ARCHITECTURE
ENGINEERING
PLANNING
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ADDENDUM NO. 03

PROJECT: Suffern Central School District
RP Connor Heating System Conversion

CPL PROJECT NO. 12396.23

SED PROJECT NO. RP Connor Elementary School: 50-04-01-06-0-005-021

DATE: 7/13/2023

Include this Addendum as part of the Contract Documents. It supplements portions of the original specifications and drawings, the extent of which shall remain, except as revised herein:

CLARIFICATIONS:

1.1 The intention is to have the UV's be provided with DX coils with the intention of future condenser connection. Addendum 1 is to add the 8 condensers as a bid alternate, but the DX coils are base bid.
1.2 There is no glycol in this system.
1.3 The only new work on drawing H201B is the hot water piping connecting to the existing loop pumps for that area. Everything else is existing to remain.
1.4 Existing UV louvers are to remain and be reused as part of the base bid. The louvers are to be replaced as part of alternate MC-01. The only exceptions are UV-10, UV-11, as those are in new locations so will need new louvers as base bid, UV-17-19 louvers to remain regardless.

CHANGES TO THE DRAWINGS

2.1 Replace drawing H201A with revised H201A drawing attached.
2.2 Replace drawing H201C with revised H201C drawing attached.
2.3 Replace drawing H700 with revised H700 drawing attached.
2.4 Replace drawing H701 with revised H701 drawing attached.

CHANGES TO THE SPECIFICATIONS

3.1 Replace specification section 235100 – Breechings, Chimneys and Stacks and replace with the attached revised specification section 235100 – Breechings, Chimneys and Stacks.
3.2 Remove section 1.05.D.2 *"All prefix "G" drawings"* and 1.05.D.2 *"All prefix "G" drawings"* from specification 01-1200 Multiple Contract Summary.

END OF ADDENDUM NO. 03

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845.567.6700 TEL
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1 H201A **FIRST FLOOR PLAN - AREA A**
SCALE:1/8" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL CABINETRY AND WINDOW SILL DIMENSIONS PRIOR TO SUBMITTING SHOP DRAWINGS FOR UNIT VENTILATORS.
2. ALL CONTROLS WORK TO BE DONE BY DISTRICT BMS PROVIDER HONEYWELL.
   CONTACT: BOB GARVEY OR SEAN YATES
   O: 973-455-2503 C: 908-963-0467
   C: 862-579-8821
3. ALL NEW UNIT VENTILATORS, CABINET UNIT HEATERS, CONVECTORS, AND FIN TUBE TO BE INSTALLED DURING PHASE 2.
4. SEE H700 AND H701 FOR THE BOILER ROOM PHASING PLANS.
5. NEW CLASSROOM EXHAUST FAN RELIEF TO BE INSTALLED DURING PHASE 2.
6. EXISTING UV LOUVERS TO REMAIN. ALTERNATE NO 1. TO REPLACE WITH NEW. PROVIDE INTEL AND MATCH WITH LIKE CONSTRUCTION.

KEY NOTES:

1. FURNISH AND INSTALL NEW UNIT VENTILATOR, TEMPERATURE SENSOR, WALL BOX, AND FIN-TUBE. MODIFY EXISTING CABINETRY AS NECESSARY TO FIT NEW UNIT. EXISTING EXTERIOR LOUVER TO REMAIN AND BE REUSED. CONTRACTOR TO CONSTRUCT CHASE WALL BEHIND UNIT TO ACCOMMODATE TRANSITION DUCTWORK.
2. FURNISH AND INSTALL NEW DDC TEMPERATURE SENSOR AND CONTROLS. COORDINATE ALL CONTROLS WORK WITH THE DISTRICTS CONTROLS PROVIDER.
3. FURNISH AND INSTALL NEW DDC TEMPERATURE SENSOR AND CONTROLS. ONE THERMOSTAT SHALL CONTROL THREE UNITS. COORDINATE ALL CONTROLS WORK WITH THE DISTRICTS CONTROLS PROVIDER.
4. FURNISH AND INSTALL NEW FIN TUBE BEHIND EXISTING CABINETRY.
5. FURNISH AND INSTALL NEW CONVECTOR IN EXISTING CONVECTOR LOCATION. MODIFY WALL OPENING AS NECESSARY. PATCH AROUND NEW CONVECTOR AS NECESSARY AND MATCH TO EXISTING WALL.
6. FURNISH AND INSTALL NEW HOT WATER COIL FOR EXISTING FAN COIL UNIT. MANUFACTURER MODEL NUMBER: ENVIROTECH CDH-16. CONFIRM MANUFACTURER AND MODEL NUMBER PRIOR TO ORDERING.
7. RUN NEW REFRIGERANT PIPING FOR NEW COOLING COIL UP TO NEW CONDENSERS ON ROOF ABOVE. SIZE PIPING PER MANUFACTURER'S RECOMMENDATION. NEW REFRIGERANT PIPING TO BE RUN IN NEW PVC PIPE FORTRESS LINE SET COVERS. ROUTE NEW 3/4" CONDENSATE LINE OUT THE BACK OF THE UNIT AND TERMINATE 6" ABOVE GROUND DIRECTED AWAY FROM THE BUILDING.
8. PROVIDE NEW LOUVER OPENINGS. SEE LINTEL SCHEDULE ON H900. PATCH WITH LIKE CONSTRUCTION.
9. ALTERNATE MC-01: TO REPLACE EXISTING LOUVER WITH NEW LOUVER. SEE LINTEL SCHEDULE ON H900. PATCH WITH LIKE CONSTRUCTION.
10. FURNISH AND INSTALL NEW CABINET UNIT HEATER AIN EXITING CABINET UNIT HEATER LOCATION. MODIFY WALL OPENING AS NECESSARY. PATCH AROUND NEW CABINET UNIT HEATER AS NECESSARY AND MATCH TO EXISTING WALL.

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PROJECT INFORMATION

Project Number
13296.23

Client Name
SUFFERN CSD

Project Name
RP CONNOR - BOILER CONVERSION

District Office Address
SUFFERN CENTRAL SCHOOL DISTRICT
45 MOUNTAIN AVENUE
HILLBURN, NY 10931

SUFFERN CSD

BID #SD-041-06-0-005-021

PROJECT ISSUE & REVISION SCHEDULE

No.	Date	Description
3	7/13/2023	BID ADDENDUM #3

PROFESSIONAL STAMPS

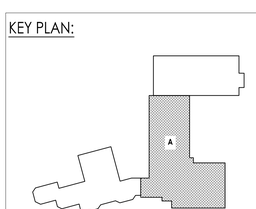
NEW YORK STATE EDUCATION STATEMENT
IT IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND THE COMMISSIONER'S REGULATIONS FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, ENGINEER OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE SEAL OF AN ARCHITECT, ENGINEER OR LAND SURVEYOR IS ALTERED, THE ALTERING ENGINEER SHALL STAMP THE PLANS AND THE NOTATION "ALTERED BY" FOLLOWED BY HIS/HER SIGNATURE AND THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

SHEET INFORMATION

Issued	Scale
06/15/2023	1/8" = 1'-0"
Project Status	
CD	
Drawn By	Checked By
AJS	AJS

Drawing Title
FIRST FLOOR HVAC NEW PLANS
AREA A

KEY PLAN:



Drawing Number
RPC
H201A

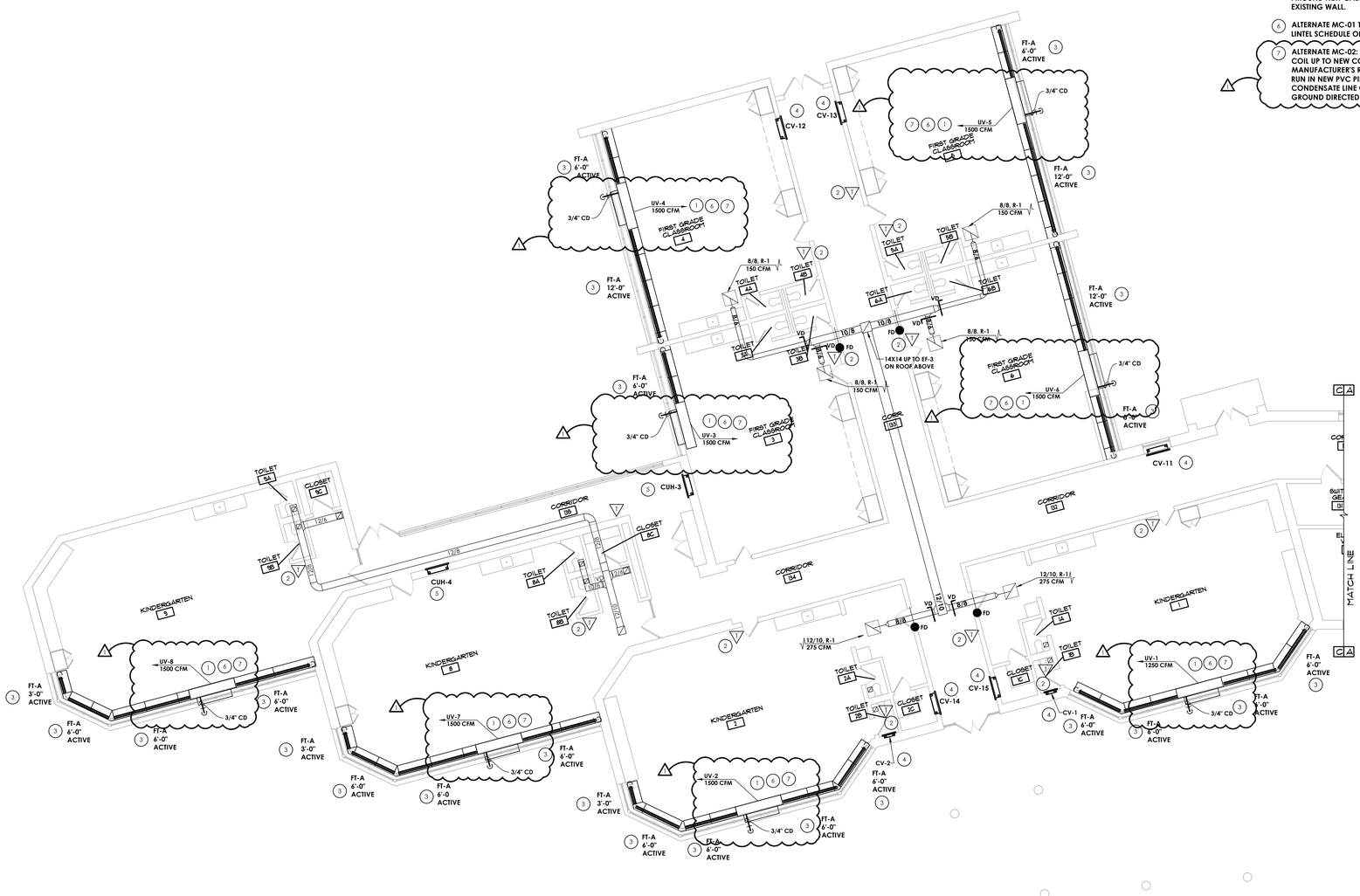
Plotted By: Brendon Mazza
Date last plotted: 7/13/2023 11:05 AM
Date last accessed: 7/13/2023 10:17 AM
Sheet size: 30x42
Drawing Name: S:\Projects\Suffern CSD\RP Connor Heating Conv\D Design\06 CAD\AutoCAD\MECH\H2\H201A.dwg

GENERAL NOTES:

1. CONTRACTOR SHALL FIELD VERIFY ALL CABINETRY AND WINDOW SILL DIMENSIONS PRIOR TO SUBMITTING SHOP DRAWINGS.
2. ALL CONTROLS WORK TO BE DONE BY DISTRICT BMS PROVIDER HONEYWELL.
   CONTACT: BOB GARVEY OR SEAN YATES
   O: 973-455-2503 C: 908-963-0467
   C: 862-579-8821
3. ALL NEW UNIT VENTILATORS, CABINET UNIT HEATERS, CONVECTORS, AND FIN TUBE TO BE INSTALLED DURING PHASE 2.
4. NEW CLASSROOM EXHAUST FAN RELIEF TO BE INSTALLED DURING PHASE 2.
5. EXISTING UV LOUVERS TO REMAIN. ALTERNATE NO 1. TO REPLACE WITH NEW. PROVIDE INTEL AND MATCH WITH LIKE CONSTRUCTION.

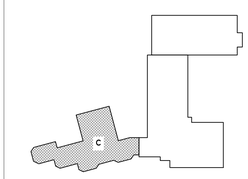
KEY NOTES:

1. FURNISH AND INSTALL NEW UNIT VENTILATOR, TEMPERATURE SENSOR, WALL BOX, AND FIN-TUBE. MODIFY EXISTING CABINETRY AS NECESSARY TO FIT NEW UNIT. EXISTING EXTERIOR LOUVER TO REMAIN AND BE REUSED. CONTRACTOR TO CONSTRUCT CHASE WALL BEHIND UNIT TO ACCOMMODATE TRANSITION DUCTWORK.
2. FURNISH AND INSTALL NEW DDC TEMPERATURE SENSOR AND CONTROLS. COORDINATE ALL CONTROLS WORK WITH THE DISTRICTS CONTROLS PROVIDER.
3. FURNISH AND INSTALL NEW FIN TUBE BEHIND EXISTING CABINETRY.
4. FURNISH AND INSTALL NEW CONVECTOR IN EXISTING CONVECTOR LOCATION. MODIFY WALL OPENING AS NECESSARY. PATCH AROUND NEW CONVECTOR AS NECESSARY AND MATCH TO EXISTING WALL.
5. FURNISH AND INSTALL NEW CABINET UNIT HEATER IN EXISTING CABINET UNIT HEATER LOCATION. MODIFY WALL OPENING AS NECESSARY. PATCH AROUND NEW CABINET UNIT HEATERS AS NECESSARY AND MATCH TO EXISTING WALL.
6. ALTERNATE MC-01 TO REPLACE EXISTING LOUVER WITH NEW LOUVER. SEE LINTEL SCHEDULE ON H900. PATCH WITH LIKE CONSTRUCTION.
7. ALTERNATE MC-02: RUN NEW REFRIGERANT PIPING FOR NEW COOLING COIL UP TO NEW CONDENSERS ON ROOF ABOVE. SIZE PIPING PER MANUFACTURER'S RECOMMENDATION. NEW REFRIGERANT PIPING TO BE RUN IN NEW PVC PIPE FORTRESS LINE SET COVERS. ROUTE NEW 3/4" CONDENSATE LINE OUT THE BACK OF THE UNIT AND TERMINATE 6" ABOVE GROUND DIRECTED AWAY FROM THE BUILDING.



1 H201C **FIRST FLOOR PLAN - AREA C**
SCALE:1/8" = 1'-0"

KEY PLAN:



TRUE NORTH

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PROJECT INFORMATION

Project Number
13296.23

Client Name
SUFFERN CSD

Project Name
RP CONNOR - BOILER CONVERSION

District Office Address
SUFFERN CENTRAL SCHOOL DISTRICT
45 MOUNTAIN AVENUE
HILLBURN, NY 10931

SUFFERN CSD

SED #:60-04-01-06-0-009-021

PROJECT ISSUE & REVISION SCHEDULE

No.	Date	Description
1	6/30/2023	BD ADDENDUM #1
3	7/13/2023	BD ADDENDUM #3

PROFESSIONAL STAMPS

SHEET INFORMATION

Issued	Scale
06/15/2023	1/8" = 1'- 0"
Project Status	
CD	
Drawn By	Checked By
AJS	AJS

Drawing Title
FIRST FLOOR HVAC NEW PLANS AREA C

Drawing Number
RPC H201C

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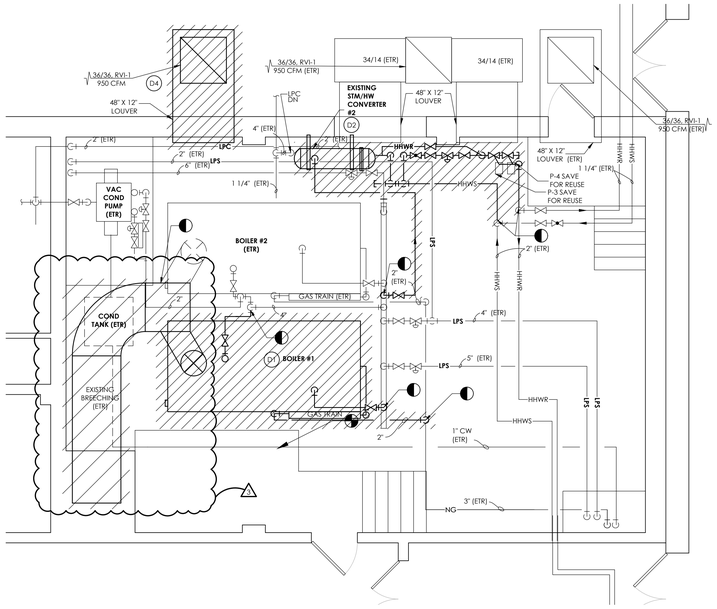
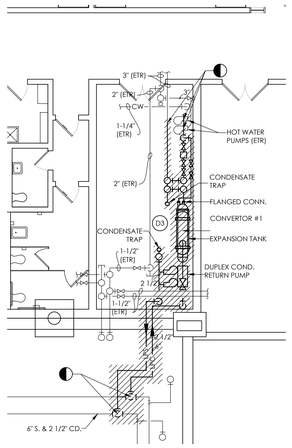
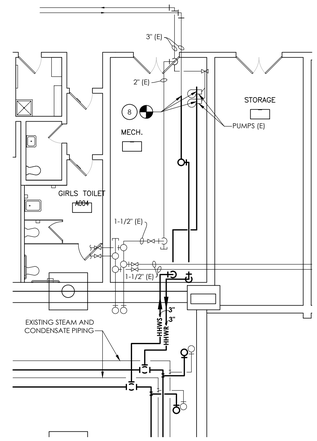
Drawing Name: S:\Projects\Suffern CSD\RP Connor Heating Conv\D Design\06 CAD\AutoCAD\MECH\H201C.dwg
Date last accessed: 7/13/2023 10:34 AM
Date last plotted: 7/13/2023 11:04 AM
Plotted By: Brendon Mozzo



1 H700 **BOILER ROOM DEMOLITION PLAN PHASE 1**
SCALE:1/4" = 1'-0"



3 H700 **MECHANICAL ROOM DEMOLITION PLAN PHASE 1**
SCALE:1/4" = 1'-0"



4 H700 **MECHANICAL ROOM NEW WORK PLAN PHASE 1**
SCALE:1/4" = 1'-0"

GENERAL NOTES:

1. ALL CONTROLS WORK TO BE DONE BY DISTRICT BMS PROVIDER HONEYWELL.
   CONTACT: BOB GARVEY OR SEAN YATES
   O: 973-455-2503 C: 908-963-0467
   C: 862-579-8821
2. BOILER 2 AND EXISTING STEAM SYSTEM TO REMAIN OPERATIONAL DURING PHASE 1. NEW HOT WATER PIPING TO BE RUN THROUGHOUT THE BUILDING IN PREPARATION OF PHASE 2.

DEMOLITION KEY NOTES:

D1 REMOVE EXISTING BOILER 1 IN ITS ENTIRETY INCLUDING GAS TRAIN, ALL PIPING TO POINTS INDICATED, AND EXHAUST FLUE BACK AND BREECHING IN ITS ENTIRETY.

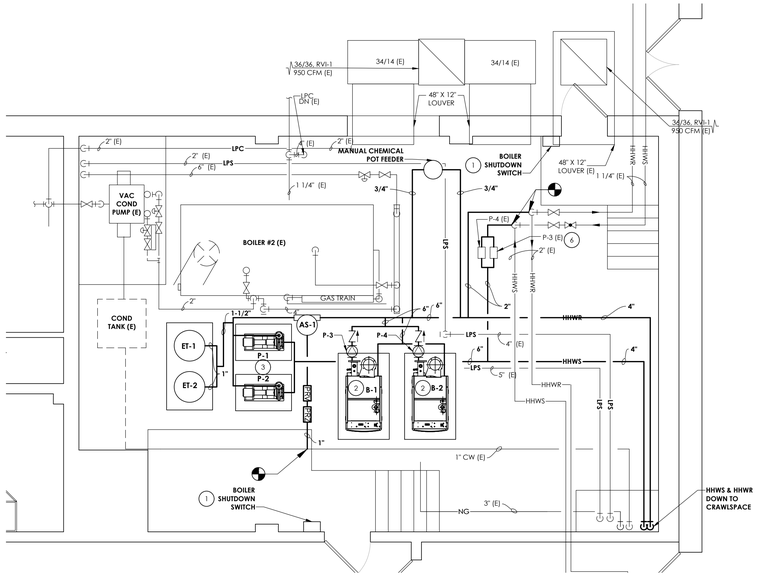
D2 REMOVE EXISTING STEAM TO HOT WATER HEAT EXCHANGER IN ITS ENTIRETY INCLUDING ALL STEAM AND CONDENSATE PIPING BACK TO MAINS. REMOVE HOT WATER PIPING BACK TO POINT INDICATED. CLEAN AND SAVE EXISTING HOT WATER PUMPS P-3 AND P-4 TO BE REUSED.

D3 REMOVE EXISTING STEAM TO HOT WATER HEAT EXCHANGER IN ITS ENTIRETY INCLUDING ALL STEAM AND CONDENSATE PIPING BACK TO MAINS AND CAP. STEAM PIPING TO BE MAINTAINED OPERATIONAL DURING PHASE 1. CLEAN AND SAVE EXISTING HOT WATER PUMPS TO BE REUSED.

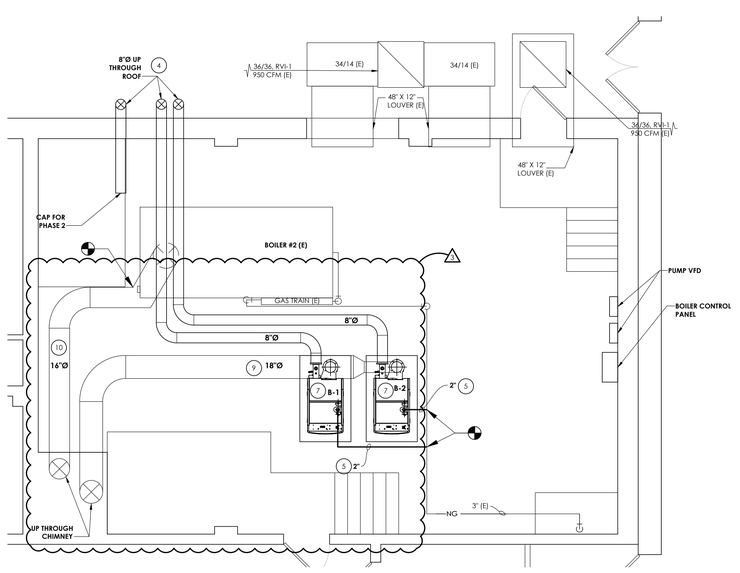
D4 REMOVE EXISTING OUTDOOR AIR LOUVER, DUCTWORK AND GRAVITY VENT ON ROOF. EXISTING OPENING TO BE REUSED AN RESIZED FOR NEW COMBUSTION AIR OPENINGS. MAINTAIN ALL ROOF WARRANTIES.

KEY NOTES:

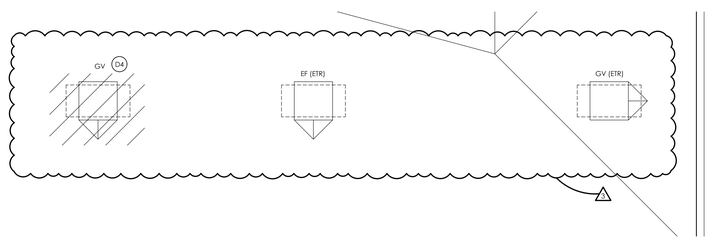
1. PROVIDE NEW BOILER SHUTDOWN SWITCH AT BOILER ROOM EXIITS.
2. INSTALL NEW BOILERS IN LOCATION SHOWN. PROVIDE NEW 6" CONCRETE HOUSEKEEPING PAD.
3. INSTALL NEW HOT WATER HEATING PUMPS. PROVIDE NEW 6" HOUSEKEEPING PAD.
4. PROVIDE 8" COMBUSTION AIR DUCT FROM EACH BOILER UP THROUGH ROOF. TERMINATE ON ROOF WITH GOOSENECK AND BIRDSCREEN. MODIFY AND USE EXISTING COMBUSTION AIR OPENINGS IF POSSIBLE. SEAL ALL UNUSED OPENING WITH LIKE CONSTRUCTION. MAINTAIN ALL ROOF WARRANTIES.
5. PROVIDE NEW VENT FOR GAS REGULATORS PER MANUFACTURER'S RECOMMENDATION.
6. REUSE EXISTING PUMPS FOR GYM LOOP.
7. PROVIDE CONDENSATE DRAIN PIPING WITH NEUTRALIZATION KIT AND ROUTE TO NEAREST FLOOR DRAIN.
8. REUSE EXISTING HOT WATER PUMPS SERVING AREA B AND CONNECT TO NEW HOT WATER PIPING.
9. INSTALL NEW 18" FLUE AND ROUTE TO NEW BOILERS. RUN NEW 18" FLUE UP THROUGH EXISTING CHIMNEY AND TERMINATE WITH VENT CAP AND BIRD SCREEN.
10. PROVIDE NEW 16" EXHAUST FLUE FOR EXISTING BOILER 2. CONNECT TO EXISTING FLUE AND RUN NEW FLUE UP THROUGH EXISTING CHIMNEY AND TERMINATE WITH VENT CAP AND BIRD SCREEN.



2 H700 **BOILER ROOM NEW WORK PIPING PLAN PHASE 1**
SCALE:1/4" = 1'-0"



5 H700 **BOILER ROOM NEW WORK GAS, BREECHING, AND COMBUSTION AIR PLAN PHASE 1**
SCALE:1/4" = 1'-0"



6 H700 **ROOF DEMOLITION PLAN PHASE 1**
SCALE:1/4" = 1'-0"

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Newburgh, NY 12550
CPLteam.com

PROJECT INFORMATION

Project Number
13296.23
Client Name
SUFFERN CSD
Project Name
RP CONNOR - BOILER CONVERSION
District Office Address
SUFFERN CENTRAL SCHOOL DISTRICT
45 MOUNTAIN AVENUE
HILLBURN, NY 10931

SUFFERN CSD

- BID #50-04-01-06-0-005-021

PROJECT ISSUE & REVISION SCHEDULE

No.	Date	Description
3	7/13/2023	BID ADDENDUM #3

PROFESSIONAL STAMPS

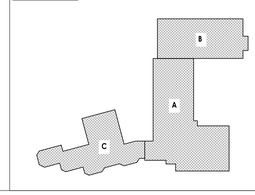
SHEET INFORMATION

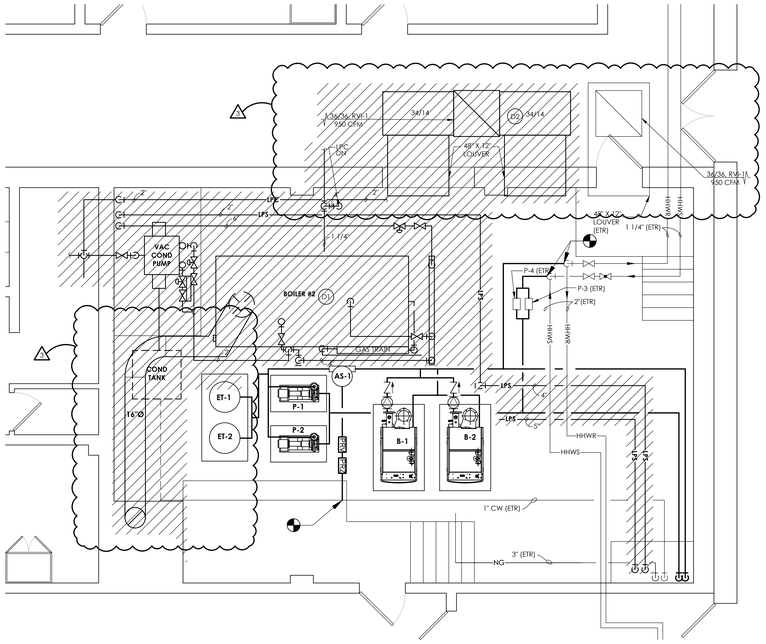
Issued	Scale
06/15/2023	1/4" =1'-0"
Project Status	
CD	
Drawn By	Checked By
BKM	XXX

Drawing Title
PHASE 1 BOILER ROOM DEMOLITION AND NEW WORK PLANS

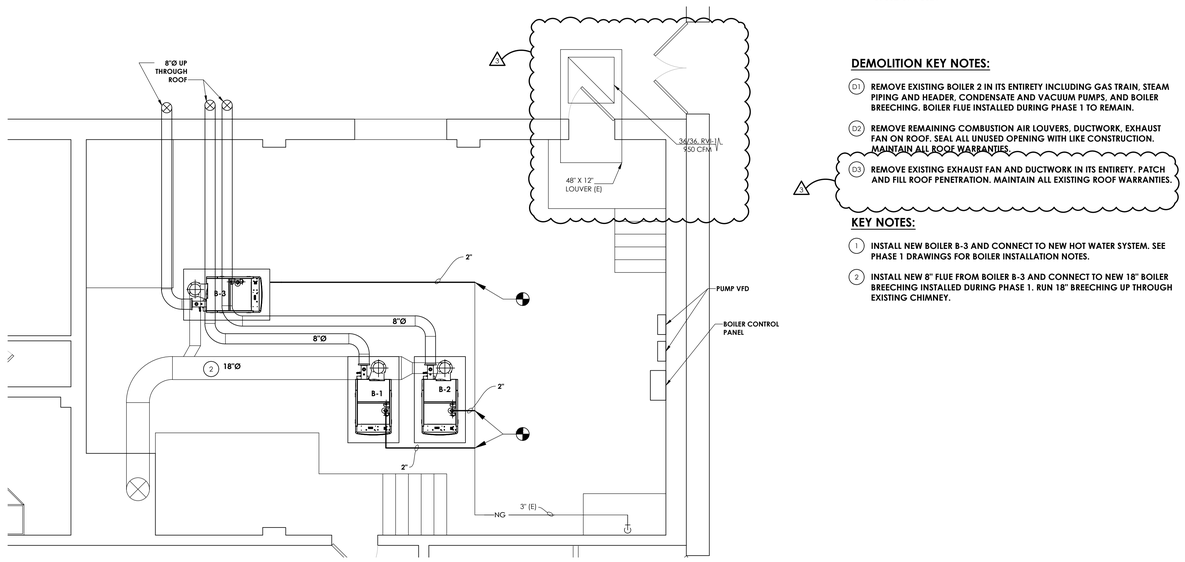
Drawing Number
RPC
H700

KEY PLAN:





1 H701 **BOILER ROOM DEMOLITION PLAN PHASE 2**
SCALE:1/4" = 1'-0"



3 H701 **BOILER ROOM NEW WORK GAS, BREECHING, AND COMBUSTION AIR PLAN PHASE 2**
SCALE:1/4" = 1'-0"

GENERAL NOTES:

1. ALL CONTROLS WORK TO BE DONE BY DISTRICT BMS PROVIDER HONEYWELL.
   CONTACT: BOB GARVEY OR SEAN YATES
   O: 973-455-2503 C: 908-963-0467
   C: 862-579-8821

DEMOLITION KEY NOTES:

D1 REMOVE EXISTING BOILER 2 IN ITS ENTIRETY INCLUDING GAS TRAIN, STEAM PIPING AND HEADER, CONDENSATE AND VACUUM PUMPS, AND BOILER BREECHING. BOILER FLUE INSTALLED DURING PHASE 1 TO REMAIN.

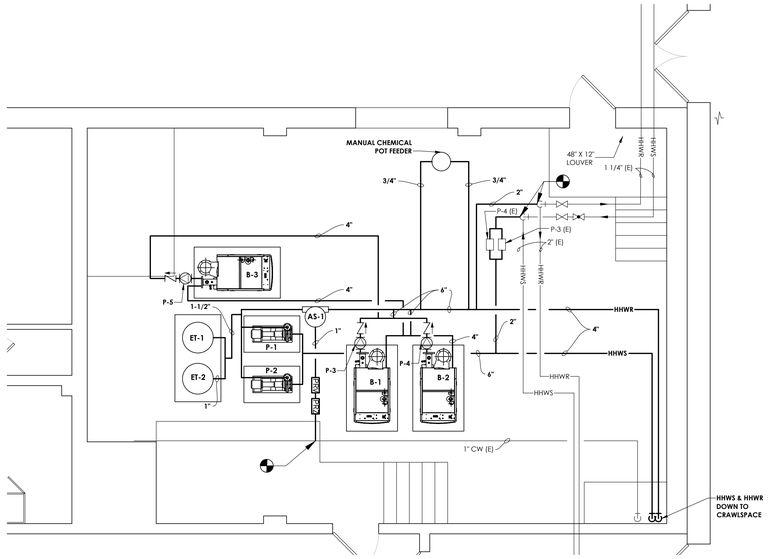
D2 REMOVE REMAINING COMBUSTION AIR LOUVERS, DUCTWORK, EXHAUST FAN ON ROOF. SEAL ALL UNUSED OPENING WITH LIKE CONSTRUCTION. MAINTAIN ALL ROOF WARRANTIES.

D3 REMOVE EXISTING EXHAUST FAN AND DUCTWORK IN ITS ENTIRETY. PATCH AND FILL ROOF PENETRATION. MAINTAIN ALL EXISTING ROOF WARRANTIES.

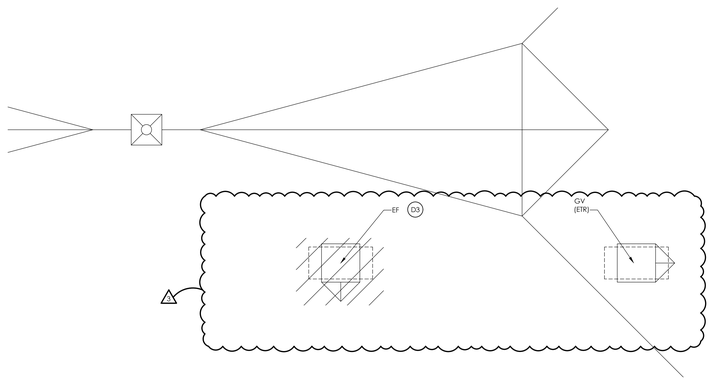
KEY NOTES:

1 INSTALL NEW BOILER B-3 AND CONNECT TO NEW HOT WATER SYSTEM. SEE PHASE 1 DRAWINGS FOR BOILER INSTALLATION NOTES.

2 INSTALL NEW 8" FLUE FROM BOILER B-3 AND CONNECT TO NEW 18" BOILER BREECHING INSTALLED DURING PHASE 1. RUN 18" BREECHING UP THROUGH EXISTING CHIMNEY.



2 H701 **BOILER ROOM NEW WORK PIPING PLAN PHASE 2**
SCALE:1/4" = 1'-0"



4 H701 **BOILER ROOM ROOF DEMO PLAN**
SCALE:1/4" = 1'-0"

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50 Front St, Suite 202
Newburgh, NY 12550
CPLteam.com

PROJECT INFORMATION

Project Number
13296.23

Client Name
SUFFERN CSD

Project Name
RP CONNOR - BOILER CONVERSION

District Office Address
SUFFERN CENTRAL SCHOOL DISTRICT
45 MOUNTAIN AVENUE
HILLBURN, NY 10931

SUFFERN CSD

☐ BID #50-04-01-06-0-005-021

PROJECT ISSUE & REVISION SCHEDULE

No.	Date	Description
3	7/13/2023	BID ADDENDUM #3

PROFESSIONAL STAMPS

SHEET INFORMATION

Issued
06/15/2023

Scale
1/4" =1'-0"

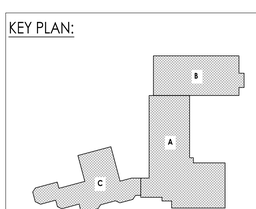
Project Status
CD

Drawn By
BKM

Checked By
XXX

Drawing Title
PHASE 2 BOILER ROOM DEMOLITION AND NEW WORK PLANS

KEY PLAN:



Drawing Number
RPC
H701

SECTION 235100
BREECHINGS, CHIMNEYS, AND STACKS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured breechings.

B. Refractory lined metal stacks.

C. Double wall metal stacks.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.

B. Section 230716 - HVAC Equipment Insulation.

1.03 REFERENCE STANDARDS

A. ASTM C401 - Standard Classification of Alumina and Alumina-Silicate Castable Refractories 2012 (Reapproved 2018).

B. NFPA 31 - Standard for the Installation of Oil Burning Equipment 2018.

C. NFPA 54 - National Fuel Gas Code 2018.

D. NFPA 82 - Standard on Incinerators and Waste and Linen Handling Systems and Equipment 2019.

E. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances 2019.

F. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2005 (Revised 2009).

G. UL 103 - Factory-Built Chimneys for Residential Type and Building Heating Appliances Current Edition, Including All Revisions.

H. UL 959 - Medium Heat Appliance Factory Built Chimneys Current Edition, Including All Revisions.

1.04 DEFINITIONS

A. Breeching: Vent connector.

B. Chimney: Primarily vertical shaft enclosing at least one vent for conducting flue gases outdoors.

C. Smoke Pipe: Round, single wall vent connector.

D. Vent: That portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.

E. Vent Connector: That part of a venting system that conducts the flue gases from the flue collar of an appliance to a chimney or vent, and may include a draft control device.

1.05 SUBMITTALS

A. See Section 013300 - Submittal Procedures, for submittal procedures.

B. Product Data: Provide data indicating factory built chimneys, including dimensional details of components and flue caps, dimensions and weights, electrical characteristics and connection requirements.

C. Shop Drawings: Indicate general construction, dimensions, weights, support and layout of breechings. Submit layout drawings indicating plan view and elevations where factory built units are used.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Breechings, Chimneys, and Stacks:

1. AMPCO by Hart & Cooley, Inc; Model VSI: www.ampcostacks.com/#sle.
2. DuraVent; DuraStack Pro (DIS2): www.duravent.com/#sle.
3. Metal-Fab, Inc: www.mtlfab.com/#sle.
4. Security Chimneys International; Secure Stack Pro (CIX2): www.securitychimneys.com/#sle.

2.02 BREECHINGS, CHIMNEYS, AND STACKS - GENERAL REQUIREMENTS

A. Regulatory Requirements:
   1. Comply with applicable codes for installation of natural gas burning appliances and equipment.
   2. Comply with NFPA 31 for installation of oil burning appliances and equipment.
   3. Factory-built vents and chimneys used for venting natural draft appliances to comply with NFPA 211 and UL listed and labeled.
   4. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.03 MANUFACTURED BREECHINGS

A. Provide factory-built, modular connector and manifold system, tested to UL 103 with positive pressure rating.

B. Assembly to be UL listed for use with building equipment in compliance with NFPA 211.

C. Fabricate with 1 inch minimum air space between walls and construct inner liner of 304 stainless steel and outer jacket of 304 stainless steel.
   1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.

D. Design, fabricate, and install gas-tight preventing products of combustion leaking into the building.
   1. Securely connect inner joints and seal with factory supplied overlapping V-bands and appropriate sealant in accordance with manufacturer's instructions.
   2. System design to compensate for all flue gas induced thermal expansion.

2.04 REFRACTORY LINED METAL STACKS

A. Fabricate jacket for size 36 inches and smaller of 24 gauge, 0.0239 inch galvanized steel with grooved seam joint, or 26 gauge, 0.0179 inch aluminized steel with riveted seams. For sizes 39 inches and larger fabricate of 11 gauge, 0.1196 inch galvanized steel with welded seam joint.

B. Weld heavy gauge stack sections together in factory. Factory apply heat resistant paint to each stack section and accessory with primer and finish paint. Touch-up or refinish in field.

C. Refractory lining to be a minimum 2 inch thick, proprietary material ASTM C401 Class __ tested to UL 959 and UL listed to withstand 2000 degrees F without fusion, have maximum acid extraction of 0.2 percent, have minimum of 3200 psi cold crush strength, and be positively bonded to steel jacket, jointed with mortar.

D. Accessories, UL Labeled:
   1. Anchor Lugs: Acid resistant coated cast iron.
   2. Clean Out Section: Welded to base of stack, with gasket, and bolt tightened inspection plate.
   3. Roof Penetration: Factory fabricated thimble, flashing and storm collar.

2.05 SINGLE WALL METAL STACKS

A. Provide single wall metal stacks, tested to UL 103 and UL listed with positive pressure rating, for use with building heating equipment, in compliance with NFPA 211.

B. Fabricate with AL29-4C stainless steel.

1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.

C. Accessories, UL Labeled:
   1. Ventilated Roof Thimble: Consists of roof penetration, vent flashing with spacers and storm collar.
   2. Stack Cap: Consists of conical rainshield with inverted cone for partial rain protection with low flow resistance.

2.06 DOUBLE WALL METAL STACKS

A. Manufacturers:
   1. Z-Flex U.S. Inc; Z-VENT Double Wall: www.z-flex.com/#sle.

B. Provide double wall metal stacks, tested to UL 103 and UL listed with positive pressure rating, for use with building heating equipment, in compliance with NFPA 211.

C. Fabricate with 1 inch minimum air space between walls and construct inner liner of 304 stainless steel and outer jacket of AL29-4C stainless steel.
   1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.

D. Accessories, UL Labeled:
   1. Ventilated Roof Thimble: Consists of roof penetration, vent flashing with spacers and storm collar.
   2. Stack Cap: Consists of conical rainshield with inverted cone for partial rain protection with low flow resistance.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NFPA 54

C. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.

D. Support breechings from building structure, rigidly with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breechings, chimneys, and stacks at 12 foot spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA (DCS) for equivalent duct support configuration and size.

E. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.

F. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

G. Insulate breechings in accordance with Section 230716.

H. Assemble and install stack sections in accordance with NFPA 82, industry practices, and in compliance with UL listing. Join sections with acid-resistant joint cement. Connect base section to foundation using anchor lugs.

I. Level and plumb chimney and stacks.

J. Clean breechings, chimneys, and stacks during installation, removing dust and debris.

3.02 SCHEDULES

A. Breechings, Chimneys and Stacks.
   1. Condensing Boiler: Double Wall, Manufactured Breeching, Stainless Steel, Category IV Vent.

2. Non-Condensing Boiler: Refractory Lined, Galvanized breeching, Type B vent.

END OF SECTION 235100