ADDENDUM – 4

April 12, 2024

PROVIDENCE HOUSING AUTHORITY
Hydronic Piping Repairs – Chad Brown & Admiral Terrace

The following changes, modifications, and clarifications are hereby made to the plans and specifications for the above referenced project.

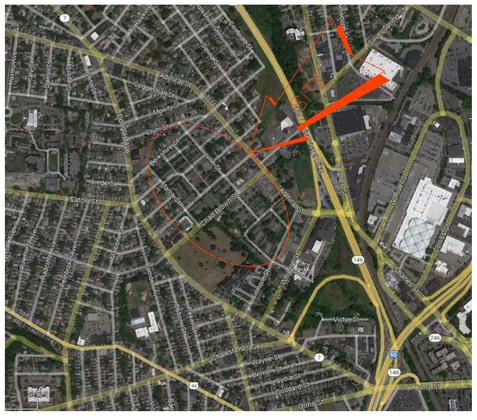
Item 1: **The voltage of the proposed circulator pumps is 115V**.

Item 2: **An updated plan set has been issued as part of this addendum, see attached.**

PROVIDENCE HOUSING AUTHORITY

CHAD BROWN HOUSING COMPLEX
HYDRONIC PIPING REPAIRS

263 CHAD BROWN STREET
PROVIDENCE, RHODE ISLAND



LOCATION MAP NTS

NORTH

SITE MAP
NTS

INDEX OF DRAWINGS	
Sheet Number	Sheet Title
CS	*COVERSHEET*
C101	*SITE MAP CHAD BROWN*
C102	*SITE MAP ADMIRAL TERRACE*
M000	*MECHANICAL LEGEND & NOTES*
M100	*275 & 285 CHAD*
M101	*279 & 289 CHAD*
M102	*283 & 291 CHAD*
M103	*94 & 108 FILLMORE*
M104	*90 & 104 FILLMORE*
M105	*100 & 124 FILLMORE*
M106	*128 & 150 FILLMORE*
M107	*80 ADMIRAL & 130 FILLMORE*
M108	*57 BERKSHIRE*
M109	*77 BERKSHIRE*
M110	*64 JUNE & 65 MARCH*
M111	*53 MARCH*
M112	*48 & 58 JUNE*
M113	*35 & 39 MARCH*
M114	*29 MARCH & 34 JUNE*
M115	*21 MARCH & 244 CHAD*
M116	*262 & 270 CHAD*
M117	*20 JUNE & 286 CHAD*
M200-202	*SCHEDULE & DETAILS*
M300-301	*SPECIFICATIONS*

PREPARED BY:

verdantas
PEOPLE FOCUSED FUTURE
1005 MAIN STREET, SUITE 8120
PAWTUCKET, RI 02860
TEL. 401.728.6860

ENGINEERING DESIGN SERVICES, INC.
* MECHANICAL ENGINEERS

ENGINEERING DESIGN SERVICES INCORPORATED

100%PLANS
JANUARY 2024
Updated 4/11/24

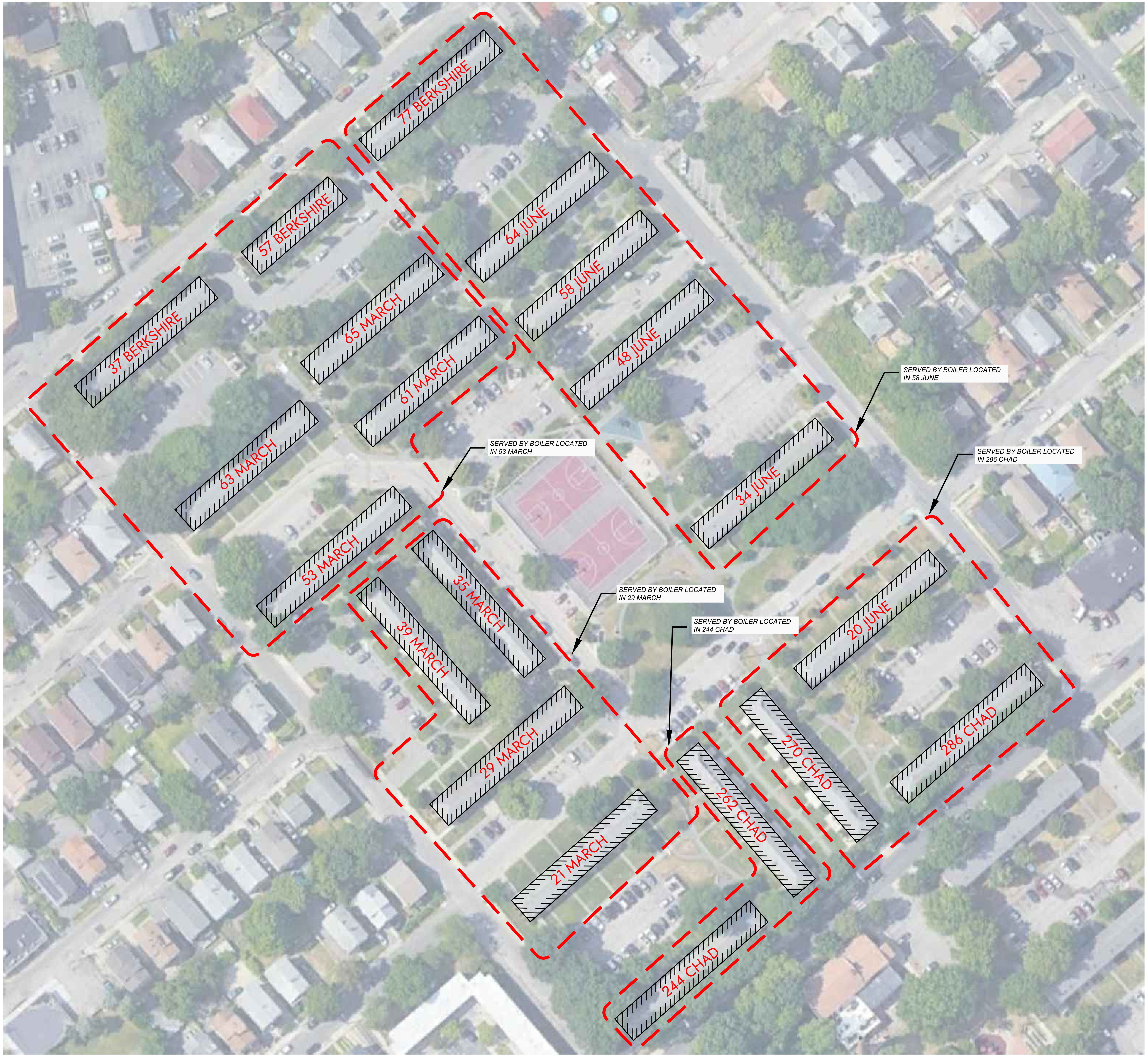
PREPARED FOR

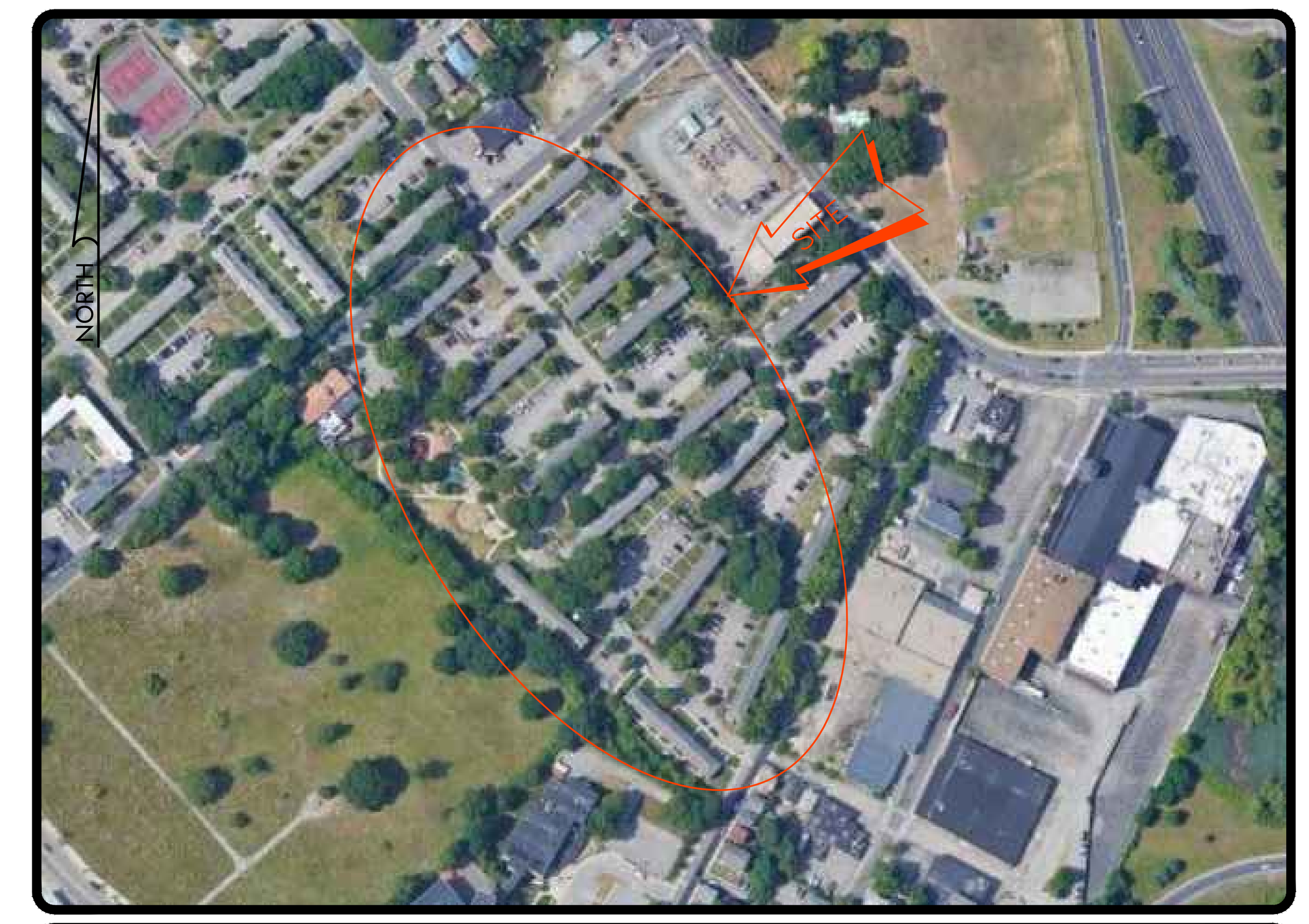
Providence pha Housing Authority

PROVIDENCE HOUSING AUTHORITY
40 LAUREL HILL AVENUE
PROVIDENCE, RHODE ISLAND

BID
DOCUMENTS
JAN
2024

Project No. 16280





MAP: LOCATION MAP SCALE: 1" = 275'

BOILER LOCATION KEY:

THE BOILER LOCATED IN 244 CHAD SERVES:
- 262 CHAD

THE BOILER LOCATED IN 286 CHAD SERVES:
- 270 CHAD
- 20 JUNE

THE BOILER LOCATED IN 29 MARCH SERVES:
- 21 MARCH
- 35 MARCH
- 39 MARCH

THE BOILER LOCATED IN 53 MARCH SERVES:
- 37 BERKSHIRE
- 57 BERKSHIRE
- 61 MARCH
- 63 MARCH
- 65 MARCH

THE BOILER LOCATED IN 58 JUNE SERVES:
- 77 BERKSHIRE
- 34 JUNE
- 48 JUNE
- 64 JUNE

Providence Housing Authority
Chad Brown
HVAC Evaluation Services
Building Inspection List for Review

verdantas formerly ES&M

Engineering Design Services Incorporated

Project # 22245RS

	Building Description	Has Steam Piping Been Removed	Circulation Pump	Insulation on Walls	Basement Height (ft)	Box Out Main
Served by Boiler in 244 Chad	244 Chad	Y	ER	Foam	4 to 7	N
	262 Chad	N	RO	Foam	6	N
Served by Boiler in 286 Chad	20 June St	N	ER	Foam	4	N
	270 Chad	N	RO	Foam	4 to 6	N
	286 Chad	Y	ER	Foam & FR	4to 7	N
Served by Boiler in 29 March	21 March St					
	29 March St	Y	ER	Foam & FR	5 to 7	Y (1)
	35 March St	N	ER	Foam	4 to 6	N
	39 March St	N	ER	Foam	4 to 6	Y
Served by Boiler in 53 March	53 March St	Y	ER	Foam & FR	?	N
	65 March St	N	RO	Foam	4 to 6	Y
	57 Berkshire	N	RN	Foam	4	Y
	61 March St					
	63 March St					
	37 Berkshire					
Served by Boiler in 58 June	34 June St	N	ER	Foam	4 to 6	Y
	48 june St	N	ER	Foam	4 to 6	Y (1)
	58 June St	Y	ER	Foam & FR	5 to 7	N
	64 June St	N	ER	Foam	5 to 7	N
	77 Berksire	N	ER	Foam	5 to 7	N

Notes:
1. For Circulation Pumps ... RO - Relocate Only, RR - Relocate and Replace, RN - Replace with New or ER - Existing to Remain
2. 21, 61, and 63 March and 37 Birkshire, the piping has been replaced (NIS).
3. Add Make Up Water to buildings without boilers.
4. Replace bleed valves in boiler rooms as appropriate.
5. All main couplings to be replaced - going to PEX piping.
6. Box out refers to set (2) of lines.

50' 0 50' 100'
DRAWING SCALE 1" = 50'

verdantas PEOPLE FOCUSED FUTURE
1005 MAIN STREET, SUITE 8120
PAWTUCKET, RI 02860
TEL. 401.728.6860

DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT NO.
RGM	ERB	RGM	16280

No.	REVISION	CHK'D BY DATE
-		

PROVIDENCE~PROVIDENCE COUNTY~RHODE ISLAND
CHAD BROWN HOUSING COMPLEX
HYRDRONIC PIPING REPAIRS
SITE MAP CHAD BROWN
CHAD BROWN

DATE: DECEMBER, 2023
SCALE: 1" = 50'
SHEET: C101

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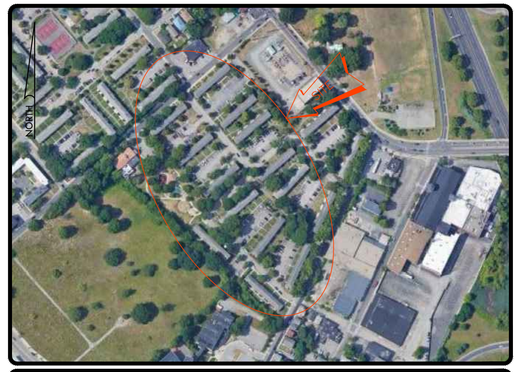

MAP: LOCATION MAP SCALE: 1" = 275'

BOILER LOCATION KEY:

THE BOILER LOCATED IN THE COMMUNITY CENTER SERVES:
- 275 CHAD
- 279 CHAD
- 283 CHAD
- 285 CHAD
- 108 FILLMORE

THE BOILER LOCATED IN 100 FILLMORE SERVES:
- 90 FILLMORE
- 124 FILLMORE
- 150 FILLMORE

THE BOILER LOCATED IN 104 FILLMORE SERVES:
- 94 FILLMORE

THE BOILER LOCATED IN 128 FILLMORE SERVES:
- 80 ADMIRAL
- 289 CHAD
- 291 CHAD
- 130 FILLMORE

Providence Housing Authority
Admiral Terrace
HVAC Evaluation Services
Building Inspection List for Review

verdantas formerly ES&M

Engineering Design Services Incorporated

Project # 22245RS

	Building Description	Has Steam Piping Been Removed	Circulation Pump	Insulation on Walls	Basement Height (ft)	Box Out Main
Served by Boiler in 263 Chad	285 Chad	N	RN	Partial Foam	5 to 7	N
	275 Chad	N	ER	Partial Foam	4 to 6	N
	263 Chad (Community Center)	Y	ER	na	na	na
	279 Chad	N	ER	Mixed	5 to 7	N
	283 Chad	N	ER	Foam	3 to 6	Y
	108 Fillmore	N	ER	None	8	Y(1)
Boiler in 104 Fillmore	104 Fillmore	Y	ER	Partial Foam	5 to 7	N
	94 Fillmore	N	ER	Partial Foam	5	Y
Served by Boiler in 100 Fillmore	90 Fillmore	N	ER	Partial Foam	5	N
	100 Fillmore	N	ER	None	8	N
	124 Fillmore	N	ER	Partial Foam	5	Y
	150 Fillmore	N	ER	Partial Foam	5	Y(1)
Served by Boiler in 128 Fillmore	128 Fillmore	N	RN	Partial Foam	5 to 8	Y(2)
	130 Fillmore	N	ER	Partial Foam	5	Y(2)
	80 Admiral	N	ER	Partial Foam	5	Y
	289 Chad	N	ER	Partial Foam	5	Y(2)
	291 Chad	N	RN	Partial Foam	5	Y(2)

Notes:
1. For Circulation Pumps ... RO - Relocate Only, RR - Relocate and Replace, RN - Replace with New or ER - Existing to Remain
2. Add Make Up Water to buildings without boilers.
3. Replace bleed valves in boiler rooms as appropriate.
4. All main couplings to be replaced - going to PEX piping.
5. Box out refers to set (2) of lines.

50' 0 50' 100'
DRAWING SCALE 1" = 50'

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PAWTUCKET, RI 02860
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DESIGNED BY:	DRAWN BY:	CHECKED BY:	PROJECT NO.
RGM	EBB	RGM	16280

No.	REVISION	CHK'D BY	DATE

PROVIDENCE-PROVIDENCE COUNTY-RHODE ISLAND
CHAD BROWN HOUSING COMPLEX
HYDRONIC PIPING REPAIRS
SITE MAP ADMIRAL TERRACE
ADMIRAL TERRACE

DATE: DECEMBER, 2023

SCALE: 1" = 50'

SHEET: C102

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CONSTRUCTION NOTES:

1. ALL WORK IS TO BE PERFORMED IN STRICT COMPLIANCE WITH LOCAL CODES AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
2. LOCATIONS OF EXISTING EQUIPMENT, PIPING, AND DUCTWORK HAVE BEEN TAKEN FROM BEST AVAILABLE INFORMATION. THE DRAWINGS ARE INTENDED TO BE USED FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR IS NOT TO SCALE DRAWINGS OR ASSUME THAT ALL EQUIPMENT IS SHOWN. HE SHALL VISIT THE SITE TO DETERMINE THE TOTAL EXTENT OF REMOVALS AND NEW WORK AS DIAGRAMMED ON THE PLANS. EXTRA COMPENSATION FOR FAILURE TO COMPLY WITH THE ABOVE STATEMENTS WILL NOT BE CONSIDERED.
3. PIPING, DUCTWORK AND EQUIPMENT AS SHOWN ARE DIAGRAMMATIC ONLY. CONTRACTOR SHALL DETERMINE EXACT LOCATIONS OF PIPING AND DUCTWORK RUNS, EQUIPMENT LOCATIONS AND CONNECTIONS TO SUIT FIELD CONDITIONS.
4. ALL OPENINGS TO THE WEATHER SHALL BE KEPT PROPERLY SEALED WEATHER TIGHT AT ALL TIMES AND COVER CURBS TO PREVENT DUST AND DIRT FROM GETTING IN DURING THE WORK, EXCEPT WHEN BEING WORKED ON TO PRECLUDE THE POSSIBILITY OF FLOODING DUE TO STORM OR OTHER CAUSES.
5. THIS CONTRACTOR, PRIOR TO SUBMITTING HIS BID SHALL VISIT THE PROJECT SITE TO FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS. REQUESTS FOR COMPENSATION FOR EXTRA WORK, WHICH WOULD HAVE BEEN EVIDENT BY COMPLIANCE WITH THE PREVIOUS STATEMENT, WILL NOT BE CONSIDERED. THE CONTRACTOR SHALL CONDUCT A THOROUGH FIELD INVESTIGATION TO VERIFY WORK SHOWN ON THE DRAWINGS. THE DRAWINGS REFLECT THE BEST AVAILABLE INFORMATION FROM EXISTING PLANS AND SITE INVESTIGATIONS.
6. DISCONNECT AND REMOVE ALL EXISTING, PIPING, DUCTWORK, SUPPORTS, HANGERS AND ALL OTHER MECHANICAL COMPONENTS MADE OBSOLETE BY THIS PROJECT.
7. PROVIDE ALL REQUIRED CUTTING AND PATCHING AS REQUIRED TO COMPLETE THE INSTALLATION OF NEW MECHANICAL SYSTEM. PATCH ALL SURFACES TO MATCH AND MAINTAIN ALL FIRE RATINGS.
8. PROVIDE ALL REQUIRED RIGGING TO ACCOMMODATE THE REMOVAL & REINSTALLATION OF ALL EQUIPMENT.
9. COORDINATE ALL WORK WITH THE BUILDING PROJECT MANAGER /OWNER/ARCHITECT.
10. CONTRACTOR TO COORDINATE ALL SYSTEM AND EQUIPMENT SHUT DOWNS WITH OWNER.
11. PROVIDE FUNCTIONAL PERFORMANCE TEST UPON COMPLETION FOR ALL EQUIPMENT IMPACTED BY PROJECT.
12. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIALS, AND LABOR TO SATISFY A COMPLETE WORKING SYSTEM, WHETHER SPECIFIED OR IMPLIED.
13. CLEAN THE JOB SITE DAILY AND REMOVE FROM THE PREMISES ANY DIRT AND DEBRIS CAUSED BY THE PERFORMANCE OF THE WORK INCLUDED IN THIS CONTRACT.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFEKEEPING OF HIS OWN PROPERTY ON THE JOB SITE. OWNER ASSUMES NO RESPONSIBILITY FOR PROTECTION OF PROPERTIES AGAINST FIRE, THEFT, AND ENVIRONMENTAL CONDITIONS.
15. CONTRACTOR SHALL REFER TO THE COMPLETE SET OF CONTRACT DOCUMENTS INCLUDING SPECIFICATIONS AND OTHER TRADES FOR A FULL UNDERSTANDING OF ALL WORK REQUIRED.
16. WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
17. ALL EQUIPMENT AND MATERIALS SHALL BE AS SPECIFIED OR "APPROVED EQUAL" BY THE ENGINEER OR ARCHITECT AND OWNER, UNLESS OTHERWISE NOTED.
18. ALL PIPING SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS IN A NEAT AND WORKMANLIKE MANNER AND BE SUPPORTED AS REQUIRED BY CODES. PIPING SHALL BE SET UP AND DOWN AND OFFSET AS REQUIRED TO SUIT FIELD CONDITIONS. DIELECTRIC COUPLINGS SHALL BE USED WHERE ANY DISSIMILAR METALS ARE JOINED.
19. PROVIDE ALL NECESSARY TEMPORARY OR PERMANENT CAPS OR PLUGS FOR PIPING. DO NOT LEAVE PIPING OPEN ENDED WHILE BEING STORED OR INSTALLED.
20. ALL NEW PIPING TO BE INSULATED AS REQUIRED BY SBC-8-2021, "RHODE ISLAND STATE ENERGY CONSERVATION CODE" SYSTEMS SHALL CONFORM TO THE REQUIREMENTS FOR AN OPERATING TEMPERATURE RANGE OF 141-200°F.
21. PIPING CONTRACTOR SHALL, AT HIS SOLE EXPENSE, HAVE THE INSTALLATIONS INSPECTED PERIODICALLY DURING CONSTRUCTION BY THE PEX-GARD MANUFACTURER(OR THEIR REPRESENTATIVE) AND OWNER. SUCH INSPECTIONS SHALL BE DOCUMENTED AND REPORTS PROVIDED TO THE OWNER/ARCHITECT. ANY DEVIATIONS FROM THE MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES SHALL BE CORRECTED AT NO COST TO THE OWNER.
22. ALL PEX-GARD CONNECTION FITTINGS TO BE INSTALLED PER SUPPLIER'S RECOMMENDATIONS. DO NOT ORDER FITTINGS BEFORE ON-SITE INSPECTION BY SUPPLIER.
23. COORDINATE LOCKOUT/TAGOUT PROCEDURES WITH PHA. CONTRACTOR TO PROVIDE TRAINING DOCUMENTS.
24. WORKERS MAY BE IN CONFINED SPACE AREAS IN CERTAIN BUILDINGS. CONTRACTOR TO PROVIDE ADEQUATE AIR AS PER OSHA STANDARDS.

MECHANICAL LEGEND

TAGS

#	-	KEY NOTE
	HWS	HOT WATER SUPPLY
	HWR	HOT WATER RETURN
	-	CIRCULATION PUMP
	-	BALL VALVE
	-	RELIEF VALVE
	-	GLOBE VALVE
	-	GATE VALVE
BV	-	AUTOMATIC BLEEDER VALVE
P	-	PRESSURE GAGE
T	-	TEMPERATURE GAGE

SCOPE OF WORK NOTE:

1. SCOPE OF WORK FOR 21 MARCH, 61 MARCH, 63 MARCH, AND 37 BERKSHIRE:
   - 1.1. ALL PIPING 2-1/2" & BELOW TO BE REPLACED IF NOT ALREADY. REPLACE CONDUITS AND WIRING FOR CIRCULATORS.
2. SCOPE OF WORK NOTE FOR 53 MARCH, 61 MARCH, 63 MARCH, 65 MARCH, 37 BERKSHIRE, AND 57 BERKSHIRE:
   - 2.1. ALL 4" STEEL PIPING TO BE REMOVED AND REPLACED WITH COPPER. PROVIDE WITH DIELECTRIC UNIONS AS APPROPRIATE. G.C. TO INSPECT SITES TO DETERMINE THE EXTEND OF WORK.
3. ALL FITTINGS FOR PEX-GARD PIPING LEADING TO THE EXTERIOR OF THE BUILDING INCLUDING BUILDINGS 262 CHAD BROWN, 283 CHAD BROWN, 291 CHAD BROWN, 100 FILMORE, AND 124 FILMORE STREETS TO BE REPLACED.

KEYED NOTES:

1. PUMP TO BE BE RELOCATED AS SHOWN. PROVIDE NEW TYPE L COPPER FOR RELOCATED PUMP.
2. REMOVE AND REINSTALL EXISTING GRUNDFOS CIRCULATION PUMP PER PLANS.
3. NOT USED.
4. REMOVE AND REPLACE EXISTING CIRCULATION PUMP WITH GRUNDFOS MAGNA 3 MODEL D 65-120 F. CONNECT POWER AND CONTROLS TO EXISTING OR APPROVED EQUAL.
5. REMOVE EXISTING CONNECTION TO PERMA-PIPE PEX-GARD PIPING AND REPLACE WITH APPROPRIATELY SIZED FITTING SCHEDULED ON M200.
6. CONSTRUCT "BOX-OUT" AS DETAILED ON PLAN M 200.
7. PROVIDE DIELECTRIC FITTINGS OF EXACT SIZE TO PUMP CONNECTIONS TO DISSIMILAR METALS IN THE BOILER ROOM PER DETAIL ON M200.
8. PROVIDE HOT WATER RETURN LINE WITH ISOLATION VALVE AND DRAIN VALVE.
9. BOILER ROOMS TO HAVE LIMITED DEMOLITION, CUTTING BACK THE PERMA-PIPE PEX-GUARD IS NOT PERMITTED. REPLACE ALL FITTINGS FROM BOILER SECONDARY LOOP TO CIRCULATION PUMP INLET. SEE DETAIL IN SHEET M201.

BUILDING NOTE:

1. INSULATE ALL DISTRIBUTION PIPING IN ALL BUILDINGS.
2. ALL INSULATION TO BE ARMAFLEX OR EQUAL, WITH THICKNESS TO MEET RI ENERGY CODE (SBC-8-2021).
3. ANY ALTERNATE INSULATION TO MEET REQUIREMENTS OF SECTION 2.10 OF THE SPECIFICATIONS.
4. ALL FITTINGS AND VALVES TO BE PROTECTED PER SECTION 2.10 OF THE SPECIFICATIONS.
5. CONTRACTOR TO PROVIDE ADEQUATE TEMPORARY LIGHTING TO PERFORM WORK.

PIPE SUPPORTS, ANCHORS, AND EXPANSION ARMS AND LOOPS:

1. ALL PIPE SUPPORTS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
2. ALL HORIZONTAL RUNS OF COPPER PIPING SHALL HAVE MAXIMUM ANCHOR POINT SPACING OF 65 FEET, AND SUPPORTS WITH A MAXIMUM SPACING OF 10 FEET, AND BE PER MANUFACTURER'S RECOMMENDATIONS.
3. ALL CONNECTIONS TO RISERS SHALL HAVE A MINIMUM EXPANSION LEG OF 18 INCHES AND BE PER MANUFACTURER'S RECOMMENDATIONS. SEE DETAIL ON SHEET M201.
4. EXPANSION LOOPS OF MAIN RUNS LONGITUDINALLY THRU THE BUILDING SHALL HAVE A MINIMUM LENGTH OF 60 INCHES AND WIDTH OF 30 INCHES MIDWAY BETWEEN ANCHOR POINTS SPACED A MINIMUM OF 65 FEET APART, AND BE PER MANUFACTURER'S RECOMMENDATIONS.
5. ALL SUPPORTS SHALL MEET OR EXCEED MANUFACTURER'S RECOMMENDATIONS. REFERENCE MANUFACTURER'S DESIGN MANUALS.

DEMOLITION NOTES:

1. PUMP PRESSURES SHALL BE MEASURED AND DOCUMENTED BEFORE ANY DEMOLITION. UPON COMPLETION OF INSTALLATIONS, ALL PUMPS SHALL BE SET TO ORIGINAL PRESSURES.
2. REMOVE ALL HYDRONIC DISTRIBUTION PIPING WITHIN THE CRAWL SPACE OF EACH BUILDING UP TO THE RISERS. LEAVE SUFFICIENT RISER PIPING FROM CRAWL SPACE BELOW FOR NECESSARY CONNECTION TO NEW WORK. REMOVE MAIN SUPPLY AND RETURN PIPING STARTING FROM UNDERGROUND PERMA-PIPE PEX-GARD FITTING (DO NOT CUT BACK PERMA-PIPE PEX-GARD PIPING) - EXCEPT IN BOILER ROOMS - WHERE THERE IS LIMITED DEMOLITION.
3. IN BUILDINGS WITH BOILER ROOMS - REMOVE DISTRIBUTION PIPING TO OUTLET OF CIRCULATION PUMP (NEW ISOLATION VALVE TO BE PROVIDED BY CONTRACTOR).
4. NO HOT WORK (WELDING, SOLDERING OR OTHER ACTIVITY THAT COULD CREATE A SOURCE OF IGNITION) TO BE PERFORMED IN ANY BUILDING CRAWL SPACE.

GENERAL NOTES:

1. PUMP PRESSURES SHALL BE MEASURED AND DOCUMENTED BEFORE ANY DEMOLITION. UPON COMPLETION OF INSTALLATIONS, ALL PUMPS SHALL BE SET TO ORIGINAL PRESSURES.
2. TRANSFER PIPING THROUGH BUILDINGS 2-1/2" AND SMALLER TO BE REPLACED WITH TYPE L COPPER. TRANSFER PIPING THROUGH BUILDINGS LARGER THAN 2-1/2" TO REMAIN.
3. ALL EXISTING STEEL DISTRIBUTION PIPING TO BE REPLACED WITH TYPE L COPPER. PIPE SIZING TO MATCH EXISTING. (1)
4. ALL INSULATION TO BE CLOSED CELL ARMAFLEX OR EQUAL FOR DISTRIBUTION PIPING. ALL INSULATION FOR TRANSFER PIPING TO BE PER SECTION 2.10 OF THE SPECIFICATIONS.
5. ISOLATION VALVES (BALL VALVES) TO BE ADDED FOR EACH BUILDING DISTRIBUTION SYSTEM PER PLANS.
6. NO HOT WORK (WELDING, SOLDERING OR OTHER ACTIVITY THAT COULD CREATE A SOURCE OF IGNITION) TO BE PERFORMED IN ANY BUIILDING CRAWL SPACE.
7. COPPER PIPING TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
8. RELIEF VALVES TO BE SET AT 150% OF MEASURED PUMP PRESSURE BUT NO MORE THAN, EQUAL TO, OR LESS THAN THE MAWP OF ANY SYSTEM COMPONENTS AND DEVICES UNLESS OTHERWISE SPECIFIED.
9. REMOVE, REPLACE, AND DISPOSE OF ALL EXPANSION TANKS WITHIN CRAWL SPACES, WHETHER IN USE OR ABANDONED.
10. FULL SYSTEM FLUSH TO BE PERFORMED ON ALL UNITS.
11. THE CONTRACTOR SHALL REMOVE ALL APARTMENT ACTUATOR VALVES (TWO PER APARTMENT) AND REPLACE WITH BALL VALVES.
12. THE CONTRACTOR SHALL COVER ALL INSULATION AT ELBOWS IN THE HYDRONIC PIPING SYSTEM IN BASEMENT/ CRAWL SPACES WITH PVC PROTECTION COVER.

ADD ALTERNATE #1:

COVER HYDRONIC PIPING INSULATION IN BASEMENT/ CRAWL SPACES WITH PVC PROTECTION COVER.

ADD ALTERNATE #2:

REPLACE ALL CONDUIT AND WIRING FROM CIRCULATION PUMP BREAKER TO DISCONNECTS AND PUMPS.

CONTRACTOR NOTE:

THE CONTRACTOR SHALL REMOVE ALL APARTMENT ACTUATOR VALVES (TWO PER APARTMENT) AND REPLACE WITH BALL VALVES.

CONTRACTOR NOTE:

1. BUILDINGS THAT REQUIRE CIRCULATION PUMP TO BE RELOCATED INCLUDE 128 FILLMORE, 65 MARCH, 270 CHAD.

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

THIS DRAWING IS A PART OF AN INTEGRATED SET OF CONSTRUCTION CONTRACT DOCUMENTS. REFER TO ALL DRAWINGS AND SPECIFICATIONS INCLUDING BUT NOT LIMITED TO "GENERAL CONDITIONS" "SUMMARY OF WORK", AND ANY APPLICABLE MANUFACTURERS TECHNICAL SPECIFICATIONS.

REFER TO ALL DRAWINGS FOR COMPLETE SCOPE OF WORK.

THIS DRAWING IS NOT TO BE SCALED OR USED AS AN AS-BUILT.

REV. NO.	DATE	DESCRIPTION
	01.09.24	FOR PERMIT & CONSTRUCTION
	03.19.24	GENERAL REVISIONS
1	04.01.24	PIPE REPLACEMENT UPDATES
2	04.11.24	REVISIONS

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Portsmouth, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

MECHANICAL -

LEGENDS & NOTES

JOB NO.: 22245RS

DRAWN BY: TC

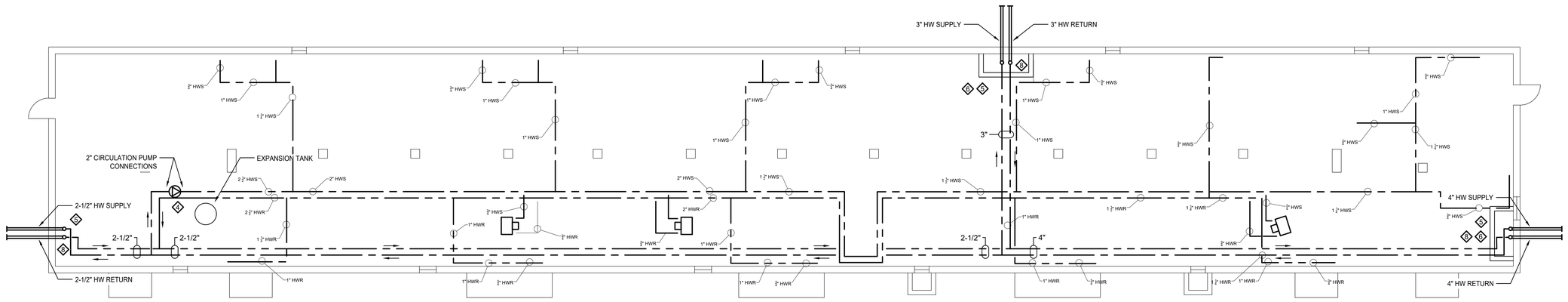
CHECKED BY: WTM

DATE ISSUED: 01.09.2024

SCALE: AS NOTED

SHEET NO.:

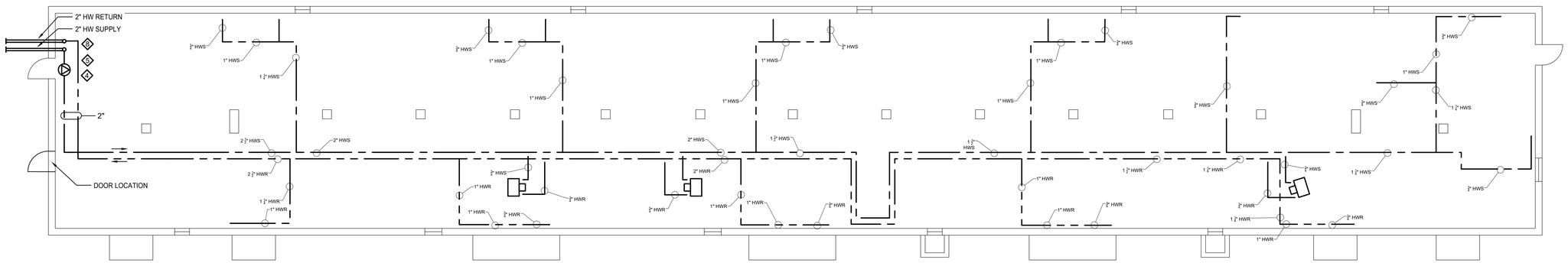
M000



1 275 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
2. PROVIDE STEEL RISER WITH DIELECTIRC COUPLING.
3. PROVIDE COPPER RISER WITH COPPER COUPLING.
4. ALL ISOLATION OF MAIN TRANSFER PIPING SHALL COMPLY WITH "TYPICAL PEX-GARD CONNECTIONS WITH SERVICE UNIONS" DETAIL. SEE PAGE M201 FOR REFERENCE.
5. ALL EXISTING UNIT HEATERS TO BE DISCONNECTED AND REMOVED.
6. FULL SYSTEM FLUSH TO BE PERFORMED ON ALL DWELLING UNITS UPON INSTALLATION.
7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.



2 285 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
2. PROVIDE STEEL RISER WITH DIELECTIRC COUPLING.
3. PROVIDE COPPER RISER WITH COPPER COUPLING.
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5. ALL EXISTING UNIT HEATERS TO BE DISCONNECTED AND REMOVED.
6. FULL SYSTEM FLUSH TO BE PERFORMED ON ALL DWELLING UNITS UPON INSTALLATION.
7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

1 / M100 275 CHAD & 285 CHAD
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

REV. NO.	DATE	DESCRIPTION
	01.09.24	FOR PERMIT & CONSTRUCTION
	03.19.24	GENERAL REVISIONS
1	04.01.24	PIPE REPLACEMENT UPDATES
2	04.11.24	REVISIONS

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

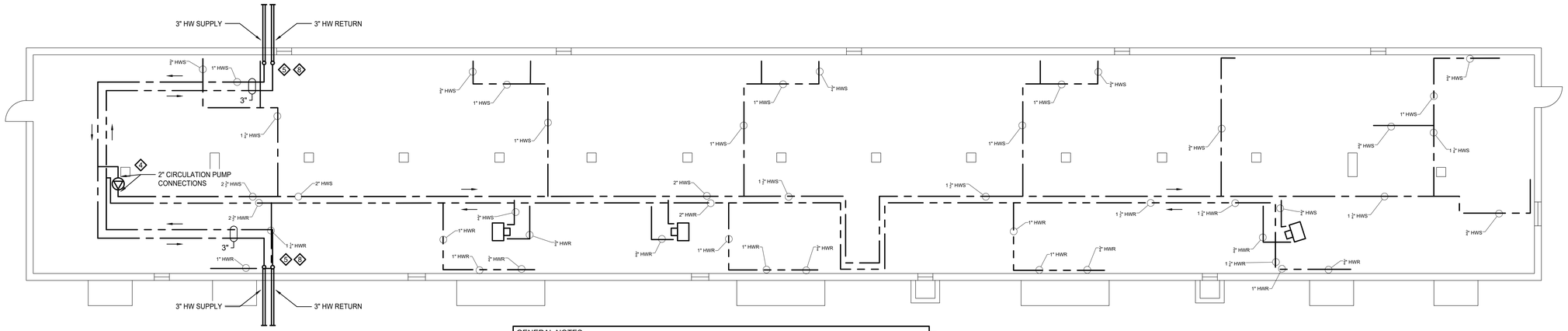
MECHANICAL -

ADMIRAL TERRACE
275 & 285 CHAD

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M100

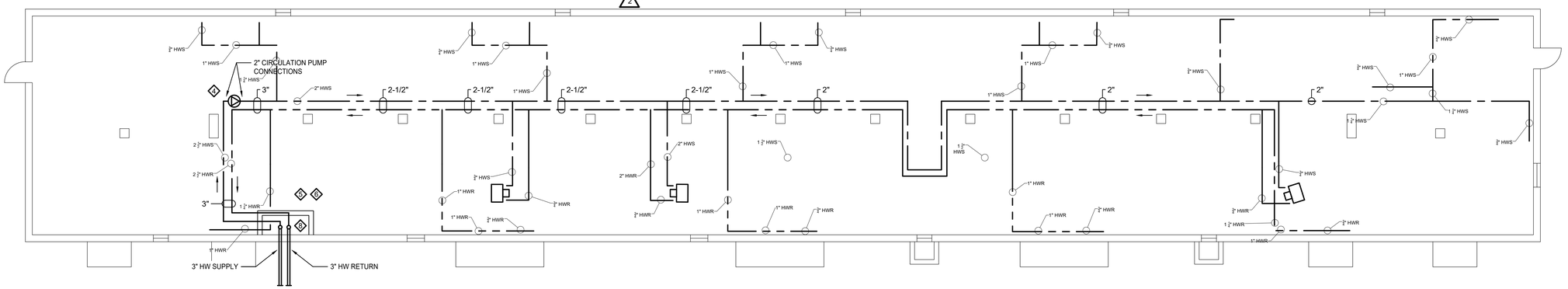


1 279 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
2. PROVIDE STEEL RISER WITH DIELECTIRC COUPLING.
3. PROVIDE COPPER RISER WITH COPPER COUPLING.
4. ALL ISOLATION OF MAIN TRANSFER PIPING SHALL COMPLY WITH "TYPICAL PEX-GARD CONNECTIONS WITH SERVICE UNIONS" DETAIL. SEE PAGE M201 FOR REFERENCE.
5. ALL EXISTING UNIT HEATERS TO BE DISCONNECTED AND REMOVED.
6. FULL SYSTEM FLUSH TO BE PERFORMED ON ALL DWELLING UNITS UPON INSTALLATION.
7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

2



2 289 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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2

1 / M101 279 CHAD & 289 CHAD
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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REFER TO ALL DRAWINGS FOR COMPLETE SCOPE OF WORK.

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Portsmouth, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

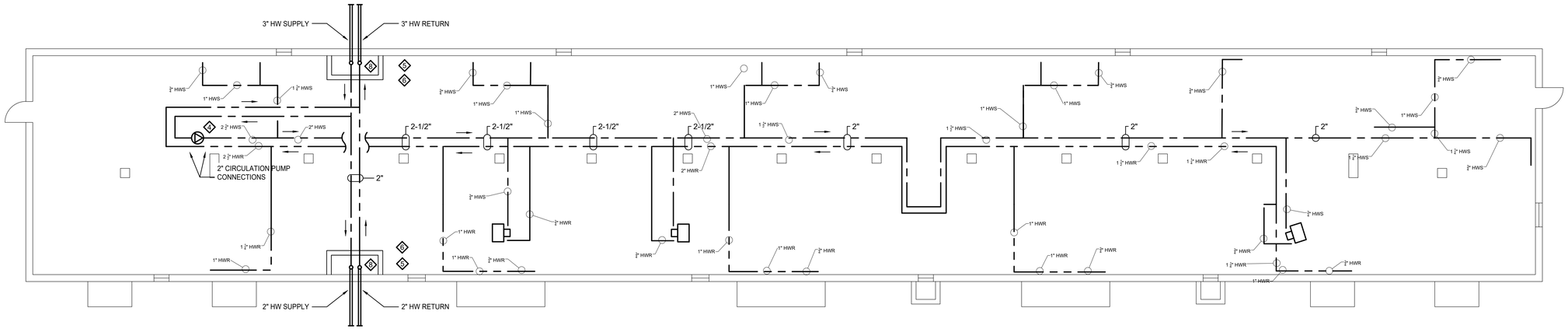
PROJECT NAME:
Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:
MECHANICAL -

ADMIRAL TERRACE
279 & 289 CHAD

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:
M101



1 283 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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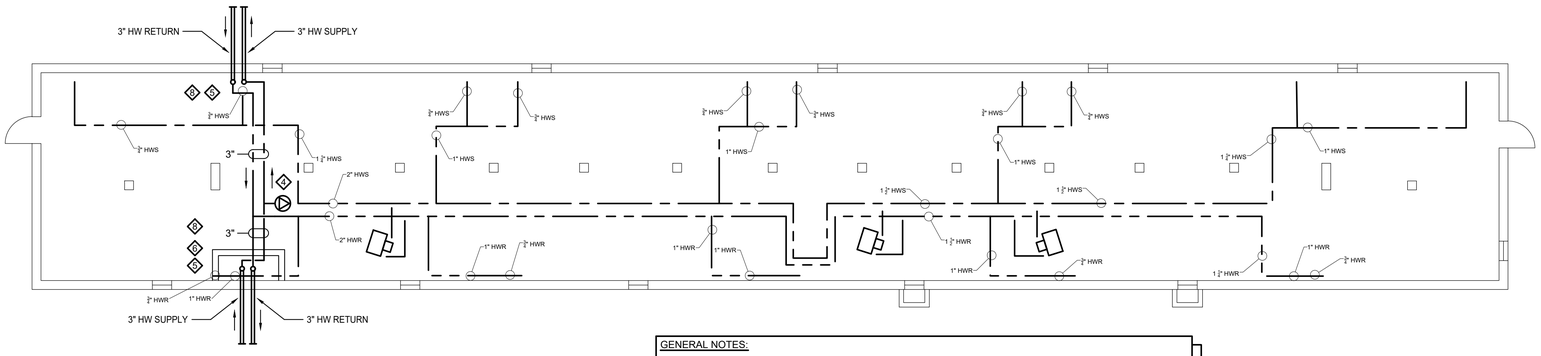
2



2 291 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

2

1 / M102 283 CHAD & 291 CHAD
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

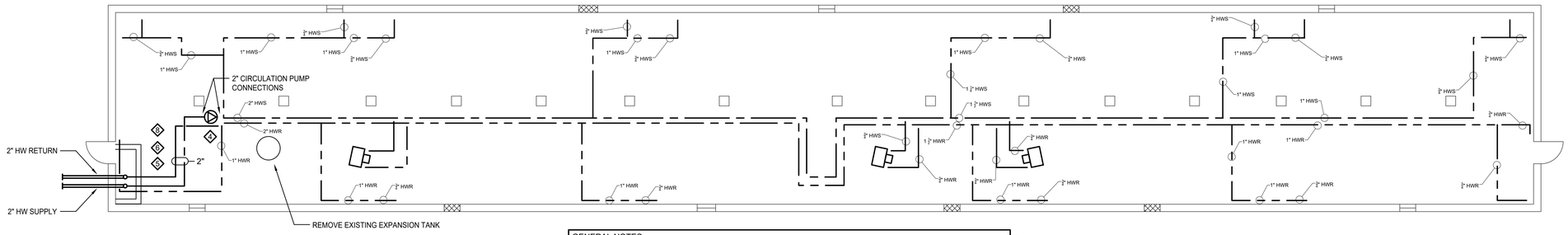
MECHANICAL -

ADMIRAL TERRACE
283 & 291 CHAD

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M102



1 94 FILLMORE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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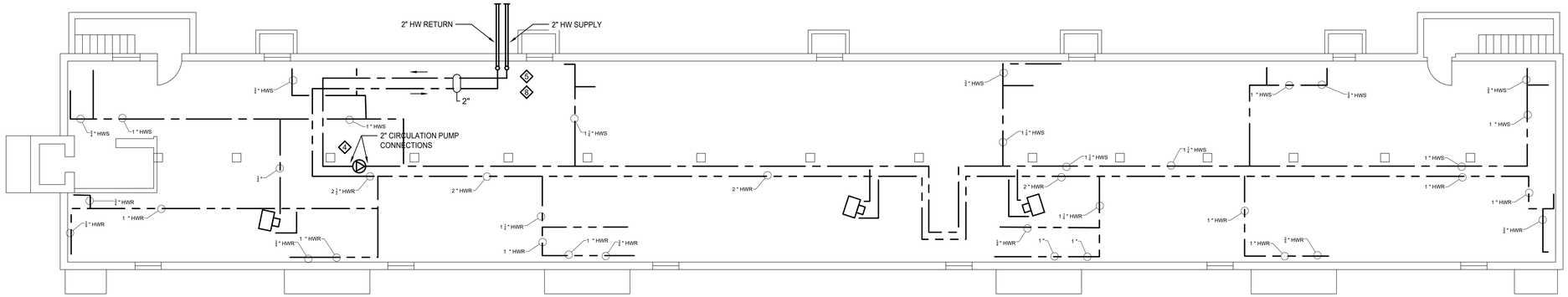
6. FULL SYSTEM FLUSH TO BE PERFORMED ON ALL PIPE LINE UNITS UPON INSTALLATION.
7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

2



2 108 FILLMORE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

2

1 / M103 94 FILLMORE & 108 FILLMORE
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Portsmouth, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

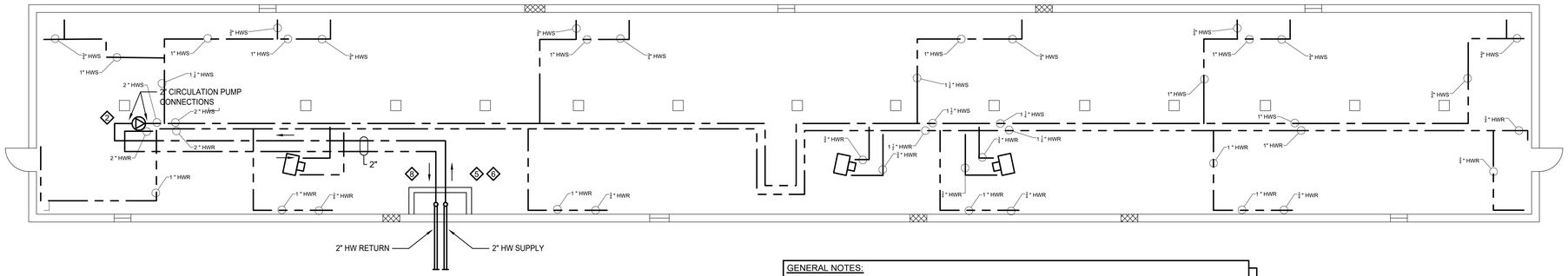
PROJECT NAME:
Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:
MECHANICAL -

ADMIRAL TERRACE
94 & 108 FILLMORE

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:
M103



1 90 FILLMORE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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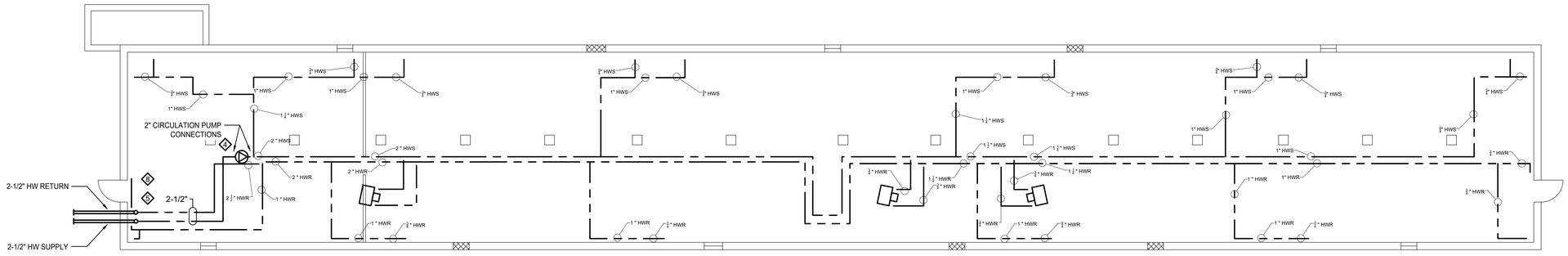
2



2 104 FILLMORE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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2

1 / M104 90 FILLMORE & 104 FILLMORE
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

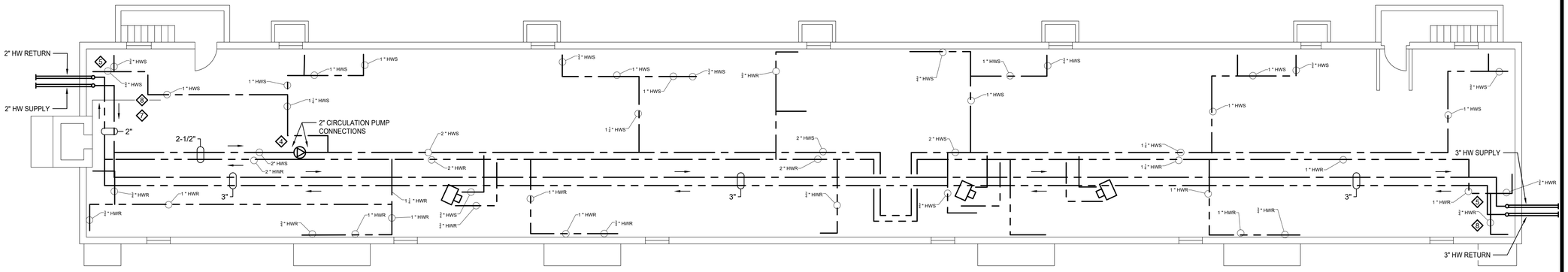
PROJECT NAME:
Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:
MECHANICAL -

ADMIRAL TERRACE
90 & 104 FILLMORE

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:
M104



1 100 FILLMORE BASEMENT

GENERAL NOTES:

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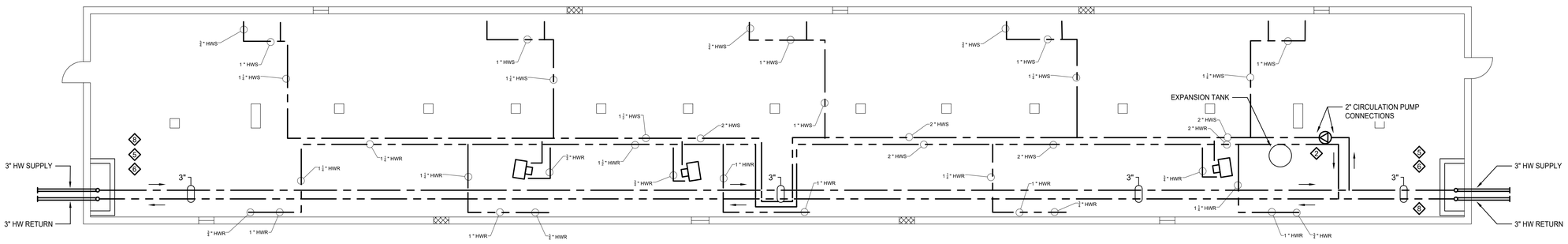

2 124 FILLMORE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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2

1 / M105 100 FILLMORE & 124 FILLMORE
SCALE: 1/8"=1'-0"

CERTIFICATION :

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No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Portsmouth, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

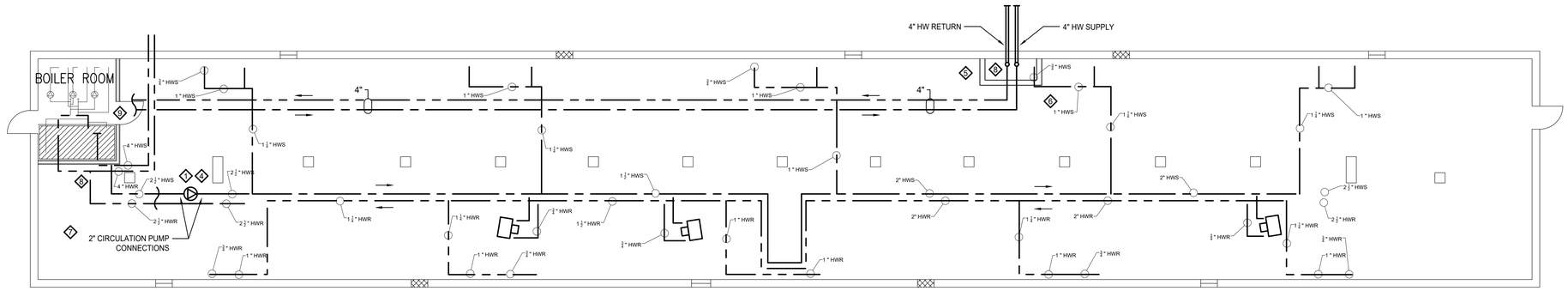
MECHANICAL -

ADMIRAL TERRACE
100 & 124 FILLMORE

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M105



1 128 FILLMORE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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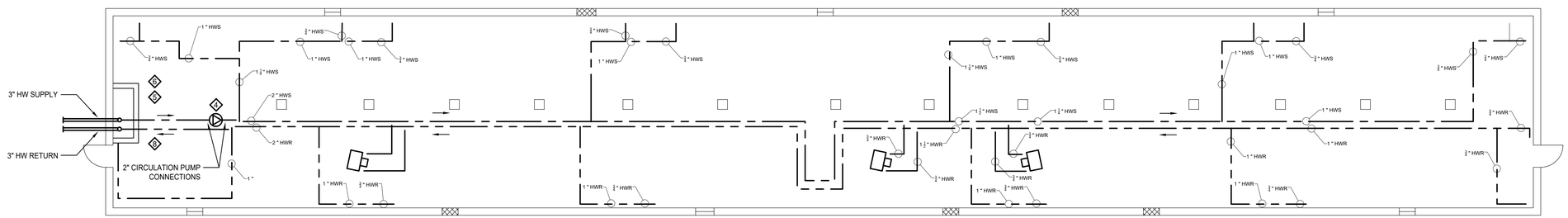

2 150 FILLMORE BASEMENT

GENERAL NOTES:

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1 / M106 128 FILLMORE & 150 FILLMORE
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Portsmouth, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

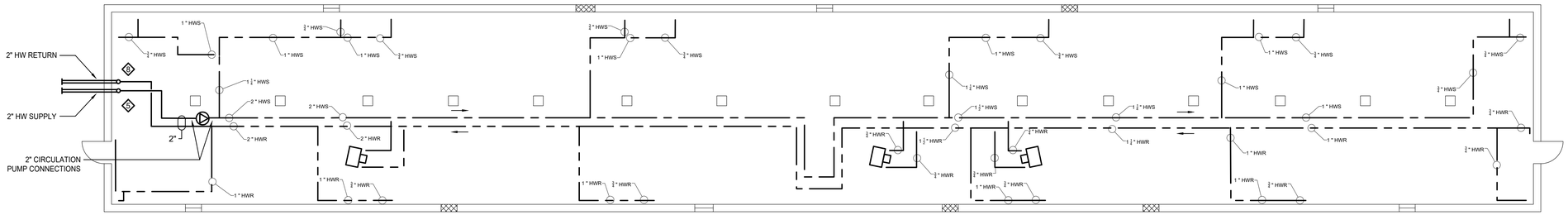
PROJECT NAME:
Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:
MECHANICAL -

ADMIRAL TERRACE
128 & 150 FILLMORE

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:
M106



1 80 ADMIRAL BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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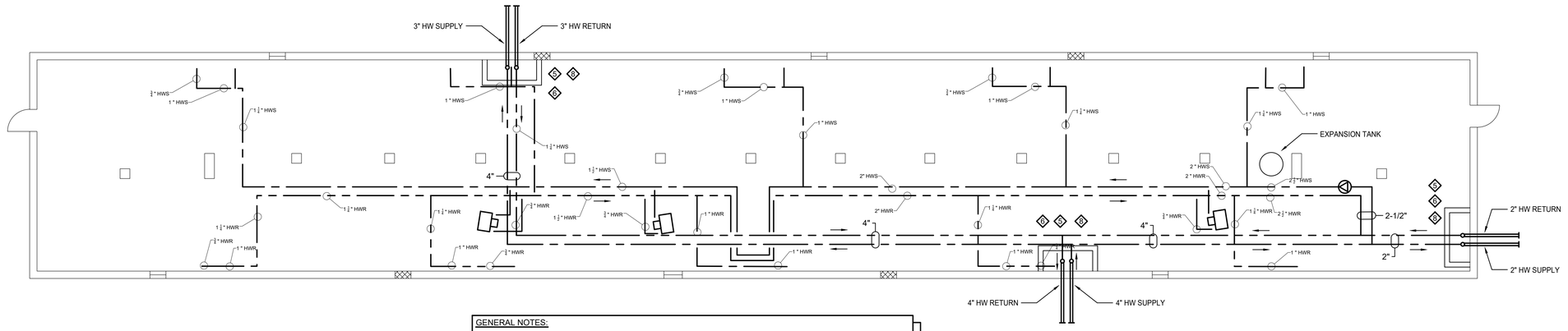
2



2 130 FILLMORE BASEMENT

GENERAL NOTES:

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5. ALL EXISTING UNIT HEATERS TO BE DISCONNECTED AND REMOVED.
6. FULL SYSTEM FLUSH TO BE PERFORMED ON ALL DWELLING UNITS UPON INSTALLATION.
7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

2

1 / M107 80 ADMIRAL & 130 FILLMORE
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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REV. NO.	DATE	DESCRIPTION
	01.09.24	FOR PERMIT & CONSTRUCTION
	03.19.24	GENERAL REVISIONS
1	04.01.24	PIPE REPLACEMENT UPDATES
2	04.11.24	REVISIONS

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

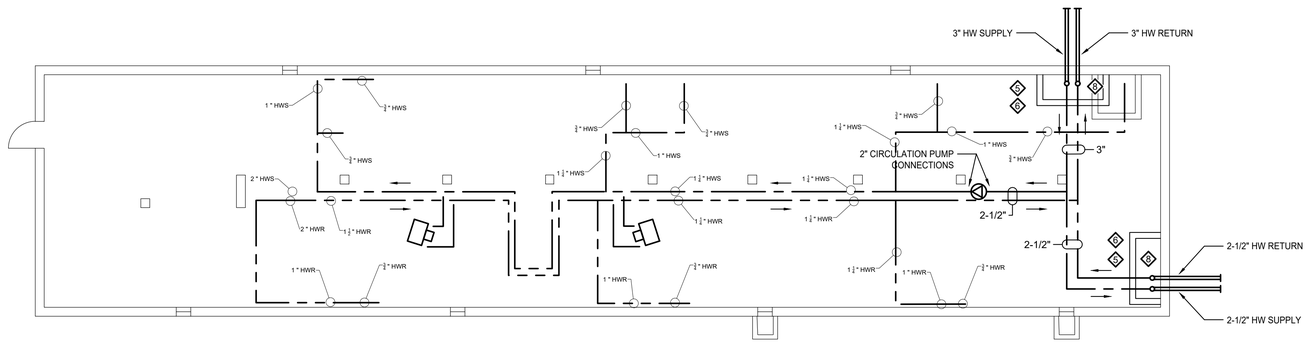
MECHANICAL -

ADMIRAL TERRACE
80 ADMIRAL &
130 FILLMORE

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M107



GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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2

2 57 BERKSHIRE BASEMENT

1 / M108 57 BERKSHIRE
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

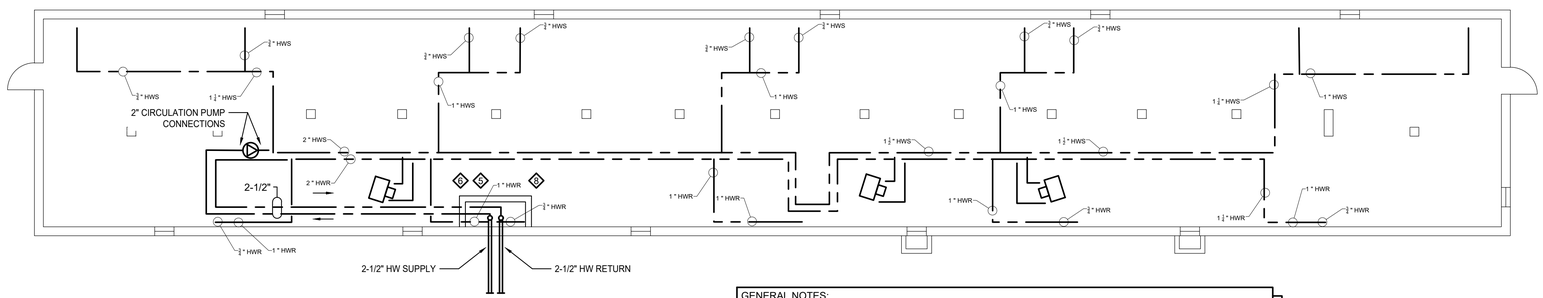
MECHANICAL -

CHAD BROWN
57 BERKSHIRE

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M108



1 77 BERKSHIRE BASEMENT

GENERAL NOTES:

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2

1 / M109 77 BERKSHIRE
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

MECHANICAL -

CHAD BROWN
77 BERKSHIRE

JOB NO.: 22245RS

DRAWN BY: TC

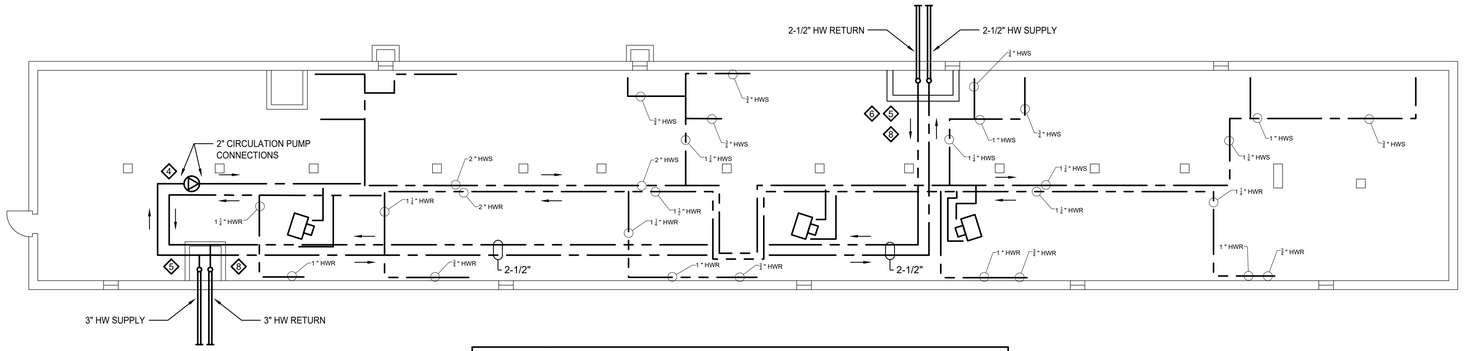
CHECKED BY: WTM

DATE ISSUED: 01.09.2024

SCALE: AS NOTED

SHEET NO.:

M109



1 64 JUNE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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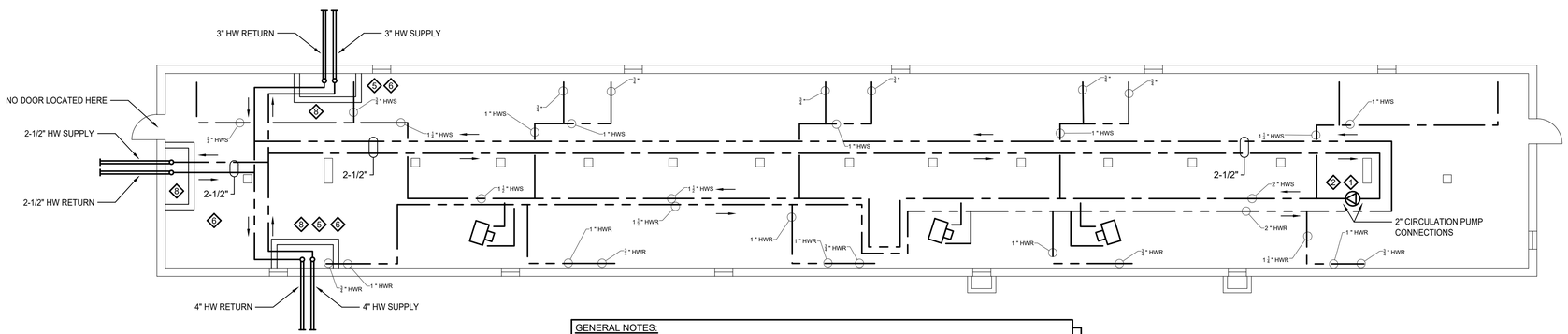

2 65 MARCH BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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2

1 / M110 64 JUNE & 65 MARCH
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

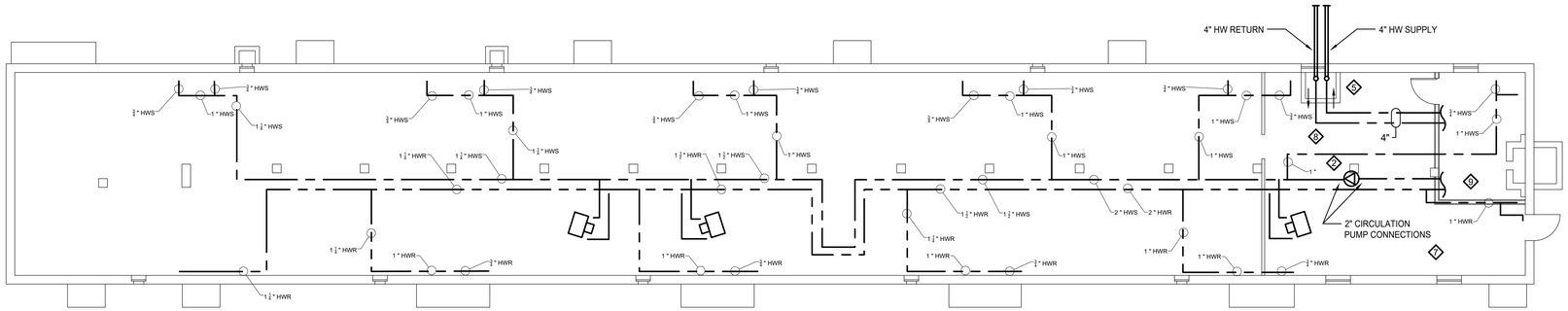
MECHANICAL -

CHAD BROWN
64 JUNE & 65 MARCH

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M110



1 53 MARCH BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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2

1 / M111 53 MARCH
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
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PROFESSIONAL ENGINEER
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PROJECT NAME:

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SHEET TITLE:

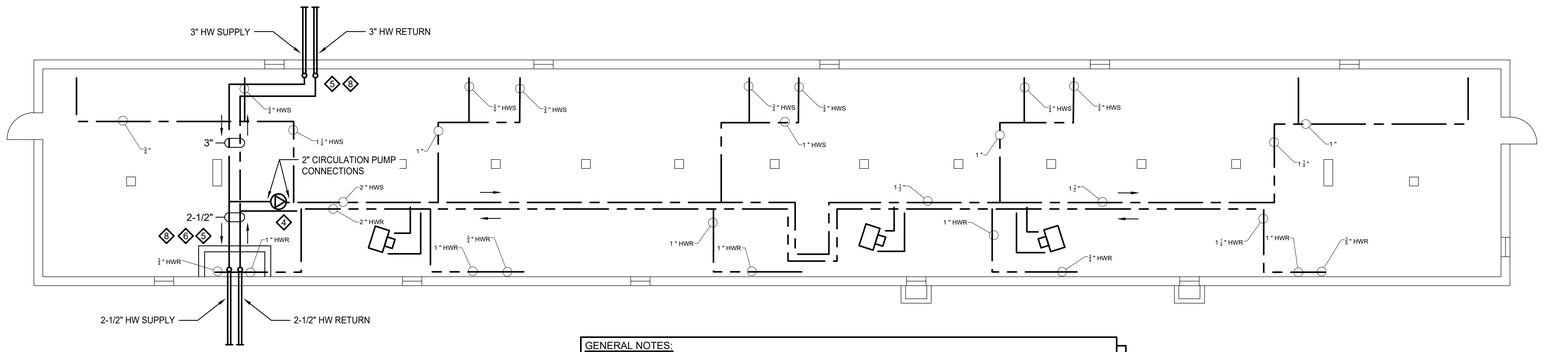
MECHANICAL -

CHAD BROWN
53 MARCH

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M111



1 48 JUNE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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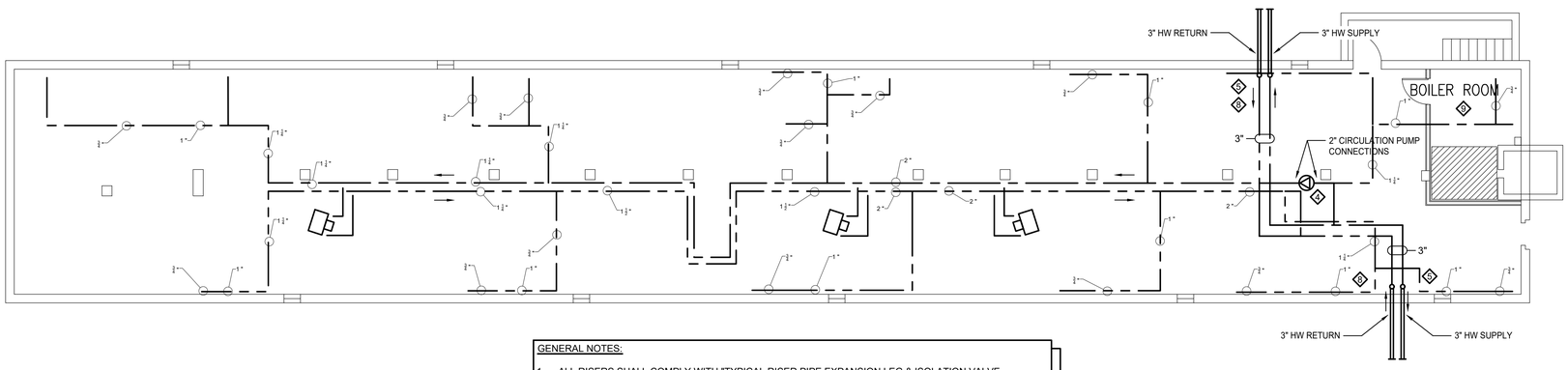

2 58 JUNE BASEMENT

GENERAL NOTES:

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2

1 / M112 48 JUNE & 58 JUNE
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

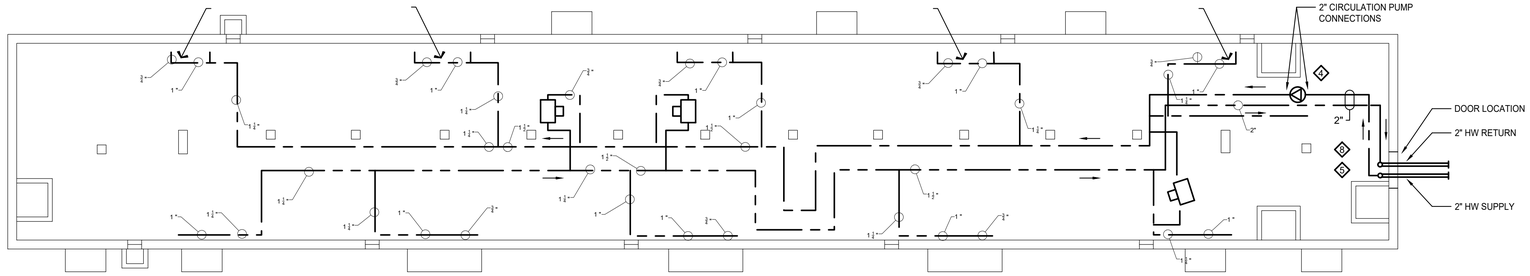
MECHANICAL -

CHAD BROWN
48 JUNE & 58 JUNE

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M112



1 35 MARCH BASEMENT

GENERAL NOTES:

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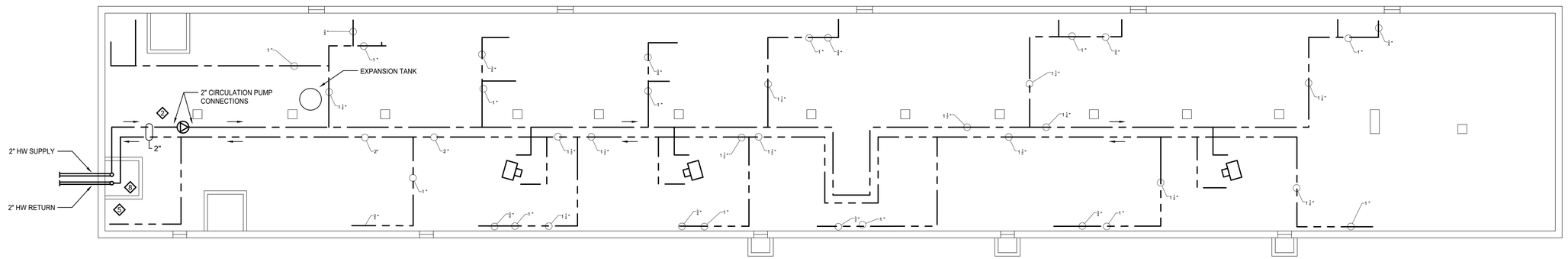

2 39 MARCH BASEMENT

GENERAL NOTES:

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1 / M113 35 MARCH & 39 MARCH
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

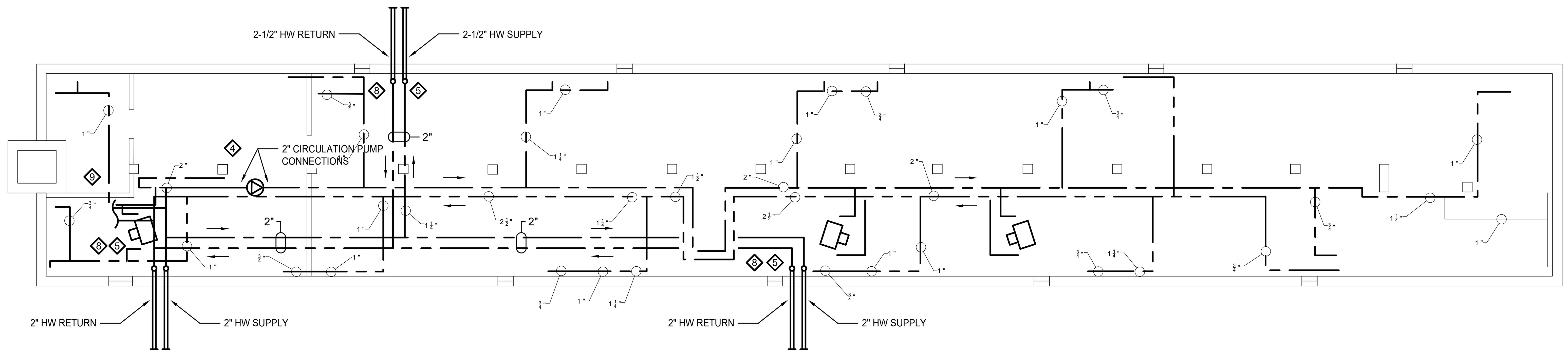
MECHANICAL -

CHAD BROWN
35 & 39 MARCH

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M113



1 29 MARCH BASEMENT

GENERAL NOTES:

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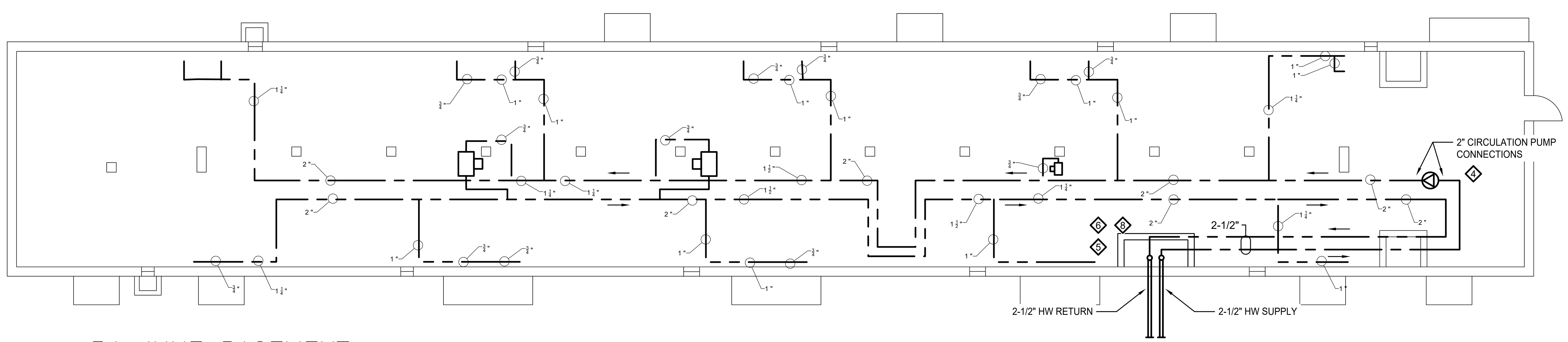

2 34 JUNE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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2

1 / M114 — 29 MARCH & 34 JUNE
SCALE: 1/8"=1'-0"

CERTIFICATION:

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

MECHANICAL -

CHAD BROWN
29 MARCH & 34 JUNE

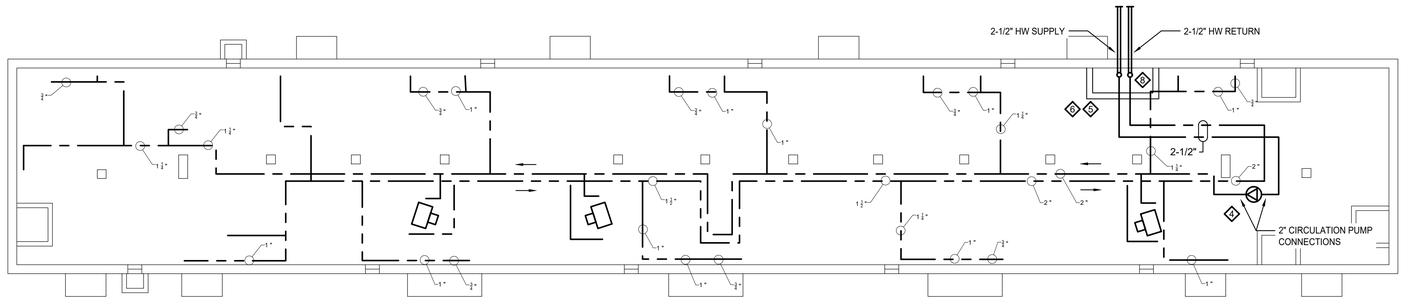
JOB NO.:	22245RS
DRAWN BY:	TC
CHECKED BY:	WTM
DATE ISSUED:	01.09.2024
SCALE:	AS NOTED

SHEET NO.:

M114

21 MARCH NOTE:

SEE SHEET M000 FOR SCOPE NOTE.



1 21 MARCH BASEMENT

GENERAL NOTES:

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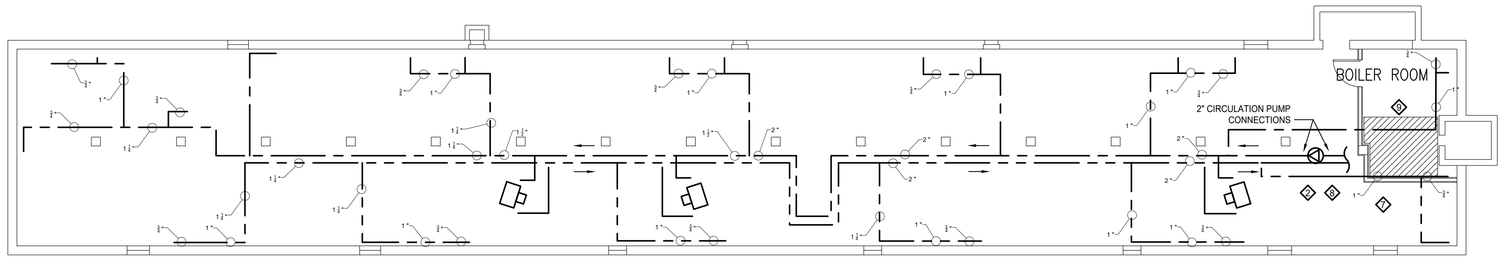

2 244 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
2. PROVIDE STEEL RISER WITH DIELECTIRC COUPLING.
3. PROVIDE COPPER RISER WITH COPPER COUPLING.
4. ALL ISOLATION OF MAIN TRANSFER PIPING SHALL COMPLY WITH "TYPICAL PEX-GARD CONNECTIONS WITH SERVICE UNIONS" DETAIL. SEE PAGE M201 FOR REFERENCE.
5. ALL EXISTING UNIT HEATERS TO BE DISCONNECTED AND REMOVED.
6. FULL SYSTEM FLUSH TO BE PERFORMED ON ALL DWELLING UNITS UPON INSTALLATION.
7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

1 / M115 21 MARCH & 244 CHAD
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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REFER TO ALL DRAWINGS FOR COMPLETE SCOPE OF WORK.

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REV. NO.	DATE	DESCRIPTION
	01.09.24	FOR PERMIT & CONSTRUCTION
	03.19.24	GENERAL REVISIONS
1	04.01.24	PIPE REPLACEMENT UPDATES
2	04.11.24	REVISIONS

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

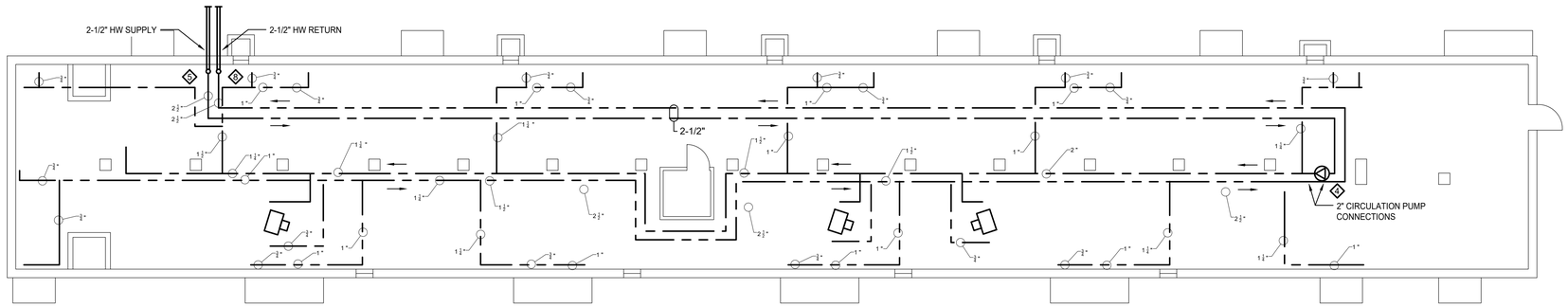
MECHANICAL -

CHAD BROWN
21 MARCH & 244 CHAD

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M115



1 262 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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3. PROVIDE COPPER RISER WITH COPPER COUPLING.
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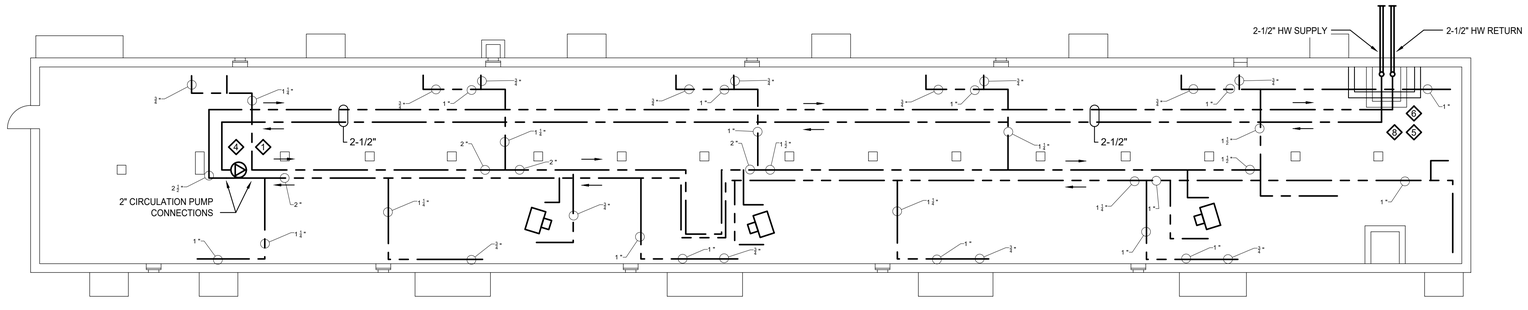

2 270 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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7. FOR INFORMATION ON HANGERS, GUIDES, AND ANCHORS, SEE PAGE M202 FOR REFERENCE.

1 / M116 262 CHAD & 270 CHAD
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

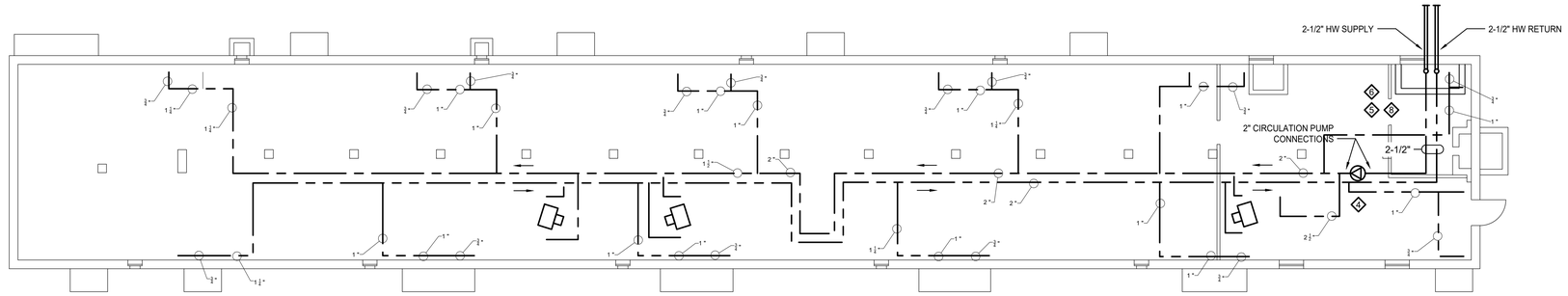
MECHANICAL -

CHAD BROWN
262 & 270 CHAD

JOB NO.:	22245RS
DRAWN BY:	TC
CHECKED BY:	WTM
DATE ISSUED:	01.09.2024
SCALE:	AS NOTED

SHEET NO.:

M116



1 20 JUNE BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
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3. PROVIDE COPPER RISER WITH COPPER COUPLING.
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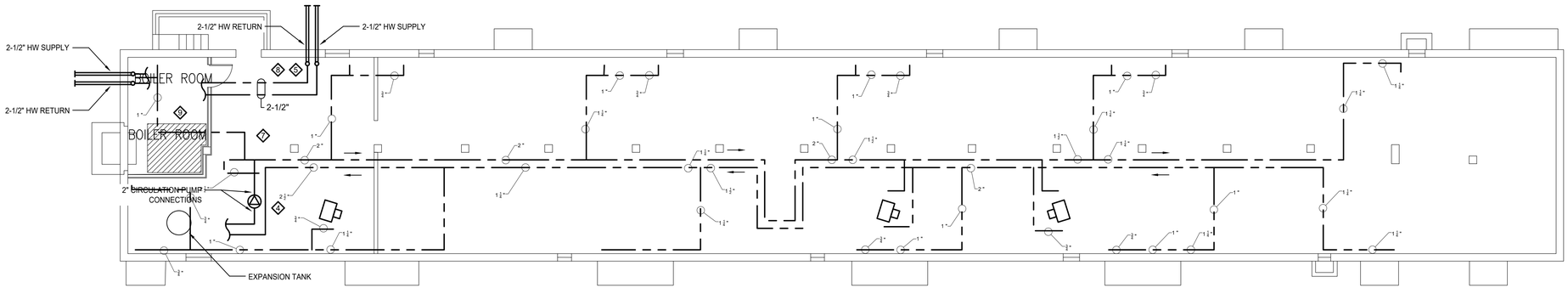
2



2 286 CHAD BASEMENT

GENERAL NOTES:

1. ALL RISERS SHALL COMPLY WITH "TYPICAL RISER PIPE EXPANSION LEG & ISOLATION VALVE INSTALLATION REQUIREMENT" & "TYPICAL RETURN RISER ISOLATION AND DRAIN" DETAILS. SEE PAGE M201 FOR REFERENCE.
2. PROVIDE STEEL RISER WITH DIELECTIRC COUPLING.
3. PROVIDE COPPER RISER WITH COPPER COUPLING.
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2

1 / M117 20 JUNE & 286 CHAD
SCALE: 1/8"=1'-0"

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER
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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Portsmouth, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:
Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:
MECHANICAL -

CHAD BROWN
20 JUNE & 286 CHAD

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO:
M117

Clamp coupling SDR11 for HeatFlex — HELA

Picture	Art. - Nr.	Product Class	Service Pipe	Inches OD	Service Pipe Connection	Material	Description
	311004025025	HeatFlex Fitting SDR11	25x2,3	1"	Clamp SDR11 PE-Xa	brass	H25/H25 clamp coupling (He)
	311004032032	HeatFlex Fitting SDR11	32x2,9	1.25"	Clamp SDR11 PE-Xa	brass	H32/H32 clamp coupling (He)
	311004040040	HeatFlex Fitting SDR11	40x3,7	1.50"	Clamp SDR11 PE-Xa	brass	H40/H40 clamp coupling (He)
	311004050050	HeatFlex Fitting SDR11	50x4,6	2"	Clamp SDR11 PE-Xa	brass	H50/H50 clamp coupling (He)
	311004063063	HeatFlex Fitting SDR11	63x5,8	2.5"	Clamp SDR11 PE-Xa	brass	H63/H63 clamp coupling (He)
	311004075075	HeatFlex Fitting SDR11	75x6,8	3"	Clamp SDR11 PE-Xa	brass	H75/H75 clamp coupling (He)
	311004090090	HeatFlex Fitting SDR11	90x8,2	3.5"	Clamp SDR11 PE-Xa	brass	H90/H90 clamp coupling (He)
	311004110110	HeatFlex Fitting SDR11	110x10,0	4"	Clamp SDR11 PE-Xa	brass	H110/H110 clamp coupling (He)
	311004125125	HeatFlex Fitting SDR11	125x11,4	4.5"	Clamp SDR11 PE-Xa	brass	H125/H125 clamp coupling (He)

Clamp fitting with male thread SDR11 for HeatFlex — HELA

Picture	Art. - Nr.	Product Class	Service Pipe	Inches OD	Service Pipe Connection	Outside Casing	Description
							Connecting to NPT THREAD IMPERIAL
	315004025034	HeatFlex Fitting SDR11	25x2,3	1"	Clamp SDR11 PE-Xa	brass	H25 (3/4") clamp fitting with male thread (He)
	315004032100	HeatFlex Fitting SDR11	32x2,9	1.25"	Clamp SDR11 PE-Xa	brass	H32 (1") clamp fitting with male thread (He)
	315004040054	HeatFlex Fitting SDR11	40x3,7	1.50"	Clamp SDR11 PE-Xa	brass	H40 (5/4") clamp fitting with male thread (He)
	315004050064	HeatFlex Fitting SDR11	50x4,6	2"	Clamp SDR11 PE-Xa	brass	H50 (6/4") clamp fitting with male thread (He)
	315004063200	HeatFlex Fitting SDR11	63x5,8	2.5"	Clamp SDR11 PE-Xa	brass	H63 (2") clamp fitting with male thread (He)
	315004075212	HeatFlex Fitting SDR11	75x6,8	3"	Clamp SDR11 PE-Xa	brass	H75 (2 1/2") clamp fitting with male thread (He
	315004090300	HeatFlex Fitting SDR11	90x8,2	3.5"	Clamp SDR11 PE-Xa	brass	H90 (3") clamp fitting with male thread (He)
	315004110400	HeatFlex Fitting SDR11	110x10,0	4"	Clamp SDR11 PE-Xa	brass	H110 (4") clamp fitting with male thread (He)
	315004125400	HeatFlex Fitting SDR11	125x11,4	4.5"	Clamp SDR11 PE-Xa	brass	H125 (5") clamp fitting with male thread (He)

Clamp fitting elbow coupling 90° SDR11 for HeatFlex — Jentro

Picture	Art. - Nr.	Product Class	Service Pipe	Inches OD	Service Pipe Connection	Outside Casing	Description
	314004025025	HeatFlex Fitting SDR11	25x2,3	1"	Clamp SDR11 PE-Xa	brass	H25/25 clamp elbow coupling 90° (Je)
	314004032032	HeatFlex Fitting SDR11	32x2,9	1.25"	Clamp SDR11 PE-Xa	brass	H32/32 clamp elbow coupling 90° (Je)
	314004040040	HeatFlex Fitting SDR11	40x3,7	1.50"	Clamp SDR11 PE-Xa	brass	H40/40 clamp elbow coupling 90° (Je)
	314004050050	HeatFlex Fitting SDR11	50x4,6	2"	Clamp SDR11 PE-Xa	brass	H50/50 clamp elbow coupling 90° (Je)
	314004063063	HeatFlex Fitting SDR11	63x5,8	2.5"	Clamp SDR11 PE-Xa	brass	H63/63 clamp elbow coupling 90° (Je)
	314004075075	HeatFlex Fitting SDR11	75x6,8	3"	Clamp SDR11 PE-Xa	brass	H75/75 clamp elbow coupling 90° (Je)
	314004090090	HeatFlex Fitting SDR11	90x8,2	3.5"	Clamp SDR11 PE-Xa	brass	H90/90 clamp elbow coupling 90° (Je)
	314004110110	HeatFlex Fitting SDR11	110x10,0	4"	Clamp SDR11 PE-Xa	brass	H110/110 clamp elbow coupling 90° (Je)

PEX-GARD CONNECTIONS

CLAMP, COUPLING, AND FITTINGS:

HELA LAIHO INDUSTIRES
NOORMARKKU (PORI), FINLAND

NO OTHER KNOWN APPROVED EQUALS

PEX-GARD CONNECTIONS

ELBOWS:

MANUFACTURER - JENTRO, NV
ROTSELAAR, BELGIUM

STOCKED BY RADIUS PIPE SOLUTIONS
PORTLAND, ME

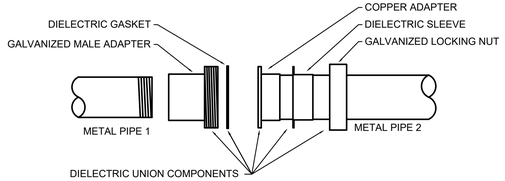
LOCAL REPRESENTATIVE:
JOHN C. DIGERTT, INC.
DURHAM, CT
P: (860) 349-0468

PIPE FITTINGS

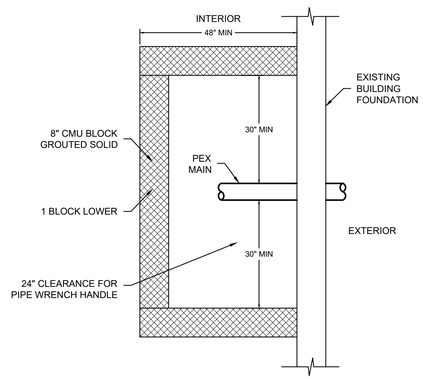
PIPE SIZE (INCHES)	ESTIMATED QUANTITY OF FITTINGS	QUANTITY OF SPARES
2	24	6
2-1/2	32	6
3	36	6
4	10	6

NOTES:
1. CONFIRM SIZE BEFORE ORDERING

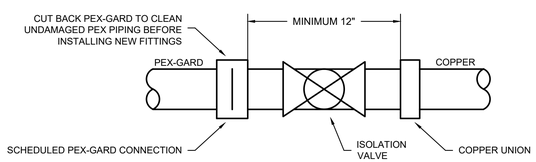
FITTING SCHEDULE
NTS



DIELECTRIC COUPLING FOR CONNECTION OF DIS-SIMILAR METALS (FOR REFERENCE ONLY) (SEE KEYNOTE #7)
NTS

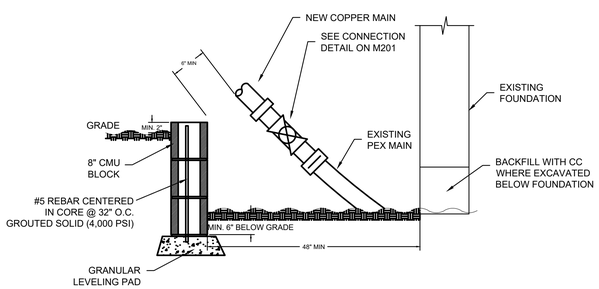


PLAN VIEW



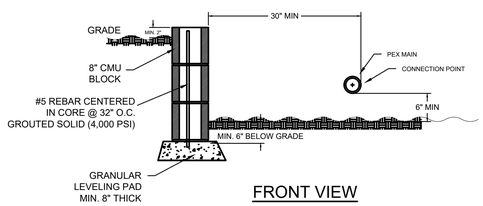
NOTES:
1. TYPICAL AT ALL ENTRIES AND EXITS OF BUILDINGS.

TYPICAL PEX-GARD CONNECTIONS WITH SERVICE UNION AS SHOWN
NTS



SIDE VIEW

NOTES:
1. SUPPORT AS REQUIRED, CONSISTENT WITH MANUFACTURER RECOMMENDATIONS.
2. BUILDINGS INCLUDE 275 CHAD, 289 CHAD, 283 CHAD, 291 CHAD, 94 FILLMORE, 90 FILLMORE, 124 FILLMORE, 128 FILLMORE, 150 FILLMORE, 130 FILLMORE, 57 BERKSHIRE, 77 BERKSHIRE, 64 JUNE, 65 MARCH, 48 JUNE, 34 JUNE, 270 CHAD, 20 JUNE.



FRONT VIEW

BOX OUT OF SUPPLY & RETURN CONNECTIONS DETAIL
NTS

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

MECHANICAL - SCHEDULES & DETAILS

JOB NO.: 22245RS

DRAWN BY: TC

CHECKED BY: WTM

DATE ISSUED: 01.09.2024

SCALE: AS NOTED

SHEET NO.:

M200

PUMP SCHEDULE (BASED ON GRUNDFOS)

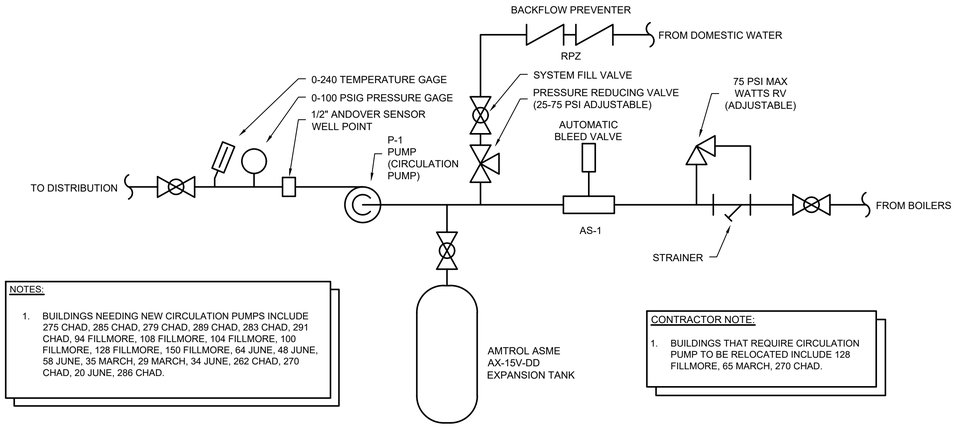
SYMBOL	MODEL	FLUID	GPM	HEAD (FT)	FLANGE STANDARD	MOTOR DATA			NOTES
						WATTS	RPM	VOLTAGE	
P-1	MAGNA 3 D 65-120F	WATER	105.0	40	GF	767	-	115/1/60	1

NOTES:
1. SHAFT SEAL SHALL BE SUITABLE FOR FLUID TYPE, TEMPERATURE & PRESSURE.

HYDRONIC SPECIALTIES SCHEDULE

SYMBOL	MODEL	SERVES SYSTEM	ACCEPTANCE (GAL)	TANK VOLUME (GAL)	NOTES
ET-1	AX-15V-DD	PUMP	3.2	8.6	1,2,4
AS-1	2"	AIR SCOOP	-	-	5

NOTES:
1. PROVIDE 125PSI WORKING PRESSURE - ASME RATED
2. COMBINATION AIR/DIRT SEPARATOR WITH REMOVABLE HEAD.
3. FULL ACCEPTANCE TANK WITH REMOVABLE BLADDER.
4. BASED ON AMTROL
5. BASED ON TACO



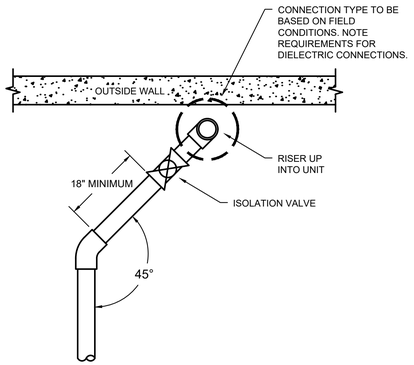
NOTES:

1. BUILDINGS NEEDING NEW CIRCULATION PUMPS INCLUDE 275 CHAD, 285 CHAD, 279 CHAD, 289 CHAD, 283 CHAD, 291 CHAD, 94 FILLMORE, 108 FILLMORE, 104 FILLMORE, 100 FILLMORE, 128 FILLMORE, 150 FILLMORE, 64 JUNE, 48 JUNE, 58 JUNE, 35 MARCH, 29 MARCH, 34 JUNE, 262 CHAD, 270 CHAD, 20 JUNE, 286 CHAD.

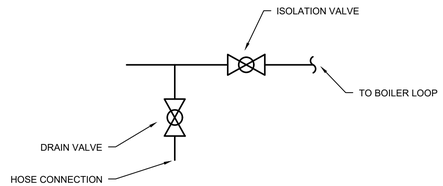
CONTRACTOR NOTE:

1. BUILDINGS THAT REQUIRE CIRCULATION PUMP TO BE RELOCATED INCLUDE 128 FILLMORE, 65 MARCH, 270 CHAD.

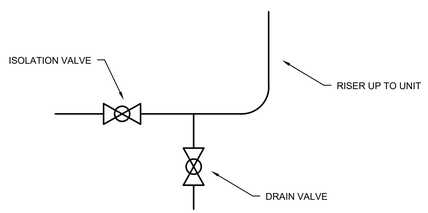
CIRCULATION PUMP
NTS



TYPICAL RISER PIPE EXPANSION LEG INSTALLATION REQUIREMENT (BOTH SUPPLY & RETURN)
NTS



TYPICAL RETURN ISOLATION AND DRAIN
NTS



TYPICAL RETURN RISER ISOLATION AND DRAIN (FOR RETURN ONLY)
NTS

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No. 7860
REGISTERED PROFESSIONAL ENGINEER
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ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Bellingham, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

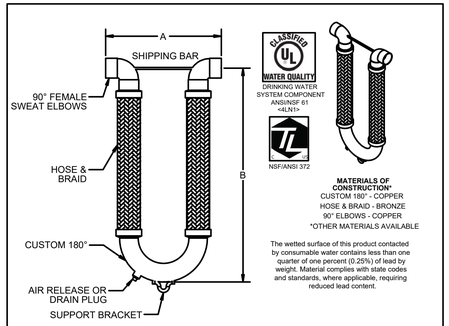
PROJECT NAME:
Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:
MECHANICAL -

SCHEDULES & DETAILS

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:
M201



CLASSIFIED WATER QUALITY
DRINKING WATER SYSTEM COMPONENT ANSI/NSF 61 <4LN1>
NSF/ANSI 372

MATERIALS OF CONSTRUCTION*
CUSTOM 180° - COPPER
HOSE & BRAID - BRONZE
90° ELBOWS - COPPER
*OTHER MATERIALS AVAILABLE

The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight. Material complies with state codes and standards, where applicable, requiring reduced lead content.

NOTE: METRALOOPS 2" AND LARGER INSTALLED IN ANY ORIENTATION OTHER THAN HANGING DOWN MUST HAVE THE 180° RETURN SUPPORTED. (SEE INSTALLATION INSTRUCTIONS.)

CONTACT FACTORY FOR ADDITIONAL SIZES AND MOVEMENTS. ALL DIMENSIONS IN INCHES.

QTY	SIZE	MODEL	MVMT	A	B	PSI*	WT (LBS)	SPRING FORCE**	PROJECT INFO
	1/2"	MLS80050	±4"	7-3/4"	15-3/8"	706	2.5	45	
	3/4"	MLS80075	±4"	9-1/2"	17-1/4"	577	2.5	47	
	1"	MLS80100	±4"	10-1/4"	19-1/4"	470	3	53	
	1-1/4"	MLS80125	±4"	11-1/8"	21-3/8"	361	4	66	
	1-1/2"	MLS80150	±4"	11-5/8"	22-1/2"	329	4.5	70	
	2"	MLS80200	±4"	13-3/8"	24-3/4"	317	12	78	

*Working pressure listed is the rating at 70 F. Contact factory for other pressure ratings at other temperatures and for steam applications.

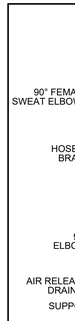
**Spring force: The total force (Lbs) required to move the Metraloop its full rated movement for 150 PSI @ 70 F.

REV.		DATE

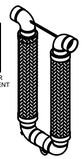
Metraflex — for pipes in motion
2323 W. HUBBARD ST.
CHICAGO, IL 60612
TEL: 312-738-3800
FAX: 312-738-0415
WWW.METRAFLEX.COM

METRALOOP MODEL MLS
SWEAT ENDS, ±4" MOVEMENT

DRAWN BY:	DATE:
APPROVED:	DATE:
SCALE: NTS	DRAWING NUMBER: MLS80050-200



CLASSIFIED WATER QUALITY
DRINKING WATER SYSTEM COMPONENT ANSI/NSF 61 <4LN1>
NSF/ANSI 372



MATERIALS OF CONSTRUCTION*
HOSE & BRAID - BRONZE
90°ELBOW - COPPER
SPOOL - COPPER
*OTHER MATERIALS AVAILABLE

The wetted surface of this product contacted by consumable water contains less than one quarter of one percent (0.25%) of lead by weight. Material complies with state codes and standards, where applicable, requiring reduced lead content.

NOTE: METRALOOPS 2" AND LARGER INSTALLED IN ANY ORIENTATION OTHER THAN HANGING DOWN MUST HAVE THE 180° RETURN SUPPORTED. (SEE INSTALLATION INSTRUCTIONS.)

CONTACT FACTORY FOR ADDITIONAL SIZES AND MOVEMENTS. ALL DIMENSIONS IN INCHES.

QTY	SIZE	MODEL	MVMT	A	B	PSI*	WT (LBS)	SPRING FORCE**	PROJECT INFO
	2-1/2"	MLS80250	±4"	17"	26-1/2"	272	18	83	
	3"	MLS80300	±4"	18-1/2"	28-1/2"	201	24	90	
	4"	MLS80400	±4"	22"	32"	142	31	120	

*Working pressure listed is the rating at 70°F. Contact factory for other pressure ratings at other temperatures and for steam applications.

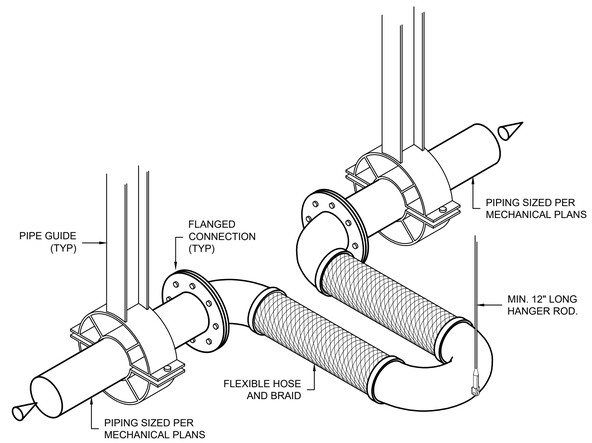
**Spring force: The total force (Lbs) required to move the Metraloop its full rated movement for 150 PSI @ 70°F.

REV.		DATE

Metraflex — for pipes in motion
2323 W. HUBBARD ST.
CHICAGO, IL 60612
TEL: 312-738-3800
FAX: 312-738-0415
WWW.METRAFLEX.COM

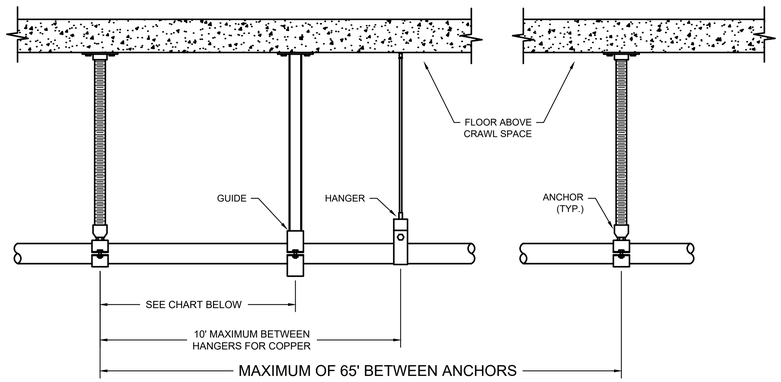
METRALOOP MODEL MLS
SWEAT ENDS, ±4" MOVEMENT

DRAWN BY:	DATE:
APPROVED:	DATE:
SCALE: N/A	DRAWING NUMBER: MLS80250-400



NOTES:
1. PROVIDE AT LEAST GUIDES ANCHORS FOR EVERY EXPANSION LOOP.
2. PROVIDE ANCHORS AT EITHER END OF PIPE LENGTH BEING SERVED BY EXPANSION LOOP

EXPANSION LOOP DETAIL
NO SCALE



NOTES:
1. TO BE PER PIPE MANUFACTURER RECOMMENDATIONS.
2. AT LEAST ONE ANCHOR SHALL BE INSTALLED NEXT TO THE CIRCULATION PUMP.
3. PROVIDE HANGER AT EVERY CHANGE IN DIRECTION.

Copper Tube Guide Spacing

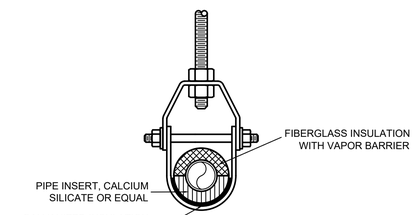
Tube Size†	Max distance from expansion loop to 1st guide/anchor	Approx. distance from 1st to 2nd guide	Maximum Spacing for Intermediate Guides for Copper Tube (Feet) 25 PSI	50 PSI	70 PSI
1/2"	2'	7'	5'	4'	3'
3/4"	3"	10-1/2"	7'	6'	5'
1"	4"	1'2"	9'	8'	6'
1-1/4"	5"	1'5-1/2"	14'	11'	9'
1-1/2"	6"	1'9"	14'	11'	9'
2"	8"	2'4"	19'	14'	12'
2-1/2"	10"	2'11"	23'	17'	15'
3"	1'	3'6"	27'	20'	18'
4"	1'4"	4'8"	31'	23'	21'

†Note: For type "M" tubing.

For type "L" tubing spacing may be increased by 10%.

For type "K" tubing spacing may be increased by 20%

HANGER, ANCHOR, & GUIDE DETAILS - SHOWN (FOR REFERENCE ONLY)
NTS



CLEVIS HANGER
(PIPES UP TO 4")

NOTE:
REFER TO SPECIFICATIONS FOR HANGER ROD SPACING.

HANGER SIZES	
PIPE SIZE	ROD SIZE
UP TO 2"	3/8"
2-1/2" - 3"	1/2"
4" - 5"	5/8"
6" - 8"	3/4"

INSERT SIZES	
PIPE SIZE	LENGTH
1-1/2"- 2-1/2"	10"
3" - 6"	12"
8" - 10"	16"
12" AND OVER	22"

PIPE HANGER DETAIL
NTS

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED PROFESSIONAL ENGINEER
MECHANICAL

THIS DRAWING IS A PART OF AN INTEGRATED SET OF CONSTRUCTION CONTRACT DOCUMENTS. REFER TO ALL DRAWINGS AND SPECIFICATIONS INCLUDING BUT NOT LIMITED TO "GENERAL CONDITIONS" "SUMMARY OF WORK", AND ANY APPLICABLE MANUFACTURERS TECHNICAL SPECIFICATIONS.

REFER TO ALL DRAWINGS FOR COMPLETE SCOPE OF WORK.

THIS DRAWING IS NOT TO BE SCALED OR USED AS AN AS-BUILT.

REV. NO.	DATE	DESCRIPTION
	01.09.24	FOR PERMIT & CONSTRUCTION
	03.19.24	GENERAL REVISIONS
1	04.01.24	PIPE REPLACEMENT UPDATES
2	04.11.24	REVISIONS

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:
Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:
MECHANICAL -
SCHEDULES & DETAILS

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:
M202 2

SECTION 230000 - MECHANICAL

PART 1: GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.

1.2 SUMMARY OF WORK

A. Provide complete functional Heating system as shown on Mechanical Construction Documents.

1.3 REFERENCE STANDARDS

A. NFPA Standards

B. ANSI Standards

C. ASME Standards

D. ASTM Standards

E. AWWA Standards

F. ASHRAE Standards

G. SMACNA Standards

H. OSHA Standards

I. NEBB Standards

J. Local Codes and Ordinances

K. Owner's Insurance Company Requirements

L. Where the contract documents indicate more stringent requirements than the above codes and ordinances, the contract documents shall take precedence.

M. File all documents, pay all fees and secure all permits, inspections and approvals necessary for the work of this section.

1.4 CONTRACT DRAWINGS & SPECIFICATIONS

A. The Contract Drawings are generally diagrammatic and convey the Scope of Work and General Arrangement of apparatus and equipment. The locations of all items shown on the drawings or called for in the specifications that are not definitely fixed by dimensions are approximate only. The exact locations necessary to secure the best conditions and results must be determined at the project and shall have the approval of the Architect and Engineer before being installed. The SubContractor shall follow drawings in laying out work and shall check drawings of the other trades to verify spaces in which work will be installed. Maintain maximum headroom and space conditions at all points. If directed by the General Contractor, Engineer and/or Architect, the SubContractor shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or before proper execution of the work.

B. Specifications: The specifications are intended only to complement the drawings; however, work detailed and/or noted only on the drawings or work described only in the specifications shall all be considered as part of the scope of work.

1.5 CONFLICT BETWEEN PLANS AND SPECIFICATIONS

A. In case of conflict between the contract drawings and specifications, the Engineer shall determine which takes precedence.

1.6 SHOP DRAWINGS AND PRODUCT DATA

A. SUBMITTALS: Submit shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system where specified in each individual section, and have them approved before procurement, fabrication, or delivery of the items to the job site. Partial submittals will not be accepted and will be returned without review. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable industry, technical society publication references, and other information necessary to establish contract compliance of each item the Contractor proposes to furnish.

B. Submit in accordance with Division 1.

C. It is the intent of these specifications that all equipment, materials and workmanship used on this project be in complete conformance with all local, state and national codes, ordinances and standards.

D. Substitutions shall be equivalent to specified equipment in all aspects of quality and performance and shall conform to the intent stated above. It is the Contractor's responsibility to submit only those items that meet these requirements. Should any non-conforming items be installed, they shall be replaced by the Contractor at no additional cost to the Owner.

E. The approval of the equipment does not relieve the SubContractor of responsibility of shop drawing errors related to details, sizes, quantities, wiring diagram arrangements and dimensions which deviate from the Specifications, and/or job conditions as they exist.

F. Refer to General Requirements for the substitutions of equipment and submittal of shop drawings. If apparatus or materials are substituted for those specified, and such substitution necessitates changes in, or additional connections, piping, supports, or construction, they shall be provided. Contractor to assume cost and entire responsibility thereof.

1.7 INSPECTION AND TESTS

A. During the progress of the work, it shall be subject to the inspection of the Owner and to such other inspectors, as may have jurisdiction.

B. At completion of the work, Contractor shall submit to the Owner's representative in writing a statement stating: (1) that the work is complete; (2) that the entire installation is in accordance with the specification; (3) that preliminary tests have been made; and (4) that the work is ready for final inspection and test.

C. A final inspection of the installation to determine compliance with the drawings and specifications will be made by the Owner's representative. Work will be checked for quality of materials, quality of workmanship, proper installation and finished appearance. This Contractor shall provide the services of the project foreman for inspection purposes. The foreman shall remove and reinstall access panels, ceiling tiles, etc., as required to facilitate any inspections required by the Owner's representative.

D. The Contractor shall arrange and conduct operating tests on all equipment in the presence of the Owner's representative. The component parts of systems and the various systems shall be demonstrated to operate in accordance with the requirements and intent of this specification. Any non-complying or defective materials or workmanship disclosed as a result of the inspection and the Contractor shall correct tests promptly, and the tests repeated as often as necessary until approved and accepted by the Owner's representative.

1.8 ELECTRICAL EQUIPMENT

A. Electrical components of mechanical equipment and systems, such as motors, factory mounted motor starters, disconnects, and control equipment shall be provided as indicated on the plans and as necessary to provide a complete and operational system.

B. Temperature control equipment, including thermostats, zone valves, relays, aquastats, etc. shall be provided as indicated on the plans and as necessary to provide a complete and operational system. This includes temperature control wiring not specifically shown on the plans.

C. All electrical equipment installed in concealed spaces shall be provided with a hard-wired electrical connection. Plug-type disconnects shall not be allowed in concealed spaces. Equipment provided with plug-in cords shall not have their cords modified.

1.9 OPENINGS IN EXTERIOR WALLS OR ROOF

A. Openings in exterior walls or roof shall be kept properly plugged and caulked at all times, except when being worked on to preclude the possibility of flooding due to storms or other causes. After completion of work, openings shall be permanently sealed and caulked in a manner approved by the Architect.

1.10 GUARANTEE

A. Except as otherwise specified, all work, materials and equipment shall be guaranteed against defects resulting from the use of inferior materials, equipment, or workmanship for one year from the date of final accepted completion of the contract, or from full acceptance by the Owner.

B. If, within any guarantee period, repairs or changes to guaranteed work are required as a result of the use of defective materials or equipment, inferior workmanship or work that is not in accordance with the terms of the contract, and upon receipt of notice from the Owner, the following shall be done without expense to the Owner.

C. Place in satisfactory condition in every particular all of such guaranteed work and correct all defects therein.

D. Repair all damage to the building, site/equipment, or contents thereof which is the result of the use of defective materials or equipment or inferior workmanship, or of work not in accordance with the terms of the contract.

E. Make good any work or materials, or the equipment and contents of said building or site disturbed in fulfilling any such guarantee.

F. In fulfilling the requirements of the contract or of any guarantee embraced in or required thereby, any work guaranteed under another contract is disturbed, restore such disturbed work to original condition and guarantee such restored work to the same extent as it was guaranteed under such other contract.

G. If upon failure to proceed promptly after notice to comply with the terms of the guarantee, the Owner may have the defects corrected and Contractor and his surety shall be liable for all expenses incurred.

H. This Contractor shall obtain in the General Contractor's and Owner's name, the standard written manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities, which the Contractor may have by law or other provisions of the Contract Documents. The guarantee shall be for a period of one (1) year minimum from the date of acceptance or final payment.

I. Contractor shall be required to document and submit date of final acceptance for final payment.

1.11 CLEANING OF SYSTEM

A. Thoroughly flush all piping and equipment of all foreign substances before placing in operation.

B. If any foreign matter should stop any part of a system after being placed in operation, clean and reconnect system.

C. Remove all covers of interior floor drains and cleanouts, clean of all dirt, concrete traces, etc., then lightly grease and reinstall.

D. Existing HVAC systems which are being tied into or otherwise modified shall be thoroughly cleaned prior to being placed back in service.

1. Hydronic Systems shall be fully flushed, cleaned, refilled and treated.

a) Contractor shall test existing system fluid to determine the concentration of freeze-inhibitor in the system prior to drain-down.

b) Refilling of the system shall include freeze inhibitor matching the concentration of the system prior to drain-down.

2. During construction, Contractor shall bring to the attention of the Owner and Engineer any perceived deficiencies in existing systems including but not limited to:

a) Code deficiencies

b) Inoperable equipment

c) Leaking ductwork and/or piping

d) Missing or deteriorating insulation

e) Excessive noise

1.12 TEMPORARY OPENINGS

A. Coordinate construction and provide temporary openings in the building as required for the admission or removal of equipment furnished under this Division.

1.13 DEFINITIONS

A. "Piping" includes, in addition to pipe, all fittings, valves, hangers, and other accessories relating to such piping.

B. "Concealed" means hidden from sight in trenches, chases, furred spaces, shafts, hung ceilings, embedded in construction or in crawl spaces.

C. "Exposed" means not installed underground or "concealed" as defined above.

D. "Provide" means furnish and install complete and ready to operate.

E. “Architect” means the Verdantas Project Manager.

1.14 EQUIPMENT DEVIATIONS

A. Where proposals to use an item of equipment other than that specified which requires any redesign of the structure, partitions, foundations, piping, wiring or any other part of the mechanical, electrical or architectural layout, all such redesign, and all new drawings and detailing required therefore, shall be prepared by the Architect at the Contractor's expense.

B. Where such approved deviation requires a different quantity and arrangement of ductwork, piping, wiring, conduit, and equipment from that specified or indicated on the drawings, furnish and install any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the Owner.

1.15 EQUIPMENT PADS

A. All grade and floor mounted equipment shall be provided with a reinforced concrete pad. Refer to architectural plans for pad locations, thickness, sizes, and construction requirements.

B. If grade and/or floor mounted equipment is shown but no pad is indicated on the architectural plans, the Contractor shall be responsible for clarifying the necessity, size, and location of any pads during the bidding process. No additional compensation will be given for pads which are required by this section but not indicated on the plans if no formal request for clarification was issued during the bidding process.

1.16 ELECTRICAL ROOM REQUIREMENTS

A. Do not install any piping, ductwork or equipment in or through electrical rooms, transformer rooms, electrical closets, telephone rooms or elevator machine rooms, unless piping or ductwork of equipment is intended to serve these rooms. Additionally, no ductwork or piping will be installed above electric panels. If the Contractor violates this requirement, he shall remove and/or relocate all items as required at his expense and to the satisfaction of the Architect.

1.17 COOPERATION WITH OTHER TRADES

A. Give full cooperation to other trades and furnish in writing to the Architect any information necessary to permit the work of all trades to be installed satisfactorily and with the least possible interference or delay.

B. Furnish to other trades, as required, all necessary templates, patterns, setting plans, and shop details for the proper installation of work and for the purpose of coordinating adjacent work.

1.18 PROJECT RECORD DOCUMENTS:

A. Each Contractor shall record clearly, neatly, accurately, and promptly as work progresses the following data:

1. Changes made resulting from change orders or instructions issued by the Architect.

2. Changes in routing made to avoid conflict with other trades or structural conditions.

3. Final location of equipment and panels if different than contract documents.

B. Upon completion of the project submit to the Architect a set of electronic media noting "as built" conditions indicating all variations and deviations of his work from contract documents.

1.19 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Operating Instructions: Provide operating instructions to the Owner's designated representative with respect to the operation functions and maintenance procedures for all equipment and systems installed. The cost of providing a manufacturer's representative at the site for instructional purposes shall be included in the Contract Price.

B. Maintenance Manuals: At the completion of the project, turn over to the General Contractor four (4) complete manuals in 3-ring binders, indexed, containing the following:

1. Complete shop drawings of all material and equipment of this section.

2. Operation descriptions of all systems.

3. Names, addresses and telephone numbers of all suppliers of system components.

4. Preventative maintenance instructions for all systems.

5. Spare parts list of all system components.

6. Copies of all valve charts.

1.20 PROTECTION

A. Protect all work and material from damage by work and workmen, and accept liability for all damage thus caused.

B. Be responsible for work and equipment until finally inspected, tested, and accepted. Protect work against theft, injury or damage; and carefully store material and equipment received on site, which is not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

C. All openings in stored & installed ductwork shall be covered & sealed when not in use to prevent contamination from dust & debris.

1.21 SCAFFOLDING, RIGGING AND HOISTING

A. Provide scaffolding, rigging, hoisting and services necessary for delivery, erection and installation of material, equipment and apparatus furnished under this division. Remove same from premises upon completion of work.

B. Coordinate proposed routing with Architect/Owner prior to rigging and protect all existing building components against damage.

1.22 MATERIALS AND WORKMANSHIP

A. All materials and apparatus required for the work, except as specified otherwise, shall be new, of first-class quality, furnished, delivered, erected, connected and finished in every detail, and so selected and arranged as to fit properly into the building spaces. Where no specific kind or quality of material is given, a first-class standard article as approved by the Architect shall be furnished.

B. Furnish the services of an experienced foreman who shall be constantly in charge of the installation of the work, together with all skilled workmen, fitters, metal workers, welder, helpers, and labor required to unload, transfer, erect, connect, adjust, start, operate, and test each system.

C. All equipment and materials shall be installed in strict accordance with the manufacturer's recommended installation instructions as well as UL Listing instructions and all Local, State and National codes.

1.23 QUIET OPERATION AND VIBRATION

A. Work shall operate under all conditions of load without any objectionable sound or vibration. In case of any moving machinery, sound, or vibration noticeable outside of room in which it is installed, or annoyingly noticeable inside its own room, will be considered objectionable. Sound or vibration conditions considered objectionable shall be corrected in an approved manner at no expense to the Owner. Vibration control shall be means of approved vibration eliminators in a manner as recommended by the manufacturer of the eliminators.

1.24 ACCESSIBILITY

A. Assure and be responsible for the adequacy of shafts and chases, the adequate clearance in double partitions and hung ceilings for the proper installation of the work. Cooperate with all other trades whose work is in the same space. Such spaces and clearances shall, however, be kept to the minimum size required.

B. Locate all equipment, which must be serviced, operated, adjusted or maintained in fully accessible positions. Equipment shall include, but not be limited to, valves, traps, cleanouts, motors, controllers, filters, dampers, starters, coils, fire dampers, smoke dampers and drain points. If required for better accessibility, furnish access doors for this purpose. Minor deviations from drawings may be made to allow for better accessibility, and the Engineer shall approve any change.

C. Provide access panels for installation in concrete block walls or gypsum wallboard ceilings and partitions in locations, which require access for service to the items located behind the permanent gypsum wallboard or concrete block finish.

D. Access panels shall be installed where required to gain access to valves, dampers, controls, etc. Panels shall be flush, insulated, and contain a continuous steel hinge and screwdriver operated latch. Panels shall be rated equal to the assembly that they are being installed in. Panels shall be UL listed.

E. Access panels located in fire rated partitions shall be fire panels. The frame and panel assembly of these fire panels shall be manufactured under the Factory Inspection Service of the Underwriters' Laboratories, Inc., and shall bear a label reading: "Frame and Fire Panel Assembly, Rating 2 hours. (B) Temperature Rise 30 Minutes, 250° F. Maximum." Rated panels shall be equipped with automatic closing mechanism and be self-latching.

F. Panels shall be provided with screwdriver operated flush cam locks.

G. Panel size shall be 12 inches x 12 inches except furnish a larger size if required to service a particular item. The exact location and size of each access panel shall be reviewed with, and approved by, the Engineer.

H. The exact location and size of each access panel shall be noted on a shop drawing and reviewed with, and approved by, the Architect and Engineer in writing prior to installation.

1.25 CUTTING AND PATCHING

A. Provide all cutting and patching necessary to install the work specified in this division. Patching shall match adjacent surfaces.

B. At floor slabs & wall openings to be cored, drilled, or cut, the Contractor shall find and mark on both faces all reinforcing, rebar, conduits, utilities, etc.. by means of x-ray, pach-ometer or prof-ometer. Submit sketch showing locations of all findings and proposed cuts or cores for review.

C. No structural members shall be cut without the approval of the Structural Engineer, and all such cutting shall be accomplished in a manner directed by the Structural Engineer.

1.26 GROUNDING

A. All components of mechanical piping systems shall be properly grounded to building ground. Where ground path is interrupted by non-conductive materials, appropriate bonding or grounding to building ground shall be provided.

1.27 WATERPROOFING

A. Where any work pierces waterproofing, including waterproof concrete, the method of installation shall be as approved by the Architect before work is started. Furnish all necessary sleeves required.

1.28 BUILDING EXPANSION JOINTS

A. Where ductwork or piping crosses a building expansion joint, provisions shall be made to allow for the movement of each side of the structure without adversely impacting the integrity of the ductwork or piping.

B. Where ductwork crosses a building expansion joint, expansion joint shall be provided with a flexible connection as indicated in these specifications and allow for a minimum of 3x the expected maximum relative deflection between the two building sections.

C. Piping crossing a building expansion joint shall be provided with an expansion joint as indicated in these specifications and allow for a minimum of 4x the expected maximum relative deflection between the two building sections.

D. Ductwork and piping shall be rigidly affixed to the structure on either side of the building expansion joint.

E. Flexible connections and piping expansion joints shall be suitable for the fluid type and pressure being transferred.

1.29 DEMOLITION

A. Prior to submitting a bid, visit site and identify existing conditions and difficulties that will affect work of this section. Demolition work will require careful site examination prior to bidding. No compensation will be granted for additional work caused by unfamiliarity with site conditions that are visible or readily construed by experienced observers.

B. Prior to commencing demolition, Contractor shall identify with Owner any equipment to be returned to the Owner after demolition. All other debris shall be disposed of by this Contractor in accordance with all applicable regulations. Any shutdowns required for demolition shall be coordinated with building owner to avoid impact to operations.

C. During demolition, any equipment, ductwork, piping, etc. found to be abandoned shall be demolished. Existing unused connections to existing ducts or piping shall be cut back to the mains and capped accordingly.

D. During Demolition, Contractor will be required to remove demolition debris on a daily basis.

E. Under demolition, the following is, in brief, the extent of the work to be performed by the Mechanical Contractor under this contract.

1. The Mechanical Contractor shall be responsible for the disconnection and removal of the existing mechanical equipment, ductwork, piping, valves, etc.,in designated areas. Cut & cap piping and ductwork back to mains. Patch all roof and wall penetrations to match existing.

2. This Contractor shall protect work against injury or damage; and carefully store material and equipment to be relocated. Open ends of work shall be closed with temporary covers or plugs during storage and construction to prevent entry of obstructing material.

3. All existing HVAC components, including but not limited to ductwork, piping, equipment, controls & accessories, shall be removed from the area of renovation.

4. Coordinate all demolition with other trades to ensure all relevant portions of the system, including associated electrical and plumbing components are removed.

5. Refer to drawing plans and notes for additional information.

1.30 TEMPORARY HEAT

A. The building must remain in full operation during the construction period. This Contractor shall provide temporary space conditioning, hot water heating, and/or domestic water production for the duration of time which the existing systems are inoperable or have owner approval for any downtime.

B. This Contractor shall provide a minimum of 48 hours' notice of any shutdowns and coordinate maximum allowable system downtimes with the Owner and/or Director of Operations prior to the start of work.

C. This Contractor shall be responsible for providing temporary heating equipment at any point during construction as required to maintain laborer comfort and avoid damage to the building or any of its associated components, systems, or equipment.

D. Contractor shall provide all temporary or permanent equipment, materials, and labor to ensure these stipulations are met.

E. Temporary heating requirements shall be coordinated with the electrical and plumbing Contractor as required. This Contractor shall carry all costs associated with utilizing other Contractors to provide materials or labor for temporary services indicated above.

1.31 REBATES

A. The Contractor shall make the owner aware of all applicable “upstream” energy rebates available for this project.

B. The Contractor shall provide the owner all necessary information and documentation for completion and submission of energy rebate applications.

PART 2: PRODUCTS

2.1 IDENTIFICATION, MARKING AND TAGGING

A. Systems and equipment to be identified and marked and valves tagged include, but are not limited to the Heating, Air Conditioning & Ventilating systems.

B. Submit samples of marking and tagging devices and wording, lettering and numbering scheme for each system.

C. Equipment Identification:

1. Manufacturer's nameplates or trademark shall be permanently affixed to all equipment and materials furnished under this division. Manufacturer's nameplates shall include all pertinent data relative to the piece of equipment including model number, serial number, and operating characteristics as applicable.

2. Separate Equipment Identification Markers shall identify each item of equipment with a permanently attached marker indicating designation and/or number corresponding to design documents.

3. Markers shall be of rigid black Bakelite or phenolic construction with white engraved or incised letters.

4. Lettering on equipment markers shall be of adequate size to be legible from floor levels. In all cases marker lettering shall no be less than 1 inch high.

5. Contractor shall coordinate with PHA on location of marking and tagging.

D. Piping System Identification:

1. Piping Systems shall be identified as indicated herein or as required by applicable codes and/or officials having jurisdiction.

2. Pipe Markers shall be color coded according to " Designations to Colors" - ASME A13.1-2007.

3. All piping and equipment shall be identified by pipe markings, which shall be provided by this Contractor. Markers shall be applied every 20 ft. Markings shall indicate pipe content, system, and direction of flow. The markers shall be as manufactured by Seton Name Plate Corp. or equal

4. Pipe Markers shall be of the pressure sensitive type as manufactured by the Seton Nameplate Corp. (F10-Code)

5. Valve Identification: Provide laminated plastic nameplates on all valves installed. Tags shall be constructed of 0.125 inches thick melamine plastic conforming to Fed. Spec. L-P-387. Surface shall be matte finish. Accurately align lettering and engrave into white core. Nameplates shall be to 2 inches round or hexagonal. Lettering shall be minimum of 0.375 inch high normal block lettering. Key the nameplates to a chart and schedule for each system. Frame one chart and schedule for each system under glass and place where directed in mechanical room. Furnish four copies of each chart and schedule. Each inscription shall identify its function. Attach nameplates with "S" hooks and chain to each valve. Valve nameplates shall be numbered and "keyed".

2.2 SLEEVES, INSERTS AND ESCUTCHEONS

A. Provide sleeves for all work passing through floor, wall, and ceiling construction. Locate and provide sleeves and inserts before the floor, wall or ceiling is constructed. If this Contractor does not comply with the above, he shall bear all costs incurred for cutting and patching required for the installation of sleeves and inserts. Holes required for sleeves in existing walls and floors, or to conform to the above shall be saw cut or core drilled. This Contractor shall provide all drilling required for the installation of hangers.

B. Pipe sleeves through outside walls shall be Schedule 80 black steel pipe with 150 lb. black steel slip-on welded flanges welded at the center of the outside. Extend sleeves 1/2 inch beyond each side of the wall. Pack the space between sleeve and pipe with oakum to within 2 inches of each face of the wall. Pack the remaining space and make watertight with an approved waterproof compound.

C. Pipe sleeves through concrete floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with finished wall or ceiling surfaces, but extending 2 inches above finished floors. Plastic, PVC, or light metal sleeves shall not be installed.

D. For new or modified pipe penetrations, provide individual or strip type inserts pressed steel construction with accommodation for removable nuts and threaded rods up to 3/4-inch diameter, permitting lateral adjustment. Individual inserts shall have an opening at the top to allow reinforcing rods to 1/2 inch diameter to be passed through the insert body. Strip inserts shall have attached rods with hooded ends to allow fastening to reinforcing rods.

E. For new or modified pipe penetrations where pipe motion due to expansion and contraction will occur, make sleeves of sufficient diameter to permit free movement of pipe. Where sleeves pass insulated pipes, the sleeves shall be large enough to pass the pipe and the insulation. Check floor and wall construction finishes to determine proper length of sleeves for various locations.

F. For new or modified pipe penetrations, provide 22 gauge galvanized steel duct sleeves through interior walls, floors and ceilings set flush with finished surfaces.

G. Pack the space between sleeves and structure, and sleeves and pipes or ducts passing through fire rated interior walls, floors, and ceilings with an approved fire and smoke proof packing material. Fire-stopping material shall maintain its dimensions and integrity while preventing the passage of flame, smoke, and gases under conditions of installation and user when exposed to the ASTM E119 time-temperature curve for a time period equivalent to the rating of the assembly penetrated. Cotton waste shall not ignite when placed in contact with the non-fire side during the test. Fire-stopping material shall be non-combustible as defined by ASTM E136; and in addition, for insulation materials, melt point shall be a minimum of 1700 degrees F. for 1-hour protection and 1850 degrees F. for 2-hour protection.

H. Fasten sleeves securely in floors, walls, etc. so that they will not become displaced when concrete is poured or when construction is built around them. Take precautions to prevent concrete, plaster, or other materials being forced into the space between pipe and sleeve during construction.

2.3 SUPPORTS & ATTACHMENTS

A. Provide all necessary supports and bases required for all equipment, piping and for all other equipment furnished under this contract. Submit shop drawings to the Architect for approval before purchase, fabrication or construction of same. All to meet manufacturer's installation recommendations.

B. All equipment, unless shown otherwise, shall be securely attached to the building structure in an approved manner. Attachments shall be of a strong and durable nature and any attachments that are not strong enough shall be replaced as directed.

C. Vibration Isolation: All mechanical equipment, piping and ductwork shall be mounted on vibration isolators/inertia bases to prevent the transmission of vibration and mechanically transmitted sound to the building structure.

1. Vibration isolators shall be selected in accordance with the weight distribution so as to produce reasonably uniform deflections.

2. All isolators and isolation materials shall be of the same manufacturer and shall be certified by the manufacturer.

2.4 SEISMIC RESTRAINTS

A. It is the intent of this seismic specification that this Contractor shall provide all necessary seismic restraints required to keep all mechanical building system components in place during a seismic event as required by the Building Code.

B. All mechanical systems must be installed in strict accordance with seismic codes, component manufacturer's and building construction standards. Whenever a conflict occurs between the manufacturer's or construction standards, the most stringent shall apply.

C. Seismic restraints shall be designed in accordance with seismic force levels as detailed in the applicable building code.

2.5 USE OF INSTALLATION

A. The Owners shall have the privilege of using any part of the installation when sufficiently complete, but such use thereof, or partial or final payment shall not be considered as an acceptance of such work in lieu of a written certificate from the Engineer.

2.6 PIPING

A. Hydronic Piping

1. Piping materials shall be as below and as specified on the plans.

a) All fittings shall be compatible with the above and installed per the manufacturer's recommendations.

b) All piping “passing through” a building in the crawl space shall be copper per below (2.0 A.3.)

2. Where steel and copper are used, they shall be as below.

3. Steel Pipe: ASTM A53, Schedule 40, black.

a) Fittings: ASTM B16.3, malleable iron or ASTM A234, forged steel welding type fittings or Victaulic ductile iron ASTM A536/395.

b) Joints: Threaded, or AWS D1.1,welded or Victaulic grooved joints.

4. Copper Tubing: ASTM B88, Type L, hard drawn.

a) All press fittings shall be Viega Solderless ProPress copper fittings or equal and be compatible with the piping above and installed per the manufacturer's recommendations.

b) Viega Solderless ProPress copper fittings to have max temperature rating of 250°F.

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B. Unions, Flanges and Couplings for steel and copper:

1. Unions for Pipe 2 Inches (50 mm) and Under:

a) Ferrous Piping: 150 psig (1034 kPa) malleable iron, threaded.

b) Copper Pipe: Bronze, ProPress.

2. Flanges for Pipe Over 2 Inches (50 mm):

a) Ferrous Piping: 150 psig (1034 kPa) forged steel, slip-on.

b) Copper Piping: Bronze.

c) Gaskets: 1/16 inch (1.6 mm) thick preformed neoprene.

3. Provide di-electric coupling wherever copper pipe meets steel pipe or other dissimilar metals. Retighten all existing dielectric unions.

2.7 VALVES

A. Valve Features

1. General Comply with ASME B31.9 for building services piping, and ASME

2. Pressure and Temperature Ratings As scheduled and required to suit system pressures and temperatures.

3. Sizes unless otherwise indicated, provide valves of same size as upstream pipe size.

4. Operators Provide the following special operator features:

a) Hand wheels fastened to valve stem, for valves other than quarter turn, by brass nut on a square-topped stem.

b) Lever handles on quarter-turn valves 6 inch and smaller, except for plug valves. Provide one wrench for every 10-plug valves, and a one years supply of recommended lubricant or sealant.

5. Extended Stems where insulation is indicated or specified, provide extended stems arranged to receive insulation.

6. Threads Comply with ANSI B2.1.

7. Flanges Comply with ANSI B16.1 for cast iron, ANSI B16.5 for steel, and ANSI B16.24 for bronze valves.

8. Solder-Joints Comply with ANSI B16.18.

9. Caution: Where soldered end connections are used, use solders having a melting point below 840 degrees. F for gate, globe, and check valves; below 421 degrees. F for ball valves.

10. Groove-Ended Valves Comply with AWWA C606

B. Gate Valves

1. Gate Valves - 2 Inch and Smaller MSS SP-80; Class 150, body and bonnet of ASTM B 62 cast bronze, threaded or solder ends, solid disc, gland packed, N.A. packing.

2. Gate Valves - 2-1/2 Inch and Larger MSS SP-70; Class 125 cast iron bodies conforming to ASTM A 126 (Body and Bonnet). Bronze trim, flanged ends, N.A. packing.

C. Ball Valves

1. Ball Valves - 1 Inch and Smaller Rated for 150 psi saturated steam pressure, 600 psi WOG pressure; 2-piece construction, bronze body conforming to ASTM B 62, standard (or regular) port, stainless steel ball, replaceable “Teflon” or “TFE” seats and seals, blowout proof stem, and vinyl-covered steel handle. Threaded ends for heating hot water and low-pressure steam.

2. Ball Valves - 1-1/4 Inch to 2 Inch Rated for 150 psi saturated steam pressure, 600 psi WOG pressure; 3-piece construction, bronze body conforming to ASTM B 62, conventional port, stainless steel ball, replaceable "Teflon" or "TFE" seats and seals, blowout proof stem, and vinyl-covered steel handle. Threaded ends for heating hot water and low-pressure steam.

3. Ball Valves-1/2 inch through 2inch Rated for up to 600 psi WOG, brass body, standard port, threaded ends, 2-piece, chrome-plated brass ball, TFE seats. Victaulic Style 722.

4. Ball Valves-1-1/2 inch through 6 inch. Rated for up to 1000 psi. ductile iron body, standard port, grooved ends, 2-piece, chrome-plated carbon steel ball, TFE seats. Victaulic Style 726.

D. Plug Valves

1. Plug Valves - 2 Inch and Smaller 150 psi WOG, bronze body, straightaway pattern, square head, threaded ends.

2. Plug Valves - 2-1/2 Inch and Larger MSS SP-78; 175 psi, lubricated plug type, semi-steel body, single gland, wrenchoperated, flanged ends

3. Plug Valves-3 Inch and Larger Grooved-Ends. Meets the intent of MSS SP-78. 175 psi, non-lubricated plug type, ductile iron body, ductile iron plug (elastomer encapsulated). Victaulic Style 377.

E. Globe Valves

1. Globe Valves - 2 Inch and Smaller MSS SP-80; Class 150, body and union bonnet of ASTM B 62 bronze, gland packed, N.A. packing. Bronze trim, composition disc.

2. Globe Valves - 2-1/2 Inch and Larger MSS SP-85; Class 125 body, bronze trim, with body and bonnet conforming to ASTM A 126, Class B; cast iron, flanged ends, with N.A. packing.

F. Butterfly Valves

1. Butterfly Valves - 2 Inch and smaller MSS SP-67; 200 psi, cast bronze body, Viton seals, full port design, stainless steel trim, threaded or solder ends.

2. Butterfly Valves - 2-1/2 Inch and larger MSS SP-67; 200 CWP, conforming to ASTM A 126, Class B cast iron, EPDM cartridge liner, A1.Bronze disc, 416 s.s. Stem. Sizes up to 6 inches shall have lever operators with locks, and sizes 8 and above shall have gear operators with position indicator. Valves on dead end service or requiring additional body strength shall be lug-wafer type, drilled and tapped.

3. Butterfly Valves - 2 Inch and Larger Grooved-Ends. Meets the intent of MSS SP-67, 300 CWP, ductile iron body, ductile iron offset disc, EPDM seat seal, bubbletight/bi-directional shutoff to full dead end rating (300 CWP). Victaulic MasterSeal or AGS Vic-300.

4. Triple-Service Assembly-2 inch and Larger, Grooved-Ends. In lieu of Triple Duty Valves or Multi-Purpose Valves, the Victaulic Triple-Service Assembly may be used. Combination MasterSeal™ Butterfly Valve and Venturi Check Valve Style 779 or AGS Vic®-300 Butterfly Valve with Style 715 Dual-Disc Check Valves.

G. Check Valves

1. Swing Check Valves - 2 Inch and Smaller MSS SP-80; Class 150 or 200, cast bronze body and cap conforming to ASTM B 62, horizontal swing, with a Teflon disc, and having threaded ends. Valve shall be capable of being repaired while the valve remains in the line.

2. Swing Check Valves - 2-1/2 Inch and Larger MSS SP-71; Class 125, cast iron body and bolted cap conforming to ASTM A 126, Class B; horizontal swing, with a bronze disc or cast iron disc with bronze disc ring, and flanged ends. Valve shall be capable of being refitted while the valve remains in the line.

3. Wafer Check Valves - (Non-Slam) Class 250, cast iron body, replaceable lapped bronze seat, lapped and balanced twin bronze flappers and stainless steel trim. Valve shall be designed to open and close at approximately one-foot differential pressure. Twin flappers shall be loaded with a stainless steel torsion spring to minimize flapper drag and assure even non-slam checking action.

4. Lift Check Valves - 2 Inch and Smaller Class 125, cast bronze body and cap conforming to ASTM B 62, horizontal, lift type valve, bronze disc and threaded ends. Valve shall be capable of being refitted and ground while the valve remains in the line.

5. Check Valves - 2 Inch and Larger, Grooved-Ends:

a) Swing Check-Ductile iron body, SS clapper, EPDM seat seal, 300 CWP. Style 712 (horizontal installation only)

b) Spring-Assisted Swing Check-Ductile iron body, aluminum-bronze or ductile iron disc, EPDM seat seal, 300 CWP. Style 716/779 (horizontal or vertical installations)

c) Spring-Assisted Dual-Plate Swing Check-Ductile iron body, SS disc , EPDM seat seal, 230 CWP. Style W715 (horizontal or vertical installations).

H. Combination Balancing & Shutoff Valves:

1. 2” and Smaller Sizes: 300 psi, threaded or sweat ends, non-ferrous Ametal® brass copper alloy body, EPDM o-ring seals. 4 turn digital readout handwheel for balancing, hidden memory feature with locking tamper-proof setting. Victaulic / TA Hydronics Series 786/787 or Engineer Approved Equal .

2. 2-1/2” and Larger Sizes: 300 psi, flanged or grooved ends, ASTM A536 ductile iron body, all other metal parts of Ametal® brass copper alloy, EPDM O-ring seals. 8, 12 or 16 turn digital readout handwheel for balancing, hidden memory feature with locking tamper-proof setting. Victaulic / TA Hydronics Series 788/789 or Engineer Approved Equal

3. .Koil-Kit™ Components: Install Series 78U union port fitting and Series 78Ystrainer/ball valve combination to complete terminal hook-up at coil outlet

I. Balancing Valves

1. Balancing valves shall be provided on all piping mains and takeoffs as required to balance the system to the flows indicated on the drawings and in the equipment schedules.

2. Balancing valves shall be sized such that the specified flow through the valve generates an input to the flow measurement device that is within the range of accuracy of the device. Oversized valves that generate inputs that are below the range of the device and undersized valves that result in excessive pressure loss are not acceptable. Balancing valve submittals shall indicate size, flow and valve characteristics.

2.8 PIPING ACCESSORIES

A. Dielectric Unions: Unions comprising steel female pipe thread end and copper solder-joint end conforming to dimensional, strength and pressure requirements of Fed. Spec. WW-U-531, Class 1. Steel parts shall be galvanized or plated. Union shall have water-impervious insulation barrier capable of limiting galvanic current to 1% of the short-circuit current in a corresponding bimetallic joint. When dry, it shall also be able to withstand a 600-volt breakdown test.

1. Dielectric Waterways: Electroplated steel or ductile-iron nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig maximum working pressure at 230 deg F. Victaulic Style 47.

2. Joints between different piping materials shall be made with a mechanical joint or dielectric fitting.

B. Strainers: Single basket type, with inlet and outlet on the same center line. Cast steel or fabricated steel body, mesh 300-series stainless- steel baskets. Open area of one basket shall be 2-1/2 times inlet or outlet piping area. Furnish on spare basket.

1. Strainers for Grooved Piping Systems:

a) Y-Pattern Strainers: Ductile iron body ASTM A536 with coupling/cap and blowdown port bottom drain connection. Grooved ends 2”-18”. 304 SS perforated removable basket with .062” or .156” holes (depending on size) and start-up screen. 300 CWP. Victaulic Style 732/W732.

b) T-Pattern Strainers: Ductile iron body ASTM A536 with coupling/cap or ASTM A53 carbon steel with T-bolt hinged closure/cap. Grooved ends 2”-24”. 304 SS perforated removable basket with .042”-.126” holes (depending on size) and start-up screen. 300 CWP. Victaulic Style 730/W730.

C. Sleeves: Provide where piping passes through masonry or concrete walls, floors, roofs and partitions. Sleeves shall be placed during construction. Sleeves in outside walls below and above grade, in floor, or in roof slabs, shall be standard weight zinc coated steel pipe. Sleeves in partitions shall be zinc coated sheet steel having a nominal weight of not less than 0.90 pound per square foot. Space between piping and the sleeve shall be not less than 0.25 inch. Sleeves shall be of sufficient length to pass through entire thickness of walls, partitions or slabs.

2.9 PIPING INSTALLATION

A. Install piping free from traps and pitch to drain.

B. Pipe Sleeves: Firmly pack space between the pipe or tubing, and sleeve with oakum and caulk on both ends of sleeve with elastic cement.

C. Unions, Flanges and Victaulic Couplings: Place unions, flanges or Victaulic couplings where necessary to permit easy disconnection of piping and apparatus. Each connection having a screw end valve shall have a union.

D. Valves: Install valves in positions accessible for operation and repair.

E. Field Testing: Upon completion and before final acceptance of the work, each system shall be tested as in service to demonstrate conformance with the contract requirements and in accordance with the requirements of ANSI B31.3 and NFPA 30.

F. Each new piping system will be hydrostatically tested at not less than 1.5 times the working pressure in accordance with ANSI B16.3, but in no case less than 200 psig and shall show no leakage or dials indicating not less than 1.5 times nor more than 2 times the test being placed in operation. Isolate any tanks connected to the system before testing.

G. Piping which contains any fluid which could potentially freeze is strictly prohibited from being installed within areas which may be subject to freezing temperatures. If, during the installation process, it is noted that such piping will be located in an area subject to freezing temperatures it must be brought immediately to the attention of the engineer. If such an installation is unavoidable affected piping shall be provided with additional insulation as required by the energy code as well as heat tracing and associated power circuiting as required to avoid the fluid freezing.

2.10 PIPING INSULATION

A. Insulation

1. All piping insulation shall be flame rated.

2. Hydronic/Steam Piping: Any alternate to closed cell foam insulation shall be preformed glass fiber meeting ASTM C547, "k" value of 0.24 @ 75°F with all service jacket (ASJ). Service temperature 0°F to +850°F, 25/50.

3. All fittings and valves shall be insulated and covered with PVC jacketing - Johns Manville or equivalent.

B. Compliance: Insulation thickness, conductivity and installation shall comply with local Mechanical and Energy Codes.

C. Minimum Pipe Insulation:

1. Hot Water: 1-1/2” Thick, ≤ 1-1/2” Nominal Pipe Diameter

2. Hot Water: 2” Thick, > 1-1/2” Nominal Pipe Diameter

D. Fittings: Factory precut insulation inserts, thickness to be same as adjacent. Enclose in premolded, PVC fitting covers.

E. Jackets:

1. Interior: Factory applied, all service jacket of white Kraft bonded to aluminum foil reinforced with fiberglass yarn and suitable for painting. Longitudinal and butt joints shall be made with factory applied pressure sensitive material.

2. Interior: Field applied, PVC jacketing - Johns Manville or equivalent.

F. Preparation

1. For other than pre-insulated piping, install materials after piping has been tested and approved.

G. Installation

1. Install materials in strict accordance with manufacturer's instructions.

2. Continue all insulation through penetrations.

H. Supports:

1. All piping shall be supported in such a manner that the insulation is not compromised by the hanger or the effects of the hanger. In all cases, hanger spacing shall be such that the circumferential joint may be made outside the hanger. Cover the evaporating holes with Contractor supplied VaporWick Sealing Tape for the length of the metal saddle.

2. Piping systems 3" (75 mm) in diameter or less, insulated with fiberglass pipe insulation, may be supported by placing saddles of the proper length and spacing under the insulation as designated in Owens Corning Pub. 1-IN-14210.

3. For hot or cold piping systems larger than 3" (75 mm) in diameter, operating at temperatures less than +200F (93C) and insulated with fiberglass, inserts such as foam or high-density fiberglass with sufficient compressive strength shall be used to support the weight of the piping system.

CERTIFICATION :

WILLIAM T. MAYER III
STATE OF RHODE ISLAND
No. 7860
REGISTERED
PROFESSIONAL ENGINEER
MECHANICAL

THIS DRAWING IS A PART OF AN INTEGRATED SET OF CONSTRUCTION CONTRACT DOCUMENTS. REFER TO ALL DRAWINGS AND SPECIFICATIONS INCLUDING BUT NOT LIMITED TO "GENERAL CONDITIONS" "SUMMARY OF WORK", AND ANY APPLICABLE MANUFACTURERS TECHNICAL SPECIFICATIONS.

REFER TO ALL DRAWINGS FOR COMPLETE SCOPE OF WORK.

THIS DRAWING IS NOT TO BE SCALED OR USED AS AN AS-BUILT.

REV. NO.	DATE	DESCRIPTION
	01.09.24	FOR PERMIT & CONSTRUCTION
	03.19.24	GENERAL REVISIONS
1	04.01.24	PIPE REPLACEMENT UPDATES
2	04.11.24	REVISIONS

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Slatersville, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

MECHANICAL - SPECIFICATIONS

JOB NO.: 22245RS

DRAWN BY: TC

CHECKED BY: WTM

DATE ISSUED: 01.09.2024

SCALE: AS NOTED

SHEET NO.:

M300

4. On vertical runs, insulation support rings shall be used.

I. Accessories:

1. Insulation Bands: ¾ inch wide; 0.015 stainless steel
2. Metal Jacket Bands: ½ inch wide; 0.015 thick aluminum.
3. Insulating Cement: ANSI/ASTM C195; hydraulic setting mineral wool.
4. Finishing Cement: ASTM C449.
5. Fibrous Glass Cloth: Untreated; 8oz/sq. yd. Weight.
6. Adhesives: Compatible with insulation.
7. Wick material for wrapping valves and fittings
8. Closure Materials -Sealing Tape, and mastics.
9. Support Materials - Hanger straps, hanger rods, saddles, support high-density blocks, and support rings.
10. All accessory materials shall be installed in accordance with project drawings and specifications, manufacturer's instructions, and/or in conformance with the current edition of "Commercial & Industrial Insulation Standards."

2.11 WATER TREATMENT

A. All hydronic HVAC systems shall be provided with water treatment chemicals during initial fill of the systems as required by the Owner. Chemicals shall be designated for use in the specific system type and be provided in concentrations as recommended by the chemical manufacturer and as approved by the Owner.

B. Contractor shall provide submittals for review and approval for all water treatment chemicals.

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2.12 FIRESTOPPING

A. Provide Firestopping systems for penetrations in fire-resistance-rated assemblies, including both membrane and through penetrations. This Contractor shall thoroughly review architectural plans for assembly type and location and shall prepare bid accordingly.

B. Materials and systems shall be designed to meet the requirements of the intended application and shall be installed per manufacturer's guidelines.

C. Submittals: Provide for review Manufacturer's product literature and tested assembly for each type of fire protection material including product characteristics, typical uses, installation procedures, performance and limitation criteria.

PART 3:EXECUTION

3.1 OPERATING INSTRUCTIONS

A. Instruction to the Owner's Personnel - After completion of all work and all tests and at such times as designated by the Architect, provide the necessary skilled personnel to operate the entire installation until receipt of owners acceptance.

B. During the operating period, instruct the Owner's representative in the complete operation, adjustment, and maintenance of the entire installation.

C. Give at least forty-eight (48) hours advance notice to the Owner to coordinate scheduling of this instructional period.

D. Furnish to the Architect five (5) complete bound sets of typewritten or blueprinted instruction manuals for operating and maintaining all systems and equipment included in the contract. All instruction manuals shall be submitted in draft, for approval, prior to final issue. Manufacturer's advertising literature or catalogs will not be acceptable for operating and maintenance instructions.

E. The above-mentioned instructions shall include the maintenance schedule for the principal items of equipment furnished under this contract.

3.2 MANUFACTURER'S RECOMMENDATIONS:

A. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Architect prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.

3.3 TESTING, ADJUSTING, STARTING UP AND COMMISSIONING

A. Testing: All work must be proved satisfactory. The tests herein specified shall be applied in the presence of, and to the satisfaction of, the Architect before the work is covered, concealed or made inaccessible to testing, repair, correction or replacement. Accommodate the testing operation to the progress of the project as a whole. Correct all defects appearing under test and repeat the tests until all parts of the work have been successfully tested. Apply the specific tests herein described. Present all work for acceptance in clean condition, properly adjusted and in good working order; for instance, all machinery must be quiet, well balanced, and must be in place and reading accurately. All systems, equipment, controls, and devices in this work shall be tested in operation and must prove for their purposes in the judgment of the Architect or his authorized representative. All internal surfaces of all lines and equipment shall be blown or flushed clean. Where pressure tests are specified, the apparatus shall be clean before the tests are applied. Contractor shall provide adequate protection of piping and duct systems to prevent vandalism and/or accidental damage, blockage, etc., that will hinder or prevent proper operation of the finished systems.

1. Provide instruments, pumps, gauges, supplies, equipment, materials, and labor for testing and starting up. Dispose of test water and wastes after test, in a manner approved by all applicable codes.
2. Perform tests which may be required by authorities or agencies in addition to those herein specified.
3. Piping for steam, hot water, chilled water, supply and return, drain, escape and relief valve discharge shall be tested with water and made tight under pressure of 150 pounds per square inch gauge maintained for one hour without pumping or as long as required to inspect all joints. Repair all leaks and retest. Piping shall be made tight without caulking. Apply pressure tests to piping only before connection of equipment. In no case shall piping, equipment or accessories be subjected to a pressure exceeding it's rating. Low-pressure elements shall be isolated or removed before tests are conducted.
4. Test valve bonnets for tightness. Test operate all valves at least once from closed-to-open-to-closed positions while valve is under pressure. Test all automatic valves for proper operation at the settings indicated. Test pressure relief valves at least three (3) times.
5. Test piping specialties for proper operation. Test air vent points to ensure that air has been vented.
6. Furnish certified shop test records for all pressure vessels. After installation, test at full operating pressures and temperatures maintained for one hour. Set and test all pressure control, relief and safety devices.
7. Repair or replace all defective work and repeat tests until the particular system and component parts thereof receive the approval of the Architect.
8. The duration of tests shall be as determined by authorities having jurisdiction, but in no case less than the time prescribed in each section of the specifications.
9. Test equipment and systems, which normally operate during seasons of the year during the appropriate season. Perform tests on individual equipment, systems and their controls. Whenever the equipment or system under test is interrelated with and depends upon the operation of other equipment, systems and controls for proper operation, function, and performance; the latter shall be operated simultaneously with the equipment of system being tested.

B. Adjusting, Balancing and Starting Up

1. Flush clean all systems prior to starting up the system. Any damages to the building or system components caused by failure to clean the systems properly shall be corrected to the satisfaction of the Architect or his authorized representative at no additional cost to the Owner.
2. In duct and piping systems, eliminate all noise and vibration and take all measures to secure proper circulation.
3. Run motor-driven equipment continuously for at least two hours in the presence of the Architect. Correct all defects of noise, vibration, alignment and balance. Replace all motors, which overheat or are noisy.
4. Balance systems completely for temperature, volume, and pressure per NEBB performance standards. Contractor shall be responsible for performing the balancing requirements of this section. Contractor shall provide proof of certification by NEBB.
5. Air and water volumetric flow rates shall be within ten (10) percent of those specified. Air and water quantities and pressures shall be tested, balanced and recorded at all terminal devices. Volumetric flows and pressures shall be recorded on suitable forms and submitted for approval.
6. Provide any and all labor and equipment necessary to properly balance the installation including but not limited to dampers, valves, flow stations, test ports, sheaves, belts, etc.
7. All sequences of the system shall be checked and all temperature controls operated and commissioned as required to insure that all systems operate per Engineers intent.

C. Commissioning

1. This Contractor shall provide the deliverables to the engineer/owner.
2. Copies of all records shall be provided to the Engineer by this Contractor including, but not limited to:
   a) Equipment manuals including the name of at least one service agency;
   b) Testing and Balancing reports;
   c) Functional performance testing of the equipment.
3. All commissioning shall be performed as indicated here and elsewhere in the specifications and shall comply with provisions of the applicable Energy Conservation Code.
4. Start-up shall be provided by factory representatives and a full start-up report shall be provided for review and approval for the following equipment:
   a) Pumps

3.4 SEQUENCE OF OPERATIONS

A. The building circulation pump is integrated with the boiler controls feeding the respective building and are enabled when the boilers are enabled.

B. Sequence of Operations: This is a performance-based specification intended to convey the control intent of the various systems. The Contractor shall provide detailed shop drawings including P&ID diagrams, equipment lists and finalized sequences for review by the Engineer prior to installation. Any questions concerning specific details shall be referred to the engineer for clarification.

C. System: It is the intent of this specification that all new systems and equipment be tied into the existing Controls. Contractor shall field coordinate controls, wiring, hardware, software, power as required. Contractor to provide and install all power and control wiring and connect to existing.

D. System: It is the intent of this specification that all existing control sequences be maintained.

E. Equipment and Wiring: This Contractor shall provide all control equipment, and wiring (regardless of voltage) to accomplish the sequence of operations as indicated. This Contractor shall carry funds sufficient to hire the Electrical Contractor required to perform the required work.

F. Functional Performance Testing: The Contractor shall perform complete and thorough Control Functional Performance Test (FPT) and Commissioning of the control systems. Upon completion of the FPT, a report shall be submitted to the engineer for review and comment.

G. Unit Heater Control: (wall and ceiling cabinet type, horizontal and vertical unit type)

1. Provide single temperature room thermostat to open valve and cycle fan motor to maintain constant space temperature.
2. Provide strap-on aquastat on unit return piping, to de-energize fan motor when fluid temperature falls below adjustable setting of aquastat.

END OF SECTION

CERTIFICATION :

WILLIAM T. MAYER III
No. 7860
REGISTERED
PROFESSIONAL ENGINEER
MECHANICAL

THIS DRAWING IS A PART OF AN INTEGRATED SET OF CONSTRUCTION CONTRACT DOCUMENTS. REFER TO ALL DRAWINGS AND SPECIFICATIONS INCLUDING BUT NOT LIMITED TO "GENERAL CONDITIONS" "SUMMARY OF WORK", AND ANY APPLICABLE MANUFACTURERS TECHNICAL SPECIFICATIONS.

REFER TO ALL DRAWINGS FOR COMPLETE SCOPE OF WORK.

THIS DRAWING IS NOT TO BE SCALED OR USED AS AN AS-BUILT.

REV. NO.	DATE	DESCRIPTION
	01.09.24	FOR PERMIT & CONSTRUCTION
	03.19.24	GENERAL REVISIONS
1	04.01.24	PIPE REPLACEMENT UPDATES
2	04.11.24	REVISIONS

ENGINEERING DESIGN SERVICES INCORPORATED
141 Industrial Highway Scituate, RI 02876
Tel (401) 765-7659 Fax (401) 765-2984

PROJECT NAME:

Chad Brown Housing Complex - Hydronic Piping Repairs Providence County - RI

SHEET TITLE:

MECHANICAL - SPECIFICATIONS

JOB NO.: 22245RS
DRAWN BY: TC
CHECKED BY: WTM
DATE ISSUED: 01.09.2024
SCALE: AS NOTED

SHEET NO.:

M301