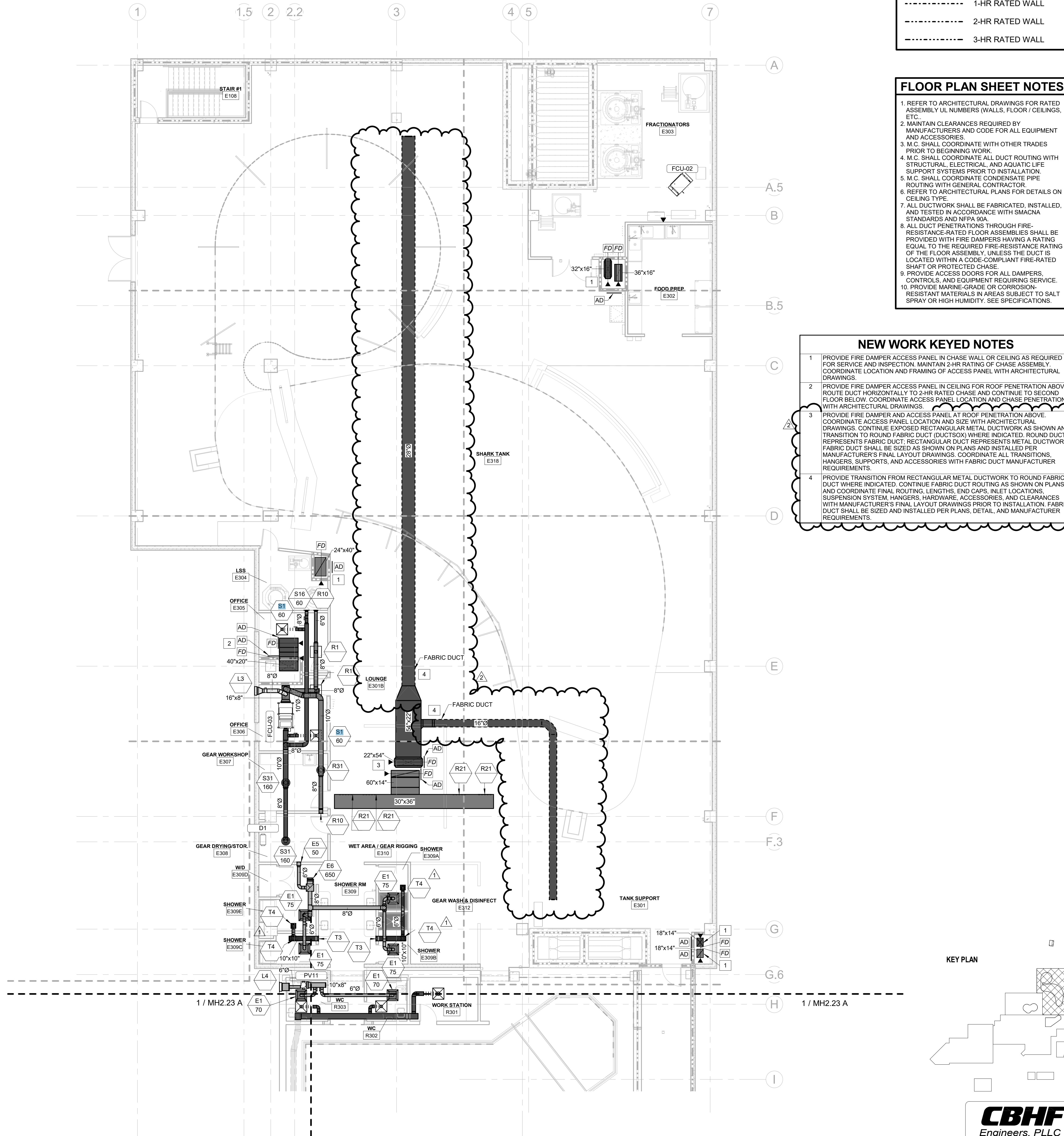
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

FLOOR PLAN SHEET NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.I. NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).
2. MAINTAIN CLEARANCES REQUIRED BY MANUFACTURERS AND CODE FOR ALL EQUIPMENT AND ACCESSORIES.
3. M.C. SHALL COORDINATE WITH OTHER TRADES PRIOR TO BEGINNING WORK.
4. M.C. SHALL COORDINATE ALL DUCT ROUTING WITH STRUCTURAL, ELECTRICAL, AND AQUATIC LIFE SUPPORT SYSTEMS PRIOR TO INSTALLATION.
5. M.C. SHALL COORDINATE CONDENSATE PIPE ROUTING WITH GENERAL CONTRACTOR.
6. REFER TO ARCHITECTURAL PLANS FOR DETAILS ON CEILING TYPE.
7. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, AND TESTED IN ACCORDANCE WITH SMACNA STANDARDS AND NFPA 90A.
8. ALL DUCT PENETRATIONS THROUGH FIRE-RESISTANCE-RATED FLOOR ASSEMBLIES SHALL BE PROVIDED WITH FIRE DAMPERS HAVING A RATING EQUAL TO THE REQUIRED FIRE-RESISTANCE RATING OF THE FLOOR ASSEMBLY, UNLESS THE DUCT IS LOCATED WITHIN A CODE-COMPLIANT FIRE-RATED SHAFT OR PROTECTED CHASE.
9. PROVIDE ACCESS DOORS FOR ALL DAMPERS, CONTROLS, AND EQUIPMENT REQUIRING SERVICE.
10. PROVIDE MARINE-GRADE OR CORROSION-RESISTANT MATERIALS IN AREAS SUBJECT TO SALT SPRAY OR HIGH HUMIDITY. SEE SPECIFICATIONS.

NEW WORK KEYED NOTES

1. PROVIDE FIRE DAMPER ACCESS PANEL IN CHASE WALL OR CEILING AS REQUIRED FOR SERVICE AND INSPECTION. MAINTAIN 2-HR RATING OF CHASE ASSEMBLY. COORDINATE LOCATION AND FRAMING OF ACCESS PANEL WITH ARCHITECTURAL DRAWINGS.
2. PROVIDE FIRE DAMPER ACCESS PANEL IN CEILING FOR ROOF PENETRATION ABOVE. ROUTE DUCT HORIZONTALLY TO 2-HR RATED CHASE AND CONTINUE TO SECOND FLOOR BELOW. COORDINATE ACCESS PANEL LOCATION AND CHASE PENETRATION WITH ARCHITECTURAL DRAWINGS.
3. PROVIDE FIRE DAMPER AND ACCESS PANEL AT ROOF PENETRATION ABOVE. COORDINATE ACCESS PANEL LOCATION AND SIZE WITH ARCHITECTURAL DRAWINGS. CONTINUE EXPOSED RECTANGULAR METAL DUCTWORK AS SHOWN AND TRANSITION TO ROUND FABRIC DUCT (DUCTSOX) WHERE INDICATED. ROUND DUCT REPRESENTS FABRIC DUCT; RECTANGULAR DUCT REPRESENTS METAL DUCTWORK. FABRIC DUCT SHALL BE SIZED AS SHOWN ON PLANS AND INSTALLED PER MANUFACTURER'S FINAL LAYOUT DRAWINGS. COORDINATE ALL TRANSITIONS, HANGERS, SUPPORTS, AND ACCESSORIES WITH FABRIC DUCT MANUFACTURER REQUIREMENTS.
4. PROVIDE TRANSITION FROM RECTANGULAR METAL DUCTWORK TO ROUND FABRIC DUCT WHERE INDICATED. CONTINUE FABRIC DUCT ROUTING AS SHOWN ON PLANS AND COORDINATE FINAL ROUTING, LENGTHS, END CAPS, INLET LOCATIONS, SUSPENSION SYSTEM, HANGERS, HARDWARE, ACCESSORIES, AND CLEARANCES WITH MANUFACTURER'S FINAL LAYOUT DRAWINGS PRIOR TO INSTALLATION. FABRIC DUCT SHALL BE SIZED AND INSTALLED PER PLANS, DETAIL, AND MANUFACTURER REQUIREMENTS.



8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

3RD FLOOR PLAN - SHARK TANK
SCALE: 1/8" = 1'-0"

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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

ROOF PLANS - TOUCH &
SHARK TANK - HVAC

MH2.24 A

FLOOR PLAN LEGEND

	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

ROOF PLAN SHEET NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.L. NUMBERS (WALLS, FLOOR / CEILINGS, ETC).
2. REFER TO STRUCTURAL DRAWINGS FOR EQUIPMENT ROOF MOUNTING CONDITIONS.
3. ALL ROOF PENETRATIONS SHALL CONFORM TO ROOF MANUFACTURER'S APPROVED METHODS.
4. MAINTAIN MINIMUM 10 FOOT SEPARATION BETWEEN EXHAUST AND ANY OUTSIDE AIR INTAKES.

NEW WORK KEYED NOTES

1. INSTALL NEW SIDE-DISCHARGE ROOFTOP UNIT ON NEW CURB AS SCHEDULED. REFER TO MECHANICAL SCHEDULE FOR UNIT DATA AND ACCESSORIES. PIPE CONDENSATE TO ROOF DRAIN AS SHOWN. SEE DETAIL 7MM-02 FOR INSTALLATION REQUIREMENTS. SARA DUCTWORK ON ROOF TO BE EXTERIOR-RATED; SEE SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.
2. INSTALL NEW DOWNFLOW ROOFTOP UNIT ON NEW CURB AS SCHEDULED. REFER TO MECHANICAL SCHEDULE FOR UNIT DATA AND ACCESSORIES. PIPE CONDENSATE TO ROOF DRAIN AS SHOWN. SEE DETAIL 7MM-02 FOR INSTALLATION REQUIREMENTS. PROVIDE FIRE DAMPER AT 1-HR RATED ROOF PENETRATION. SEE 3RD FLOOR PLAN 1/MH2.23B FOR FIRE DAMPER ACCESS AND DUCT CONTINUATION.
3. DUCTWORK PENETRATES ROOF: PROVIDE FIRE DAMPER AT 1-HR RATED ROOF PENETRATION. SEE 3RD FLOOR PLAN 1/MH2.23B FOR FIRE DAMPER ACCESS AND DUCT CONTINUATION.
4. INSTALL OUTDOOR UNIT ON HOUSEKEEPING PAD AS SHOWN. VERIFY PAD DIMENSIONS AND SUPPORTS WITH STRUCTURAL. PROVIDE ANCHORING AND RESTRAINTS SUITABLE FOR HIGH-WIND / HURRICANE REGIONS PER MANUFACTURER, STRUCTURAL, AND LOCAL CODE REQUIREMENTS. COORDINATE FINAL CLEARANCES AND ACCESS WITH ARCHITECT AND GC.
5. ROUTE REFRIGERANT PIPING THROUGH 1-HR RATED ROOF USING UL-LISTED THROUGH-PENETRATION FIRESTOP SYSTEM. PROVIDE SLEEVES, SEALANT, AND INSULATION PER SPECIFICATIONS. MAINTAIN FIRE-RESISTIVE RATING OF ROOF ASSEMBLY.
6. PROVIDE MANUFACTURED ROOFTOP SUPPORT BASE WITH B22 CHANNEL, SPACED MAXIMUM 6'-0" O.C., TYPICAL.
7. INSTALL ROOF-MOUNTED POWER VENTILATOR ON NEW CURB AS SCHEDULED. COORDINATE CURB LOCATION AND OPENING WITH ROOFING AND STRUCTURAL DRAWINGS. CURB TO BE FLASHED AND SEALED BY ROOFING CONTRACTOR. PROVIDE FIRE DAMPER AT 1-HR RATED ROOF PENETRATION PER CODE.
8. INSTALL ROOF-MOUNTED POWER VENTILATOR ON EXISTING ROOF CURB AND OPENING AS SHOWN. VERIFY INTEGRITY OF EXISTING CURB AND COORDINATE WITH ROOFING CONTRACTOR FOR ANY FLASHING AND SEALING. PROVIDE FIRE DAMPER AT 1-HR RATED ROOF PENETRATION PER CODE.
9. OUTDOOR UNIT IS MOUNTED ON MANUFACTURER'S WALL BRACKETS TO ADJACENT EXTERIOR WALL ON THE EXISTING ROOF. COORDINATE FINAL MOUNTING HEIGHT AND CLEARANCES WITH ARCHITECT AND GC. CONFIRM ALL EXISTING ROOF PENETRATIONS, WALL CONDITIONS, AND POTENTIAL INTERFERENCES WITH GC AND ALL AFFECTED TRADES PRIOR TO INSTALLATION TO ENSURE THE SELECTED MOUNTING LOCATION IS NOT IMPACTED BY FIELD CONDITIONS. PROVIDE ANCHORING AND RESTRAINTS SUITABLE FOR HIGH-WIND / HURRICANE REGIONS PER MANUFACTURER, STRUCTURAL, AND LOCAL CODE REQUIREMENTS.

KEY PLAN

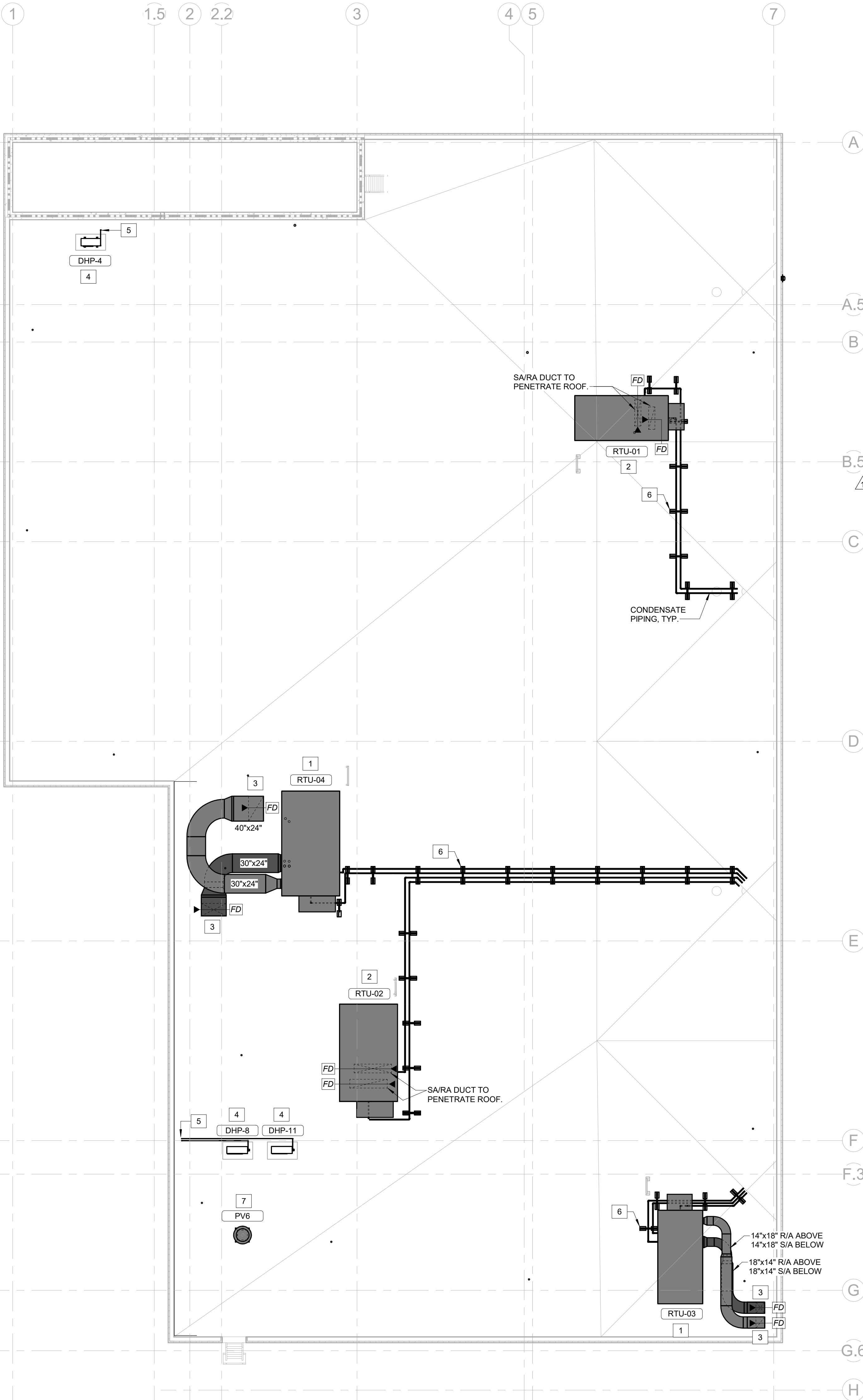
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SCALE: 1/8" = 1'-0"

ROOF PLAN - SHARK TANK - HVAC

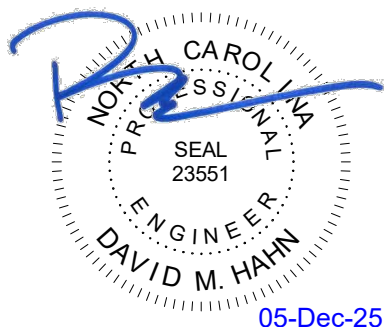
SCALE: 1/8" = 1'-0"



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

ROOF PLAN - TOUCH & SHARK TANK - HVAC

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



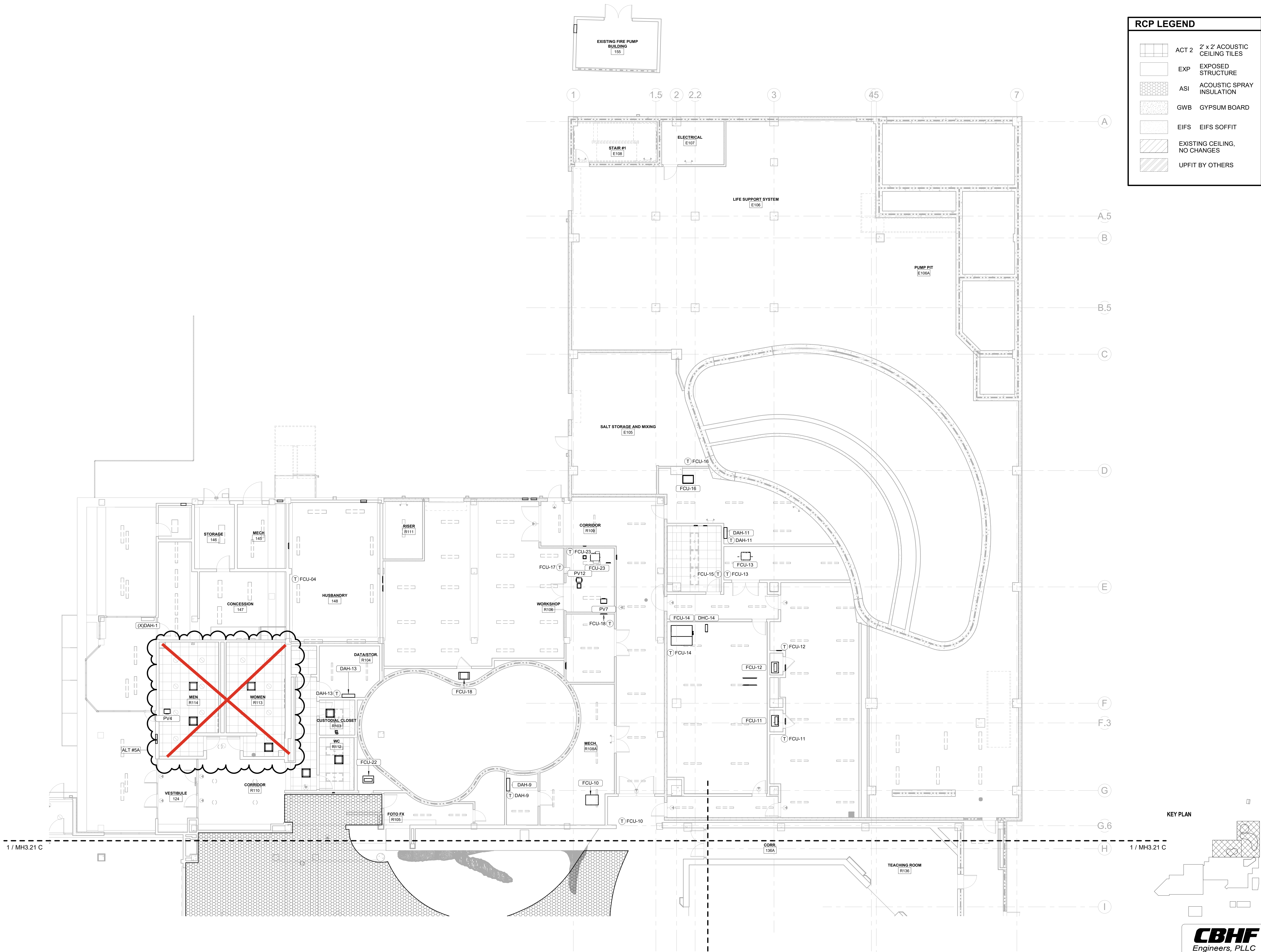
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

FIRST FLOOR -RCP- TOUCH
& SHARK TANK - HVAC

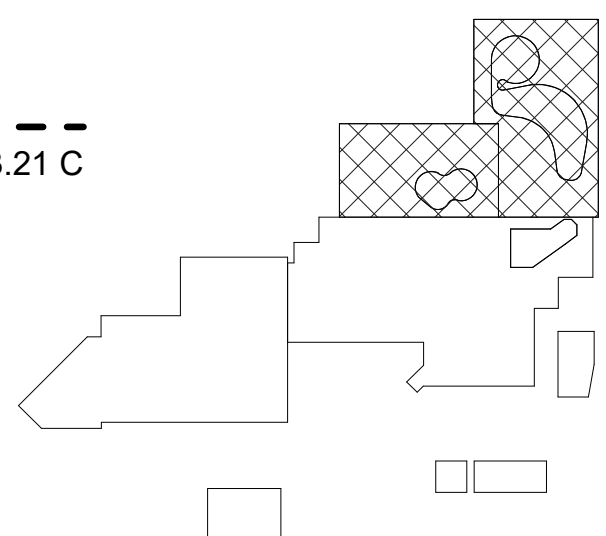
MH3.21 B

RCP LEGEND

	ACT 2	2' x 2' ACOUSTIC CEILING TILES
	EXP	EXPOSED STRUCTURE
	ASI	ACOUSTIC SPRAY INSULATION
	GWB	GYPSUM BOARD
	EIFS	EIFS SOFFIT
	EXISTING CEILING, NO CHANGES	
	UPFIT BY OTHERS	



KEY PLAN



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

1ST FLOOR RCP - TOUCH AND SHARK TANK - HVAC
SCALE: 1/8" = 1'-0"

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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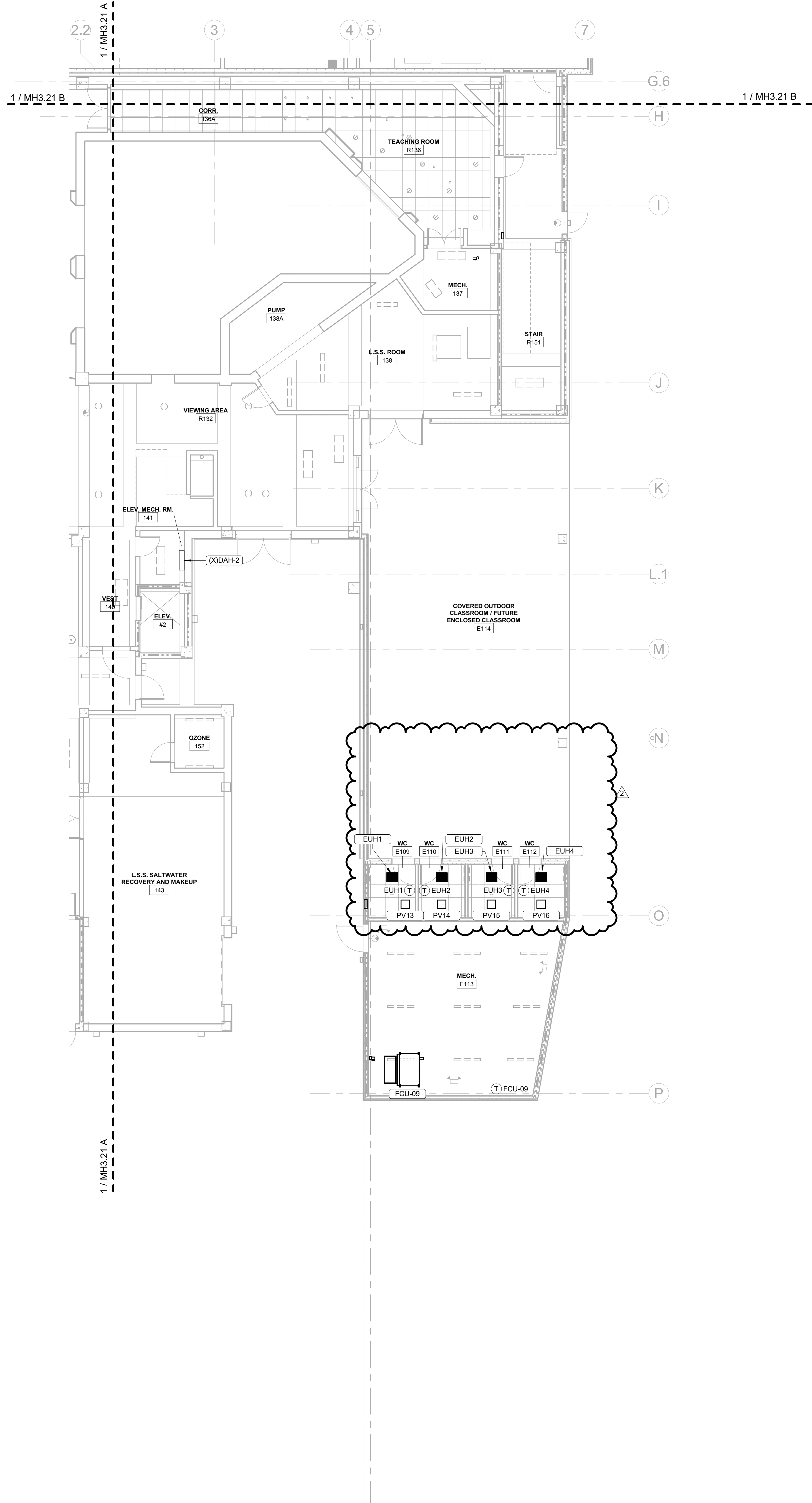
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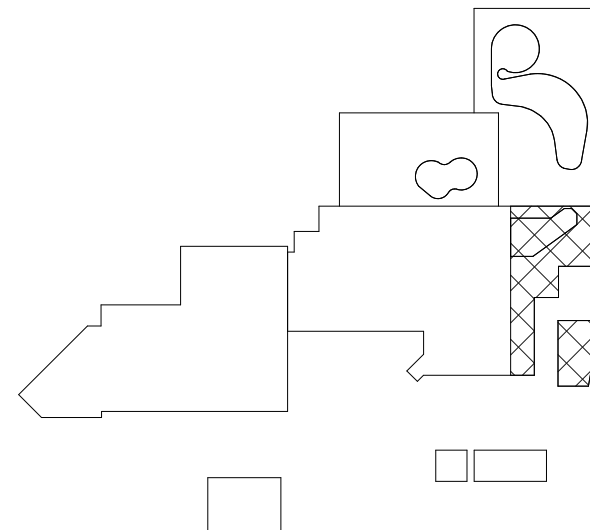
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

FIRST FLOOR -RCP-
SOUTHEAST WING - HVAC

MH3.21 C



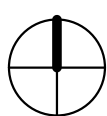
KEY PLAN



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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



1ST FLOOR RCP - SOUTHEAST WING - HVAC (VE)

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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06-May-26

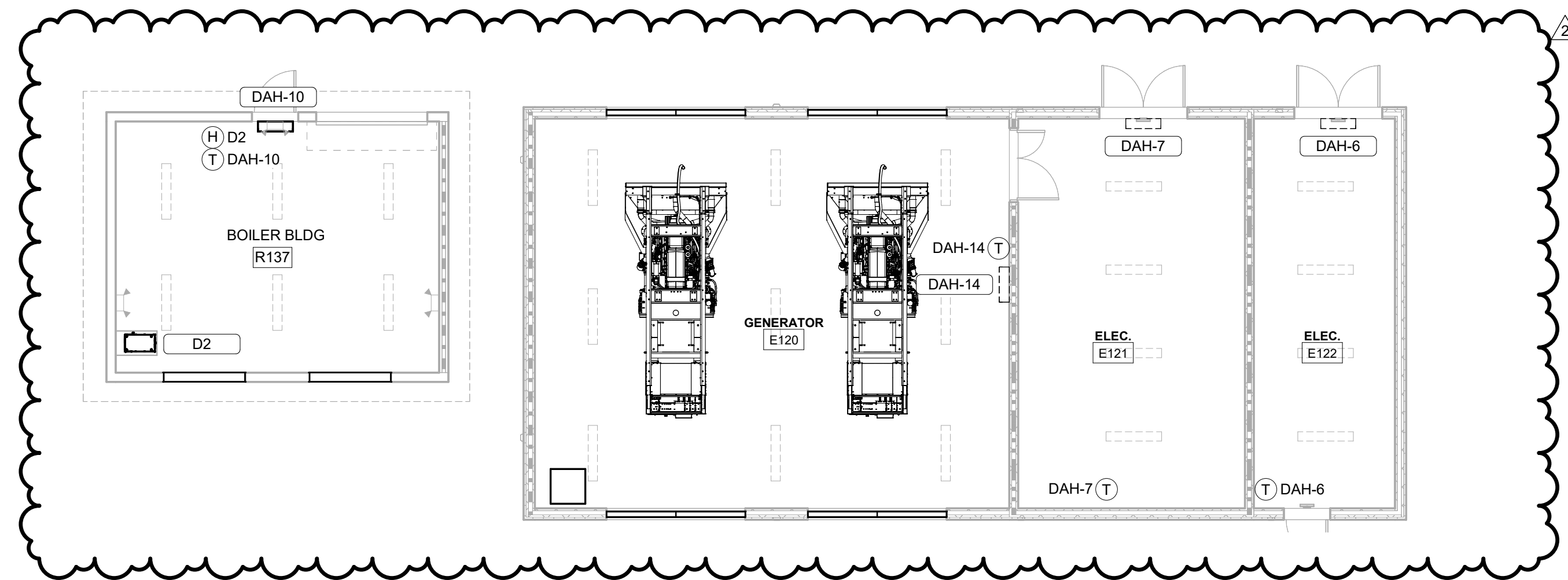
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

FIRST FLOOR -RCP- MAIN
ENTRY & MECH BLDG -
HVAC

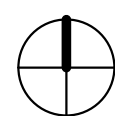
MH3.21 D

RCP LEGEND

	ACT 2	2' x 2' ACOUSTIC CEILING TILES
	EXP	EXPOSED STRUCTURE
	ASI	ACOUSTIC SPRAY INSULATION
	GWB	GYPSUM BOARD
	EIFS	EIFS SOFFIT
	EXISTING CEILING, NO CHANGES	
	UPFIT BY OTHERS	

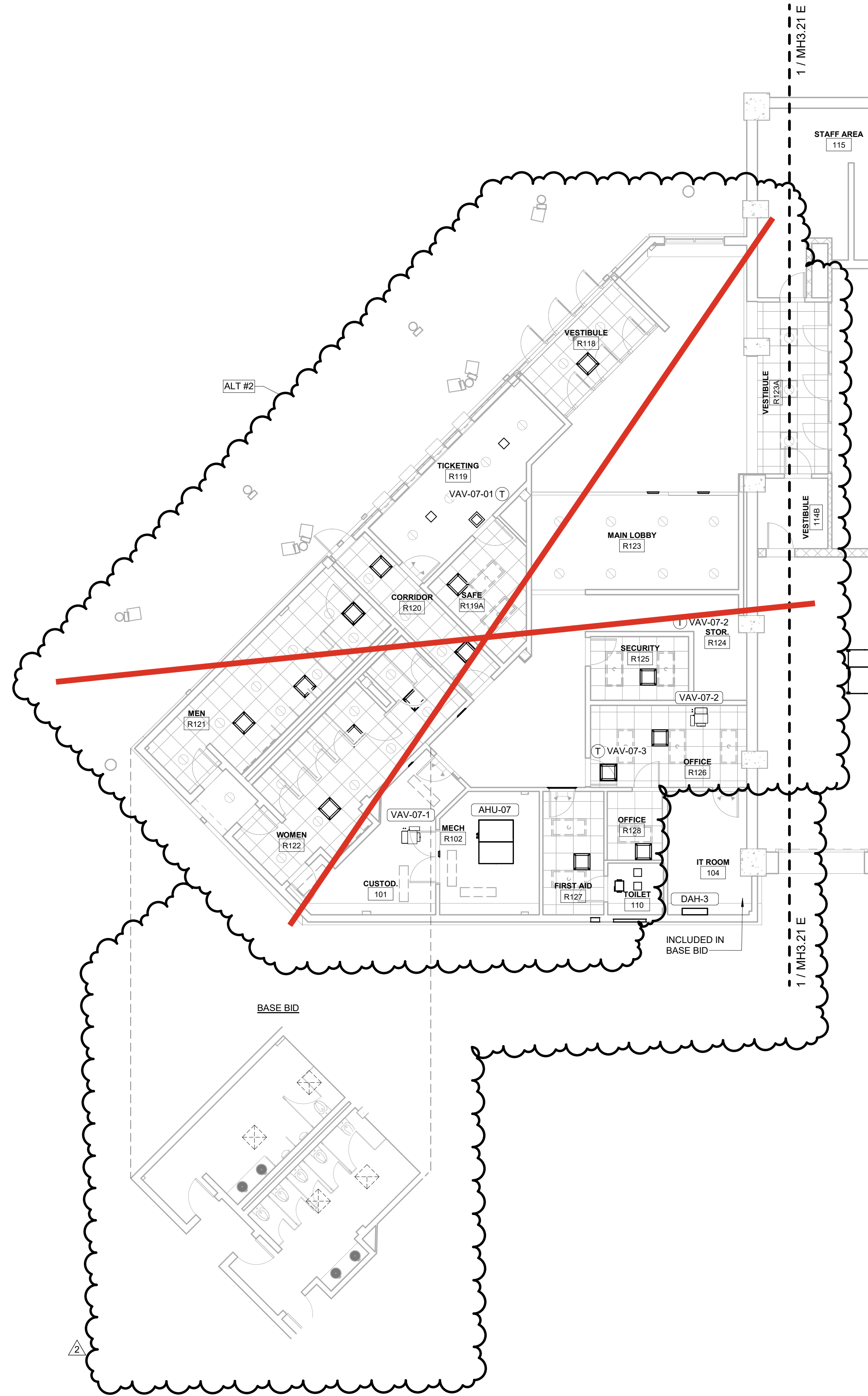


8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

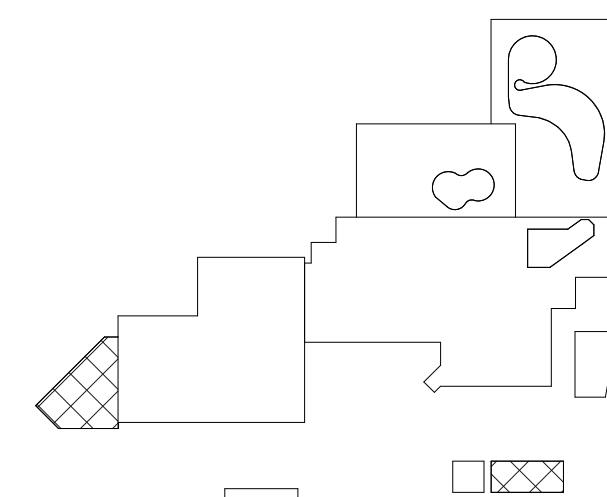


1ST FLOOR RCP - GENERATOR & BOILER BUILDING - HVAC
SCALE: 1/8" = 1'-0"

2



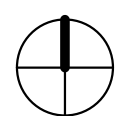
KEY PLAN



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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



1ST FLOOR RCP - MAIN ENTRY - HVAC
SCALE: 1/8" = 1'-0"

1

RENOVATION & EXPANSION: PHASE 1

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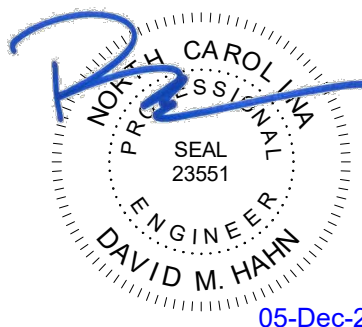


MH3.21 E

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



NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

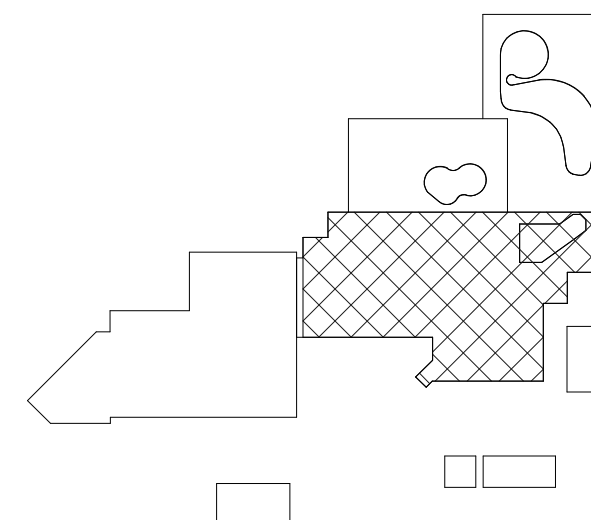
SECOND FLOOR - RCP -
CAPE FEAR SHOALS -
HVAC

MH3.22 A

RCP LEGEND	
	ACT 2 2' x 2' ACOUSTIC CEILING TILES
	EXP EXPOSED STRUCTURE
	ASI ACOUSTIC SPRAY INSULATION
	GWB GYPSUM BOARD
	EIFS EIFS SOFFIT
	EXISTING CEILING, NO CHANGES
	UPFIT BY OTHERS



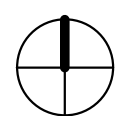
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Engineers, PLLC

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Fax: 910.791.5266
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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



2ND FLOOR RCP - CAPE FEAR SHOALS HVAC

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

SZOSTAK DESIGN, INC.
ARCHITECT
310 1/2 WEST FRANKLIN STREET
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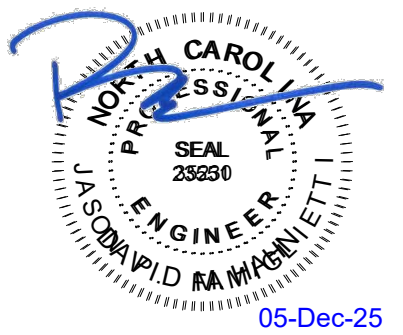
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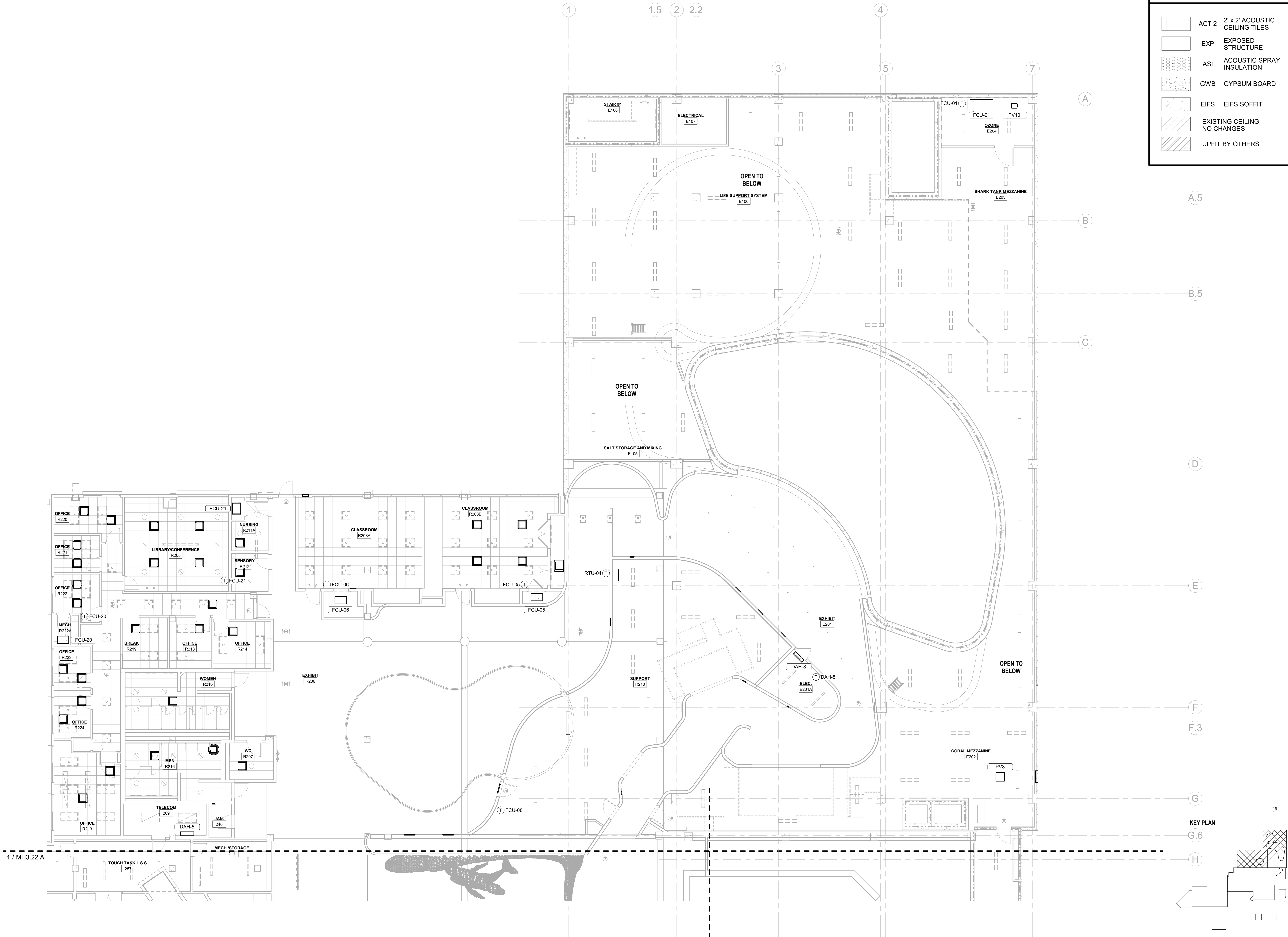


NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

SECOND FLOOR - RCP -
TOUCH AND SHARK TANK -
HVAC

MH3.22 B

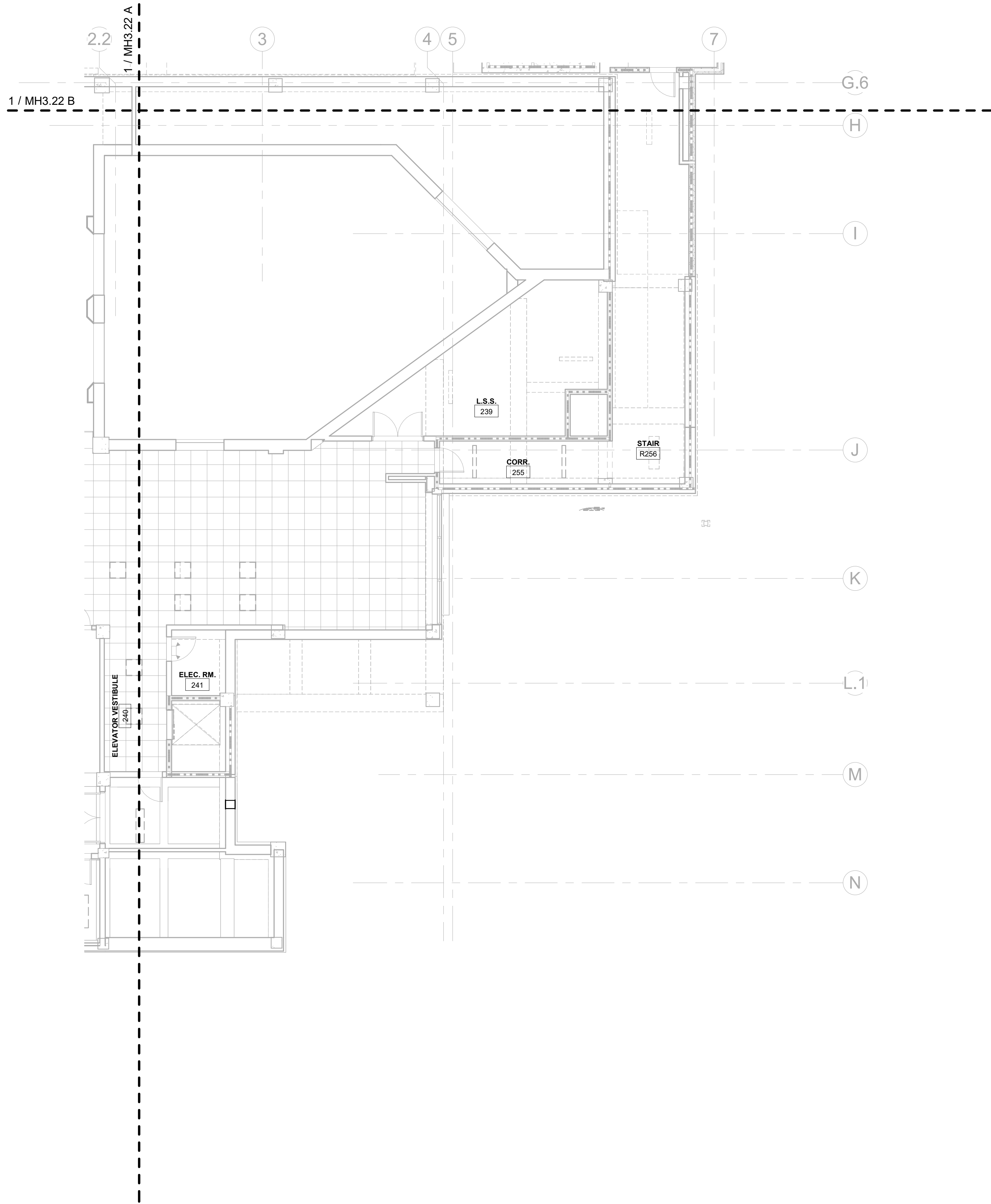
RCP LEGEND	
	ACT 2 2' x 2' ACOUSTIC CEILING TILES
	EXP EXPOSED STRUCTURE
	ASI ACOUSTIC SPRAY INSULATION
	GWB GYPSUM BOARD
	EIFS EIFS SOFFIT
	EXISTING CEILING, NO CHANGES
	UPFIT BY OTHERS



8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

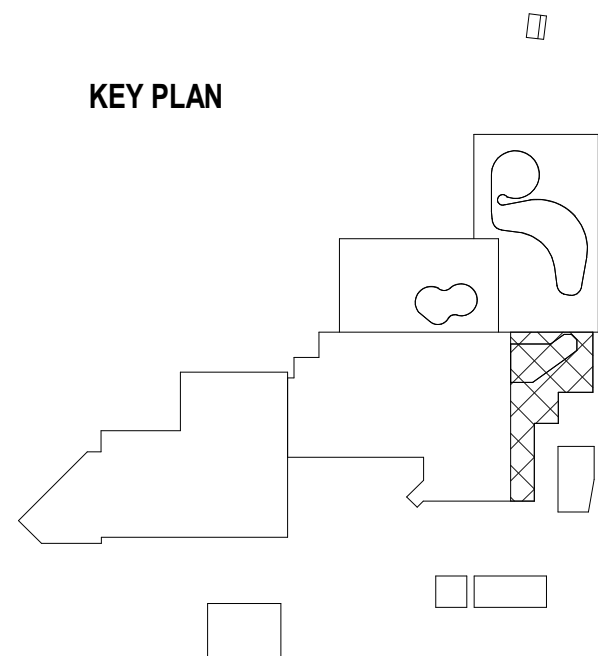
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2ND FLOOR RCP - TOUCH AND SHARK TANK - HVAC
SCALE: 1/8" = 1'-0"



RCP LEGEND	
	ACT 2 2' x 2' ACOUSTIC CEILING TILES
	EXP EXPOSED STRUCTURE
	ASI ACOUSTIC SPRAY INSULATION
	GWB GYPSUM BOARD
	EIFS EIFS SOFFIT
	EXISTING CEILING, NO CHANGES
	UPFIT BY OTHERS

KEY PLAN



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2ND FLOOR RCP - SOUTHEAST WING - HVAC

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

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

SECOND FLOOR - RCP -
SOUTHEAST WING - HVAC

MH3.22 C

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
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TEL: 919.419.1199
FAX: 919.419.1689
WWW.SURFACE678.COM
LICENSE # C-098

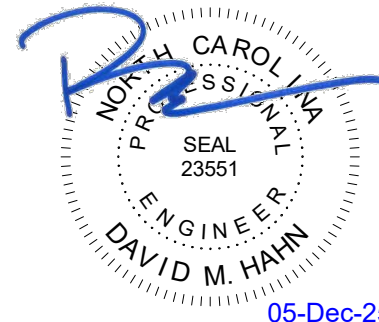
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WWW.CHEATHAMPA.COM
LICENSE # C-1073

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WWW.PALACIOCOLLABORATIVE.COM

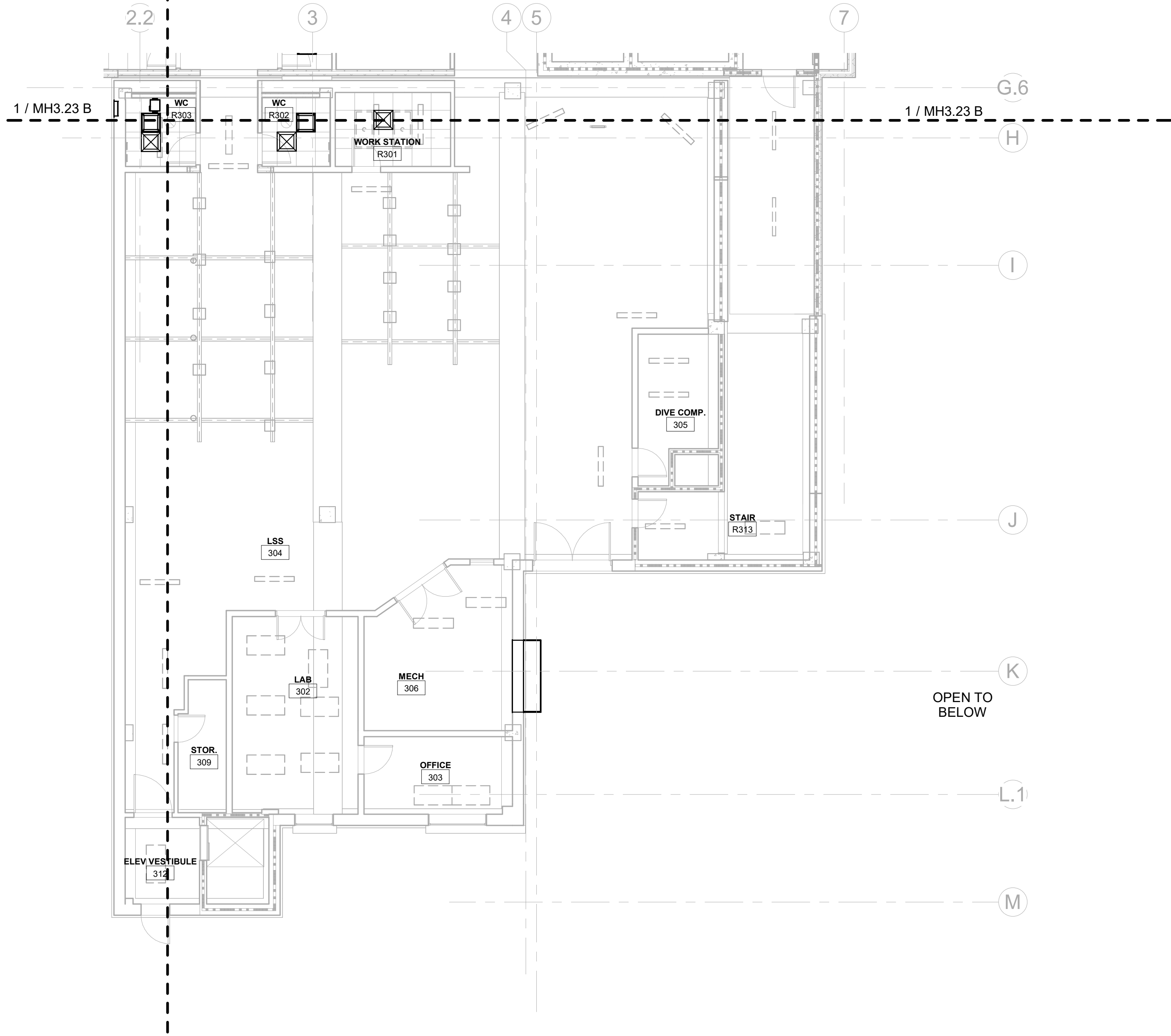
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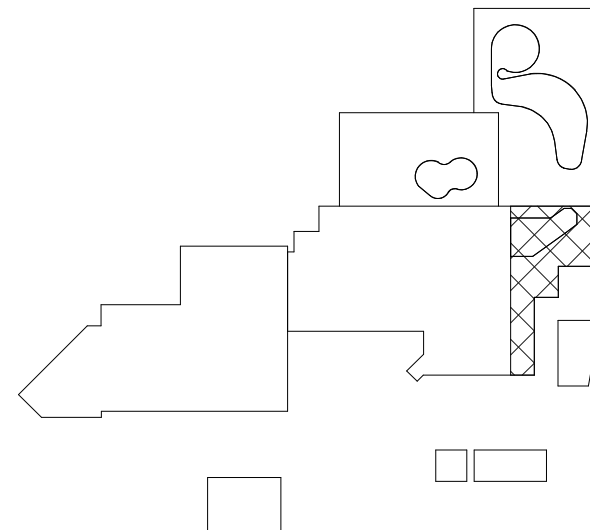
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

THIRD FLOOR - RCP -
SOUTHEAST WING - HVAC

MH3.23 A



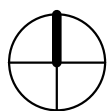
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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



3RD FLOOR RCP - SOUTHEAST WING - HVAC

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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CHEATHAM & ASSOCIATES, PA

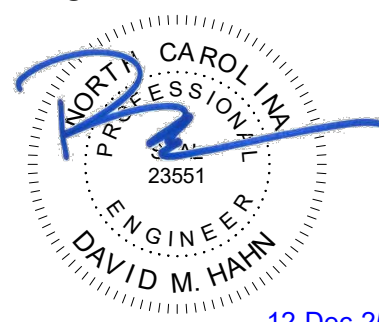
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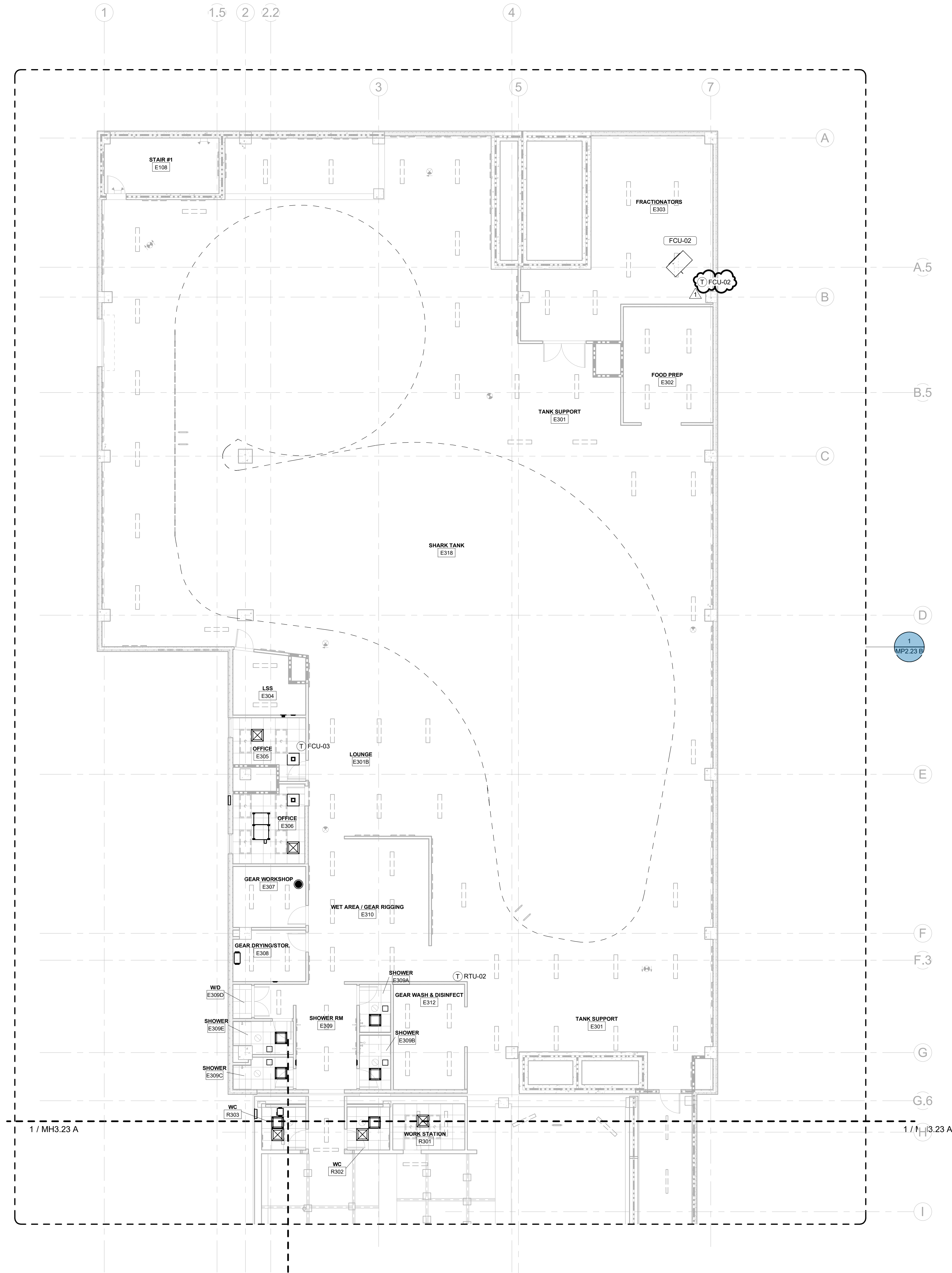


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-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

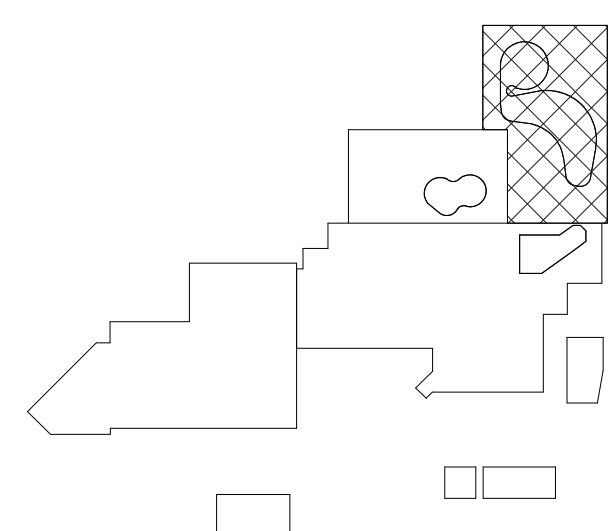
THIRD FLOOR - RCP -
SHARK TANK - HVAC

MH.23.23 B

RCP LEGEND	
	ACT 2 2' x 2' ACOUSTIC CEILING TILES
	EXP EXPOSED STRUCTURE
	ASI ACOUSTIC SPRAY INSULATION
	GWB GYPSUM BOARD
	EIFS EIFS SOFFIT
	EXISTING CEILING, NO CHANGES
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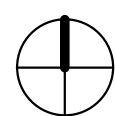
KEY PLAN



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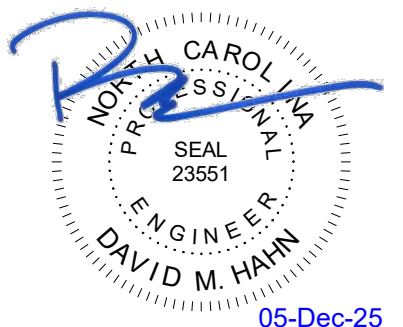
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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



3RD FLOOR - RCP - SHARK TANK - HVAC

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

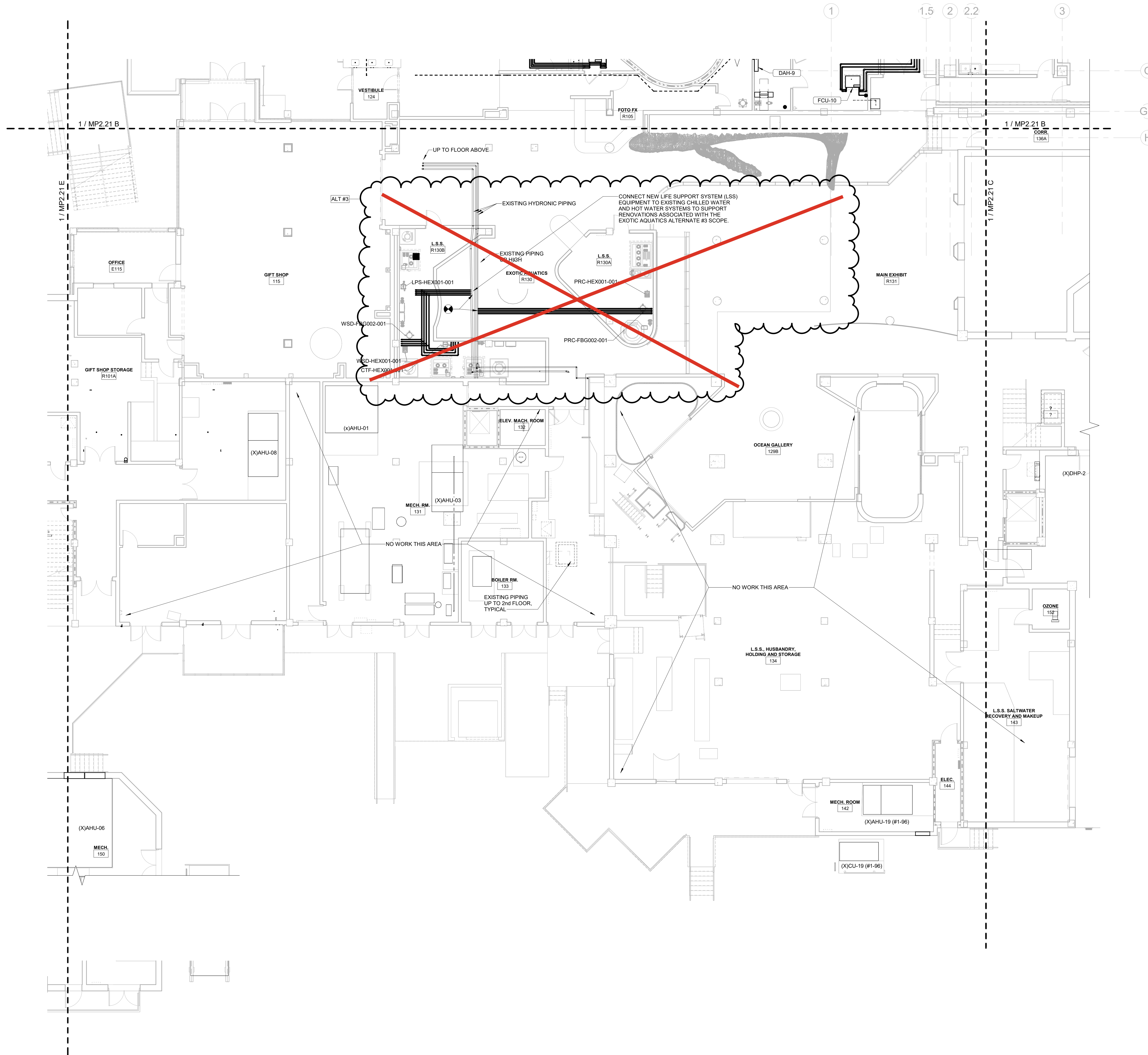


NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

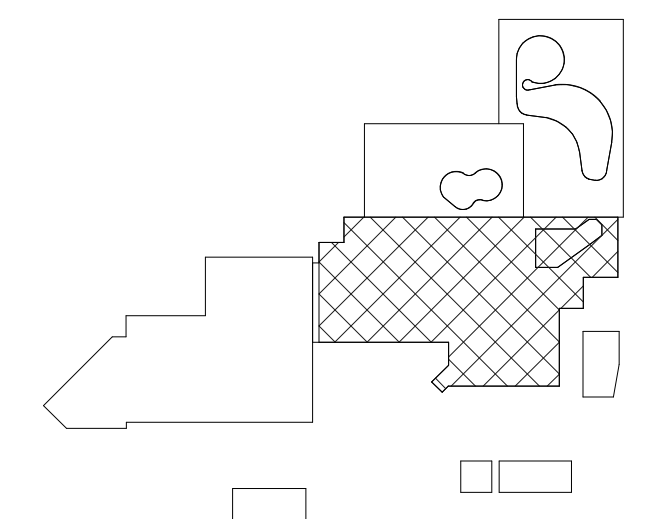
FIRST FLOOR PLAN - CAPE
FEAR SHOALS -
HYDRONICS

MP2.21 A

FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL



KEY PLAN



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06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2

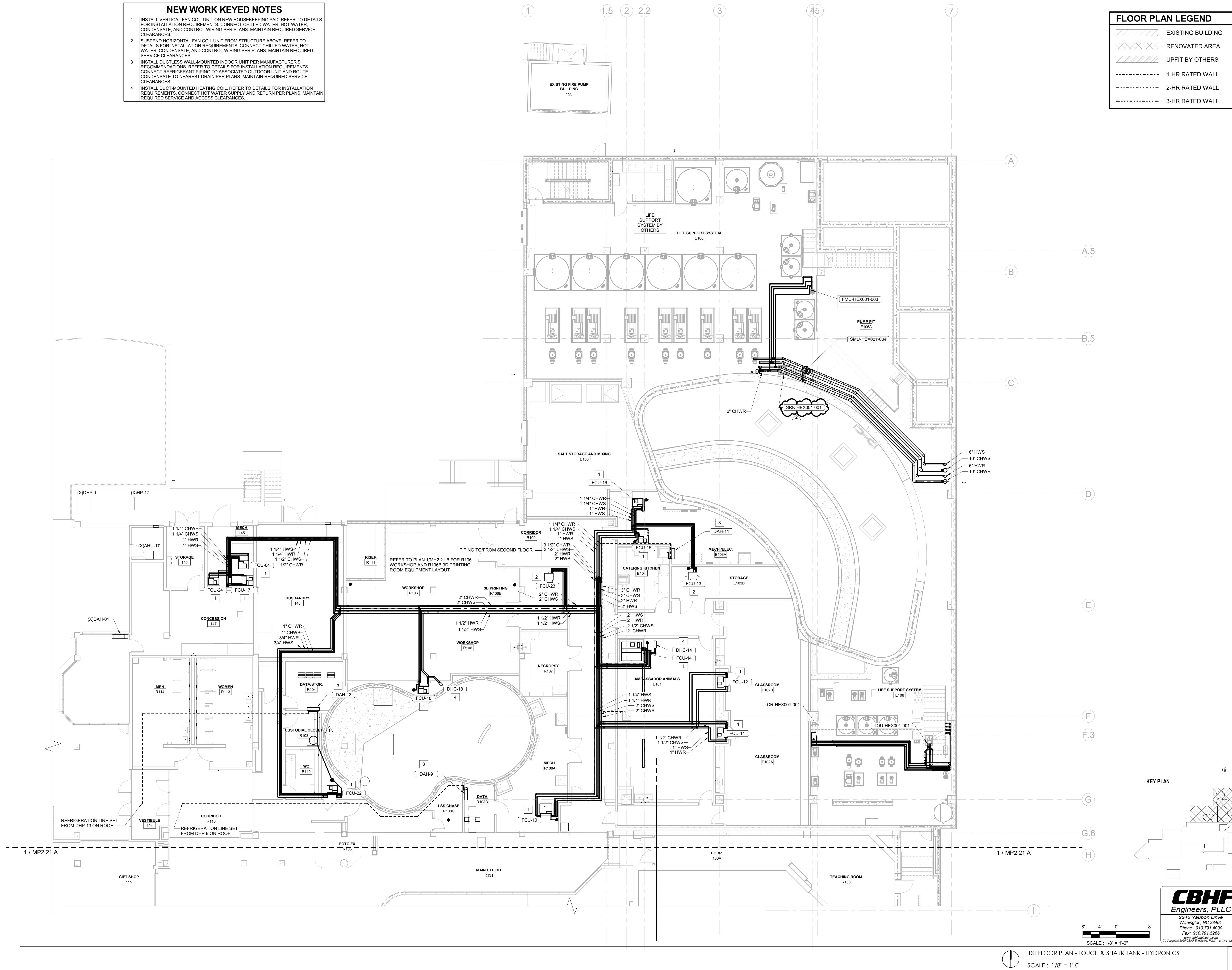
FIRST FLOOR PLAN - TOUCH AND SHARK TANK -
HYDRONICS

MP2.21 B

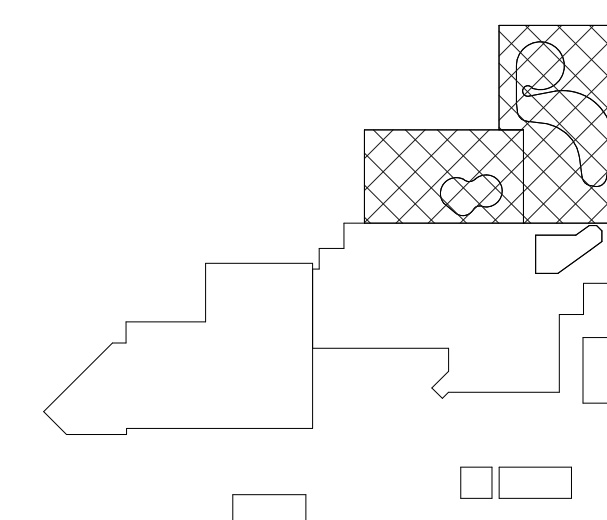
FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

NEW WORK KEYED NOTES

1. INSTALL VERTICAL FAN COIL UNIT ON NEW HOUSEKEEPING PAD. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
2. SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
3. INSTALL DUCTLESS WALL-MOUNTED INDOOR UNIT PER MANUFACTURER'S RECOMMENDATIONS. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT REFRIGERANT PIPING TO ASSOCIATED OUTDOOR UNIT AND ROUTE CONDENSATE TO NEAREST DRAIN PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
4. INSTALL DUCT-MOUNTED HEATING COIL. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT HOT WATER SUPPLY AND RETURN PER PLANS. MAINTAIN REQUIRED SERVICE AND ACCESS CLEARANCES.



KEY PLAN



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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"

1ST FLOOR PLAN - TOUCH & SHARK TANK - HYDRONICS
SCALE: 1/8" = 1'-0"

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

FIRST FLOOR PLAN -
SOUTHEAST WING -
HYDRONICS

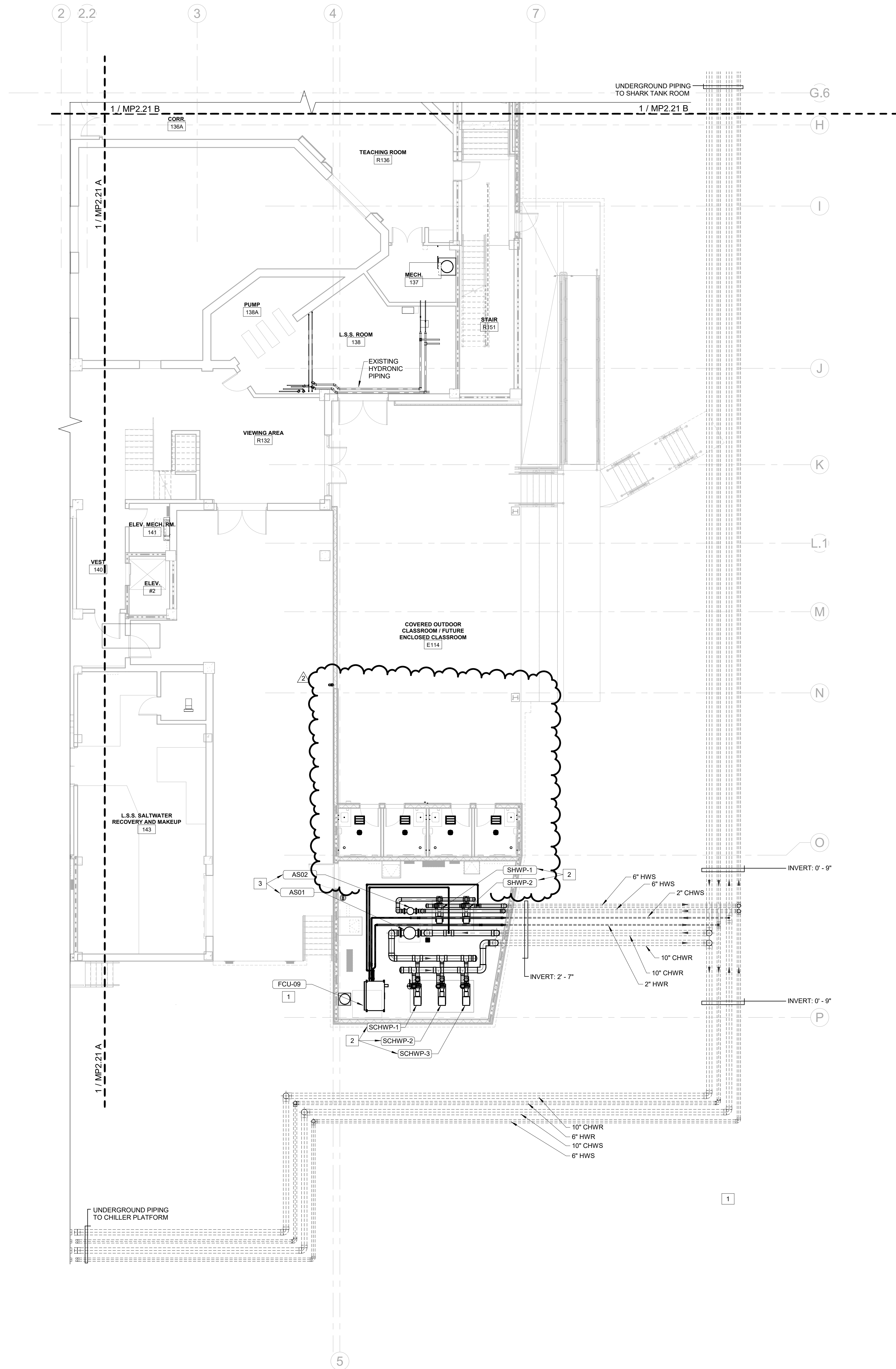
MP2.21 C

FLOOR PLAN LEGEND

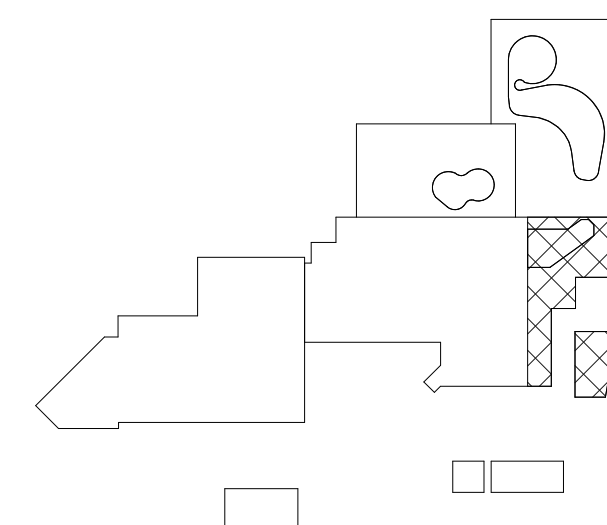
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

NEW WORK KEYED NOTES

- 1 SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES
- 2 INSTALL BASE-MOUNTED CHILLED WATER AND HOT WATER PUMPS FOR SECONDARY BUILDING LOOP. REFER TO DETAILS AND PIPING DIAGRAMS FOR INSTALLATION AND CONNECTION REQUIREMENTS. ALIGN AND GROUT PUMP BASES PER MANUFACTURER'S RECOMMENDATIONS. MAINTAIN REQUIRED SERVICE CLEARANCES.
- 3 INSTALL AIR SEPARATOR IN LOCATION SHOWN. REFER TO DETAILS AND PIPING DIAGRAMS FOR INSTALLATION AND CONNECTION REQUIREMENTS. MAINTAIN REQUIRED SERVICE CLEARANCES.



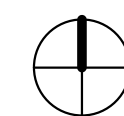
KEY PLAN



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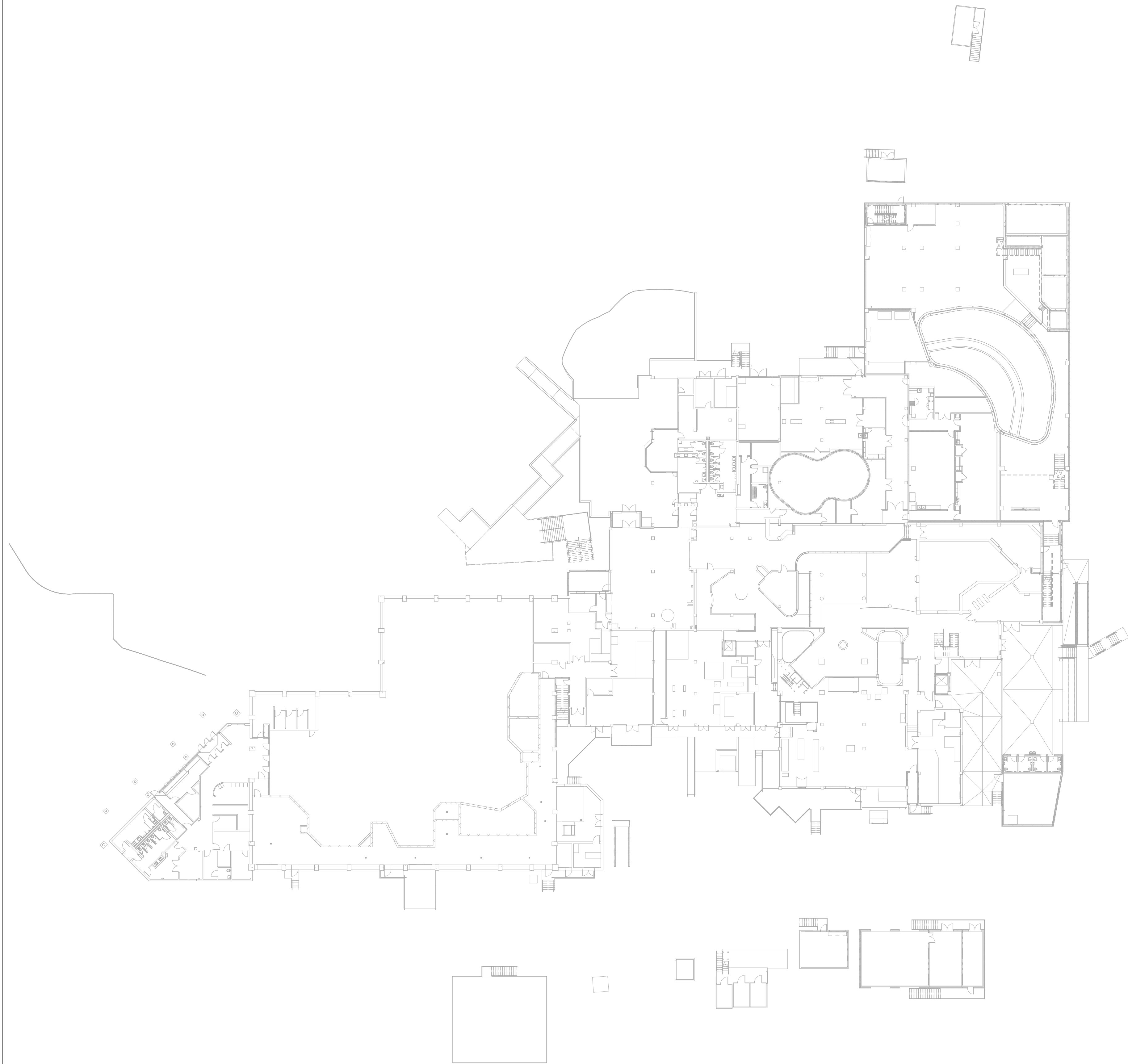
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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



1ST FLOOR PLAN - SOUTHEAST WING - HYDRONICS

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



FUEL OIL SYSTEM GENERAL NARRATIVE – FOR BIDDING PURPOSES

FURNISH AND INSTALL A COMPLETE FUEL OIL STORAGE AND TRANSFER SYSTEM TO SERVE TWO NEW GENERATORS AND AN EXISTING FUEL-OIL-FIRED BOILER. WORK SHALL INCLUDE ALL FUEL OIL PIPING, PUMPS, CONTROLS, TANKS, VALVES, AND ACCESSORIES REQUIRED FOR A FULLY OPERATIONAL SYSTEM. SYSTEM COMPONENTS ARE SPECIFIED ELSEWHERE IN THESE DOCUMENTS; ROUTING AND COORDINATION SHALL BE DETERMINED IN THE FIELD AND COORDINATED WITH OTHER TRADES.

THE FUEL OIL STORAGE AND TRANSFER SYSTEM SHALL COMPLY WITH THE REQUIREMENTS OF 2018 NCFC CHAPTER 57, INCLUDING APPLICABLE REQUIREMENTS FOR STORAGE TANKS, PIPING, VENTING, OVERFILL PROTECTION, LEAK DETECTION/MONITORING, EMERGENCY SHUTDOWN, SECONDARY CONTAINMENT, AND FLOOD ZONE INSTALLATION.

THE SYSTEM SHALL INCLUDE A NEW ABOVEGROUND FUEL OIL STORAGE TANK (AST) INSTALLED AT GRADE AND LOCATED IN A FLOOD ZONE. THE TANK SHALL BE EQUIPPED WITH A SUBMERSIBLE TURBINE PUMP SYSTEM AND TANK MONITORING SYSTEM AS SPECIFIED. PROVIDE FLOOD-RESISTANT INSTALLATION PER LOCAL CODE.

PROVIDE DUPLEX SUBMERSIBLE TURBINE PUMPS WITH LEAD/LAG OPERATION AND AUTOMATIC ROTATION CAPABILITIES. PUMPS SHALL BE CONTROLLED BY A DUPLEX CONTROLLER WITH FLOW SWITCH MONITORING, ALARM REPORTING, AND MODBUS INTEGRATION FOR REMOTE STATUS. CONTROLLER SHALL BE SPC1.2 OR EQUAL.

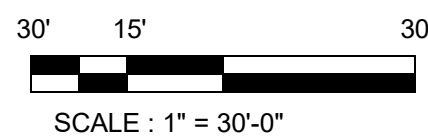
FUEL OIL SHALL BE DELIVERED FROM THE AST TO TWO NEW GENERATOR DAY TANKS LOCATED IN A NEW GENERATOR BUILDING. DAY TANKS WILL BE PROVIDED BY DIVISION 26 WITH RETURN PUMPS TO MAINTAIN PROPER LEVELS AND CIRCULATE FUEL TO PREVENT STRATIFICATION OR COOLING. SYSTEM SHALL ALLOW FOR SIMULTANEOUS OPERATION OF BOTH GENERATORS. INCLUDE ALL REQUIRED LEVEL SENSORS, OVERFILL ALARMS, VENTS, AND EMERGENCY SHUTDOWNS.

IN ADDITION, MAINTAIN OPERATION OF AN EXISTING FUEL OIL-FIRED BOILER SERVED BY A SEPARATE EXISTING DAY TANK AND SUPPLY PUMP LOCATED INSIDE THE EXISTING GENERATOR BUILDING. PROVIDE NEW FUEL OIL SUPPLY AND RETURN PIPING BETWEEN THE NEW AST AND THE EXISTING DAY TANK. FIELD-VERIFY CONNECTION DETAILS.

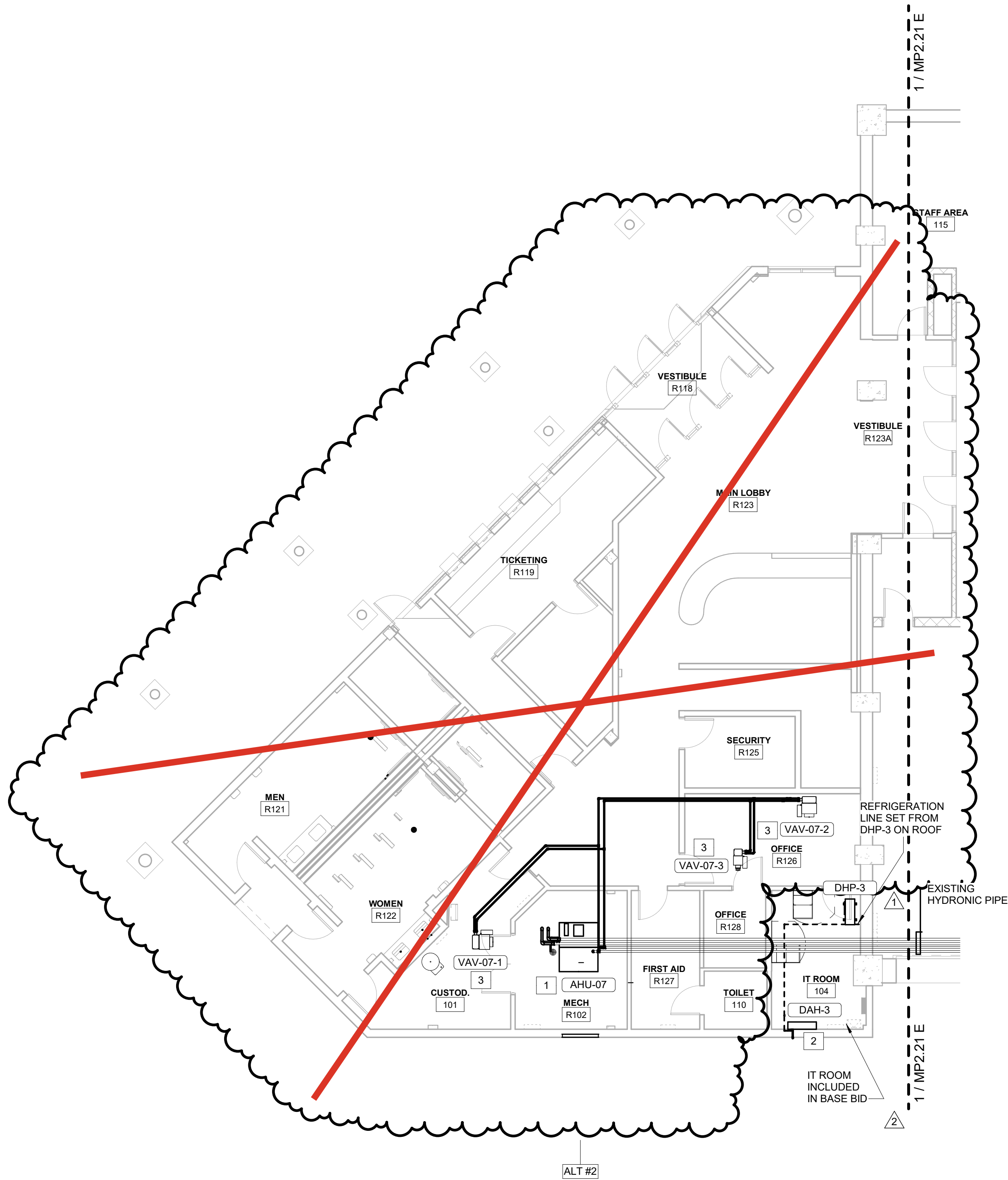
FUEL SYSTEM MONITORING SHALL BE VIA TMS3000 TANK MONITORING SYSTEM OR APPROVED EQUIVALENT. SYSTEM SHALL MONITOR TANK INVENTORY, HIGH/LOW LEVELS, WATER PRESENCE, AND LEAK CONDITIONS. PROVIDE PROBES AND SENSORS FOR PRIMARY AND SECONDARY CONTAINMENT IN COMPLIANCE WITH EPA REQUIREMENTS.

CONTRACTOR SHALL COORDINATE ALL PENETRATIONS THROUGH FLOOD-RATED ENCLOSURES AND ENSURE ALL WORK IS IN COMPLIANCE WITH APPLICABLE CODE REQUIREMENTS FOR FLOOD ZONE INSTALLATION, INCLUDING SUPPORTS, VENTING, AND EQUIPMENT MOUNTING HEIGHTS.

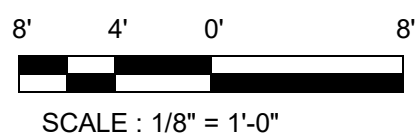
ALL POWER, CONTROL, AND ALARM WIRING SHALL BE PROVIDED UNDER THIS CONTRACT. FINAL WIRING TERMINATIONS SHALL BE COORDINATED WITH THE ELECTRICAL CONTRACTOR.



MECHANICAL SITE PLAN
SCALE : 1" = 30'-0"



NEW WORK KEYED NOTES	
1	INSTALL AIR HANDLING UNIT ON EXISTING HOUSEKEEPING PAD IN MECHANICAL ROOM. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING AS SHOWN ON PLANS. MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCES.
2	INSTALL DUCTLESS WALL-MOUNTED INDOOR UNIT PER MANUFACTURER'S RECOMMENDATIONS. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT REFRIGERANT PIPING TO ASSOCIATED OUTDOOR UNIT AND ROUTE CONDENSATE TO NEAREST DRAIN PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
3	INSTALL SINGLE DUCT VAV BOX WITH HOT WATER COIL. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT HOT WATER SUPPLY AND RETURN PER PLANS. MAINTAIN SERVICE AND ACCESS CLEARANCES.



1ST FLOOR PLAN - MAIN ENTRY - HYDRONICS
SCALE : 1/8" = 1'-0"

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FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2
2.2	07-01-26	BULLETIN #2.2

FIRST FLOOR PLAN - MAIN
ENTRY, MECH SITE PLAN
AND FUEL OIL SYSTEM
NARRATIVE - HYDRONICS

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

FIRST FLOOR PLAN -
FRESHWATER HABITAT -
HYDRONICS

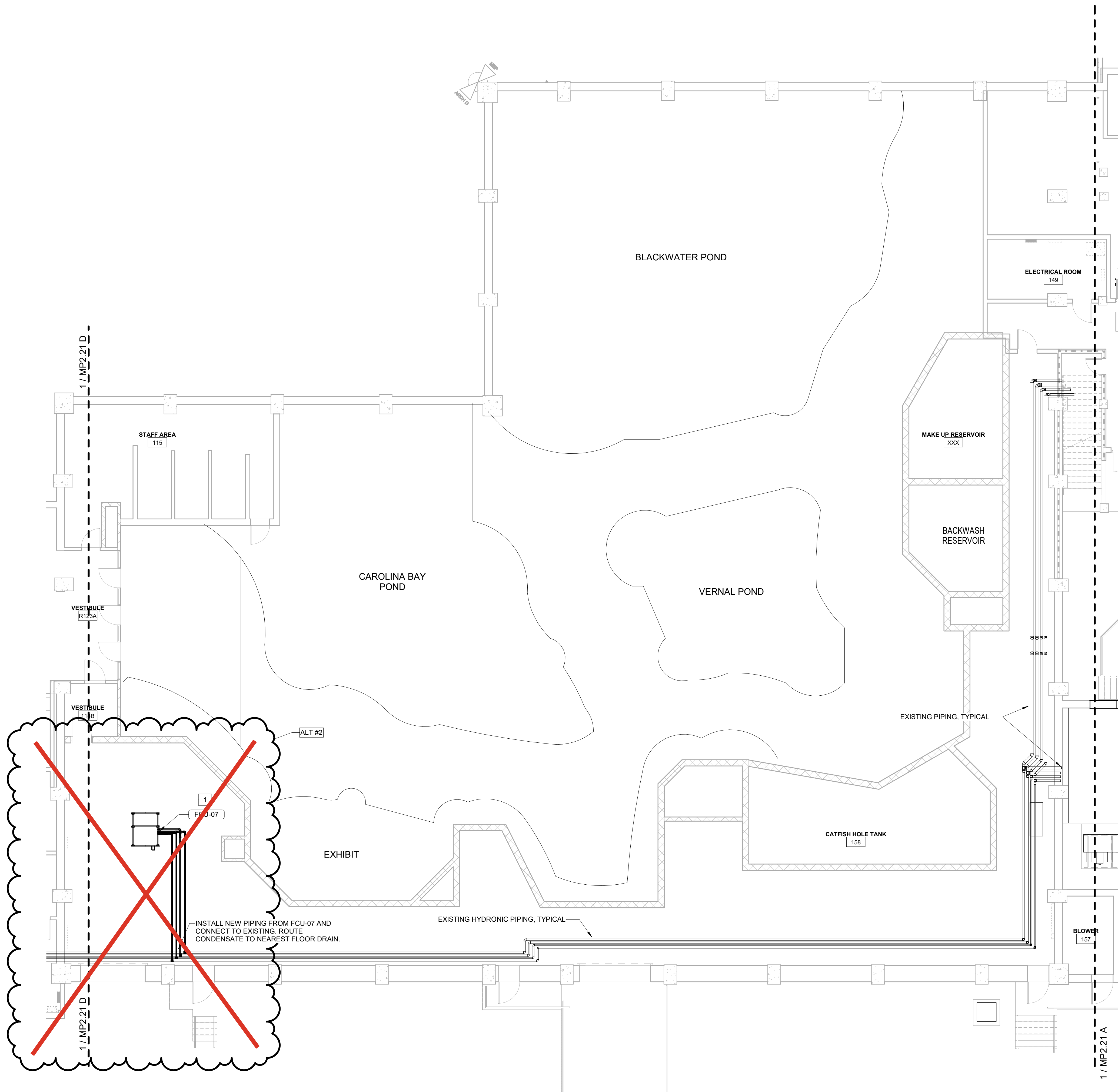
MP2.21 E

FLOOR PLAN LEGEND

	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

NEW WORK KEYED NOTES

- SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.



KEY PLAN

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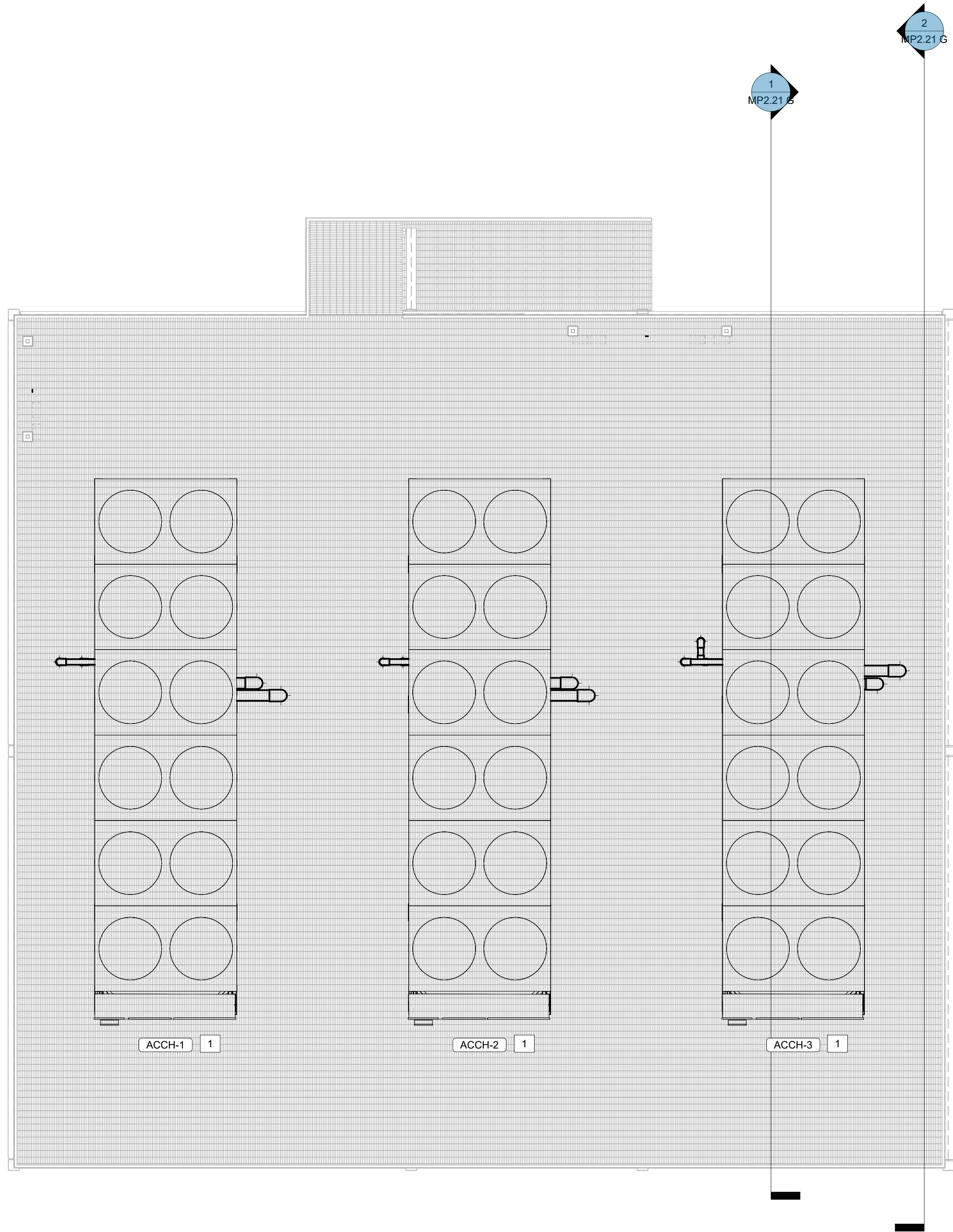
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8' 4' 0' 8'
SCALE: 1/8" = 1'-0"



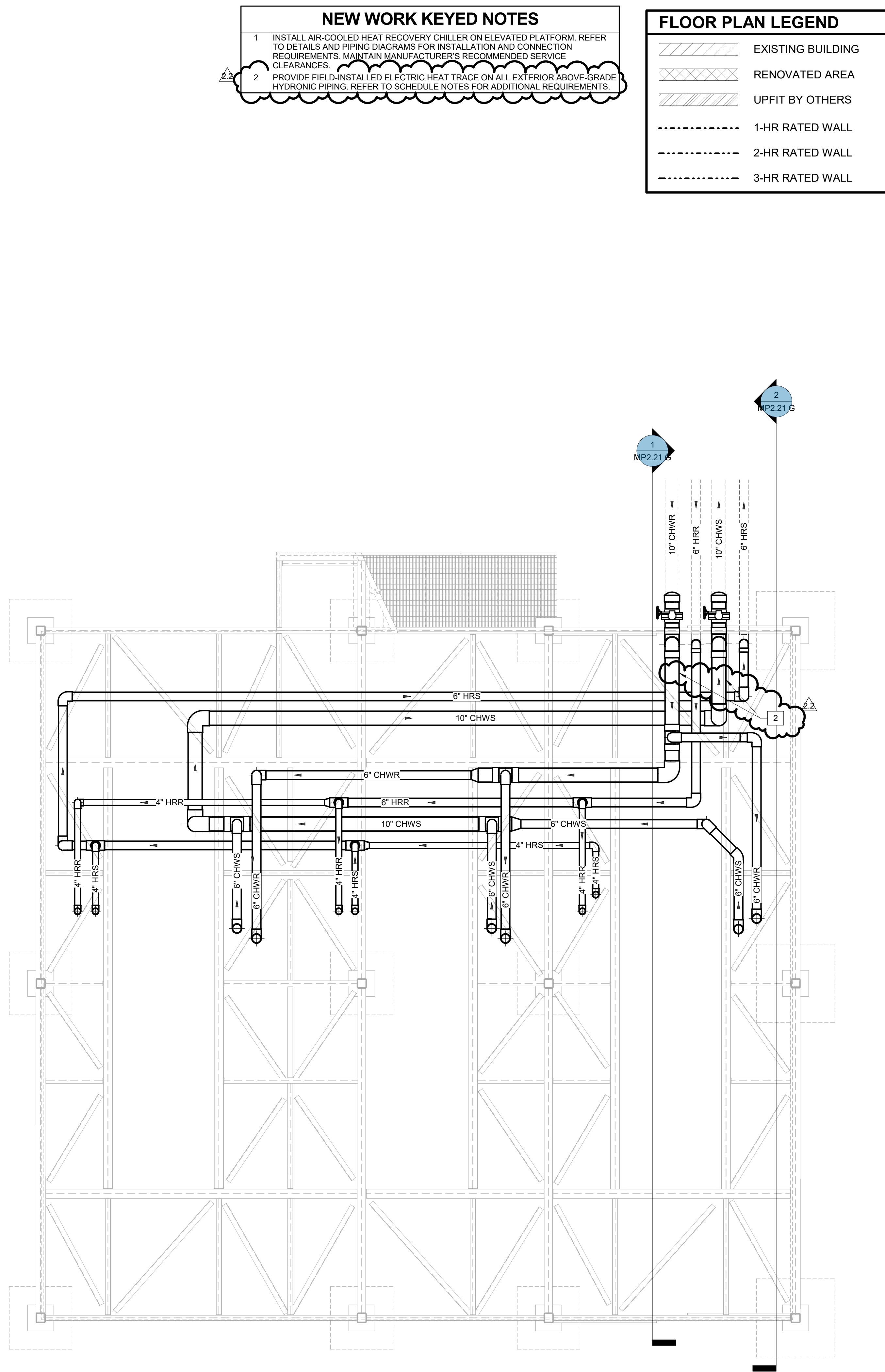
1ST FLOOR PLAN - FRESHWATER HABITAT - HYDRONICS

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



CHILLER ABOVE PLATFORM HYDRONIC PIPING PLAN
SCALE: 1/4" = 1'-0"

2



CHILLER BELOW PLATFORM HYDRONIC PIPING PLAN
SCALE: 1/4" = 1'-0"

1

NEW WORK KEYED NOTES

1. INSTALL AIR-COOLED HEAT RECOVERY CHILLER ON ELEVATED PLATFORM. REFER TO DETAILS AND PIPING DIAGRAMS FOR INSTALLATION AND CONNECTION REQUIREMENTS. MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCES.

2. PROVIDE FIELD-INSTALLED ELECTRIC HEAT TRACE ON ALL EXTERIOR ABOVE-GRADE HYDRONIC PIPING. REFER TO SCHEDULE NOTES FOR ADDITIONAL REQUIREMENTS.

FLOOR PLAN LEGEND

EXISTING BUILDING

RENOVATED AREA

UPFIT BY OTHERS

1-HR RATED WALL

2-HR RATED WALL

3-HR RATED WALL

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
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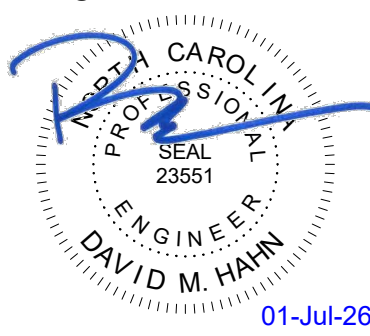
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2	04-27-26	BULLETIN #2
2.2	07-01-26	BULLETIN #2.2

CHILLER PLATFORM -
HYDRONICS

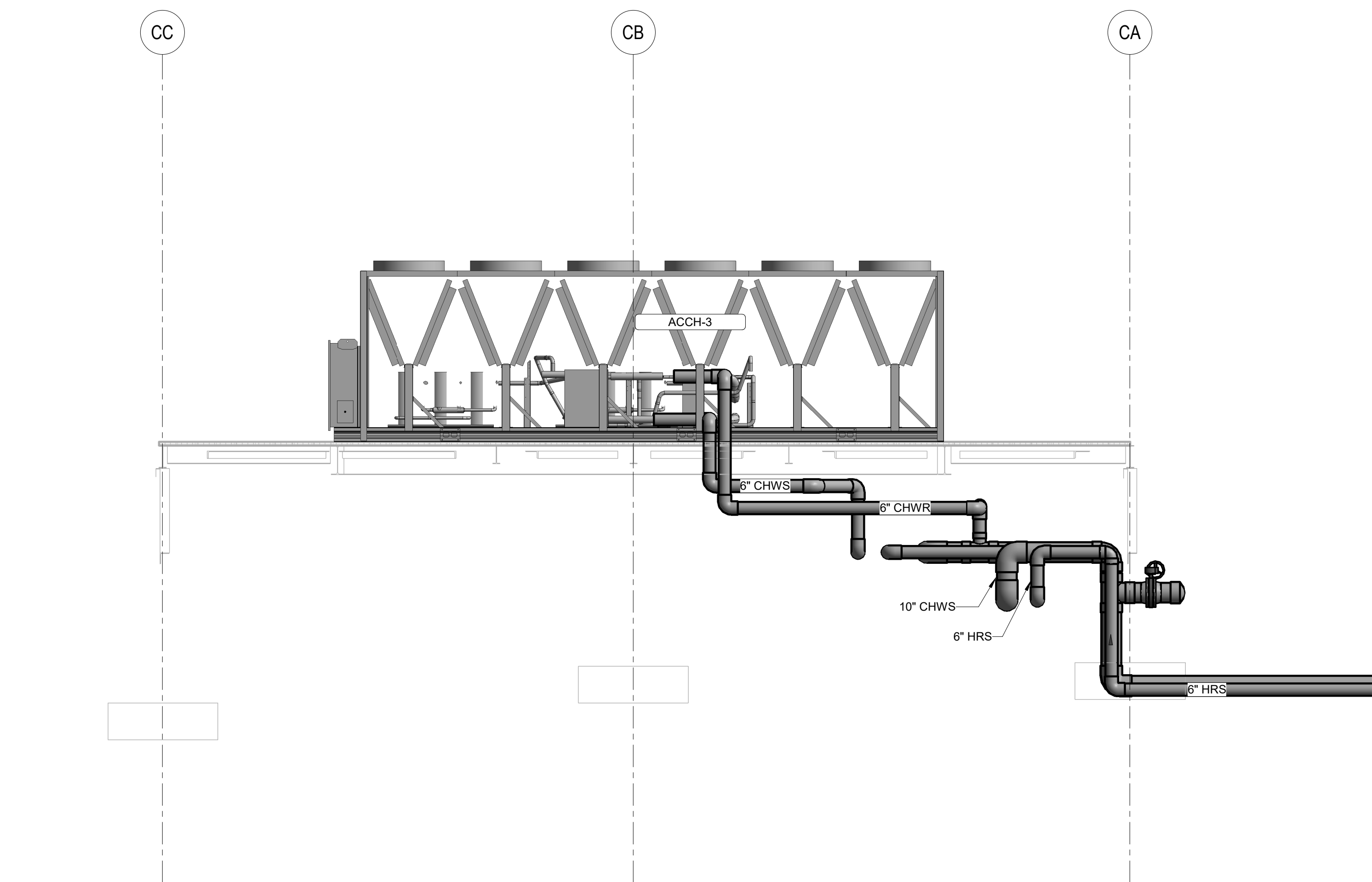
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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2
2.1	06-03-26	BULLETIN #2.1

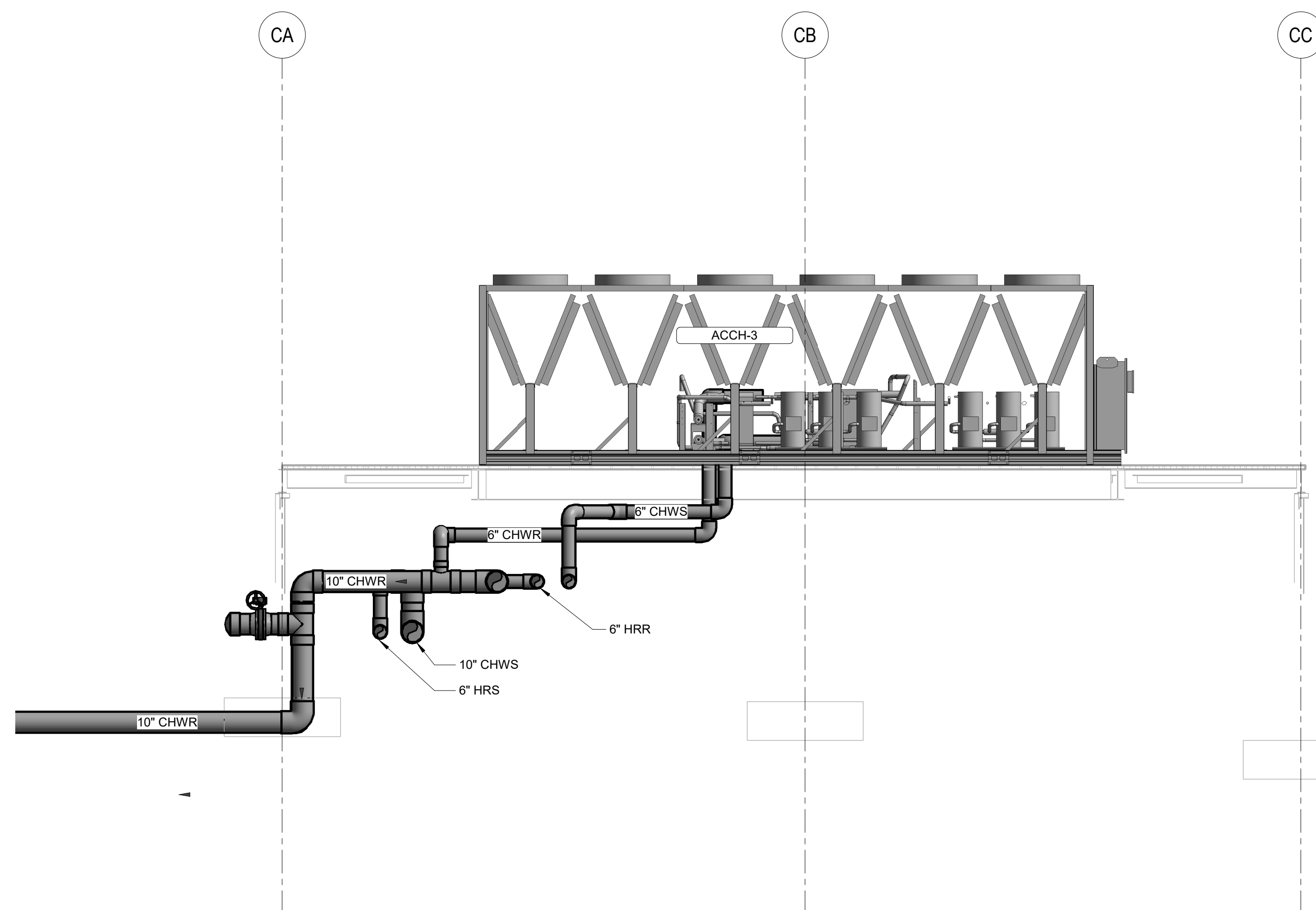
CHILLER PLATFORM AND
PUMP BUILDING -
HYDRONICS SECTIONS
AND 3D VIEWS

MP2.21 G



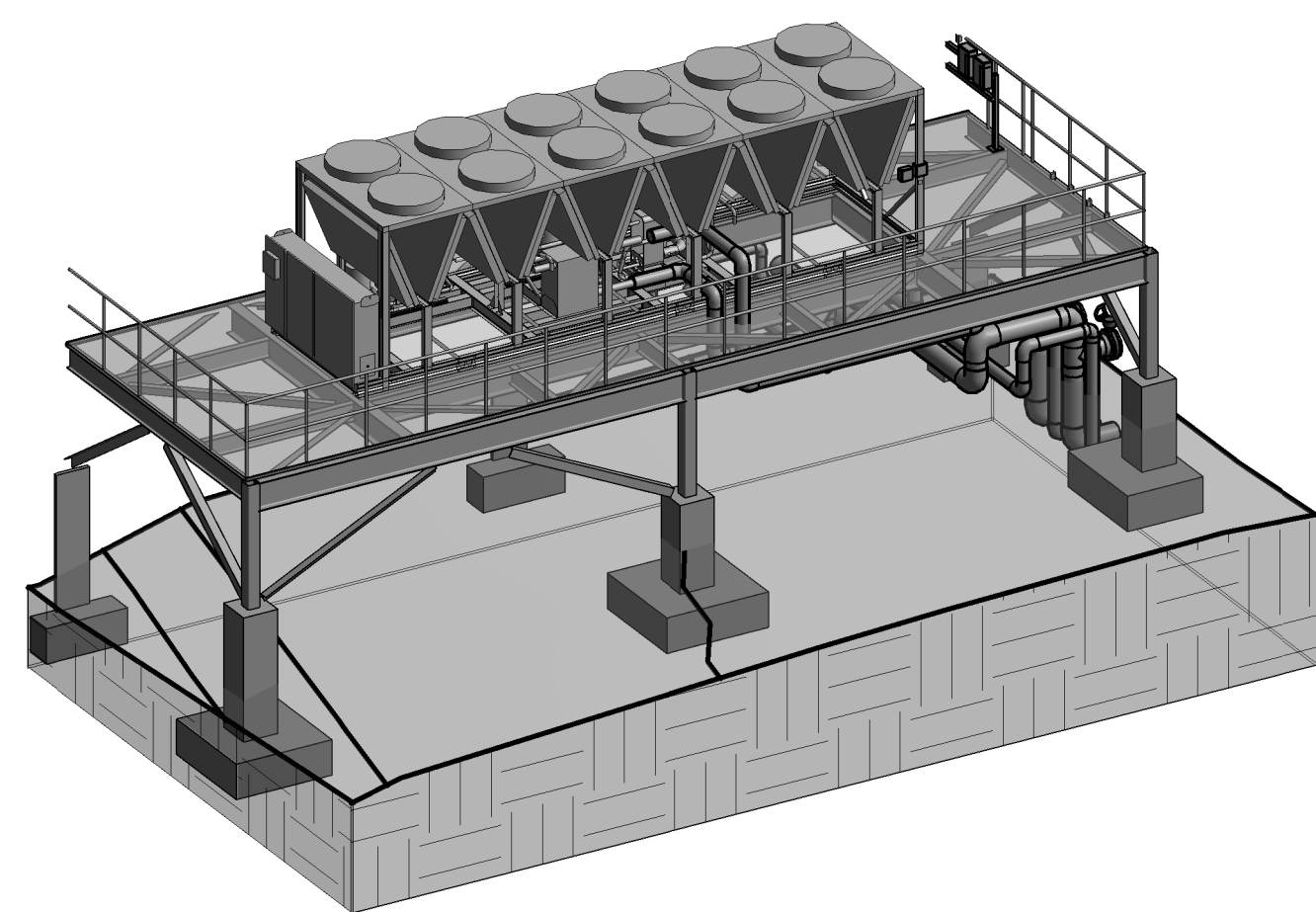
CHILLER PLATFORM SECTION - LOOKING WEST
SCALE : 1/4" = 1'-0"

2



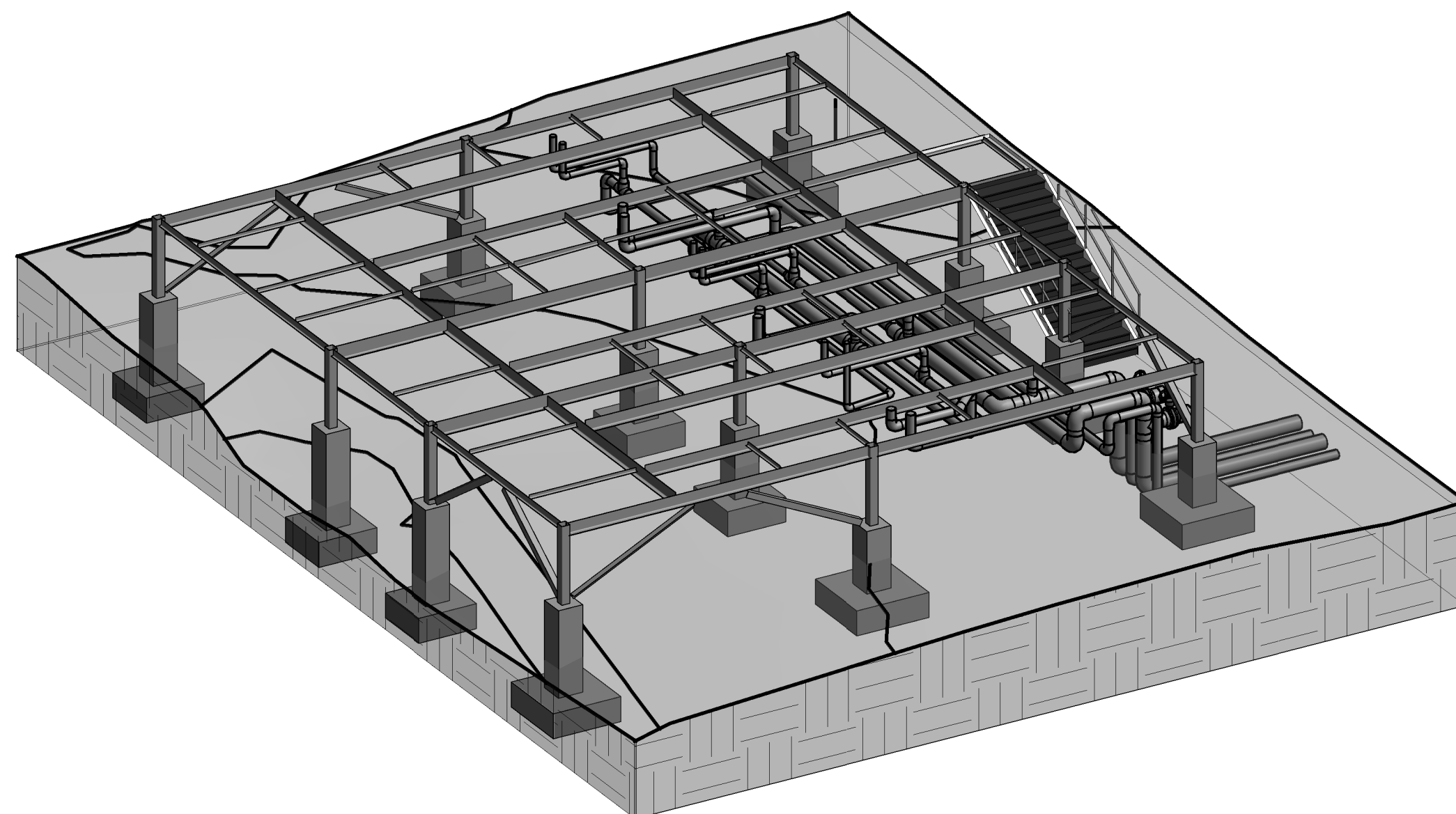
CHILLER PLATFORM SECTION - LOOKING EAST
SCALE : 1/4" = 1'-0"

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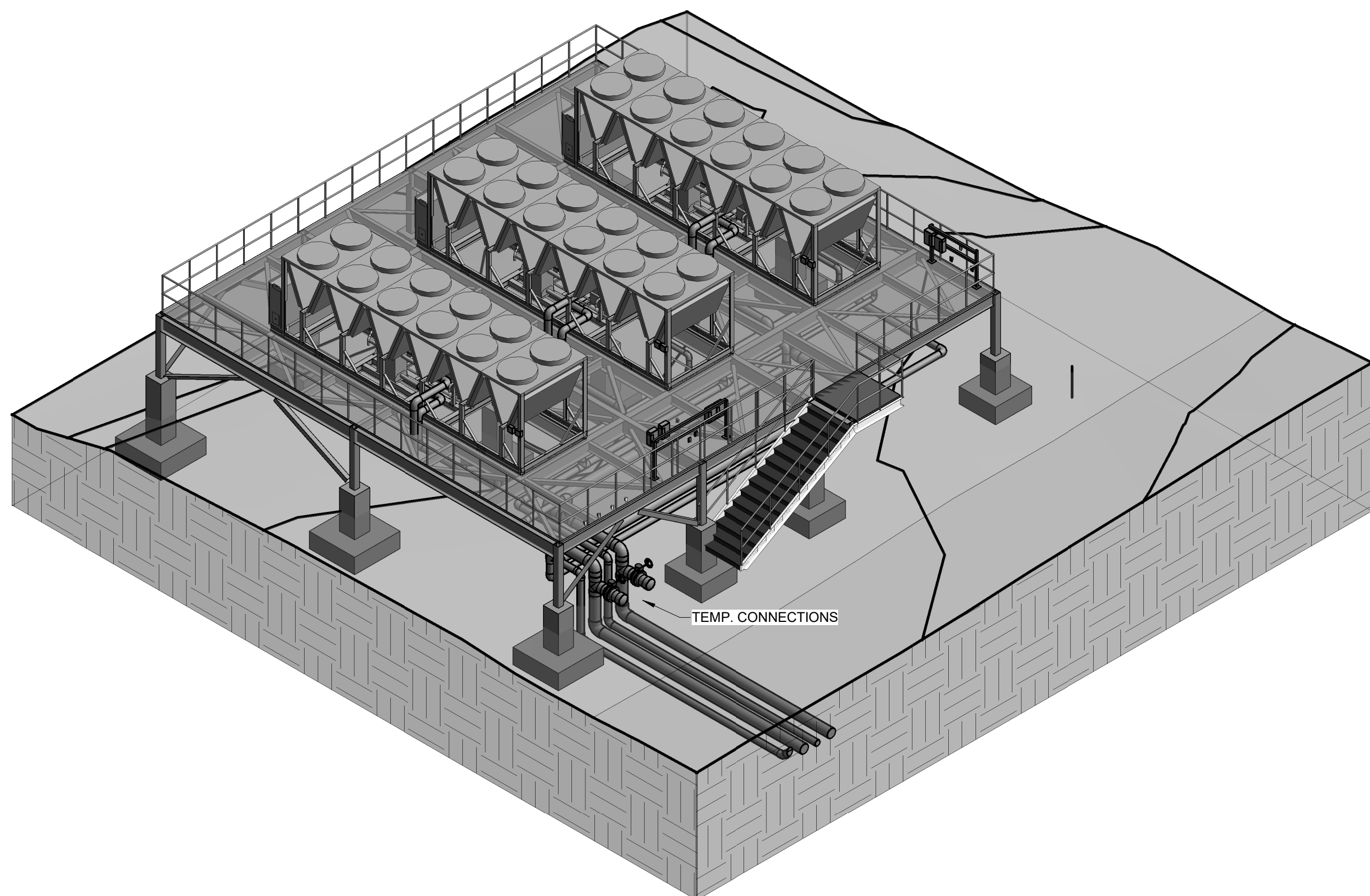
CHILLER PLATFORM 3D - LOOKING NORTH-WEST
SCALE :

4



CHILLER PLATFORM BELOW FRAMES - LOOKING NORTH-WEST
SCALE :

5

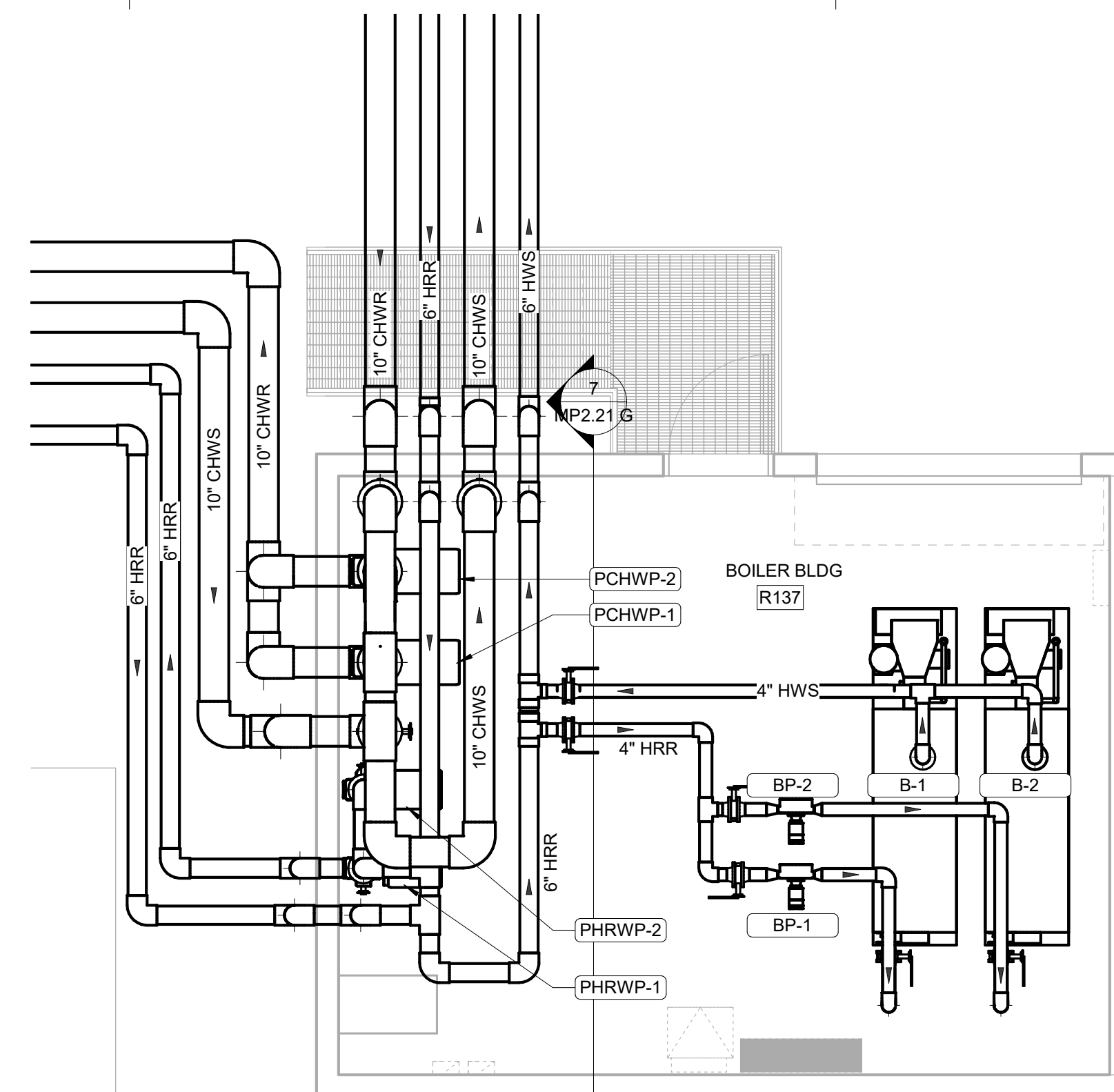


CHILLER PLATFORM 3D - LOOKING SOUTH-WEST
SCALE :

3

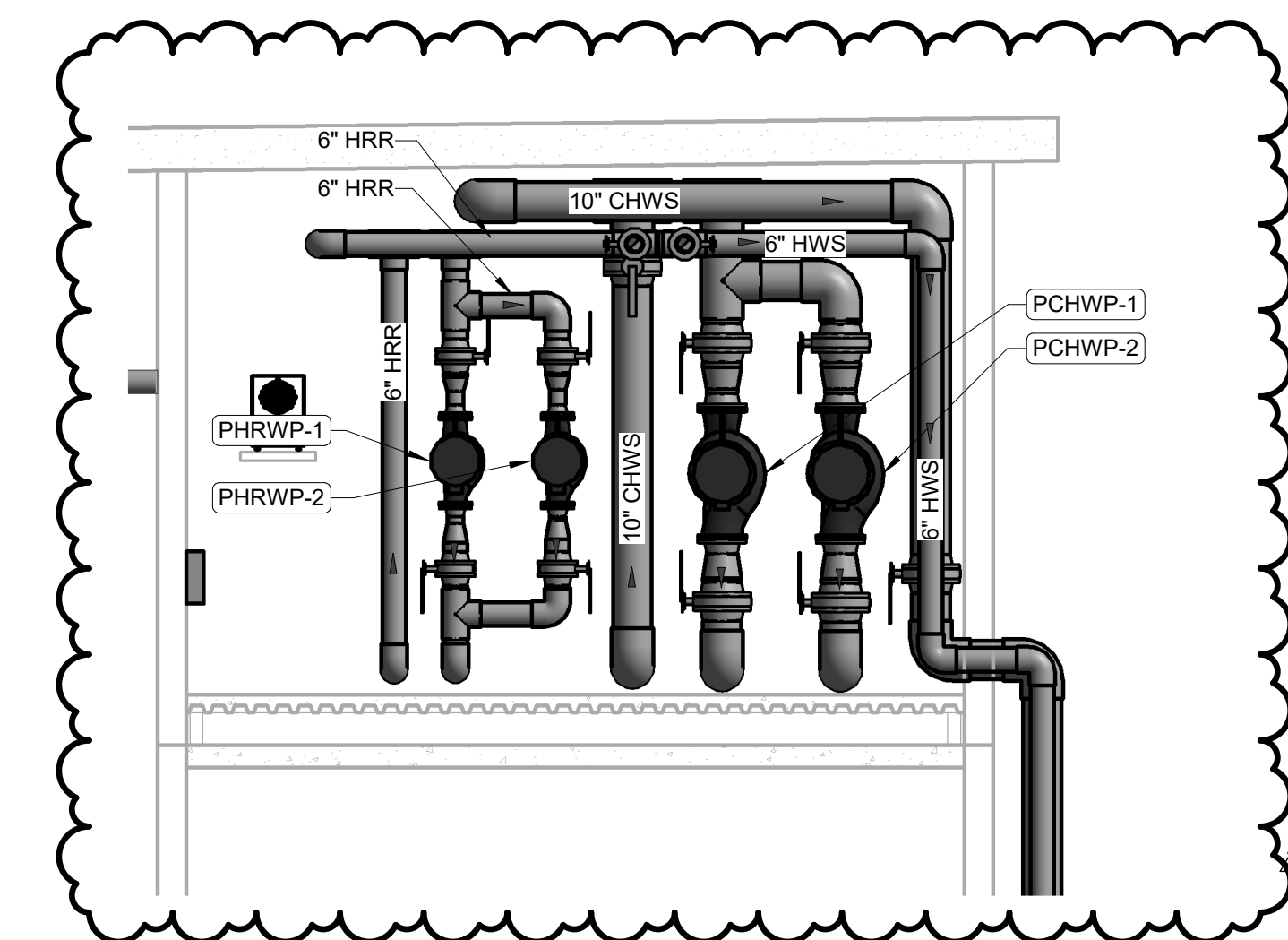
FLOOR PLAN LEGEND

	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL



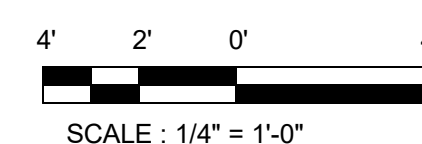
1ST FLOOR PLAN - BOILER BUILDING - HYDRONICS
SCALE : 1/4" = 1'-0"

6



CENTRAL PLANT SECTION - LOOKING EAST
SCALE : 1/4" = 1'-0"

7



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

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7/2/2026

RENOVATION
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PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
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LICENSE # F-1105

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FAX: 910.791.2554
WWW.CBHFENGINEERS.COM
LICENSE # P-6554

LIGHTSWITCH

LIGHTING DESIGNER
10565 INDIANA COURT
RANCHO CUCAMONGA, CA 91730
TEL: 909.360.7000
WWW.LIGHTSWITCH.NET

TUNSTALL CONSULTING ENGINEERS PLLC

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2405 IRON GATE DRIVE SUITE 102
WILMINGTON, NC 28412
TEL: 910.343.8433
FAX: 910.343.9404
WWW.IRONSCHENKERS.COM
LICENSE # F-3132

SURFACE 678, PA

LANDSCAPE ARCHITECT
215 AGNES STREET SUITE 150
DURHAM, NC 27703
TEL: 919.419.1199
FAX: 919.419.1689
WWW.SURFACE678.COM
LICENSE # C-098

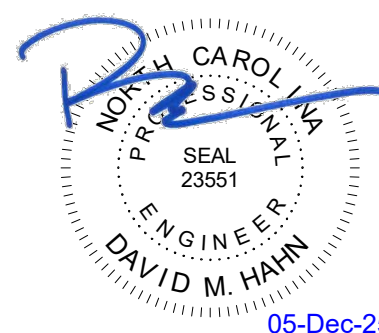
CHEATHAM & ASSOCIATES, PA

FIRE PROTECTION ENGINEER
3412 ENTERPRISE DRIVE
WILMINGTON, NC 28405
TEL: 910.452.4510
WWW.CHEATHAMP.A.COM
LICENSE # C-1073

PALACIO COLLABORATIVE

COST ESTIMATOR
4817 ENTERPRISE BOULEVARD SUITE 400
DURHAM, NC 27703
TEL: 919.453.9100
WWW.PALACIOCOLLABORATIVE.COM

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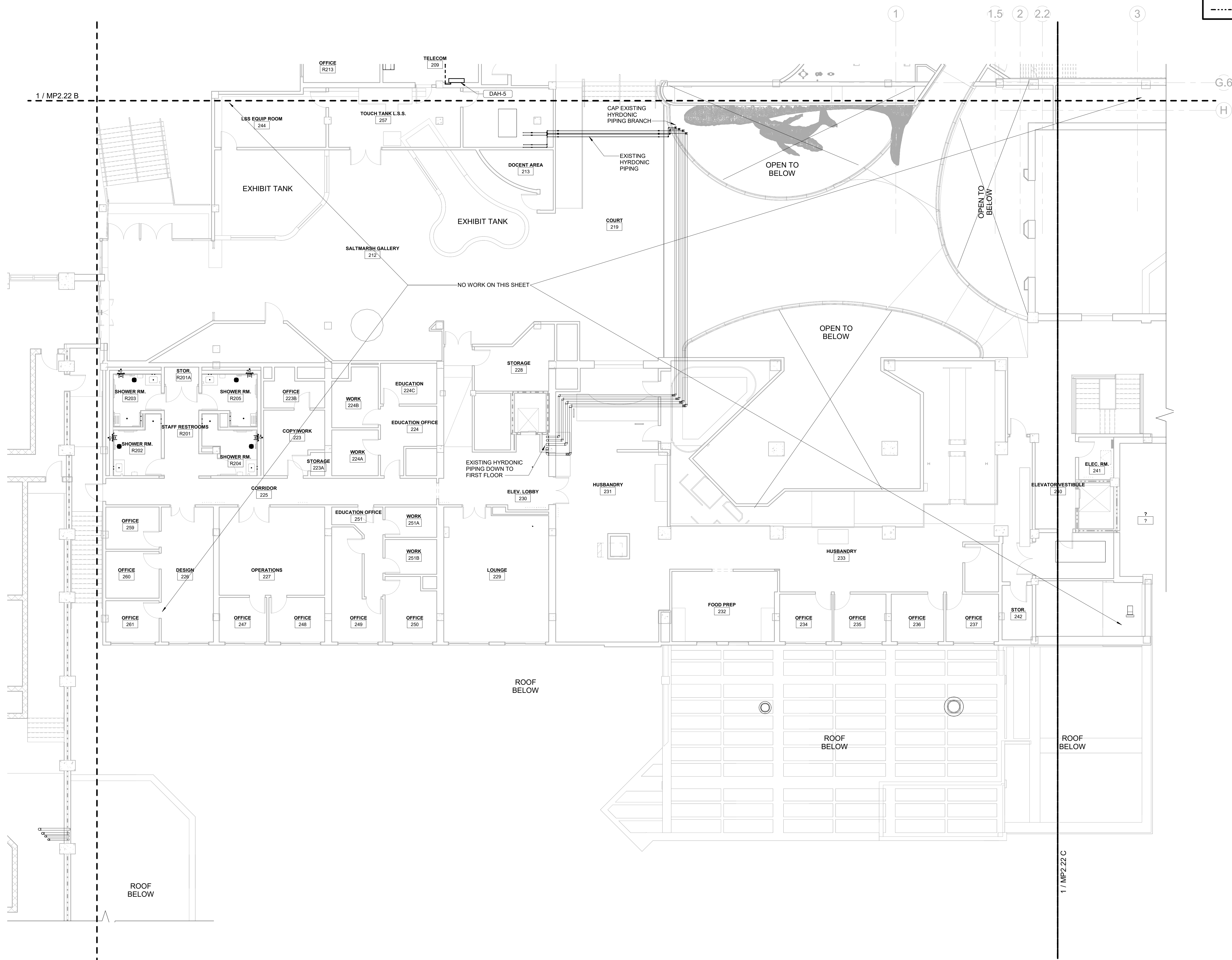
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

SECOND FLOOR PLAN -
CAPE FEAR SHOALS -
HYDRONICS

MP2.22 A

FLOOR PLAN LEGEND

	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL



KEY PLAN

CBHF
Engineers, PLLC

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Wilmington, NC 28401
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2ND FLOOR PLAN - CAPE FEAR - HYDRONICS

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

NEW WORK KEYED NOTES	
1	INSTALL VERTICAL FAN COIL UNIT ON NEW HOUSEKEEPING PAD. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
2	SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
3	INSTALL DUCTLESS WALL-MOUNTED INDOOR UNIT PER MANUFACTURER'S RECOMMENDATIONS. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT REFRIGERANT PIPING TO ASSOCIATED OUTDOOR UNIT AND ROUTE CONDENSATE TO NEAREST DRAIN PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
4	INSTALL DUCTLESS OUTDOOR CONDENSING UNIT PER MANUFACTURER'S RECOMMENDATIONS. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT REFRIGERANT PIPING TO ASSOCIATED INDOOR UNIT WITH ISOLATION VALVES AND INSULATION AS SHOWN ON PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.

FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
KURE BEACH, NC 28449

NORTH CAROLINA DEPT. OF
NATURAL & CULTURAL RESOURCES

SZOSTAK DESIGN, INC.

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WWW.SZOSTAKDESIGN.COM
LICENSE # 31079

TJP ENGINEERING, INC.

LIFE SUPPORT SYSTEMS ENGINEER
5680 VENTURE LANE SUITE 205N
BEND, OR 97007
TEL: 503.433.0300
WWW.TJPEENGINEERING.COM
LICENSE # C-3505

ROTO GROUP, LLC.

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SURFACE 678, PA

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PALACIO COLLABORATIVE

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4815 EMERSON BOULEVARD SUITE 400
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-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

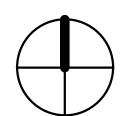
SECOND FLOOR PLAN -
TOUCH AND SHARK TANK -
HYDRONICS

MP2.22 B

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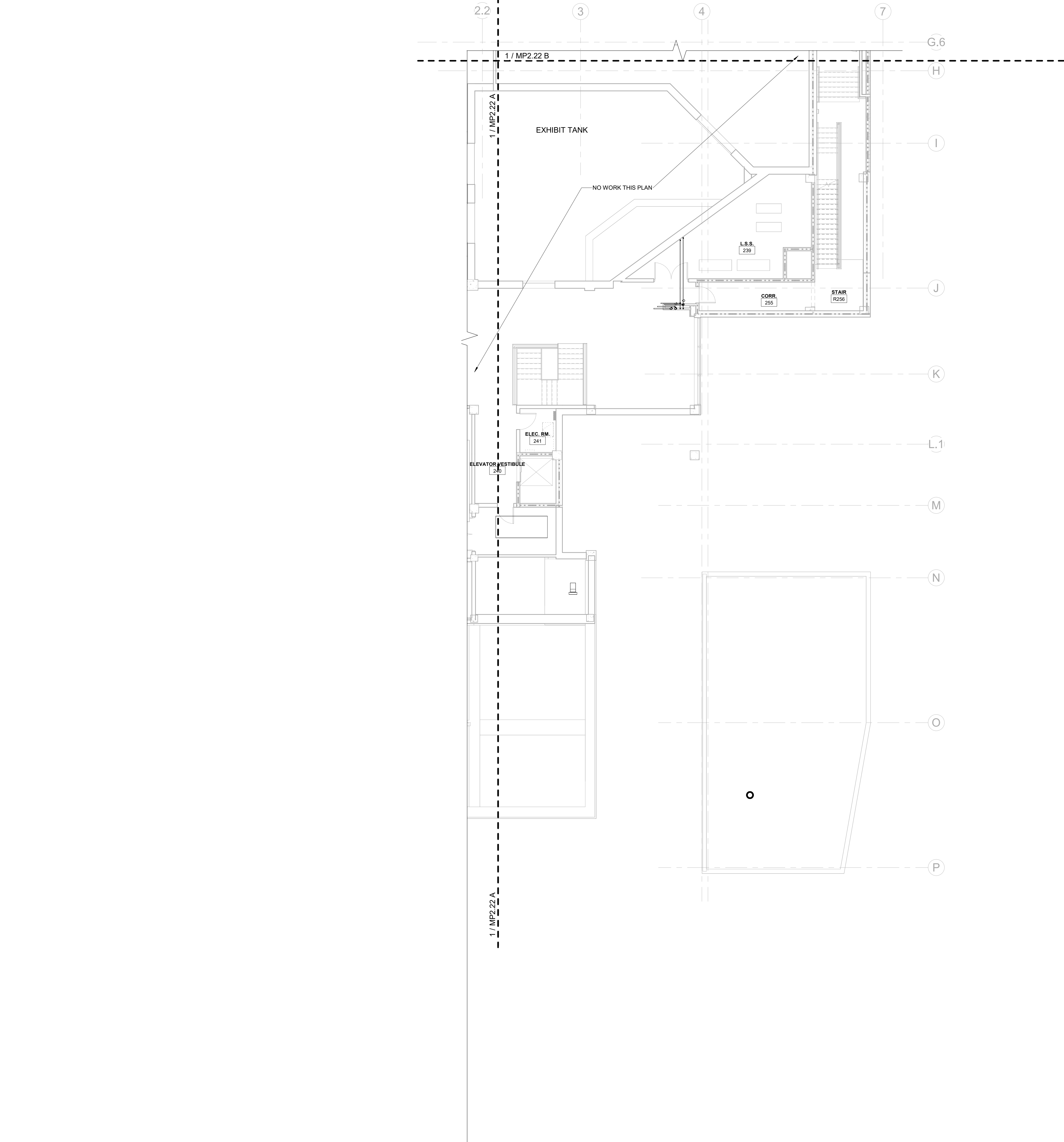
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SCALE: 1/8" = 1'-0"



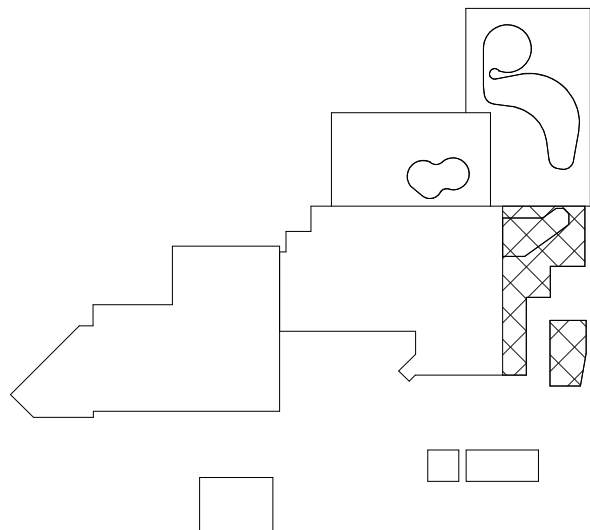
2ND FLOOR PLAN - TOUCH & SHARK TANK - HYDRONICS

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

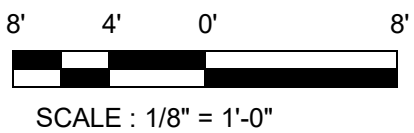


FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

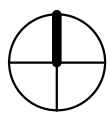
KEY PLAN



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



2ND FLOOR PLAN - SOUTEAST WING - HYDRONICS

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

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
KURE BEACH, NC 28449

NORTH CAROLINA DEPT. OF
NATURAL & CULTURAL RESOURCES

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SURFACE 678, PA

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TEL: 919.419.1199
FAX: 919.419.1688
WWW.SURFACE678.COM
LICENSE # C-098

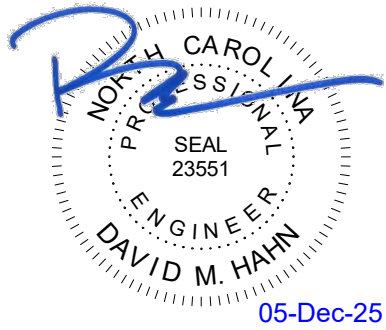
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WWW.CHEATHAMPA.COM
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PALACIO COLLABORATIVE

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WWW.PALACIOCOLLABORATIVE.COM

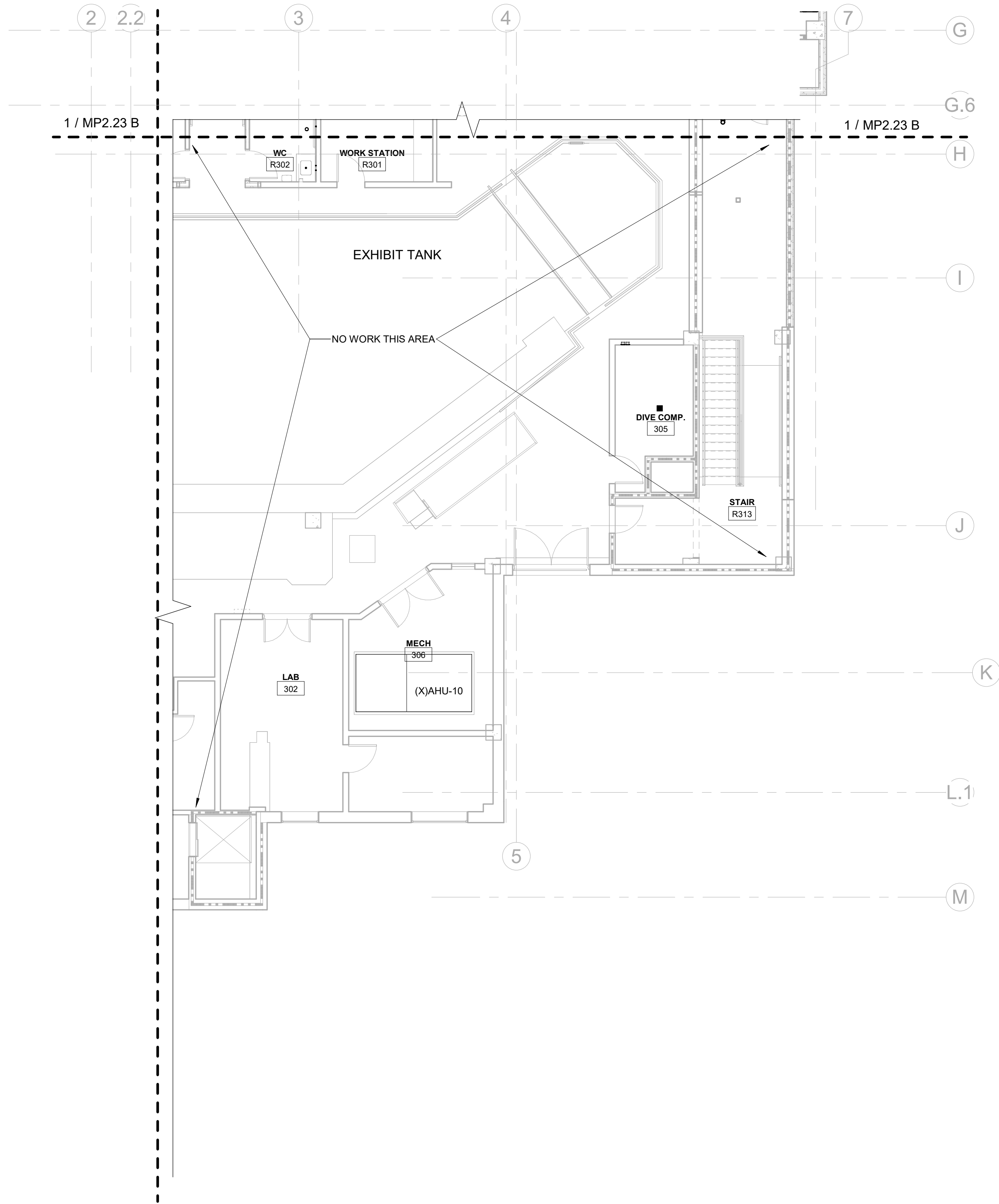
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NO.	DATE	DESCRIPTION
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SECOND FLOOR PLAN -
SOUTEAST WING -
HYDRONICS

MP2.22 C



FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
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LIGHTSWITCH

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LANDSCAPE ARCHITECT
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DURHAM, NC 27701
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FAX: 919.419.1688
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LICENSE # C-098

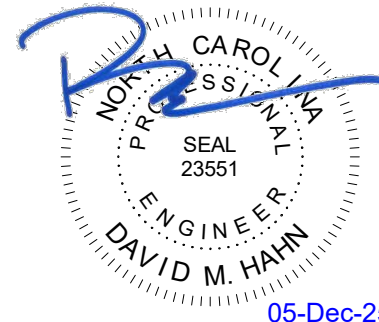
CHEATHAM & ASSOCIATES, PA

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TEL: 910.452.6110
WWW.CHEATHAMPA.COM
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PALACIO COLLABORATIVE

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WWW.PALACIOCOLLABORATIVE.COM

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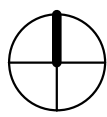
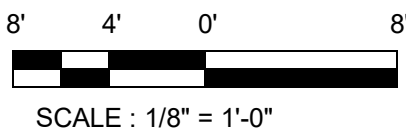


NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

THIRD FLOOR PLAN -
SOUTHEAST WING -
HYDRONICS

MP2.23 A

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3RD FLOOR PLAN - SOUTHEAST WING - HYDRONICS

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

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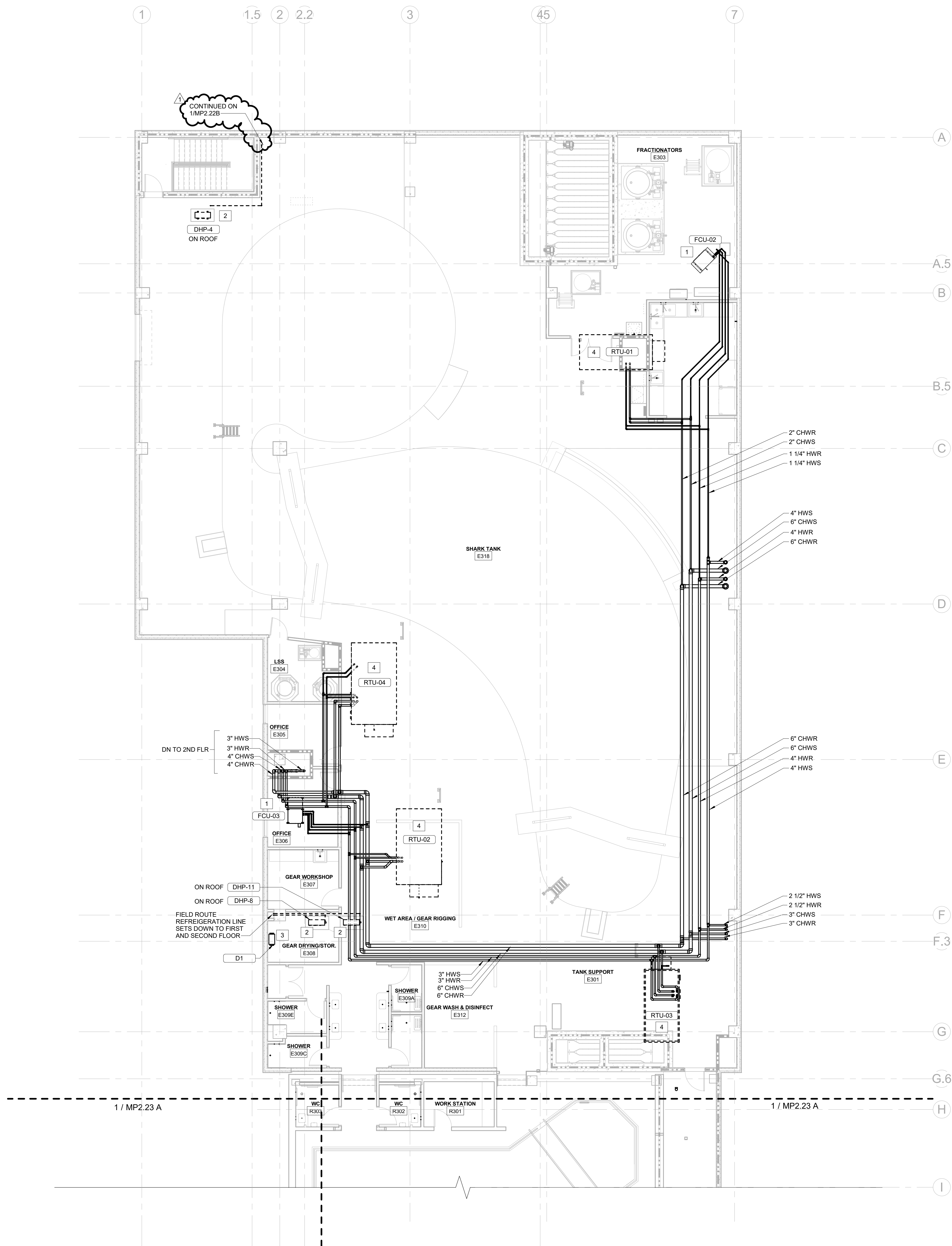


12-Dec-25

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

THIRD FLOOR PLAN -
SHARK TANK - HYDRONICS

MP2.23 B

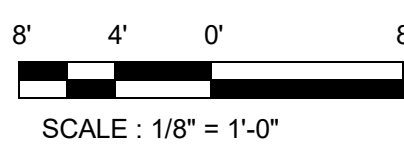


FLOOR PLAN LEGEND	
	EXISTING BUILDING
	RENOVATED AREA
	UPFIT BY OTHERS
	1-HR RATED WALL
	2-HR RATED WALL
	3-HR RATED WALL

ROOF PLAN SHEET NOTES	
1.	REFER TO ARCHITECTURAL DRAWINGS FOR RATED ASSEMBLY U.I. NUMBERS (WALLS, FLOOR / CEILINGS, ETC.).
2.	REFER TO STRUCTURAL DRAWINGS FOR EQUIPMENT ROOF MOUNTING CONDITIONS.
3.	ALL ROOF PENETRATIONS SHALL CONFORM TO ROOF MANUFACTURER'S APPROVED METHODS.
4.	MAINTAIN MINIMUM 10 FOOT SEPARATION BETWEEN EXHAUST AND ANY OUTSIDE AIR INTAKES.

NEW WORK KEYED NOTES	
1	SUSPEND HORIZONTAL FAN COIL UNIT FROM STRUCTURE ABOVE. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, HOT WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
2	INSTALL DUCTLESS OUTDOOR CONDENSING UNIT PER MANUFACTURER'S RECOMMENDATIONS. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT REFRIGERANT PIPING TO ASSOCIATED INDOOR UNIT WITH ISOLATION VALVES AND INSULATION AS SHOWN ON PLANS. MAINTAIN REQUIRED SERVICE CLEARANCES.
3	INSTALL DEHUMIDIFICATION UNIT ON CORROSION-RESISTANT WALL BRACKETS WITH SUPPORT PLATFORM. REFER TO DETAILS FOR INSTALLATION REQUIREMENTS. CONNECT CHILLED WATER, CONDENSATE, AND CONTROL WIRING PER PLANS. MAINTAIN SERVICE CLEARANCES.
4	INSTALL ROOFTOP UNIT ON STRUCTURAL ROOF CURB. REFER TO DETAILS AND PIPING DIAGRAMS FOR INSTALLATION AND CONNECTION REQUIREMENTS. MAINTAIN MANUFACTURER'S RECOMMENDED SERVICE CLEARANCES AND PROVIDE CONDENSATE DRAIN AS SHOWN ON PLANS.

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RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
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900 LOGGERHEAD RD,
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CHEATHAM & ASSOCIATES, PA

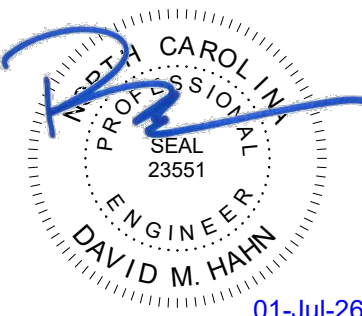
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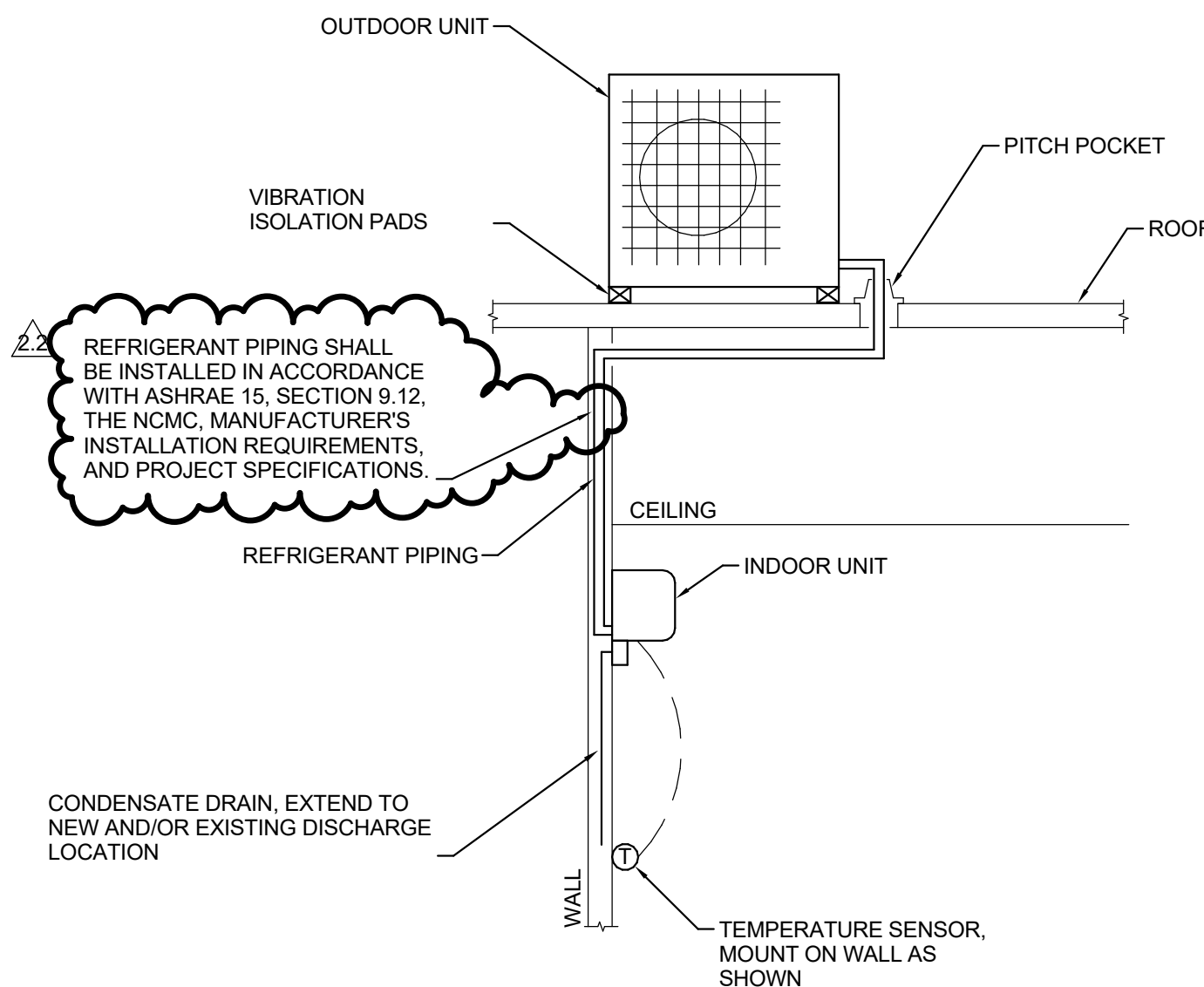


01-Jul-26

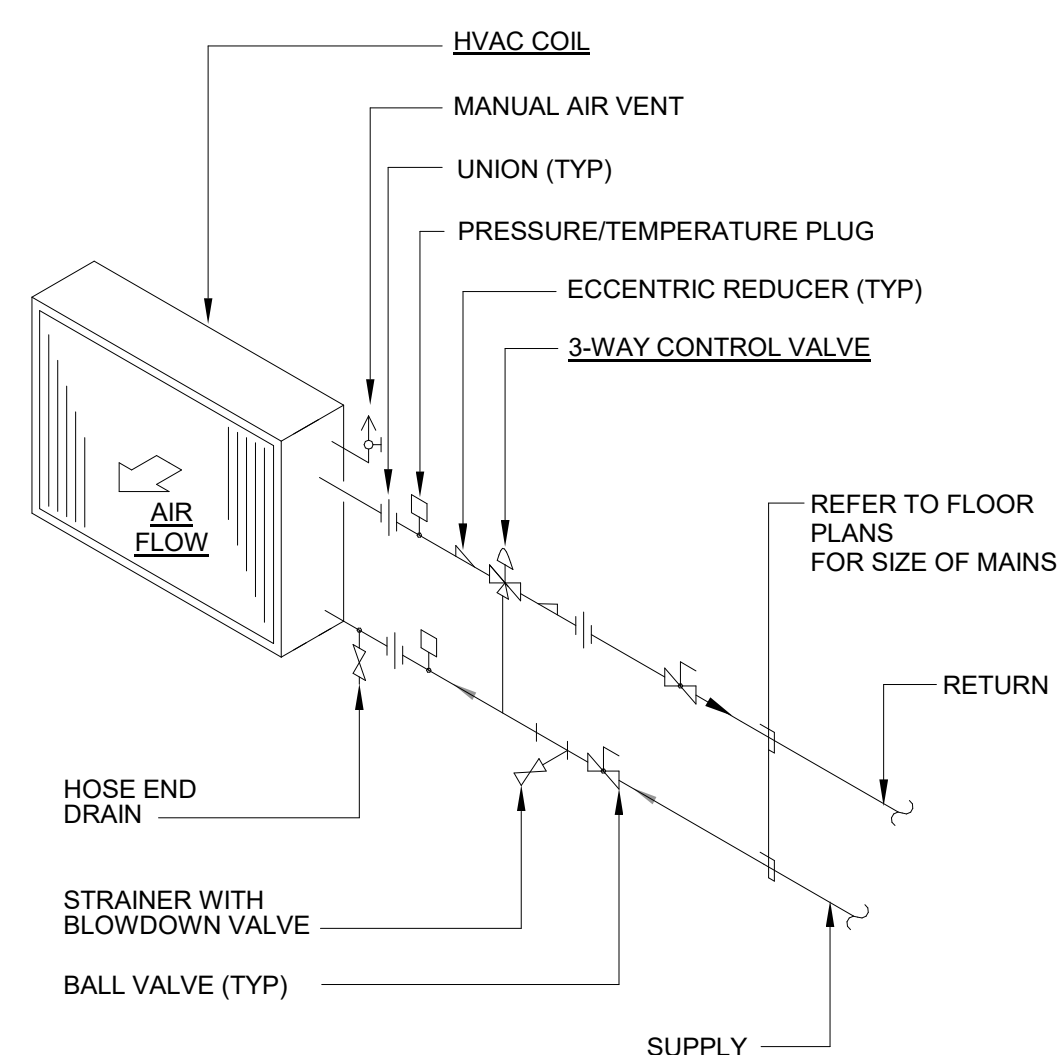
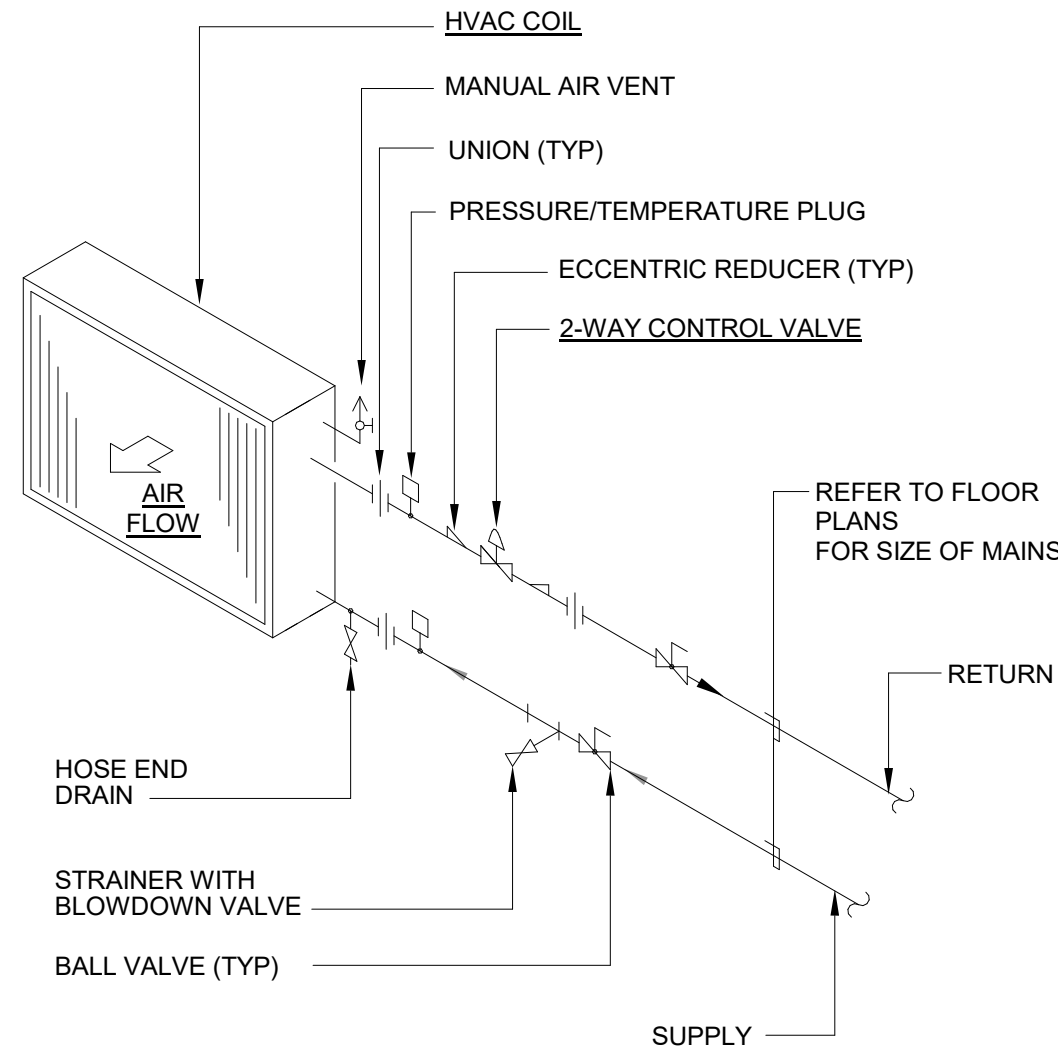
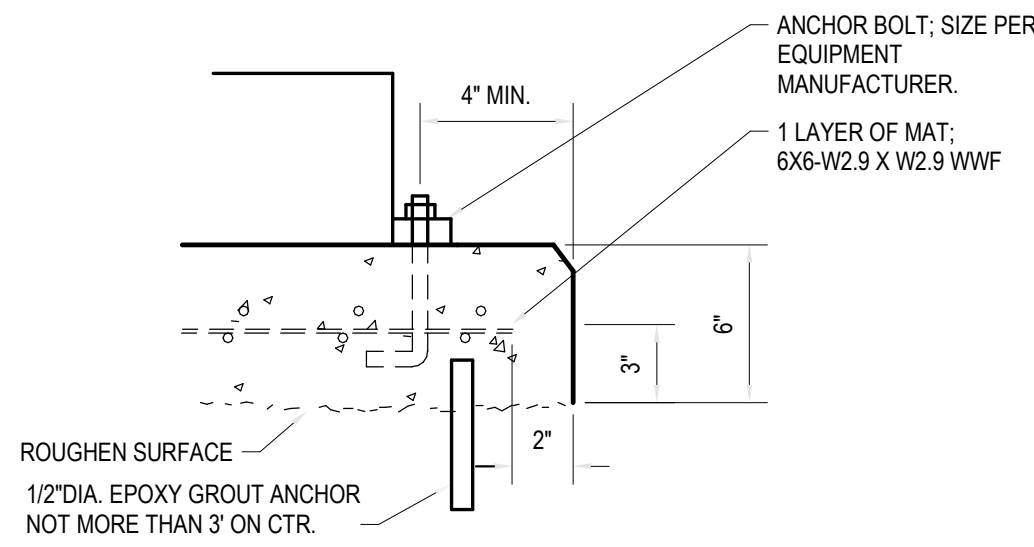
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2.2	07-01-26	BULLETIN #2.2

MECHANICAL DETAILS

M-5.1



- NOTE:
1. MESH SHALL BE FURNISHED IN SHEETS.
 2. ALL PAD EDGES SHALL BE CHAMFERED.
 3. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3,000 PSI AT 28 DAYS
 4. ONLY ANCHOR EQUIPMENT WITH MANUFACTURER SUPPLIED ANCHOR MOUNTS



DUCTLESS SPLIT SYSTEM DETAIL
SCALE : NO SCALE

1

EQUIPMENT HOUSEKEEPING PAD DETAIL
SCALE : NO SCALE

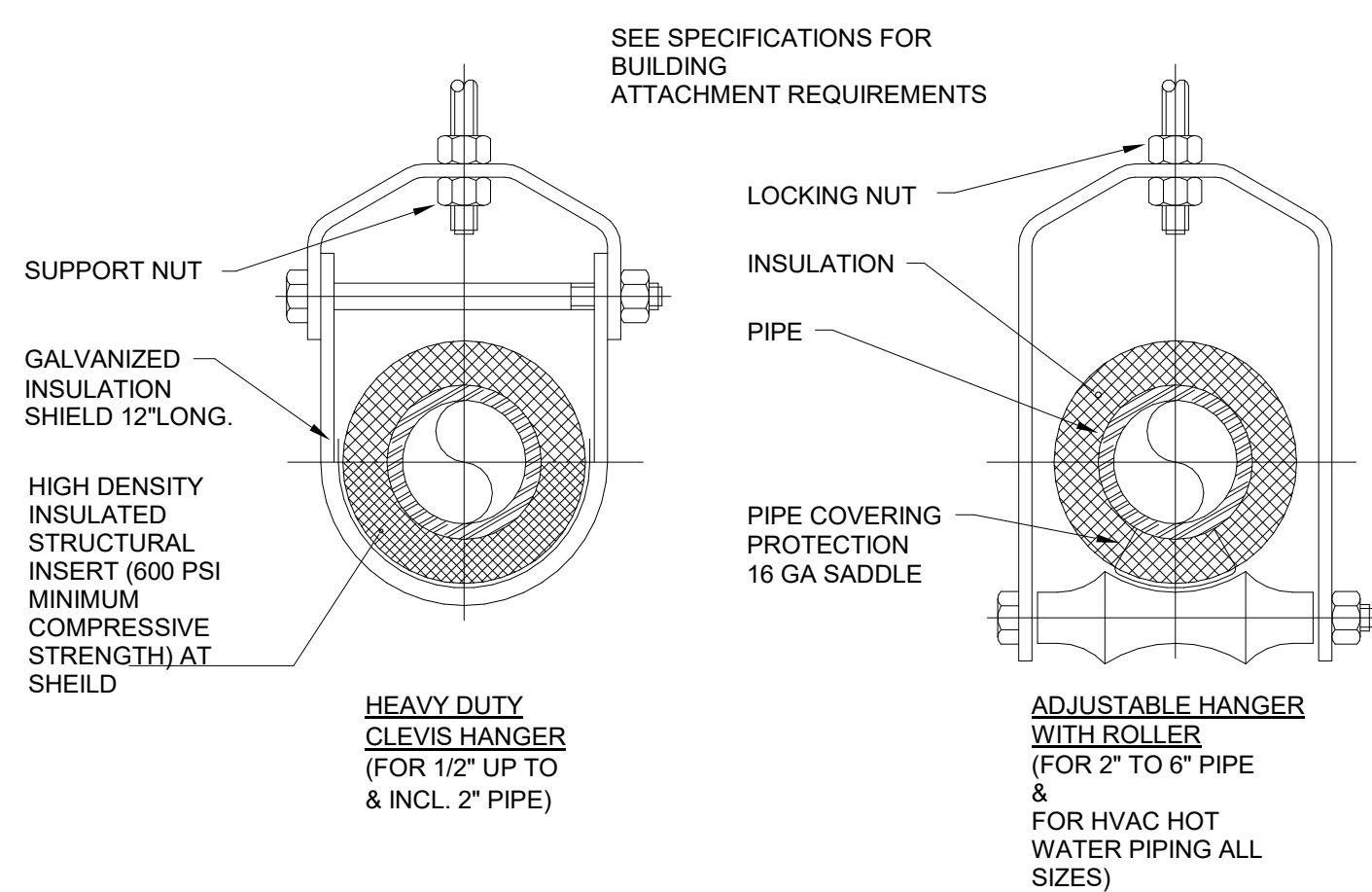
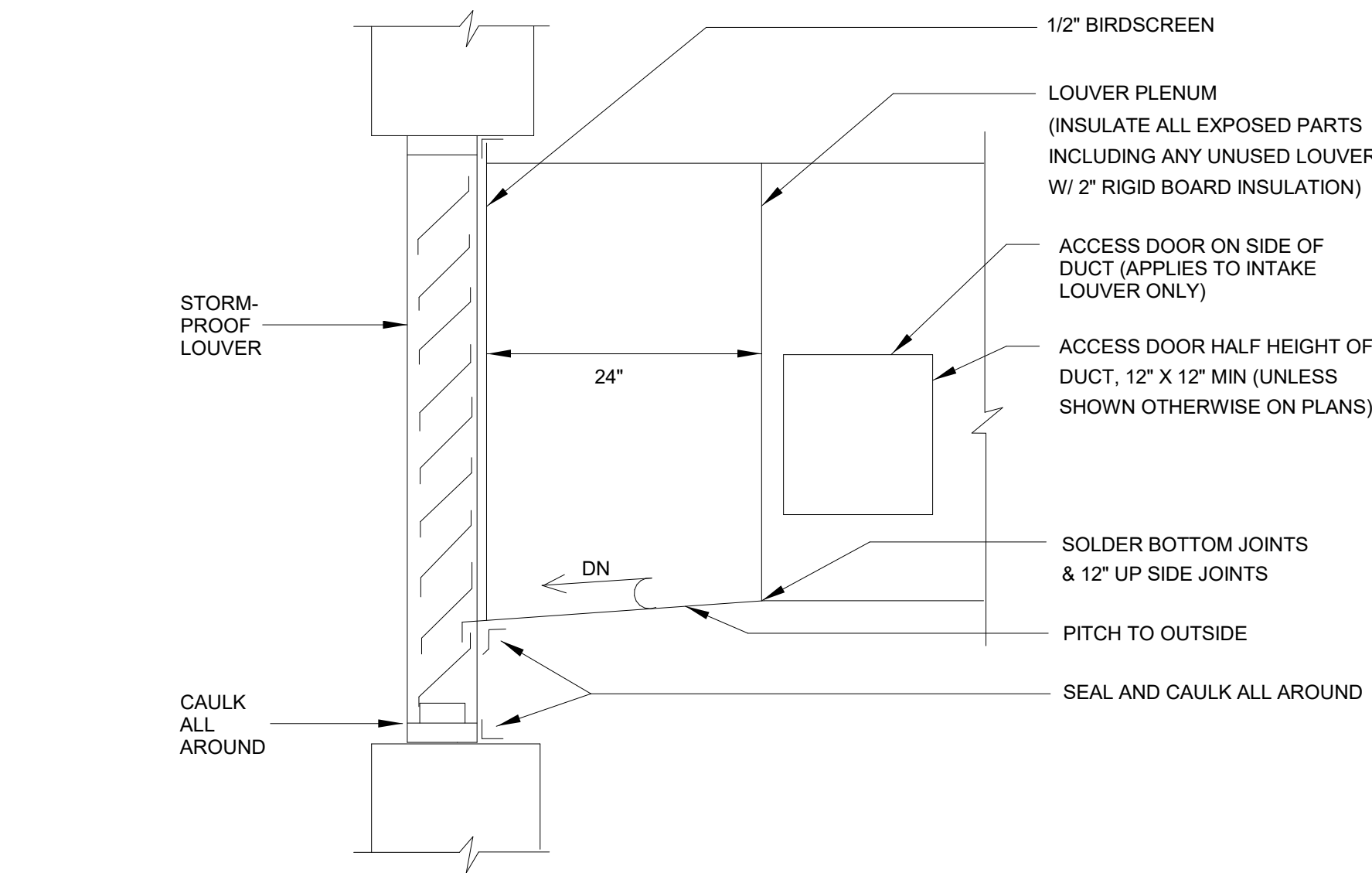
2

HVAC COIL (2-WAY VALVE) DETAIL
SCALE : NO SCALE

3

HVAC COIL (3-WAY VALVE) DETAIL
SCALE : NO SCALE

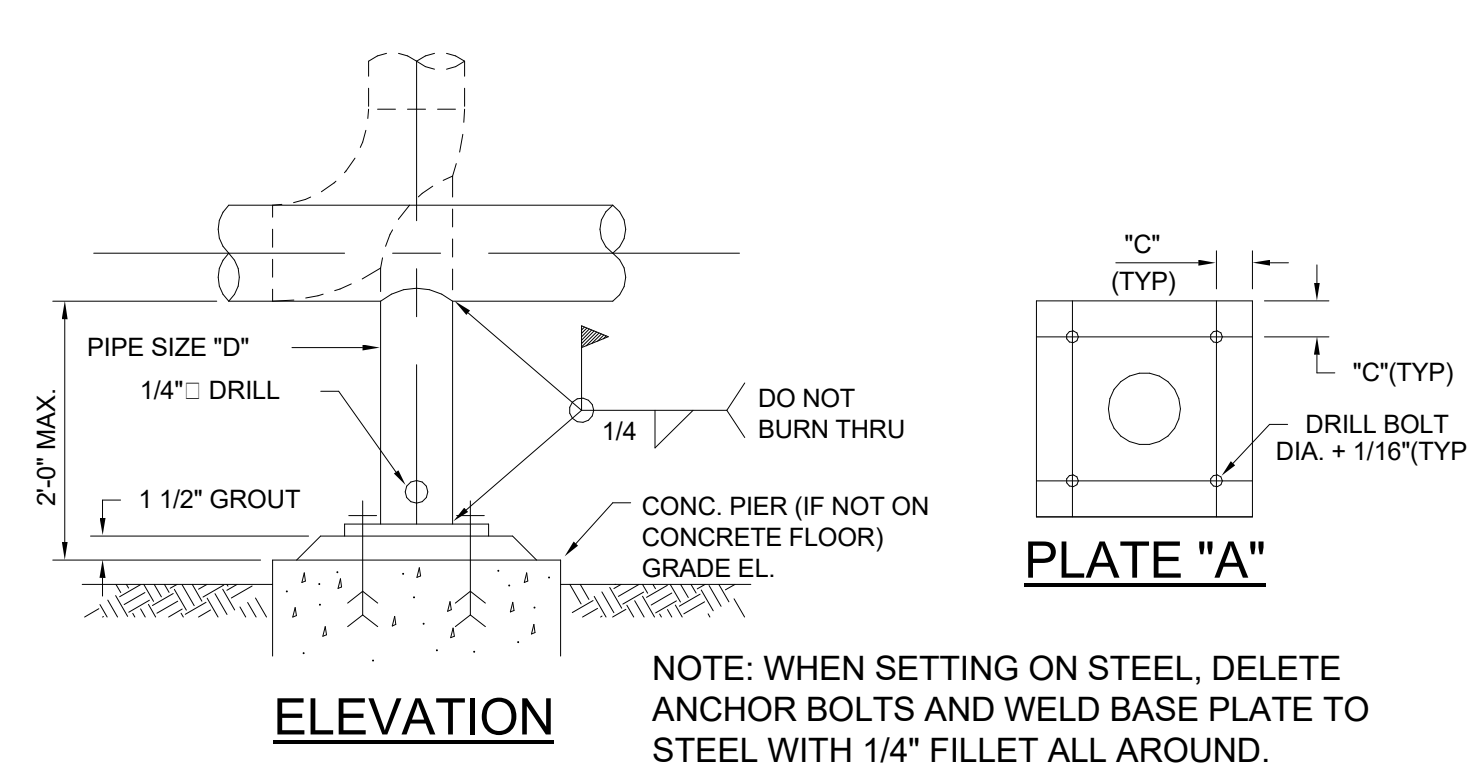
4



NOTES:

1. THIS DETAIL SHALL BE USED AS A GUIDE. ALL HANGERS SHALL MEET THE REQUIREMENTS OF THE SPECIFICATIONS.
2. PIPE 6" AND LARGER SHALL HAVE ROLLER SUPPORTED WITH DUAL RODS.
3. FOR CHW SERVICE OVER 3" REPLACE SADDLE WITH 12" LONG 14 GA SHIELD WITH RIGID INSULATION BETWEEN PIPE AND SHIELD.
4. WHERE TRAPEZE HANGERS ARE USED FOR HEATING HOT WATER PROVIDE ROLLERS.

PIPE SIZE	MAXIMUM SPACING	ROD SIZE
1/2" - 2"	8'	1/2"
2 1/2"	10'	5/8"
3"	10'	5/8"
4"	14'	5/8"
5"	14'	5/8"



ELEVATION

NOTE: WHEN SETTING ON STEEL, DELETE
ANCHOR BOLTS AND WELD BASE PLATE TO
STEEL WITH 1/4" FILLET ALL AROUND.

PIPE SIZE	STANCHION SIZE "D"	PLATE "A"	DIM "C"	ANCHOR BOLT SIZE
2"	1 1/2" SCH. 40	6"x12"x6"	1"	1/2"
3"-4"	2" SCH. 40	6"x5/8"x6"	1"	1/2"
6"-8"	3" SCH. 40	10"x3/4"x10"	1"	5/8"
10"-14"	4" SCH. 40	10"x3/4"x10"	1"	5/8"
16"-20"	6" SCH. 40	12"x1"x12"	1"	3/4"

LOUVER PLENUM DETAIL
SCALE : NO SCALE

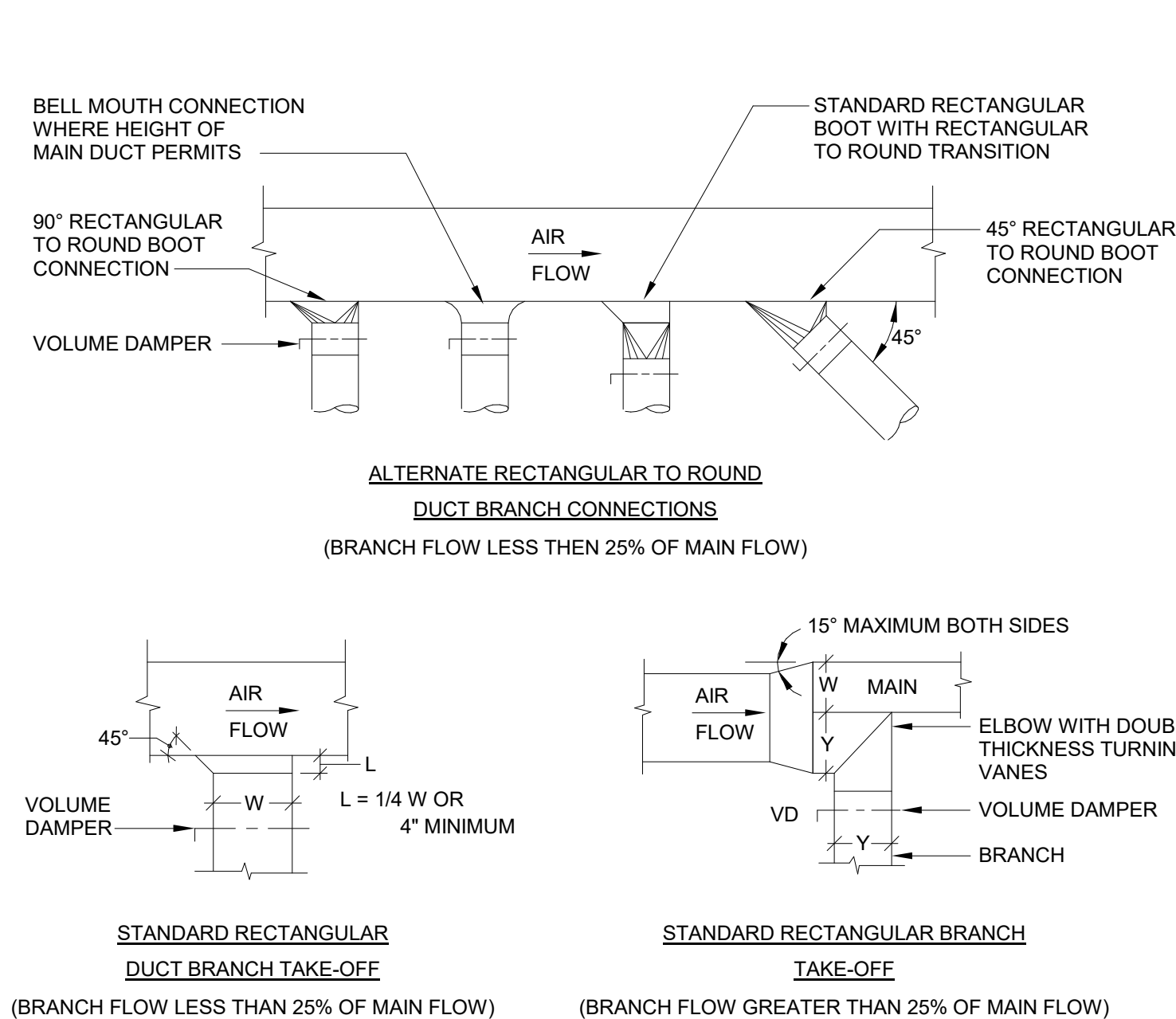
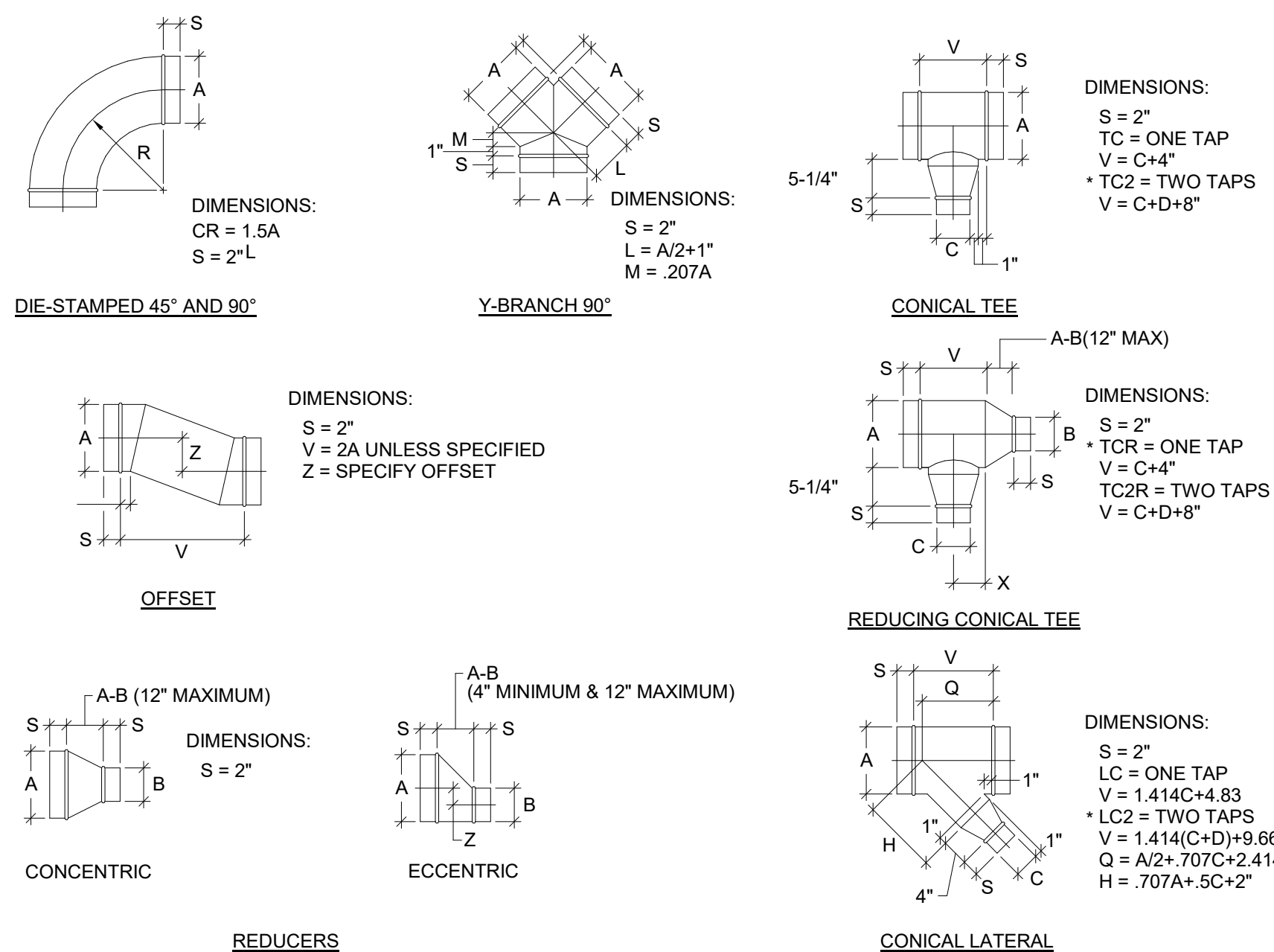
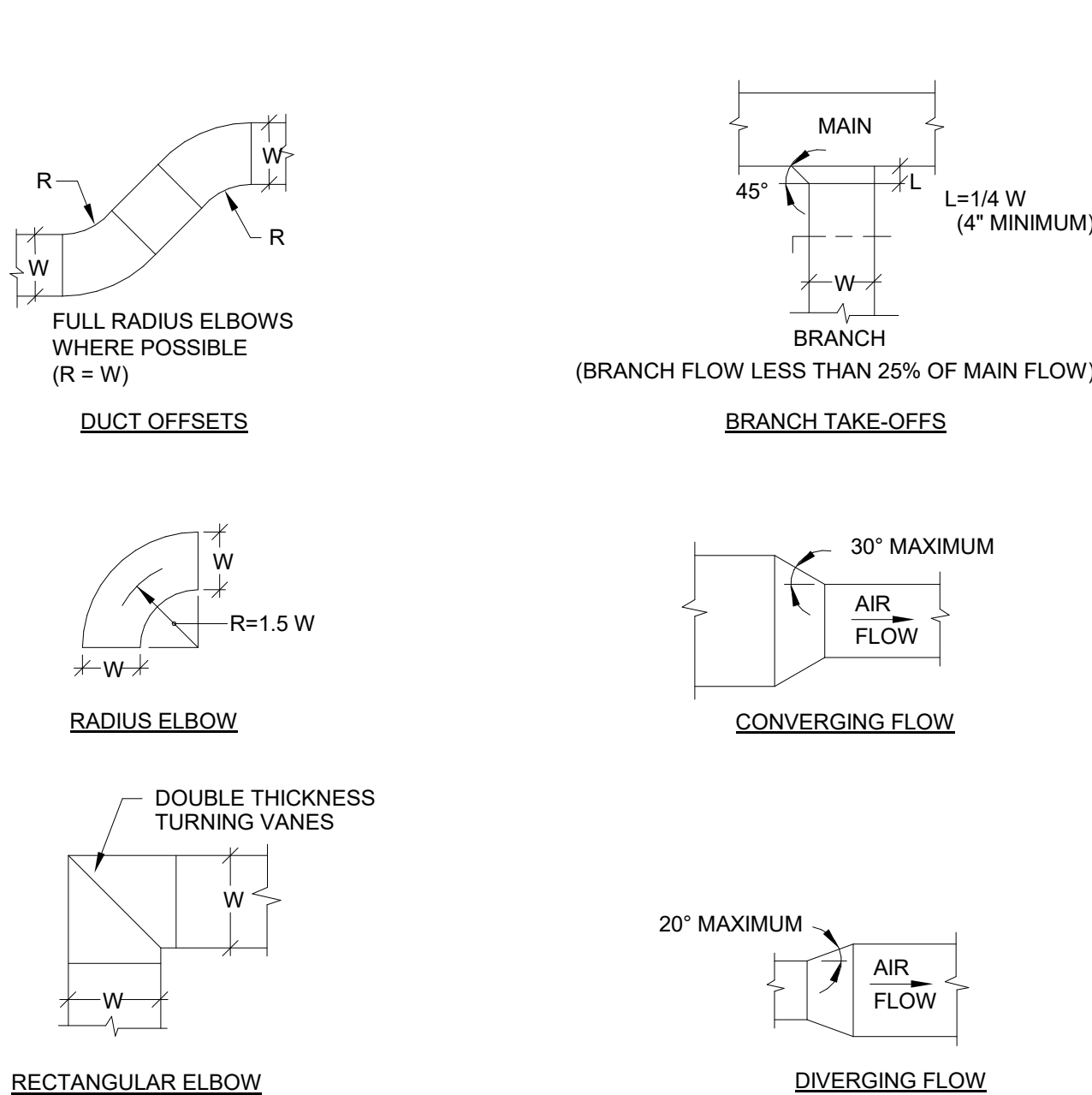
5

PIPE HANGER SUPPORT DETAIL
SCALE : NO SCALE

6

PIPE SUPPORT DETAIL
SCALE : NO SCALE

7



RECTANGULAR DUCT FITTING DETAILS
SCALE : NO SCALE

8

ROUND DUCT FITTING DETAILS
SCALE : NO SCALE

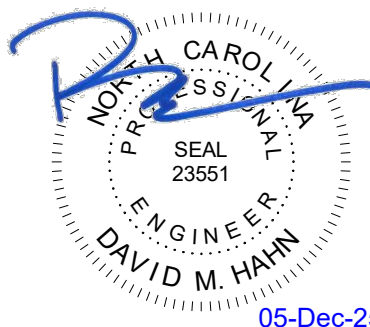
9

ROUND/RECT. DUCT TAKE-OFF FITTING DETAILS
SCALE : NO SCALE

10

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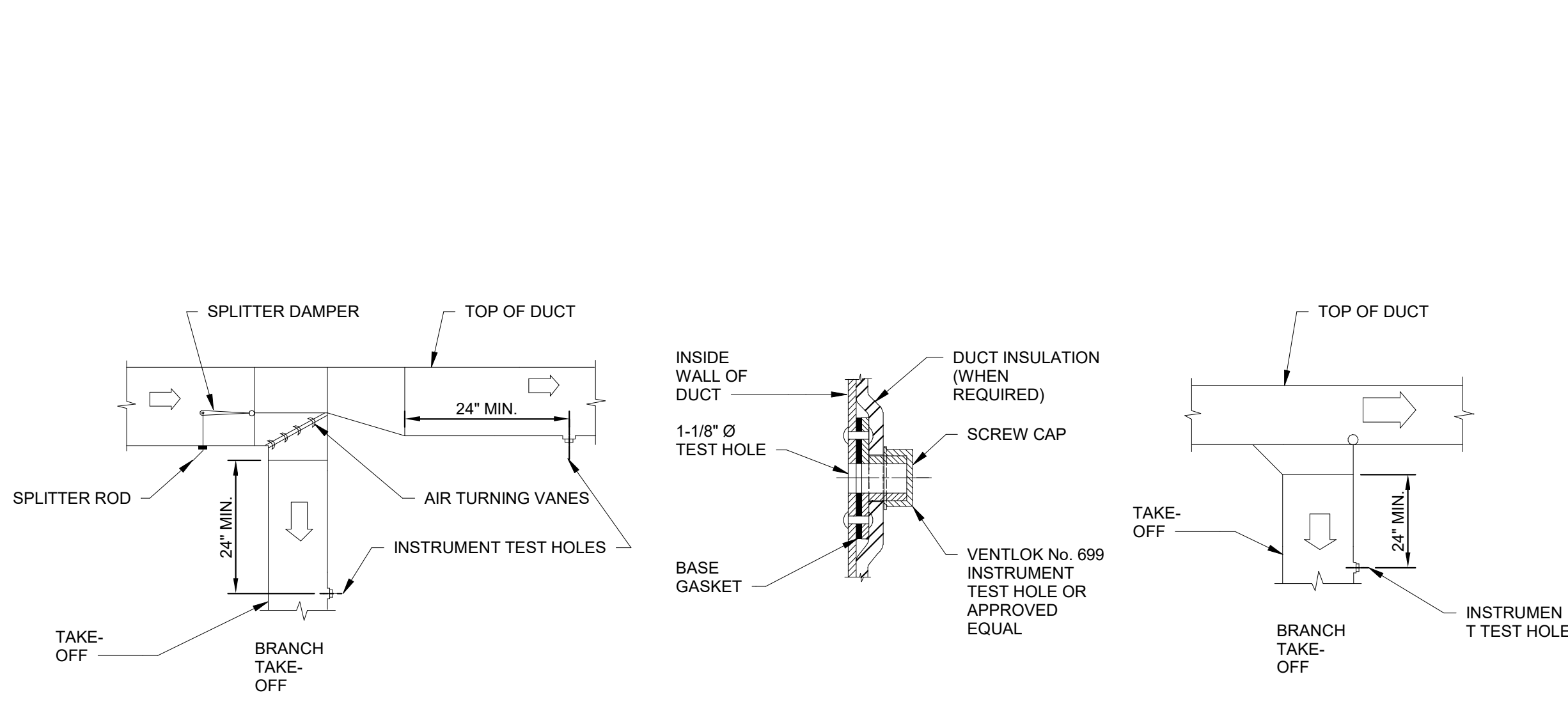
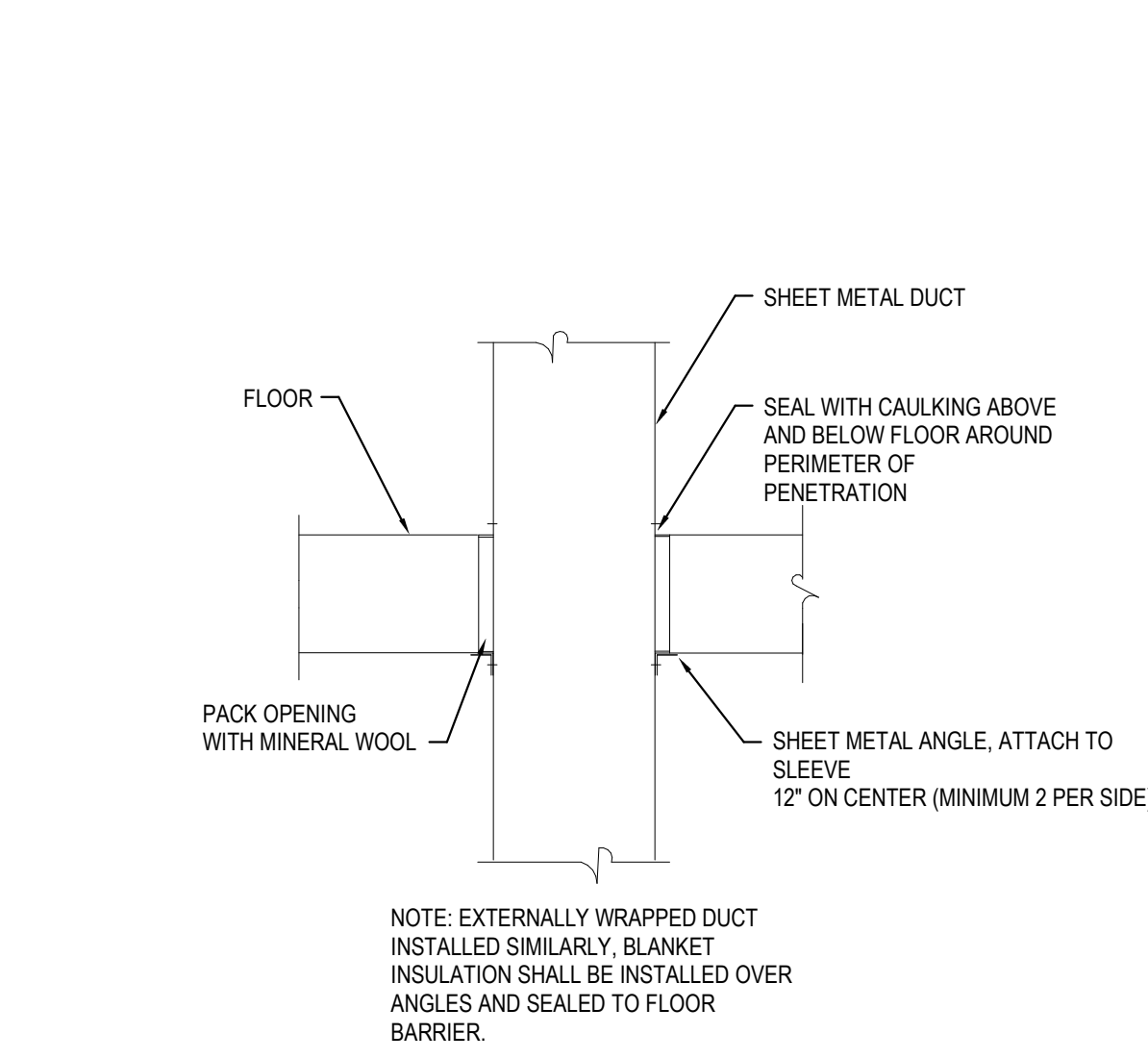
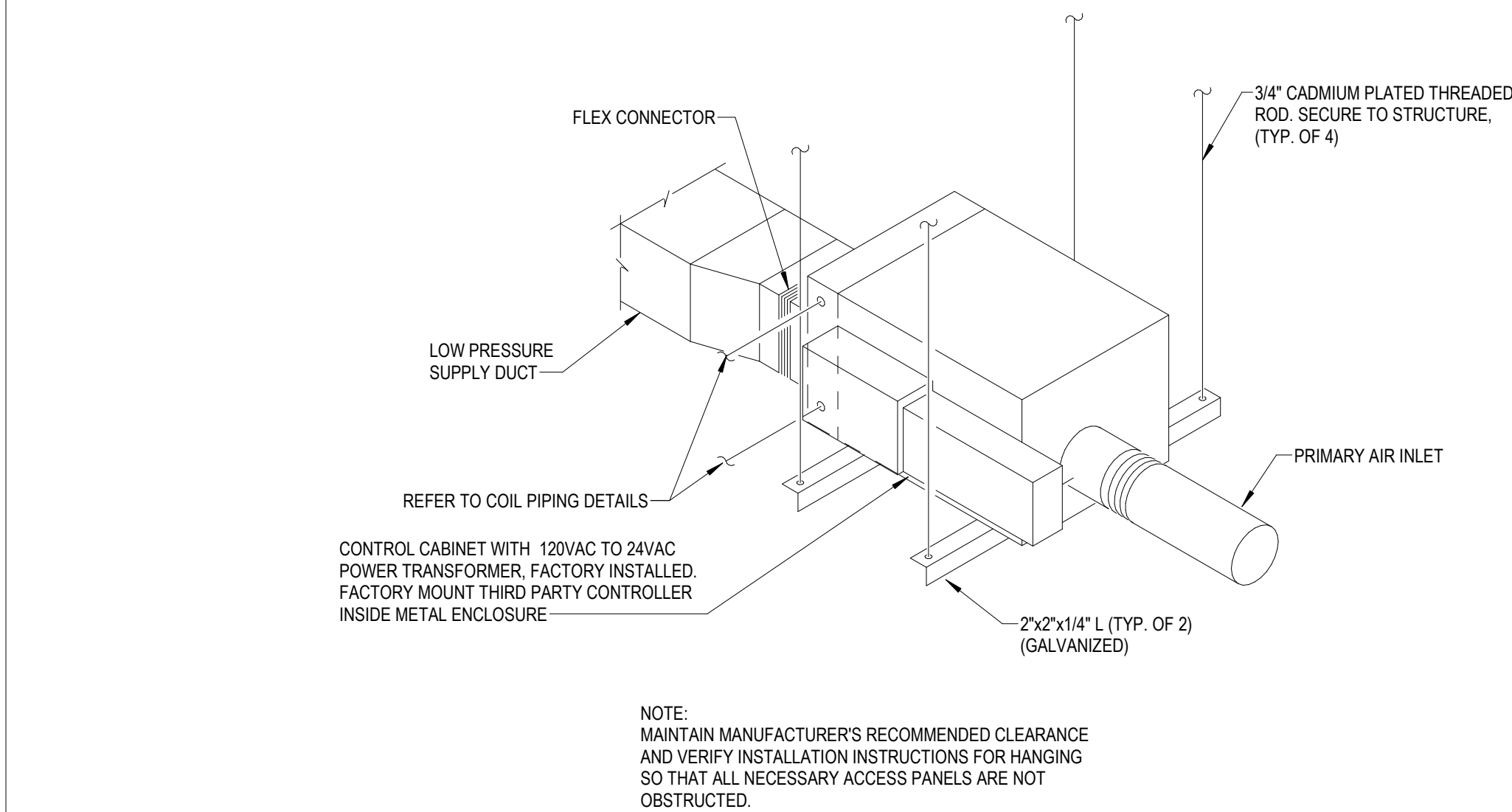
NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

MECHANICAL DETAILS

M-5.2

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TYPICAL SINGLE DUCT TERMINAL WITH HOT WATER COIL
SCALE : NO SCALE

1

TYPICAL DUCT THROUGH NON-RATED WALL
SCALE : NO SCALE

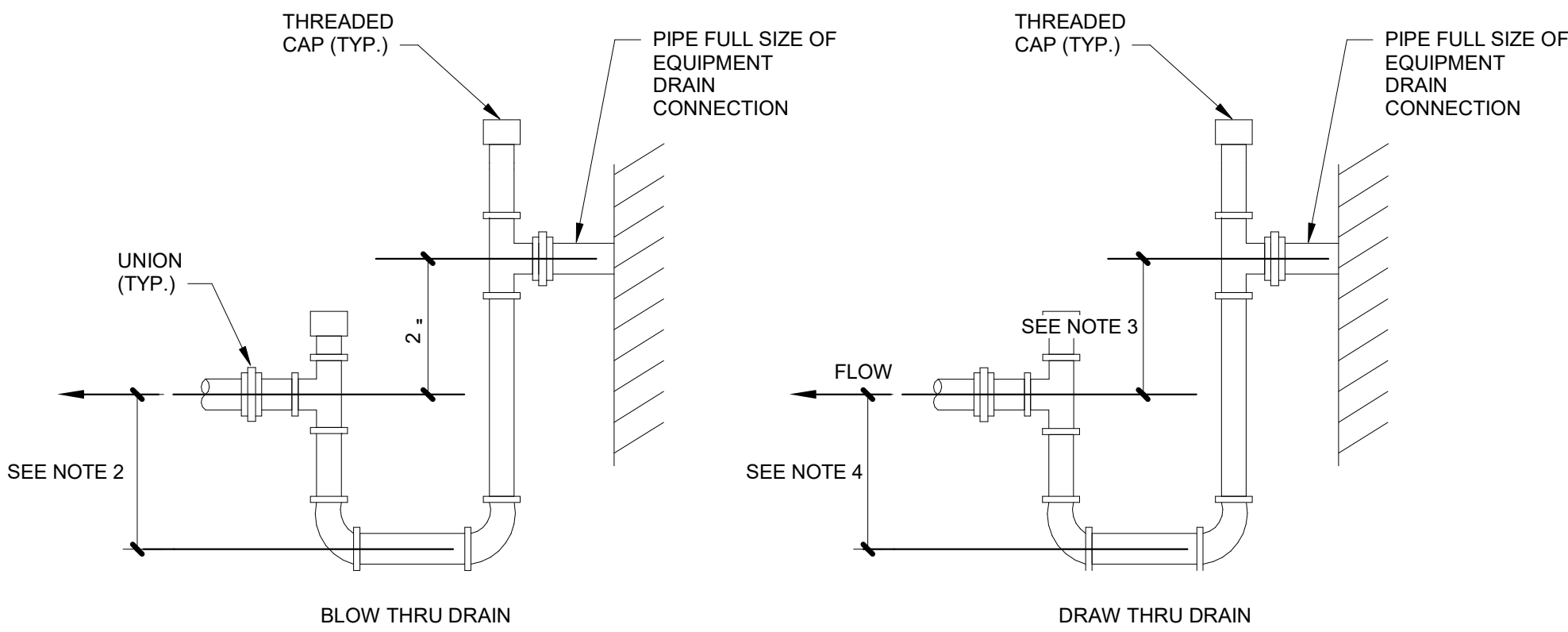
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TYPICAL LOW PRESSURE DUCT DETAILS
SCALE : NO SCALE

3

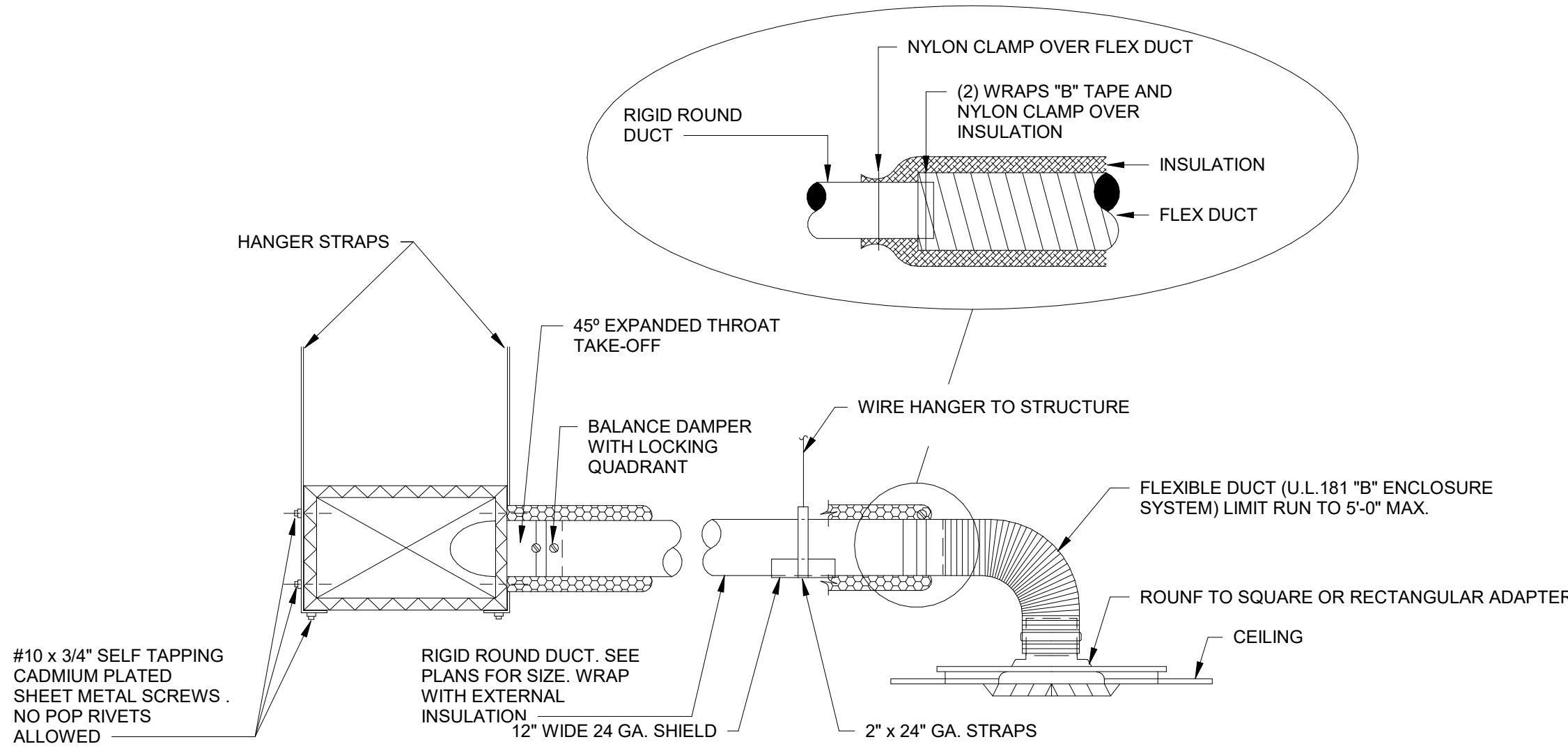
NOTES:

1. LOCATE TRAPS SO AS TO BE ACCESSIBLE FOR CLEANING.
2. HEIGHT SHALL BE EQUAL TO UNIT MAXIMUM TOTAL STATIC PRESSURE PLUS 1/2".
3. HEIGHT SHALL BE EQUAL TO UNIT MAXIMUM NEGATIVE STATIC PRESSURE PLUS 1".
4. HEIGHT SHALL BE 1/2" OF HEIGHT INSTALLED ON NOTE 3.
5. PIPE TO NEAREST DRAIN.
6. TRAP SHALL NOT BLOCK ACCESS TO EQUIPMENT.
7. PROVIDE UNIONS AT INLET AND OUTLET OF TRAP.



4

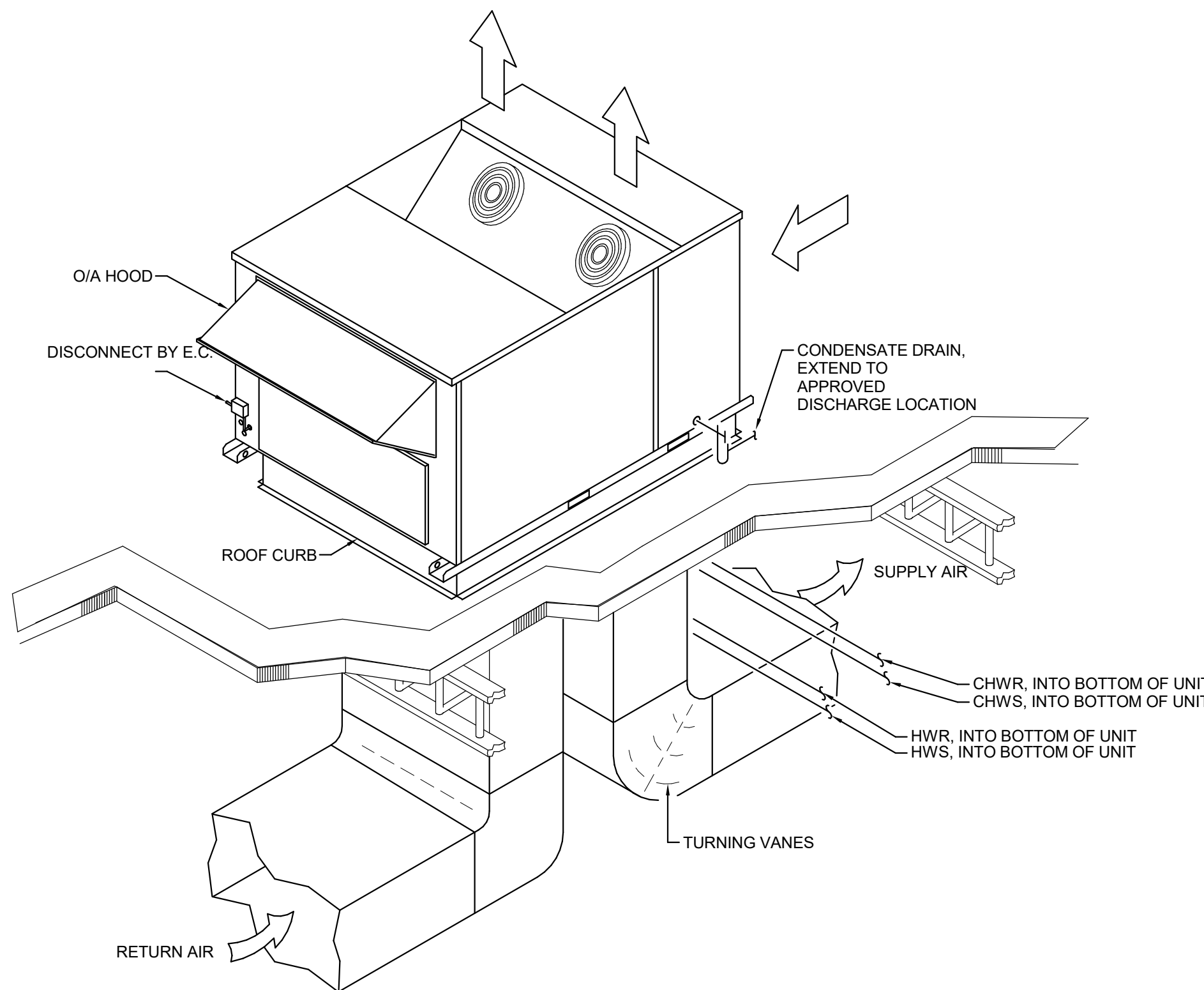
TYPICAL DIFFUSER CONNECTION DETAIL
SCALE : NO SCALE



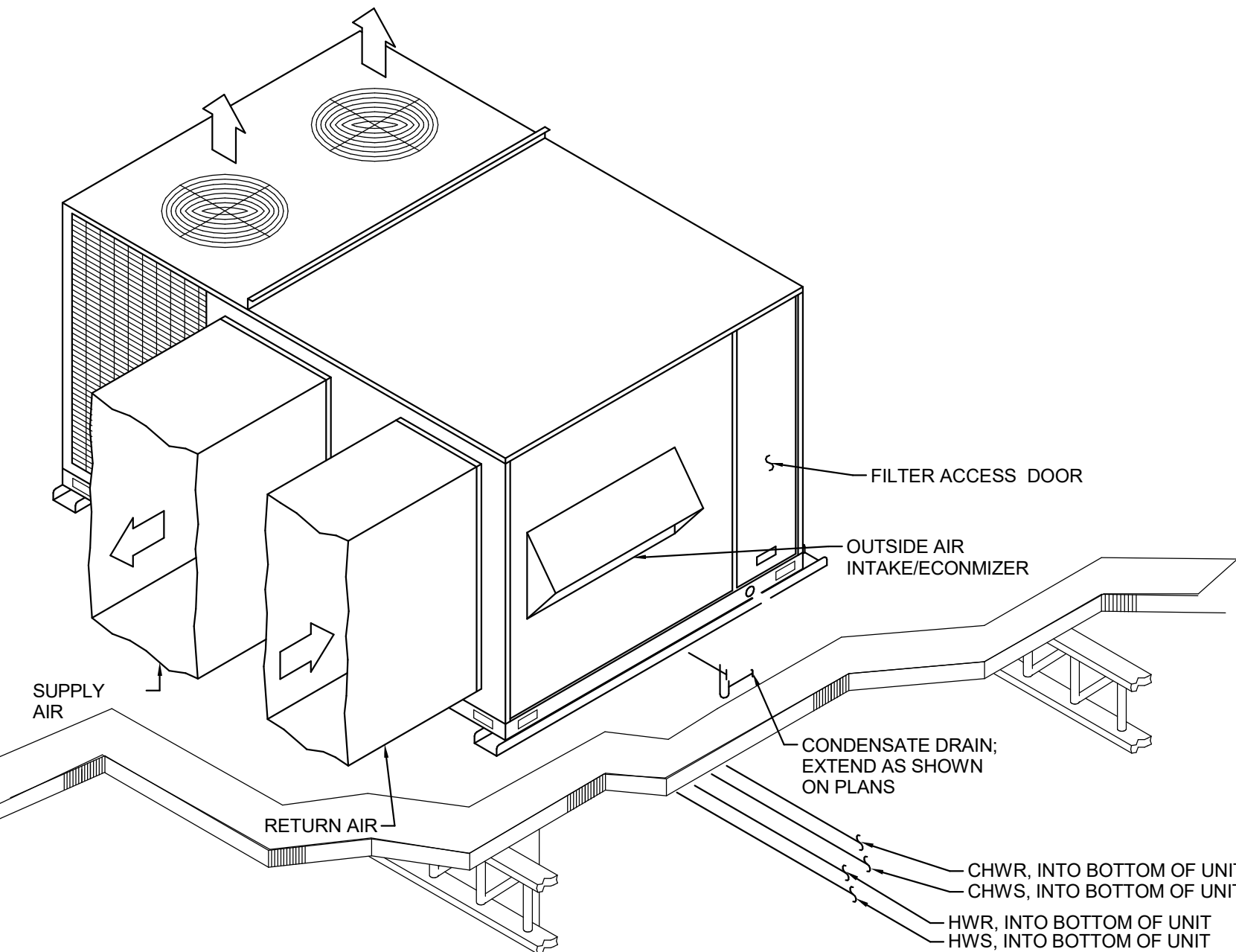
5

FAN COIL DETAIL
SCALE : 12\"/>

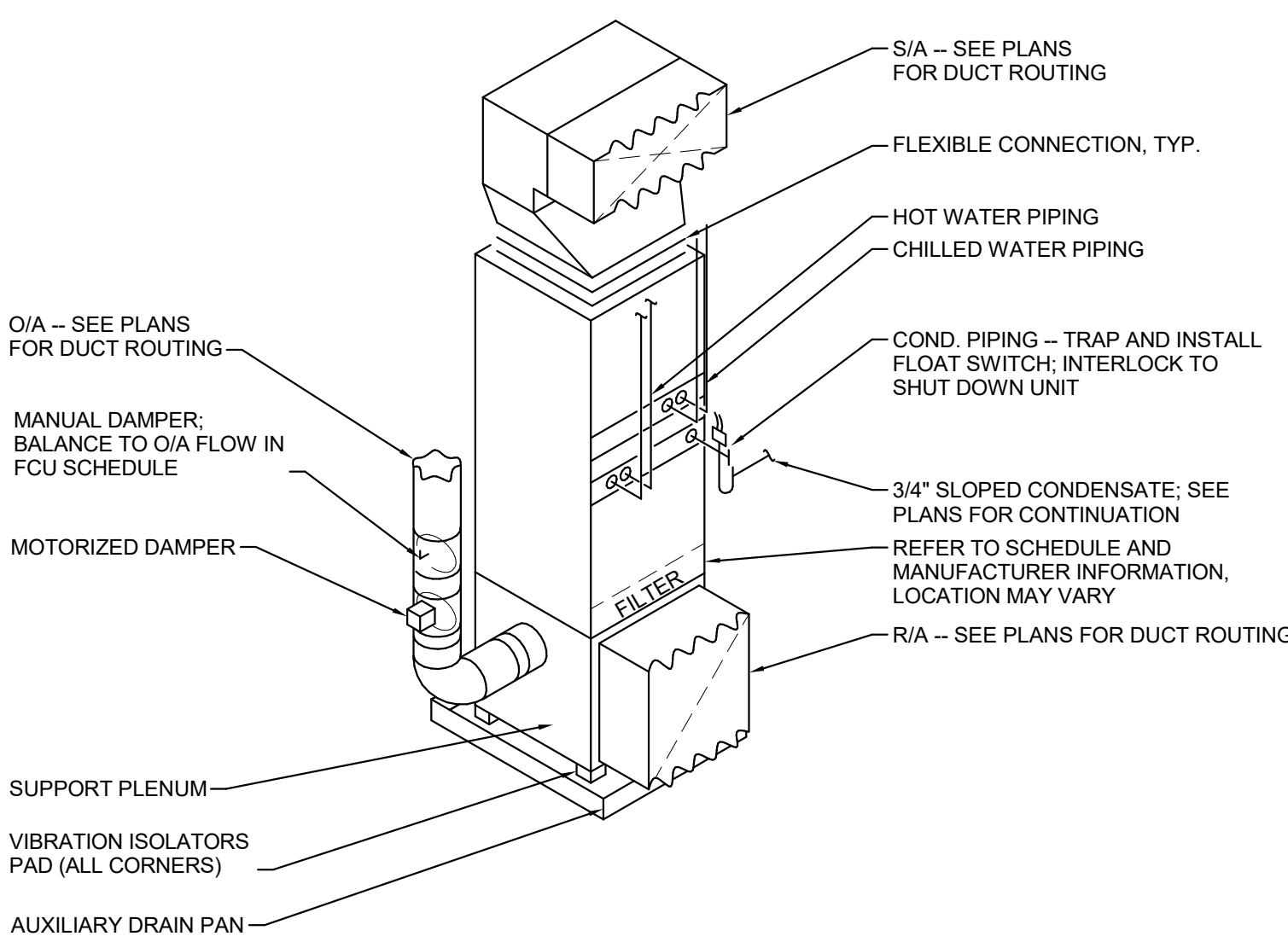
6



7



8



9

ROOFTOP UNIT BOTTOM DISCHARGE DETAIL
SCALE : 12" = 1'-0"

ROOFTOP UNIT SIDE DISCHARGE DETAIL
SCALE : 12" = 1'-0"

TYPICAL VERTICAL FCU DETAIL
SCALE : 12" = 1'-0"

TYPICAL VERTICAL FCU DETAIL
SCALE : 12" = 1'-0"

ROOFTOP UNIT SCHEDULE

DRAWING CODE	UNIT LOCATION	BOD MFR	BOD MODEL	ALTERNATE APPROVED MFRS (SEE NOTE 18)	SYSTEM TYPE	AIRFLOW SA (IN. WG.)	SA ESP (IN. WG.)	MAX OA	MIN OA	RA	SUPPLY FAN QTY TYPE	AIRFLOW	TOTAL ESP (IN. WG.)	RPM	HP	BHP	MOTOR/HEAT	TOTAL ESP (IN. WG.)	CHILLED WATER COIL AIRFLOW	EAT (db)	EAT (wb)	LAT (db)	LAT (wb)	SENS CAP (MBH)	TOTAL CAP (MBH)	EWT	LWT	FLOW (GPM)	TOTAL CAP (TON)	WPD (FT. H2O)	PIPE CONN. (IN.)	PREHEAT AND/OR REHEAT COIL COIL POSITION (SEE NOTE 9)	AIRFLOW	EAT	LAT	EWT	LWT	FLOW (GPM)	TOTAL CAP (MBH)	WPD (FT. H2O)	PIPE CONN. (IN.)	FILTERS PRE FILTERS SA & EA	FINAL FILTERS SA	ELECTRICAL POWER SUPPLY (V/PH/Hz)	UNIT FLA (A)	MCA (A)	MOCP (A)	LSS EMERG. BACKUP	EST. WEIGHT (LBS)	OCCUP. CONTROL METHOD	NOTES	ACCESS
RTU-01	N.E. SHARK ROOF	ANNEXAIR	AHU-E-03-C-H	TRANE, PETRA, CAHS	4-PIPE CAV	3,690	1.5	610	-	3,080	2 PLUG	1,845	4.91	2,734	4.14	3.76	5.26	4.91	3,690	79.0	64.6	53.0	52.2	106	135	44	54	27.0	11.3	20.0	1.5	REHEAT	3,690	50.0	75.0	120	100	10.0	102.0	10.0	1.25	2" MERV 10	4" MERV 15	460/3/60	16.0	18.0	25	YES	2,800	24 HR	1 - 18	A - H
RTU-02	CENTER SHARK ROOF	ANNEXAIR	AHU-E-07-C-H	TRANE, PETRA, CAHS	4-PIPE CAV	8,295	1.5	1,025	185	7,270	3 PLUG	2,765	4.91	2,338	4.88	4.44	4.27	4.91	8,295	78.6	67.2	52.7	51.8	237	387	44	54	77.0	32.3	20.0	2.0	REHEAT	8,295	50.0	75.0	120	100	23.0	229.0	10.0	1.25	2" MERV 10	4" MERV 15	460/3/60	25.0	27.0	35	YES	4,500	24 HR	1 - 18	A - H
RTU-03	S.E. SHARK ROOF	ANNEXAIR	AHU-E-02-C-H	TRANE, PETRA, CAHS	4-PIPE CAV	1,820	1.5	540	220	1,280	2 PLUG	910	4.91	2,735	2.19	1.99	6.06	4.91	1,820	81.6	69.0	53.0	52.5	58	94	44	54	19.0	7.9	20.0	1.25	REHEAT	1,820	50.0	75.0	120	100	5.0	51.0	10.0	3/4"	2" MERV 10	4" MERV 15	460/3/60	9.0	10.0	15	YES	2,500	24 HR	1 - 18	A - H
RTU-04	S.W. SHARK ROOF	ANNEXAIR	AHU-E-07-H-C-H	TRANE, PETRA, CAHS	4-PIPE VAV	6,510	1.5	2,230	2,300	4,280	2 PLUG	3,255	5.13	2,323	7.74	7.04	5.69	5.13	6,510	80.9	69.9	51.1	50.5	214	390	44	54	78.0	32.5	20.0	2.0	PRE / REHEAT	2230 / 6510	23.0 / 50.0	50.0 / 75.0	120	100	7.0 / 18.0	67.0 / 180.0	10.0 / 10.0	7/5 / 1.25	2" MERV 10	4" MERV 15	460/3/60	22.0	25.0	35	NO	4,600	DCV	1 - 18	A - H

NOTES:

- REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.
- ARRLOW IN CFM, TEMPERATURES IN °F
- COIL, DRAIN AND MOTOR SIDE ACCESS TO BE FIELD CONFIRMED PRIOR TO SUBMITTING FOR APPROVAL.
- MAX COIL FACE VELOCITY SHALL NOT EXCEED SCHEDULED VALUES.
- ALL CONTROLS, SENSORS, ACTUATORS AND WIRING PROVIDED AND INSTALLED BY DDC CONTRACTOR.
- REFER TO PLANS AND SECTION FOR UNIT ARRANGEMENTS.
- FAN SHALL BE DIRECT DRIVE ECM W/ CORROSION COATED MOTORS W/ MODULATING SPEED CONTROLLER PER MOTOR. SEE EQUIPMENT SCHEDULE FOR SIZES AND QUANTITIES.
- N+1 FAN REDUNDANCY WITH BACKDRAFT DAMPERS.
- CONSTRUCTION TYPE: BIOCUMPOSITE
- CASING: DEFLECTION OF L/300
- CASING: 0.5% LEAKAGE RATE AT 6 INCHES (ASHRAE 111 CLASS 2)
- CASING: R-13 THERMAL PERFORMANCE W/ FOAM INSULATION
- CASING: SHALL HAVE NO EXTERIOR CONDENSATION W/ INTERIOR AHU TEMPERATURE DOWN TO 42.5 °F WHILE EXTERIOR CONDITIONS ARE 95.0°F db / 85.0°F wb
- CASING SHALL BE COMPLETELY PROTECTED AGAINST WEATHERIZATION W/ MINIMUM 15-YEAR WARRANTY AGAINST CORROSION
- EQUIPMENT SPECIFIC SEISMIC & WIND RATED CURB, RESTRAINT & FASTENERS W/ ENGINEER CERTIFICATION
- FILTER FRAMES SHALL BE CORROSION COATED
- ALL COILS SHALL BE CORROSION COATED
- ALTERNATE 11 - ALTERNATE APPROVED MANUFACTURERS SHALL MEET ALL OF THE CONSTRUCTION LEVEL REQUIREMENTS AS PER SCHEDULE, NOTES & ACCESSORIES INCLUDING MINIMUM 15-YEAR CASING WARRANTY
 - (18.1) MINIMUM 18 GAUGE MARINE GRADE POWDER COATED ALUMINUM EXTERIOR AND INTERIOR CABINET
 - (18.2) EXTERIOR COATINGS MUST BE HIGH-PERFORMANCE EPOXY OR POLYURETHANE BASED WITH A MINIMUM OF 5,000 HOUR SALT SPRAY RATING (ASTM B117), IF A HIGHER RATED COATING IS AVAILABLE, INCLUDE THE ASSOCIATED COST INCREASE AS A SEPARATE LINE ITEM IN THE SUBMITTAL.

ACCESS:

- COOLING COIL SECTIONS SHALL BE PROVIDED WITH AN INSULATED, DOUBLE WALL, BIOCUMPOSITE OR 316 STAINLESS STEEL DRAIN PAN WITH POSITIVE DRAINAGE MEETING INDOOR AIR QUALITY (IAQ) IN ACCORDANCE WITH ASHRAE 62.1.
- COPPER COIL, ALUMINUM FIN, STAINLESS STEEL COIL, CASING.
- PROVIDE FILTERS AS SPECIFIED, THREE SETS OF EACH TYPE, PROVIDE ONE SET IN UNIT, PROVIDE ONE SET FOR INSTALLATION AFTER SYSTEM IS BALANCED AND BUILDING IS CLEANED, AND ONE SET FOR TURN OVER TO OWNER.
- PROVIDE RETURN AIR AND OUTDOOR AIR DAMPERS. ALL DAMPERS SHALL BE SET ALUMINUM CONSTRUCTION.
- HINGED ACCESS DOORS
- PROVIDE MARINE LIGHTS AND GFI RECEPTACLE, REQUIRE SEPARATE 120V CIRCUIT PROVIDED/INSTALLED BY ELECTRICAL CONTRACTOR
- SINGLE POINT POWER W/ FACTORY DISCONNECT SWITCH
- 316 STAINLESS STEEL OR NON-CORROSIVE COATED FASTENERS THROUGHOUT UNIT CABINET

INDOOR AIR HANDLER SCHEDULE

DRAWING CODE	AREA SERVED	BOD MFR	MODEL	ALTERNATE APPROVED MFRS	CONFIGURATION (4 PIPE)	COOLING COIL						PREHEAT / REHEAT COIL						FAN SECTION						MOTOR QTY	(W)	(HP)	VOLTAGE (V/PH/Hz)	MCA (A)	MOCP (A)	UNIT DIMENSIONS			OPERATING WEIGHT (LBS.)	LSS EMERGENCY POWER	FILTER	NOTES	ACCESS			
						TOTAL CAP (MBH)	SENSIBLE CAP (MBH)	EAT (°F db)	EAT (°F wb)	LAT (°F db)	LAT (°F wb)	EWT (°F)	LWT (°F)	FLOW (GPM)	COIL PD (FT. H2O)	COIL POS. PH	COIL POS. RH	COIL POS. CAP (MBH)	EAT (°F)	LAT (°F)	EWT (°F)	LWT (°F)	FLOW (GPM)							COIL PD (FT. H2O)	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)						ESP (IN.H2O)	L (IN.)	W (IN.)
FCU-01	E204 - OZONE	TRANE	FCDB120	DAIKIN, IEC	HORIZONTAL CAB	35.0	26.8	76.9	64.1	53.4	52.7	44.0	55.6	6.0	11.4	-	RH	14.8	60.4	73.4	120.0	100.2	1.5	1.0	1,050	210.000	1	277	-	120V/1/60	6.1	15	83.0	26.0	10.0	218	YES	1" MERV 13	1 - 9	-
FCU-02	E303 - FRACTIONATORS	TRANE	FCDB060	DAIKIN, IEC	HORIZONTAL CAB	11.5	11.5	74.8	45.8	53.8	34.9	44.0	55.4	2.0	2.1	-	RH	5.6	69.5	79.8	120.0	105.0	0.8	0.2	505	-0.00	1	110	-	120V/1/60	3.9	15	58.0	26.0	10.0	155	YES	1" MERV 13	1 - 9	-
FCU-03	E306 - OFFICES	TRANE	BCH024	DAIKIN, IEC	HORIZONTAL	29.2	16.2	81.5	69.8	52.1	50.9	44.0	54.0	6.0	6.4	-	RH	24.2	50.8	95.6	120.0	101.3	2.5	3.2	500	200.0	1	-	5	120V/1/60	9.3	15	53.7	30.0	17.0	226	NO	2" MERV 13	1 - 8,10	C
FCU-04	148 - HUSBANDRY	TRANE	BCVE036	DAIKIN, IEC	VERT / FRONT RET.	34.9	21.9	76.6	65.6	51.8	50.9	44.0	53.6	7.5	4.5	-	RH	31.1	55.0	90.7	120.0	102.8	3.5	0.6	805	85.0	1	-	5	120V/1/60	9.3	15	23.0	29.8	49.9	244	YES	2" MERV 13	1 - 8,10	-
FCU-05	R208B - CLASSROOM	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	41.6	21.6	84.7	72.7	53.5	52.2	44.0	54.1	8.5	11.0	-	RH	26.9	44.3	84.0	120.0	99.5	2.5	0.5	625	340.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	204	NO	2" MERV 13	1 - 8,10	-
FCU-06	R208A - CLASSROOM	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	40.0	20.6	85.1	73.1	53.1	51.9	44.0	54.3	8.0	9.9	-	RH	26.3	42.9	84.7	120.0	99.9	2.5	0.5	580	330.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	204	NO	2" MERV 13	1 - 8,10	-
FCU-07	114A - FW HUSBANDRY	TRANE	BCH054	DAIKIN, IEC	HORIZONTAL	43.2	37.6	76.3	62.3	53.0	52.0	44.0	54.7	8.5	2.1	-	RH	32.7	55.0	75.5	120.0	102.6	3.5	0.6	1,470	125.0	1	-	1	120V/1/60	16.6	25	59.9	46.0	18.0	337	YES	2" MERV 13	1 - 8,10,12	C
FCU-08	R210 - SUPPORT	TRANE	BCVE036	DAIKIN, IEC	VERTICAL	51.9	29.4	80.9	69.5	52.9	52.0	44.0	54.1	10.5	8.2	-	RH	33.0	56.8	88.9	120.0	102.0	3.5	0.6	950	260.0	1	-	5	120V/1/60	9.3	15	23.0	29.8	49.9	244	YES	2" MERV 13	1 - 8,10	-
FCU-09	E113 - MECH	TRANE	BCH072	DAIKIN, IEC	HORIZONTAL	56.8	56.8	76.7	46.8	50.4	33.0	44.0	54.5	11.5	4.2	-	RH	45.6	55.0	76.0	120.0	101.3	4.5	1.0	1,900	-0.50	1	-	1.5	460V/0/3	4.1	15	59.9	58.0	18.0	424	YES	2" MERV 13	1 - 8,10	C
FCU-10	R131 - CFS EXHIBIT	TRANE	BCVE060	DAIKIN, IEC	VERT / FRONT RET.	63.8	45.0	74.3	63.3	52.7	51.7	44.0	54.3	13.0	7.9	-	RH	67.6	54.0	86.9	120.0	100.2	6.5	1.3	1,900	-0.75	1	-	1.5	460V/0/3	4.1	15	27.5	34.8	58.6	372	NO	2" MERV 13	1 - 8,10	-
FCU-11	E102A - CLASSROOM	TRANE	BCH024	DAIKIN, IEC	VERTICAL	33.0	16.7	84.6	73.1	51.9	50.8	44.0	54.4	6.5	6.8	-	RH	21.5	43.0	86.1	120.0	99.3	2.0	0.4	460	265.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	204	NO	2" MERV 13	1 - 8,10	-
FCU-12	E102B - CLASSROOM	TRANE	BCH024	DAIKIN, IEC	VERTICAL	33.0	16.6	84.4	73.1	51.9	50.8	44.0	54.4	6.5	6.8	-	RH	21.5	43.0	86.1	120.0	99.3	2.0	0.4	460	265.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	204	NO	2" MERV 13	1 - 8,10	-
FCU-13	E103B - STORAGE	TRANE	FCB020	DAIKIN, IEC	HORIZONTAL CONC	3.8	3.2	74.9	62.2	52.5	51.9	44.0	54.0	0.8	1.3	-	RH	3.1	57.0	79.2	120.0	111.6	0.8	0.1	130	-0.25	1	42	-	120V/1/60	2.8	15	32.7	25.0	10.0	81	NO	1" MERV 13	1 - 8,10	-
FCU-14	E101 - AMB. ANIMALS	TRANE	BCH072	DAIKIN, IEC	VERTICAL	138.2	63.4	91.5	78.9	52.1	51.2	44.0	55.9	23.5	15.2	PH	61.7	23.0	62.5	120.0	100.1	6.0	1.8	1,440	1,440.0	1	-	1	460V/0/3	3.1	15	54.6	58.0	53.8	500	YES	2" MERV 13	1,2,3,5,6,7,8,10,11	C	
FCU-15	E104 - CATERING KITCHEN	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	19.7	11.5	82.1	69.2	50.9	49.9	44.0	54.1	4.0	2.9	-	RH	10.3	50.8	79.2	120.0	100.4	1.0	0.3	335	100.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	200	NO	2" MERV 13	1 - 8,10	-
FCU-16	E105 - SALT STORAGE	TRANE	BCVE036	DAIKIN, IEC	VERTICAL	30.6	20.0	75.7	64.7	51.7	50.7	44.0	53.7	6.5	3.5	-	RH	30.0	55.0	91.7	120.0	103.4	3.5	0.6	755	55.0	1	-	5	120V/1/60	9.3	15	23.0	29.8	49.9	244	NO	2" MERV 13	1 - 8,10	-
FCU-17	R106 - WORKSHOP	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	22.3	14.4	78.6	66.3	52.5	51.3	44.0	54.3	4.5	3.6	-	RH	19.2	50.3	95.1	120.0	105.3	2.5	0.5	500	105.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	204	NO	2" MERV 13	1 - 8,10	-
FCU-18	R107 - NECROSPSY	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	38.1	17.9	93.0	79.0	50.9	49.8	44.0	54.3	7.5	8.8	PH	-	17.1	23.0	64.5	120.0	98.0	1.5	0.6	380	380.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	200	NO	2" MERV 13	1,2,3,5,6,7,8,10,11	B
FCU-20	R213 - TOUCH TANK OFFICES	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	22.3	15.7	77.0	64.5	53.3	51.9	44.0	54.4	4.5	3.6	-	RH	21.2	55.0	87.4	120.0	100.0	2.0	0.4	605	85.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	204	NO	2" MERV 13	1 - 8,10	B
FCU-21	R205 - LIBRARY / CONF / OFF.	TRANE	BCVE036	DAIKIN, IEC	VERTICAL	44.5	25.6	79.3	68.3	52.6	51.6	44.0	54.2	9.0	6.3	-	RH	30.9	54.4	87.2	120.0	100.2	3.0	0.4	870	280.0	1	-	5	120V/1/60	9.3	15	23.0	29.8	49.9	244	NO	2" MERV 13	1 - 8,10	-
FCU-22	R110 - CORRIDOR	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	22.9	14.5	79.0	66.7	52.6	51.4	44.0	54.5	4.5	3.6	-	RH	12.5	55.0	78.0	120.0	101.5	1.3	0.4	500	120.0	1	-	5	120V/1/60	9.3	15	19.5	29.8	45.9	200	NO	2" MERV 13	1 - 8,10	-
FCU-23	R106B - CNC/3D PRINTING	TRANE	FCB030	DAIKIN, IEC	HORIZONTAL CONC	7.6	7.0	74.9	61.6	53.4	52.6	44.0	54.1	1.5	4.3	-	RH	3.9	65.0	77.0	120.0	112.2	1.0	0.2	300	-0.25	1	113	-	120V/1/60	2.8	15	32.7	25.0	10.0	81	NO	1" MERV 13	1 - 9	-
FCU-24	147 - CONCESSION	TRANE	BCVE024	DAIKIN, IEC	VERTICAL	25.2	16.1	77.8	66.2	53.4	52.2	44.0	54.6	5.0	4.3	-	RH	20.8	61.2	93.3	120.0	104.3	2.5	0.5	600	105.0	1	-	0.5	120V/1/60	9.3	15	19.5	29.8	45.9	204	NO	2" MERV 13	1 - 8,10	-
AHU-07	R123 - MAIN LOBBY	TRANE	BCVE090	DAIKIN, IEC	HORIZ. MZ VAV	131.5	74.0	80.4	69.3	53.5	52.2	44.0	54.1	27.0	7.7	-	-	-	-	-	-	-	-	-	2,490	855.150	1	-	0.3	460V/0/3	6.9	15	60.8	48.0	66.7	574	NO	2" MERV 13	1 - 8,10,12	A, C

NOTES:

1

REFER TO SPECIFICATIONS FOR FURTHER INFORMATION.

2

PROVIDE FACTORY INSTALLED DISCONNECT SWITCH.

3

PROVIDE ECM FAN MOTOR.

4

PROVIDE HEATING COIL IN REHEAT POSITION.

5

PROVIDE STAINLESS STEEL DRAIN PAN WITH WATER-LEVEL DETECTION DEVICE CONFORMING TO UL 508 IN ACCORDANCE WITH NCMC DECTION 307.2.3.

6

CONTROL VALVE SUPPLIED BY CONTROLS CONTRACTOR.

7

DOUBLE WALL PANELS

8

FIELD-APPLY CORROSION-RESISTANT COATING TO ALL COILS AND HORIZONTAL AND EXTERIOR CABINETS PRIOR TO INSTALLATION TO MEET ASTM-B117 15,000 HR

9

PROVIDE 2" MERV 13 FILTER WHERE RETURN GRILLE NOT PROVIDED WITH FILTER GRILLE.

10

PROVIDE 2" MERV 13 FILTER WHERE RETURN GRILLE NOT PROVIDED WITH FILTER GRILLE.

11

UNIT INCLUDES AN INTERNAL PREHEAT COIL AND A DUCT-MOUNTED REHEAT COIL.

12

INCLUDED IN ALTERNATE #2 ONLY

ACCESS:

A

DUCT SMOKE DETECTOR INSTALLED IN RETURN AIR DUCT.

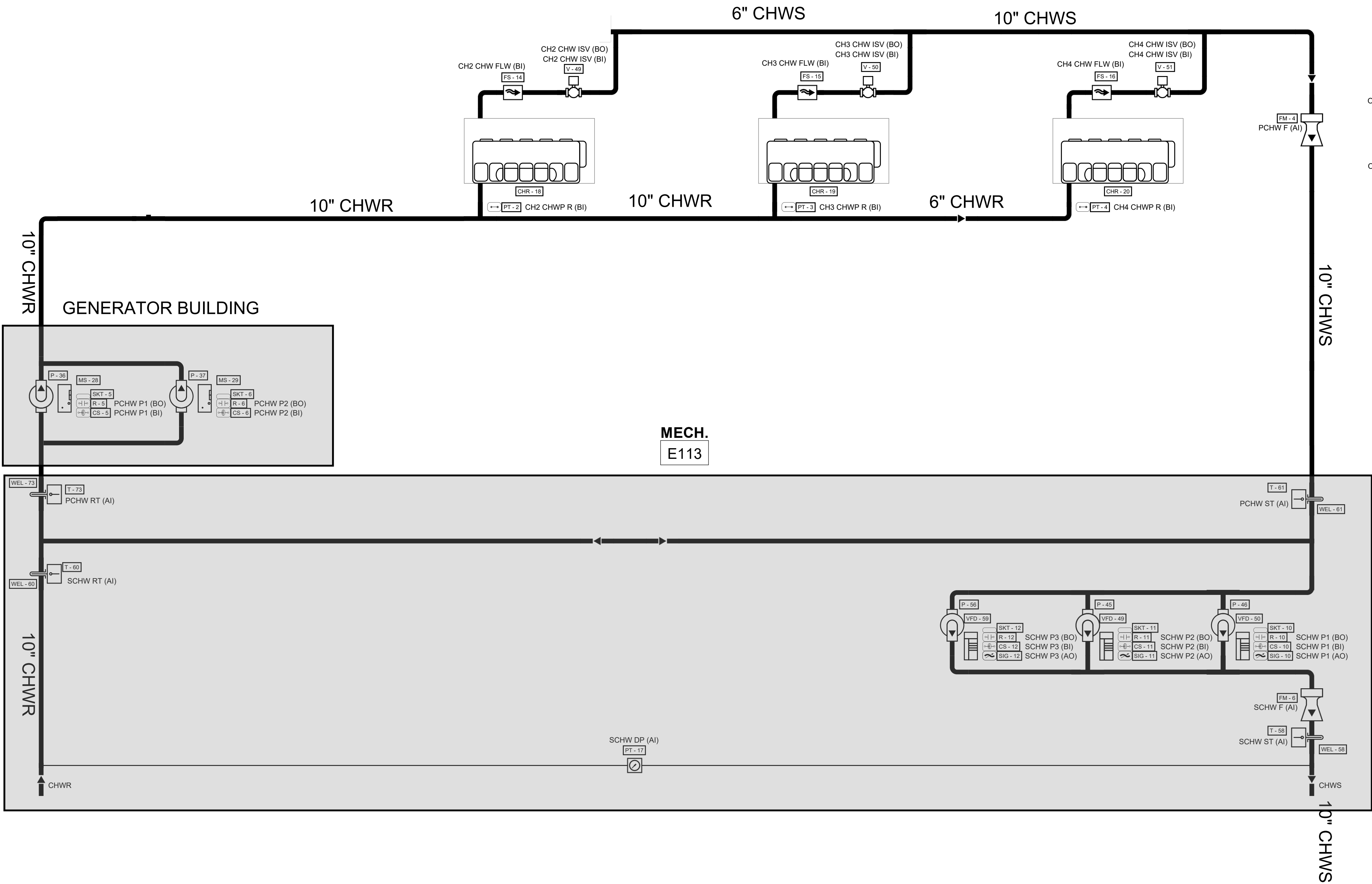
B

120V CONDENSATE PUMP

C

FACTORY OR FIELD-FABRICATED ANGLED FILTER BOX

Flow Diagram: COOLING PLANT SYSTEMS



Sequence of Operation: COOLING PLANT SYSTEMS

System General Description:

The cooling plant control system shall monitor and control the system's chiller(s), pump(s), and control valves as shown on the cooling plant flow diagram, in the cooling plant points list and as detailed in the sequence of operation listed below.

The cooling plant system consists of air-cooled chiller(s) with its piping configuration arranged as a primary / secondary loop supplying chilled water to the facility.

The manifolded chilled water distribution pumps are configured as lead / lag control.

Cooling Plant System Enable/Disable:

The cooling plant system shall be enabled/disabled by the cooling plant controller as requested by the Building Automation System (BAS) operator interface panel or the BAS time of day schedule. The cooling plant control system shall start and stop the chilled water pumps and chillers based upon system load.

When the cooling plant system is enabled the system shall enable the lead secondary chilled water pump to start based on a call for cooling from the BAS. When flow status for the pump is proven, the system shall report running status to the BAS.

When the cooling plant system is enabled the system shall send an enable signal to the lead chiller. Upon receiving the enable signal the chiller shall send a chilled water pump request signal to the control system to enable the chilled water pumping sequence.

When the cooling plant system is enabled, the system shall respond to a chilled water pump request from any system chiller. The system shall command the associated chilled water isolation valve open and enable the lead primary chilled water pump to start. As additional chillers make chilled water pump requests, open the associated chilled water isolation valve and enable the next (lag) primary chilled water pump to start.

The cooling plant is disabled when all chillers are disabled and there is not an active chilled water pump request. When the plant is disabled, the chilled water pumps shall be commanded off and the chiller isolation valves shall be closed.

Chiller Staging:

Chillers shall operate in a lead/lag sequence, so that the last chiller enabled is the first to be disabled. The cooling plant system shall initiate the start of the next chiller in the sequence whenever the chilled water load, as determined by the system supply water temperature, is not met for 20 minutes (adj.). The system shall initiate the shut down of the next chiller in the sequence whenever excess chilled water capacity exists, as determined by percent run load amps, for 20 minutes (adj.). Chiller lead/lag sequence order shall be based on a round robin logic. (Round robin logic example: 1-2-3, then 2-3-1, then 3-1-2, then 1-2-3, etc.).

The chiller sequence order can be rotated on a schedule. Chiller rotations shall be programmed to occur at one of the following operator-defined intervals:

NEVER: Chillers shall always have the same sequence number.

DAY OF WEEK: Chillers shall rotate on a user-specified day and time once per week.

FIXED NUMBER OF DAYS: Chillers shall rotate after the number of days specified has elapsed.

RUN HOURS: Chillers rotate to attempt to even out the amount of time each chiller runs. When any chiller reaches the user-defined run hours setpoint (which is measured only from the last rotation), the system controller can re-sequence the chillers, if necessary, to put the chiller with the least total run hours into a higher-use position in the sequence.

ROTATIONAL INPUT: Chillers shall rotate when the specified reference commands them to rotate.

From the BAS operator interface, an operator shall be able to manually change the lead/lag sequence or request any chiller to be unavailable which would remove it from the rotation sequence.

Chiller Isolation Valves:

Chiller isolation valves shall prevent the flow of fluid through non-operating chillers. When the system receives a chiller water pump request from a chiller, the chiller isolation valve shall be controlled to 100% open. Chiller isolation valve stroke time shall be (60-120) seconds (adj.) to reduce operating chiller flow transients. When the valve is confirmed to be 100% open the system shall start the respective chilled water pump. If the chiller's isolation valve is not confirmed open after (valve stroke time plus 60 sec) 180 seconds (adj.), the system shall annunciate a chiller isolation valve failure alarm to the BAS operator interface.

Primary Chilled Water Pump Commands:

When the chilled water system is enabled, the system shall start a chilled water pump through a contact closure of the pumps motor starter enable contacts. The system shall detect primary chilled water pump run status by a current switch.

The manifolded primary chilled water pumps shall operate in a lead/lag sequence that shall be rotated on a weekly schedule. The rotation sequence shall be based on calculated run time with the pump having the least run time designated as lead, the pump with the next lowest run time shall be the second in the sequence (or lag pump) and so on. From the BAS operator interface, an operator shall be able to manually change the lead/lag sequence or request any pump to be unavailable which would remove it from the rotation sequence.

Primary Chilled Water Pump Failure:

If the lead start/stop relay is enabled and the pump's running status is off for more than 30 seconds (adj.), the system shall annunciate a chilled water pump failure alarm to the BAS and start the next pump in the sequence. Once the problem has been corrected, the operator shall be able to clear the alarm failure from the BAS operator interface or by manually overriding the pump on. This shall re-enable the lead/standby sequence.

Secondary Chilled Water Pump Commands:

The system shall start a secondary chilled water pump through a contact closure of the pump's variable speed drive run-enable contacts. The system shall detect secondary chilled water pump run status by a variable speed drive current switch.

The secondary chilled water pump(s) lead/lag sequence shall be rotated on a weekly schedule. The rotation sequence shall be based on calculated run time with the pump having the least run time designated as lead, the pump with the next lowest run time shall be the second in the sequence (or lag pump) and so on. From the BAS operator interface, an operator shall be able to manually change the lead/lag sequence or request any pump to be unavailable which would remove it from the rotation sequence.

If the chilled water system differential pressure falls 0.5 psig (adj.) below setpoint and the lead pump is at 100% (adj.) for more than 5 minutes (adj.), the next pump in the sequence shall start. If the pump speed control output is below 65% (adj.) for more than 5 minutes (adj.), the last operating pump in the sequence shall be disabled.

Secondary Chilled Water Pump Speed:

The system shall monitor the secondary chilled water system differential pressure sensor. When the pump variable speed drive is enabled, the system shall control the analog speed signal that is sent to the variable speed drives of operating pumps to maintain a chilled water system differential pressure setpoint of 15 psig (adj.).

Secondary Chilled Water Pump Failure:

If the lead start/stop relay is enabled and the pump's running status is off for more than 30 seconds (adj.), the system shall annunciate a secondary chilled water pump failure alarm to the BAS and start the lag pump. When a secondary chilled water pump failure exists, lead/lag/standby automation shall be disabled and the currently running pump becomes the lead pump. Once the problem has been corrected, the operator shall be able to clear the alarm failure from the BAS operator interface. This shall re-enable the lead/lag/standby sequence.

Optimized Distribution Pump Differential Pressure Control:

The system shall monitor the chilled water system differential pressure sensor. The system shall control the chilled water pump(s) variable speed drive to maintain the chilled water system differential pressure to its setpoint. The BAS shall monitor the position of all chilled water control valves served by the cooling plant. At chilled water system startup, the chilled water system pressure setpoint shall be set to the system design value of XX psi (adj.). In all cases the distribution pump(s) differential pressure setpoint shall be bound between a minimum of 30 psi (adj) and a maximum of the system design value.

The setpoint control shall be based on ASHRAE Guideline 36 "Trim and Respond Logic". At a frequency of once every 10 minutes (adj), the control system shall calculate requests for cooling based on the criteria shown below:

CHILLERS (CH-1, CH-2, CH-3)

For each chiller:

Analog Inputs (AI)

- Chx Chilled Water Differential Pressure
- Chx Chilled Water Supply Temperature (if provided by chiller)
- Chx Chilled Water Return Temperature (if provided by chiller)

Binary Inputs (BI)

- Chx Chilled Water Flow Status
- Chx Isolation Valve Open Status
- Chx Chiller Run Status
- Chx General Alarm

Binary Outputs (BO)

- Chx Enable Command
- Chx Isolation Valve Command

Software Points (SFT)

- Chx Pump Request from Chiller
- Chx Availability Status

Alarms

- Chx Failure
- Chx Loss of Flow
- Chx Isolation Valve Failure

PRIMARY CHILLED WATER PUMPS (PCHWP-1, PCHWP-2)

Analog Inputs (AI)

- Primary CHW Supply Temperature
- Primary CHW Return Temperature
- Primary CHW Flow Meter

Binary Inputs (BI)

- PCHWP-x Run Status
- PCHWP-x VFD Fault
- PCHWP-x Failure

Analog Outputs (AO)

- PCHWP-x Speed Command

Binary Outputs (BO)

- PCHWP-x Start/Stop Command

Alarms

- Primary Pump Failure
- Primary Pump VFD Fault

SECONDARY CHILLED WATER PUMPS (SCHWP-1, SCHWP-2, SCHWP-3)

Analog Inputs (AI)

- Secondary CHW Differential Pressure
- Secondary CHW Supply Temperature
- Secondary CHW Return Temperature
- Secondary CHW Flow Meter

Binary Inputs (BI)

- SCHWP-x Run Status
- SCHWP-x VFD Fault
- SCHWP-x Failure

Analog Outputs (AO)

- SCHWP-x Speed Command

Binary Outputs (BO)

- SCHWP-x Start/Stop Command

Alarms

- Secondary Pump Failure
- Secondary Pump VFD Fault
- Differential Pressure Sensor Failure

SYSTEM LEVEL POINTS

Analog Inputs (AI)

- Outdoor Air Temperature
- Outdoor Air Humidity

Binary Inputs (BI)

- BAS Communication Status

Analog Setpoints (SFT)

- Chilled Water Supply Temperature Setpoint
- Outdoor Air Enable Setpoint

Binary Outputs (BO)

- Chiller Plant Enable

Software Points (SFT)

- Lead/Lag Rotation
- Plant Status
- Plant Mode

Alarms

- Chilled Water High Temperature
- Chilled Water Low Temperature
- Sensor Failure
- Communication Failure

1) The air handler unit (AHU) other equipment served by the cooling plant has been running in a Cooling Mode for 15 minutes (adj).

2) If an AHU's (or other equipment) chilled water valve is greater than 95%, send 1 request until the chilled water valve is less than 70%.

3) If an AHU's (or other equipment) chilled water valve is serving a critical load (i.e. data center), send 2 requests (adj) if an AHU's chilled water valve is greater than 95%, send 1 request when the chilled water valve is between 80% and 95%. Send zero requests when the chilled water valve is less than 65%.

4) Else if the chilled water valve is less than 95%, send 0 requests.

The BAS shall default to ignoring the first 2 requests (adj). (Note: At startup set Ignore value to at least 40% of the number of AHUs served).

When (Requests greater than Ignores) the system shall respond by adjusting the chilled water pump differential pressure setpoint upward by ((Requests - Ignores) * (3) psi) (adj), but no larger than 10 psi (adj). When requests are equal to, or less than Ignores, the setpoint shall be reset downward by 2 psi (adj).

IRN 002
7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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O.	DATE	DESCRIPTION
1	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

MECHANICAL CONTROLS

M-7.1

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HEAT RECOVERY CHILLER SYSTEM SEQUENCE OF OPERATIONS

SCALE: 12" = 1'-0"

Sequence of Operation: RTU04

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints.

Occupied:

During occupied periods, the supply fan shall run continuously and the mixed air dampers shall open to maintain minimum ventilation requirements.

In the cooling mode The chilled water valve shall modulate to control the discharge air setpoint.

In the heating mode the hot water valve shall modulate to control the discharge air setpoint.

If the discharge air temperature sensor fails, the chilled water valve should close, the heating valve should close, the outdoor air should close, and an alarm should annunciate at the BAS

Unoccupied:

During the unoccupied periods, the supply fan shall be disabled, the outside air damper shall close, the mechanical cooling shall be disabled, the mechanical heating shall be disabled, to conserve energy.

Optimal Stop:

Outside air damper shall remain enabled to provide minimum ventilation.

Morning Warm-Up Mode:

The outside air damper shall remain closed.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Occupied Humidity Control:

If the space relative humidity is greater than 50% (adj.), the chilled water valve shall modulate to maintain space relative humidity setpoint of 50% (adj.) and the reheat valve shall modulate to maintain the discharge air temperature setpoint. Mode shall terminate when the space relative humidity falls below the relative humidity setpoint of 50% (adj.) minus 3% (adj.). If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Demand Control Ventilation:

Using a return CO2 input (local sensor or network communicated value), the controller shall monitor and compare the measured return CO2 to the return CO2 concentration setpoint (adj.). When the measured return CO2 concentration reaches the setpoint (adj.), the outside air damper shall modulate open incrementally until the return air CO2 level is satisfied or the outside air damper reaches the full open position. If the measured CO2 concentration falls, the outside air damper shall modulate toward minimum outdoor air position setpoint. If the mixed air temperature drops below the mixed air low limit setpoint the CO2 sensor input is overridden and the outside air damper will be modulated closed to maintain the mixed air temperature low limit setpoint. When the mixed air temperature rises above the mixed air low limit setpoint, CO2 operation is restored.

Discharge Air Temperature Control:

Also, the BAS shall override this reset function whenever outdoor dew point is higher than 60.0 deg. F (adj.) or indoor humidity (measured at the source of control) is higher than 60% RH (adj.). If the discharge air temperature drops below the minimum limit, a low temperature alarm shall annunciate, and the unit shall shut down. If the discharge air temperature rises above the maximum limit, a high temperature alarm shall annunciate.

Supply Fan:

The supply fan shall be off in the unoccupied mode. The supply fan shall be on if the control is heating or cooling in the unoccupied mode. When the controller is in the occupied mode, the supply fan shall operate continuously. The supply fan should be modulated to maintain a constant air flow setpoint. The supply fan should be modulated to maintain a constant speed. The speed will be determined by the test and balance contractor.

If the supply fan fails to prove status for 30 seconds (adj.), the fan shall be commanded off, the outside air damper shall close, cooling shall be disabled, all heating shall be disabled, and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Preheat Control:

When the fan is off, if the outdoor air temperature is below 40.0 deg. F (adj.) or the outside air temperature sensor is failed, the preheat valve shall modulate to maintain a mixed air temperature of 45.0 deg. F (adj.). If the outdoor air temperature is above 40.0 deg. F (adj.) and the outdoor air temperature sensor is not failed the preheat valve shall be closed. If the mixed air temperature sensor fails the preheat valve shall be 10% open.

When the fan is on, the preheat shall control to maintain a leaving preheat temperature of 45.0 deg. F (adj.). If the preheat temperature sensor fails and the mixed air temperature is below 45.0 deg. F (adj.) the preheat valve shall be 10% open. If the preheat temperature sensor fails and the mixed air temperature is above 50.0 deg. F (adj.) the preheat valve shall be commanded closed. An alarm shall annunciate at the BAS if the leaving preheat temperature sensor, the mixed air temperature sensor or the outside air temperature sensor are failed.

Mixed Air Low Limit:

The initial damper opening rate shall be limited to 2% per minute (adj.) until the damper has reached its minimum ventilation position. The outside air damper shall modulate to a position less than the minimum damper position if the mixed air temperature drops below 50.0 deg. F (adj.). If the mixed air temperature sensor fails an alarm shall annunciate at the BAS and the outside air damper shall return to the minimum position.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the motor starter. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the fan shall be commanded off and the outside air damper shall close. All valves shall be commanded open to 100% open (adjust per climate). An alarm shall annunciate at the BAS and manual reset of the low limit temperature switch shall be required to restart the fan.

Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Filter Status:

A differential pressure switch shall monitor the differential pressure across the filter(s) when the fan is running. If the switch closes during normal operation a dirty filter alarm shall annunciate at the BAS.

Points List - RTU04	System Point Description	POINTS										ALARMS				
		GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HWI)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
	AIR CLEANING ACCESS DOOR INTERLOCK...						X									
	AIR CLEANING ACCESS DOOR INTERLOCK...						X									
	CHANGEOVER COIL LEAVING AIR TEMPERATURE...	X	X							X	X			X		
	COIL LEAVING AIR LOW TEMP CUTOUT ALARM...			X									X			
	COMPRESSOR 1 COMMAND...	X			X											
	COMPRESSOR 2 COMMAND...	X			X											
	COMPRESSOR 3 COMMAND...	X			X											
	COMPRESSOR 4 COMMAND...	X			X											
	CONDENSATE OVERFLOW DETECTION LOCAL...	X	X									X	X			
	COOLING COIL LEAVING TEMPERATURE...	X	X							X	X			X		
	COOLING OUTPUT COMMAND...	X			X											
	FILTER STATUS...	X	X									X				
	HEATING OUTPUT COMMAND...	X		X												
	MIXED AIR DAMPER COMMAND...	X			X											
	MIXED AIR LOW TEMPERATURE CUTOUT ALARM...			X									X			
	MIXED AIR TEMPERATURE LOCAL...	X	X								X			X		
	OUTDOOR AIR DAMPER COMMAND...			X		X										
	OUTDOOR AIR FLOW...	X	X													
	OUTDOOR AIR RELATIVE HUMIDITY LOCAL...	X	X													
	OUTDOOR AIR TEMPERATURE LOCAL...	X	X													
	PREHEAT LEAVING COIL TEMPERATURE LOCAL...	X	X											X		
	PREHEAT OUTPUT COMMAND...	X			X											
	REHEAT LEAVING COIL TEMPERATURE LOCAL...	X	X							X	X			X		
	REHEAT OUTPUT COMMAND...	X			X											
	RETURN AIR CO2 LOCAL...		X	X						X						
	RETURN AIR DAMPER COMMAND...	X			X											
	RETURN AIR HUMIDITY LOCAL...	X	X							X						
	RETURN AIR TEMPERATURE LOCAL...	X	X													
	SPACE HUMIDITY LOCAL...	X						X						X		
	SPACE TEMPERATURE LOCAL...	X						X		X	X			X		
	SPACE TEMPERATURE SETPOINT LOCAL...	X						X								
	SUPPLY AIR HUMIDITY LOCAL...	X	X							X	X			X		
	SUPPLY FAN START STOP COMMAND...	X			X											
	SUPPLY FAN STATUS...	X		X												
	SUPPLY FAN 2 SPEED COMMAND...	X			X											
	SUPPLY FAN 2 START STOP COMMAND...	X			X											
	SUPPLY FAN 2 STATUS...	X		X												
	BAS COMMUNICATION STATE...					X									X	
	MAINTENANCE REQUIRED...					X						X				
	MIXED AIR TEMPERATURE LOW LIMIT SETPOINT...					X										
	OCCUPIED COOLING SETPOINT...	X				X										
	OCCUPIED HEATING SETPOINT...	X				X										
	SUPPLY FAN FAILURE...	X				X						X				
	UNOCCUPIED COOLING SETPOINT...	X				X										
	UNOCCUPIED HEATING SETPOINT...	X				X										

Sequence of Operation: RTU01, 02, 03 [QTY: 3]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints.

Occupied:

During occupied periods, the supply fan shall run continuously and the mixed air dampers shall open to maintain minimum ventilation requirements.

In the cooling mode The chilled water valve shall modulate to control the discharge air setpoint.

In the heating mode the hot water valve shall modulate to control the discharge air setpoint.

If the discharge air temperature sensor fails, the chilled water valve should close, the heating valve should close, the outdoor air should close, and an alarm should annunciate at the BAS

Unoccupied:

During the unoccupied periods, the supply fan shall be disabled, the outside air damper shall close, the mechanical cooling shall be disabled, the mechanical heating shall be disabled, to conserve energy.

Optimal Stop:

Outside air damper shall remain enabled to provide minimum ventilation.

Morning Warm-Up Mode:

The outside air damper shall remain closed.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Occupied Humidity Control:

If the space relative humidity is greater than 50% (adj.), the chilled water valve shall modulate to maintain space relative humidity setpoint of 50% (adj.) and the reheat valve shall modulate to maintain the discharge air temperature setpoint. Mode shall terminate when the space relative humidity falls below the relative humidity setpoint of 50% (adj.) minus 3% (adj.). If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Discharge Air Temperature Control:

Also, the BAS shall override this reset function whenever outdoor dew point is higher than 60.0 deg. F (adj.) or indoor humidity (measured at the source of control) is higher than 60% RH (adj.). If the discharge air temperature drops below the minimum limit, a low temperature alarm shall annunciate, and the unit shall shut down. If the discharge air temperature rises above the maximum limit, a high temperature alarm shall annunciate.

Supply Fan:

The supply fan shall be off in the unoccupied mode. The supply fan shall be on if the control is heating or cooling in the unoccupied mode. When the controller is in the occupied mode, the supply fan shall operate continuously. The supply fan should be modulated to maintain a constant air flow setpoint. The supply fan should be modulated to maintain a constant speed. The speed will be determined by the test and balance contractor.

If the supply fan fails to prove status for 30 seconds (adj.), the fan shall be commanded off, the outside air damper shall close, cooling shall be disabled, all heating shall be disabled, and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Mixed Air Low Limit:

The initial damper opening rate shall be limited to 2% per minute (adj.) until the damper has reached its minimum ventilation position. The outside air damper shall modulate to a position less than the minimum damper position if the mixed air temperature drops below 50.0 deg. F (adj.). If the mixed air temperature sensor fails an alarm shall annunciate at the BAS and the outside air damper shall return to the minimum position.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the motor starter. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the fan shall be commanded off and the outside air damper shall close. All valves shall be commanded open to 100% open (adjust per climate). An alarm shall annunciate at the BAS and manual reset of the low limit temperature switch shall be required to restart the fan.

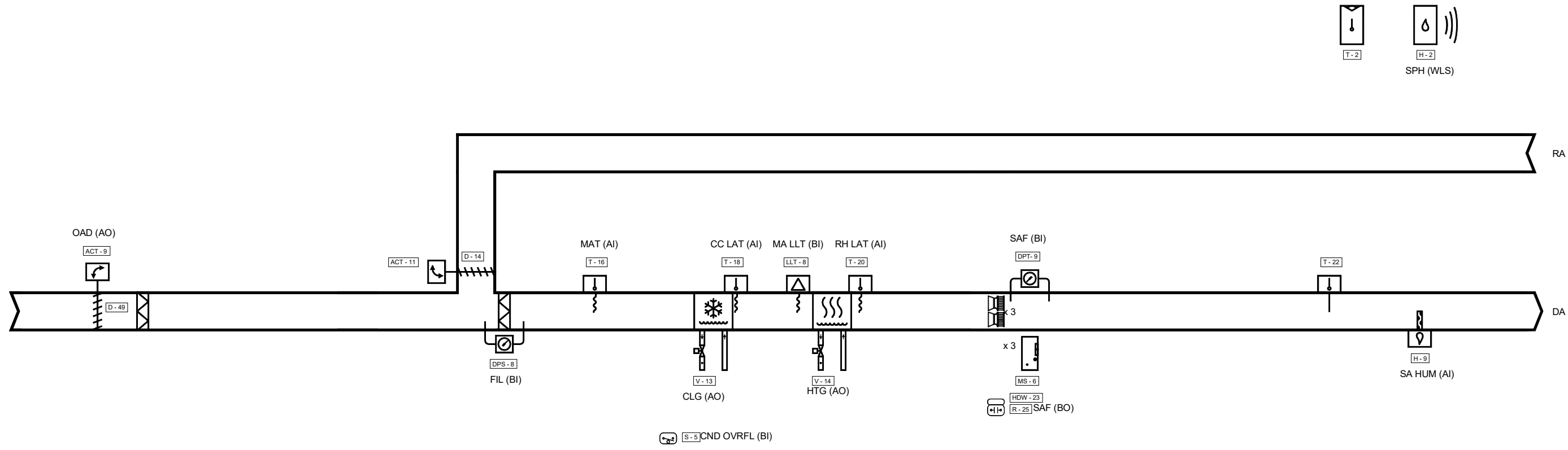
Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

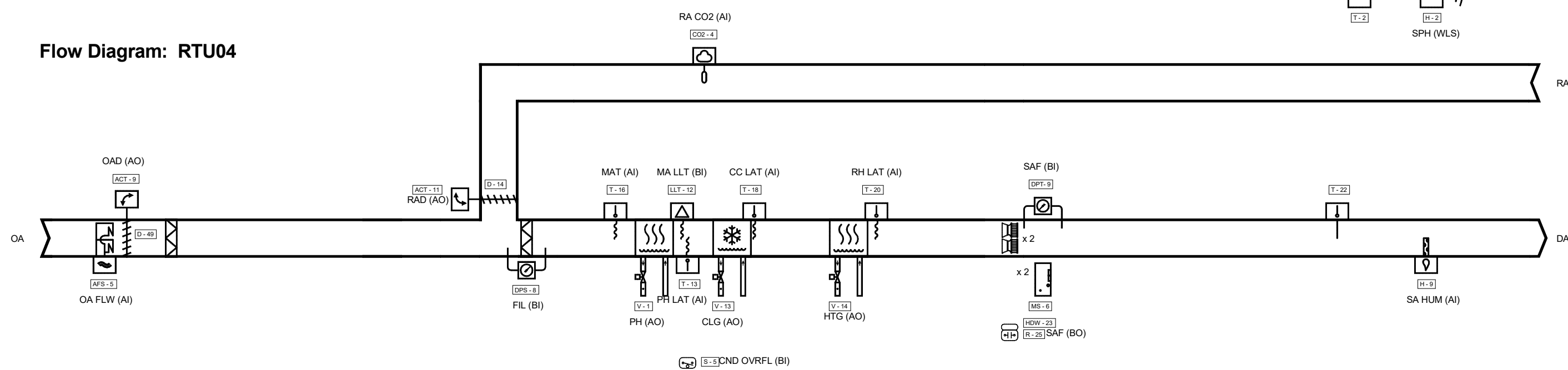
Filter Status:

A differential pressure switch shall monitor the differential pressure across the filter(s) when the fan is running. If the switch closes during normal operation a dirty filter alarm shall annunciate at the BAS.

Flow Diagram: RTU01, 02, 03 [QTY: 3]



Flow Diagram: RTU04



RTU04 CONTROLS

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

2

RTU01, 02, 03 CONTROLS

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

1

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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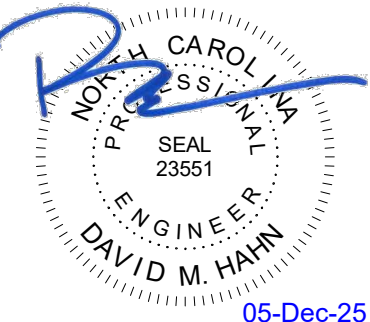
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05-Dec-25

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

MECHANICAL CONTROLS

M-7.3

Sequence of Operation: VAV07-1, 2, 3 [QTY: 3]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied, and Unoccupied commands. The BAS may also send a Heat/Cool mode, priority shutdown commands, space temperature and/or space temperature setpoint. If communication is lost with the BAS, the controller shall operate using its local setpoints.

Occupied:

The occupancy mode will be communicated or hardwired to the controller via a binary input. When the unit is in the occupied mode the VAV will maintain the space temperature at the active occupied heating or cooling setpoint. Applicable ventilation and airflow setpoints will be enforced. The occupied mode will be the default mode of the VAV. Applicable ventilation and airflow setpoints will be enforced. The occupied mode will be the default mode of the VAV.

Occupied Standby:

The occupancy mode will be communicated or hardwired to the controller via a binary input, even though the BAS has scheduled the space as occupied. In the occupied standby mode, the active cooling and heating setpoints shall be relaxed (see cooling and heating mode) and both the ventilation airflow and minimum airflow setpoints shall be lowered (see VAV schedule).

Occupied Bypass:

Mode used to temporarily place the unit into the occupied operation. Tenants shall be able to override the unoccupied mode from the space sensor. The override shall last for a maximum of 4 hours (adj.). The tenants shall be able to cancel the override from the space sensor at any time. During the override the unit shall operate in occupied mode.

Heat/Cool Mode:

The Heat/Cool mode shall be set by a communicated value or automatically by the VAV. In standalone or auto mode the VAV shall compare the primary air temperature with the configured auto changeover setpoint to determine if the air is "hot" or "cold". Heating mode implies the primary air temperature is hot. Cooling mode implies the primary air temperature is cold.

Cooling Mode:

When the unit is in cooling mode, the VAV controller shall maintain the space temperature at the active cooling setpoint by modulating the airflow between the active cooling minimum airflow setpoint to the maximum cooling airflow setpoint. The VAV shall use the measured space temperature and the active cooling setpoint to determine the requested cooling capacity of the unit. The outputs will be controlled based on the unit configuration and the requested cooling capacity.

Based on the VAV controller occupancy mode, the active cooling setpoint will be one of the following:

Setpoint	Default Value
Occupied Cooling Setpoint	74.0 deg. F
Unoccupied Cooling Setpoint	85.0 deg. F
Occupied Standby Cooling Setpoint	78.0 deg. F
Occupied Min Cooling Airflow Setpoint	See VAV Schedule
Occupied Max Cooling Airflow Setpoint	See VAV Schedule

Heat/Cool Setpoint:

The space temperature setpoint shall be determined either by a local (e.g., thumbwheel) setpoint, the VAV default setpoint or a communicated value. The VAV shall use the locally stored default setpoints when neither a local setpoint nor communicated setpoint is present. If both a local setpoint and communicated setpoint exist, the VAV shall use the communicated value.

Reheat Control Mode:

Reheat will only be allowed when the supply air temperature is 5.0 deg. F below the configured reheat enable setpoint of 70.0 deg. F (adj.). The reheat will be enabled when the space temperature drops below the active heating setpoint and the minimum airflow requirements are met. During reheat the VAV will operate at its minimum heating airflow setpoint and energize the heat as follows:

Setpoint	Default Value
Occupied Heating Setpoint	71.0 deg. F
Unoccupied Heating Setpoint	80.0 deg. F
Occupied Standby Heating Setpoint	67.0 deg. F
Occupied Min Heating Airflow Setpoint	See VAV Schedule
Occupied Max Heating Airflow Setpoint	See VAV Schedule

Reheat will only be allowed when the supply air temperature is 5.0 deg. F below the configured reheat enable setpoint of 70.0 deg. F (adj.). Reheat Control:

- Primary air temperature is 5.0 deg. F below the configured reheat enable setpoint of 70.0 deg. F (adj.).
- Space temperature drops below the active heating setpoint and the minimum airflow requirements are met.
- Supply air temperature is below the configured reheat enable setpoint.

When reheat enabled, the VAV will operate at its minimum heating airflow setpoint and control the heat as follows:

Modulating Hot Water Reheat:

If the space temperature is below the heating setpoint the hot water reheat valve will modulate as required to maintain space temperature at the active heating setpoint while the VAV operates at its minimum heating airflow setpoint. If the discharge air temperature reaches the design heating discharge air temperature setpoint (adj.), the VAV will modulate airflow between the minimum heating airflow setpoint and the maximum heating airflow setpoint as required to maintain space temperature at the active heating setpoint, while the hot water reheat valve modulates to maintain discharge air temperature at the design heating discharge air temperature setpoint. If the airflow reaches the maximum heating airflow setpoint, the VAV will modulate the hot water reheat valve as required to maintain space temperature at the active heating setpoint, while the VAV operates at its maximum heating airflow setpoint.

Heating Mode:

When the unit is in heating mode, the VAV controller will maintain the space temperature at the active heating setpoint by modulating the VAV damper (between the active heating minimum and maximum airflow setpoints). Based on the VAV controller occupancy mode, the active heating setpoint will be one of the following:

Setpoint	Default Value
Occupied Heating Setpoint	71.0 deg. F
Unoccupied Heating Setpoint	80.0 deg. F
Occupied Standby Heating Setpoint	67.0 deg. F
Occupied Min Heating Airflow Setpoint	See VAV Schedule
Occupied Max Heating Airflow Setpoint	See VAV Schedule

Local Reheat Control:

Reheat will only be allowed when the primary air temperature is 5.0 deg. F below the configured reheat enable setpoint of 70.0 deg. F (adj.). The reheat shall be enabled when the space temperature drops below the active heating setpoint and the minimum airflow requirements are met. During reheat the VAV shall operate at its minimum heating airflow setpoint and energize the heat as follows:

Proportional Hot Water Reheat:

If the space temperature is below the heating setpoint the hot water reheat valve shall control as required to maintain the active heating setpoint.

Demand Control Ventilation:

When the unit is in unoccupied mode, the ventilation airflow setpoint will be zero. When the unit is in occupied mode, the ventilation airflow setpoint shall equal the design outdoor airflow (see VAV schedule).

The current ventilation airflow setpoint shall be communicated to the BAS for control of the system outdoor-air intake.

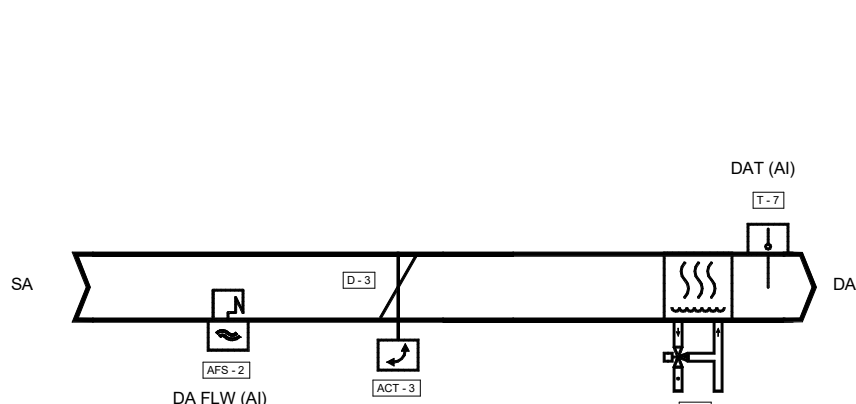
Space Sensor Failure:

If there is a fault with the operation of the zone sensor an alarm shall be annunciated at the BAS. Space sensor failure shall cause the VAV to drive the damper to minimum air flow if the VAV is in the occupied mode, or drive it closed if the VAV is in the unoccupied mode.

Space Humidity Monitoring:

The VAV Box will monitor the space humidity.

Flow Diagram: VAV07-1, 2, 3 [QTY: 3]



VAV TERMINAL UNITS CONTROLS

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

IRN 002
7/2/2026
RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
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NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

MECHANICAL CONTROLS

M-7.4

Sequence of Operation: AHU07

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. The BAS shall also send the discharge air temperature setpoint and the duct static pressure setpoint. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints.

Occupied:

During occupied periods, the supply fan shall run continuously and the mixed air dampers shall open to maintain minimum ventilation requirements.

In the cooling mode The chilled water valve shall modulate to control the discharge air setpoint.

to control the discharge air setpoint.

If the discharge air temperature sensor fails, the cooling will fallback to control to the active space temperature setpoint and an alarm shall be annunciated at the BAS

If the discharge air temperature sensor fails, and the space temperature sensor fails, the chilled water valve should close, the outdoor air should close, and an alarm should annunciate at the BAS

Unoccupied:

During the unoccupied periods, the supply fan shall be disabled, the outside air damper shall close, the mechanical cooling shall be disabled, to conserve energy.

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall switch to the unoccupied mode. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Heat/Cool Mode:

When the space temperature rises above the occupied cooling setpoint the mode shall transition to cooling. When the space temperature falls below the occupied heating setpoint the mode shall transition to heating. When the space temperature is below the occupied cooling setpoint and above the occupied heating setpoint the mode shall remain in its last state. If the space temperature sensor fails the mode shall remain in its last state and an alarm shall annunciate at the BAS. If the local and communicated setpoints fail the controller shall disable the supply fan and an alarm shall annunciate at the BAS.

Morning Warm-Up Mode:

During optimal start, if the average space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Daytime Warm-Up Control:

During Occupied periods, when the space temperature is below the Daytime Warm-up Initiate setpoint, a daytime warm-up sequence shall be activated. The outside air damper shall modulate to maintain minimum ventilation requirements, and the heating shall enable to maintain the discharge air temperature heating setpoint. Daytime Warm-up shall terminate when the average space temperature reaches the Occupied heating setpoint.

Pre-Cool Mode:

During optimal start, if the average space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Discharge Air Temperature Control:

The discharge air temperature setpoint shall be reset to the optimal setpoint communicated by the BAS. The Space Temperature BAS and the Space Temperature Setpoint BAS shall be communicated to the unit controller by the BAS. The discharge air temperature setpoint shall be reset based upon the deviation of the Space Temperature BAS from the Space Temperature Setpoint BAS. If the discharge air temperature drops below the minimum limit, a low temperature alarm shall annunciate, and the unit shall shut down.

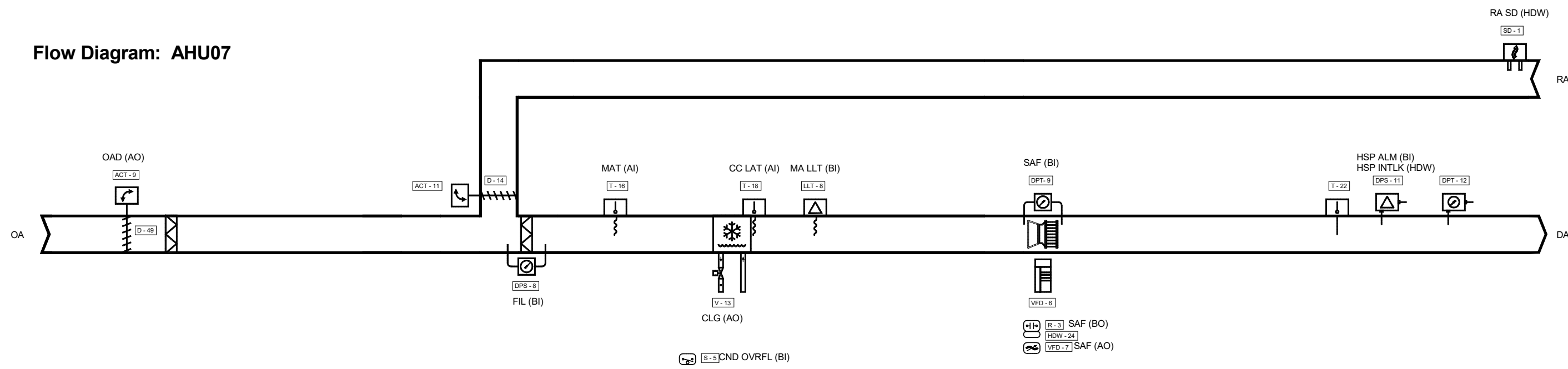
Supply Fan:

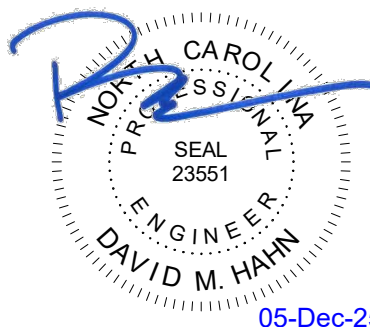
The supply fan shall be off in the unoccupied mode. The supply fan shall be on if the control is heating or cooling in the unoccupied mode. When the controller is in the occupied mode, the supply fan shall operate continuously. The supply fan speed shall be modulated to maintain the duct static pressure setpoint. The supply fan should be modulated to maintain a constant air flow setpoint. The supply fan should be modulated to maintain a constant speed. The speed will be determined by the test and balance contractor. The duct static pressure setpoint shall be sent by the BAS and is reset between the minimum and maximum static pressure limits to maintain the critical zone VAV air damper in a position between 65% and 75% open.

If the supply fan fails to prove status for 30 seconds (adj.), the fan shall be commanded off, the outside air damper shall close, cooling shall be disabled, and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

A hardwired, high static pressure cut-off switch shall be electrically interlocked with the variable speed drive. If the high static pressure cut-off switch is tripped the fan shall be commanded off, cooling should be disabled, and an alarm shall annunciate at the BAS. A manual reset of the high static pressure cut-off switch shall be required to restart the fan.

Flow Diagram: AHU07





NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

MECHANICAL CONTROLS

M-7.5

Sequence of Operation: FCU03, 15, 17, 20, 21 [QTY: 5]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously and the outdoor air damper shall open to maintain minimum ventilation requirements. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start and the DX cooling shall be enabled. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F minus the unoccupied differential 4.0 deg. F (adj.) the supply fan shall stop and the DX cooling shall be disabled. Test for bug reporting

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start at high speed before transitioning to continuous operation at the selected speed. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the safety circuit. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the supply fan shall be commanded off, water valves shall open to 100%, outside air damper shall close, and an alarm shall annunciate at the BAS.

The controller shall automatically attempt to restart the unit after 30 minutes. If the unit restarts successfully with no low temperature condition, the diagnostic is cleared. If a second low temperature condition occurs within a 24 hour period the unit shall be locked out until manually reset.

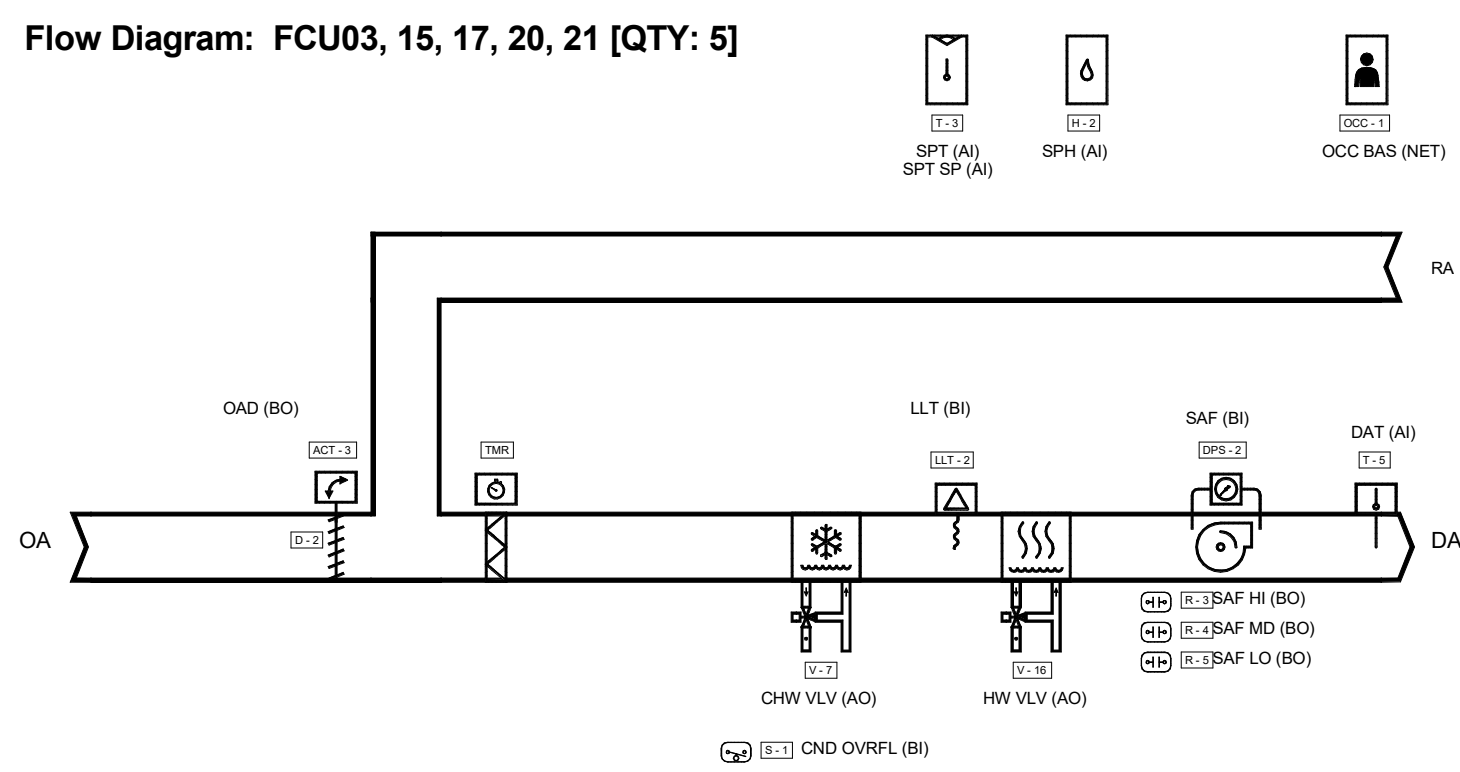
Filter Timer:

The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

Points List - FCU03, 15, 17, 20, 21 [QTY: 5]

System Point Description	POINTS										ALARMS				
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT ...	BINARY HARDWARE OUTPUT ...	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HOW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
CHILLED WATER VALVE...	X		X												
CONDENSATE OVERFLOW DETECTION LOCAL...	X	X										X	X		
DISCHARGE AIR TEMPERATURE...	X	X							X	X				X	
HOT WATER VALVE...	X		X												
LOW LIMIT CUTOUT...	X	X										X	X		
OUTDOOR AIR DAMPER...	X			X											
SPACE HUMIDITY SENSOR LOCAL...	X	X								X				X	
SPACE TEMPERATURE LOCAL...	X	X								X	X			X	
SPACE TEMPERATURE SETPOINT LOCAL...	X	X													
SUPPLY FAN STATUS LOCAL...	X	X	X												
SUPPLY FAN OUTPUT HIGH...	X			X											
SUPPLY FAN OUTPUT MEDIUM...	X			X											
SUPPLY FAN OUTPUT LOW...	X			X											
BAS COMMUNICATION STATE...					X										X
FILTER TIMER HOURS...					X							X	X		
MAINTENANCE REQUIRED...					X							X			
SPACE DEHUMIDIFICATION SETPOINT...					X										
SPACE TEMPERATURE SETPOINT ACTIVE...	X			X											
OCCUPIED BYPASS TIMER...					X										
OCCUPIED COOLING SETPOINT...	X			X											
OCCUPIED HEATING SETPOINT...	X			X											
UNOCCUPIED COOLING SETPOINT...	X			X											
OCCUPANCY BAS...	X						X		X						
UNOCCUPIED HEATING SETPOINT...	X				X										

Flow Diagram: FCU03, 15, 17, 20, 21 [QTY: 5]



Sequence of Operation: FCU01, 02 [QTY: 2]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously and the outdoor air damper shall open to maintain minimum ventilation requirements. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is below the unoccupied heating setpoint of 60.0 deg. F (adj.) the supply fan shall start, the outside air damper shall remain closed and the hot water valve shall open. When the space temperature rises above the unoccupied heating setpoint of 60.0 deg. F (adj.) plus the unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop and the hot water valve shall close. When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start, the outside air damper shall remain closed and the chilled water valve shall open. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F (adj.) minus the Unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop, the chilled water valve shall close and the outside air damper shall remain closed.

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

If the space relative humidity is greater than the humidity setpoint, the chilled water valve shall modulate to maintain space relative humidity and the hot water valve shall modulate to maintain the space temperature cooling setpoint. Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start and run continuously. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the safety circuit. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the supply fan shall be commanded off, water valves shall open to 100%, outside air damper shall close, and an alarm shall annunciate at the BAS.

The controller shall automatically attempt to restart the unit after 30 minutes. If the unit restarts successfully with no low temperature condition, the diagnostic is cleared. If a second low temperature condition occurs within a 24 hour period the unit shall be locked out until manually reset.

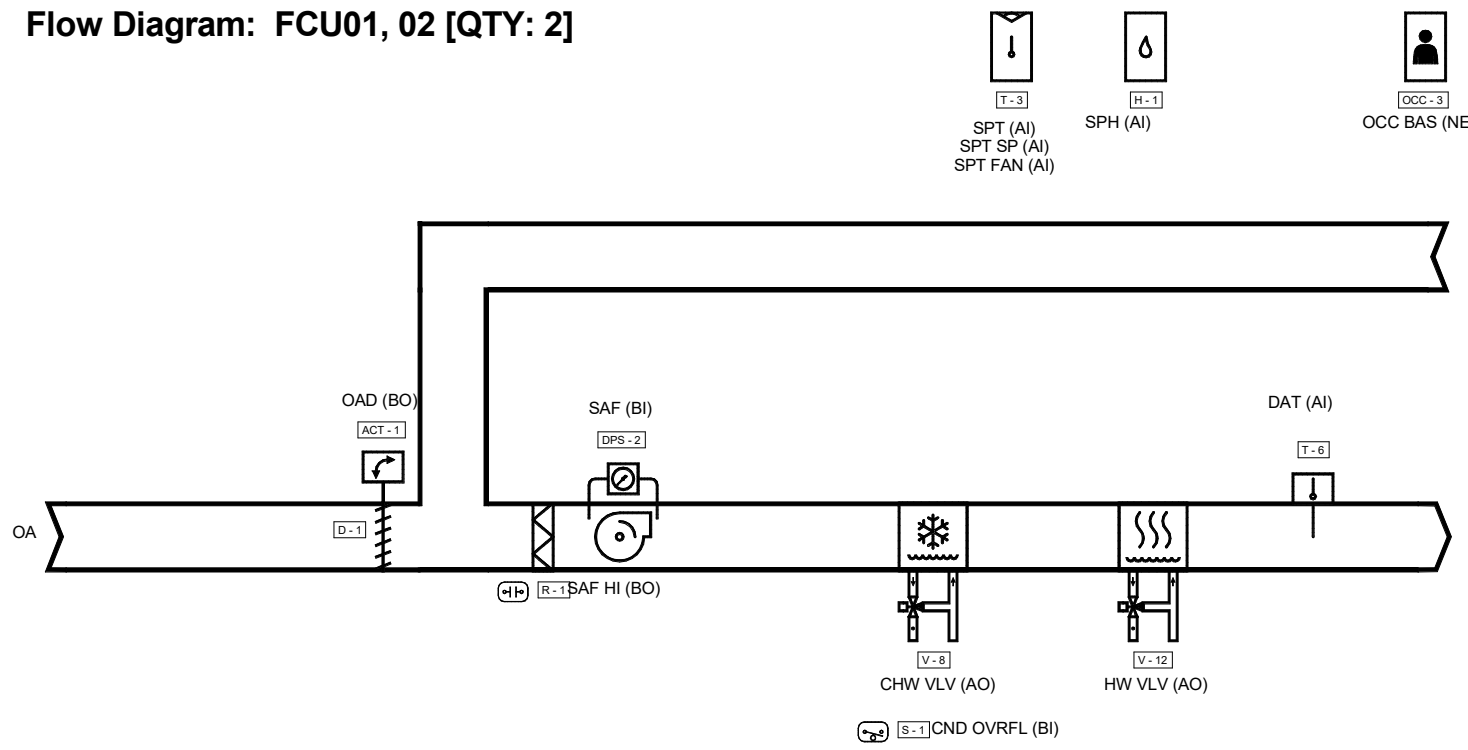
Filter Timer:

The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

Points List - FCU01, 02 [QTY: 2]

System Point Description	POINTS										ALARMS				
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HOW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
CHILLED WATER VALVE...	X														
CONDENSATE OVERFLOW DETECTION LOCAL...	X	X							X	X			X	X	
DISCHARGE AIR TEMPERATURE...	X	X								X	X				X
HOT WATER VALVE...	X		X												
LOW LIMIT CUTOUT...	X	X										X	X		
OUTDOOR AIR DAMPER...	X			X											
SPACE HUMIDITY SENSOR LOCAL...	X	X								X					X
SPACE TEMPERATURE LOCAL...	X	X								X	X				X
SPACE TEMPERATURE SETPOINT LOCAL...	X	X													
SUPPLY FAN STATUS LOCAL...	X		X												
SUPPLY FAN OUTPUT HIGH...	X			X											
BAS COMMUNICATION STATE...					X										X
FILTER TIMER HOURS...					X								X	X	
MAINTENANCE REQUIRED...					X								X		
OCCUPANCY BAS...	X								X						
OCCUPIED BYPASS TIMER...					X										
OCCUPIED COOLING SETPOINT...	X			X											
OCCUPIED HEATING SETPOINT...	X			X											
SPACE DEHUMIDIFICATION SETPOINT...					X										
SPACE TEMPERATURE SETPOINT ACTIVE...	X			X											
UNOCCUPIED COOLING SETPOINT...	X			X											
UNOCCUPIED HEATING SETPOINT...	X			X											
SPACE FAN SETPOINT...		X													

Flow Diagram: FCU01, 02 [QTY: 2]





NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

MECHANICAL CONTROLS

M-7.6

Sequence of Operation: FCU05, 06, 11, 12 [QTY: 4]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously and the outdoor air damper shall open to maintain minimum ventilation requirements. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start and the DX cooling shall be enabled. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F minus the unoccupied differential 4.0 deg. F (adj.) the supply fan shall stop and the DX cooling shall be disabled. Test for bug reporting

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start at high speed before transitioning to continuous operation at the selected speed. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the safety circuit. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the supply fan shall be commanded off, water valves shall open to 100%, outside air damper shall close, and an alarm shall annunciate at the BAS.

The controller shall automatically attempt to restart the unit after 30 minutes. If the unit restarts successfully with no low temperature condition, the diagnostic is cleared. If a second low temperature condition occurs within a 24 hour period the unit shall be locked out until manually reset.

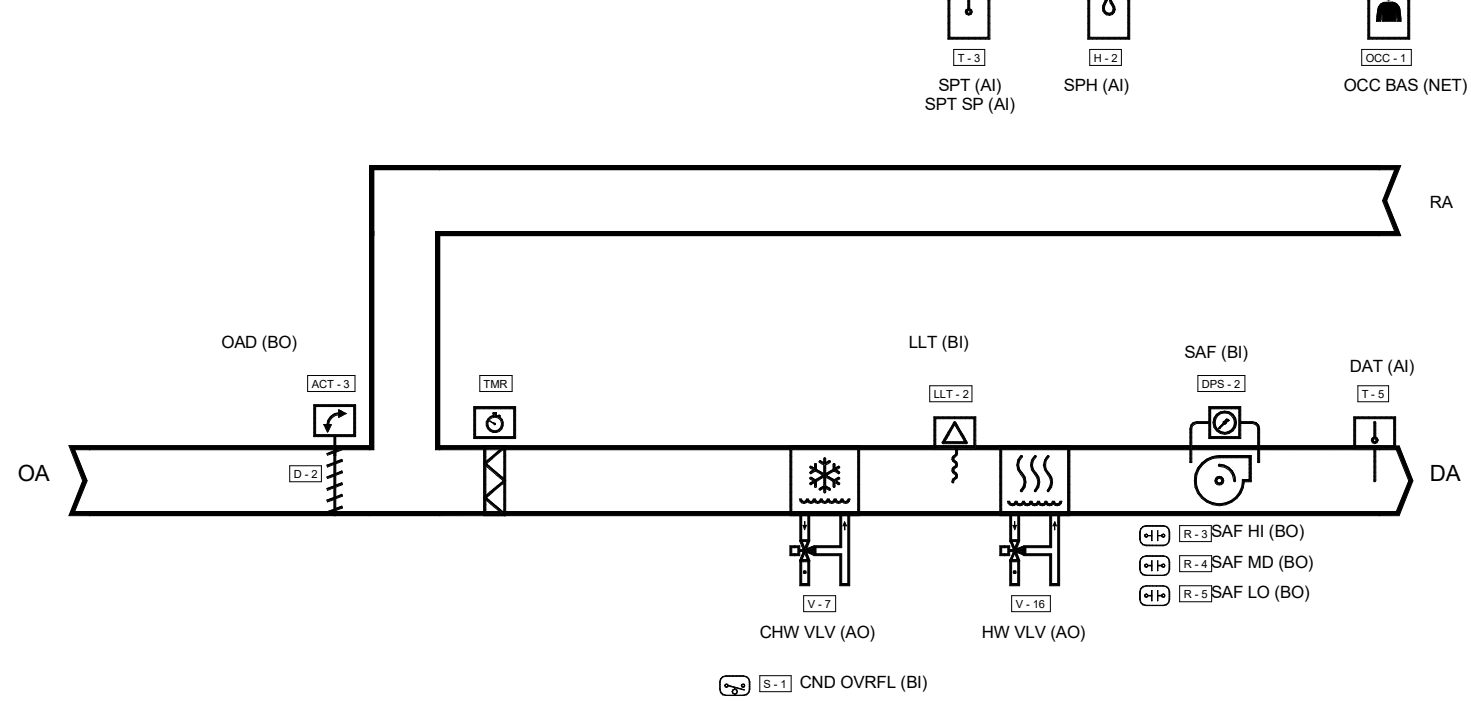
Filter Timer:

The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

Points List - FCU05, 06, 11, 12 [QTY: 4]

System Point Description	POINTS										ALARMS				
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SPT)	HARDWARE INTERLOCK (HWI)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
CHILLED WATER VALVE...	X			X											
CONDENSATE OVERFLOW DETECTION LOCAL...	X	X										X	X		
DISCHARGE AIR TEMPERATURE...	X	X								X	X			X	
HOT WATER VALVE...	X		X												
LOW LIMIT CUTOUT...	X	X										X	X		
OUTDOOR AIR DAMPER...	X			X											
SPACE HUMIDITY SENSOR LOCAL...	X	X							X					X	
SPACE TEMPERATURE LOCAL...	X	X							X	X				X	
SPACE TEMPERATURE SETPOINT LOCAL...	X	X													
SUPPLY FAN STATUS LOCAL...	X		X												
SUPPLY FAN OUTPUT HIGH...	X			X											
SUPPLY FAN OUTPUT MEDIUM...	X			X											
SUPPLY FAN OUTPUT LOW...	X			X											
BAS COMMUNICATION STATE...				X											X
FILTER TIMER HOURS...				X								X	X		
MAINTENANCE REQUIRED...				X								X			
SPACE DEHUMIDIFICATION SETPOINT...				X											
SPACE TEMPERATURE SETPOINT ACTIVE...	X		X												
OCCUPIED BYPASS TIMER...				X											
OCCUPIED COOLING SETPOINT...	X		X												
OCCUPIED HEATING SETPOINT...	X			X											
UNOCCUPIED COOLING SETPOINT...	X		X												
OCCUPANCY BAS...								X							
UNOCCUPIED HEATING SETPOINT...	X			X											

Flow Diagram: FCU05, 06, 11, 12 [QTY: 4]



Sequence of Operation: FCU04, 07, 08, 16 [QTY: 4]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously and the outdoor air damper shall open to maintain minimum ventilation requirements. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start and the DX cooling shall be enabled. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F minus the unoccupied differential 4.0 deg. F (adj.) the supply fan shall stop and the DX cooling shall be disabled. Test for bug reporting

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start at high speed before transitioning to continuous operation at the selected speed. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the safety circuit. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the supply fan shall be commanded off, water valves shall open to 100%, outside air damper shall close, and an alarm shall annunciate at the BAS.

The controller shall automatically attempt to restart the unit after 30 minutes. If the unit restarts successfully with no low temperature condition, the diagnostic is cleared. If a second low temperature condition occurs within a 24 hour period the unit shall be locked out until manually reset.

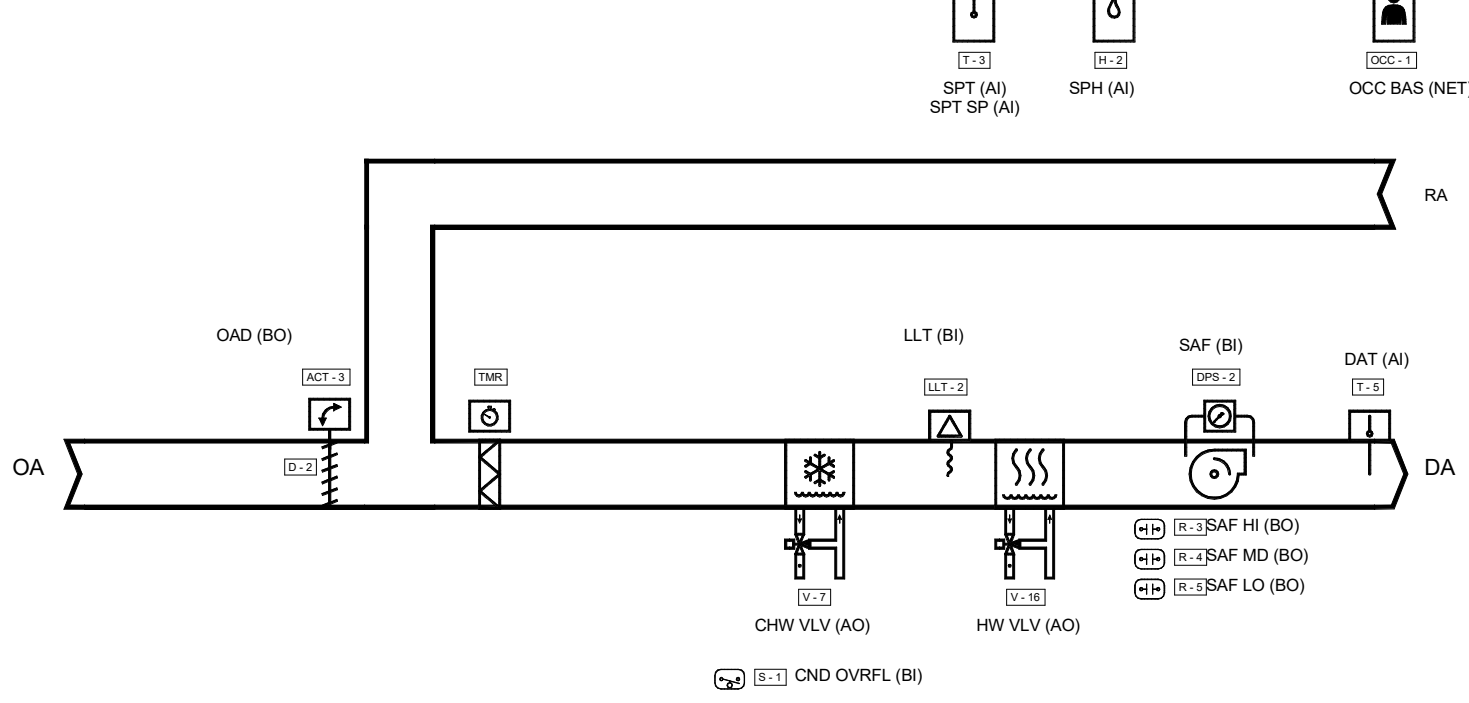
Filter Timer:

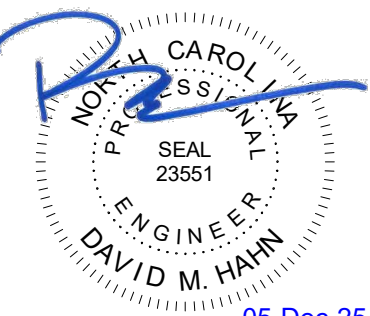
The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

Points List - FCU04, 07, 08, 16 [QTY: 4]

System Point Description	POINTS										ALARMS				
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SPT)	HARDWARE INTERLOCK (HWI)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
CHILLED WATER VALVE...	X			X											
CONDENSATE OVERFLOW DETECTION LOCAL...	X	X										X	X		
DISCHARGE AIR TEMPERATURE...	X	X								X	X			X	
HOT WATER VALVE...	X		X												
LOW LIMIT CUTOUT...	X	X										X	X		
OUTDOOR AIR DAMPER...	X			X											
SPACE HUMIDITY SENSOR LOCAL...	X	X								X				X	
SPACE TEMPERATURE LOCAL...	X	X								X	X			X	
SPACE TEMPERATURE SETPOINT LOCAL...	X	X													
SUPPLY FAN STATUS LOCAL...	X		X												
SUPPLY FAN OUTPUT HIGH...	X			X											
SUPPLY FAN OUTPUT MEDIUM...	X			X											
SUPPLY FAN OUTPUT LOW...	X			X											
BAS COMMUNICATION STATE...				X											X
FILTER TIMER HOURS...				X								X	X		
MAINTENANCE REQUIRED...				X								X			
SPACE DEHUMIDIFICATION SETPOINT...				X											
SPACE TEMPERATURE SETPOINT ACTIVE...		X		X											
OCCUPIED BYPASS TIMER...				X											
OCCUPIED COOLING SETPOINT...		X		X											
OCCUPIED HEATING SETPOINT...		X		X											
UNOCCUPIED COOLING SETPOINT...		X		X											
OCCUPANCY BAS...		X						X							
UNOCCUPIED HEATING SETPOINT...		X		X											

Flow Diagram: FCU04, 07, 08, 16 [QTY: 4]





NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION

MECHANICAL CONTROLS

M-7.7

Sequence of Operation: FCU10

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously and the outdoor air damper shall open to maintain minimum ventilation requirements. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start and the DX cooling shall be enabled. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F minus the unoccupied differential 4.0 deg. F (adj.) the supply fan shall stop and the DX cooling shall be disabled. Test for bug reporting

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start at high speed before transitioning to continuous operation at the selected speed. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the safety circuit. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the supply fan shall be commanded off, water valves shall open to 100%, outside air damper shall close, and an alarm shall annunciate at the BAS.

The controller shall automatically attempt to restart the unit after 30 minutes. If the unit restarts successfully with no low temperature condition, the diagnostic is cleared. If a second low temperature condition occurs within a 24 hour period the unit shall be locked out until manually reset.

Smoke Detector Shutdown:

The unit shall shut down in response to a signal from the smoke detector indicating the presence of smoke. The smoke detector shall be interlocked to the unit through the dry contacts of the smoke detector. A manual reset of the smoke detector shall be required to restart the unit.

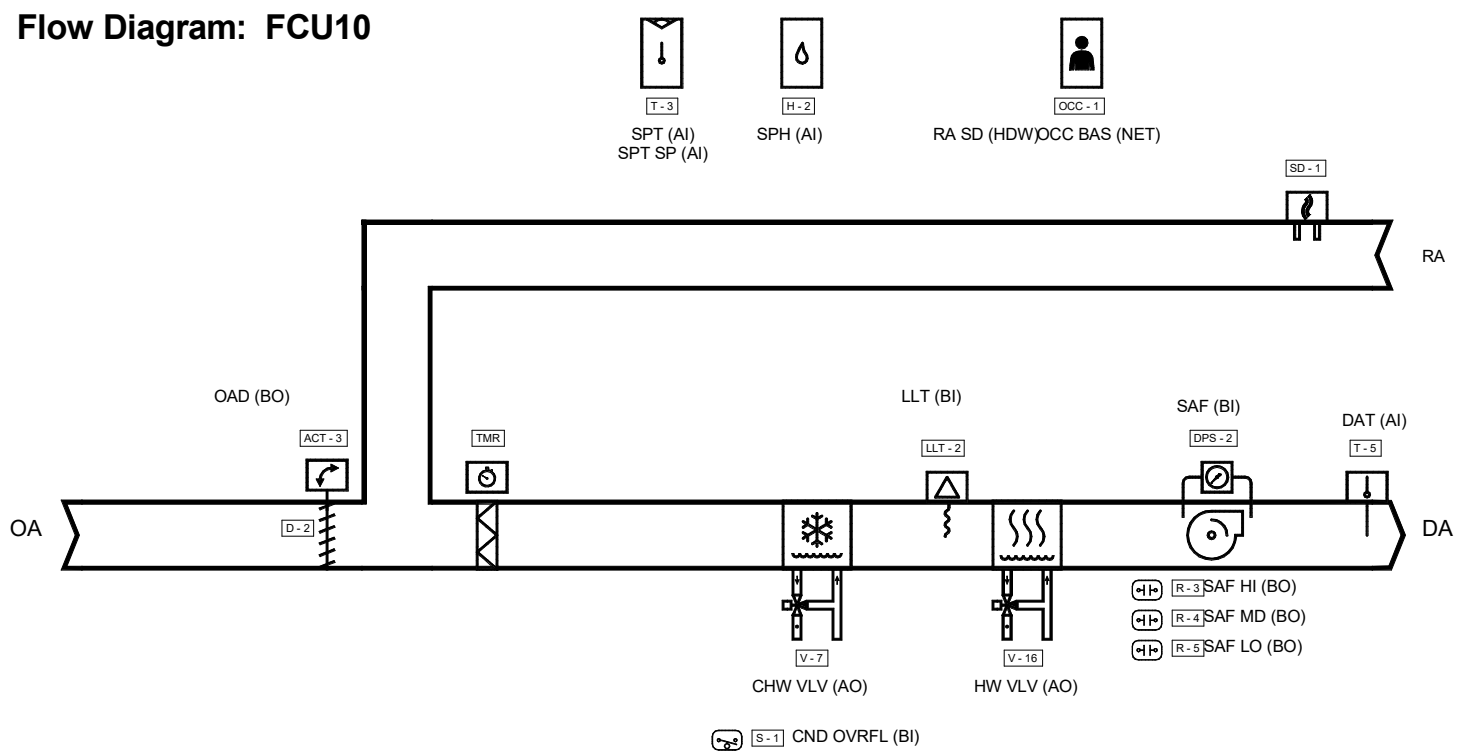
Filter Timer:

The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

Points List - FCU10

System Point Description	POINTS										ALARMS				
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SPT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
CHILLED WATER VALVE...	X			X											
CONDENSATE OVERFLOW DETECTION LOCAL...		X	X									X	X		
DISCHARGE AIR TEMPERATURE...	X	X							X	X				X	
HOT WATER VALVE...	X		X												
LOW LIMIT CUTOUT...	X	X	X									X	X		
OUTDOOR AIR DAMPER...	X			X											
RETURN AIR SMOKE DETECTOR...						X									
SPACE HUMIDITY SENSOR LOCAL...	X	X							X					X	
SPACE TEMPERATURE LOCAL...	X	X							X	X				X	
SPACE TEMPERATURE SETPOINT LOCAL...	X	X													
SUPPLY FAN STATUS LOCAL...	X	X													
SUPPLY FAN OUTPUT HIGH...	X			X											
SUPPLY FAN OUTPUT MEDIUM...				X											
SUPPLY FAN OUTPUT LOW...	X			X											
BAS COMMUNICATION STATE...					X										X
FILTER TIMER HOURS...					X							X	X		
MAINTENANCE REQUIRED...					X							X			
SPACE DEHUMIDIFICATION SETPOINT...					X										
SPACE TEMPERATURE SETPOINT ACTIVE...	X			X											
OCCUPIED BYPASS TIMER...					X										
OCCUPIED COOLING SETPOINT...	X			X											
OCCUPIED HEATING SETPOINT...	X			X											
UNOCCUPIED COOLING SETPOINT...	X			X											
OCCUPANCY BAS...	X							X							
UNOCCUPIED HEATING SETPOINT...	X			X											

Flow Diagram: FCU10



Sequence of Operation: FCU09

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is below the unoccupied heating setpoint of 60.0 deg. F (adj.) and hot water is detected, the supply fan shall start and the Heat/Cool water valve shall open. If hot water is not available, the electric heat shall be energized. When the space temperature rises above the unoccupied heating setpoint of 60.0 deg. F (adj.) plus the unoccupied differential of 2.0 deg. F (adj.) the supply fan shall stop and the Heat/Cool water valve shall close. When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start and the chilled water valve shall open. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F (adj.) minus the unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop and the chilled water valve shall close. Test for bug reporting

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start at high speed before transitioning to continuous operation at the selected speed. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

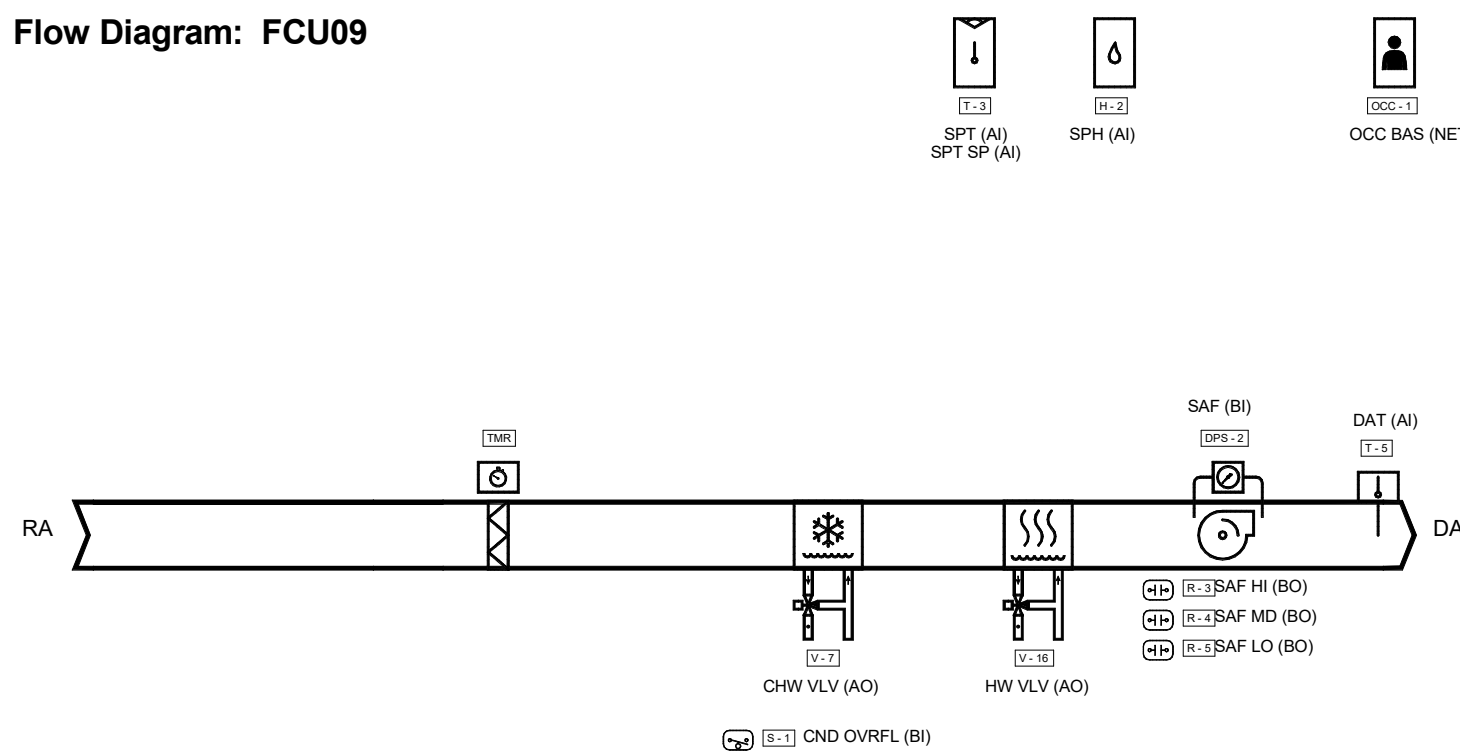
Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Filter Timer:

The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

Flow Diagram: FCU09



Sequence of Operation: FCU14, 18 [QTY: 2]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously and the outdoor air damper shall open to maintain minimum ventilation requirements. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start and the DX cooling shall be enabled. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F minus the unoccupied differential 4.0 deg. F (adj.) the supply fan shall stop and the DX cooling shall be disabled. Test for bug reporting

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. The outside air damper shall remain closed. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. The outside air damper shall remain closed. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint. Outside air damper shall remain enabled to provide minimum ventilation.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start at high speed before transitioning to continuous operation at the selected speed. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Freeze Protection:

A hardwired, low limit temperature switch shall be electrically interlocked with the safety circuit. If the low limit temperature switch is tripped 38.0 deg. F (adj.), the supply fan shall be commanded off, water valves shall open to 100%, outside air damper shall close, and an alarm shall annunciate at the BAS.

The controller shall automatically attempt to restart the unit after 30 minutes. If the unit restarts successfully with no low temperature condition, the diagnostic is cleared. If a second low temperature condition occurs within a 24 hour period the unit shall be locked out until manually reset.

Filter Timer:

The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

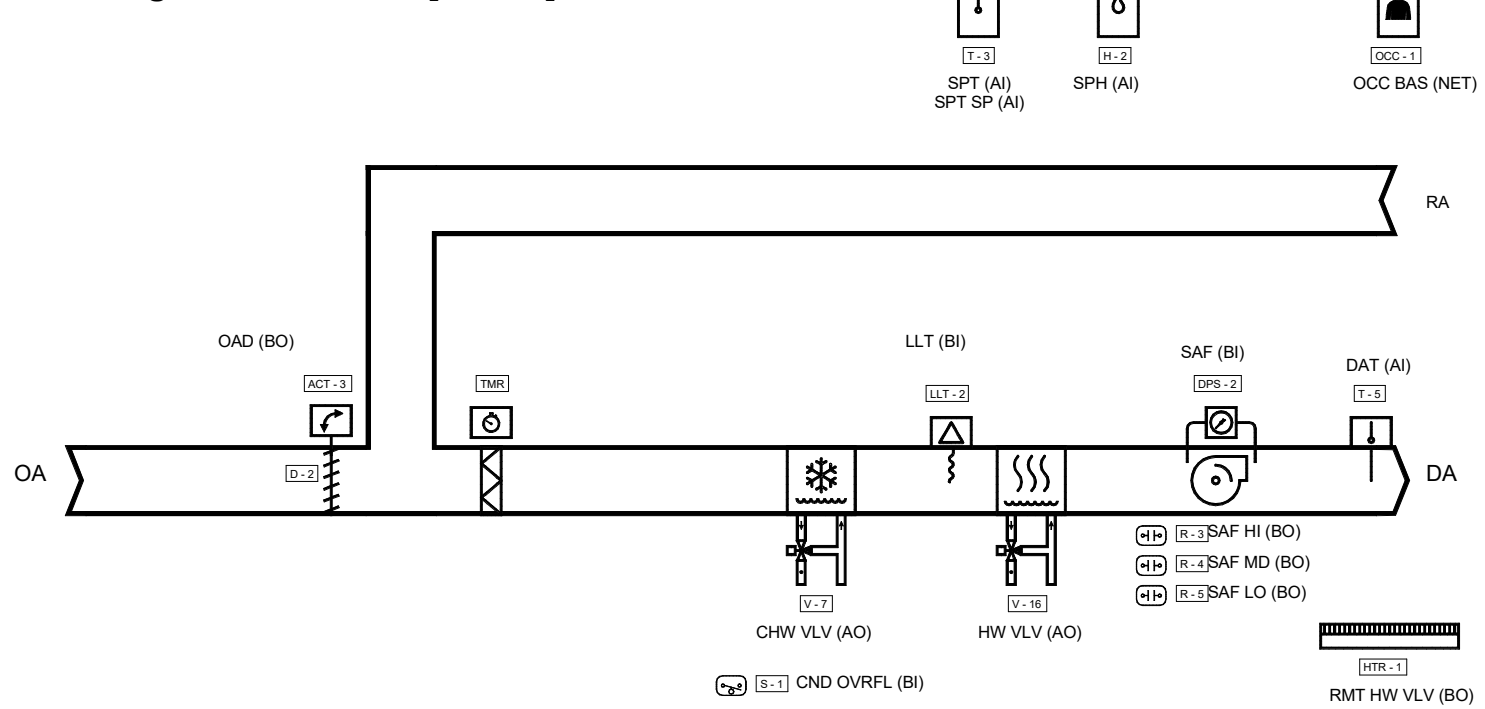
Remote Heating Source

When the space temperature falls 2.0 deg. F (adj) below the space temperature setpoint, then open the hot water valve for the remote heater to help maintain space temperature. If the outside air temperature falls below 55.0 deg. F (adj) then enable the remote heat to slow radiant heat loss around the perimeter of the building.

Points List - FCU14, 18 [QTY: 2]

System Point Description	POINTS										ALARMS				
	GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HOW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
CHILLED WATER VALVE...	X		X												
CONDENSATE OVERFLOW DETECTION LOCAL...		X	X									X	X		
DISCHARGE AIR TEMPERATURE...	X	X								X	X			X	
HOT WATER VALVE...	X			X											
LOW LIMIT CUTOUT...	X	X										X	X		
OUTDOOR AIR DAMPER...	X			X											
REMOTE HOT WATER VALVE...	X			X											
SPACE HUMIDITY SENSOR LOCAL...		X	X							X				X	
SPACE TEMPERATURE LOCAL...		X	X							X	X			X	
SPACE TEMPERATURE SETPOINT LOCAL...		X	X												
SUPPLY FAN STATUS LOCAL...		X	X												
SUPPLY FAN OUTPUT HIGH...		X			X										
SUPPLY FAN OUTPUT MEDIUM...		X			X										
SUPPLY FAN OUTPUT LOW...		X			X										
BAS COMMUNICATION STATE...						X									X
FILTER TIMER HOURS...						X						X	X		
MAINTENANCE REQUIRED...						X						X			
SPACE DEHUMIDIFICATION SETPOINT...						X									
SPACE TEMPERATURE SETPOINT ACTIVE...		X				X									
OCCUPIED BYPASS TIMER...						X									
OCCUPIED COOLING SETPOINT...		X				X									
OCCUPIED HEATING SETPOINT...		X				X									
UNOCCUPIED COOLING SETPOINT...		X				X									
OCCUPANCY BAS...		X							X						
UNOCCUPIED HEATING SETPOINT...		X				X									

Flow Diagram: FCU14, 18 [QTY: 2]



Sequence of Operation: FCU13

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller Occupied Bypass, Morning Warm-up/Pre-Cool, Occupied/Unoccupied and Heat/Cool modes. If a BAS is not present, or communication is lost with the BAS the controller shall operate using default modes and setpoints

Occupied:

During occupied periods, the supply fan shall run continuously. The chilled water valve and the hot water valve shall control to maintain the active space temperature setpoint.

Unoccupied:

When the space temperature is below the unoccupied heating setpoint of 60.0 deg. F (adj.) the supply fan shall start and the hot water valve shall open. When the space temperature rises above the unoccupied heating setpoint of 60.0 deg. F (adj.) plus the unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop and the hot water valve shall close. When the space temperature is above the unoccupied cooling setpoint of 85.0 deg. F (adj.) the supply fan shall start and the chilled water valve shall open. When the space temperature falls below the unoccupied cooling setpoint of 85.0 deg. F (adj.) minus the unoccupied differential of 4.0 deg. F (adj.) the supply fan shall stop and the chilled water valve shall close.

Optimal Start:

The BAS shall monitor the scheduled occupied time, occupied space setpoints and space temperature to calculate when the optimal start occurs.

Morning Warm-Up Mode

During optimal start, if the space temperature is below the occupied heating setpoint a morning warm-up mode shall be activated. When morning warm-up is initiated the unit shall enable the heating and supply fan. When the space temperature reaches the occupied heating setpoint (adj.), the unit shall transition to the occupied mode.

Pre-Cool Mode:

During optimal start, if the space temperature is above the occupied cooling setpoint, pre-cool mode shall be activated. When pre-cool is initiated the unit shall enable the fan and cooling. When the space temperature reaches occupied cooling setpoint (adj.), the unit shall transition to the occupied mode.

Optimal Stop:

The BAS shall monitor the scheduled unoccupied time, occupied setpoints and space temperature to calculate when the optimal stop occurs. When the optimal stop mode is active the unit controller shall maintain the space temperature to the space temperature offset setpoint.

Occupied Bypass:

The BAS shall monitor the status of the ON and CANCEL buttons of the space temperature sensor. When an occupied bypass request is received from a space sensor, the unit shall transition from its current occupancy mode to occupied bypass mode and the unit shall maintain the space temperature to the occupied setpoints (adj.).

Space Temperature Control:

Cascade zone control shall be used in the occupied, occupied bypass, and occupied standby modes. It maintains zone temperature by controlling the discharge air temperature to control the zone temperature while minimizing the fan speed. The space temperature shall be maintained between the occupied cooling setpoint of 74.0 deg. F (adj.) and the occupied heating setpoint of 71.0 deg. F (adj.). The unit shall transition to the cooling mode when the space temperature rises one degree above the occupied cooling setpoint of 74.0 deg. F (adj.). The unit shall transition to the heating mode when the space temperature drops one degree below the occupied heating setpoint of 71.0 deg. F (adj.).

Occupied Humidity Control:

If the space relative humidity is greater than the humidity setpoint, the chilled water valve shall modulate to maintain space relative humidity and the hot water valve shall modulate to maintain the space temperature cooling setpoint. Dehumidification mode shall terminate when the space relative humidity falls below the relative humidity setpoint minus the relative humidity offset. If the space relative humidity sensor fails the dehumidification sequence shall be terminated and an alarm shall annunciate at the BAS.

Supply Fan Operation:

The supply fan shall cycle on demand during the unoccupied mode. When the controller transitions to the occupied mode, the supply fan shall start and run continuously. The supply fan status shall be monitored by a differential pressure switch. If the supply fan fails the fan shall be commanded off and an alarm shall annunciate at the BAS. A manual reset shall be required to restart the fan.

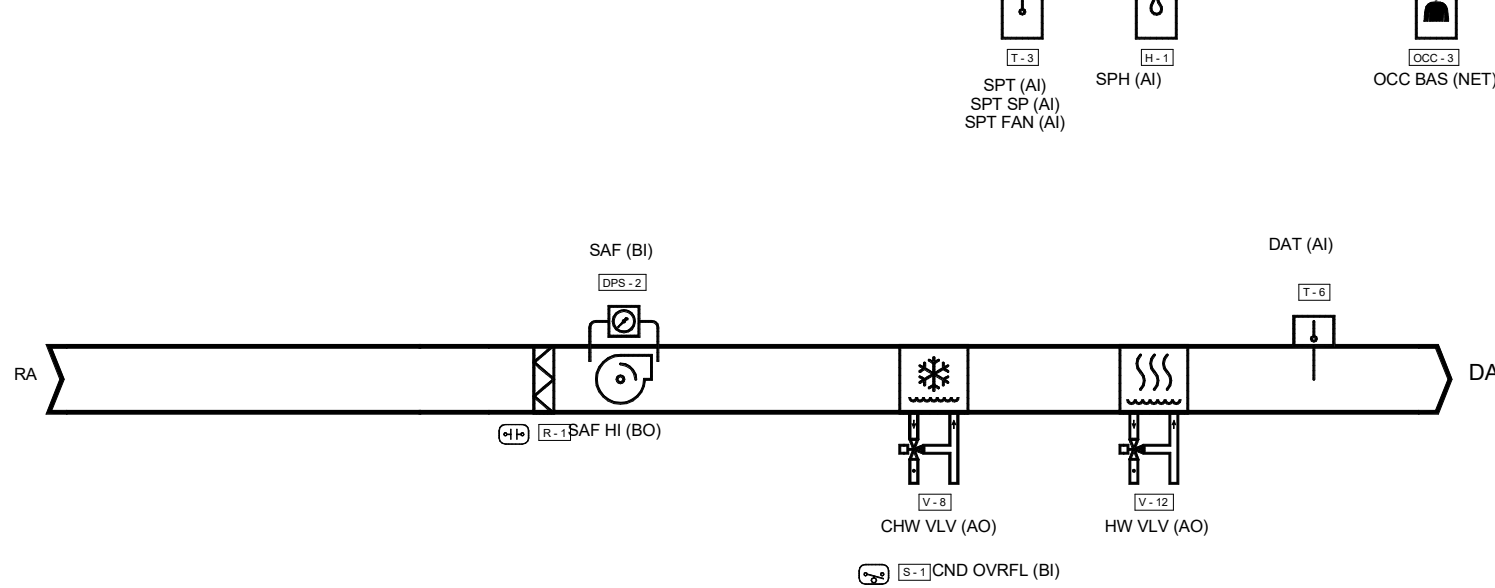
Condensate Overflow Monitoring:

If the condensate level reaches the trip point, a condensate overflow diagnostic shall annunciate at the BAS. To prevent the condensate drain pan from overflowing and causing water damage to the building the fan shall be disabled and the chilled water valve shall close.

Filter Timer:

The fan-run time (hrs) shall be compared to the filter maintenance timer setpoint. Once the setpoint is reached a filter timer alarm diagnostic shall annunciate at the BAS. When the diagnostic is cleared, the filter-maintenance timer is reset to zero, and the timer begins accumulating fan-run time again.

Flow Diagram: FCU13



Sequence of Operation: PV10

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller an Occupied or Unoccupied command. If a BAS is not present, or communication is lost with the BAS, the controller shall operate in the Occupied mode.

Occupied:

During occupied periods, the exhaust fan shall run continuously.

Unoccupied:

During unoccupied periods the exhaust fan shall be disabled.

Operation:

The damper end switch shall prove fully open prior to fan start. When the exhaust fan is disabled, the exhaust air damper shall close.

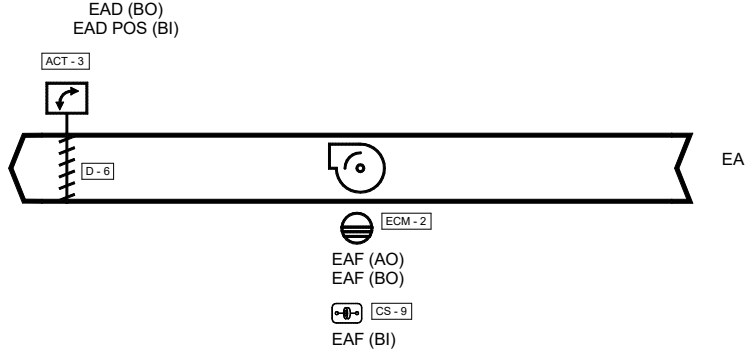
the normally open exhaust air damper shall open.

Fan Status:

The fan status shall be monitored by a current sensing switch. If the fan is signaled to start, and status is not proven within 20 seconds (adj.), an alarm shall annunciate at the BAS.

Points List - PV10																
System Point Description		POINTS										ALARMS				
		GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
EXHAUST AIR DAMPER COMMAND...						X										
EXHAUST AIR DAMPER POSITION STAT...	X	X		X												
EXHAUST FAN SPEED COMMAND...					X											
EXHAUST FAN STATUS...	X	X		X												
EXHAUST FAN START STOP COMMAND...	X					X										
BAS COMMUNICATION STATE...							X									

Flow Diagram: PV10



PV10 CONTROLS

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

4

Sequence of Operation: PV02, 05, 06, 09 [QTY: 4]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller an Occupied or Unoccupied command. If a BAS is not present, or communication is lost with the BAS, the controller shall operate in the Occupied mode.

Occupied:

During occupied periods, the exhaust fan shall run continuously.

Unoccupied:

During unoccupied periods the exhaust fan shall be disabled.

Operation:

The damper end switch shall prove fully open prior to fan start. When the exhaust fan is disabled, the exhaust air damper shall close.

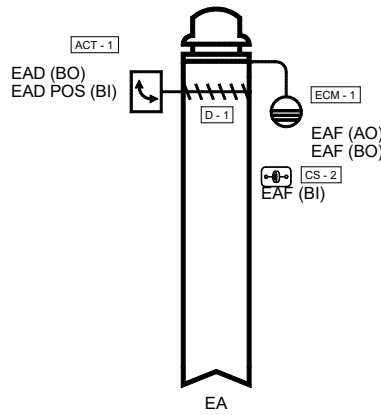
the normally open exhaust air damper shall open.

Fan Status:

The fan status shall be monitored by a current sensing switch. If the fan is signaled to start, and status is not proven within 20 seconds (adj.), an alarm shall annunciate at the BAS.

Points List - PV02, 05, 06, 09 [QTY: 4]																
System Point Description		POINTS										ALARMS				
		GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SFT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
EXHAUST AIR DAMPER COMMAND...						X										
EXHAUST AIR DAMPER POSITION STAT...	X	X		X												
EXHAUST FAN SPEED COMMAND...					X											
EXHAUST FAN STATUS...	X	X		X												
EXHAUST FAN START STOP COMMAND...	X					X										
BAS COMMUNICATION STATE...							X									

Flow Diagram: PV02, 05, 06, 09 [QTY: 4]



PV02, 05, 06, 09 CONTROLS

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

3

Sequence of Operation: PV01, 03, 04 [QTY: 3]

Building Automation System Interface:

The Building Automation System (BAS) shall send the controller an Occupied or Unoccupied command. If a BAS is not present, or communication is lost with the BAS, the controller shall operate in the Occupied mode.

Occupied:

During occupied periods, the exhaust fan shall run continuously.

Unoccupied:

During unoccupied periods the exhaust fan shall be disabled.

Operation:

The damper end switch shall prove fully open prior to fan start. When the exhaust fan is disabled, the exhaust air damper shall close.

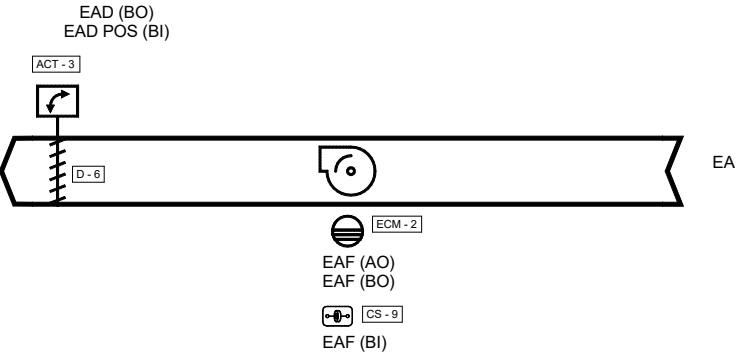
the normally open exhaust air damper shall open.

Fan Status:

The fan status shall be monitored by a current sensing switch. If the fan is signaled to start, and status is not proven within 20 seconds (adj.), an alarm shall annunciate at the BAS.

Points List - PV01, 03, 04 [QTY: 3]																
System Point Description		POINTS										ALARMS				
		GRAPHIC	ANALOG HARDWARE INPUT (AI)	BINARY HARDWARE INPUT (BI)	ANALOG HARDWARE OUTPUT...	BINARY HARDWARE OUTPUT...	SOFTWARE POINT (SPT)	HARDWARE INTERLOCK (HDW)	WIRELESS (WLS)	NETWORK (NET)	HIGH ANALOG LIMIT	LOW ANALOG LIMIT	BINARY	LATCH DIAGNOSTIC	SENSOR FAIL	COMMUNICATION FAIL
EXHAUST AIR DAMPER COMMAND...						X										
EXHAUST AIR DAMPER POSITION STAT...	X	X		X												
EXHAUST FAN SPEED COMMAND...					X											
EXHAUST FAN STATUS...	X	X	X													
EXHAUST FAN START STOP COMMAND...	X					X										
BAS COMMUNICATION STATE...							X									

Flow Diagram: PV01, 03, 04 [QTY: 3]



PV01, 03, 04 CONTROLS

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

2

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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06-May-26

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2	04-27-26	BULLETIN #2

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M-7.9

7/2/2026

RENOVATION & EXPANSION: PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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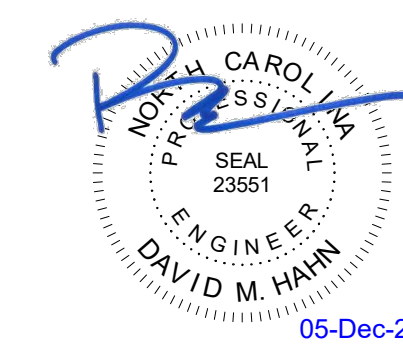
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MECHANICAL CHILLER WATER PIPING FLOW DIAGRAM DEMO

M-8.1

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CHILLED WATER PIPING FLOW DIAGRAM DEMO

SCALE: NO SCALE

7/2/2026

RENOVATION & EXPANSION: PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

900 LOGGERHEAD RD,
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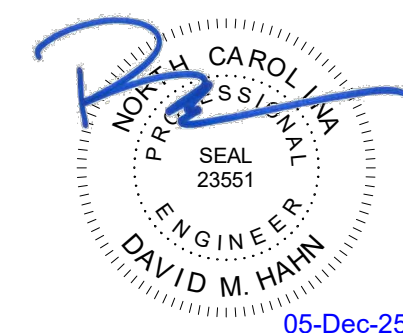
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-	12-5-25	FOR CONSTRUCTION

MECHANICAL HEATING HOT WATER PIPING FLOW DIAGRAM DEMO

M-8.2

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HEATING HOT WATER PIPING FLOW DIAGRAM DEMO

SCALE : NO SCALE

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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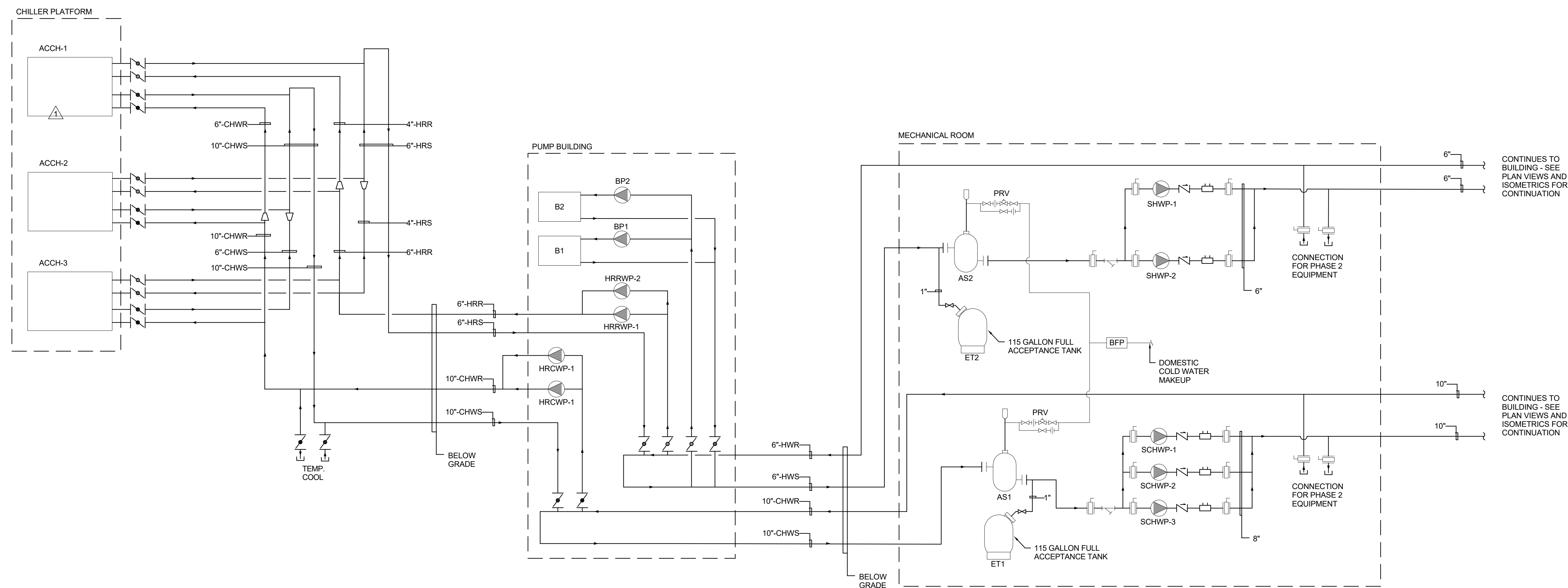


06-May-26

NO.	DATE	DESCRIPTION
	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2

MECHANICAL CHILLED
AND HOT WATER PIPING
FLOW DIAGRAM

M-8.3



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HYDRONIC PIPING DIAGRAM

SCALE: 1/2" = 1'-0"

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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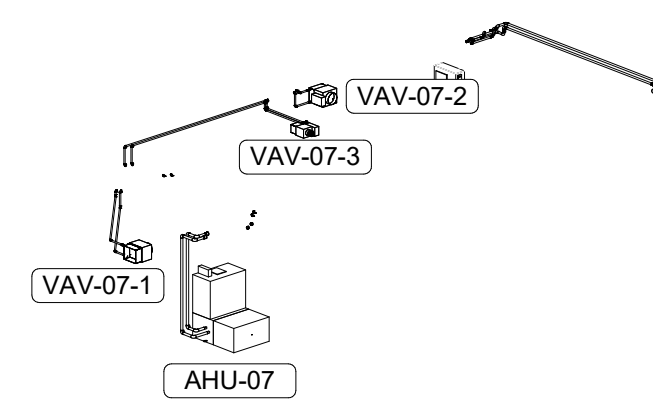
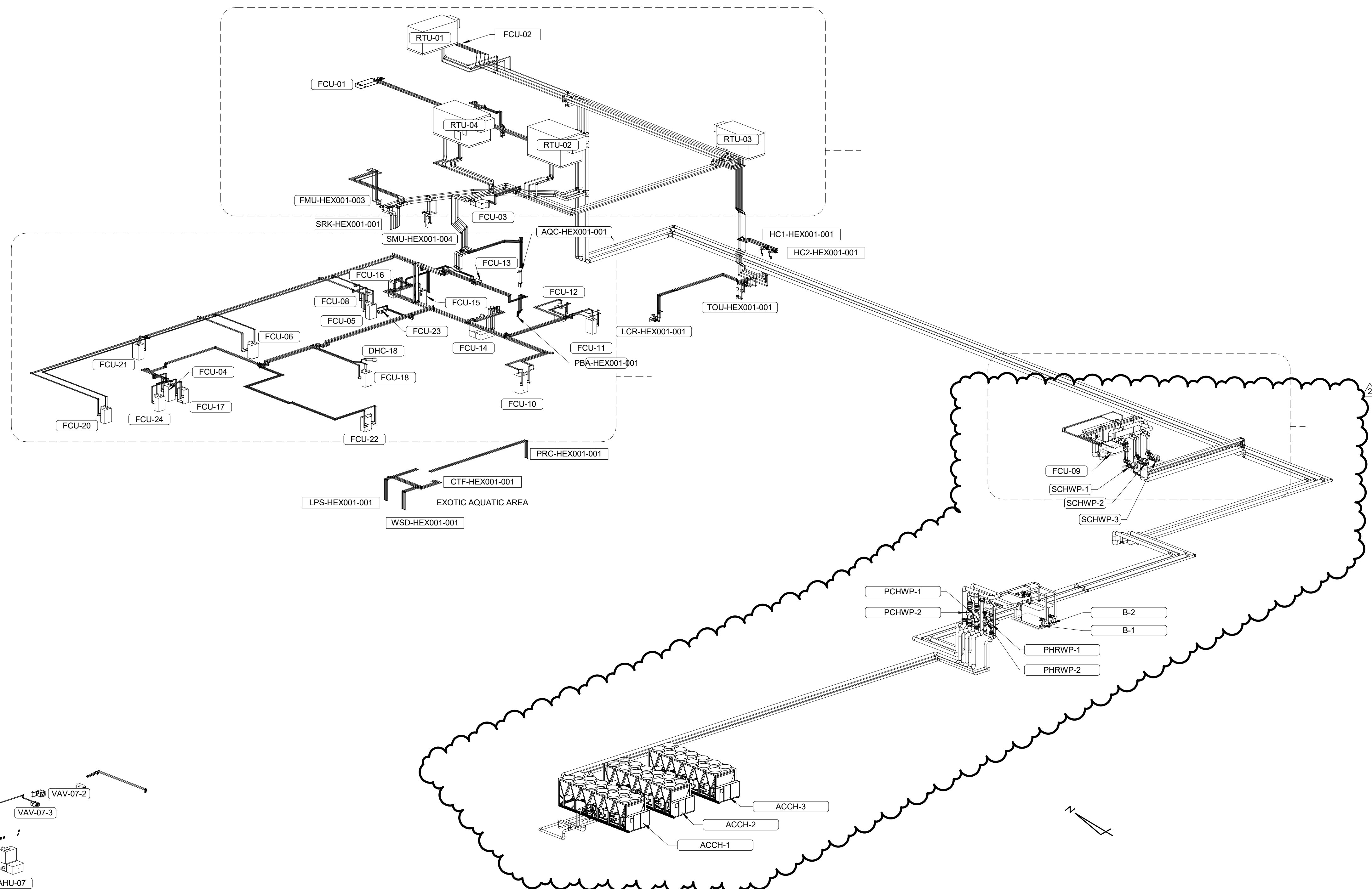


06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1
2	04-27-26	BULLETIN #2

MECHANICAL ISOMETRICS

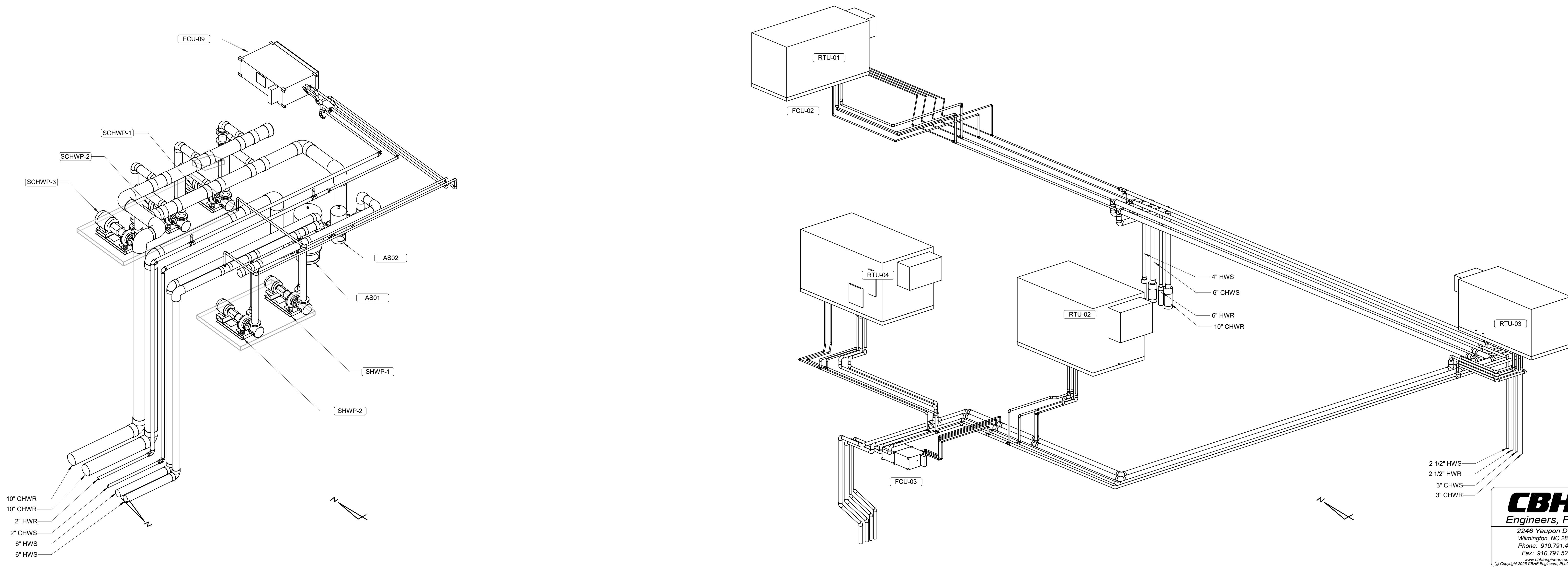
M-8.4



HYDRONIC WATER ISOMETRIC

SCALE :

1



HYDRONIC WATER ISOMETRIC - MECHANICAL ROOM

SCALE :

2

HYDRONIC WATER ISOMETRIC - SHARK - THIRD FLR AND ROOF

SCALE :

3

IRN 002

7/2/2026

RENOVATION
& EXPANSION:
PHASE 1

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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-	12-5-25	FOR CONSTRUCTION
1	12-12-25	BULLETIN #1

MECHANICAL ISOMETRICS

M-8.5

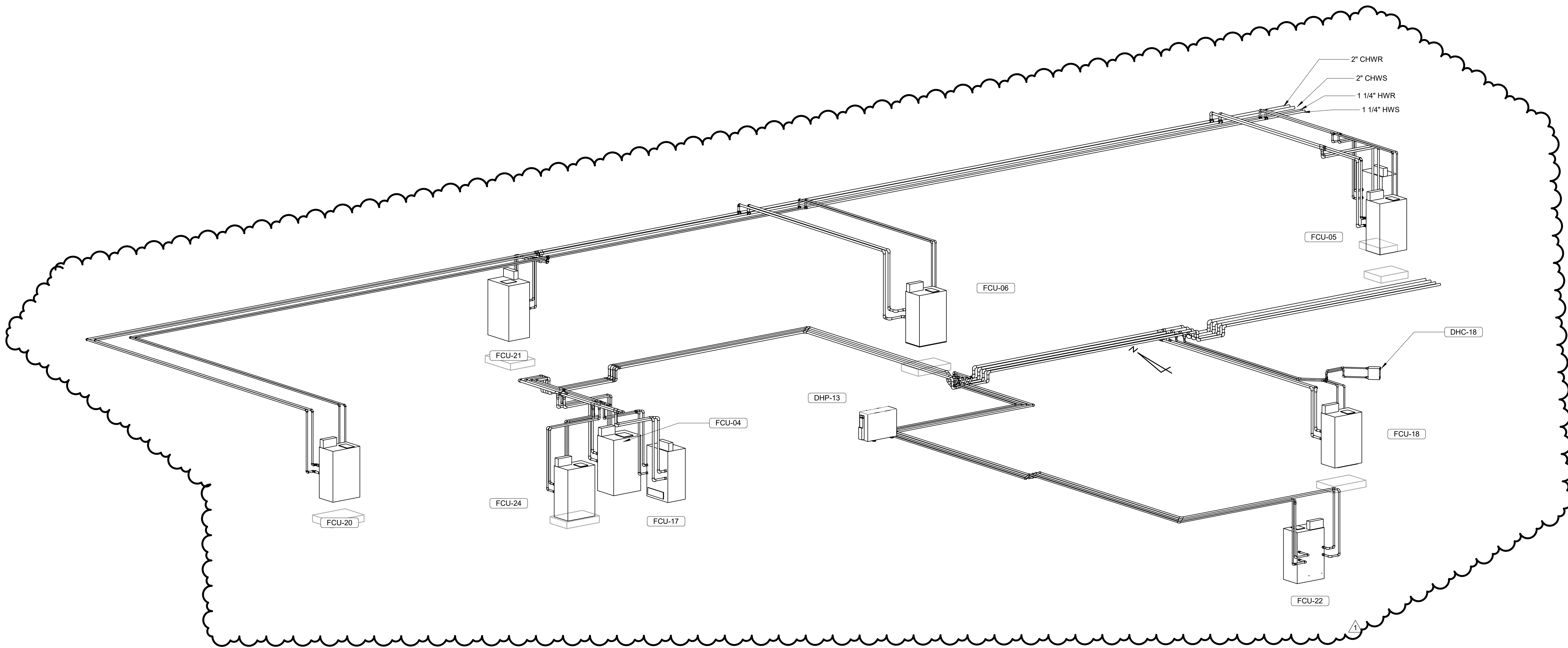
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HYDRONIC WATER ISOMETRIC - SHARK - FIRST AND SECOND FLOOR

SCALE :

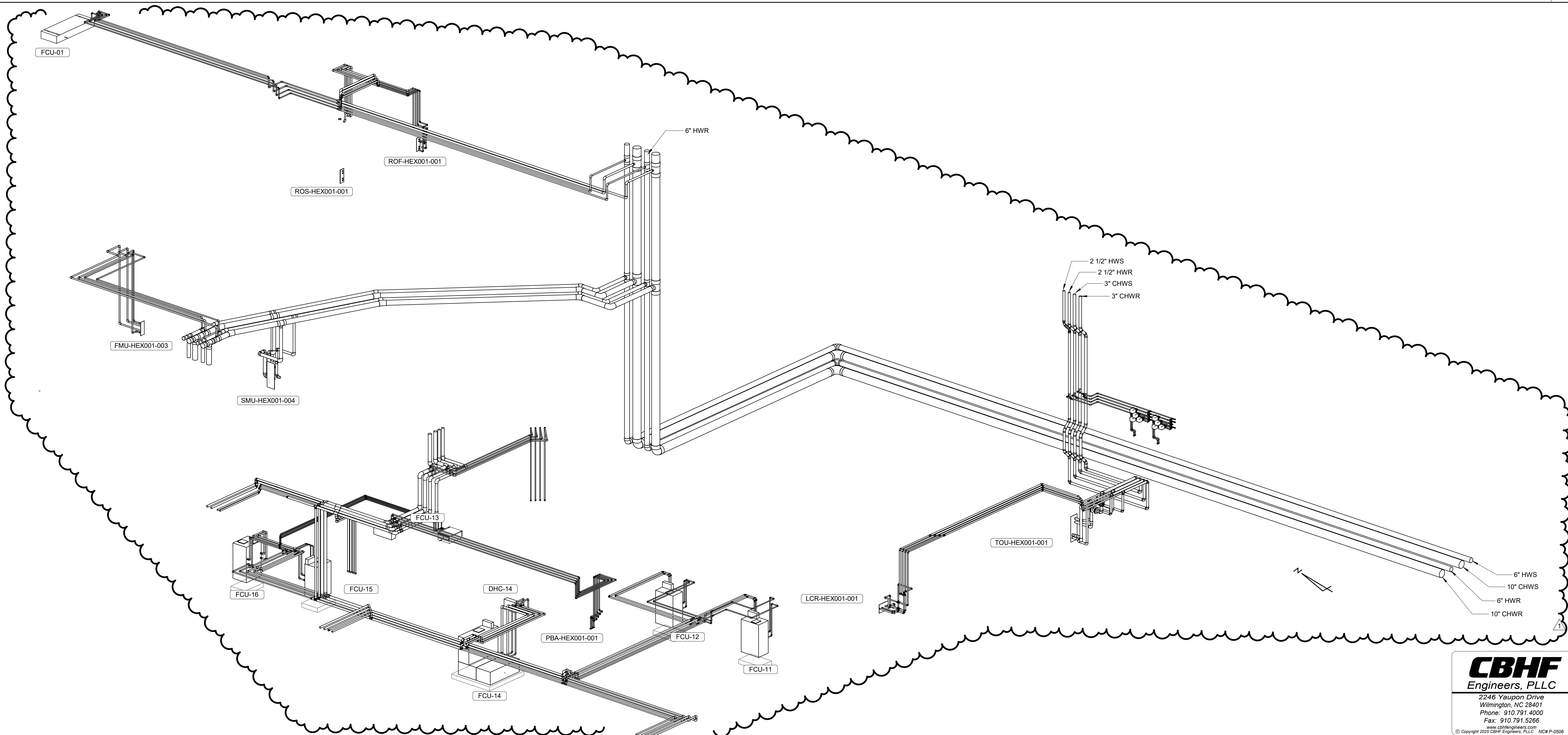
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HYDRONIC WATER ISOMETRIC - TOUCH - FIRST AND SECOND FLOOR

SCALE :

2

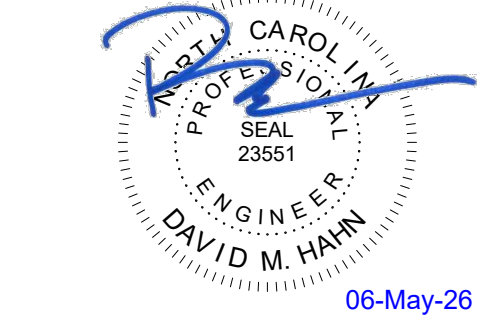


HYDRONIC WATER ISOMETRIC - SHARK - FIRST AND SECOND FLOOR

SCALE :

1

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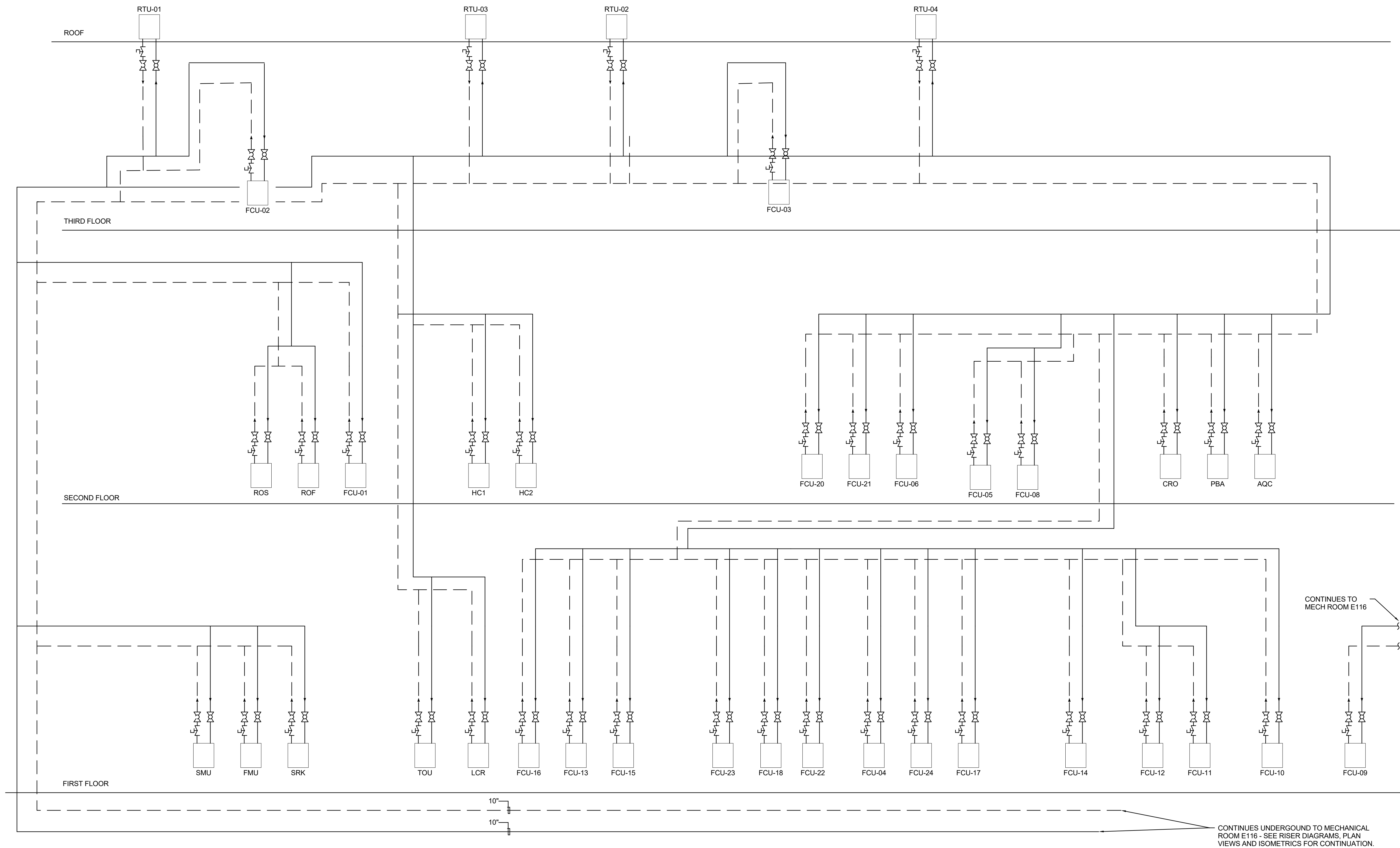


06-May-26

NO.	DATE	DESCRIPTION
-	12-5-25	FOR CONSTRUCTION
2	04-27-26	BULLETIN #2

CHILLED WATER PIPING
FLOW DIAGRAM -
BUILDING LOOP

M-8.6



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IRN 002

7/2/2026

RENOVATION
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PHASE I

SCO #17-18042-02A
CODE: 42014-4G02
ITEM: 41414-4Y4A

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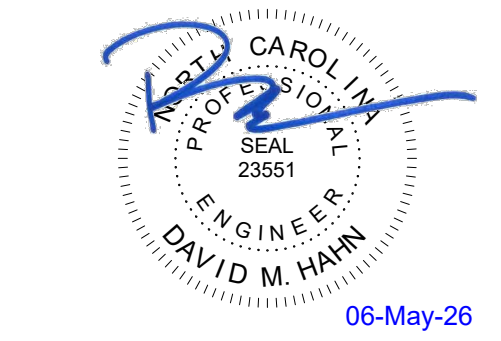
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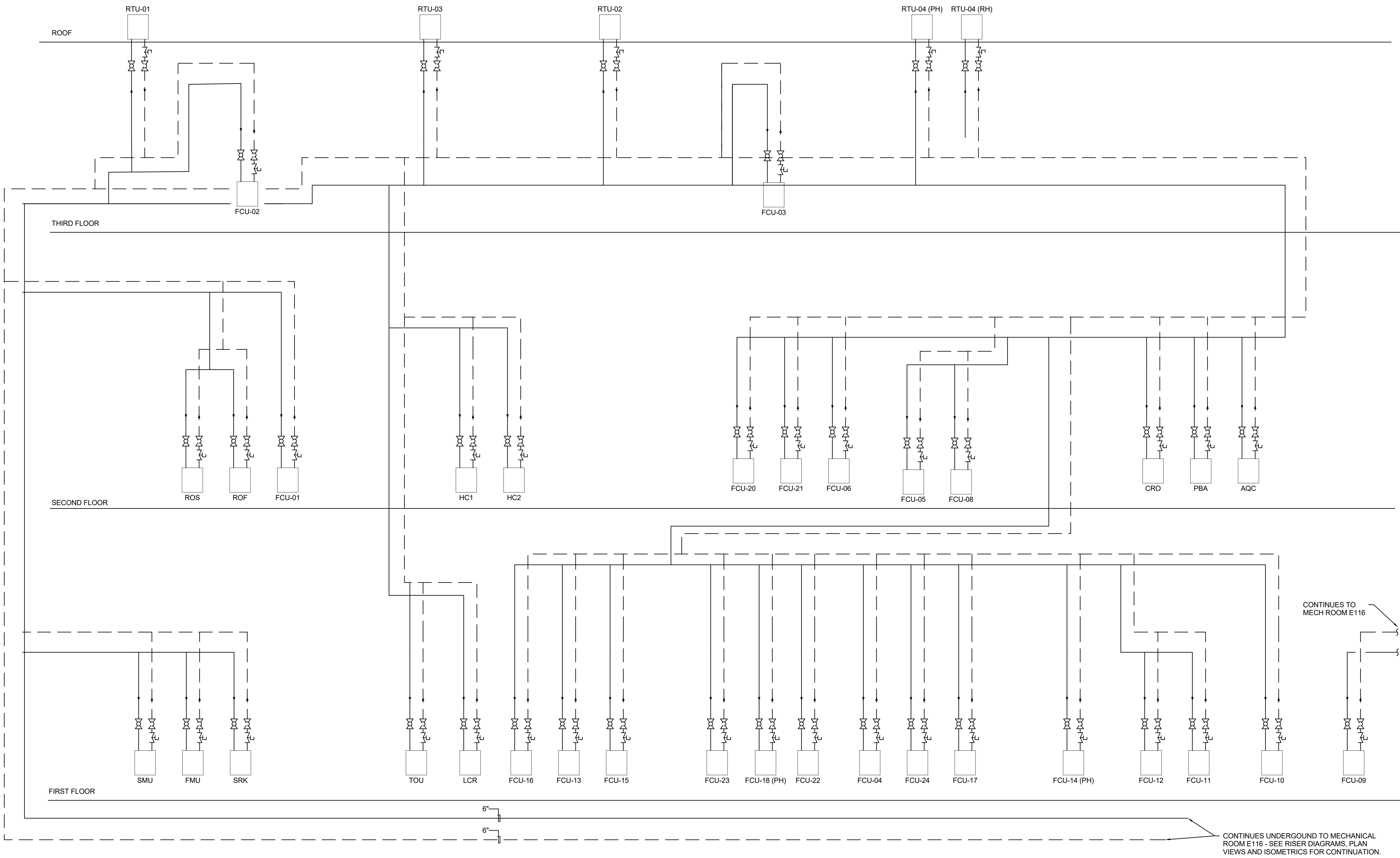


06-May-26

NO.	DATE	DESCRIPTION
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2	04-27-26	BULLETIN #2

HEATING HOT WATER
PIPING FLOW DIAGRAM -
BUILDING LOOP

M-8.7



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HEATING HOT WATER PIPING FLOW DIAGRAM - BUILDING LOOP

SCALE : NO SCALE