BOARD OF DIRECTORS MEMO

To: **Sudden Valley Community Association Board of Directors**

From: **Jo Anne Jensen, General Manager**

Date: **February 26, 2026**

Subject: **Contract Award and Capital Request – Clubhouse HVAC**

Purpose
The purpose of this memo is to request approval of SVCA's standard construction contract with Lynden Sheet Metal for the replacement of elements of the Clubhouse HVAC system and the additional capital request needed to address a shortfall in current funding.

Background
On August 28, 2025, the SVCA Board of Directors approved funding in the amount of $147,752 for the replacement of the 20-ton HVAC unit that serves the Clubhouse. A portion of that funding was allocated to make temporary repairs to the current unit to keep it functioning through the winter.

On December 17, 2025, PNW issued a bid package to 5 contractors for the replacement of the HVAC unit:

- Lynden Sheet Metal Inc. – Quote Received
- Barron Heating AC Electrical & Plumbing – Quote Received
- Marrs Heating, AC, Plumbing & Electrical – No Bid
- Future Temp Plumbing & Heating – No Bid
- Andgar – Unresponsive

The bid package (attached) included six amendments to accommodate changes in the original design made necessary by changes in building codes. Specifically, the type of refrigerant used in the original design is no longer allowed.

The funding approved last August included:

- $100,000.00 – HVAC unit replacement estimate from Berona Engineers, Inc. dated August 13th, 2024
- $25,000.00 – Exterior work allowance – trenching, asphalt patching, landscape repairs, etc.
- $11,000.00 – WSST at 8.8%
- $5,400.00 – Construction Management Fee
- $141,400.00 – Total Construction Allowance

After receipt of bids, the updated construction budget is:

- $152,294.98 – per quote from Lynden Sheet Metal. Price includes WSST of 8.8%
- $7,614.75 – 5% construction contingency
- $25,000.00 – Exterior work allowance – We propose to complete this work using SVCA's on-call contractor. The work includes asphalt removal, trenching from the Clubhouse to the exterior unit, and asphalt patching. The HVAC contractor will install the necessary piping as

part of their contract.
- $5,400.00 – Construction Management Fee
- $190,309.73 – Total Construction Budget

Funding
The board allocated a total of $169,928 for this project in 2024 and 2025. To date, $23,803.79 has been spent on the design and permitting phase of the project, leaving $146,124.21 available for this project. Because the cost of the project exceeds the remaining budget, I will ask the board to approve $44,186 in additional funds. This amount will be partially offset by $32,448 budgeted for the renovation of the old administrative offices in the Clubhouse.

Requests
I request that the SVCA Board of Directors authorize $44,186 in additional funding for the replacement of the Clubhouse HVAC unit, capital project 9724.06.

I also request that the SVCA Board of Directors approve the award of this contract to Lynden Sheet Metal and authorize the General Manager to execute SVCA's standard construction contract.

Motions
I move that the SVCA Board of Directors authorize $44,186 in additional funding for the replacement of the Clubhouse HVAC unit, capital project 9724.06.

I also move that the SVCA Board of Directors approve the award of this contract to Lynden Sheet Metal and authorize the General Manager to execute SVCA's standard construction contract.

Approvals
Motion 1
Recommended: _____ Not Recommended _____ Finance Committee

Signed: _____ Date: _____
Jean Maixner, Treasurer

Approved: _____ Not Approved: _____ SVCA Board of Directors

Signed: _____ Date: _____
Keith McLean, Board President

Motion 2
Recommended: _____ Not Recommended _____ Finance Committee

Signed: _____ Date: _____
Jean Maixner, Treasurer

Approved: _____ Not Approved: _____ SVCA Board of Directors

Signed: _____ Date: _____
Keith McLean, Board President

PNW SERVICES, INC.

February 10th, 2026

Sudden Valley Community Association
Attn: Michael Brock
4 Clubhouse Circle
Bellingham, WA 98229

RE: Project Scope Letter
Clubhouse HVAC Replacement

PNW is providing this overall project scope letter to SVCA for the Clubhouse HVAC Replacement project. On December 17th, 2025 PNW issued a bid package to 5 contractors requesting quotes for replacing one of the HVAC units in the Clubhouse basement.

- Lynden Sheet Metal Inc. – Quote Received
- Barron Heating AC Electrical & Plumbing – Quote Received
- Marrs Heating, AC, Plumbing & Electrical – No Bid
- Future Temp Plumbing & Heating – No Bid
- Andgar – Unresponsive

Attached is the bid package and summary of bids received. PNW is recommending SVCA issue a contract to Lynden Sheet Metal for $152,294.98.

On August 28th, 2025 SVCA's Board approved the following construction funding per the Capital Request:

- $100,000.00 – HVAC unit replacement estimate from Berona Engineers, Inc. dated August 13th, 2024. (This estimate was later updated to $141,440 in January 2026 after a redesign was required)
- $25,000.00 – Exterior work allowance – trenching, asphalt patching, landscape repairs, etc.
- $11,000.00 – WSST at 8.8%
- $5,400.00 – Construction Management
- $141,400.00 – Total Construction Allowance

After receipt of bids, the updated construction budget is:

- $152,294.98 - per quote from Lynden Sheet Metal. Price includes WSST.
- $7,614.75 – 5% construction contingency
- $25,000.00 – Exterior work allowance – no change. This work is proposed to be completed by SVCA's On-Call Roads contractor. It includes asphalt removal, trenching from the Clubhouse to the exterior unit, and asphalt patching. The HVAC contractor will install the necessary piping as part of their contract.
- $5,400.00 – Construction Management – no change.

- $190,309.73 - Total Construction Budget

As part of contract award, change order funding in the amount of $48,909.73 is needed for the project to proceed.

PNW
SERVICES, INC.

Please let me know if you have any questions, or if you would like any further information.

Sincerely,

Tyler Andrews
President

PO Box 30498 • Bellingham, WA 98228 • p: 425-954-9614

February 9, 2026 - Bid Tabulation

Project: Clubhouse HVAC Replacement

				Lynden Sheet Metal		Barron Heating & AC		Engineers Estimate	
Item #	**Description**	**Quantity**	**Unit**	**Unit Price**	**Total**	**Unit Price**	**Total**	**Unit Price**	**Total**
1	Mobilization	1	LS	$ 1,500.00	$ 1,500.00	$ 21,228.18	$ 21,228.18		$ -
2	Demolition	1	LS	$ 1,500.00	$ 1,500.00	$ 35,380.31	$ 35,380.31		$ -
3	HVAC - Supply New Unit	1	LS	$ 41,000.00	$ 41,000.00	$ 66,801.73	$ 66,801.73		$ -
4	HVAC - New Unit Installation	1	LS	$ 85,977.00	$ 85,977.00	$ 84,912.74	$ 84,912.74		$ -
5	Electrical	1	LS	$ 5,000.00	$ 5,000.00	$ 5,131.21	$ 5,131.21		$ -
6	Exterior Trenching & Asphalt Patching	1	LS	By SVCA	By SVCA	By SVCA	By SVCA		$ -
7	Minor Changes	1	EST.	$ 5,000.00	$ 5,000.00	$ 5,000.00	$ 5,000.00		$ -
	Subtotal				**$139,977.00**		**$218,454.17**		**$ 130,000.00**
	WSST @ 8.8%				**$ 12,317.98**		**$ 19,223.97**		**$ 11,440.00**
	Total w/ WSST				**$152,294.98**		**$237,678.14**		**$ 141,440.00**

PNW SERVICES, INC.

December 16th, 2025

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Bid Form – Clubhouse HVAC Replacement

Bid submissions are due by 11:00am on Friday, January 9th, 2026. Email bid submissions to tylera@pnwcivil.com.

Firm Name: LSM Heating, Plumbing and Electrical

Bid Schedule – Clubhouse HVAC Replacement					
Item #	Description	Quantity	Unit	Unit Price	Total
1	Mobilization	1	LS	$	$ 1,500.00
2	Demolition	1	LS	$	$ 1,500.00
3	HVAC – Supply New Unit	1	LS	$	$ 41,000.00
4	HVAC – New Unit Installation	1	LS	$	$ 85,977.00
5	Electrical	1	LS	$	$ 5,000.00
6	Exterior Trenching & Asphalt Patching	1	LS	By SVCA	By SVCA
7	Minor Changes	1	EST.	$5,000.00	$5,000.00
	Subtotal				$ 139,977.00
	WSST @ 8.8%				$ 12,317.98
	Total w/ WSST				$ 152,294.98

Acknowledgement of addendums: Noted 1-6

By: Britton Brink
Signature of Authorized Person

Date: 02/10/2026

Print Name & Title: Britton Brink-PM

Please see the attached quote for scope of work and Exclusions.

HEATING - PLUMBING - ELECTRICAL

837 Evergreen Street, Lynden, WA 98264 (360)354-3991, (360) 354-1219 fax
www. lyndensheetmetal.com ~ Contractor's License: CC LSMHEHP754RW

PROPOSAL

PROPOSAL SUBMITTED TO:	PHONE:	DATE:
PNW SERVICES-ATTN: TYLER	360-739-2072	2/9/2026
MAILING ADDRESS:	JOB DESCRIPTION: SUDDEN VALLEY CLUBHOUSE HVAC REPLACEMENT	
CITY:	JOB SITE ADDRESS: 4 CLUBHOUSE CIRC. BELLINGHAM,WA	
Includes addendums 1-6:	EMAIL;	

Job Scope:
-Remove and dispose of the existing indoor air handler and outdoor heatpump and associated piping.
-Supply and install a new Samsung or like in kind Mitsubishi or Daikin 16-ton outdoor heatpump placed on the existing concrete pad and install the 2-new indoor air handlers in the existing locations hung from the ceiling with new spring isolators and seismic bracing.

Includes the following:
-Modify the existing water lines to be able to remove and replace the indoor equipment.
-Reconnect ducting to the new equipment as shown.
-Instal new refrigeration piping from the outdoor unit ran under ground in new 4" PVC conduit and through the existing foundation knockouts to the new indoor air handlers including insualtion and existing lineset PVC jacket.
-Provide new low voltage wiring as needed.
-Provide all required high voltage electrical reconnection to the new outdoor unit and new circuts for the indoor units.
-Run the condensate to the existing drain, does not include modifications to the existing main drain if needed.
-Includes up to 4-hrs of owner training.

Total for the above scope of work----------$134,977.00

SYSTEM PRICE
*Sales Tax will be added to this number

Exclusions:
-Owner to provide all required carpentry, fence removal / replacement at outdoor unit, concrete pad expansion if needed for the revised outdoor unit, trenching and back fill or concrete core drilling if needed.
-Does not include permit fee's, TAB or WSEC equipment commissioning if required by the building official.
-Does not includes any DDC controls as LSM was told these do not existing onsite.
-This quote is based on performing work during normal business hours.
-Does not includes any changes that may be required by the building official.

Bid prices do not include permit fees, any electrical, water lines or carpentry, unless stated otherwise.
Current sales tax will be added all prices.

PAYMENT TERMS: A 50% deposit is required before any equipment is ordered and the balance will be billed in monthly progress payments.

Thank you for the opportunity to quote this project for you. If you have any questions, please don't hesitate to contact me.
If you wish to proceed with the work, please circle chosen options, sign acceptance and return to us along with down payment.

Proposal Submitted by Britton Brink

This proposal may be withdrawn or prices updated if not accepted within 30 days of proposal date.

ACCEPTANCE OF PROPOSAL - The above prices, specifications and conditions are satisfactory and are hereby accepted. I authorized LSM to do the work. Payment will be made as outlined above. If I cancel the work, I realize I may be subject to a restocking fee on any ordered equipment.

Date_____ Signature _____

PNW SERVICES, INC.

December 16th, 2025

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Bid Form – Clubhouse HVAC Replacement

Bid submissions are due by 11:00am on Friday, January 9th, 2026. Email bid submissions to tylera@pnwcivil.com.

Firm Name: Barron Heating and Air Conditioning, Inc.

Bid Schedule – Clubhouse HVAC Replacement					
Item #	Description	Quantity	Unit	Unit Price	Total
1	Mobilization	1	LS	$21,228.18	$21,228.18
2	Demolition	1	LS	$35,380.31	$35,380.31
3	HVAC – Supply New Unit	1	LS	$66,801.73	$66,801.73
4	HVAC – New Unit Installation	1	LS	$84,912.74	$84,912.74
5	Electrical	1	LS	$5,131.21	$5,131.21
6	Exterior Trenching & Asphalt Patching	1	LS	By SVCA	By SVCA
7	Minor Changes	1	EST.	$5,000.00	$5,000.00
	Subtotal				$218,454.17
	WSST @ 8.8%				$19,223.97
	Total w/ WSST				$237,678.14

Acknowledgement of addendums: Received and reviewed addendums #1-#6

By: _____ Date: 2-9-2026
Signature of Authorized Person

Print Name & Title: Jake Mehl, Commercial Sales and Business Development

PNW SERVICES, INC.

February 4th, 2026

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Quote Request – Clubhouse HVAC Replacement

Addendum #6 to the Bid Documents

A. This Addendum shall be considered part of the bid documents for the above-mentioned project, and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence.

B. Addendum #5 was issued with the updated mechanical drawings, but the architectural and structural drawings weren't included. Attached is a combined full set of drawings – no changes to the drawings has occurred since Addendum #5.

C. Contractor is responsible for verifying existing rebar layout prior to drilling anchors in concrete per Drawing S1.0.

D. Dimensions shown on Drawing S1.0 shall be adjusted as necessary to fit new equipment identified in Addendum #5 & 6 mechanical drawings.

Bid Form: No changes

Changes to Submittal Date: No Change, bid date is Monday, February 9th, 2026 at 5:00pm per Addendum #4.

Changes to Drawings:
- Combined set of drawings per attached – 11 pages.

End of Addendum No. 6

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072.

GENERAL NOTES

GENERAL NOTES

1. IN GENERAL, PLAN DIMENSIONS SHOWN ARE TO FACE OF STUD OR FACE OF CONCRETE, UNLESS OTHERWISE NOTED. DO NOT SCALE THESE DRAWINGS. USE CALCULATED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS, DATUM AND LEVELS PRIOR TO CONSTRUCTION. NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
2. PERSONS USING THE INFORMATION IN THESE CONSTRUCTION DOCUMENTS WITHOUT PERMISSION OF THE ARCHITECT DOES SO AT THEIR OWN RISK AND BY SUCH AGREES TO INDEMNIFY THE ARCHITECT AS WELL AS ARCHITECT'S EMPLOYEES AND CONSULTANTS, AND TO HOLD HARMLESS FOR ANY INJURY OR LOSS OF DAMAGE THAT MAY OCCUR.
3. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ARCHITECT HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ARCHITECT.
4. THE CONTRACTOR SHALL HAVE AND MAINTAIN INSURANCE AS APPROVED BY THE BUILDING OWNER AND THE TENANT IF TENANT IS THE CONTRACTORS CLIENT.
5. CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO ENSURE THAT ALL PROPERTY IS PROTECTED DURING THIS CONSTRUCTION. ANY DAMAGE OR CHANGED CONDITIONS SHALL BE REPAIRED AND RESTORED TO A CONDITION EQUAL TO THAT EXISTING AT THE COMMENCEMENT OF THE WORK. CONTRACTOR SHALL RESTORE ANY DAMAGE AT HIS OWN EXPENSE. WHERE EXISTING WORK IS DAMAGES, CUT OR DEFACED DUE TO PERFORMANCE OF NEW WORK, THE CONTRACTOR SHALL PATCH AND REPAIR SAME TO MATCH ADJOINING SURFACES. REPAIRED FINISHES SHALL BE EXTENDED TO THE NEAREST VISUAL BREAK LINES SUCH AS CORNER, CEILING LINES, TOP OF BASE OR SIMILAR.
6. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO INITIATING THE WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
7. WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
8. ALL WORK SHALL COMPLY WITH THE 2009 IBC, IFC, IPC, IMC AS AMENDED BY WASH. STATE. PROJECT SHALL ALSO COMPLY W/ JURISDICTIONAL CODE AMENDMENTS BY THE LOCAL AGENCY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING NECESSARY PERMITS & INSPECTIONS TO COMPLETE THE WORK. CONTRACTOR TO HAVE CURRENT VALID CITY OR COUNTY BUSINESS LICENSE PRIOR TO ISSUANCE OF PERMIT. WHEN REQUIRED BY LAW.
9. ERRORS, OMISSIONS AND DISCREPANCIES, IF ANY, SHALL BE REFERRED TO THE ARCHITECT IMMEDIATELY FOR DIRECTION OF HOW TO PROCEED.
10. VERIFY ALL ROUGH-IN DIMENSIONS FOR EQUIPMENT PROVIDED IN THE CONTRACT BY OTHERS PROVIDE ALL BLOCK-OUTS, BLOCKING, BACKING AND JACKS REQUIRED FOR DUCTS, PIPES, CONDUITS, EQUIPMENT, FIXTURES AND CABINETS. VERIFY SIZE AND LOCATION.
11. DO NOT SIGNIFICANTLY VARY OR MODIFY THE WORK SHOWN, EXCEPT UPON WRITTEN INSTRUCTIONS OF THE ARCHITECT.
12. VERIFY LOCATION OF ALL EXISTING UTILITIES INCLUDING BUT NOT LIMITED TO SEWER, SEPTIC, WATER, GAS, POWER AND TELEPHONE. CAP. MARK AND PROTECT.
13. DETAILS ARE INTENDED TO SHOW THE INTENT OF THE DESIGN, MINOR MODIFICATION MAY BE REQUIRED TO SUIT THE FIELD DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK OF THE CONTRACT.
14. PROVIDE CLOSURE, MEETING THE REQUIREMENTS OF ALL GOVERNING AUTHORITIES, AT RATED PARTITIONS, FLOORS, CEILINGS, AND ROOF LOCATIONS. ALL REQUIRED FIRE-RATED PARTITIONS SHALL BE CONTINUOUS FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.
15. NO BUILDING OR PORTION OF A BUILDING SHALL BE OCCUPIED OR USED FOR STORAGE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
16. THE CONTRACTOR SHALL CONSULT PLANS OF ALL TRADES, INCLUDING DESIGN-BUILD DOCUMENTS REQUIRED BY CONTRACT DOCUMENTS, TO VERIFY SIZE, WEIGHT, POWER, LOCATION AND OTHER REQUIREMENTS AND LOCATION OF THOSE ITEMS TO BE INSTALLED PRIOR TO COMMENCEMENT OF WORK.
17. ELECTRICAL, MECHANICAL AND PLUMBING: GENERAL CONTRACTOR TO PROVIDE ALL REQUIRED ENGINEERING, CALCULATIONS, FORMS, APPLY, PAY FOR & OBTAIN ALL REQUIRED PERMITS.
18. GENERAL CONTRACTOR SHALL BRING TO THE OWNER'S ATTENTION ANY DISCREPANCIES WITHIN THE CONTRACT DOCUMENTS, ACTUAL FIELD CONDITIONS AND ANY DESIGN AND LAYOUT CHANGES REQUIRED DUE TO ANY SPECIFIC EQUIPMENT SELECTIONS OR ANY OTHER REASON PRIOR TO PURCHASING EQUIPMENT AND MATERIAL.
19. PROVIDE BARRIER FREE SIGNAGE AT RESTROOMS.
20. MOUNT ALL SINKS AT 34" AFF, UNO. COUNTERS 34" AFF WHEN SINK COUNTER MOUNTED.
21. EXTERIOR BUILDING SIGNAGE IS NIC. CONTRACTOR TO PROVIDE POWER TO SIGN LOCATIONS.
22. THE ARCHITECT HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND/OR CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK. THE UNDERTAKING OF PERIODIC SITE VISITS BY THE ARCHITECT SHALL NOT BE CONSTRUED AS SUPERVISION OF ACTUAL CONSTRUCTION NOR MAKE HIM RESPONSIBLE FOR THE PERFORMANCE OF WORK BY THE CONTRACTOR OR CONTRACTOR'S EMPLOYEES, OR EMPLOYEES OF SUPPLIERS OR SUBCONTRACTORS, OR FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.
23. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.
24. THESE DRAWINGS ARE THE EXCLUSIVE PROPERTY OF THE ARCHITECT AND MAY BE REPRODUCED ONLY WITH THE WRITTEN PERMISSION OF THE ARCHITECT. AUTHORIZED REPRODUCTIONS MUST BEAR THE NAME OF THE ARCHITECT.
25. PROVIDE FIRE BLOCKING, DRAFT STOPS AND FIRE STOPS IN ATTICS, FLOORS AND WALL CAVITIES AS REQUIRED PER THE IBC.
26. CONTRACTOR SHALL RETAIN ONE SET OF THE PLANS TO NOTE AND DOCUMENT ALL CHANGES DURING CONSTRUCTION. THE SET SHALL BE A PART OF THE CONTRACTOR'S CLOSE-OUT PACKAGE TO THE OWNER. CLOSE- OUT PACKAGE SHALL INCLUDE (3) SET OF SHOP DRAWINGS, PRODUCT LITERATURE, EQUIPMENT WARRANTEE MANUALS.
27. CONTRACTOR SHALL PROVIDE SOLID BLOCKING, UNLESS NOTED OTHERWISE AS REQUIRED FOR NAILING OF ALL INTERIOR AND EXTERIOR TRIMS, FINISHES AND FIXTURES. THE CONTRACTOR SHALL PROVIDE FOR ALL THE NECESSARY FRAMING AND BRACING FOR THE INSTALLATION OF OWNER FURNISHED ITEMS.
28. CONTRACTOR SHALL ONLY PROCEED WITH WORK WHERE HAZARDOUS MATERIALS ARE PRESENT AFTER RECEIPT OF THE BUILDING OWNERS HAZARDOUS MATERIALS GOOD FAITH REPORT REQUIRED BY THE STATE. PRIOR TO ANY DEMOLITION VERIFY & PERFORM ADDITIONAL HAZARDOUS MATERIAL TESTING AS REQUIRED. LEGALLY REMOVE HAZARDOUS MATERIALS. PROVIDE LEGAL DOCUMENTATION. CONTRACTOR SHALL COMPLY WITH FEDERAL AND STATE RULES AND REGULATIONS WHEN HANDLING, REMOVING OR ENCAPSULATING HAZARDOUS MATERIALS ON THE PROJECT.
29. LEGALLY REMOVE & DISPOSE OF THE DEMOLITION AND CONSTRUCTION DEBRIS.
30. DIMENSIONS TO STUD FACE UNLESS NOTED AS "CLEAR" OR "CLR" WHICH MEANS TO FACE OF WALL FINISH.

SYMBOLS

- XXX — DETAIL REFERENCE
- X / XXX — BLDG SECTION
- X / XXX — WALL SECTION
- A / D XXX B / C — INTERIOR ELEVATION
- XXX / Y — DOOR NUMBER
- XXX — ROOM NUMBER
- ELEVATION DATUM
- X — COLUMN GRID
- X — WALL TYPE
- POWER POLE
- CATCH BASIN
- D — STORM DRAIN MANHOLE
- S — SANITARY SEWER MANHOLE
- FIRE HYDRANT

ARCHITECTURAL ABBREVIATIONS

A.H.U.	AIR HANDLING UNIT
ALT.	ALTERNATE
A.V.	AUDIO / VISUAL
BLDG.	BUILDING
DIA.	DIAMETER
D.S.	DOWNSPOUT
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EXT.	EXTERIOR
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.F.	FINISH FLOOR
GA.	GAUGE
G.L.B.	GLUE LAMINATED BEAM
G.W.B.	GYPSUM WALLBOARD
HR.	HOUR
INSUL.	INSULATION
INT.	INTERIOR
MECH.	MECHANICAL
MISC.	MISCELLANEOUS
N.I.C.	NOT IN CONTRACT
O.C.	ON CENTER
OPP.	OPPOSITE
P.T.	PRESSURE TREATED
REF.	REFERENCE
RM.	ROOM
S.D.	SMOKE DETECTOR
SHT.	SHEET
SIM.	SIMILIAR
SS.	STAINLESS STEEL
ST.	STREET
STRUCT.	STRUCTURAL
T.O.C.	TOP OF CONCRETE
TS.	TUBE STEEL
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
W/	WITH
@	AT
&	AND

BUILDING OWNER

SUDDEN VALLEY COMMUNITY ASSOCIATION
4 CLUBHOUSE CIRCLE
BELLINGHAM, WA
CONTACT:

CONSULTANTS

ARCHITECT:
SARAH BROWN ARCHITECTURE + DESIGN
PROJECT ARCHITECT: SARAH BROWN
PH: (360) 920.5498
EMAIL: SARAH@SBARCHDESIGN.COM

STRUCTURAL ENGINEERING:
KINGWORKS
CONTACT: QUINN HANKS
PH: (360) 202.5211
EMAIL: QUINN@KING-WORKS.COM

MECHANICAL ENGINEERING:
BERONA ENGINEERS
CONTACT: ROB RUSSELL
PH: (425) 744.6033 EXT 102
EMAIL: ROB@BERONAENGINEERS.COM

CONTRACTOR

PNW CIVIL INC.
PO BOX 30498
BELLINGHAM, WA 98228
CONTACT: TYLER ANDREWS
PH: (360) 739-2072

BUILDING CODE REQUIREMENTS

2021 INTERNATIONAL BUILDING CODE, IEBC PRESCRIPTIVE COMPLIANCE METHOD & WA STATE AMENDMENTS.

PROJECT DESCRIPTION

PROJECT DESCRIPTION:	THIS PROJECT CONSISTS OF AN AHU REPLACEMENT IN EXISTING MECHANICAL ROOM
CONSTRUCTION TYPE:	V-B
OCCUPANCY:	GROUP : B-BUSINESS
AREA:	MAIN FLOOR: 8,101 SQ FT WO BASEMENT: 7,164 SQ FT
RESTROOMS:	NO WORK
FIRE SPRINKLERS:	SPRINKLED
FIRE ALARM:	PROVIDE & LOCATE FIRE ALARM NOTIFICATION APPLIANCE(S) STATION(S) AND SENSOR(S) AS REQUIRED BY FIRE DEPARTMENT

PROJECT NOTES

DEMOLITION NOTES:

1. LEGALLY REMOVE DEMOLITION DEBRIS FROM SITE.
2. PROTECT ALL STRUCTURAL MEMBERS AND COLUMNS.
3. DEMOLITION DEBRIS SHALL NOT BE ALLOWED TO DAMAGE OR OVERLOAD THE EXISTING STRUCTURE.

1 VICINITY MAP
SCALE: NTS

N

PROJECT ADDRESS

4 CLUBHOUSE CIRCLE
BELLINGHAM, WA 98229

LAND USE INFORMATION

PARCEL No.: 0301731; 3704082055100000

ABBREV. LEGAL DESCRIPTION:
BUSINESS PERSONAL PROPERTY ASSETS - SUDDEN VALLEY COMM ASSOC/ G&CC

THAT PTN OF TRACTS A-B LY WITHIN SEC 8 DAF-BEG AT SE COR OF LOT 13 SUDDEN VALLEY DIV 32-TH ALG ELY PLAT BNDRY ON FOL COURSES N 09 DEG 35'56" W 781.11 FT-TH N 15 DEG 53'34" E 170.39 FT-TH N 01 DEG 46'44" W 161.08 FT-TH N 15 DEG 56' 43" E 305.77 FT-TH N 20

PROPERTY CHARACTERISTICS

LAND USE:	72
TAX DIST:	1015 - 501 R L FSW LWWS
LEGAL ACRES:	73 ACRES

DRAWING INDEX

Sarah Brown ARCHITECTURE + DESIGN
3222 EAGLERIDGE WAY, BELLINGHAM, WA 98226
C) 360.920.5498
E) SARAH@SBARCHDESIGN.COM

11122 REGISTERED ARCHITECT
Sarah Brown
SARAH J A BROWN
STATE OF WASHINGTON

CLUBHOUSE MECH. TI

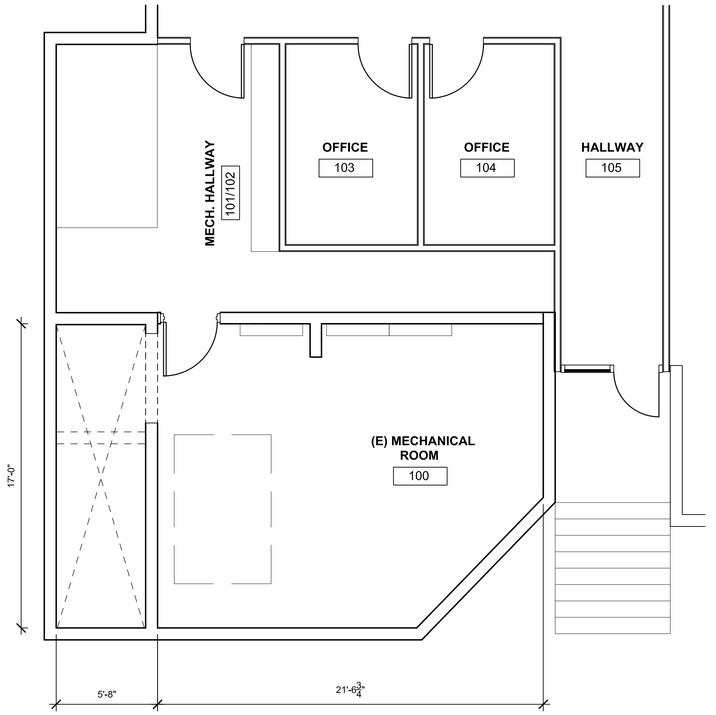
SUDDEN VALLEY COMMUNITY ASSOC.
4 CLUBHOUSE CIRCLE
BELLINGHAM, WA

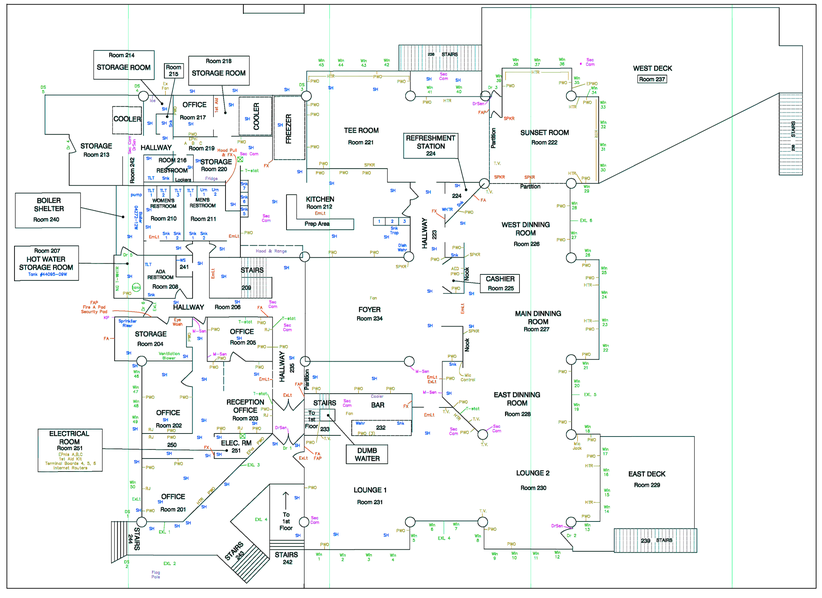
JOB NO: 202404.11
DATE: 08.14.2025

REV	ISSUED FOR	DATE

PROJECT INFO

A1.01





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11122 REGISTERED ARCHITECT
SARAH J A BROWN
STATE OF WASHINGTON

CLUBHOUSE MECH. TI

SUDDEN VALLEY COMMUNITY ASSOC.
4 CLUBHOUSE CIRCLE
BELLINGHAM, WA

JOB NO: 202404.11
DATE: 08.14.2025

REV	ISSUED FOR	DATE

BUILDING & ENLARGED PLAN

A2.01

KINGWORKS STRUCTURAL ENGINEERS
600 Dupont St, Suite B
Bellingham, WA 98225
360.714.8260
www.king-works.com

AIR HANDLER INFO

AIR HANDLER UNIT (AHU-) SCHEDULE																		
TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL						NOTES
			EVAPORATOR	TOTAL COOL (BTUH)	SENS COOL (BTUH)	DESIGN FLOW (CFM)	O.A. FLOW (CFM)	ESP (IN WG)	VELOCITY (RPM)	HP	FEI	VOLTAGE	PHASE	FLA	BREAKER	WEIGHT (LBS)	DIMENSIONS (H"xW"xD")	
AHU-2	LOWER FLOOR	DAIKIN	CAH008GDBC	193,252	147,436	4,000	-	1.25	1,993	5.0	0.91	460	3	6.2	20	1078	34"x64"x58"	1-8

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. RFIELD ROUTE TO APPROVED DRAIN.
3. WITH R-410A REFRIGERANT.
4. TEMPERED OUTSIDE AIR PROVIDED BY 100% O.A. RTU-2.
5. PROVIDE W/ MERV-8 FILTER
6. CONNECT TO EXIST BUILDING CONTROL SYSTEM.
7. COOLING PROVIDED BY DX COIL FROM CU-2.
8. HEATING PROVIDED BY SEPARATE EXISTING DUCT MOUNTED HOT WATER HEATING COIL.

CLIP INFO

Crosby
WIRE ROPE CLIPS

G-450 U-BOLT CLIP

NEVER SADDLE A DEAD HORSE.

NEVER USE MALLEABLE CLIPS FOR ANY CRITICAL APPLICATION

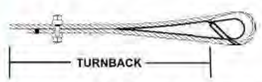
FOR ELEVATOR, PERSONNEL HOIST, AND SCAFFOLD APPLICATIONS, ANSI A17.1 AND A10.4 DO NOT RECOMMEND U-BOLT CLIPS. CROSBY RECOMMENDS FIST GRIP CLIPS FOR TIE OFF LINES FOR FALL PROTECTION.

G-429 FIST GRIP CLIP

16

SIZE (IN.)	NUMBER OF CLIPS	TURNBACK LENGTH (IN.)	TORQUE FT-LBS.	SIZE (IN.)	NUMBER OF CLIPS	TURNBACK LENGTH (IN.)	TORQUE FT-LBS.
1/8	2	3-1/4	4.5	3/16	2	4	30
3/16	2	3-3/4	7.5	1/4	2	4	30
1/4	2	4-3/4	15	5/16	2	5	30
5/16	2	5-1/4	30	3/8	2	5-1/4	45
3/8	2	6-1/2	45	7/16	2	6-1/2	65
7/16	2	7	65	1/2	3	11	65
1/2	3	11-1/2	65	9/16	3	12-3/4	130
9/16	3	12	95	5/8	3	13-1/2	130
5/8	3	12	95	3/4	3	16	225
3/4	4	18	130	1	5	37	225
1	5	26	225				

SOME STANDARDS MAY REQUIRE A MINIMUM OF 3 WIRE ROPE CLIPS, THE NUMBER OF CLIPS IS BASED UPON USING RRL OR RLL WIRE ROPE. 6 X 19 OR 6 X 36 CLASS, FC OR IWRC; IPS OR XIP, XXIP, ALSO APPLIES TO ROTATION - RESISTANT RRL WIRE ROPE. 8 X 19 CLASS, IPS, XIP, XXIP SIZES 1-3/4 INCH AND SMALLER. IF A PULLEY (SHEAVE) IS USED FOR TURNING BACK THE WIRE ROPE, ADD ONE ADDITIONAL CLIP. CLIPS ARE 80% EFFICIENT UNDER 1' AND 90% 1" AND ABOVE.



1 APPLY FIRST CLIP ONE BASE WIDTH FROM DEAD END

2 APPLY SECOND CLIP AS NEAR THIMBLE AS POSSIBE

3 APPLY ALL ADDITIONAL CLIPS EVENLY BETWEEN THE FIRST TWO

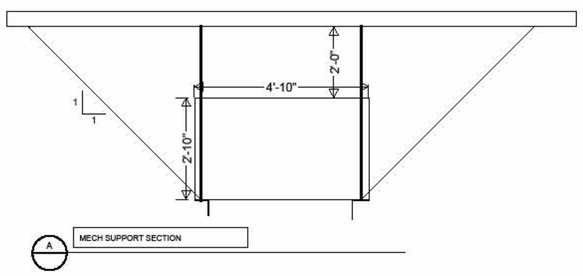
STRUCTURAL NOTES

DESIGN CRITERIA
Unit weight : 1078 lbs
Seismic design acceleration: Sds = 0.85
Seismic horizontal force (Fph): 397 lb
Seismic vertical force (Fpv): 183 lb
Overstrength factor for anchorage to concrete: 2.0

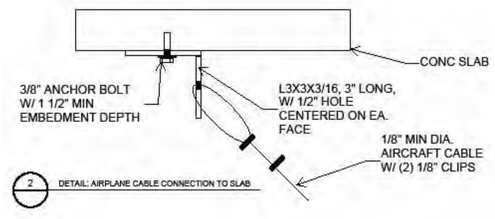
MATERIALS
- Pre-approved Epoxy for post-installed threaded rod or reinforcing in concrete base material: Simpson SET-3G.
- Anchor type shall be according to the drawings. All post-installed anchors installed in concrete shall have ICC-ES reports demonstrating IBC compliance for use in cracked concrete and for seismic loading. Substitutions not permitted without written permission by KW.

INSTALLATION: Post-installed anchor hole diameter, drilling depth, cleaning and installation procedure shall be in accordance with the current Manufacturer's Printed Installation Instructions (MPII) provided in the ICC/ES report. Holes shall be drilled with rotohammer equipment. Core-drilled holes are not permitted unless specifically noted otherwise.

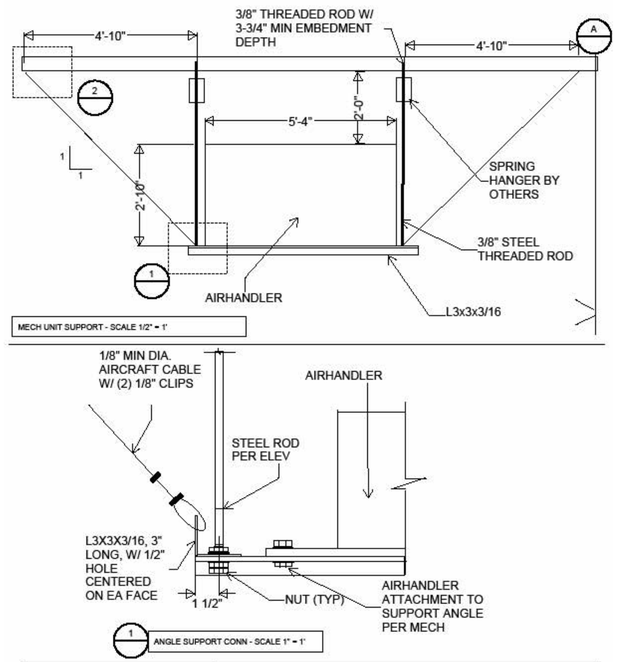
REINFORCEMENT LOCATIONS: All post-installed anchors shall be located to avoid drilling into reinforcement, unless specifically approved by the Engineer. Reinforcement shall be placed with consideration for locations of post-installed anchors. Do not damage reinforcing during drilling operations.



3 MECHANICAL SUPPORT SECTION
1/4" = 1'-0"



2 AIRPLANE CABLE CONNECTION
1/4" = 1'-0"



1 MECH UNIT SUPPORT
1/4" = 1'-0"

REV	Description	Date
	Revision Schedule	

NORTH. PLAN.

SCALE.
As indicated

PNW SV CLUBHOUSE
MECHANICAL

4 CLUBHOUSE CIRCLE
BELLINGHAM, WA 98229

Client Name

MECHANICAL UNIT SUPPORT

PROJECT#. 24153
DRAWN. JAndreasen CHECK. QHanks
ISSUED. 10/4/2024

S1.0

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GENERAL

NORTH ARROW

SECTION CALLOUT

DETAIL CALLOUT

POINT OF CONNECTION

REVISION NOTE

FLAG NOTE (CONSTRUCTION)

EF-3 — EQUIPMENT IDENTIFIER

LIGHT LINE WEIGHT INDICATES EXISTING WORK

BOLD LINE WEIGHT INDICATES NEW WORK

LIGHT DASHED LINES INDICATE WORK TO BE ABANDONED OR REMOVED

SLASHED LINES INDICATE EXISTING WORK TO BE DEMOLISHED

HVAC

CUBIC FEET PER MINUTE

CENTER LINE

ROUND DUCT INDICATOR

THERMOSTAT LINE

RISE — DIRECTION OF RISE FOR DUCT

24x12 — DUCT (FIRST FIGURE DENOTES VIEW SHOWN)

24x12 / 10x8 — SINGLE LINE DUCTWORK INDICATES DUCT WITH VIEW DIMENSION LESS THAN 12 INCHES

SUPPLY OR EXHAUST TAKEOFF

SUPPLY DUCT TURNING TOWARD, UP

SUPPLY DUCT TURNING AWAY

EXHAUST DUCT TURNING TOWARD, UP

EXHAUST DUCT TURNING AWAY

ROUND DUCT TURNING TOWARD, UP

ROUND DUCT TURNING AWAY

CONICAL WYE

CONICAL TEE

VOLUME DAMPER(VD)

FIRE SMOKE DAMPER(FSD)

MOTORIZED DAMPER(FD)

FIRE DAMPER(FD)

3-WAY SUPPLY DIFFUSER

2-WAY SUPPLY DIFFUSER

2-WAY CORNER SUPPLY DIFFUSER

1-WAY SUPPLY DIFFUSER

DOUBLE LINE, LINED DUCT/ ACOUSTIC DUCT

SINGLE LINE, LINED DUCT/ ACOUSTIC DUCT

TV — RECTANGULAR 90° ELBOW W/ TURNING VANES TYPICAL

30X20 / 18"ø — RECTANGLE TO ROUND FITTING

SOUND ATTENUATOR

ACCESS DOORS

FLEXIBLE DUCT

TS — THERMOSTAT OR TEMPERATURE SENSOR

T — THERMOSTAT OR TEMPERATURE SENSOR(CEILING)

DSD — DUCT SMOKE DETECTOR

DPT — DIFFERENTIAL PRESSURE TRANSDUCER

ROUND SUPPLY AIR DIFFUSER

ROUND SUPPLY AIR DIFFUSER WITH PORTION BLANKED OFF

HVAC (CONT.)

LINEAR SUPPLY AIR DIFFUSER

SQUARE SUPPLY AIR DIFFUSER

SQUARE RETURN AIR GRILLE

SQUARE EXHAUST AIR GRILLE

SIDEWALL SUPPLY AIR GRILLE OR REGISTER

SIDEWALL RETURN/EXHAUST AIR GRILLE OR REGISTER

AIR FLOW DIRECTION THRU DOOR GRILLE OR UNDERCUT

ABBREVIATIONS

AC	AIR CONDITIONING
ACF	AIR CURTAIN FAN
ADA	AMERICAN DISABILITIES ACT
AD	AREA DRAIN
ADJ	ADJACENT, ADJUST, ADJUSTABLE, ADJUSTMENT
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINED
ALIGN	ALIGNMENT
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AVG	AVERAGE
BFF	BELOW FINISH FLOOR
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BPD	BACKFLOW PREVENTION DEVICE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BV	BALANCING VALVE
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CI	CAST IRON
CLG	CEILING
CO	CLEANOUT
CONN	CONNECT, CONNECTED, CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS, CONTINUATION
COORD	COORDINATE
CORR	CORRIDOR
COTG	CLEANOUT TO GRADE
CU FT	CUBIC FEET
CU IN	CUBIC INCHES
CW	COLD WATER
DB	DRY BULB TEMPERATURE
DCV	DEMAND CONTROL VENTILATION
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DEG	DEGREE
DET	DETAIL
DFU	DRAINAGE FIXTURE UNIT
DIA	DIAMETER
DIFF	DIFFERENTIAL, DIFFERENT, DIFFUSER
DIM	DIMENSION
DISCH	DISCHARGE
DN	DOWN
DOM	DOMESTIC
DR	DRAIN
DS	DOWNSPOUT
DSD	DUCT SMOKE DETECTOR
DWG	DRAWING
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
ELECT	ELECTRICAL
ELEV	ELEVATION
EMERG	EMERGENCY
ENT	ENTERING
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
F	FAHRENHEIT
FC	FANCOIL
FCO	FLOOR CLEANOUT
FD	FIRE DAMPER, FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FIO	FURNISHED AND INSTALLED BY OWNER
FLA	FULL LOAD AMP
FLEX	FLEXIBLE
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOIC	FURNISHED BY OWNER INSTALLED BY CONTRACTOR
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
FT	FOOT, FEET
FU	FIXTURE UNITS
G	GAS
GA	GAGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL
GND	GROUND
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GW	GREASE WASTE
H	HEIGHT, HIGH
HB	HOSE BIBB
HP	HORSEPOWER
HR	HOUR
HTG	HEATING
HVAC	HEATING VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HWC	HOT WATER CIRCULATING
HWR	HOT WATER HEATING RETURN
HWS	HOT WATER HEATING SUPPLY
HZ	HERTZ

ABBREVIATIONS (CONT.)

IBC	INTERNATIONAL BUILDING CODE
ID	INDIRECT DRAIN
IE	INVERT ELEVATION
IMC	INTERNATIONAL MECHANICAL CODE
IN	INCH
INSUL	INSULATE, INSULATION
IW	INDIRECT WASTE
KW	KILOWATT
KWH	KILOWATT HOUR
L	LENGTH
LAV	LAVATORY
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAL FOOT
LVG	LEAVING
MA	MIXED AIR
MAX	MAXIMUM
MBH, MBTU	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
MTG	MOUNTING
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OAC	OUTDOOR AIR CONDITIONER
OAT	OUTSIDE AIR TEMPERATURE
OD	OUTSIDE DIAMETER, OVERALL DIAMETER
OH	OVERHEAD
ORD	OVERFLOW ROOF DRAIN
OSA	OUTSIDE AIR
P	PUMP
PD	PRESSURE DROP, PIT DRAIN
PH	PHASE
POC	POINT OF CONNECTION
PRELIM	PRELIMINARY
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAGE
RA	RETURN AIR
RD	ROOF DRAIN
RECIRC	RECIRCULATING
RECT	RECTANGULAR
REF	REFERENCE
REG	REGULATOR
REQD	REQUIRED
RND	ROUND
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
SAN	SANITARY
SCHED	SCHEDULE
SD	SUPPLY DIFFUSER
SF	SUPPLY FAN, SQUARE FEET
SG	SUPPLY GRILLE
SO	SCREENED OPENING
SOV	SHUT OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SPECD	SPECIFIED
SST	STAINLESS STEEL
SS	SOIL STACK, SANITARY SEWER
STRUCT	STRUCTURAL
SWG	SUPPLY WALL GRILLE
SWR	SUPPLY WALL REGISTER
TBD	TO BE DETERMINED
TEMP	TEMPERATURE, TEMPORARY
TSTAT	THERMOSTAT
THRU	THROUGH
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TP	TRAP PRIMER
TS	TEMPERATURE SENSOR
TV	TURNING VANE
TW	TEMPERED WATER
TWR	TEMPERED WATER RECIRCULATE
TYP	TYPICAL
UPC	UNIFORM PLUMBING CODE
UTR	UP THRU ROOF
V	VENT
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VOL	VOLUME
VS	VENT STACK
VTR	VENT TO ROOF
W	WASTE
WCO	WALL CLEAN OUT
WB	WET BULB TEMPERATURE
WEF	WALL EXHAUST FAN
WG	WATER GAGE
WHA	WATER HAMMER ARRESTOR
W/	WITH
W/O	WITHOUT
WS	WASTE STACK
WT	WEIGHT
WSFU	WATER SUPPLY FIXTURE UNIT

DRAWING LIST

GENERAL NOTES:

1. COMPLETE INSTALLATION OF THE MECHANICAL SYSTEM SHALL BE PER THE LATEST ADOPTED VERSION OF INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), WASHINGTON STATE ENERGY CODE (WSEC), UNIFORM PLUMBING CODE (UPC), INTERNATIONAL FUEL GAS CODE (IFGC), INTERNATIONAL FIRE CODE (IFC), NFPA AND HEALTH CODES AND REGULATIONS AS ADOPTED BY THE LOCAL JURISDICTIONS.
2. CONTRACTOR SHALL COORDINATE DIFFUSER, GRILLE AND REGISTER LOCATIONS AND DUCT ROUTING CLEARANCES WITH THE STRUCTURAL, REFLECTED CEILING AND LIGHTING PLANS.
3. MAKE ACCEPTABLE ACCESS PROVISIONS FOR REMOVAL OF FILTER AND MAINTENANCE FOR ALL INDOOR UNITS. REFER TO MANUFACTURER'S INSTALLATION GUIDE.
4. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE.
5. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR.
6. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE DOCUMENTS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
7. ALL GAS EQUIPMENT SHALL BE INSTALLED PER THEIR LISTINGS, IMC, UPC, IFGC AND LOCAL CODES.
8. ALL ROOF PENETRATIONS SHALL BE MINIMUM OF 5 FEET AWAY FROM THE AREA/OCCUPATION SEPARATION WALLS. ALL PIPE, DUCT AND CONDUIT PENETRATIONS THROUGH RATED ASSEMBLIES SHALL BE FIRE AND SMOKE STOPPED PER CODE.
9. ALL EQUIPMENT, DAMPERS, PIPING, AND ACCESSORIES IN CONCEALED SPACES REQUIRING ACCESS SHALL HAVE ACCESS DOORS. ALL ACCESS DOORS IN FIRE RATED STRUCTURE SHALL BE FIRE RATED. COORDINATE LOCATIONS WITH ARCHITECT. CONTRACTOR TO PROVIDE ACCESS DOORS.
10. ALL EQUIPMENT SHALL BE FREE FROM DEFECTS IN MATERIAL, WORKMANSHIP, AND SHALL BE OF THE KIND AND QUALITY DESCRIBED HEREIN.
11. COORDINATE WITH THE STRUCTURAL ENGINEER AND GENERAL CONTRACTOR TO PROVIDE STRUCTURAL SUPPORT AND SEISMIC RESTRAINTS FOR ALL EQUIPMENT.
12. ALL EQUIPMENT SHALL BE APPROVED FOR INSTALLATION IN THE STATE OF WASHINGTON AND SHALL HAVE ALL CERTIFICATIONS AND RATINGS REQUIRED TO MEET ALL ENERGY, POLLUTION, ENVIRONMENTAL, SEISMIC, ETC. CODES AND REGULATIONS.
13. VERIFY ALL THE MECHANICAL EQUIPMENT'S ELECTRICAL LOADS VOLTAGE/PHASE, ETC. WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING.
14. WHERE MULTIPLE RISERS OR HORIZONTAL LOOPS ARE USED, BALANCING VALVES IN THE RETURN LINES ARE REQUIRED. A CHECK VALVE SHALL BE PROVIDED IN EACH RETURN TO PREVENT TEMPORARY REVERSAL OF FLOW.
15. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY IMC, UPC, IBC, WASHINGTON STATE ENERGY CODE AND ALL APPLICABLE LOCAL AMENDMENTS.
16. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
17. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, ELECTRICAL WORK, ETC., SHOWN ON CONTRACT DOCUMENT DRAWINGS.
18. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
19. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE NEBB STANDARDS. AABC ACCEPTABLE PENDING AGENCY APPROVAL.
20. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
21. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
22. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
23. AIR AND FLUID FLOW RATES SHALL BE TESTED AND BALANCED WITHIN THE TOLERANCES DEFINED IN SPECIFICATIONS OR SHOWN ON PLANS. SYSTEMS SHALL BE BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, THEN ADJUSTED TO MEET DESIGN FLOW CONDITIONS.
24. RECORD DRAWINGS SHALL BE PROVIDED TO THE OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE AS REQUIRED BY SECTION C103.6 OF THE WSEC. THE DRAWINGS SHALL INDICATE THE LOCATION AND PERFORMANCE DATA OF EQUIPMENT, GENERAL CONFIGURATION OF DUCTWORK AND PIPING DISTRIBUTION SYSTEMS, INCLUDING FLOW RATES AS A MINIMUM, THAT HAVE BEEN DEVIATED FROM THESE DOCUMENTS. A COMPLETE RECORD OF CHANGES SHALL BE KEPT TO DATE ON A DAILY BASIS AND MADE ACCESSIBLE TO OWNER AND ENGINEER.

GENERAL HVAC NOTE:

1. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
2. LOCATE ALL TEMPERATURE, DEVICES IN DUCTWORK LOCATIONS WITH STRAIGHT SECTION OF DUCT UP AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
3. COORDINATE AND PROVIDE ALL DUCT TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT DIMENSIONS BEFORE FABRICATION.
4. ALL EQUIPMENT, DUCTWORK, ETC., SHALL BE SUPPORTED AS REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION, AND SEISMICALLY BRACED AS REQUIRED. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
5. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC. ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.
6. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'-0" (CENTERLINE) ABOVE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE ABOVE LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
7. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
8. PROVIDE ALL 90 DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.
9. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE (WITHIN TRUSSES), WITH SPACE FOR INSULATION IF REQUIRED.
10. MAXIMUM LENGTH OF FLEXIBLE DUCTS LOCATED ABOVE HARD CEILINGS SHALL BE AS CODE PERMITS BUT NO LONGER THAN 4 FEET.
11. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS ,INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

2021 WASHINGTON STATE ENERGY CODE (WSEC) NOTES

1. HVAC EQUIPMENT SHALL HAVE MINIMUM PERFORMANCE AT SPECIFIED RATING CONDITIONS NOT LESS THAN THE VALUES INDICATED IN TABLE C403.3.2(1) THRU C403.3.2(12) OF THE WSEC AND AS INDICATED ON THE CONTRACT DOCUMENTS.
2. PROVIDE DEADBAND BETWEEN HEATING/COOLING SPACE SENSOR SETPOINTS OF 5 DEGREES AS REQUIRED BY SECTION C403.4.1.2 OF THE WSEC OR AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
3. HVAC SYSTEMS SHALL BE EQUIPPED WITH AUTOMATIC CONTROLS CAPABLE OF ACCOMPLISHING SETBACK OR SHUTDOWN DURING UNOCCUPIED PERIODS AS REQUIRED BY SECTION C403.4.2 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
4. PROVIDE BALANCING DEVICES IN ALL BRANCH DUCTS AS REQUIRED BY SECTION C408.2.2 AND C408.2.2.1 OF THE WSEC AND AS INDICATED ON THE CONTRACT DOCUMENTS.
5. ALL DUCTWORK SHALL COMPLY WITH SMACNA STANDARDS FOR CONSTRUCTION OF GALVANIZED DUCTWORK. ALL DUCTWORK SHALL BE SEALED AS REQUIRED BY SECTION C403.10.1 "DUCT AND PLENUM INSULATION AND SEALING" OF THE WSEC. DUCT TAPE NOT ALLOWED.
6. ALL DUCTWORK SHALL BE INSULATED AS REQUIRED BY SECTION C403.10.1 "DUCT AND PLENUM INSULATION AND SEALING" OF THE WSEC.
7. ALL PIPING SHALL BE INSULATED AS REQUIRED BY SECTION C403.10.3 OF THE WSEC.
8. HEATING AND COOLING EQUIPMENT FANS SHALL BE SHUT OFF DURING UNOCCUPIED PERIODS AS REQUIRED BY SECTION C403.3.5.2 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
9. SUPPLY AIR AND WATER TEMPERATURES SHALL BE AUTOMATICALLY RESET AS REQUIRED IN SECTION C403.4.4 AND C403.6.4 OF THE WSEC OR AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
10. ALL AIR SYSTEMS SHALL BE PROVIDED WITH A 100% CAPABLE AIR ECONOMIZER CAPABILITY AS REQUIRED BY THE SECTION C403.5 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
11. AIR ECONOMIZERS SHALL BE CAPABLE OF PROVIDING PARTIAL COOLING EVEN WHEN ADDITIONAL MECHANICAL COOLING IS REQUIRED TO MEET THE REMAINDER OF THE COOLING LOAD, AS REQUIRED IN SECTION 403.5.1 OF THE WSEC.
12. SIMULTANEOUS HEATING AND COOLING TO INDIVIDUAL ZONES SHALL BE PROHIBITED AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES EXCEPT WHERE PERMITTED IN SECTION C403.4.1, EXCEPTIONS 1 THROUGH 3 OF THE WSEC.
13. VARIABLE FREQUENCY DRIVES SHALL BE PROVIDED FOR VARIABLE FLOW HEATING AND AIR HANDLING SYSTEMS AS REQUIRED BY SECTION C403.2.3 OF THE WSEC AND AS DESCRIBED IN THE CONTRACT DOCUMENTS INCLUDING TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
14. MOTOR EFFICIENCY SHALL NOT BE LESS THAN THE MINIMUM CALLOUTS PER SECTION C405.8 OF THE WSEC FOR FULL LOAD EFFICIENCIES.
15. HVAC SYSTEMS SHALL BE BALANCED AS REQUIRED BY SECTION C408.2 OF THE WSEC.
16. OPERATION AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE OWNER AS REQUIRED BY SECTION C103.6.2 OF THE WSEC. AS A MINIMUM, THE MANUALS SHALL INCLUDE:
    - A. SUBMITTAL DATA.
    - B. OPERATION AND MAINTENANCE DATA FOR EQUIPMENT.
    - C. NAMES AND ADDRESSES OF SERVICE AGENCIES.
    - D. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION.
17. COMMISSIONING SHALL BE PROVIDED AND A REPORT OF COMMISSIONING BE SUBMITTED TO THE OWNER AS REQUIRED BY SECTION C408 OF THE WSEC. AND CONTRACTOR SHALL SUBMIT FORM "FIGURE C408.1.4.1" COMMISSIONING COMPLIANCE CHECKLIST.
18. IF NOT SPECIFICALLY STATED ABOVE, CONTRACTOR SHALL COMPLY WITH THE WSEC ITEMS THAT DO APPLY TO THIS PROJECT.

APPLICABLE CODES

2021 INTERNATIONAL BUILDING CODE W/ WA STATE AMENDMENTS
2021 INTERNATIONAL MECHANICAL CODE WITH WA STATE AMENDMENTS
2021 WA STATE ENERGY CODE

GENERAL HVAC NOTES (CONT.)

12. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL VOLUME DAMPERS AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/OR INSPECTION.
13. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.
14. ALL OSA, RELIEF/EXHAUST AIR, AND RETURN AIR DAMPERS SHALL BE MOTORIZED CONTROL AND SHALL HAVE A MAX LEAKAGE OF 4CFM/FT² @ 1.0"WG IN ACCORDANCE W/ AMCA 500D.ACCEPTABLE ACCESS PROVISIONS FOR REMOVAL OF FILTER AND MAINTENANCE FOR ALL INDOOR UNITS.
15. ALL AIR DISTRIBUTION SUPPLY OUTLETS AND RETURN/EXHAUST INLETS SHALL HAVE VOLUME CONTROL DEVICES.
16. ALL 90 DEGREE TRUNK DUCT ELBOWS SHALL BE SMOOTH-ROUND OR SQUARE WITH TURNING VANES.
17. CONTRACTOR SHALL LOCATE AND COORDINATE EXACT LOCATION OF DUCTWORK WITHIN THE STRUCTURE AT SITE.
18. ALL FAN SYSTEMS WITH OVER 2000 CFM SHALL HAVE SMOKE/DUCT DETECTORS TO SHUT-DOWN FAN UPON DETECTION. DUCT/SMOKE DETECTORS FURNISHED AND INSTALLED BY ELECTRICAL AND WIRED BY ELECTRICAL. DUCT/SMOKE DETECTORS SHALL BE LISTED BY AN APPROVED AGENCY AND FOR INSTALLATION IN AIR DUCTS PER IMC.
19. ALL DUCT PENETRATIONS THROUGH RATED ENCLOSURES SHALL BE FIRE DAMPERED AND/OR SMOKE DAMPERED AS REQUIRED.
20. ALL MECHANICAL HEATING AND VENTILATION EQUIPMENT SHALL CONFORM TO SMACNA, LOCAL AND STATE REGULATIONS FOR SEISMIC RESTRAINT (INCLUDING PIPING AND DUCTWORK). COORDINATE WITH STRUCTURAL.
21. ALL RECTANGULAR DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS. SUPPLY AND RETURN DUCTWORK FOR HVAC TO HAVE 1" SOUNDLINING FOR THE FIRST 10 FEET FROM UNIT DISCHARGE OUTLET. ALL DUCT LINING TO MEET AND EXCEED MOLD, HUMIDITY, EROSION RESISTANT, ETC. TO MEET 1MC CHAPTER 6. ALL DUCTWORK TO BE CLASS-I AIR DUCTS. CLASS-II DUCTS SHALL NOT BE USED.
22. PROVIDE COMPLETE REFRIGERATION PIPING, INSULATION AND CONTROLS TO ALL MECHANICAL REFRIGERANT EQUIPMENT.

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PERMIT SET 08-15-2025

REVISIONS

NO	DATE	BY	DESCRIPTION
1	01/28/26	RR	AHU-2 Rev

TITLE

HVAC LEGENDS AND NOTES

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M0.0.DWG
JOB NUMBER	2024.11

M0.0

MECHANICAL GENERAL PROVISIONS DIVISION 22 AND 23

PART 1 – GENERAL

1. SECTION INCLUDES
 A. BASIC GENERAL PROVISIONS SPECIFICALLY APPLICABLE TO DIVISION 23 SECTIONS, IN ADDITION TO DIVISION 1 – GENERAL REQUIREMENTS.
2. GENERAL REQUIREMENTS
 A. CONDITIONS:
  a. CONFORM TO ALL BIDDING REQUIREMENTS, GENERAL CONDITIONS AND AMENDMENTS TO THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS AND SPECIAL CONDITIONS AND GENERAL REQUIREMENTS, DIVISION 1, WHICH GOVERN THE WORK SPECIFIED HEREIN.
  b. THE CONTRACTOR IS OBLIGATED TO COMPLY WITH THE ABOVE IN ADDITION TO THE REQUIREMENTS OF THIS SECTION.
  c. MODIFICATIONS BY THIS SECTION DO NOT NULLIFY ANY OTHER PORTIONS OF THE ABOVE REFERENCED CONDITIONS.
 B. PLANS AND SPECIFICATIONS:
  a. PLANS AND SPECIFICATIONS SHALL BE TAKEN TOGETHER.
  b. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS AND WORK SHOWN ON THE PLANS AND/OR CALLED FOR IN THESE SPECIFICATIONS.
  c. PROVIDE WORK SPECIFIED AND NOT INDICATED ON PLANS, OR WORK INDICATED ON PLANS AND NOT SPECIFIED, AS THOUGH MENTIONED IN BOTH.
  d. WHEN DISCREPANCIES OCCUR BETWEEN PLANS AND SPECIFICATIONS OR WITHIN THE PLANS AND SPECIFICATIONS, THE ARCHITECT SHALL DETERMINE WHICH TAKES PRECEDENCE AND THE CONTRACTOR SHALL PERFORM THE SELECTED REQUIREMENT WITHOUT ADDITIONAL COST.
  e. MECHANICAL DRAWINGS:
   • MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL ARRANGEMENT OF PIPING, DUCTWORK, EQUIPMENT, ETC. FOLLOW AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT. BECAUSE OF SMALL SCALE OF MECHANICAL DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES, WHICH MAY BE REQUIRED.
   • CONSIDER ARCHITECTURAL, STRUCTURAL CIVIL, ACOUSTICAL, AND ELECTRICAL DRAWINGS PART OF THIS WORK INSOFAR AS THESE DRAWINGS FURNISH INFORMATION RELATING TO DESIGN AND CONSTRUCTION OF BUILDING.
   • INVESTIGATE ARCHITECTURAL AND STRUCTURAL AND FINISH CONDITIONS AFFECTING THIS WORK AND ARRANGE WORK ACCORDINGLY, PROVIDING SUCH FITTINGS, VALVES, AND ACCESSORIES REQUIRED MEETING CONDITIONS.
 C. READ AND BECOME FAMILIAR WITH BIDDING DOCUMENTS AND ALL OTHER DIVISIONS OF THIS SPECIFICATION AS THEY DO APPLY TO WORK IN DIVISION 23.
3. DEFINITIONS AND ABBREVIATIONS
 A. THE WORD "PROVIDE," AS USED IN DIVISION 23, MEANS "FURNISH AND INSTALL."
 B. THE WORD "CONTRACTOR," AS USED IN THESE SPECIFICATIONS, MEANS THE MECHANICAL CONTRACTOR.
 C. THE WORD "APPROVED," AS USED IN THESE SPECIFICATIONS, MEANS APPROVAL OF THE ARCHITECT.
 D. ABBREVIATIONS:
  • AABC – ASSOCIATED AIR BALANCE COUNCIL
  • AMCA – AIR MOVING AND CONDITIONING ASSOCIATION
  • ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
  • AHRI – AIR CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
  • ASHRAE – AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
  • ASME – AMERICAN SOCIETY OF MECHANICAL ENGINEERS
  • ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
  • AWWA – AMERICAN WATER WORKS ASSOCIATION
  • AWS – AMERICAN WELDING SOCIETY
  • CISPI – CAST IRON SOIL PIPE INSTITUTE
  • IBC – INTERNATIONAL BUILDING CODE
  • IMC – INTERNATIONAL MECHANICAL CODE
  • FM – FACTORY MUTUAL ENGINEERING CORPORATION
  • NEBB – NATIONAL ENVIRONMENTAL BALANCING BUREAU
  • NEC – NATIONAL ELECTRICAL CODE
  • NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
  • NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
  • OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
  • SEC – SEATTLE ENERGY CODE
  • SMACNA – SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC.
  • SBC – SEATTLE BUILDING CODE
  • SPC – SEATTLE PLUMBING CODE
  • SMC – SEATTLE MECHANICAL CODE
  • UL – UNDERWRITERS LABORATORY
  • UPC – UNIFORM PLUMBING CODE
  • WSEC – WASHINGTON STATE ENERGY CODE
4. CODES, PERMITS AND INSPECTIONS
 A. CODES: UNLESS OTHERWISE STATED OR SHOWN AS TO MEET OR EXCEED CODES. WORK SHALL BE INSTALLED AS A MINIMUM IN CONFORMITY WITH APPLICABLE LOCAL ORDINANCES AND STATUTES. STANDARDS AND SIZES, WHICH EXCEED PRECEDING REQUIREMENTS, SHALL BE INSTALLED AS DRAWN OR SPECIFIED. NOTHING IN THE SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT DEVIATION TO LESS THAN THE REQUIREMENTS OF GOVERNING CODES.
 B. CODES AND STANDARDS: APPLICABLE CODES AND STANDARDS SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO:
  a. UNIFORM PLUMBING CODE, BY INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS AND LOCAL AMENDMENTS.
  b. INTERNATIONAL MECHANICAL CODE, BY INTERNATIONAL CODE COUNCIL AND LOCAL AMENDMENTS.
  c. INTERNATIONAL BUILDING CODE, BY INTERNATIONAL CODE COUNCIL AND LOCAL AMENDMENTS.
  d. REQUIREMENTS OF OSHA, EPA AND WISHA.
  e. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND LOCAL AMENDMENTS.
  f. ASME CODES FOR BOILER AND PRESSURE VESSELS.
  g. SMACNA HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION.
  h. ALL LOCAL AND STATE AMENDMENTS.
  i. REQUIREMENTS OF ALL AGENCIES HAVE JURISDICTIONAL AUTHORITY OVER INSTALLATION OF MECHANICAL SYSTEMS.
 C. AGENCIES HAVING JURISDICTIONAL AUTHORITY OVER MECHANICAL INSTALLATION.
  a. LOCAL MUNICIPAL BUILDING DEPARTMENT
  b. LOCAL SEWER AND WATER DISTRICT REQUIREMENTS
  c. STATE AND COUNTY DEPARTMENT OF HEALTH
  d. LOCAL FIRE MARSHAL
  e. STATE BOILER INSPECTOR
 D. PERMITS, FEES AND INSPECTIONS:
  a. CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS, FEES AND INSPECTIONS REQUIRED IN CONNECTION WITH THIS INSTALLATION. THE CONTRACTOR SHALL PRESENT THE OWNER WITH PROPERLY SIGNED CERTIFICATES OF FINAL INSPECTION BEFORE THE WORK WILL BE ACCEPTED.
  b. CONTRACTOR SHALL CALL FOR ALL INSPECTIONS BY LOCAL BUILDING OFFICIAL(S) WHEN THEY BECOME DUE, AND SHALL NOT COVER ANY WORK UNTIL APPROVED BY THESE GOVERNING AUTHORITIES.
  c. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH UTILITY COMPANIES FOR WATER, GAS AND DRAINAGE SERVICES, ETC., ASSOCIATED WITH THE WORK AND INCLUDE REQUIRED PAYMENTS FOR METERS, PIPING, SERVICES, CONNECTION CHARGES AND MATERIALS FURNISHED AND INSTALLED BY UTILITY COMPANIES. WORK AND MATERIALS SHALL BE IN STRICT ACCORDANCE WITH RULES OF RESPECTIVE AUTHORITIES.
 E. UNDERWRITERS APPROVAL: WHERE UNDERWRITERS LABORATORY STANDARDS EXIST, ALL ITEMS OF ELECTRICAL EQUIPMENT OR ITEMS PARTIALLY COMPOSED OF ELECTRICAL EQUIPMENT SHALL CARRY UNDERWRITERS' LABORATORY LABEL EITHER FOR THE ENTIRE UNIT OR FOR THE ELECTRICAL PORTION OF THE EQUIPMENT. IF STANDARDS DO NOT EXIST, EQUIPMENT WILL BE APPROVED IF THE ITEM HAS BEEN SUBMITTED TO THE TESTING LABORATORY AND THE MANUFACTURER CERTIFIES COMPLIANCE WITH UNDERWRITERS LABORATORY STANDARDS ESTABLISHED FOR SIMILAR ITEMS.
 F. ASME CODE STAMP: ASME CODE STAMP REQUIRED ON ALL PRESSURE VESSELS AND RELIEF VALVES. CERTIFICATE REQUIRED FROM THE STATE BOILER INSPECTOR SHOWING APPROVAL OF THE EQUIPMENT AND ITS INSTALLATION.
5. WORK INCLUDED
 A. WORK UNDER THIS DIVISION SHALL INCLUDE FURNISHING ALL MATERIALS, LABOR, EQUIPMENT, TOOLS, APPLIANCES, HOISTING, SCAFFOLDING, SUPERVISION AND OVERHEAD FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK.
 B. ALL EQUIPMENT, MATERIALS AND PRODUCTS AS NOTED IN PART 2 OF EACH SECTION SHOULD BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
 C. PROVIDE ALL ADDITIONAL PIPING, DUCTS, CAPS AND VALVES NOT SHOWN ON DRAWINGS, TO MAINTAIN FULLY OPERATIONAL SYSTEMS DURING THE PROJECT AT NO ADDITIONAL COST TO THE OWNER.
 D. SOME EQUIPMENT MAY REQUIRE TEMPORARY INSTALLATION DURING ONE PHASE AND REQUIRE RELOCATION TO FINAL LOCATION UNDER ANOTHER PHASE. PROVIDE ALL ASSOCIATED LABOR AND MATERIALS TO ACCOMMODATE THIS PHASING.
 E. MECHANICAL SYSTEMS – INCLUDING BUT NOT LIMITED TO:
  a. PLUMBING SYSTEMS.
  b. AUTOMATIC SPRINKLER SYSTEMS.
  c. HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS.
  d. TEMPERATURE CONTROLS SYSTEM.
 F. DEMOLITION WHEN APPLICABLE:
  a. PERFORM ALL DEMOLITION OR INTERFACE WORK REQUIRED IN THE EXISTING BUILDING FOR THE REMOVAL OF OR INTERFACES WITH EXISTING MECHANICAL EQUIPMENT, DUCTWORK, TUBING, OR PIPING. RELOCATE OR MODIFY THE EXISTING PIPING, TUBING AND DUCTWORK AS REQUIRED BY ANY GENERAL CONSTRUCTION ALTERATIONS OR BY THE INSTALLATION OF NEW DUCTWORK, TUBING, OR PIPING IN THE EXISTING BUILDING.
  b. EXISTING MATERIALS, REMOVAL AND DISPOSITION:
   • SCOPE: FOR MECHANICAL ITEMS, WHICH REMAIN THE PROPERTY OF THE OWNER, REFER TO DRAWINGS.
   • IN COORDINATION WITH THE OWNER'S REPRESENTATIVES, THESE MATERIALS SHALL BE MADE AVAILABLE FOR THEIR INSPECTION AND DECISION AS TO WHETHER THE OWNER WILL RETAIN POSSESSION. ITEMS SELECTED FOR RETENTION SHALL BE DELIVERED TO A LOCATION ON THE PREMISES SELECTED BY THE OWNER AND TURNED OVER TO THEM. TAKE REASONABLE CARE TO AVOID DAMAGE TO THIS MATERIAL.
   • ALL MATERIAL NOT SELECTED FOR RETENTION BY THE OWNER AND THE CONTRACTOR SHALL DISPOSE OF DEBRIS.
  c. REUSE OF MATERIALS: DO NOT REUSE PIPING IN GENERAL, BUT CAST–IRON SOIL PIPE MAY BE REUSED IN NEW WORK IF OF PROPER ARRANGEMENT, WALL THICKNESS AND PRESSURE RATING.
  d. NOTIFY ARCHITECT OF DISCOVERY OF ANY HAZARDOUS MATERIALS SUCH AS ASBESTOS, ETC.
6. WORK SEQUENCE
 A. CONTRACTOR SHALL FOLLOW ALL PHASING FOR THIS PROJECT AS PROVIDED IN THE ARCHITECTURAL DRAWINGS WHEN APPLICABLE.
 B. INSTALL WORK IN STAGES TO ACCOMMODATE OWNER'S OCCUPANCY REQUIREMENTS DURING THE CONSTRUCTION PERIOD. COORDINATE MECHANICAL SCHEDULE AND OPERATIONS WITH OWNER.
7. QUALITY ASSURANCE
 A. REFERENCES HEREINAFTER IN DIVISION 23 OF THIS SPECIFICATION TO MATERIAL OR TYPE OF CONSTRUCTION ARE FOR THE PURPOSE OF ESTABLISHING A STANDARD OF QUALITY. ANY EQUIPMENT OR MATERIAL THAT IS PROPOSED BY THE CONTRACTOR AND IS NOT SPECIFICALLY IDENTIFIED IN THE CONTRACT DOCUMENTS SHALL REQUIRE ENGINEER'S APPROVAL.
 B. PROVIDE MATERIALS BEARING LEGIBLE MARKINGS SHOWING THE STANDARDS TO WHICH THEY CONFORM: I.E. ASTM, ANSI, COMMERCIAL STANDARDS, AMCA, ARI, ETC.
 C. WHERE SPECIFICALLY NOTED, PROVIDE MANUFACTURERS' CERTIFICATION THAT MATERIALS MEET OR EXCEED MINIMUM REQUIREMENTS SPEC. CERTIFICATION SHALL BE SIGNED AND DATED BY MANUFACTURER'S EXECUTIVE OR AUTHORIZED REPRESENTATIVE.
 D. MAKE COMPLETE INSTALLATION, CONNECTING TO ALL EQUIPMENT SHOWN ON THE CONTRACT DOCUMENTS, PLANS, OR CALLED FOR IN THE SPECIFICATIONS. CONTRACTOR TO PROVIDE ALL EXTRA DAMPERS AND VALVES AS REQUIRED AND "NOT SHOWN ON PLANS" TO OBTAIN DESIGN CRITERIA AS REQUIRED BY THE BALANCING CONTRACTOR.
 E. ALL WORK, MATERIAL AND EQUIPMENT TO BE FREE OF DEFECT.
8. SUBSTITUTIONS A. MANUFACTURERS:
 A. THE USE OF BRAND NAMES IS FOR THE PURPOSE OF DESCRIPTION AND ESTABLISHING LEVEL OF QUALITY AND DOES NOT ELIMINATE THE REQUIREMENTS OF MEETING SPECIFICATIONS.
 B. MANUFACTURERS LISTED IN CONTRACT DOCUMENTS ARE APPROVED TO BID THE PROJECT FOR THE ITEMS INDICATED WITHOUT OBTAINING PRIOR APPROVAL. OTHER MANUFACTURERS DESIRING TO BID THE PROJECT REQUIRE PRIOR APPROVAL.
 C. THE PRIOR APPROVAL LISTING OF A MANUFACTURER DOES NOT NECESSARILY MEAN THAT THE PRODUCTS OF THAT MANUFACTURER ARE EQUAL TO THOSE SPECIFIED. THE LISTING IS ONLY AN INDICATION OF THOSE MANUFACTURERS WHICH MAY BE CAPABLE OF MANUFACTURING; OR HAVE IN THE PAST MANUFACTURED, ITEMS EQUIVALENT TO OR EXCEEDS THOSE SPECIFIED, AND IS INTENDED TO AID THE CONTRACTOR IN IDENTIFYING MANUFACTURERS.
 D. EXCEPTIONS: OTHER BRANDS NOT ACCEPTED WHERE AN ITEM OR CLASS OF MATERIAL IS SPECIFIED EXCLUSIVELY BY TRADE NAME AND FOLLOWED BY THE WORD ONLY.
 E. THE APPROVAL OF A MANUFACTURER APPLIES TO THE MANUFACTURER ONLY AND DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF MEETING ALL APPLICABLE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
 F. REQUESTS FOR SUBSTITUTIONS (PRIOR APPROVALS) SHALL BE FURNISHED NO LATER THAN 10 WORKING DAYS PRIOR TO BID DATE OR REQUEST MAY NOT BE CONSIDERED. ALL SUBSTITUTION REQUESTS REVIEWED AND ACCEPTED WILL BE DESCRIBED AND LISTED IN AN ADDENDUM ISSUED PRIOR TO BID DATE. PRIOR APPROVALS ARE FOR MANUFACTURERS ONLY AND NOT SPECIFIC STYLES OR MODELS OF EQUIPMENT OR MATERIALS AND DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
9. PLANS AND SPECIFICATIONS
 A. THE CONTRACT DOCUMENTS, DRAWINGS AND SPECIFICATIONS ARE INTENDED TO COVER THE WORK, UNLESS OTHERWISE INDICATED. PROVIDE MATERIALS, WHICH ARE NECESSARY FOR THE PROPER COMPLETION OF THE INSTALLATION OR OPERATION OF THE EQUIPMENT.
 B. THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW EXACT OR COMPLETE PIPING AND DUCTWORK CONFIGURATIONS OR THE NECESSARY NUMBER AND TYPES OF FITTINGS. INCLUDE LABOR AND MATERIALS REQUIRED TO COMPLETE THE WORK.
 C. MINOR DEVIATIONS:
  a. CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE EXTENT AND GENERAL ARRANGEMENT OF SYSTEMS. GENERALLY FOLLOW THE LAYOUTS SHOWN AND COORDINATE THE INSTALLATION OF WORK WITH THAT OF THE OTHER TRADES.
  b. MINOR DEVIATIONS MAY BE MADE ON THE JOB WITH THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER, PROVIDED NO ADDITIONAL CHARGES WILL BE MADE TO THE OWNER FOR SUCH DEVIATION.
10. WORKMANSHIP
 A. THE CONTRACTOR SHALL PROVIDE COMPLETED SYSTEMS WITH A NEAT AND FINISHED APPEARANCE. IF, IN THE JUDGMENT OF THE ENGINEER, ANY PORTION OF THE WORK HAS NOT BEEN PERFORMED IN A WORKMANLIKE MANNER OR IS LEFT IN A ROUGH, UNFINISHED STATE, THE CONTRACTOR WILL BE REQUIRED TO REMOVE, REINSTALL OR REPLACE SAME AND PATCH AND PAINT SURROUNDING SURFACES IN A MANNER ACCEPTABLE TO THE ENGINEER, WITHOUT ADDITIONAL COST TO THE OWNER.
11. SAFETY AND PROTECTION
 A. SAFETY MEASURES TO BE TAKEN: THE ENGINEER HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK. THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK.
 B. HEAD PROTECTION: PROVIDE HEAD PROTECTION WHERE DUCT ANGLES, PIPE HANGERS, EQUIPMENT SUPPORT ANGLES, ETC., ARE EXPOSED IN WALKWAYS, OR IN ACCESS WAYS FOR ANY MAINTENANCE. COVER ALL SUCH POTENTIALLY INJURIOUS PROTRUSIONS OCCURRING LESS THAN 7'–0" ABOVE THE FLOOR WITH PADDING. PADDING SHALL BE SECURELY AND PERMANENTLY FASTENED AND FINISHED COMPARABLE TO ADJACENT FINISHES.
12. RESPONSIBILITY AND GUARANTEES
 A. WITHOUT ADDITIONAL COST TO OWNER, CORRECT ALL DEFECTS AND FAILURES DISCOVERED WITHIN ONE YEAR FROM DATE OF FINAL ACCEPTANCE EXCEPT WHEN, IN THE OPINION OF THE ENGINEER, SUCH CONDITION IS DUE TO NEGLECT OR CARELESSNESS OF THOSE OTHER THAN THE CONTRACTOR.
 B. THE GUARANTEE OF THE CONTRACTOR IS INDEPENDENT OF SHORTER TIME LIMITS BY ANY MANUFACTURER OF EQUIPMENT HE HAS FURNISHED.
 C. MAKE ALL NECESSARY ADJUSTMENTS DURING FIRST YEAR OF OPERATION.
 D. THE PRESENCE OF AN INSPECTOR DURING ANY CONSTRUCTION DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR DEFECTS DISCOVERED AFTER COMPLETION OF THE WORK.
13. SERVICE A. WHERE REQUIRED BY THE SPECIFICATIONS, EQUIPMENT SUCH AS PACKAGED AIR CONDITIONERS, FURNACES, ETC. SHALL BE FURNISHED AND INSTALLED UNDER SUPERVISION OF FACTORY–TRAINED REPRESENTATIVE.

PART 2 – PRODUCTS

1. SUBMITTALS
 A. GENERAL: CONFORM TO DIVISION 1, WITH ADDITIONAL REQUIREMENTS AS INDICATED BELOW.
 B. PRODUCT DATA, DESIGN DATA:
  a. PROCESS: SUBMIT COMPLETE MECHANICAL SUBMITTAL IN MULTIPLE COMPLETE PACKAGES AS FOLLOWS. INCOMPLETE, PIECE–MEAL SUBMITTALS WILL NOT BE ACCEPTED, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED. ALLOW MINIMUM 10 WORKDAYS FOR EACH SUBMITTAL REVIEW.
   • ALL MECHANICAL SPECIFICATION SECTIONS, INCLUDING MATERIALS AND EQUIPMENT.
   • MATERIALS SHOP AND FIELD INSTALLATION DRAWINGS.
   • MATERIALS AND SHOP DRAWINGS.
  b. BINDING AND FORMAT: BIND IN THREE–RING BINDER(S). LABEL FRONT OF BINDER(S) WITH NAME OF PROJECT, NAME OF OWNER, YEAR OF COMPLETION; TITLE MECHANICAL SUBMITTALS, NAMES OF ENGINEER AND MECHANICAL CONTRACTOR, AND VOLUME NO. (IF APPLICABLE). LABEL BACK EDGE OF BINDER WITH TITLE, NAME OF PROJECT, OWNER, YEAR OF COMPLETION, AND VOLUME NO. (IF APPLICABLE). FOLD DRAWINGS TO 8"SIZE AND BIND AS ABOVE (WITH REINFORCING AT PUNCHED HOLES) OR PLACE IN CLEAR PLASTIC HOLDER DESIGNED FOR THREE–RING BINDERS.
   • INCLUDE OVERALL TABLE OF CONTENTS OF ITEMS SUBMITTED, ORGANIZED BY SPECIFICATION SECTION.
   • INCLUDE HEAVY, TABBED DIVIDER SHEET FOR EACH SPECIFICATION SECTION, WITH SPECIFICATION SECTION NUMBER AND TITLE ON TAB. INCLUDE TABLE OF CONTENTS FOR EACH SPECIFICATION SECTION, INCLUDING CATALOG NUMBERS OR DRAWING NUMBERS IF APPROPRIATE.
   • O & M MANUAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
  c. CONTENTS:
   • INCLUDE COMPLETE SUBMITTAL INFORMATION DESCRIBED UNDER PRODUCT DATA, DESIGN DATA IN THIS SECTION.
   • INCLUDE INSTALLATION INSTRUCTIONS, OPERATION AND MAINTENANCE INFORMATION, START–UP INSTRUCTIONS, AND SPARE PARTS LISTS.
   • INCLUDE NAMES, ADDRESS, TELEPHONE NUMBERS, AND FAX NUMBERS OF MANUFACTURERS AND VENDORS OF MATERIALS AND EQUIPMENT.
   • INCLUDE INFORMATION ON THE SPECIFIC EQUIPMENT INSTALLED FOR THIS PROJECT.
  d. ELECTRONIC COPY ACCEPTED
 C. FABRICATION DRAWINGS. FOR WORK IN THIS DIVISION, PREPARE FABRICATION DRAWINGS. SUBMIT MINIMUM 30 DAYS PRIOR TO STARTING FABRICATION OR INSTALLATION OF WORK. DO NOT FABRICATE OR INSTALL WORK UNTIL REVIEWED/ACCEPTED BY A/E.
  a. PREPARE FABRICATION DRAWINGS FOR THE FOLLOWING AREAS:
   • MECHANICAL (FURNACES, DOMESTIC HOTWATER HEATER) ROOMS.
   • BOILER ROOMS.
   • CHILLER ROOM.
   • VERTICAL CHASSES.
   • UTILITY TUNNELS.
   • FILTER ASSEMBLIES.
  b. FABRICATION AND INSTALLATION DRAWINGS SHALL BE PRODUCED AND SHOW COMPLETE DIMENSIONED INSTALLATION TO SCALE, CONSISTING OF DETAILED DRAWINGS IN AUTOCAD FORMAT, SAME SIZE AS CONTRACT DRAWINGS, COORDINATING WORK OR OTHER TRADES TO RESULT IN PROPER FIT IN THE AVAILABLE SPACE. DRAWINGS SHALL BE COMPLETED IN TIMELY MANNER, COORDINATED WITH THE CONSTRUCTION SCHEDULE. MINIMUM SCALE 1/8"=1'–0".
  c. SHEET METAL: PLANS SHOWING DUCTWORK, HANGERS, SUPPORTS, EQUIPMENT, WORK OF OTHER TRADES IN CLOSE PROXIMITY TO DUCTWORK. VERTICAL ELEVATIONS OR WORK ABOVE FINISHED FLOOR SHOWING CEILINGS, LIGHTS AND OTHER ITEMS NECESSARY TO FULLY COORDINATE THE INSTALLATION.
  d. PIPING: PLANS SHOWING PLUMBING AND HVAC PIPING, HANGERS, SUPPORTS, EQUIPMENT, WORK OF OTHER TRADES IN CLOSE PROXIMITY TO PIPING. VERTICAL ELEVATIONS OR WORK SHOWING FINISHED FLOOR, CEILINGS, LIGHTS AND OTHER ITEMS NECESSARY TO FULLY COORDINATE THE INSTALLATION.
 D. TEST REPORTS AND CERTIFICATES: SUBMIT IN ONE COMPREHENSIVE PACKAGE PRIOR TO SUBSTANTIAL COMPLETION.
 E. BALANCING AND TESTING REPORTS: SUBMIT FOR REVIEW.
 F. OPERATION AND MAINTENANCE MANUAL:
  a. PROCESS: SUBMIT COMPLETE O & M MANUAL IN ONE COMPLETE PACKAGE. INCOMPLETE, PIECE–MEAL SUBMITTALS WILL NOT BE ACCEPTED, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED. INCLUDE MECHANICAL SPECIFICATION SECTIONS, WITH MATERIALS AND EQUIPMENT.
  b. BINDING AND FORMAT:
   • BIND IN THREE–RING BINDER(S). PERMANENTLY IMPRINT FRONT OF BINDER(S) WITH NAME OF PROJECT, NAME OF OWNER, YEAR OF COMPLETION, TITLE "MECHANICAL OPERATIONS AND MAINTENANCE" MANUAL, NAMES OF ENGINEER AND CONTRACTOR, AND VOLUME NO. (IF APPLICABLE). PERMANENTLY IMPRINT BACK EDGE OF BINDER WITH TITLE, NAME OF PROJECT, OWNER, YEAR OF COMPLETION, AND VOLUME NO. (IF APPLICABLE). FOLD DRAWINGS TO 8 SIZE AND BIND AS ABOVE (WITH REINFORCING AT PUNCHED HOLES) OR PLACE IN CLEAR PLASTIC HOLDER DESIGNED FOR THREE–RING BINDERS.
   • INCLUDE OVERALL TABLE OF CONTENTS OF ITEMS SUBMITTED, ORGANIZED BY SPECIFICATION SECTION.
   • INCLUDE HEAVY, TABBED DIVIDER SHEET FOR EACH SPECIFICATION SECTION, WITH SPECIFICATION SECTION NUMBER AND TITLE ON TAB. INCLUDE TABLE OF CONTENTS FOR EACH SPECIFICATION SECTION, INCLUDING CATALOG NUMBERS OR DRAWING NUMBERS IF APPROPRIATE.
   • O & M MANUAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
  c. CONTENTS:
   • INCLUDE COMPLETE SUBMITTAL INFORMATION DESCRIBED UNDER PRODUCT DATA, DESIGN DATA IN THIS SECTION.
   • INCLUDE INSTALLATION INSTRUCTIONS, OPERATION AND MAINTENANCE INFORMATION, START–UP INSTRUCTIONS, AND SPARE PARTS LISTS.
   • INCLUDE NAMES, ADDRESS, TELEPHONE NUMBERS, AND FAX NUMBERS OF MANUFACTURERS AND VENDORS OF MATERIALS AND EQUIPMENT.
   • INCLUDE INFORMATION ON THE SPECIFIC EQUIPMENT INSTALLED FOR THIS PROJECT.
  d. ELECTRONIC COPY ACCEPTED
 G. RECORD DRAWINGS:
  a. GENERAL
   • CORRECTIONS AND CHANGES MADE DURING THE PROGRESS OF THE WORK SHALL BE NEATLY RECORDED AS ACTUALLY INSTALLED, INCLUDING ALL CHANGE ORDERS, RFI'S, ETC.
   • ONE SET OF PRINTS SHOWING THIS INFORMATION (IN RED), SHALL BE KEPT UP TO DATE AT ALL TIMES. THESE MARKED PRINTS SHALL BE KEPT AT THE JOB SITE AND IN RED.
   • AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL OBTAIN AUTOCAD V 2000, OF CONTRACT DRAWINGS. DRAWING FILES SHALL BE CORRECTED BY THE CONTRACTOR TO INDICATE ALL CHANGES AND CORRECTIONS MADE DURING THE PROJECT.
   • UPON COMPLETION, HE SHALL SUBMIT THE CORRECTED AUTOCAD DRAWING FILES PLUS 2 PLOT COPIES, TO THE ARCHITECT FOR REVIEW.
   • QUALITY OF WORKMANSHIP MUST BE CLEARLY LEGIBLE AND BE CONSISTENT WITH INDUSTRY DRAFTING STANDARDS. DRAWINGS PROVIDED LACKING THESE STANDARDS WILL NOT BE ACCEPTED.
  b. LAYOUT OF FIELD INSTALLATION DRAWINGS BY CONTRACTOR:
   • FOR ALL WORK IN MECHANICAL (FURNACE AND DOMESTIC HOTWATER HEATER) ROOMS, CONTRACTOR SHALL PREPARE ADDITIONAL DETAIL DRAWINGS TO SCALE SIMILAR TO THAT OF THE BIDDING DRAWINGS, PREPARED ON MYLAR PAPER SAME SIZE AS CONTRACT DRAWINGS AND SHALL WITH THESE LAYOUTS, COORDINATE HIS WORK WITH THE DRAWINGS AS TO THE AREA IT APPLIES. SEE 2.1.C.a. ABOVE.
   • SUBMIT THESE DRAWINGS TO THE ARCHITECT FOR REVIEW, BEFORE COMMENCING SHOP FABRICATION OR ERECTION IN THE FIELD. AT COMPLETION OF THE PROJECT, INCLUDE A SET OF SUCH DRAWINGS WITH EACH SET OF RECORD DRAWINGS AND CAD FILES FOR OWNER'S PURPOSES.
  c. ELECTRONIC COPY ACCEPTED
 H. CERTIFICATIONS: SUBMIT WRITTEN CERTIFICATIONS FROM THE GOVERNING BUILDING AUTHORITIES STATING THAT WORK HAS BEEN INSPECTED, ACCEPTED, AND COMPLIES WITH APPLICABLE CODES AND ORDINANCES.
2. CUTTING & PATCHING
 A. CUTTING:
  d. DO CUTTING, CORE–DRILLING AND SIMILAR WORK REQUIRED FOR INSTALLATION OF SYSTEMS UNDER DIVISION 22 AND 23.
  e. THROUGH CONCRETE SLABS OR WALLS, ALL ROUND HOLES SHALL BE CORE DRILLED WITH A DIAMOND DRILL AND ALL RECTANGULAR OPENINGS SHALL BE CUT WITH A DIAMOND SAW. CONTRACTOR SHALL MAKE PROVISIONS FOR WATER, CAPTURE WHEN WORKING ABOVE OCCUPIED SPACES OR AREAS SUBJECT TO WATER DAMAGE.
  f. CUT NO STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ARCHITECT/ENGINEER.
  g. DRILLING AND CUTTING OF CONCRETE AND OTHER WORK WHICH MAKES OBJECTIONABLE NOISE IN OCCUPIED BUILDING SHALL BE PERFORMED AT TIMES AS COORDINATED WITH THE OWNER BEFORE DOING THE WORK.
 B. PATCHING OF FINISHED BUILDING ELEMENTS AFTER MECHANICAL INSTALLATION SHALL BE IN ACCORDANCE WITH DIVISION 01, NOT BY DIVISION 23 SUBCONTRACTOR.
3. EXCAVATION AND BACKFILL
 A. CONTRACTOR SHALL DO ALL EXCAVATION AND BACKFILL REQUIRED FOR DIVISION 22 AND 23 WORK, INCLUDING ANY NECESSARY SHEATHING AND PUMPING.
 B. TRENCH BOTTOMS AND SHELVES SHALL BE CUT TO SUIT REQUIRED GRADES OF MECHANICAL WORK.
 C. PIPING SHALL REST ON UNDISTURBED EARTH OR PEA GRAVEL.
 D. BELL HOLES SHALL BE PROVIDED FOR ALL BELL AND HUB OR MECHANICAL JOINT PIPING.
 E. AFTER WORK HAS BEEN INSPECTED, TESTED AND APPROVED, ALL EXCAVATION SHALL BE BACKFILLED IN LAYERS OF APPROXIMATELY 8 INCHES, EACH LAYER MOISTENED AS DIRECTED AND PNEUMATICALLY TAMPED TO MINIMUM COMPACTION OF 90 PERCENT.
 F. JETTING OR FLOODING WILL NOT BE PERMITTED.
 G. RESTORE ALL SURFACES TO ORIGINAL CONDITION, PROPERLY INSTALLED TO ELIMINATE ANY SETTLEMENT AND SATISFACTORY TO ARCHITECT.
 H. REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF PIPES PASSING THROUGH OR NEAR FOOTINGS AND FOUNDATIONS.
4. PLATES AND ISOLATORS
 A. PLATES:
  a. CHROME PLATED, STAMPED OR CAST BRASS.
  b. GRINNELL FIGURE 10 OR BEATON CORBIN.
 B. ISOLATORS:
  a. STONEMAN TRISOLATOR, NO. 100 FOR STEEL PIPE, NO. 500 FOR COPPER TUBE.
  b. LINK–SEAL TYPE MODEL LS OR P

MECHANICAL GENERAL PROVISIONS CONTD.

BE BY COUPLING MANUFACTURER.

F. SPRING–LOADED CHECK VALVES:
   a. IRON BODY, BRONZE TRIM, STAINLESS STEEL SPRING, RENEWABLE COMPOSITION DISC, SCREWED, WAFER, OR FLANGED ENDS.
   b. CHECK VALVES IN MECHANICAL COUPLING SYSTEMS, I.E., VICTAULIC, ETC., MAY BE BY COUPLING MANUFACTURER.

G. BACKFLOW PREVENTERS:
   a. MANUFACTURERS:
      - WATTS.
      - CMB INDUSTRIES; FEBCO DIV.
      - ZURN INDUSTRIES INC; WILKINS DIV.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS AND APPROVED BY LOCAL JURISDICTION MAY BE CONSIDERED.
   b. DOUBLE CHECK VALVE:
      - 2" AND UNDER; BRONZE BODY, RUBBER CHECK VALVES, STAINLESS STEEL CHECK SEATS, SHAFTS AND FLANGE BOLTS, BRONZE BALL VALVE TEST COCKS, BRONZE BALL VALVE SHUT–OFFS, STRAINER, THREADED CONNECTIONS, 175 PSI PRESSURE RATING.
      - 2–1/2" AND OVER; EPOXY COATED IRON BODY, BRONZE TRIM, STAINLESS STEEL INTERNAL PARTS, REMOVABLE BRONZE SEATS, GATE VALVE SHUT–OFFS, STRAINER, FLANGED ENDS, 175 PSI PRESSURE RATING.
   c. REDUCED PRESSURE TYPE:
      - 2" AND UNDER; BRONZE BODY, RUBBER CHECK VALVES WITH REDUCED PRESSURE ZONE, STAINLESS STEEL CHECK SEATS, SHAFTS AND FLANGE BOLTS, BRONZE BALL VALVE TEST COCKS, BRONZE BALL VALVE SHUT–OFFS, STRAINER, THREADED CONNECTIONS, 175 PSI PRESSURE RATING.
      - 2–1/2" AND OVER; EPOXY COATED IRON BODY, BRONZE TRIM, STAINLESS STEEL INTERNAL PARTS, REMOVABLE BRONZE SEATS, GATE VALVE SHUT–OFFS, STRAINER, FLANGED ENDS, 175 PSI PRESSURE RATING.

C. WATER PRESSURE REDUCING VALVES:
   a. UP TO 2 INCHES
      - BRONZE BODY, STAINLESS STEEL AND BRONZE INTERNAL PARTS, FABRIC REINFORCED DIAPHRAGM, INTEGRAL STRAINER, THERMAL EXPANSION BY–PASS, THREADED ENDS.
      - WATTS U5B, OR APPROVED.
   b. OVER 2 INCHES:
      - CAST IRON BODY, BRONZE FITTED, NYLON REINFORCED ELASTOMERIC DIAPHRAGM AND SEAT DISC, FLANGED, PILOT OPERATED, ADJUSTABLE CLOSING SPEED, COPPER CONTROL TUBING WITH BRASS FLARED–END FITTINGS.
      - WATTS ACV, CLA–VAL, CASH OR APPROVED.

D. RELIEF VALVES:
   a. MANUFACTURERS:
      - WATTS.
      - B&G.
      - AMTROL.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. BRONZE BODY, TEFLON SEAT, STEEL STEM AND SPRINGS, AUTOMATIC, DIRECT TEMPERATURE AND PRESSURE ACTUATED, CAPACITIES ASME CERTIFIED AND LABELED.

E. CALIBRATED BALANCING VALVES:
   a. ADJUSTABLE ORIFICE TYPE:
      - MANUFACTURERS:
        - ARMSTRONG MODEL CBV.
        - DAN FOSS.
        - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
      - GENERAL:
        - VALVES SHALL BE Y–PATTERN, EQUAL PERCENTAGE GLOBE STYLE PROVIDING PRECISE FLOW MEASUREMENT, PRECISE FLOW BALANCING AND POSITIVE DRIP TIGHT SHUT–OFF.
        - VALVES SHALL HAVE MULTI–TURN ADJUSTMENT: MINIMUM 720°.
        - VALVES SHALL HAVE MEANS OF LOCKING IN BALANCED POSITION.
        - FURNISH VALVES WITH PREFORMED INSULATION WITH COVER.
      - CONSTRUCTION:
        - UP TO 2" SIZE: BRASS OR BRONZE BODY WITH THREAD OR SWEAT CONNECTIONS, BRONZE STEM WITH RESIN OR PFTE DISC, AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
        - 2½" TO 12" SIZE: DUCTILE IRON BODY WITH GROOVED END OR FLANGED CONNECTIONS, BRONZE VALVE STEM AND PLUG DISC, TWO 1/4" TEMPERATURE AND PRESSURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
   b. FIXED ORIFICE TYPE:
      - MANUFACTURERS:
        - FDI "FLOWSET".
        - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
      - GENERAL:
        - VALVES SHALL BE BALL STYLE WITH INTEGRAL FIXED VENTURI PROVIDING PRECISE FLOW MEASUREMENT, PRECISE FLOW BALANCING AND POSITIVE DRIP TIGHT SHUT–OFF.
        - VALVES SHALL HAVE 90° ADJUSTMENT WITH MEMORY STOP.
        - VALVES SHALL HAVE MEANS OF LOCKING IN BALANCED POSITION.
      - CONSTRUCTION:
        - UP TO 3" SIZE: BRONZE BODY WITH UNION ON INLET, THREAD OR SWEAT CONNECTIONS, STAINLESS STEEL OR BRASS BALL WITH TFE SEAT RINGS AND TWO, … PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
        - 4" TO 8" SIZE: DUCTILE OR CAST IRON BODY WITH GROOVED END OR FLANGED CONNECTIONS, BRONZE VALVE STEM AND PLUG DISC AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.

F. AUTOMATIC FLOW CONTROL VALVES:
   a. MANUFACTURERS
      - IMI HYDRONIC.
      - GRISWOLD CONTROLS.
      - HAYS FLUID CONTROL.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. CONSTRUCTION:
      - FLOW CONTROL ELEMENT(S): ONE OR MORE BRASS AND/OR STAINLESS STEEL ORIFI AND SPRING.
      - UP TO 3"SIZE: DUCTILE IRON, CAST IRON, BRASS OR WROUGHT COPPER VALVE BODY, THREADED OR SWEAT CONNECTIONS, RATED ANSI CLASS 125. TWO, PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, AND ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
      - 4" TO 12" SIZE: DUCTILE IRON, STEEL OR BRONZE VALVE BODY, FLANGED OR GROOVED CONNECTIONS, RATED ANSI GLASS 150. TWO, PRESSURE/TEMPERATURE TEST PORTS WITH EXTENSIONS AND NORDEL CHECK VALVES WITH GASKETED CAPS, AND ADDITIONAL DRAIN CONNECTIONS.
   c. CALIBRATION:
      - CONTROL FLOW WITHIN PLUS OR MINUS 10 PERCENT OF SELECTED RATING OVER OPERATING PRESSURE RANGE OF AT LEAST 10 TIMES MINIMUM PRESSURE REQUIRED FOR CONTROL.
      - MAXIMUM ALLOWABLE MINIMUM PRESSURE FOR OPERATING RANGE; 3.5 PSIG.

G. STRAINERS:
   a. MANUFACTURERS:
      - WATTS.
      - ARMSTRONG.
      - SPIRAX/SARCO.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. SIZE 2 INCH AND UNDER: SCREWED BRASS OR IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 1/32 INCH STAINLESS STEEL PERFORATED SCREEN.
   c. SIZE 2 –1/2 INCH TO 4 INCH: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 3/64 INCH STAINLESS STEEL PERFORATED SCREEN.
   d. SIZE 5 INCH AND LARGER: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, BASKET PATTERN WITH 1/8 INCH STAINLESS STEEL PERFORATED SCREEN.
   e. PROVIDE NIPPLE AND BLOWDOWN VALVE WITH PLUG ON ALL STRAINERS 1" PIPE SIZE AND LARGER.

13. HEAT TRACE FOR FREEZE PROTECTION
A. MANUFACTURERS:
   a. BASIS FOR DESIGN: RAYCHEM XL–TRACE.
   b. SUBSTITUTE MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
   c. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
   d. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSTITUTED EQUIPMENT OR MATERIALS FITTING THE AVAILABLE SPACE AND FOR ANY IMPACTS TO OTHER TRADES.

B. CONSTRUCTION:
   a. THE SELF–REGULATING HEATER SHALL CONSIST OF TWO (2) 16 AWG TINNED–COPPER BUS WIRES EMBEDDED IN PARALLEL IN A SELF–REGULATING POLYMER CORE THAT VARIES ITS POWER OUTPUT TO RESPOND TO TEMPERATURE ALL ALONG ITS LENGTH, ALLOWING THE HEATER TO BE CROSSED OVER ITSELF WITHOUT OVERHEATING, TO BE USED DIRECTLY ON METALLIC OR PLASTIC PIPE, AND TO BE CUT TO LENGTH IN THE FIELD.
   b. THE HEATER SHALL BE COVERED BY A RADIATION CROSS–LINKED MODIFIED POLYOLEFIN DIELECTRIC JACKET.
   c. TO PROVIDE A GROUND PATH AND TO ENHANCE THE HEATING CABLE'S RUGGEDNESS, THE HEATER SHALL HAVE AN OUTER BRAID OF TINNED–COPPER AND AN OUTER JACKET OF MODIFIED POLYOLEFIN (–CR).

C. REQUIREMENTS:
   a. SYSTEM SHALL MEET REQUIREMENTS OF CURRENT NATIONAL ELECTRIC CODE (NEC), SECTION 427.
   b. THE HEATER SHALL OPERATE ON LINE VOLTAGE OF 120 VOLTS WITHOUT THE USE OF TRANSFORMERS.
   c. IN ORDER TO PROVIDE ENERGY CONSERVATION AND TO PREVENT OVERHEATING, THE HEATER SHALL HAVE A SELF–REGULATING FACTOR OF A LEAST 90 PERCENT. THE SELF–REGULATION FACTOR IS DEFINED AS THE PERCENTAGE REDUCTION, WITHOUT THERMOSTATIC CONTROL, OF THE HEATER OUTPUT GOING FROM 40°F PIPE TEMPERATURE OPERATION TO 150°F PIPE TEMPERATURE OPERATION. PROVIDE SUFFICIENT HEAT CABLE, AS SIZED IN ACCORDANCE WITH FOLLOWING TABLE TO KEEP THE PIPE SURFACE AT 40°F WITH 10°F OUTDOOR AMBIENT TEMPERATURE. THE REQUIRED HEATER OUTPUT RATING IS IN WATTS PER FOOT AT 50°F. (HEATER SELECTION BASED ON 1" FIBERGLASS INSULATION ON METAL PIPING).

HEAT TRACE WATTAGE BASED ON AMBIENT TEMPERATURE				
PIPE SIZE	MINIMUM AMBIENT TEMPERATURE			
	10°F	0°F	-10°F	-20°F
1/2 - 3 INCH	5 WATT	5 WATT	5 WATT	5 WATT
4 INCH	5 WATT	5 WATT	5 WATT	8 WATT
6 INCH	5 WATT	8 WATT	8 WATT	8 WATT
8 INCH	8 WATT	8 WATT	2-5 WATT	2-8 WATT
10 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT
12 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT
14 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT

D. COMPONENTS:
   a. ALL HEATING CABLE COMPONENTS SHALL BE UL LISTED FOR USE AS PART OF THE SYSTEM TO PROVIDE PIPE FREEZE PROTECTION. COMPONENT ENCLOSURES SHALL BE RATED NEMA 4X TO PREVENT WATER INGRESS AND CORROSION.
   b. INSTALLATION SHALL NOT REQUIRE THE INSTALLING CONTRACTOR TO CUT INTO THE HEATING CABLE CORE TO EXPOSE THE BUS WIRES.
   c. CONNECTION SYSTEMS REQUIRING THE INSTALLING CONTRACTOR STRIP THE BUS WIRES, OR WHICH USE CRIMPS OR TERMINAL BLOCKS SHALL NOT BE ACCEPTABLE.
   d. ALL COMPONENTS THAT MAKE AN ELECTRICAL CONNECTION SHALL BE RE–ENTERABLE FOR SERVICING.
   e. NO COMPONENT SHALL USE SILICONE TO SEAL THE ELECTRICAL CONNECTIONS.
   f. PROVIDE INDICATOR SIGNAL LIGHT TO VERIFY ELECTRICAL POWER AT BEGINNING OF CIRCUIT ON DOWNSTREAM SIDE OF THERMOSTAT.

E. CONTROLS:
   a. THE SYSTEM SHALL BE CONTROLLED BY A SWITCH EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   b. –OR–
   c. THE SYSTEM SHALL BE CONTROLLED BY A BULB–SENSING THERMOSTAT SET AT 40°F EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   d. THERMOSTAT TO INCLUDE NEMA 4X ENCLOSURE, SP–ST SWITCH AND THREE FOOT CAPILLARY AND BULB.
      - –OR– THE SYSTEM SHALL BE CONTROLLED BY AN AMBIENT SENSING THERMOSTAT SET AT 40°F EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   e. THERMOSTAT TO INCLUDE NEMA 4X ENCLOSURE, [STAINLESS STEEL PROBE SENSOR AND SP–ST SWITCH.][SP–ST SWITCH AND THREE FOOT CAPILLARY AND BULB.]

14. ELECTRIC MOTORS
A. MANUFACTURERS:
   a. THE FOLLOWING MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
      - RELIANCE.
      - BALDOR.
      - CENTURY.
      - GENERAL ELECTRIC.
   b. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
   c. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSTITUTED EQUIPMENT OR MATERIALS FITTING THE AVAILABLE SPACE AND FOR ANY IMPACTS TO OTHER TRADES.

B. GENERAL:
   a. SUBMITTALS: SUBMIT TEST RESULTS VERIFYING NOMINAL EFFICIENCY AND POWER FACTOR FOR THREE PHASE MOTORS ONE (1) HORSEPOWER AND LARGER.
   b. OPERATION & MAINTENANCE DATA: INCLUDE ASSEMBLY DRAWINGS, BEARING DATA INCLUDING REPLACEMENT SIZES, AND LUBRICATION INSTRUCTIONS.
   c. QUALIFICATIONS: COMPANY SPECIALIZING IN MANUFACTURE OF ELECTRIC MOTORS FOR HVAC AND PLUMBING USE, AND THEIR ACCESSORIES, WITH MINIMUM THREE YEARS DOCUMENTED PRODUCT DEVELOPMENT, TESTING, AND MANUFACTURING EXPERIENCE.
   d. REGULATORY REQUIREMENTS:
   e. CONFORM TO APPLICABLE ELECTRICAL CODE.
   f. CONFORM TO LOCAL ENERGY CODE.
   g. PROTECT MOTORS STORED ON SITE FROM WEATHER AND MOISTURE BY MAINTAINING FACTORY COVERS AND SUITABLE WEATHER –PROOF COVERING. FOR EXTENDED OUTDOOR STORAGE, REMOVE MOTORS FROM EQUIPMENT AND STORE SEPARATELY.
   h. PROVIDE MINIMUM FIVE YEAR MANUFACTURER'S WARRANTY UNDER PROVISIONS OF DIVISION 23.

C. CONSTRUCTION AND REQUIREMENTS:
   a. ELECTRICAL SERVICE: REFER TO DIVISION 26 FOR REQUIRED ELECTRICAL CHARACTERISTICS.
   b. MOTORS: DESIGN FOR CONTINUOUS OPERATION IN 40°C ENVIRONMENT, AND FOR TEMPERATURE RISE IN ACCORDANCE WITH ANSI/NEMA MG 1 LIMITS FOR INSULATION CLASS, SERVICE FACTOR, AND MOTOR ENCLOSURE TYPE.
   c. EXPLOSION –PROOF MOTORS: UL APPROVED AND LABELED FOR HAZARD CLASSIFICATION, WITH OVER TEMPERATURE PROTECTION.
   d. VISIBLE NAMEPLATE: INDICATING MOTOR HORSEPOWER, VOLTAGE, PHASE, CYCLES, RPM, FULL LOAD AMPS, LOCKED ROTOR AMPS, FRAME SIZE, MANUFACTURER'S NAME AND MODEL NUMBER, SERVICE FACTOR, POWER FACTOR, EFFICIENCY.
   e. MOTORS POWERED BY VARIABLE FREQUENCY DRIVES (VFDS) SHALL HAVE MINIMUM 1.15 SERVICE FACTOR AND SHALL HAVE CLASS F, OR BETTER, INSULATION.
   f. SINGLE PHASE MOTORS: □DRIP –PROOF ENCLOSURE: CLASS A (50°C TEMPERATURE RISE) INSULATION, NEMA SERVICE FACTOR, PRELUBRICATED SLEEVE OR BALL BEARINGS.
      - ENCLOSED MOTORS: CLASS A (50°C TEMPERATURE RISE) INSULATION, 1.0 SERVICE FACTOR, PRELUBRICATED BALL BEARINGS.
   g. SPLIT PHASE MOTORS:
      - STARTING TORQUE: LESS THAN 150 PERCENT OF FULL LOAD TORQUE.
      - STARTING CURRENT: UP TO SEVEN TIMES FULL LOAD CURRENT.
      - BREAKDOWN TORQUE: APPROXIMATELY 200 PERCENT OF FULL LOAD TORQUE.
      - PERMANENT –SPLIT CAPACITOR MOTORS:
      - STARTING TORQUE: EXCEEDING ONE FOURTH OF FULL LOAD TORQUE.
      - STARTING CURRENT: UP TO SIX TIMES FULL LOAD CURRENT.
      - MULTIPLE SPEED: THROUGH TAPPED WINDINGS.
   h. CAPACITOR START MOTORS:
      - STARTING TORQUE: THREE TIMES FULL LOAD TORQUE.
      - STARTING CURRENT: LESS THAN FIVE TIMES FULL LOAD CURRENT.
      - PULL –UP TORQUE: UP TO 350 PERCENT OF FULL LOAD TORQUE.
      - BREAKDOWN TORQUE: APPROXIMATELY 250 PERCENT OF FULL LOAD TORQUE.
      - MOTORS: CAPACITOR IN SERIES WITH STARTING WINDING; CAPACITOR –START/CAPACITOR –RUN MOTORS SHALL HAVE TWO CAPACITORS IN PARALLEL WITH RUN CAPACITOR REMAINING IN CIRCUIT AT OPERATING SPEEDS.
   i. THREE PHASE MOTORS:
      - STARTING TORQUE: BETWEEN ONE AND ONE AND ONE –HALF TIMES FULL LOAD TORQUE.
      - STARTING CURRENT: SIX TIMES FULL LOAD CURRENT.
      - POWER OUTPUT, LOCKED ROTOR TORQUE, BREAKDOWN OR PULLOUT TORQUE: NEMA DESIGN B CHARACTERISTICS.
      - DESIGN, CONSTRUCTION, TESTING, AND PERFORMANCE: CONFORM TO ANSI/NEMA MG 1 FOR DESIGN B MOTORS.
      - INSULATION SYSTEM: NEMA CLASS F OR BETTER.
      - TESTING PROCEDURE: IN ACCORDANCE WITH ANSI/IEEE 112, TEST METHOD B. LOAD TEST MOTORS TO DETERMINE FREEDOM FROM ELECTRICAL OR MECHANICAL DEFECTS AND COMPLIANCE WITH PERFORMANCE DATA.
      - MOTOR FRAMES: NEMA STANDARD T –FRAMES OF STEEL, ALUMINUM, OR CAST IRON WITH END BRACKETS OF CAST IRON OR ALUMINUM WITH STEEL INSERTS.
      - BEARINGS: GREASE LUBRICATED ANTI –FRICTION BALL BEARINGS WITH HOUSINGS EQUIPPED WITH PLUGGED PROVISION FOR RELUBRICATION, RATED FOR MINIMUM AFBMA 9, L –10 LIFE OF 200,000 HOURS. CALCULATE BEARING LOAD WITH NEMA MINIMUM V – BELT PULLEY WITH BELT CENTER LINE AT END OF NEMA STANDARD SHAFT EXTENSION. STAMP BEARING SIZES ON NAMEPLATE.
      - SOUND POWER LEVELS: TO ANSI/NEMA MG 1.
      - PART WINDING START WHERE INDICATED: USE PART OF WINDING TO REDUCE LOCKED ROTOR STARTING CURRENT TO APPROXIMATELY 60 PERCENT OF FULL WINDING LOCKED ROTOR CURRENT WHILE PROVIDING APPROXIMATELY 50 PERCENT OF FULL WINDING LOCKED ROTOR TORQUE.
      - WEATHERPROOF EPOXY SEALED MOTORS (WHERE INDICATED): EPOXY SEAL WINDINGS USING VACUUM AND PRESSURE WITH ROTOR AND STARTER SURFACES PROTECTED WITH EPOXY ENAMEL. BEARINGS SHALL BE DOUBLE SHIELDED WITH WATERPROOF NON –WASHING GREASE.
      - NOMINAL EFFICIENCY: MEET OR EXCEED VALUES IN SCHEDULES AT FULL LOAD AND RATED VOLTAGE WHEN TESTED IN ACCORDANCE WITH ANSI/IEEE 112.
      - NOMINAL POWER FACTOR: MEET OR EXCEED VALUES IN SCHEDULES AT FULL LOAD AND RATED VOLTAGE WHEN TESTED IN ACCORDANCE WITH ANSI/IEEE 112.
   j. TEAO, C–FACED MOTORS, THREE PHASE POWER:
      - DIRECT DRIVE AIROVER MOTORS REQUIRED FOR VANE AXIAL FANS, CLASS F INSULATION.
      - MOTORS SHALL HAVE DUAL RATING ON NAMEPLATE FOR STILL AIR AND AIROVER OPERATION.

D. NEMA OPEN MOTOR SERVICE FACTORS:

HP	3600 RPM	1800 RPM	1200 RPM	900 RPM
1/6 - 1/3	1.35	1.35	1.35	1.35
1/2	1.25	1.25	1.25	1.15
3/4	1.25	1.25	1.15	1.15
1-1/4	1.15	1.15	1.15	1.15
1-1/2 - 150	1.15	1.15	1.15	1.15

E. MINIMUM NOMINAL FULL LOAD EFFICIENCY OF ENERGY EFFICIENT MOTORS:

	OPEN			CLOSED		
HP	3600 RPM	1800 RPM	1200 RPM	3600 RPM	1800 RPM	1200 RPM
1.0	-	82.5%	80.0%	75.5%	82.5%	80.0%
1.5	82.5%	84.0%	84.0%	82.5%	84.0%	85.5%
2.0	84.0%	84.0%	85.5%	84.0%	84.0%	86.5%
3.0	84.0%	86.5%	85.5%	85.5%	87.5%	87.5%
5.0	85.5%	87.5%	87.5%	87.5%	87.5%	87.5%
7.5	87.5%	88.5%	88.5%	88.5%	89.5%	89.5%
10	88.5%	89.5%	90.2%	89.5%	89.5%	89.5%
15	89.5%	91.0%	90.2%	90.2%	91.0%	90.2%
20	90.2%	91.0%	91.0%	90.2%	91.0%	90.2%
25	91.0%	91.7%	91.7%	91.0%	92.4%	91.7%
30	91.0%	92.4%	92.4%	91.0%	92.4%	91.7%

15. MECHANICAL–ELECTRICAL INTERFACE
A. SEPARATION OF WORK BETWEEN TRADES AND SUBCONTRACTORS IS NOT WITHIN THE SCOPE OF THESE SPECIFICATIONS. THE FOLLOWING IS PROPOSED FOR ASSISTANCE IN BIDDING ONLY.
B. UNLESS OTHERWISE INDICATED, MECHANICAL EQUIPMENT AND CONTROLS ARE SUGGESTED TO BE FURNISHED, INSTALLED AND WIRED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE; COORDINATE ALL WORK WITH DIVISION 26, ELECTRICAL:

MECHANICAL EQUIPMENT AND CONTROLS				
ITEM	POWER FURNISHED BY:	CONTROL INSTALLED BY:	POWER WIRING BY:	CONTROL WIRING BY:
EQUIPMENT MOTORS:	M	M	E	M
MAGNETIC MOTOR STARTERS AUTOMATICALLY CONTROLLED WITH OR WITHOUT HOA SWITCHES:	E	E	E	M
MAGNETIC MOTOR STARTERS MANUALLY CONTROLLED:	E	E	E	E
FURNISHED W/ MECH. EQUIPMENT, FACTORY-MOUNTED:	M	M	E	M
FURNISHED W/MECH. EQUIPMENT, FOR FIELD MOUNTING:	M	E	E	M
DISCONNECT SWITCHES, MANUAL MOTOR STARTERS, THERMAL OVERLOAD SWITCHES:	E	E	E	-
VALVES, FLOAT CONTROLS, DAMPER MOTORS, EP AND PE SWITCHES, OTHER MISCELLANEOUS	M	M	M	M
DIVISION 23 CONTROLS	E	M	-	M
M = DIVISION 23, MECHANICAL E = DIVISION 26, ELECTRICAL				

C. MECHANICAL–ELECTRICAL COORDINATION
   a. CHECK MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS TO ASSURE PROPER LOCATION AND ELECTRICAL CHARACTERISTICS OF OUTLETS SERVING MECHANICAL AND ELECTRICAL EQUIPMENT.
   b. ADVISE THE ARCHITECT/ENGINEER OF ANY MODIFICATIONS REQUIRED TO SUIT EQUIPMENT FURNISHED.
   c. PROVIDE FUNCTIONAL TEST OF CONTROL SYSTEM, AIR DISTRIBUTION SYSTEM AND ALL MECHANICAL COMPONENTS. TEST TO BE CONDUCTED IN THE PRESENCE OF THE BUILDING OWNER'S REPRESENTATIVE. WRITTEN VERIFICATION OF TEST TO BE SIGNED BY OWNER'S REPRESENTATIVE. THE TESTS SHALL VERIFY THAT ALL SYSTEMS ARE FUNCTIONAL AND OPERATIONAL PRIOR TO SUBSTANTIAL COMPLETION. ANY WORK NOT PASSING THE TESTS SHALL BE CORRECTED IMMEDIATELY.
   d. EXCEPT AS NOTED OTHERWISE, MOTOR STARTERS AND OTHER MEANS FOR OPERATION AND CONTROL OF EQUIPMENT ARE PROVIDED UNDER DIVISION 23, MECHANICAL.

D. WIRING
   a. POWER WIRING IS IN DIVISION 26.
   b. PROVIDE UNDER DIVISION 23 ALL CONTROL WIRING, LINE OR LOW VOLTAGE, THROUGH THE COILS OF THE MAGNETIC STARTERS AND RELAYS AND THROUGH THE CONTACTS OF THERMOSTATS AND OTHER PILOT DEVICES.
   c. PROVIDE UNDER DIVISION 23 CONDUIT FOR ALL LINE VOLTAGE CONTROL WIRING AND EXPOSED LOW VOLTAGE WIRING IN MECHANICAL ROOMS AND CEILING PLENUMS.
   d. PROVIDE FLEXIBLE CONDUIT REQUIRED ON SHORT RUNS TO EQUIPMENT SUBJECT TO VIBRATION, I.E., MOTORS, FANS.
   e. MOUNT STARTERS, DISCONNECTS AND PANELS ON WALLS WHERE PRACTICAL, NOT ON EQUIPMENT OR ON STAND FROM FLOOR.
   f. PROVIDE ELECTRICAL EQUIPMENT FURNISHED UNDER THIS SECTION OF SPECIFICATIONS IN STRICT ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.

PART 3 – EXECUTION

1. PROJECT/SITE CONDITIONS
A. EXAMINE PREMISES AND UNDERSTAND THE CONDITIONS, WHICH MAY AFFECT PERFORMANCE OF WORK OF THIS DIVISION BEFORE SUBMITTING PROPOSALS FOR THIS WORK. NO SUBSEQUENT ALLOWANCE FOR TIME OR MONEY WILL BE CONSIDERED FOR ANY CONSEQUENCE RELATED TO FAILURE TO EXAMINE SITE CONDITIONS.
B. PREPARE DRAWINGS SHOWING PROPOSED REARRANGEMENT OF WORK TO MEET PROJECT CONDITIONS, INCLUDING CHANGES TO WORK SPECIFIED IN OTHER SECTIONS. OBTAIN PERMISSION OF ARCHITECT/ENGINEER BEFORE PROCEEDING.
C. REFER TO RECORD DRAWINGS.

2. GENERAL COORDINATION AND INSTALLATION
A. INFORM OTHER TRADES THRU GENERAL CONTRACTOR AS TO REQUIREMENTS FOR SLEEVES, BOXES, OTHER OPENINGS, AND EMBEDDED ITEMS. COORDINATE WITH OTHER TRADES IN ORDER TO MAINTAIN JOB PROGRESS SCHEDULE AND TO AVOID CONFLICTS IN THE INSTALLATION OF WORK BY OTHER TRADES.
B. FURNISH AND INSTALL PIPE SLEEVES AND EMBEDDED ITEMS REQUIRED UNDER DIVISION 23.
C. CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH THE WORK INVOLVED AND SHALL VERIFY AT THE SITE ALL MEASUREMENTS NECESSARY FOR THE PROPER INSTALLATION OF HIS WORK.
D. CONTRACTOR SHALL REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR BUILDING CONSTRUCTION AND OTHER DETAILS WHICH AFFECT THE MECHANICAL INSTALLATION AND SHALL CONFER WITH THOSE TRADES FOR FINISH ADJACENT TO HIS WORK AND ARRANGE TO HAVE VISIBLE PORTIONS OF HIS WORK (SUCH AS ACCESS DOORS, GRILLES, ETC.) FIT IN AND HARMONIZE WITH THE FINISH IN A MANNER SATISFACTORY TO THE ARCHITECT.
E. CEILING HEIGHTS: REFER TO ARCHITECTURAL DRAWINGS FOR CEILING HEIGHT REQUIREMENTS.
F. ACCESSIBILITY OF EQUIPMENT: EQUIPMENT, COILS, VALVES, DAMPERS, ETC. SHALL BE INSTALLED SO AS TO BE ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR, AND ACCESS CLEARANCES SHALL COMPLY WITH ALL APPLICABLE CODES AND AS RECOMMENDED BY RESPECTIVE MANUFACTURER.
G. BELTS, PULLEYS, COUPLINGS, PROJECTING SET SCREWS, KEYS AND OTHER ROTATING PARTS WHICH MAY POSE A DANGER TO PERSONNEL, SHALL BE FULLY ENCLOSED OR GUARDED IN ACCORDANCE WITH OSHA REGULATIONS.
H. PROVIDE OFFSETS AROUND ALL ELECTRICAL PANELS (AND SIMILAR ELECTRICAL EQUIPMENT) TO MAINTAIN SPACE CLEAR ABOVE AND BELOW PANEL TO STRUCTURE AND CLEARANCE OF 3 FEET DIRECTLY IN FRONT OF PANEL. EXCEPT WHERE INDICATED OTHERWISE OR REQUIRED BY NEC TO BE MORE.

3. PLATES AND ISOLATORS
A. PLATES:
   a. INSTALL WHERE PIPES PASS THROUGH FINISHED CEILINGS AND FLOORS.
B. ISOLATORS:
   a. MODEL 100 OR 500 FOR PIPING THRU FRAME WALLS.
   b. MODEL LS FOR PIPING THRU CONCRETE WALLS AND FLOORS.
   c. PYRO–PAC IF FLOOR OR WALL IS FIRE RATED.

4. SLEEVES
A. INSTALL 20 GAGE GALVANIZED SLEEVES FOR PIPING THRU CONCRETE FLOORS ABOVEGROUND AND THRU MASONRY, PLASTERED AND FRAME WALLS. CLEARANCE AROUND PIPE FOR INSTALLATION OF ISOLATORS AND SEALS.IRON PIPE SLEEVES FOR PIPING THRU CONCRETE WALLS AND BEAMS. GROUT AROUND SLEEVES THRU WALLS.
B. IRON PIPE SLEEVES THRU CONCRETE FLOORS IN MECHANICAL ROOMS, IN TOILET ROOMS AND OTHER AREAS WITH CONCRETE FLOORS SUBJECT TO FLOODING AND MOPPING. SET TO EXTEND 1" ABOVE FINISHED FLOORS. SEALED OR CAULK. NO FLOOR PLATES.
C. WHERE COVERING IS SPECIFIED, MAKE SLEEVES OR CORES PROPER SIZE TO ALLOW FOR ISOLATORS THRU WALLS AND UNFINISHED FLOORS.
D. EXCEPT AS NOTED IN THE FOREGOING, CUT SLEEVES FLUSH WITH SURFACE.
E. SLEEVE PIPES PASSING THRU WALLS OR FLOORS IN FINISHED AREAS, THRU STONEMAN TRISOLATORS, OR LINK–SEAL TYPE LS OR PYRO–SEAL OR 3M FIRE BARRIER FS–195, TO EXTEND THRU BOTH FACES OF THE WALL OR FLOOR. CAULK AROUND SLEEVES TO PREVENT SOUND TRANSMISSION.
F. WHERE SLEEVES ARE OVERSIZE THRU FIRE SEPARATIONS, FILL VOID WITH DOW CORNING 3–6548 SILICONE RTV FOAM, LINK–SEAL PYRO–SEAL, FLAME–SAFE FIRE RETARDANT COMPOUND, OR EQUAL.
G. BORE OPENINGS FOR PIPES THRU CONCRETE AND MASONRY, USING DIAMOND CORE DRILL WHERE SLEEVING NOT DONE DURING CONSTRUCTION. H. MAKE ALL HOLES THRU PLENUMS AIRTIGHT.

5. FIRE–RATED PENETRATION SEALS
A. INSTALL IN ACCORDANCE WITH IBC.
B. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR SEALING FITTINGS AND BARRIER SEALING SYSTEMS.

6. FLASHING
A. PROVIDE FLEXIBLE FLASHING AND METAL COUNTERFLASHING WHERE PIPING AND DUCTWORK PENETRATE WEATHER OR WATERPROOFED WALLS, FLOORS, AND ROOFS.
B. FLASH VENT AND SOIL PIPES PROJECTING 3 INCHES MINIMUM ABOVE FINISHED ROOF SURFACE WITH LEAD WOR

MECHANICAL GENERAL PROVISIONS CONTD.

AN INDIVIDUAL HANGER.
•• ON ALL PIPING–" AND SMALLER.

c. VERTICAL PIPING:
- ATTACHMENT – VERTICAL PIPING SHALL BE SECURED AT SUFFICIENTLY CLOSE INTERVALS TO KEEP THE PIPE IN ALIGNMENT AND CARRY THE WEIGHT OF THE PIPE AND CONTENTS. STACKS SHALL BE SUPPORTED AT THEIR BASES AND IF OVER 2 STORIES IN HEIGHT OR 24' AT EVERY 12' BY APPROVED METAL FLOOR CLAMPS.
- SCREWED PIPE – SCREWED PIPE (I.P.S.) SHALL BE SUPPORTED AT NOT LESS THAN EVERY OTHER STORY HEIGHT OR 24'.
- COPPER TUBING – COPPER TUBING SHALL BE SUPPORTED AT EACH STORY FOR PIPING 1" AND LARGER DIAMETER, AND AT NOT MORE THAN 6 FOOT INTERVALS FOR PIPING 1" AND SMALLER IN DIAMETER
- PIPES OF OTHER APPROVED MATERIAL SHALL BE SUPPORTED IN ACCORDANCE WITH THEIR APPROVED INSTALLATION STANDARDS.

d. HORIZONTAL PIPING:
- SUPPORTS – HORIZONTAL OR LESS THAN 90° FROM HORIZONTAL, PIPING SHALL BE SUPPORTED AT SUFFICIENTLY CLOSE INTERVALS TO KEEP IT IN ALIGNMENT AND PREVENT SAGGING.
- SCREWED PIPE – SCREWED PIPE (I.P.S.) OR FLANGED PIPE SHALL BE SUPPORTED AT APPROXIMATELY 10 FOOT INTERVALS.
- COPPER TUBING – COPPER TUBING SHALL BE SUPPORTED AT APPROXIMATELY 6 FOOT INTERVALS FOR TUBING 1" AND SMALLER IN DIAMETER AND 10 FOOT INTERVALS FOR TUBING 2" AND LARGER IN DIAMETER.
- PIPES OF OTHER APPROVED MATERIALS SHALL BE SUPPORTED IN ACCORDANCE WITH THEIR APPROVED INSTALLATION STANDARDS.

e. BRACE SPACING:
- TRANSVERSE BRACINGS AT 40' – 0" O.C. MAXIMUM UNLESS OTHERWISE NOTED.
- LONGITUDINAL BRACINGS AT 80' – 0" O.C. MAXIMUM UNLESS OTHERWISE NOTED. WHEN THERMAL EXPANSION OR CONTRACTION IS INVOLVED, PROVIDE LONGITUDINAL BRACINGS AT ANCHOR POINTS. THE LONGITUDINAL BRACES AND THE CONNECTIONS MUST BE CAPABLE OF RESISTING THE FORCE INDUCED BY EXPANSION AND CONTRACTION.
- TRANSVERSE BRACING FOR ONE PIPE SECTION MAY ALSO ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED PERPENDICULAR TO IT, IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE OF SIMILAR SIZE.
- FOR THREADED PIPING THE FLEXIBILITY MAY BE PROVIDED BY THE INSTALLATION OF SWING JOINTS. IN WELDED OR SOLDER JOINT PIPING, THE FLEXIBILITY SHALL BE PROVIDED BY EXPANSION LOOPS OR MANUFACTURED FLEXIBLE CONNECTORS. FOR PIPING WITH MANUFACTURED BALL JOINTS SELECT LENGTH OF PIPING OFFSET USING "SEISMIC DRIFT" IN PLACE OF "EXPANSION PER JOINT MANUFACTURERS" SELECTION TABLE. SEISMIC DRIFT = 0.015 FT. PER FOOT OF HEIGHT.

f. DO NOT USE BRANCH LINES TO BRACE MAIN LINES.

g. TRAPEZE HANGERS MAY BE USED. PROVIDE FLEXIBILITY IN JOINTS WHERE PIPES PASS THROUGH BUILDING SEISMIC OR EXPANSION JOINTS, OR WHERE RIGIDLY SUPPORTED PIPES CONNECT TO EQUIPMENT WITH VIBRATION ISOLATORS.

h. A RIGID PIPING SYSTEM SHALL NOT BE BRACED TO DISSIMILAR PARTS OF A BUILDING OR TWO DISSIMILAR BUILDING SYSTEMS THAT MAY RESPOND IN A DIFFERENT MODE DURING AN EARTHQUAKE. EXAMPLES: WALL AND A ROOF; SOLID CONCRETE WALL AND A METAL DECK WITH LIGHTWEIGHT CONCRETE FILL.

i. PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALLS OR FLOORS TO ALLOW FOR ANTICIPATED DIFFERENTIAL MOVEMENTS.

j. AT VERTICAL PIPE RISERS, WHEREVER POSSIBLE, SUPPORT THE WEIGHT OF THE RISER AT A POINT OR POINTS ABOVE THE CENTER OF GRAVITY OF THE RISER. PROVIDE LATERAL GUIDES AT THE TOP AND BOTTOM OF THE RISER, AND AT INTERMEDIATE POINTS NOT TO EXCEED 30'–0" ON CENTER.

k. CAST IRON PIPE OF ALL TYPES, AND ANY OTHER PIPE JOINED WITH A SHIELD AND CLAMP ASSEMBLY WHERE THE TOP OF THE PIPE IS 12" OR MORE FROM SUPPORTING STRUCTURE SHALL BE BRACED ON EACH SIDE OF A CHANGE IN DIRECTION OF 90° OR MORE. RISER JOINTS SHALL BE BRACED OR STABILIZED BETWEEN FLOORS.

l. FOR GAS PIPING, THE BRACING DETAILS, SCHEDULES AND NOTES MAY BE USED EXCEPT THAT TRANSVERSE BRACING SHALL BE AT 20'–0" O.C. MAXIMUM AND LONGITUDINAL BRACING AT 40' – 0" O.C. MAXIMUM. ALSO 1", 1", 1", AND 2" DIAMETER PIPES SHALL BE BRACED THE SAME AS 2" DIAMETER PIPE IN THE SCHEDULE. (NO BRACING IS REQUIRED FOR PIPES–" DIAMETER AND SMALLER).

m. IT IS THE RESPONSIBILITY OF THE USER OF THE GUIDELINES TO ASCERTAIN THAT AN APPROPRIATE SIZE DEVICE BE SELECTED FOR EACH INDIVIDUAL PIECE OF EQUIPMENT.

C. EQUIPMENT RESTRAINTS:
a. MECHANICAL EQUIPMENT ANCHORAGES SUCH AS BOLTS, EXPANSION ANCHORS, SCREWS, ETC., SHALL COMPLY WITH THE FORCE LEVEL REQUIREMENTS ZONE 3 SEISMIC HAZARD.
b. RESTRAINING DEVICES MUST BE PLACED ON ALL SIDES OF THE EQUIPMENT BASE.
c. IT IS THE RESPONSIBILITY OF THE EQUIPMENT MANUFACTURER TO DESIGN HIS EQUIPMENT SO THAT THE STRENGTH AND ANCHORAGE OF THE INTERNAL COMPONENTS OF THE EQUIPMENT EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE UNIT ITSELF TO THE SUPPORTING STRUCTURE.
d. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ASCERTAIN THAT AN APPROPRIATE SIZE DEVICE BE SELECTED FOR EACH INDIVIDUAL PIECE OF EQUIPMENT.

10. ACCESS DOORS
A. WHEN NECESSARY TO GAIN ACCESS TO THE MECHANICAL SYSTEM THRU FINISHED WALLS OR CEILINGS, FURNISH METAL PANEL ACCESS DOORS OF PROPER SIZE, SUITABLE TO INSTALLATION CONDITIONS, FOR THE GENERAL CONTRACTOR TO INSTALL AND GIVE NECESSARY INFORMATION FOR PROPER LOCATION. NOTIFY GENERAL CONTRACTOR OF REQUIREMENTS PRIOR TO BIDDING.
B FIRE RATED WITH UL LABEL IF LOCATED IN A FIRE SEPARATION.

11. VALVES AND ACCESSORIES
A. RECORD ACTUAL LOCATIONS OF VALVES IN ALL MECHANICAL SYSTEMS ON PROJECT RECORD DRAWINGS.
B. PROVIDE VALVES AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
C. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
D. PROVIDE ACCESS WHERE VALVES AND FITTINGS ARE NOT EXPOSED.
E. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.
F. PROVIDE UNIONS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS.
G. INSTALL BRASS MALE ADAPTERS EACH SIDE OF VALVES IN COPPER PIPED SYSTEM. SWEAT SOLDER ADAPTERS TO PIPE.
H. INSTALL GATE, BALL OR BUTTERFLY VALVES FOR SHUT –OFF AND TO ISOLATE EQUIPMENT, PART OF SYSTEMS, OR VERTICAL RISERS.
I. PROVIDE GLOBE, BALL OR BUTTERFLY VALVES FOR THROTTLING, BYPASS, OR MANUAL FLOW CONTROL SERVICES.
J. PROVIDE CHECK VALVES ON DISCHARGE OF WATER PUMPS.
K. PROVIDE PLUG VALVES IN NATURAL GAS SYSTEMS FOR SHUT –OFF SERVICE.
L. PROVIDE BALANCING VALVES OR FLOW CONTROL VALVES IN WATER RECIRCULATING SYSTEMS WHERE INDICATED.

12. HEAT TRACE INSTALLATION
A. APPLY THE HEATING CABLES LINEARLY ON THE PIPE AFTER PIPING HAS BEEN SUCCESSFULLY PRESSURE TESTED. SECURE THE HEATER TO PIPING BEFORE INSULATION WITH CABLE TIES OR FIBERGLASS TAPE AT TWO–FOOT INTERVALS. POWER CONNECTION, END SEAL, SPLICE AND TEE KIT COMPONENTS SHALL BE APPLIED IN THE FIELD. WIRE AT THE ENDS OF CIRCUITS IS NOT TO BE TIED TOGETHER.
B. APPLY "ELECTRIC TRACED" SIGNS TO THE OUTSIDE OF THE THERMAL INSULATION AT TEN FOOT INTERVALS ALONG THE PIPE ON ALTERNATING SIDES.
C. AFTER INSTALLATION, AND BEFORE AND AFTER INSTALLING THE THERMAL INSULATION, SUBJECT HEATER TO TESTING USING A 2500 VDC MEGGER. MINIMUM INSULATION RESISTANCE SHOULD BE 20 TO 1000 MEGAOHMS REGARDLESS OF LENGTH.
D. THE INSTALLER SHALL PROVIDE RESISTANCE TEST FOR BOTH HEATING CABLE WIRES TO VERIFY THE CONNECTION OF ANY SPLICES OR TEES.
E. MECHANICAL CONTRACTOR IS RESPONSIBLE TO COORDINATE INSTALLATION OF HEAT TRACING WITH ELECTRICAL CONTRACTOR AND ALL SUBCONTRACTORS.

13. MECHANICAL IDENTIFICATION INSTALLATION
A. DEGREASE AND CLEAN SURFACES TO RECEIVE ADHESIVE FOR IDENTIFICATION MATERIALS.
B. PREPARE SURFACES IN ACCORDANCE WITH DIVISION 09 FOR STENCIL PAINTING.
C. PLASTIC NAMEPLATES: INSTALL WITH CORROSIVE –RESISTANT MECHANICAL FASTENERS, OR ADHESIVE.
D. PLASTIC OR METAL TAGS: INSTALL WITH CORROSIVE – RESISTANT CHAIN.
E. STENCIL PAINTING: APPLY IN ACCORDANCE WITH DIVISION 09.
F. PLASTIC PIPE MARKERS: INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
G. PLASTIC TAPE PIPE MARKERS: INSTALL COMPLETE AROUND PIPE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
H. UNDERGROUND PLASTIC PIPE MARKERS: INSTALL 6 TO 8 INCHES BELOW FINISHED GRADE, DIRECTLY ABOVE BURIED PIPE.
I. EQUIPMENT: IDENTIFY AIR HANDLING UNITS, PUMPS, HEAT TRANSFER EQUIPMENT, TANKS, AND WATER TREATMENT DEVICES WITH PLASTIC NAMEPLATES. SMALL DEVICES, SUCH AS IN –LINE PUMPS, MAY BE IDENTIFIED WITH PLASTIC OR METAL TAGS.
J. CONTROLS: IDENTIFY CONTROL PANELS AND MAJOR CONTROL COMPONENTS OUTSIDE PANELS WITH PLASTIC NAMEPLATES.
K. VALVES: IDENTIFY VALVES IN MAIN AND BRANCH PIPING WITH TAGS.
L. PIPING: IDENTIFY PIPING, CONCEALED OR EXPOSED, WITH PLASTIC PIPE MARKERS. IDENTIFY SERVICE, FLOW DIRECTION, AND PRESSURE. INSTALL IN CLEAR VIEW AND ALIGN WITH AXIS OF PIPING. LOCATE IDENTIFICATION NOT TO EXCEED 20 FEET ON STRAIGHT RUNS INCLUDING RISERS AND DROPS, ADJACENT TO EACH VALVE AND "T", AT EACH SIDE OF PENETRATION OF STRUCTURE OR ENCLOSURE, AND AT EACH OBSTRUCTION.DUCTWORK: IDENTIFY DUCTWORK WITH STENCILED PAINTING. IDENTIFY AS TO AIR HANDLING UNIT NUMBER, AND AREA SERVED. LOCATE IDENTIFICATION AT AIR HANDLING UNIT, AT EACH SIDE OF PENETRATION OF STRUCTURE OR ENCLOSURE, AND AT EACH OBSTRUCTION.

14. MOTORS
A. APPLICATION:
a. MOTORS DRAWING LESS THAN 250 WATTS AND INTENDED FOR INTERMITTENT SERVICE MAY BE GERMANE TO EQUIPMENT MANUFACTURER AND NEED NOT CONFORM TO THESE SPECIFICATIONS.
b. MOTORS SHALL BE OPEN DRIP –PROOF TYPE, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.
c. MOTORS WITH FRAME SIZES 143T AND LARGER SHALL BE ENERGY EFFICIENT TYPE.
d. SINGLE–PHASE MOTORS FOR SHAFT MOUNTED FANS AND CENTRIFUGAL PUMPS SHALL BE SPLIT PHASE TYPE.
e. SINGLE–PHASE MOTORS FOR SHAFT MOUNTED FANS OR BLOWERS SHALL BE PERMANENT SPLIT CAPACITOR TYPE.
f. SINGLE–PHASE MOTORS FOR AIR COMPRESSORS SHALL BE CAPACITOR START TYPE.
g. MOTORS LOCATED IN DIRECT DRIVE VANE–AXIAL FANS SHALL BE TOTALLY ENCLOSED TYPE.
h. MOTORS LOCATED IN EXTERIOR LOCATIONS SHALL BE TOTALLY ENCLOSED WEATHERPROOF EPOXY –SEALED TYPE.

15. MAINTAINING SERVICE
A. THE EXISTING BUILDING WILL REMAIN OCCUPIED DURING CONSTRUCTION.
B. ALL SERVICES SHALL BE MAINTAINED IN THE OCCUPIED AREAS OF THE BUILDING WITH A MINIMUM OF INTERRUPTION.
C. CONTRACTOR SHALL REPAIR OR REPLACE PROMPTLY ANY EXISTING UTILITIES DAMAGED BY THE CONTRACTOR'S OPERATION.
D. CONTRACTOR SHALL COORDINATE PHASING IF APPLICABLE OF CONSTRUCTION WORK WITH GENERAL CONTRACTOR AND SHALL ABIDE BY GENERAL CONTRACTOR'S PHASING SCHEDULE.

16. PRODUCT DELIVERY, STORAGE AND HANDLING
A. USE CARE IN TRANSPORTING, STORAGE AND HANDLING TO AVOID DAMAGE.
B. KEEP MATERIALS AND EQUIPMENT CLEAN, DRY AND FREE FROM HARMFUL AND HAZARDOUS CONDITIONS.

17. PROTECTION AND CLEANING
A. PROTECT ALL MATERIALS, EQUIPMENT, FIXTURES, PIPING AND VALVES FROM DAMAGE AND AGAINST RUST AND DIRTY CONDITIONS DURING PROGRESS OF THE JOB.
B. PROMPTLY REMOVE ALL WASTE MATERIAL AND RUBBISH AT THE END OF EACH WORKDAY.
C. CLEAN UP ALL EQUIPMENT AND FLUSH OUT AND CLEAN ALL PLUMBING FIXTURES AT COMPLETION OF JOB.
D. CLEAN OUT VENTILATION EQUIPMENT BOTH INSIDE AND OUT ON COMPLETION OF THE JOB. INSTALL CLEAN FILTERS.
E. FLUSH OUT ALL PIPING, CLEAN DIRT LEGS AND STRAINERS.

18. INSPECTION
A. DO NOT ALLOW ANY WORK TO BE COVERED UP OR ENCLOSED UNTIL INSPECTED, TESTED AND APPROVED BY ARCHITECT AND OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK.
B. SHOULD ANY WORK BE ENCLOSED OR COVERED UP BEFORE SUCH INSPECTION AND TEST, CONTRACTOR SHALL, AT ITS OWN EXPENSE, UNCOVER WORK, AND AFTER IT HAS BEEN INSPECTED, TESTED AND APPROVED, MAKE ALL REPAIRS AS NECESSARY TO RESTORE ALL WORK DISTURBED TO ITS ORIGINAL CONDITION.

19. TEMPORARY SYSTEMS
A. AIR SYSTEMS: DO NOT USE AIR SYSTEMS DURING CONSTRUCTION FOR TEMPORARY HEAT OR CONSTRUCTION VENTILATION. COVER DUCT AND GRILLE OPENINGS WITH TAPED–ON PLASTIC SHEET OR EQUIVALENT TO KEEP ALL CONSTRUCTION DUST OUT OF THE DUCTWORK.
B. TEMPORARY HEAT:
a. MAKE SEPARATE TEMPORARY HEATING SYSTEM AVAILABLE AND OPERATE AS EARLY AS PRACTICAL FOR TEMPORARY HEATING OF BUILDING DURING CONSTRUCTION.
b. FUEL AND POWER WILL BE THE RESPONSIBILITY OF CONTRACTOR.

20. OPERATING & MAINTENANCE INSTRUCTIONS
A. FOLLOWING INITIAL OPERATION OF MECHANICAL SYSTEMS AND PRIOR TO ACCEPTANCE BY THE OWNER, PERFORM THE FOLLOWING SERVICES:
a. AT LEAST TWO WEEKS PRIOR TO EACH INSTRUCTION PERIOD GIVE WRITTEN NOTIFICATION OF READINESS TO PROCEED TO THE ARCHITECT/ENGINEER AND THE OWNER, AND OBTAIN MUTUALLY ACCEPTABLE DATES.
b. CONDUCT DEMONSTRATIONS AND INSTRUCTIONS FOR THE OWNER'S REPRESENTATIVES, POINTING OUT REQUIREMENTS FOR SERVICING AND MAINTAINING EQUIPMENT AND SYSTEMS PROVIDED UNDER THIS CONTRACT.
c. IF REQUESTED BY THE ARCHITECT/ENGINEER, FURNISH QUALIFICATIONS OF CONTRACTORS' PERSONNEL IN CHARGE OF THE INSTRUCTION; FOREMAN POSITION IS MINIMUM ACCEPTABLE.
d. OWNER'S REPRESENTATIVE MAY INCLUDE PERSONNEL FROM OPERATIONS, FACILITIES ENGINEERING AND MAINTENANCE DEPARTMENTS.
e. INCLUDE PRELIMINARY DISCUSSION, INFORMATION FROM MAINTENANCE MANUAL AND CONTRACT DRAWINGS; CONDUCT TOURS OF THE NEW CONSTRUCTION, EXPLAINING MAINTENANCE, OPERATION AND ADJUSTMENT OF EACH PIECE OF EQUIPMENT.
f. MINIMUM DURATION OF INSTRUCTION PERIODS:
- HEATING, VENTILATING, AND AIR CONDITIONING; 8 HOURS
- CONTROLS; 16 HOURS

g. PROVIDE WRITTEN OUTLINE OF MATERIAL TO BE COVERED IN INSTRUCTION PERIODS FOR REVIEW TWO WEEKS MINIMUM PRIOR TO SESSIONS.
h. INSTRUCTION PERIODS SHALL OCCUR AFTER O&M MANUALS HAVE BEEN REVIEWED AND APPROVED AND SHALL INCORPORATE MANUALS IN THE COURSE MATERIAL.

21. FUNCTIONAL TESTING
A. PRIOR TO PERFORMING THE FUNCTIONAL TEST IN THE PRESENCE OF THE ENGINEER AND BUILDING OWNER'S REPRESENTATIVE, THE CONTRACTOR SHALL HAVE TESTED ALL MECHANICAL SYSTEMS, COMPONENTS AND CONTROLS TO FULLY PROVE FUNCTIONALITY. MAKE ALL FINAL CALIBRATIONS, ADJUSTMENTS AND REPAIRS PRIOR TO CALLING FOR FUNCTIONAL TEST TO BE WITNESSED.
B. PROVIDE FUNCTIONAL TEST OF ALL MECHANICAL SYSTEMS, COMPONENTS AND CONTROL SYSTEM. SYSTEMS AND COMPONENTS SHALL BE RUN THROUGH ALL MODES OF OPERATION DEMONSTRATING THAT SYSTEMS AND COMPONENTS ARE FULLY FUNCTIONAL. TEST SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER AND BUILDING OWNER'S REPRESENTATIVE. PROVIDE WRITTEN TEST PROCEDURE TWO WEEKS PRIOR TO SCHEDULED TEST. PROVIDE WRITTEN VERIFICATION OF TEST TO BE SIGNED BY OWNER'S REPRESENTATIVE. PROVIDE OWNER WITH COPY OF SIGNED VERIFICATION.
C. SHOULD SYSTEMS NOT FUNCTION PROPERLY IN FUNCTIONAL TEST WITNESSED BY ENGINEER OR SYSTEMS, IN–PART OR WHOLE, NOT READY AND/OR COMPLETE FOR TEST, CONTRACTOR SHALL REIMBURSE ENGINEER FOR TIME AND EXPENSES, MINIMUM OF $800/WORK DAY, REQUIRED TO WITNESS ADDITIONAL TESTS OF SYSTEMS OR COMPONENTS NOT PERFORMING ACCEPTABLY OR NOT COMPLETE FOR A FULL TEST. THIS PORTION OF THE BID CONTRACT SHALL BE DEEMED NON–CONFORMING IN FUNCTIONAL TEST IS NOT COMPLETED AS SCHEDULED. PAYMENT TO ENGINEER FOR THE NON–CONFORMING FUNCTIONAL TEST MUST BE MADE PRIOR TO ANY ADDITIONAL FUNCTIONAL TESTS.

22. PROJECT CLOSEOUT
A. REQUIREMENTS FOR FINAL INSPECTION:
a. ALL OF THE FOLLOWING ITEMS SHALL BE COMPLETED PRIOR TO FINAL INSPECTIONS. NO EXCEPTIONS WILL BE MADE AND NO APPROVAL FOR FINAL PAYMENT WILL BE MADE UNTIL ALL ITEMS ARE COMPLETED:
b. CLEANING EQUIPMENT AND PREMISES
c. PROOF OF FUNCTIONAL TESTING
d. OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS
e. OPERATOR TRAINING SESSIONS
f. TESTING, ADJUSTING AND BALANCING
g. APPROVALS OF ALL CODE AUTHORITIES AND BUILDING OFFICIALS
h. RECORD DRAWINGS ("AS–BUILT")
i. GUARANTEE

B. REFER TO DIVISION 01 FOR ADDITIONAL REQUIREMENTS.

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PROFESSIONAL ENGINEER

SVCA
CLUBHOUSE HVAC
4 CLUBHOUSE CIR,
BELLINGHAM, WA, 98229

REVISIONS

NO	DATE	BY	DESCRIPTION
1	01/28/26	RR	AHU-2 Rev

TITLE

HVAC SPECIFICATONS

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M0.0.DWG
JOB NUMBER	2024.11

PERMIT SET 08-15-2025

M0.3

AIR HANDLER UNIT (AHU-) SCHEDULE

TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL						NOTES
			EVAPORATOR	TOTAL COOL (BTUH)	SENS COOL (BTUH)	DESIGN FLOW (CFM)	O.A. FLOW (CFM)	ESP (IN WG)	VELOCITY (RPM)	HP	FEI	VOLTAGE	PHASE	MCA	BREAKER	WEIGHT (LBS)	DIMENSIONS (H"xL"xW")	
AHU-2A	LOWER FLOOR	SAMSUNG	AM096HEHDCG	96,000	74,000	2,500	-	1.25	-	-	-	208	1	5.9	15	200	18"x40"x48"	1-9
AHU-2B	LOWER FLOOR	SAMSUNG	AM096HEHDCG	96,000	74,000	2,500	-	1.25	-	-	-	208	1	5.9	15	200	18"x40"x48"	1-9

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. RFIELD ROUTE TO APPROVED DRAIN.
3. WITH R-32 REFRIGERANT.
4. TEMPERED OUTSIDE AIR PROVIDED BY 100% O.A.
5. PROVIDE W/ MERV-8 FILTER
6. CONNECT TO EXIST BUILDING CONTROL SYSTEM.
7. COOLING PROVIDED BY DX COIL FROM CU-2.
8. TO OPERATE SIMULTANEOUSLY.
9. HEATING PROVIDED BY SEPARATE EXISTING DUCT MOUNTED HOT WATER HEATING COIL.

SPLIT SYSTEM HEATPUMP (CU-) SCHEDULE

TAG	SERVES	MANUF.	MODEL	CAPACITY	CAPACITY	ELECTRICAL				EER	COP	REFRIG CIRCUITS	DIMENSIONS	WEIGHT	NOTES
				COOL (BTUH)	HEAT (BTUH)	VOLTAGE	PHASE	MCA	BREAKER				(H"xL"xW")		
CU-2	AHU-2A/ AHU-2B	SAMSUNG	AM192HCVGIG	192,000	206,000	460	3	34	40	11	3.55	2	66"x74"x30"	820	1,2,3,4,5

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. WITH R-32 REFRIGERANT.
3. W/ FIELD GFI RECEPTACLE
4. W/ LOW AMBIENT CONTROL TO 45 DEGREES F
5. VERIFY REFRIGERANT LIBE SIZE W/ SUPPLIER.

AHU-2A & 2B CONTROLS

- AHU-2A & AHU-2B TO OPERATE SIMULTANEOUSLY DURING OPERATING HOURS;
- FAN TO OPERATE ON BUILDING OCCUPANCY SCHEDULE.
- UPON CALL FOR HEATING, CONDENSING UNIT TO ENGAGE AND ACT AS PRIMARY HEATING SOURCE; DOWNSTREAM HEATING COIL VALVE TO OPEN WHEN DISCHARGE TEMPERATURE IS NOT MET.
- UPON CALL FOR COOLING, HEATING COIL VALVE TO CLOSE (IF OPEN) AND CONDENSING UNIT COOLING TO ENGAGE.

REFRIGERANT CONCENTRATION LIMIT (RCL) CALCULATIONS:

REFRIGERANT SHUT-OFF BOX LOCATED IN MECHANICAL ROOM
MECH ROOM VOLUME: 340 SQ FT X 10 FT= 3400 FT3
TOTAL REFRIG CHARGE FROM SYSTEM= 40 LBS

ALLOWABLE MAX RCL= 0.061 LB/FT3

RCL= 0.061 LB/FT3 X 3400 FT3= 207 LB

PERMIT SET 08-15-2025

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HVAC SCHEDULES

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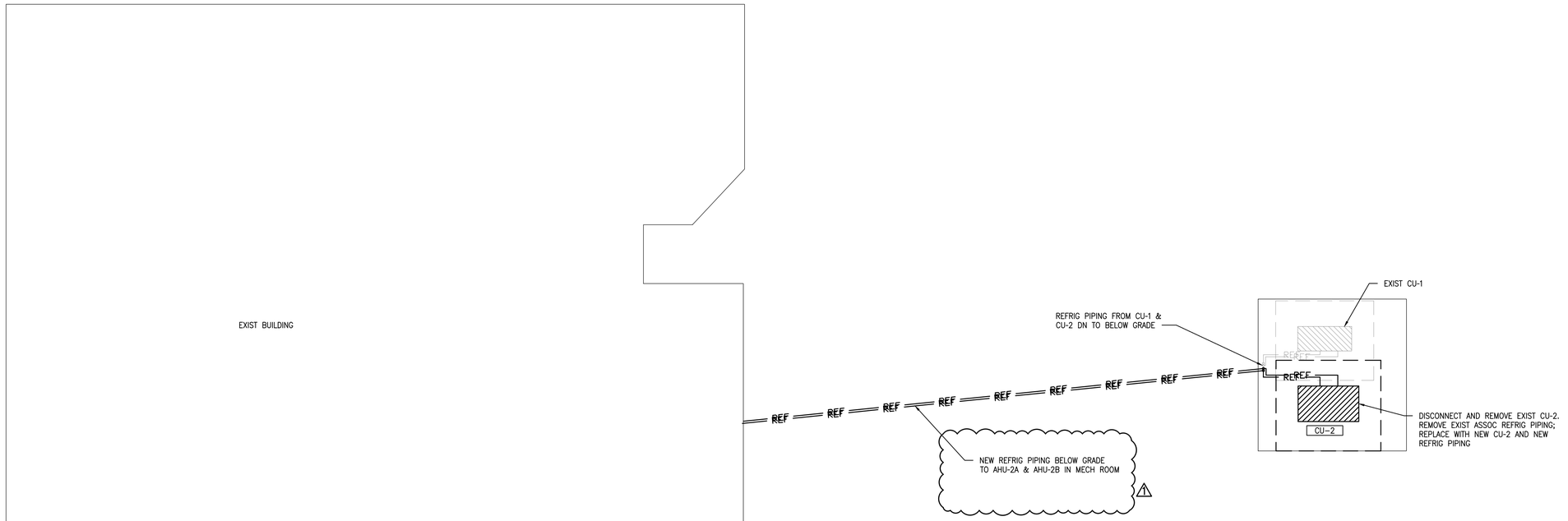
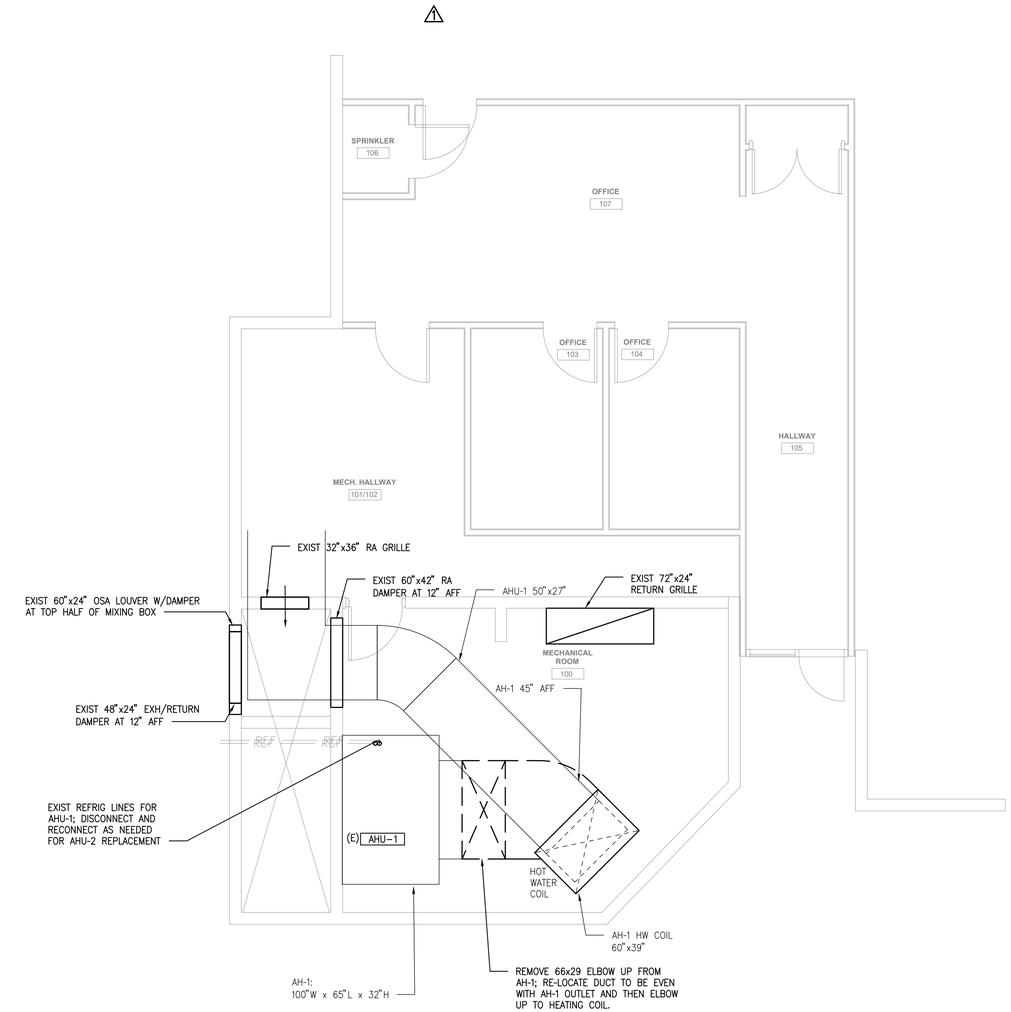
DATE	08/15/2025
CADD FILE	2024.11 M1.0.DWG
JOB NUMBER	2024.11

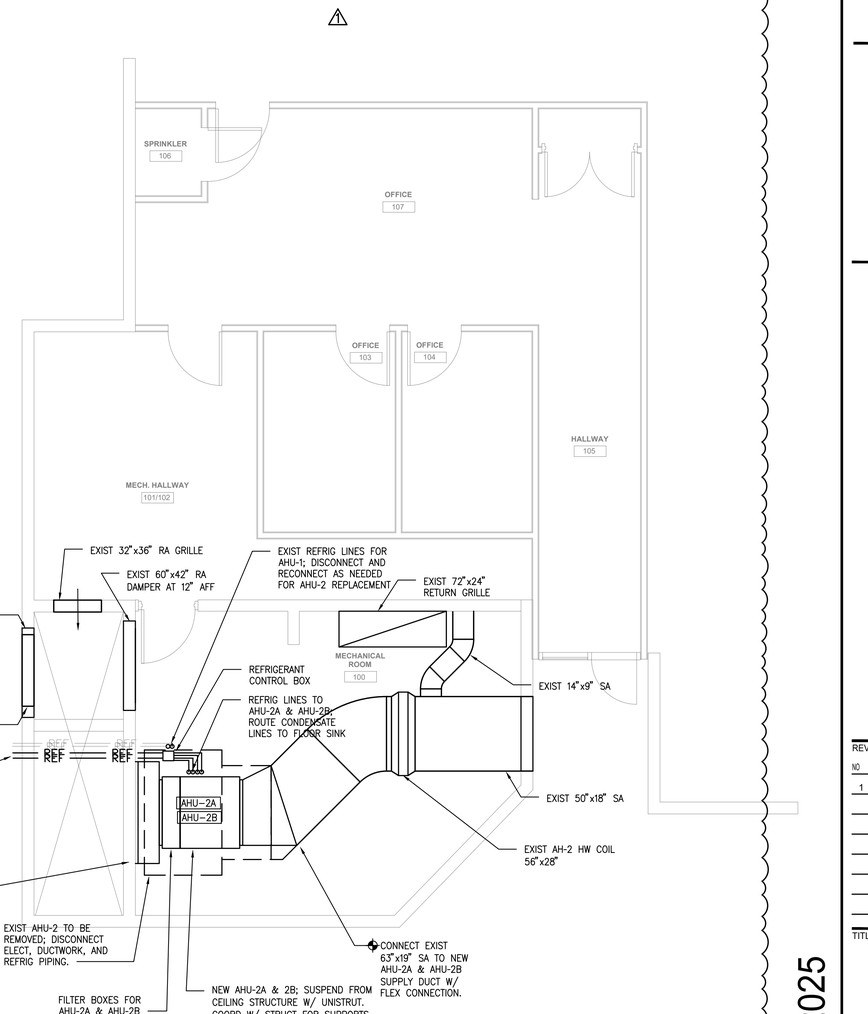
M1.0


EXIST BUILDING
EXIST BUILDING
REFRIG PIPING FROM CU-1 & CU-2 DN TO BELOW GRADE
EXIST CU-1
REF
REF
REF



HVAC FLOOR PLAN- AHU-1

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



HVAC FLOOR PLAN- AHU-2

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

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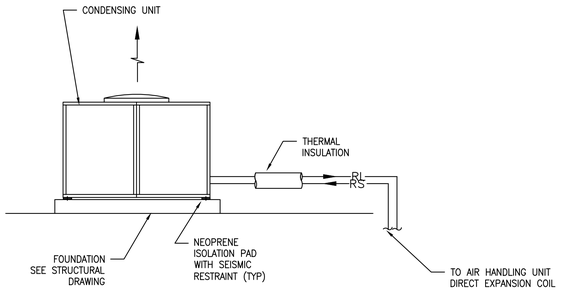
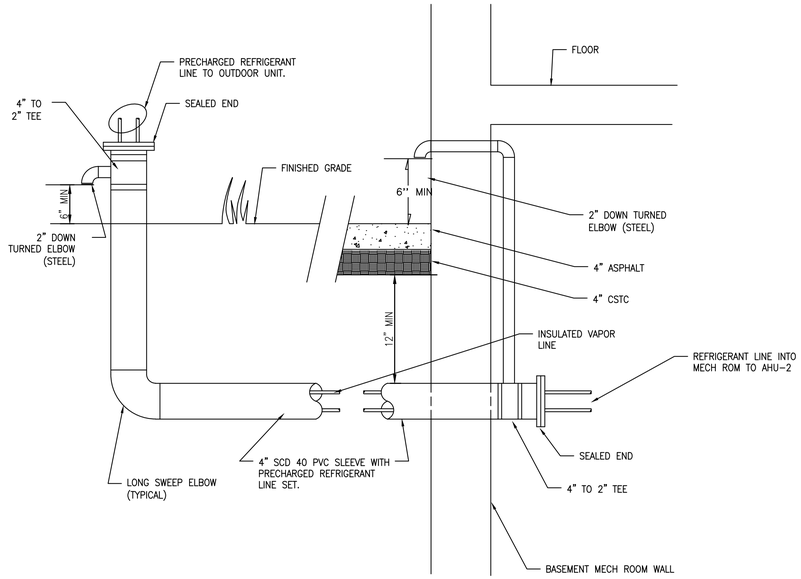
HVAC MECH ROOM PLAN

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.1.DWG
JOB NUMBER	2024.11

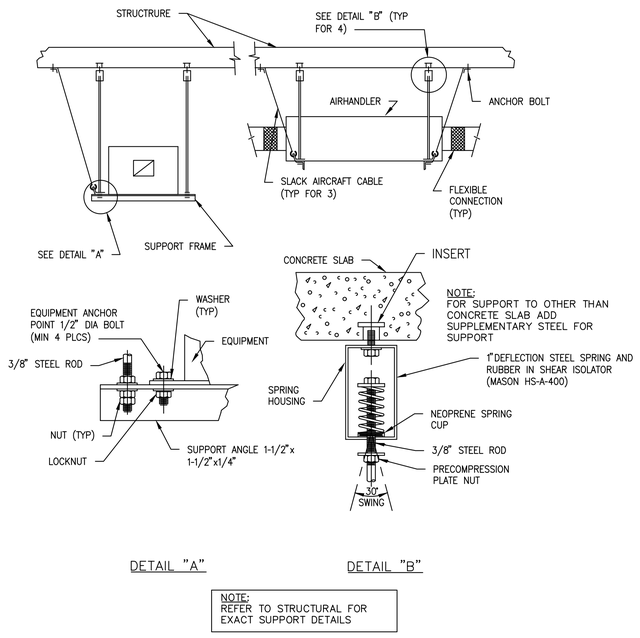
M2.1



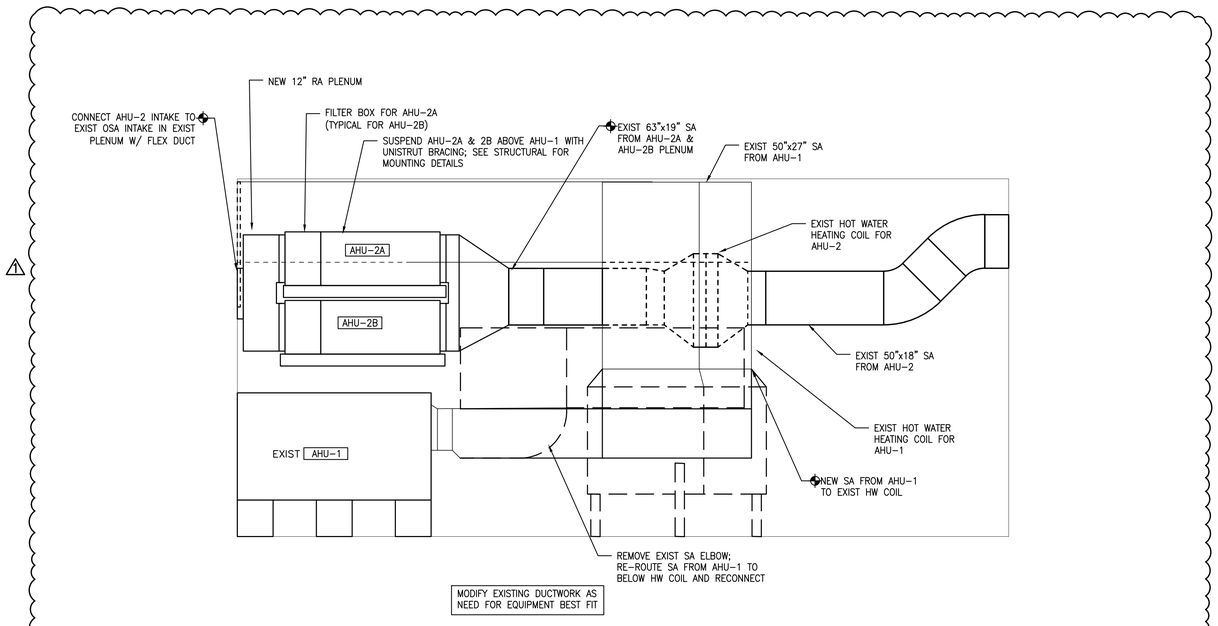
1 AIR COOLED CONDENSING DETAIL
SCALE: NONE



2 UNDERGROUND PIPING DETAIL
SCALE: NTS



3 AHU SUPPORT DETAIL
NOT TO SCALE



1

4 MECH ROOM HVAC SECTION
SCALE: NONE

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JOB NUMBER	2024.11

M3.0

PNW SERVICES, INC.

January 28th, 2026

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Quote Request – Clubhouse HVAC Replacement

Addendum #5 to the Bid Documents

A. This Addendum shall be considered part of the bid documents for the above-mentioned project, and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence.

B. SVCA will apply for a new Mechanical Permit, and that will be provided to contractor once issued.

Bid Form: No changes

Changes to Submittal Date: No Change, bid date is Monday, February 9th, 2026 at 5:00pm per Addendum #4.

Changes to Drawings:
- New set of drawings issued per attached – 8 pages.

End of Addendum No. 5

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072.

GENERAL

NORTH ARROW

SECTION CALLOUT

DETAIL CALLOUT

POINT OF CONNECTION

REVISION NOTE

FLAG NOTE (CONSTRUCTION)

EF-3 — EQUIPMENT IDENTIFIER

LIGHT LINE WEIGHT INDICATES EXISTING WORK

BOLD LINE WEIGHT INDICATES NEW WORK

LIGHT DASHED LINES INDICATE WORK TO BE ABANDONED OR REMOVED

SLASHED LINES INDICATE EXISTING WORK TO BE DEMOLISHED

HVAC

CUBIC FEET PER MINUTE

CENTER LINE

ROUND DUCT INDICATOR

THERMOSTAT LINE

RISE — DIRECTION OF RISE FOR DUCT

24x12 — DUCT (FIRST FIGURE DENOTES VIEW SHOWN)

24x12 / 10x8 — SINGLE LINE DUCTWORK INDICATES DUCT WITH VIEW DIMENSION LESS THAN 12 INCHES

SUPPLY OR EXHAUST TAKEOFF

SUPPLY DUCT TURNING TOWARD, UP

SUPPLY DUCT TURNING AWAY

EXHAUST DUCT TURNING TOWARD, UP

EXHAUST DUCT TURNING AWAY

ROUND DUCT TURNING TOWARD, UP

ROUND DUCT TURNING AWAY

CONICAL WYE

CONICAL TEE

VOLUME DAMPER(VD)

FIRE SMOKE DAMPER(FSD)

MOTORIZED DAMPER(FD)

FIRE DAMPER(FD)

3-WAY SUPPLY DIFFUSER

2-WAY SUPPLY DIFFUSER

2-WAY CORNER SUPPLY DIFFUSER

1-WAY SUPPLY DIFFUSER

DOUBLE LINE, LINED DUCT/ ACOUSTIC DUCT

SINGLE LINE, LINED DUCT/ ACOUSTIC DUCT

TV — RECTANGULAR 90° ELBOW W/ TURNING VANES TYPICAL

30X20 / 18"ø — RECTANGLE TO ROUND FITTING

SOUND ATTENUATOR

ACCESS DOORS

FLEXIBLE DUCT

TS — THERMOSTAT OR TEMPERATURE SENSOR

T — THERMOSTAT OR TEMPERATURE SENSOR(CEILING)

DSD — DUCT SMOKE DETECTOR

DPT — DIFFERENTIAL PRESSURE TRANSDUCER

ROUND SUPPLY AIR DIFFUSER

ROUND SUPPLY AIR DIFFUSER WITH PORTION BLANKED OFF

HVAC (CONT.)

LINEAR SUPPLY AIR DIFFUSER

SQUARE SUPPLY AIR DIFFUSER

SQUARE RETURN AIR GRILLE

SQUARE EXHAUST AIR GRILLE

SIDEWALL SUPPLY AIR GRILLE OR REGISTER

SIDEWALL RETURN/EXHAUST AIR GRILLE OR REGISTER

AIR FLOW DIRECTION THRU DOOR GRILLE OR UNDERCUT

ABBREVIATIONS

AC	AIR CONDITIONING
ACF	AIR CURTAIN FAN
ADA	AMERICAN DISABILITIES ACT
AD	AREA DRAIN
ADJ	ADJACENT, ADJUST, ADJUSTABLE, ADJUSTMENT
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINED
ALIGN	ALIGNMENT
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AVG	AVERAGE
BFF	BELOW FINISH FLOOR
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BPD	BACKFLOW PREVENTION DEVICE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BV	BALANCING VALVE
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CI	CAST IRON
CLG	CEILING
CO	CLEANOUT
CONN	CONNECT, CONNECTED, CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS, CONTINUATION
COORD	COORDINATE
CORR	CORRIDOR
COTG	CLEANOUT TO GRADE
CU FT	CUBIC FEET
CU IN	CUBIC INCHES
CW	COLD WATER
DB	DRY BULB TEMPERATURE
DCV	DEMAND CONTROL VENTILATION
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DEG	DEGREE
DET	DETAIL
DFU	DRAINAGE FIXTURE UNIT
DIA	DIAMETER
DIFF	DIFFERENTIAL, DIFFERENT, DIFFUSER
DIM	DIMENSION
DISCH	DISCHARGE
DN	DOWN
DOM	DOMESTIC
DR	DRAIN
DS	DOWNSPOUT
DSD	DUCT SMOKE DETECTOR
DWG	DRAWING
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
ELECT	ELECTRICAL
ELEV	ELEVATION
EMERG	EMERGENCY
ENT	ENTERING
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
F	FAHRENHEIT
FC	FANCOIL
FCO	FLOOR CLEANOUT
FD	FIRE DAMPER, FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FIO	FURNISHED AND INSTALLED BY OWNER
FLA	FULL LOAD AMP
FLEX	FLEXIBLE
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOIC	FURNISHED BY OWNER INSTALLED BY CONTRACTOR
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
FT	FOOT, FEET
FU	FIXTURE UNITS
G	GAS
GA	GAGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL
GND	GROUND
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GW	GREASE WASTE
H	HEIGHT, HIGH
HB	HOSE BIBB
HP	HORSEPOWER
HR	HOUR
HTG	HEATING
HVAC	HEATING VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HWC	HOT WATER CIRCULATING
HWR	HOT WATER HEATING RETURN
HWS	HOT WATER HEATING SUPPLY
HZ	HERTZ

ABBREVIATIONS (CONT.)

IBC	INTERNATIONAL BUILDING CODE
ID	INDIRECT DRAIN
IE	INVERT ELEVATION
IMC	INTERNATIONAL MECHANICAL CODE
IN	INCH
INSUL	INSULATE, INSULATION
IW	INDIRECT WASTE
KW	KILOWATT
KWH	KILOWATT HOUR
L	LENGTH
LAV	LAVATORY
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAL FOOT
LVG	LEAVING
MA	MIXED AIR
MAX	MAXIMUM
MBH, MBTU	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
MTG	MOUNTING
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OAC	OUTDOOR AIR CONDITIONER
OAT	OUTSIDE AIR TEMPERATURE
OD	OUTSIDE DIAMETER, OVERALL DIAMETER
OH	OVERHEAD
ORD	OVERFLOW ROOF DRAIN
OSA	OUTSIDE AIR
P	PUMP
PD	PRESSURE DROP, PIT DRAIN
PH	PHASE
POC	POINT OF CONNECTION
PRELIM	PRELIMINARY
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAGE
RA	RETURN AIR
RD	ROOF DRAIN
RECIRC	RECIRCULATING
RECT	RECTANGULAR
REF	REFERENCE
REG	REGULATOR
REQD	REQUIRED
RND	ROUND
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
SAN	SANITARY
SCHED	SCHEDULE
SD	SUPPLY DIFFUSER
SF	SUPPLY FAN, SQUARE FEET
SG	SUPPLY GRILLE
SO	SCREENED OPENING
SOV	SHUT OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SPECD	SPECIFIED
SST	STAINLESS STEEL
SS	SOIL STACK, SANITARY SEWER
STRUCT	STRUCTURAL
SWG	SUPPLY WALL GRILLE
SWR	SUPPLY WALL REGISTER
TBD	TO BE DETERMINED
TEMP	TEMPERATURE, TEMPORARY
TSTAT	THERMOSTAT
THRU	THROUGH
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TP	TRAP PRIMER
TS	TEMPERATURE SENSOR
TV	TURNING VANE
TW	TEMPERED WATER
TWR	TEMPERED WATER RECIRCULATE
TYP	TYPICAL
UPC	UNIFORM PLUMBING CODE
UTR	UP THRU ROOF
V	VENT
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VOL	VOLUME
VS	VENT STACK
VTR	VENT TO ROOF
W	WASTE
WCO	WALL CLEAN OUT
WB	WET BULB TEMPERATURE
WEF	WALL EXHAUST FAN
WG	WATER GAGE
WHA	WATER HAMMER ARRESTOR
W/	WITH
W/O	WITHOUT
WS	WASTE STACK
WT	WEIGHT
WSFU	WATER SUPPLY FIXTURE UNIT

DRAWING LIST

GENERAL NOTES:

1. COMPLETE INSTALLATION OF THE MECHANICAL SYSTEM SHALL BE PER THE LATEST ADOPTED VERSION OF INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), WASHINGTON STATE ENERGY CODE (WSEC), UNIFORM PLUMBING CODE (UPC), INTERNATIONAL FUEL GAS CODE (IFGC), INTERNATIONAL FIRE CODE (IFC), NFPA AND HEALTH CODES AND REGULATIONS AS ADOPTED BY THE LOCAL JURISDICTIONS.
2. CONTRACTOR SHALL COORDINATE DIFFUSER, GRILLE AND REGISTER LOCATIONS AND DUCT ROUTING CLEARANCES WITH THE STRUCTURAL, REFLECTED CEILING AND LIGHTING PLANS.
3. MAKE ACCEPTABLE ACCESS PROVISIONS FOR REMOVAL OF FILTER AND MAINTENANCE FOR ALL INDOOR UNITS. REFER TO MANUFACTURER'S INSTALLATION GUIDE.
4. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE.
5. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR.
6. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE DOCUMENTS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
7. ALL GAS EQUIPMENT SHALL BE INSTALLED PER THEIR LISTINGS, IMC, UPC, IFGC AND LOCAL CODES.
8. ALL ROOF PENETRATIONS SHALL BE MINIMUM OF 5 FEET AWAY FROM THE AREA/OCCUPATION SEPARATION WALLS. ALL PIPE, DUCT AND CONDUIT PENETRATIONS THROUGH RATED ASSEMBLIES SHALL BE FIRE AND SMOKE STOPPED PER CODE.
9. ALL EQUIPMENT, DAMPERS, PIPING, AND ACCESSORIES IN CONCEALED SPACES REQUIRING ACCESS SHALL HAVE ACCESS DOORS. ALL ACCESS DOORS IN FIRE RATED STRUCTURE SHALL BE FIRE RATED. COORDINATE LOCATIONS WITH ARCHITECT. CONTRACTOR TO PROVIDE ACCESS DOORS.
10. ALL EQUIPMENT SHALL BE FREE FROM DEFECTS IN MATERIAL, WORKMANSHIP, AND SHALL BE OF THE KIND AND QUALITY DESCRIBED HEREIN.
11. COORDINATE WITH THE STRUCTURAL ENGINEER AND GENERAL CONTRACTOR TO PROVIDE STRUCTURAL SUPPORT AND SEISMIC RESTRAINTS FOR ALL EQUIPMENT.
12. ALL EQUIPMENT SHALL BE APPROVED FOR INSTALLATION IN THE STATE OF WASHINGTON AND SHALL HAVE ALL CERTIFICATIONS AND RATINGS REQUIRED TO MEET ALL ENERGY, POLLUTION, ENVIRONMENTAL, SEISMIC, ETC. CODES AND REGULATIONS.
13. VERIFY ALL THE MECHANICAL EQUIPMENT'S ELECTRICAL LOADS VOLTAGE/PHASE, ETC. WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING.
14. WHERE MULTIPLE RISERS OR HORIZONTAL LOOPS ARE USED, BALANCING VALVES IN THE RETURN LINES ARE REQUIRED. A CHECK VALVE SHALL BE PROVIDED IN EACH RETURN TO PREVENT TEMPORARY REVERSAL OF FLOW.
15. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY IMC, UPC, IBC, WASHINGTON STATE ENERGY CODE AND ALL APPLICABLE LOCAL AMENDMENTS.
16. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
17. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, ELECTRICAL WORK, ETC., SHOWN ON CONTRACT DOCUMENT DRAWINGS.
18. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
19. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE NEBB STANDARDS. AABC ACCEPTABLE PENDING AGENCY APPROVAL.
20. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
21. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
22. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
23. AIR AND FLUID FLOW RATES SHALL BE TESTED AND BALANCED WITHIN THE TOLERANCES DEFINED IN SPECIFICATIONS OR SHOWN ON PLANS. SYSTEMS SHALL BE BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, THEN ADJUSTED TO MEET DESIGN FLOW CONDITIONS.
24. RECORD DRAWINGS SHALL BE PROVIDED TO THE OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE AS REQUIRED BY SECTION C103.6 OF THE WSEC. THE DRAWINGS SHALL INDICATE THE LOCATION AND PERFORMANCE DATA OF EQUIPMENT, GENERAL CONFIGURATION OF DUCTWORK AND PIPING DISTRIBUTION SYSTEMS, INCLUDING FLOW RATES AS A MINIMUM, THAT HAVE BEEN DEVIATED FROM THESE DOCUMENTS. A COMPLETE RECORD OF CHANGES SHALL BE KEPT TO DATE ON A DAILY BASIS AND MADE ACCESSIBLE TO OWNER AND ENGINEER.

GENERAL HVAC NOTE:

1. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
2. LOCATE ALL TEMPERATURE, DEVICES IN DUCTWORK LOCATIONS WITH STRAIGHT SECTION OF DUCT UP AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
3. COORDINATE AND PROVIDE ALL DUCT TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT DIMENSIONS BEFORE FABRICATION.
4. ALL EQUIPMENT, DUCTWORK, ETC., SHALL BE SUPPORTED AS REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION, AND SEISMICALLY BRACED AS REQUIRED. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
5. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC. ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.
6. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'-0" (CENTERLINE) ABOVE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE ABOVE LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
7. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
8. PROVIDE ALL 90 DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.
9. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE (WITHIN TRUSSES), WITH SPACE FOR INSULATION IF REQUIRED.
10. MAXIMUM LENGTH OF FLEXIBLE DUCTS LOCATED ABOVE HARD CEILINGS SHALL BE AS CODE PERMITS BUT NO LONGER THAN 4 FEET.
11. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS ,INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

2021 WASHINGTON STATE ENERGY CODE (WSEC) NOTES

1. HVAC EQUIPMENT SHALL HAVE MINIMUM PERFORMANCE AT SPECIFIED RATING CONDITIONS NOT LESS THAN THE VALUES INDICATED IN TABLE C403.3.2(1) THRU C403.3.2(12) OF THE WSEC AND AS INDICATED ON THE CONTRACT DOCUMENTS.
2. PROVIDE DEADBAND BETWEEN HEATING/COOLING SPACE SENSOR SETPOINTS OF 5 DEGREES AS REQUIRED BY SECTION C403.4.1.2 OF THE WSEC OR AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
3. HVAC SYSTEMS SHALL BE EQUIPPED WITH AUTOMATIC CONTROLS CAPABLE OF ACCOMPLISHING SETBACK OR SHUTDOWN DURING UNOCCUPIED PERIODS AS REQUIRED BY SECTION C403.4.2 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
4. PROVIDE BALANCING DEVICES IN ALL BRANCH DUCTS AS REQUIRED BY SECTION C408.2.2 AND C408.2.2.1 OF THE WSEC AND AS INDICATED ON THE CONTRACT DOCUMENTS.
5. ALL DUCTWORK SHALL COMPLY WITH SMACNA STANDARDS FOR CONSTRUCTION OF GALVANIZED DUCTWORK. ALL DUCTWORK SHALL BE SEALED AS REQUIRED BY SECTION C403.10.1 "DUCT AND PLENUM INSULATION AND SEALING" OF THE WSEC. DUCT TAPE NOT ALLOWED.
6. ALL DUCTWORK SHALL BE INSULATED AS REQUIRED BY SECTION C403.10.1 "DUCT AND PLENUM INSULATION AND SEALING" OF THE WSEC.
7. ALL PIPING SHALL BE INSULATED AS REQUIRED BY SECTION C403.10.3 OF THE WSEC.
8. HEATING AND COOLING EQUIPMENT FANS SHALL BE SHUT OFF DURING UNOCCUPIED PERIODS AS REQUIRED BY SECTION C403.3.5.2 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
9. SUPPLY AIR AND WATER TEMPERATURES SHALL BE AUTOMATICALLY RESET AS REQUIRED IN SECTION C403.4.4 AND C403.6.4 OF THE WSEC OR AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
10. ALL AIR SYSTEMS SHALL BE PROVIDED WITH A 100% CAPABLE AIR ECONOMIZER CAPABILITY AS REQUIRED BY THE SECTION C403.5 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
11. AIR ECONOMIZERS SHALL BE CAPABLE OF PROVIDING PARTIAL COOLING EVEN WHEN ADDITIONAL MECHANICAL COOLING IS REQUIRED TO MEET THE REMAINDER OF THE COOLING LOAD, AS REQUIRED IN SECTION 403.5.1 OF THE WSEC.
12. SIMULTANEOUS HEATING AND COOLING TO INDIVIDUAL ZONES SHALL BE PROHIBITED AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES EXCEPT WHERE PERMITTED IN SECTION C403.4.1, EXCEPTIONS 1 THROUGH 3 OF THE WSEC.
13. VARIABLE FREQUENCY DRIVES SHALL BE PROVIDED FOR VARIABLE FLOW HEATING AND AIR HANDLING SYSTEMS AS REQUIRED BY SECTION C403.2.3 OF THE WSEC AND AS DESCRIBED IN THE CONTRACT DOCUMENTS INCLUDING TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
14. MOTOR EFFICIENCY SHALL NOT BE LESS THAN THE MINIMUM CALLOUTS PER SECTION C405.8 OF THE WSEC FOR FULL LOAD EFFICIENCIES.
15. HVAC SYSTEMS SHALL BE BALANCED AS REQUIRED BY SECTION C408.2 OF THE WSEC.
16. OPERATION AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE OWNER AS REQUIRED BY SECTION C103.6.2 OF THE WSEC. AS A MINIMUM, THE MANUALS SHALL INCLUDE:
    - A. SUBMITTAL DATA.
    - B. OPERATION AND MAINTENANCE DATA FOR EQUIPMENT.
    - C. NAMES AND ADDRESSES OF SERVICE AGENCIES.
    - D. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION.
17. COMMISSIONING SHALL BE PROVIDED AND A REPORT OF COMMISSIONING BE SUBMITTED TO THE OWNER AS REQUIRED BY SECTION C408 OF THE WSEC. AND CONTRACTOR SHALL SUBMIT FORM "FIGURE C408.1.4.1" COMMISSIONING COMPLIANCE CHECKLIST.
18. IF NOT SPECIFICALLY STATED ABOVE, CONTRACTOR SHALL COMPLY WITH THE WSEC ITEMS THAT DO APPLY TO THIS PROJECT.

APPLICABLE CODES

2021 INTERNATIONAL BUILDING CODE W/ WA STATE AMENDMENTS
2021 INTERNATIONAL MECHANICAL CODE WITH WA STATE AMENDMENTS
2021 WA STATE ENERGY CODE

GENERAL HVAC NOTES (CONT.)

12. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL VOLUME DAMPERS AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/OR INSPECTION.
13. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.
14. ALL OSA, RELIEF/EXHAUST AIR, AND RETURN AIR DAMPERS SHALL BE MOTORIZED CONTROL AND SHALL HAVE A MAX LEAKAGE OF 4CFM/FT² @ 1.0"WG IN ACCORDANCE W/ AMCA 500D.ACCEPTABLE ACCESS PROVISIONS FOR REMOVAL OF FILTER AND MAINTENANCE FOR ALL INDOOR UNITS.
15. ALL AIR DISTRIBUTION SUPPLY OUTLETS AND RETURN/EXHAUST INLETS SHALL HAVE VOLUME CONTROL DEVICES.
16. ALL 90 DEGREE TRUNK DUCT ELBOWS SHALL BE SMOOTH-ROUND OR SQUARE WITH TURNING VANES.
17. CONTRACTOR SHALL LOCATE AND COORDINATE EXACT LOCATION OF DUCTWORK WITHIN THE STRUCTURE AT SITE.
18. ALL FAN SYSTEMS WITH OVER 2000 CFM SHALL HAVE SMOKE/DUCT DETECTORS TO SHUT-DOWN FAN UPON DETECTION. DUCT/SMOKE DETECTORS FURNISHED AND INSTALLED BY ELECTRICAL AND WIRED BY ELECTRICAL. DUCT/SMOKE DETECTORS SHALL BE LISTED BY AN APPROVED AGENCY AND FOR INSTALLATION IN AIR DUCTS PER IMC.
19. ALL DUCT PENETRATIONS THROUGH RATED ENCLOSURES SHALL BE FIRE DAMPERED AND/OR SMOKE DAMPERED AS REQUIRED.
20. ALL MECHANICAL HEATING AND VENTILATION EQUIPMENT SHALL CONFORM TO SMACNA, LOCAL AND STATE REGULATIONS FOR SEISMIC RESTRAINT (INCLUDING PIPING AND DUCTWORK). COORDINATE WITH STRUCTURAL.
21. ALL RECTANGULAR DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS. SUPPLY AND RETURN DUCTWORK FOR HVAC TO HAVE 1" SOUNDLINING FOR THE FIRST 10 FEET FROM UNIT DISCHARGE OUTLET. ALL DUCT LINING TO MEET AND EXCEED MOLD, HUMIDITY, EROSION RESISTANT, ETC. TO MEET 1MC CHAPTER 6. ALL DUCTWORK TO BE CLASS-I AIR DUCTS. CLASS-II DUCTS SHALL NOT BE USED.
22. PROVIDE COMPLETE REFRIGERATION PIPING, INSULATION AND CONTROLS TO ALL MECHANICAL REFRIGERANT EQUIPMENT.

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PERMIT SET 08-15-2025

REVISIONS

NO	DATE	BY	DESCRIPTION
1	01/28/26	RR	AHU-2 Rev

TITLE

HVAC LEGENDS AND NOTES

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M0.0.DWG
JOB NUMBER	2024.11

M0.0

MECHANICAL GENERAL PROVISIONS DIVISION 22 AND 23

PART 1 – GENERAL

1. SECTION INCLUDES
 A. BASIC GENERAL PROVISIONS SPECIFICALLY APPLICABLE TO DIVISION 23 SECTIONS, IN ADDITION TO DIVISION 1 – GENERAL REQUIREMENTS.
2. GENERAL REQUIREMENTS
 A. CONDITIONS:
  a. CONFORM TO ALL BIDDING REQUIREMENTS, GENERAL CONDITIONS AND AMENDMENTS TO THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS AND SPECIAL CONDITIONS AND GENERAL REQUIREMENTS, DIVISION 1, WHICH GOVERN THE WORK SPECIFIED HEREIN.
  b. THE CONTRACTOR IS OBLIGATED TO COMPLY WITH THE ABOVE IN ADDITION TO THE REQUIREMENTS OF THIS SECTION.
  c. MODIFICATIONS BY THIS SECTION DO NOT NULLIFY ANY OTHER PORTIONS OF THE ABOVE REFERENCED CONDITIONS.
 B. PLANS AND SPECIFICATIONS:
  a. PLANS AND SPECIFICATIONS SHALL BE TAKEN TOGETHER.
  b. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS AND WORK SHOWN ON THE PLANS AND/OR CALLED FOR IN THESE SPECIFICATIONS.
  c. PROVIDE WORK SPECIFIED AND NOT INDICATED ON PLANS, OR WORK INDICATED ON PLANS AND NOT SPECIFIED, AS THOUGH MENTIONED IN BOTH.
  d. WHEN DISCREPANCIES OCCUR BETWEEN PLANS AND SPECIFICATIONS OR WITHIN THE PLANS AND SPECIFICATIONS, THE ARCHITECT SHALL DETERMINE WHICH TAKES PRECEDENCE AND THE CONTRACTOR SHALL PERFORM THE SELECTED REQUIREMENT WITHOUT ADDITIONAL COST.
  e. MECHANICAL DRAWINGS:
   • MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL ARRANGEMENT OF PIPING, DUCTWORK, EQUIPMENT, ETC. FOLLOW AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT. BECAUSE OF SMALL SCALE OF MECHANICAL DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES, WHICH MAY BE REQUIRED.
   • CONSIDER ARCHITECTURAL, STRUCTURAL CIVIL, ACOUSTICAL, AND ELECTRICAL DRAWINGS PART OF THIS WORK INSOFAR AS THESE DRAWINGS FURNISH INFORMATION RELATING TO DESIGN AND CONSTRUCTION OF BUILDING.
   • INVESTIGATE ARCHITECTURAL AND STRUCTURAL AND FINISH CONDITIONS AFFECTING THIS WORK AND ARRANGE WORK ACCORDINGLY, PROVIDING SUCH FITTINGS, VALVES, AND ACCESSORIES REQUIRED MEETING CONDITIONS.
 C. READ AND BECOME FAMILIAR WITH BIDDING DOCUMENTS AND ALL OTHER DIVISIONS OF THIS SPECIFICATION AS THEY DO APPLY TO WORK IN DIVISION 23.
3. DEFINITIONS AND ABBREVIATIONS
 A. THE WORD "PROVIDE," AS USED IN DIVISION 23, MEANS "FURNISH AND INSTALL."
 B. THE WORD "CONTRACTOR," AS USED IN THESE SPECIFICATIONS, MEANS THE MECHANICAL CONTRACTOR.
 C. THE WORD "APPROVED," AS USED IN THESE SPECIFICATIONS, MEANS APPROVAL OF THE ARCHITECT.
 D. ABBREVIATIONS:
  • AABC – ASSOCIATED AIR BALANCE COUNCIL
  • AMCA – AIR MOVING AND CONDITIONING ASSOCIATION
  • ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
  • AHRI – AIR CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
  • ASHRAE – AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
  • ASME – AMERICAN SOCIETY OF MECHANICAL ENGINEERS
  • ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
  • AWWA – AMERICAN WATER WORKS ASSOCIATION
  • AWS – AMERICAN WELDING SOCIETY
  • CISPI – CAST IRON SOIL PIPE INSTITUTE
  • IBC – INTERNATIONAL BUILDING CODE
  • IMC – INTERNATIONAL MECHANICAL CODE
  • FM – FACTORY MUTUAL ENGINEERING CORPORATION
  • NEBB – NATIONAL ENVIRONMENTAL BALANCING BUREAU
  • NEC – NATIONAL ELECTRICAL CODE
  • NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
  • NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
  • OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
  • SEC – SEATTLE ENERGY CODE
  • SMACNA – SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC.
  • SBC – SEATTLE BUILDING CODE
  • SPC – SEATTLE PLUMBING CODE
  • SMC – SEATTLE MECHANICAL CODE
  • UL – UNDERWRITERS LABORATORY
  • UPC – UNIFORM PLUMBING CODE
  • WSEC – WASHINGTON STATE ENERGY CODE
4. CODES, PERMITS AND INSPECTIONS
 A. CODES: UNLESS OTHERWISE STATED OR SHOWN AS TO MEET OR EXCEED CODES. WORK SHALL BE INSTALLED AS A MINIMUM IN CONFORMITY WITH APPLICABLE LOCAL ORDINANCES AND STATUTES. STANDARDS AND SIZES, WHICH EXCEED PRECEDING REQUIREMENTS, SHALL BE INSTALLED AS DRAWN OR SPECIFIED. NOTHING IN THE SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT DEVIATION TO LESS THAN THE REQUIREMENTS OF GOVERNING CODES.
 B. CODES AND STANDARDS: APPLICABLE CODES AND STANDARDS SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO:
  a. UNIFORM PLUMBING CODE, BY INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS AND LOCAL AMENDMENTS.
  b. INTERNATIONAL MECHANICAL CODE, BY INTERNATIONAL CODE COUNCIL AND LOCAL AMENDMENTS.
  c. INTERNATIONAL BUILDING CODE, BY INTERNATIONAL CODE COUNCIL AND LOCAL AMENDMENTS.
  d. REQUIREMENTS OF OSHA, EPA AND WISHA.
  e. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND LOCAL AMENDMENTS.
  f. ASME CODES FOR BOILER AND PRESSURE VESSELS.
  g. SMACNA HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION.
  h. ALL LOCAL AND STATE AMENDMENTS.
  i. REQUIREMENTS OF ALL AGENCIES HAVE JURISDICTIONAL AUTHORITY OVER INSTALLATION OF MECHANICAL SYSTEMS.
 C. AGENCIES HAVING JURISDICTIONAL AUTHORITY OVER MECHANICAL INSTALLATION.
  a. LOCAL MUNICIPAL BUILDING DEPARTMENT
  b. LOCAL SEWER AND WATER DISTRICT REQUIREMENTS
  c. STATE AND COUNTY DEPARTMENT OF HEALTH
  d. LOCAL FIRE MARSHAL
  e. STATE BOILER INSPECTOR
 D. PERMITS, FEES AND INSPECTIONS:
  a. CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS, FEES AND INSPECTIONS REQUIRED IN CONNECTION WITH THIS INSTALLATION. THE CONTRACTOR SHALL PRESENT THE OWNER WITH PROPERLY SIGNED CERTIFICATES OF FINAL INSPECTION BEFORE THE WORK WILL BE ACCEPTED.
  b. CONTRACTOR SHALL CALL FOR ALL INSPECTIONS BY LOCAL BUILDING OFFICIAL(S) WHEN THEY BECOME DUE, AND SHALL NOT COVER ANY WORK UNTIL APPROVED BY THESE GOVERNING AUTHORITIES.
  c. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH UTILITY COMPANIES FOR WATER, GAS AND DRAINAGE SERVICES, ETC., ASSOCIATED WITH THE WORK AND INCLUDE REQUIRED PAYMENTS FOR METERS, PIPING, SERVICES, CONNECTION CHARGES AND MATERIALS FURNISHED AND INSTALLED BY UTILITY COMPANIES. WORK AND MATERIALS SHALL BE IN STRICT ACCORDANCE WITH RULES OF RESPECTIVE AUTHORITIES.
 E. UNDERWRITERS APPROVAL: WHERE UNDERWRITERS LABORATORY STANDARDS EXIST, ALL ITEMS OF ELECTRICAL EQUIPMENT OR ITEMS PARTIALLY COMPOSED OF ELECTRICAL EQUIPMENT SHALL CARRY UNDERWRITERS' LABORATORY LABEL EITHER FOR THE ENTIRE UNIT OR FOR THE ELECTRICAL PORTION OF THE EQUIPMENT. IF STANDARDS DO NOT EXIST, EQUIPMENT WILL BE APPROVED IF THE ITEM HAS BEEN SUBMITTED TO THE TESTING LABORATORY AND THE MANUFACTURER CERTIFIES COMPLIANCE WITH UNDERWRITERS LABORATORY STANDARDS ESTABLISHED FOR SIMILAR ITEMS.
 F. ASME CODE STAMP: ASME CODE STAMP REQUIRED ON ALL PRESSURE VESSELS AND RELIEF VALVES. CERTIFICATE REQUIRED FROM THE STATE BOILER INSPECTOR SHOWING APPROVAL OF THE EQUIPMENT AND ITS INSTALLATION.
5. WORK INCLUDED
 A. WORK UNDER THIS DIVISION SHALL INCLUDE FURNISHING ALL MATERIALS, LABOR, EQUIPMENT, TOOLS, APPLIANCES, HOISTING, SCAFFOLDING, SUPERVISION AND OVERHEAD FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK.
 B. ALL EQUIPMENT, MATERIALS AND PRODUCTS AS NOTED IN PART 2 OF EACH SECTION SHOULD BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
 C. PROVIDE ALL ADDITIONAL PIPING, DUCTS, CAPS AND VALVES NOT SHOWN ON DRAWINGS, TO MAINTAIN FULLY OPERATIONAL SYSTEMS DURING THE PROJECT AT NO ADDITIONAL COST TO THE OWNER.
 D. SOME EQUIPMENT MAY REQUIRE TEMPORARY INSTALLATION DURING ONE PHASE AND REQUIRE RELOCATION TO FINAL LOCATION UNDER ANOTHER PHASE. PROVIDE ALL ASSOCIATED LABOR AND MATERIALS TO ACCOMMODATE THIS PHASING.
 E. MECHANICAL SYSTEMS – INCLUDING BUT NOT LIMITED TO:
  a. PLUMBING SYSTEMS.
  b. AUTOMATIC SPRINKLER SYSTEMS.
  c. HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS.
  d. TEMPERATURE CONTROLS SYSTEM.
 F. DEMOLITION WHEN APPLICABLE:
  a. PERFORM ALL DEMOLITION OR INTERFACE WORK REQUIRED IN THE EXISTING BUILDING FOR THE REMOVAL OF OR INTERFACES WITH EXISTING MECHANICAL EQUIPMENT, DUCTWORK, TUBING, OR PIPING. RELOCATE OR MODIFY THE EXISTING PIPING, TUBING AND DUCTWORK AS REQUIRED BY ANY GENERAL CONSTRUCTION ALTERATIONS OR BY THE INSTALLATION OF NEW DUCTWORK, TUBING, OR PIPING IN THE EXISTING BUILDING.
  b. EXISTING MATERIALS, REMOVAL AND DISPOSITION:
   • SCOPE: FOR MECHANICAL ITEMS, WHICH REMAIN THE PROPERTY OF THE OWNER, REFER TO DRAWINGS.
   • IN COORDINATION WITH THE OWNER'S REPRESENTATIVES, THESE MATERIALS SHALL BE MADE AVAILABLE FOR THEIR INSPECTION AND DECISION AS TO WHETHER THE OWNER WILL RETAIN POSSESSION. ITEMS SELECTED FOR RETENTION SHALL BE DELIVERED TO A LOCATION ON THE PREMISES SELECTED BY THE OWNER AND TURNED OVER TO THEM. TAKE REASONABLE CARE TO AVOID DAMAGE TO THIS MATERIAL.
   • ALL MATERIAL NOT SELECTED FOR RETENTION BY THE OWNER AND THE CONTRACTOR SHALL DISPOSE OF DEBRIS.
  c. REUSE OF MATERIALS: DO NOT REUSE PIPING IN GENERAL, BUT CAST–IRON SOIL PIPE MAY BE REUSED IN NEW WORK IF OF PROPER ARRANGEMENT, WALL THICKNESS AND PRESSURE RATING.
  d. NOTIFY ARCHITECT OF DISCOVERY OF ANY HAZARDOUS MATERIALS SUCH AS ASBESTOS, ETC.
6. WORK SEQUENCE
 A. CONTRACTOR SHALL FOLLOW ALL PHASING FOR THIS PROJECT AS PROVIDED IN THE ARCHITECTURAL DRAWINGS WHEN APPLICABLE.
 B. INSTALL WORK IN STAGES TO ACCOMMODATE OWNER'S OCCUPANCY REQUIREMENTS DURING THE CONSTRUCTION PERIOD. COORDINATE MECHANICAL SCHEDULE AND OPERATIONS WITH OWNER.
7. QUALITY ASSURANCE
 A. REFERENCES HEREINAFTER IN DIVISION 23 OF THIS SPECIFICATION TO MATERIAL OR TYPE OF CONSTRUCTION ARE FOR THE PURPOSE OF ESTABLISHING A STANDARD OF QUALITY. ANY EQUIPMENT OR MATERIAL THAT IS PROPOSED BY THE CONTRACTOR AND IS NOT SPECIFICALLY IDENTIFIED IN THE CONTRACT DOCUMENTS SHALL REQUIRE ENGINEER'S APPROVAL.
 B. PROVIDE MATERIALS BEARING LEGIBLE MARKINGS SHOWING THE STANDARDS TO WHICH THEY CONFORM: I.E. ASTM, ANSI, COMMERCIAL STANDARDS, AMCA, ARI, ETC.
 C. WHERE SPECIFICALLY NOTED, PROVIDE MANUFACTURERS' CERTIFICATION THAT MATERIALS MEET OR EXCEED MINIMUM REQUIREMENTS SPEC. CERTIFICATION SHALL BE SIGNED AND DATED BY MANUFACTURER'S EXECUTIVE OR AUTHORIZED REPRESENTATIVE.
 D. MAKE COMPLETE INSTALLATION, CONNECTING TO ALL EQUIPMENT SHOWN ON THE CONTRACT DOCUMENTS, PLANS, OR CALLED FOR IN THE SPECIFICATIONS. CONTRACTOR TO PROVIDE ALL EXTRA DAMPERS AND VALVES AS REQUIRED AND "NOT SHOWN ON PLANS" TO OBTAIN DESIGN CRITERIA AS REQUIRED BY THE BALANCING CONTRACTOR.
 E. ALL WORK, MATERIAL AND EQUIPMENT TO BE FREE OF DEFECT.
8. SUBSTITUTIONS A. MANUFACTURERS:
 A. THE USE OF BRAND NAMES IS FOR THE PURPOSE OF DESCRIPTION AND ESTABLISHING LEVEL OF QUALITY AND DOES NOT ELIMINATE THE REQUIREMENTS OF MEETING SPECIFICATIONS.
 B. MANUFACTURERS LISTED IN CONTRACT DOCUMENTS ARE APPROVED TO BID THE PROJECT FOR THE ITEMS INDICATED WITHOUT OBTAINING PRIOR APPROVAL. OTHER MANUFACTURERS DESIRING TO BID THE PROJECT REQUIRE PRIOR APPROVAL.
 C. THE PRIOR APPROVAL LISTING OF A MANUFACTURER DOES NOT NECESSARILY MEAN THAT THE PRODUCTS OF THAT MANUFACTURER ARE EQUAL TO THOSE SPECIFIED. THE LISTING IS ONLY AN INDICATION OF THOSE MANUFACTURERS WHICH MAY BE CAPABLE OF MANUFACTURING; OR HAVE IN THE PAST MANUFACTURED, ITEMS EQUIVALENT TO OR EXCEEDS THOSE SPECIFIED, AND IS INTENDED TO AID THE CONTRACTOR IN IDENTIFYING MANUFACTURERS.
 D. EXCEPTIONS: OTHER BRANDS NOT ACCEPTED WHERE AN ITEM OR CLASS OF MATERIAL IS SPECIFIED EXCLUSIVELY BY TRADE NAME AND FOLLOWED BY THE WORD ONLY.
 E. THE APPROVAL OF A MANUFACTURER APPLIES TO THE MANUFACTURER ONLY AND DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF MEETING ALL APPLICABLE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
 F. REQUESTS FOR SUBSTITUTIONS (PRIOR APPROVALS) SHALL BE FURNISHED NO LATER THAN 10 WORKING DAYS PRIOR TO BID DATE OR REQUEST MAY NOT BE CONSIDERED. ALL SUBSTITUTION REQUESTS REVIEWED AND ACCEPTED WILL BE DESCRIBED AND LISTED IN AN ADDENDUM ISSUED PRIOR TO BID DATE. PRIOR APPROVALS ARE FOR MANUFACTURERS ONLY AND NOT SPECIFIC STYLES OR MODELS OF EQUIPMENT OR MATERIALS AND DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
9. PLANS AND SPECIFICATIONS
 A. THE CONTRACT DOCUMENTS, DRAWINGS AND SPECIFICATIONS ARE INTENDED TO COVER THE WORK, UNLESS OTHERWISE INDICATED. PROVIDE MATERIALS, WHICH ARE NECESSARY FOR THE PROPER COMPLETION OF THE INSTALLATION OR OPERATION OF THE EQUIPMENT.
 B. THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW EXACT OR COMPLETE PIPING AND DUCTWORK CONFIGURATIONS OR THE NECESSARY NUMBER AND TYPES OF FITTINGS. INCLUDE LABOR AND MATERIALS REQUIRED TO COMPLETE THE WORK.
 C. MINOR DEVIATIONS:
  a. CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE EXTENT AND GENERAL ARRANGEMENT OF SYSTEMS. GENERALLY FOLLOW THE LAYOUTS SHOWN AND COORDINATE THE INSTALLATION OF WORK WITH THAT OF THE OTHER TRADES.
  b. MINOR DEVIATIONS MAY BE MADE ON THE JOB WITH THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER, PROVIDED NO ADDITIONAL CHARGES WILL BE MADE TO THE OWNER FOR SUCH DEVIATION.
10. WORKMANSHIP
 A. THE CONTRACTOR SHALL PROVIDE COMPLETED SYSTEMS WITH A NEAT AND FINISHED APPEARANCE. IF, IN THE JUDGMENT OF THE ENGINEER, ANY PORTION OF THE WORK HAS NOT BEEN PERFORMED IN A WORKMANLIKE MANNER OR IS LEFT IN A ROUGH, UNFINISHED STATE, THE CONTRACTOR WILL BE REQUIRED TO REMOVE, REINSTALL OR REPLACE SAME AND PATCH AND PAINT SURROUNDING SURFACES IN A MANNER ACCEPTABLE TO THE ENGINEER, WITHOUT ADDITIONAL COST TO THE OWNER.
11. SAFETY AND PROTECTION
 A. SAFETY MEASURES TO BE TAKEN: THE ENGINEER HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK. THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK.
 B. HEAD PROTECTION: PROVIDE HEAD PROTECTION WHERE DUCT ANGLES, PIPE HANGERS, EQUIPMENT SUPPORT ANGLES, ETC., ARE EXPOSED IN WALKWAYS, OR IN ACCESS WAYS FOR ANY MAINTENANCE. COVER ALL SUCH POTENTIALLY INJURIOUS PROTRUSIONS OCCURRING LESS THAN 7'–0" ABOVE THE FLOOR WITH PADDING. PADDING SHALL BE SECURELY AND PERMANENTLY FASTENED AND FINISHED COMPARABLE TO ADJACENT FINISHES.
12. RESPONSIBILITY AND GUARANTEES
 A. WITHOUT ADDITIONAL COST TO OWNER, CORRECT ALL DEFECTS AND FAILURES DISCOVERED WITHIN ONE YEAR FROM DATE OF FINAL ACCEPTANCE EXCEPT WHEN, IN THE OPINION OF THE ENGINEER, SUCH CONDITION IS DUE TO NEGLECT OR CARELESSNESS OF THOSE OTHER THAN THE CONTRACTOR.
 B. THE GUARANTEE OF THE CONTRACTOR IS INDEPENDENT OF SHORTER TIME LIMITS BY ANY MANUFACTURER OF EQUIPMENT HE HAS FURNISHED.
 C. MAKE ALL NECESSARY ADJUSTMENTS DURING FIRST YEAR OF OPERATION.
 D. THE PRESENCE OF AN INSPECTOR DURING ANY CONSTRUCTION DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR DEFECTS DISCOVERED AFTER COMPLETION OF THE WORK.
13. SERVICE A. WHERE REQUIRED BY THE SPECIFICATIONS, EQUIPMENT SUCH AS PACKAGED AIR CONDITIONERS, FURNACES, ETC. SHALL BE FURNISHED AND INSTALLED UNDER SUPERVISION OF FACTORY–TRAINED REPRESENTATIVE.

PART 2 – PRODUCTS

1. SUBMITTALS
 A. GENERAL: CONFORM TO DIVISION 1, WITH ADDITIONAL REQUIREMENTS AS INDICATED BELOW.
 B. PRODUCT DATA, DESIGN DATA:
  a. PROCESS: SUBMIT COMPLETE MECHANICAL SUBMITTAL IN MULTIPLE COMPLETE PACKAGES AS FOLLOWS. INCOMPLETE, PIECE–MEAL SUBMITTALS WILL NOT BE ACCEPTED, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED. ALLOW MINIMUM 10 WORKDAYS FOR EACH SUBMITTAL REVIEW.
   • ALL MECHANICAL SPECIFICATION SECTIONS, INCLUDING MATERIALS AND EQUIPMENT.
   • MATERIALS SHOP AND FIELD INSTALLATION DRAWINGS.
   • MATERIALS AND SHOP DRAWINGS.
  b. BINDING AND FORMAT: BIND IN THREE–RING BINDER(S). LABEL FRONT OF BINDER(S) WITH NAME OF PROJECT, NAME OF OWNER, YEAR OF COMPLETION; TITLE MECHANICAL SUBMITTALS, NAMES OF ENGINEER AND MECHANICAL CONTRACTOR, AND VOLUME NO. (IF APPLICABLE). LABEL BACK EDGE OF BINDER WITH TITLE, NAME OF PROJECT, OWNER, YEAR OF COMPLETION, AND VOLUME NO. (IF APPLICABLE). FOLD DRAWINGS TO 8"SIZE AND BIND AS ABOVE (WITH REINFORCING AT PUNCHED HOLES) OR PLACE IN CLEAR PLASTIC HOLDER DESIGNED FOR THREE–RING BINDERS.
   • INCLUDE OVERALL TABLE OF CONTENTS OF ITEMS SUBMITTED, ORGANIZED BY SPECIFICATION SECTION.
   • INCLUDE HEAVY, TABBED DIVIDER SHEET FOR EACH SPECIFICATION SECTION, WITH SPECIFICATION SECTION NUMBER AND TITLE ON TAB. INCLUDE TABLE OF CONTENTS FOR EACH SPECIFICATION SECTION, INCLUDING CATALOG NUMBERS OR DRAWING NUMBERS IF APPROPRIATE.
   • O & M MANUAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
  c. CONTENTS:
   • INCLUDE COMPLETE SUBMITTAL INFORMATION DESCRIBED UNDER PRODUCT DATA, DESIGN DATA IN THIS SECTION.
   • INCLUDE INSTALLATION INSTRUCTIONS, OPERATION AND MAINTENANCE INFORMATION, START–UP INSTRUCTIONS, AND SPARE PARTS LISTS.
   • INCLUDE NAMES, ADDRESS, TELEPHONE NUMBERS, AND FAX NUMBERS OF MANUFACTURERS AND VENDORS OF MATERIALS AND EQUIPMENT.
   • INCLUDE INFORMATION ON THE SPECIFIC EQUIPMENT INSTALLED FOR THIS PROJECT.
  d. ELECTRONIC COPY ACCEPTED
 C. FABRICATION DRAWINGS. FOR WORK IN THIS DIVISION, PREPARE FABRICATION DRAWINGS. SUBMIT MINIMUM 30 DAYS PRIOR TO STARTING FABRICATION OR INSTALLATION OF WORK. DO NOT FABRICATE OR INSTALL WORK UNTIL REVIEWED/ACCEPTED BY A/E.
  a. PREPARE FABRICATION DRAWINGS FOR THE FOLLOWING AREAS:
   • MECHANICAL (FURNACES, DOMESTIC HOTWATER HEATER) ROOMS.
   • BOILER ROOMS.
   • CHILLER ROOM.
   • VERTICAL CHASSES.
   • UTILITY TUNNELS.
   • FILTER ASSEMBLIES.
  b. FABRICATION AND INSTALLATION DRAWINGS SHALL BE PRODUCED AND SHOW COMPLETE DIMENSIONED INSTALLATION TO SCALE, CONSISTING OF DETAILED DRAWINGS IN AUTOCAD FORMAT, SAME SIZE AS CONTRACT DRAWINGS, COORDINATING WORK OR OTHER TRADES TO RESULT IN PROPER FIT IN THE AVAILABLE SPACE. DRAWINGS SHALL BE COMPLETED IN TIMELY MANNER, COORDINATED WITH THE CONSTRUCTION SCHEDULE. MINIMUM SCALE 1/8"=1'–0".
  c. SHEET METAL: PLANS SHOWING DUCTWORK, HANGERS, SUPPORTS, EQUIPMENT, WORK OF OTHER TRADES IN CLOSE PROXIMITY TO DUCTWORK. VERTICAL ELEVATIONS OR WORK ABOVE FINISHED FLOOR SHOWING CEILINGS, LIGHTS AND OTHER ITEMS NECESSARY TO FULLY COORDINATE THE INSTALLATION.
  d. PIPING: PLANS SHOWING PLUMBING AND HVAC PIPING, HANGERS, SUPPORTS, EQUIPMENT, WORK OF OTHER TRADES IN CLOSE PROXIMITY TO PIPING. VERTICAL ELEVATIONS OR WORK SHOWING FINISHED FLOOR, CEILINGS, LIGHTS AND OTHER ITEMS NECESSARY TO FULLY COORDINATE THE INSTALLATION.
 D. TEST REPORTS AND CERTIFICATES: SUBMIT IN ONE COMPREHENSIVE PACKAGE PRIOR TO SUBSTANTIAL COMPLETION.
 E. BALANCING AND TESTING REPORTS: SUBMIT FOR REVIEW.
 F. OPERATION AND MAINTENANCE MANUAL:
  a. PROCESS: SUBMIT COMPLETE O & M MANUAL IN ONE COMPLETE PACKAGE. INCOMPLETE, PIECE–MEAL SUBMITTALS WILL NOT BE ACCEPTED, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED. INCLUDE MECHANICAL SPECIFICATION SECTIONS, WITH MATERIALS AND EQUIPMENT.
  b. BINDING AND FORMAT:
   • BIND IN THREE–RING BINDER(S). PERMANENTLY IMPRINT FRONT OF BINDER(S) WITH NAME OF PROJECT, NAME OF OWNER, YEAR OF COMPLETION, TITLE "MECHANICAL OPERATIONS AND MAINTENANCE" MANUAL, NAMES OF ENGINEER AND CONTRACTOR, AND VOLUME NO. (IF APPLICABLE). PERMANENTLY IMPRINT BACK EDGE OF BINDER WITH TITLE, NAME OF PROJECT, OWNER, YEAR OF COMPLETION, AND VOLUME NO. (IF APPLICABLE). FOLD DRAWINGS TO 8 SIZE AND BIND AS ABOVE (WITH REINFORCING AT PUNCHED HOLES) OR PLACE IN CLEAR PLASTIC HOLDER DESIGNED FOR THREE–RING BINDERS.
   • INCLUDE OVERALL TABLE OF CONTENTS OF ITEMS SUBMITTED, ORGANIZED BY SPECIFICATION SECTION.
   • INCLUDE HEAVY, TABBED DIVIDER SHEET FOR EACH SPECIFICATION SECTION, WITH SPECIFICATION SECTION NUMBER AND TITLE ON TAB. INCLUDE TABLE OF CONTENTS FOR EACH SPECIFICATION SECTION, INCLUDING CATALOG NUMBERS OR DRAWING NUMBERS IF APPROPRIATE.
   • O & M MANUAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
  c. CONTENTS:
   • INCLUDE COMPLETE SUBMITTAL INFORMATION DESCRIBED UNDER PRODUCT DATA, DESIGN DATA IN THIS SECTION.
   • INCLUDE INSTALLATION INSTRUCTIONS, OPERATION AND MAINTENANCE INFORMATION, START–UP INSTRUCTIONS, AND SPARE PARTS LISTS.
   • INCLUDE NAMES, ADDRESS, TELEPHONE NUMBERS, AND FAX NUMBERS OF MANUFACTURERS AND VENDORS OF MATERIALS AND EQUIPMENT.
   • INCLUDE INFORMATION ON THE SPECIFIC EQUIPMENT INSTALLED FOR THIS PROJECT.
  d. ELECTRONIC COPY ACCEPTED
 G. RECORD DRAWINGS:
  a. GENERAL
   • CORRECTIONS AND CHANGES MADE DURING THE PROGRESS OF THE WORK SHALL BE NEATLY RECORDED AS ACTUALLY INSTALLED, INCLUDING ALL CHANGE ORDERS, RFI'S, ETC.
   • ONE SET OF PRINTS SHOWING THIS INFORMATION (IN RED), SHALL BE KEPT UP TO DATE AT ALL TIMES. THESE MARKED PRINTS SHALL BE KEPT AT THE JOB SITE AND IN RED.
   • AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL OBTAIN AUTOCAD V 2000, OF CONTRACT DRAWINGS. DRAWING FILES SHALL BE CORRECTED BY THE CONTRACTOR TO INDICATE ALL CHANGES AND CORRECTIONS MADE DURING THE PROJECT.
   • UPON COMPLETION, HE SHALL SUBMIT THE CORRECTED AUTOCAD DRAWING FILES PLUS 2 PLOT COPIES, TO THE ARCHITECT FOR REVIEW.
   • QUALITY OF WORKMANSHIP MUST BE CLEARLY LEGIBLE AND BE CONSISTENT WITH INDUSTRY DRAFTING STANDARDS. DRAWINGS PROVIDED LACKING THESE STANDARDS WILL NOT BE ACCEPTED.
  b. LAYOUT OF FIELD INSTALLATION DRAWINGS BY CONTRACTOR:
   • FOR ALL WORK IN MECHANICAL (FURNACE AND DOMESTIC HOTWATER HEATER) ROOMS, CONTRACTOR SHALL PREPARE ADDITIONAL DETAIL DRAWINGS TO SCALE SIMILAR TO THAT OF THE BIDDING DRAWINGS, PREPARED ON MYLAR PAPER SAME SIZE AS CONTRACT DRAWINGS AND SHALL WITH THESE LAYOUTS, COORDINATE HIS WORK WITH THE DRAWINGS AS TO THE AREA IT APPLIES. SEE 2.1.C.a. ABOVE.
   • SUBMIT THESE DRAWINGS TO THE ARCHITECT FOR REVIEW, BEFORE COMMENCING SHOP FABRICATION OR ERECTION IN THE FIELD. AT COMPLETION OF THE PROJECT, INCLUDE A SET OF SUCH DRAWINGS WITH EACH SET OF RECORD DRAWINGS AND CAD FILES FOR OWNER'S PURPOSES.
  c. ELECTRONIC COPY ACCEPTED
 H. CERTIFICATIONS: SUBMIT WRITTEN CERTIFICATIONS FROM THE GOVERNING BUILDING AUTHORITIES STATING THAT WORK HAS BEEN INSPECTED, ACCEPTED, AND COMPLIES WITH APPLICABLE CODES AND ORDINANCES.
2. CUTTING & PATCHING
 A. CUTTING:
  d. DO CUTTING, CORE–DRILLING AND SIMILAR WORK REQUIRED FOR INSTALLATION OF SYSTEMS UNDER DIVISION 22 AND 23.
  e. THROUGH CONCRETE SLABS OR WALLS, ALL ROUND HOLES SHALL BE CORE DRILLED WITH A DIAMOND DRILL AND ALL RECTANGULAR OPENINGS SHALL BE CUT WITH A DIAMOND SAW. CONTRACTOR SHALL MAKE PROVISIONS FOR WATER, CAPTURE WHEN WORKING ABOVE OCCUPIED SPACES OR AREAS SUBJECT TO WATER DAMAGE.
  f. CUT NO STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ARCHITECT/ENGINEER.
  g. DRILLING AND CUTTING OF CONCRETE AND OTHER WORK WHICH MAKES OBJECTIONABLE NOISE IN OCCUPIED BUILDING SHALL BE PERFORMED AT TIMES AS COORDINATED WITH THE OWNER BEFORE DOING THE WORK.
 B. PATCHING OF FINISHED BUILDING ELEMENTS AFTER MECHANICAL INSTALLATION SHALL BE IN ACCORDANCE WITH DIVISION 01, NOT BY DIVISION 23 SUBCONTRACTOR.
3. EXCAVATION AND BACKFILL
 A. CONTRACTOR SHALL DO ALL EXCAVATION AND BACKFILL REQUIRED FOR DIVISION 22 AND 23 WORK, INCLUDING ANY NECESSARY SHEATHING AND PUMPING.
 B. TRENCH BOTTOMS AND SHELVES SHALL BE CUT TO SUIT REQUIRED GRADES OF MECHANICAL WORK.
 C. PIPING SHALL REST ON UNDISTURBED EARTH OR PEA GRAVEL.
 D. BELL HOLES SHALL BE PROVIDED FOR ALL BELL AND HUB OR MECHANICAL JOINT PIPING.
 E. AFTER WORK HAS BEEN INSPECTED, TESTED AND APPROVED, ALL EXCAVATION SHALL BE BACKFILLED IN LAYERS OF APPROXIMATELY 8 INCHES, EACH LAYER MOISTENED AS DIRECTED AND PNEUMATICALLY TAMPED TO MINIMUM COMPACTION OF 90 PERCENT.
 F. JETTING OR FLOODING WILL NOT BE PERMITTED.
 G. RESTORE ALL SURFACES TO ORIGINAL CONDITION, PROPERLY INSTALLED TO ELIMINATE ANY SETTLEMENT AND SATISFACTORY TO ARCHITECT.
 H. REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF PIPES PASSING THROUGH OR NEAR FOOTINGS AND FOUNDATIONS.
4. PLATES AND ISOLATORS
 A. PLATES:
  a. CHROME PLATED, STAMPED OR CAST BRASS.
  b. GRINNELL FIGURE 10 OR BEATON CORBIN.
 B. ISOLATORS:
  a. STONEMAN TRISOLATOR, NO. 100 FOR STEEL PIPE, NO. 500 FOR COPPER TUBE.
  b. LINK–SEAL TYPE MODEL LS OR P

MECHANICAL GENERAL PROVISIONS CONTD.

BE BY COUPLING MANUFACTURER.

F. SPRING–LOADED CHECK VALVES:
   a. IRON BODY, BRONZE TRIM, STAINLESS STEEL SPRING, RENEWABLE COMPOSITION DISC, SCREWED, WAFER, OR FLANGED ENDS.
   b. CHECK VALVES IN MECHANICAL COUPLING SYSTEMS, I.E., VICTAULIC, ETC., MAY BE BY COUPLING MANUFACTURER.

G. BACKFLOW PREVENTERS:
   a. MANUFACTURERS:
      - WATTS.
      - CMB INDUSTRIES; FEBCO DIV.
      - ZURN INDUSTRIES INC; WILKINS DIV.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS AND APPROVED BY LOCAL JURISDICTION MAY BE CONSIDERED.
   b. DOUBLE CHECK VALVE:
      - 2" AND UNDER; BRONZE BODY, RUBBER CHECK VALVES, STAINLESS STEEL CHECK SEATS, SHAFTS AND FLANGE BOLTS, BRONZE BALL VALVE TEST COCKS, BRONZE BALL VALVE SHUT–OFFS, STRAINER, THREADED CONNECTIONS, 175 PSI PRESSURE RATING.
      - 2–1/2" AND OVER; EPOXY COATED IRON BODY, BRONZE TRIM, STAINLESS STEEL INTERNAL PARTS, REMOVABLE BRONZE SEATS, GATE VALVE SHUT–OFFS, STRAINER, FLANGED ENDS, 175 PSI PRESSURE RATING.
   c. REDUCED PRESSURE TYPE:
      - 2" AND UNDER; BRONZE BODY, RUBBER CHECK VALVES WITH REDUCED PRESSURE ZONE, STAINLESS STEEL CHECK SEATS, SHAFTS AND FLANGE BOLTS, BRONZE BALL VALVE TEST COCKS, BRONZE BALL VALVE SHUT–OFFS, STRAINER, THREADED CONNECTIONS, 175 PSI PRESSURE RATING.
      - 2–1/2" AND OVER; EPOXY COATED IRON BODY, BRONZE TRIM, STAINLESS STEEL INTERNAL PARTS, REMOVABLE BRONZE SEATS, GATE VALVE SHUT–OFFS, STRAINER, FLANGED ENDS, 175 PSI PRESSURE RATING.

C. WATER PRESSURE REDUCING VALVES:
   a. UP TO 2 INCHES
      - BRONZE BODY, STAINLESS STEEL AND BRONZE INTERNAL PARTS, FABRIC REINFORCED DIAPHRAGM, INTEGRAL STRAINER, THERMAL EXPANSION BY–PASS, THREADED ENDS.
      - WATTS U5B, OR APPROVED.
   b. OVER 2 INCHES:
      - CAST IRON BODY, BRONZE FITTED, NYLON REINFORCED ELASTOMERIC DIAPHRAGM AND SEAT DISC, FLANGED, PILOT OPERATED, ADJUSTABLE CLOSING SPEED, COPPER CONTROL TUBING WITH BRASS FLARED–END FITTINGS.
      - WATTS ACV, CLA–VAL, CASH OR APPROVED.

D. RELIEF VALVES:
   a. MANUFACTURERS:
      - WATTS.
      - B&G.
      - AMTROL.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. BRONZE BODY, TEFLON SEAT, STEEL STEM AND SPRINGS, AUTOMATIC, DIRECT TEMPERATURE AND PRESSURE ACTUATED, CAPACITIES ASME CERTIFIED AND LABELED.

E. CALIBRATED BALANCING VALVES:
   a. ADJUSTABLE ORIFICE TYPE:
      - MANUFACTURERS:
        - ARMSTRONG MODEL CBV.
        - DAN FOSS.
        - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
      - GENERAL:
        - VALVES SHALL BE Y–PATTERN, EQUAL PERCENTAGE GLOBE STYLE PROVIDING PRECISE FLOW MEASUREMENT, PRECISE FLOW BALANCING AND POSITIVE DRIP TIGHT SHUT–OFF.
        - VALVES SHALL HAVE MULTI–TURN ADJUSTMENT: MINIMUM 720°.
        - VALVES SHALL HAVE MEANS OF LOCKING IN BALANCED POSITION.
        - FURNISH VALVES WITH PREFORMED INSULATION WITH COVER.
      - CONSTRUCTION:
        - UP TO 2" SIZE: BRASS OR BRONZE BODY WITH THREAD OR SWEAT CONNECTIONS, BRONZE STEM WITH RESIN OR PFTE DISC, AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
        - 2½" TO 12" SIZE: DUCTILE IRON BODY WITH GROOVED END OR FLANGED CONNECTIONS, BRONZE VALVE STEM AND PLUG DISC, TWO 1/4" TEMPERATURE AND PRESSURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
   b. FIXED ORIFICE TYPE:
      - MANUFACTURERS:
        - FDI "FLOWSET".
        - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
      - GENERAL:
        - VALVES SHALL BE BALL STYLE WITH INTEGRAL FIXED VENTURI PROVIDING PRECISE FLOW MEASUREMENT, PRECISE FLOW BALANCING AND POSITIVE DRIP TIGHT SHUT–OFF.
        - VALVES SHALL HAVE 90° ADJUSTMENT WITH MEMORY STOP.
        - VALVES SHALL HAVE MEANS OF LOCKING IN BALANCED POSITION.
      - CONSTRUCTION:
        - UP TO 3" SIZE: BRONZE BODY WITH UNION ON INLET, THREAD OR SWEAT CONNECTIONS, STAINLESS STEEL OR BRASS BALL WITH TFE SEAT RINGS AND TWO, … PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
        - 4" TO 8" SIZE: DUCTILE OR CAST IRON BODY WITH GROOVED END OR FLANGED CONNECTIONS, BRONZE VALVE STEM AND PLUG DISC AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.

F. AUTOMATIC FLOW CONTROL VALVES:
   a. MANUFACTURERS
      - IMI HYDRONIC.
      - GRISWOLD CONTROLS.
      - HAYS FLUID CONTROL.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. CONSTRUCTION:
      - FLOW CONTROL ELEMENT(S): ONE OR MORE BRASS AND/OR STAINLESS STEEL ORIFI AND SPRING.
      - UP TO 3"SIZE: DUCTILE IRON, CAST IRON, BRASS OR WROUGHT COPPER VALVE BODY, THREADED OR SWEAT CONNECTIONS, RATED ANSI CLASS 125. TWO, PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, AND ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
      - 4" TO 12" SIZE: DUCTILE IRON, STEEL OR BRONZE VALVE BODY, FLANGED OR GROOVED CONNECTIONS, RATED ANSI GLASS 150. TWO, PRESSURE/TEMPERATURE TEST PORTS WITH EXTENSIONS AND NORDEL CHECK VALVES WITH GASKETED CAPS, AND ADDITIONAL DRAIN CONNECTIONS.
   c. CALIBRATION:
      - CONTROL FLOW WITHIN PLUS OR MINUS 10 PERCENT OF SELECTED RATING OVER OPERATING PRESSURE RANGE OF AT LEAST 10 TIMES MINIMUM PRESSURE REQUIRED FOR CONTROL.
      - MAXIMUM ALLOWABLE MINIMUM PRESSURE FOR OPERATING RANGE; 3.5 PSIG.

G. STRAINERS:
   a. MANUFACTURERS:
      - WATTS.
      - ARMSTRONG.
      - SPIRAX/SARCO.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. SIZE 2 INCH AND UNDER: SCREWED BRASS OR IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 1/32 INCH STAINLESS STEEL PERFORATED SCREEN.
   c. SIZE 2 –1/2 INCH TO 4 INCH: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 3/64 INCH STAINLESS STEEL PERFORATED SCREEN.
   d. SIZE 5 INCH AND LARGER: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, BASKET PATTERN WITH 1/8 INCH STAINLESS STEEL PERFORATED SCREEN.
   e. PROVIDE NIPPLE AND BLOWDOWN VALVE WITH PLUG ON ALL STRAINERS 1" PIPE SIZE AND LARGER.

13. HEAT TRACE FOR FREEZE PROTECTION
A. MANUFACTURERS:
   a. BASIS FOR DESIGN: RAYCHEM XL–TRACE.
   b. SUBSTITUTE MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
   c. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
   d. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSTITUTED EQUIPMENT OR MATERIALS FITTING THE AVAILABLE SPACE AND FOR ANY IMPACTS TO OTHER TRADES.

B. CONSTRUCTION:
   a. THE SELF–REGULATING HEATER SHALL CONSIST OF TWO (2) 16 AWG TINNED–COPPER BUS WIRES EMBEDDED IN PARALLEL IN A SELF–REGULATING POLYMER CORE THAT VARIES ITS POWER OUTPUT TO RESPOND TO TEMPERATURE ALL ALONG ITS LENGTH, ALLOWING THE HEATER TO BE CROSSED OVER ITSELF WITHOUT OVERHEATING, TO BE USED DIRECTLY ON METALLIC OR PLASTIC PIPE, AND TO BE CUT TO LENGTH IN THE FIELD.
   b. THE HEATER SHALL BE COVERED BY A RADIATION CROSS–LINKED MODIFIED POLYOLEFIN DIELECTRIC JACKET.
   c. TO PROVIDE A GROUND PATH AND TO ENHANCE THE HEATING CABLE'S RUGGEDNESS, THE HEATER SHALL HAVE AN OUTER BRAID OF TINNED–COPPER AND AN OUTER JACKET OF MODIFIED POLYOLEFIN (–CR).

C. REQUIREMENTS:
   a. SYSTEM SHALL MEET REQUIREMENTS OF CURRENT NATIONAL ELECTRIC CODE (NEC), SECTION 427.
   b. THE HEATER SHALL OPERATE ON LINE VOLTAGE OF 120 VOLTS WITHOUT THE USE OF TRANSFORMERS.
   c. IN ORDER TO PROVIDE ENERGY CONSERVATION AND TO PREVENT OVERHEATING, THE HEATER SHALL HAVE A SELF–REGULATING FACTOR OF A LEAST 90 PERCENT. THE SELF–REGULATION FACTOR IS DEFINED AS THE PERCENTAGE REDUCTION, WITHOUT THERMOSTATIC CONTROL, OF THE HEATER OUTPUT GOING FROM 40°F PIPE TEMPERATURE OPERATION TO 150°F PIPE TEMPERATURE OPERATION. PROVIDE SUFFICIENT HEAT CABLE, AS SIZED IN ACCORDANCE WITH FOLLOWING TABLE TO KEEP THE PIPE SURFACE AT 40°F WITH 10°F OUTDOOR AMBIENT TEMPERATURE. THE REQUIRED HEATER OUTPUT RATING IS IN WATTS PER FOOT AT 50°F. (HEATER SELECTION BASED ON 1" FIBERGLASS INSULATION ON METAL PIPING).

HEAT TRACE WATTAGE BASED ON AMBIENT TEMPERATURE				
PIPE SIZE	MINIMUM AMBIENT TEMPERATURE			
	10°F	0°F	-10°F	-20°F
1/2 - 3 INCH	5 WATT	5 WATT	5 WATT	5 WATT
4 INCH	5 WATT	5 WATT	5 WATT	8 WATT
6 INCH	5 WATT	8 WATT	8 WATT	8 WATT
8 INCH	8 WATT	8 WATT	2-5 WATT	2-8 WATT
10 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT
12 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT
14 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT

D. COMPONENTS:
   a. ALL HEATING CABLE COMPONENTS SHALL BE UL LISTED FOR USE AS PART OF THE SYSTEM TO PROVIDE PIPE FREEZE PROTECTION. COMPONENT ENCLOSURES SHALL BE RATED NEMA 4X TO PREVENT WATER INGRESS AND CORROSION.
   b. INSTALLATION SHALL NOT REQUIRE THE INSTALLING CONTRACTOR TO CUT INTO THE HEATING CABLE CORE TO EXPOSE THE BUS WIRES.
   c. CONNECTION SYSTEMS REQUIRING THE INSTALLING CONTRACTOR STRIP THE BUS WIRES, OR WHICH USE CRIMPS OR TERMINAL BLOCKS SHALL NOT BE ACCEPTABLE.
   d. ALL COMPONENTS THAT MAKE AN ELECTRICAL CONNECTION SHALL BE RE–ENTERABLE FOR SERVICING.
   e. NO COMPONENT SHALL USE SILICONE TO SEAL THE ELECTRICAL CONNECTIONS.
   f. PROVIDE INDICATOR SIGNAL LIGHT TO VERIFY ELECTRICAL POWER AT BEGINNING OF CIRCUIT ON DOWNSTREAM SIDE OF THERMOSTAT.

E. CONTROLS:
   a. THE SYSTEM SHALL BE CONTROLLED BY A SWITCH EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   b. –OR–
   c. THE SYSTEM SHALL BE CONTROLLED BY A BULB–SENSING THERMOSTAT SET AT 40°F EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   d. THERMOSTAT TO INCLUDE NEMA 4X ENCLOSURE, SP–ST SWITCH AND THREE FOOT CAPILLARY AND BULB.
      - –OR– THE SYSTEM SHALL BE CONTROLLED BY AN AMBIENT SENSING THERMOSTAT SET AT 40°F EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   e. THERMOSTAT TO INCLUDE NEMA 4X ENCLOSURE, [STAINLESS STEEL PROBE SENSOR AND SP–ST SWITCH.][SP–ST SWITCH AND THREE FOOT CAPILLARY AND BULB.]

14. ELECTRIC MOTORS
A. MANUFACTURERS:
   a. THE FOLLOWING MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
      - RELIANCE.
      - BALDOR.
      - CENTURY.
      - GENERAL ELECTRIC.
   b. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
   c. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSTITUTED EQUIPMENT OR MATERIALS FITTING THE AVAILABLE SPACE AND FOR ANY IMPACTS TO OTHER TRADES.

B. GENERAL:
   a. SUBMITTALS: SUBMIT TEST RESULTS VERIFYING NOMINAL EFFICIENCY AND POWER FACTOR FOR THREE PHASE MOTORS ONE (1) HORSEPOWER AND LARGER.
   b. OPERATION & MAINTENANCE DATA: INCLUDE ASSEMBLY DRAWINGS, BEARING DATA INCLUDING REPLACEMENT SIZES, AND LUBRICATION INSTRUCTIONS.
   c. QUALIFICATIONS: COMPANY SPECIALIZING IN MANUFACTURE OF ELECTRIC MOTORS FOR HVAC AND PLUMBING USE, AND THEIR ACCESSORIES, WITH MINIMUM THREE YEARS DOCUMENTED PRODUCT DEVELOPMENT, TESTING, AND MANUFACTURING EXPERIENCE.
   d. REGULATORY REQUIREMENTS:
   e. CONFORM TO APPLICABLE ELECTRICAL CODE.
   f. CONFORM TO LOCAL ENERGY CODE.
   g. PROTECT MOTORS STORED ON SITE FROM WEATHER AND MOISTURE BY MAINTAINING FACTORY COVERS AND SUITABLE WEATHER –PROOF COVERING. FOR EXTENDED OUTDOOR STORAGE, REMOVE MOTORS FROM EQUIPMENT AND STORE SEPARATELY.
   h. PROVIDE MINIMUM FIVE YEAR MANUFACTURER'S WARRANTY UNDER PROVISIONS OF DIVISION 23.

C. CONSTRUCTION AND REQUIREMENTS:
   a. ELECTRICAL SERVICE: REFER TO DIVISION 26 FOR REQUIRED ELECTRICAL CHARACTERISTICS.
   b. MOTORS: DESIGN FOR CONTINUOUS OPERATION IN 40°C ENVIRONMENT, AND FOR TEMPERATURE RISE IN ACCORDANCE WITH ANSI/NEMA MG 1 LIMITS FOR INSULATION CLASS, SERVICE FACTOR, AND MOTOR ENCLOSURE TYPE.
   c. EXPLOSION –PROOF MOTORS: UL APPROVED AND LABELED FOR HAZARD CLASSIFICATION, WITH OVER TEMPERATURE PROTECTION.
   d. VISIBLE NAMEPLATE: INDICATING MOTOR HORSEPOWER, VOLTAGE, PHASE, CYCLES, RPM, FULL LOAD AMPS, LOCKED ROTOR AMPS, FRAME SIZE, MANUFACTURER'S NAME AND MODEL NUMBER, SERVICE FACTOR, POWER FACTOR, EFFICIENCY.
   e. MOTORS POWERED BY VARIABLE FREQUENCY DRIVES (VFDS) SHALL HAVE MINIMUM 1.15 SERVICE FACTOR AND SHALL HAVE CLASS F, OR BETTER, INSULATION.
   f. SINGLE PHASE MOTORS: □DRIP –PROOF ENCLOSURE: CLASS A (50°C TEMPERATURE RISE) INSULATION, NEMA SERVICE FACTOR, PRELUBRICATED SLEEVE OR BALL BEARINGS.
      - ENCLOSED MOTORS: CLASS A (50°C TEMPERATURE RISE) INSULATION, 1.0 SERVICE FACTOR, PRELUBRICATED BALL BEARINGS.
   g. SPLIT PHASE MOTORS:
      - STARTING TORQUE: LESS THAN 150 PERCENT OF FULL LOAD TORQUE.
      - STARTING CURRENT: UP TO SEVEN TIMES FULL LOAD CURRENT.
      - BREAKDOWN TORQUE: APPROXIMATELY 200 PERCENT OF FULL LOAD TORQUE.
      - PERMANENT –SPLIT CAPACITOR MOTORS:
      - STARTING TORQUE: EXCEEDING ONE FOURTH OF FULL LOAD TORQUE.
      - STARTING CURRENT: UP TO SIX TIMES FULL LOAD CURRENT.
      - MULTIPLE SPEED: THROUGH TAPPED WINDINGS.
   h. CAPACITOR START MOTORS:
      - STARTING TORQUE: THREE TIMES FULL LOAD TORQUE.
      - STARTING CURRENT: LESS THAN FIVE TIMES FULL LOAD CURRENT.
      - PULL –UP TORQUE: UP TO 350 PERCENT OF FULL LOAD TORQUE.
      - BREAKDOWN TORQUE: APPROXIMATELY 250 PERCENT OF FULL LOAD TORQUE.
      - MOTORS: CAPACITOR IN SERIES WITH STARTING WINDING; CAPACITOR –START/CAPACITOR –RUN MOTORS SHALL HAVE TWO CAPACITORS IN PARALLEL WITH RUN CAPACITOR REMAINING IN CIRCUIT AT OPERATING SPEEDS.
   i. THREE PHASE MOTORS:
      - STARTING TORQUE: BETWEEN ONE AND ONE AND ONE –HALF TIMES FULL LOAD TORQUE.
      - STARTING CURRENT: SIX TIMES FULL LOAD CURRENT.
      - POWER OUTPUT, LOCKED ROTOR TORQUE, BREAKDOWN OR PULLOUT TORQUE: NEMA DESIGN B CHARACTERISTICS.
      - DESIGN, CONSTRUCTION, TESTING, AND PERFORMANCE: CONFORM TO ANSI/NEMA MG 1 FOR DESIGN B MOTORS.
      - INSULATION SYSTEM: NEMA CLASS F OR BETTER.
      - TESTING PROCEDURE: IN ACCORDANCE WITH ANSI/IEEE 112, TEST METHOD B. LOAD TEST MOTORS TO DETERMINE FREEDOM FROM ELECTRICAL OR MECHANICAL DEFECTS AND COMPLIANCE WITH PERFORMANCE DATA.
      - MOTOR FRAMES: NEMA STANDARD T –FRAMES OF STEEL, ALUMINUM, OR CAST IRON WITH END BRACKETS OF CAST IRON OR ALUMINUM WITH STEEL INSERTS.
      - BEARINGS: GREASE LUBRICATED ANTI –FRICTION BALL BEARINGS WITH HOUSINGS EQUIPPED WITH PLUGGED PROVISION FOR RELUBRICATION, RATED FOR MINIMUM AFBMA 9, L –10 LIFE OF 200,000 HOURS. CALCULATE BEARING LOAD WITH NEMA MINIMUM V – BELT PULLEY WITH BELT CENTER LINE AT END OF NEMA STANDARD SHAFT EXTENSION. STAMP BEARING SIZES ON NAMEPLATE.
      - SOUND POWER LEVELS: TO ANSI/NEMA MG 1.
      - PART WINDING START WHERE INDICATED: USE PART OF WINDING TO REDUCE LOCKED ROTOR STARTING CURRENT TO APPROXIMATELY 60 PERCENT OF FULL WINDING LOCKED ROTOR CURRENT WHILE PROVIDING APPROXIMATELY 50 PERCENT OF FULL WINDING LOCKED ROTOR TORQUE.
      - WEATHERPROOF EPOXY SEALED MOTORS (WHERE INDICATED): EPOXY SEAL WINDINGS USING VACUUM AND PRESSURE WITH ROTOR AND STARTER SURFACES PROTECTED WITH EPOXY ENAMEL. BEARINGS SHALL BE DOUBLE SHIELDED WITH WATERPROOF NON –WASHING GREASE.
      - NOMINAL EFFICIENCY: MEET OR EXCEED VALUES IN SCHEDULES AT FULL LOAD AND RATED VOLTAGE WHEN TESTED IN ACCORDANCE WITH ANSI/IEEE 112.
      - NOMINAL POWER FACTOR: MEET OR EXCEED VALUES IN SCHEDULES AT FULL LOAD AND RATED VOLTAGE WHEN TESTED IN ACCORDANCE WITH ANSI/IEEE 112.
   j. TEAO, C–FACED MOTORS, THREE PHASE POWER:
      - DIRECT DRIVE AIROVER MOTORS REQUIRED FOR VANE AXIAL FANS, CLASS F INSULATION.
      - MOTORS SHALL HAVE DUAL RATING ON NAMEPLATE FOR STILL AIR AND AIROVER OPERATION.

D. NEMA OPEN MOTOR SERVICE FACTORS:

HP	3600 RPM	1800 RPM	1200 RPM	900 RPM
1/6 - 1/3	1.35	1.35	1.35	1.35
1/2	1.25	1.25	1.25	1.15
3/4	1.25	1.25	1.15	1.15
1-1/4	1.15	1.15	1.15	1.15
1-1/2 - 150	1.15	1.15	1.15	1.15

E. MINIMUM NOMINAL FULL LOAD EFFICIENCY OF ENERGY EFFICIENT MOTORS:

	OPEN			CLOSED		
HP	3600 RPM	1800 RPM	1200 RPM	3600 RPM	1800 RPM	1200 RPM
1.0	-	82.5%	80.0%	75.5%	82.5%	80.0%
1.5	82.5%	84.0%	84.0%	82.5%	84.0%	85.5%
2.0	84.0%	84.0%	85.5%	84.0%	84.0%	86.5%
3.0	84.0%	86.5%	85.5%	85.5%	87.5%	87.5%
5.0	85.5%	87.5%	87.5%	87.5%	87.5%	87.5%
7.5	87.5%	88.5%	88.5%	88.5%	89.5%	89.5%
10	88.5%	89.5%	90.2%	89.5%	89.5%	89.5%
15	89.5%	91.0%	90.2%	90.2%	91.0%	90.2%
20	90.2%	91.0%	91.0%	90.2%	91.0%	90.2%
25	91.0%	91.7%	91.7%	91.0%	92.4%	91.7%
30	91.0%	92.4%	92.4%	91.0%	92.4%	91.7%

15. MECHANICAL–ELECTRICAL INTERFACE
A. SEPARATION OF WORK BETWEEN TRADES AND SUBCONTRACTORS IS NOT WITHIN THE SCOPE OF THESE SPECIFICATIONS. THE FOLLOWING IS PROPOSED FOR ASSISTANCE IN BIDDING ONLY.
B. UNLESS OTHERWISE INDICATED, MECHANICAL EQUIPMENT AND CONTROLS ARE SUGGESTED TO BE FURNISHED, INSTALLED AND WIRED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE; COORDINATE ALL WORK WITH DIVISION 26, ELECTRICAL:

MECHANICAL EQUIPMENT AND CONTROLS				
ITEM	POWER FURNISHED BY:	CONTROL INSTALLED BY:	POWER WIRING BY:	CONTROL WIRING BY:
EQUIPMENT MOTORS:	M	M	E	M
MAGNETIC MOTOR STARTERS AUTOMATICALLY CONTROLLED WITH OR WITHOUT HOA SWITCHES:	E	E	E	M
MAGNETIC MOTOR STARTERS MANUALLY CONTROLLED:	E	E	E	E
FURNISHED W/ MECH. EQUIPMENT, FACTORY-MOUNTED:	M	M	E	M
FURNISHED W/MECH. EQUIPMENT, FOR FIELD MOUNTING:	M	E	E	M
DISCONNECT SWITCHES, MANUAL MOTOR STARTERS, THERMAL OVERLOAD SWITCHES:	E	E	E	-
VALVES, FLOAT CONTROLS, DAMPER MOTORS, EP AND PE SWITCHES, OTHER MISCELLANEOUS	M	M	M	M
DIVISION 23 CONTROLS	E	M	-	M
M = DIVISION 23, MECHANICAL E = DIVISION 26, ELECTRICAL				

C. MECHANICAL–ELECTRICAL COORDINATION
   a. CHECK MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS TO ASSURE PROPER LOCATION AND ELECTRICAL CHARACTERISTICS OF OUTLETS SERVING MECHANICAL AND ELECTRICAL EQUIPMENT.
   b. ADVISE THE ARCHITECT/ENGINEER OF ANY MODIFICATIONS REQUIRED TO SUIT EQUIPMENT FURNISHED.
   c. PROVIDE FUNCTIONAL TEST OF CONTROL SYSTEM, AIR DISTRIBUTION SYSTEM AND ALL MECHANICAL COMPONENTS. TEST TO BE CONDUCTED IN THE PRESENCE OF THE BUILDING OWNER'S REPRESENTATIVE. WRITTEN VERIFICATION OF TEST TO BE SIGNED BY OWNER'S REPRESENTATIVE. THE TESTS SHALL VERIFY THAT ALL SYSTEMS ARE FUNCTIONAL AND OPERATIONAL PRIOR TO SUBSTANTIAL COMPLETION. ANY WORK NOT PASSING THE TESTS SHALL BE CORRECTED IMMEDIATELY.
   d. EXCEPT AS NOTED OTHERWISE, MOTOR STARTERS AND OTHER MEANS FOR OPERATION AND CONTROL OF EQUIPMENT ARE PROVIDED UNDER DIVISION 23, MECHANICAL.

D. WIRING
   a. POWER WIRING IS IN DIVISION 26.
   b. PROVIDE UNDER DIVISION 23 ALL CONTROL WIRING, LINE OR LOW VOLTAGE, THROUGH THE COILS OF THE MAGNETIC STARTERS AND RELAYS AND THROUGH THE CONTACTS OF THERMOSTATS AND OTHER PILOT DEVICES.
   c. PROVIDE UNDER DIVISION 23 CONDUIT FOR ALL LINE VOLTAGE CONTROL WIRING AND EXPOSED LOW VOLTAGE WIRING IN MECHANICAL ROOMS AND CEILING PLENUMS.
   d. PROVIDE FLEXIBLE CONDUIT REQUIRED ON SHORT RUNS TO EQUIPMENT SUBJECT TO VIBRATION, I.E., MOTORS, FANS.
   e. MOUNT STARTERS, DISCONNECTS AND PANELS ON WALLS WHERE PRACTICAL, NOT ON EQUIPMENT OR ON STAND FROM FLOOR.
   f. PROVIDE ELECTRICAL EQUIPMENT FURNISHED UNDER THIS SECTION OF SPECIFICATIONS IN STRICT ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.

PART 3 – EXECUTION

1. PROJECT/SITE CONDITIONS
   A. EXAMINE PREMISES AND UNDERSTAND THE CONDITIONS, WHICH MAY AFFECT PERFORMANCE OF WORK OF THIS DIVISION BEFORE SUBMITTING PROPOSALS FOR THIS WORK. NO SUBSEQUENT ALLOWANCE FOR TIME OR MONEY WILL BE CONSIDERED FOR ANY CONSEQUENCE RELATED TO FAILURE TO EXAMINE SITE CONDITIONS.
   B. PREPARE DRAWINGS SHOWING PROPOSED REARRANGEMENT OF WORK TO MEET PROJECT CONDITIONS, INCLUDING CHANGES TO WORK SPECIFIED IN OTHER SECTIONS. OBTAIN PERMISSION OF ARCHITECT/ENGINEER BEFORE PROCEEDING.
   C. REFER TO RECORD DRAWINGS.
2. GENERAL COORDINATION AND INSTALLATION
   A. INFORM OTHER TRADES THRU GENERAL CONTRACTOR AS TO REQUIREMENTS FOR SLEEVES, BOXES, OTHER OPENINGS, AND EMBEDDED ITEMS. COORDINATE WITH OTHER TRADES IN ORDER TO MAINTAIN JOB PROGRESS SCHEDULE AND TO AVOID CONFLICTS IN THE INSTALLATION OF WORK BY OTHER TRADES.
   B. FURNISH AND INSTALL PIPE SLEEVES AND EMBEDDED ITEMS REQUIRED UNDER DIVISION 23.
   C. CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH THE WORK INVOLVED AND SHALL VERIFY AT THE SITE ALL MEASUREMENTS NECESSARY FOR THE PROPER INSTALLATION OF HIS WORK.
   D. CONTRACTOR SHALL REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR BUILDING CONSTRUCTION AND OTHER DETAILS WHICH AFFECT THE MECHANICAL INSTALLATION AND SHALL CONFER WITH THOSE TRADES FOR FINISH ADJACENT TO HIS WORK AND ARRANGE TO HAVE VISIBLE PORTIONS OF HIS WORK (SUCH AS ACCESS DOORS, GRILLES, ETC.) FIT IN AND HARMONIZE WITH THE FINISH IN A MANNER SATISFACTORY TO THE ARCHITECT.
   E. CEILING HEIGHTS: REFER TO ARCHITECTURAL DRAWINGS FOR CEILING HEIGHT REQUIREMENTS.
   F. ACCESSIBILITY OF EQUIPMENT: EQUIPMENT, COILS, VALVES, DAMPERS, ETC. SHALL BE INSTALLED SO AS TO BE ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR, AND ACCESS CLEARANCES SHALL COMPLY WITH ALL APPLICABLE CODES AND AS RECOMMENDED BY RESPECTIVE MANUFACTURER.
   G. BELTS, PULLEYS, COUPLINGS, PROJECTING SET SCREWS, KEYS AND OTHER ROTATING PARTS WHICH MAY POSE A DANGER TO PERSONNEL, SHALL BE FULLY ENCLOSED OR GUARDED IN ACCORDANCE WITH OSHA REGULATIONS.
   H. PROVIDE OFFSETS AROUND ALL ELECTRICAL PANELS (AND SIMILAR ELECTRICAL EQUIPMENT) TO MAINTAIN SPACE CLEAR ABOVE AND BELOW PANEL TO STRUCTURE AND CLEARANCE OF 3 FEET DIRECTLY IN FRONT OF PANEL. EXCEPT WHERE INDICATED OTHERWISE OR REQUIRED BY NEC TO BE MORE.
3. PLATES AND ISOLATORS
   A. PLATES:
      a. INSTALL WHERE PIPES PASS THROUGH FINISHED CEILINGS AND FLOORS.
   B. ISOLATORS:
      a. MODEL 100 OR 500 FOR PIPING THRU FRAME WALLS.
      b. MODEL LS FOR PIPING THRU CONCRETE WALLS AND FLOORS.
      c. PYRO–PAC IF FLOOR OR WALL IS FIRE RATED.
4. SLEEVES
   A. INSTALL 20 GAGE GALVANIZED SLEEVES FOR PIPING THRU CONCRETE FLOORS ABOVEGROUND AND THRU MASONRY, PLASTERED AND FRAME WALLS. CLEARANCE AROUND PIPE FOR INSTALLATION OF ISOLATORS AND SEALS.IRON PIPE SLEEVES FOR PIPING THRU CONCRETE WALLS AND BEAMS. GROUT AROUND SLEEVES THRU WALLS.
   B. IRON PIPE SLEEVES THRU CONCRETE FLOORS IN MECHANICAL ROOMS, IN TOILET ROOMS AND OTHER AREAS WITH CONCRETE FLOORS SUBJECT TO FLOODING AND MOPPING. SET TO EXTEND 1" ABOVE FINISHED FLOORS. SEALED OR CAULK. NO FLOOR PLATES.
   C. WHERE COVERING IS SPECIFIED, MAKE SLEEVES OR CORES PROPER SIZE TO ALLOW FOR ISOLATORS THRU WALLS AND UNFINISHED FLOORS.
   D. EXCEPT AS NOTED IN THE FOREGOING, CUT SLEEVES FLUSH WITH SURFACE.
   E. SLEEVE PIPES PASSING THRU WALLS OR FLOORS IN FINISHED AREAS, THRU STONEMAN TRISOLATORS, OR LINK–SEAL TYPE LS OR PYRO–SEAL OR 3M FIRE BARRIER FS–195, TO EXTEND THRU BOTH FACES OF THE WALL OR FLOOR. CAULK AROUND SLEEVES TO PREVENT SOUND TRANSMISSION.
   F. WHERE SLEEVES ARE OVERSIZE THRU FIRE SEPARATIONS, FILL VOID WITH DOW CORNING 3–6548 SILICONE RTV FOAM, LINK–SEAL PYRO–SEAL, FLAME–SAFE FIRE RETARDANT COMPOUND, OR EQUAL.
   G. BORE OPENINGS FOR PIPES THRU CONCRETE AND MASONRY, USING DIAMOND CORE DRILL WHERE SLEEVING NOT DONE DURING CONSTRUCTION. H. MAKE ALL HOLES THRU PLENUMS AIRTIGHT.
5. FIRE–RATED PENETRATION SEALS
   A. INSTALL IN ACCORDANCE WITH IBC.
   B. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR SEALING FITTINGS AND BARRIER SEALING SYSTEMS.
6. FLASHING
   A. PROVIDE FLEXIBLE FLASHING AND METAL COUNTERFLASHING WHERE PIPING AND DUCTWORK PENETRATE WEATHER OR WATERPROOFED WALLS, FLOORS, AND ROOFS.
   B. FLASH VENT AND SOIL PIPES PROJECTING 3 INCHES MINIMUM ABOV

MECHANICAL GENERAL PROVISIONS CONTD.

AN INDIVIDUAL HANGER.
•• ON ALL PIPING–" AND SMALLER.

c. VERTICAL PIPING:
- ATTACHMENT – VERTICAL PIPING SHALL BE SECURED AT SUFFICIENTLY CLOSE INTERVALS TO KEEP THE PIPE IN ALIGNMENT AND CARRY THE WEIGHT OF THE PIPE AND CONTENTS. STACKS SHALL BE SUPPORTED AT THEIR BASES AND IF OVER 2 STORIES IN HEIGHT OR 24' AT EVERY 12' BY APPROVED METAL FLOOR CLAMPS.
- SCREWED PIPE – SCREWED PIPE (I.P.S.) SHALL BE SUPPORTED AT NOT LESS THAN EVERY OTHER STORY HEIGHT OR 24'.
- COPPER TUBING – COPPER TUBING SHALL BE SUPPORTED AT EACH STORY FOR PIPING 1" AND LARGER DIAMETER, AND AT NOT MORE THAN 6 FOOT INTERVALS FOR PIPING 1" AND SMALLER IN DIAMETER
- PIPES OF OTHER APPROVED MATERIAL SHALL BE SUPPORTED IN ACCORDANCE WITH THEIR APPROVED INSTALLATION STANDARDS.

d. HORIZONTAL PIPING:
- SUPPORTS – HORIZONTAL OR LESS THAN 90° FROM HORIZONTAL, PIPING SHALL BE SUPPORTED AT SUFFICIENTLY CLOSE INTERVALS TO KEEP IT IN ALIGNMENT AND PREVENT SAGGING.
- SCREWED PIPE – SCREWED PIPE (I.P.S.) OR FLANGED PIPE SHALL BE SUPPORTED AT APPROXIMATELY 10 FOOT INTERVALS.
- COPPER TUBING – COPPER TUBING SHALL BE SUPPORTED AT APPROXIMATELY 6 FOOT INTERVALS FOR TUBING 1" AND SMALLER IN DIAMETER AND 10 FOOT INTERVALS FOR TUBING 2" AND LARGER IN DIAMETER.
- PIPES OF OTHER APPROVED MATERIALS SHALL BE SUPPORTED IN ACCORDANCE WITH THEIR APPROVED INSTALLATION STANDARDS.

e. BRACE SPACING:
- TRANSVERSE BRACINGS AT 40' – 0" O.C. MAXIMUM UNLESS OTHERWISE NOTED.
- LONGITUDINAL BRACINGS AT 80' – 0" O.C. MAXIMUM UNLESS OTHERWISE NOTED. WHEN THERMAL EXPANSION OR CONTRACTION IS INVOLVED, PROVIDE LONGITUDINAL BRACINGS AT ANCHOR POINTS. THE LONGITUDINAL BRACES AND THE CONNECTIONS MUST BE CAPABLE OF RESISTING THE FORCE INDUCED BY EXPANSION AND CONTRACTION.
- TRANSVERSE BRACING FOR ONE PIPE SECTION MAY ALSO ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED PERPENDICULAR TO IT, IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE OF SIMILAR SIZE.
- FOR THREADED PIPING THE FLEXIBILITY MAY BE PROVIDED BY THE INSTALLATION OF SWING JOINTS. IN WELDED OR SOLDER JOINT PIPING, THE FLEXIBILITY SHALL BE PROVIDED BY EXPANSION LOOPS OR MANUFACTURED FLEXIBLE CONNECTORS. FOR PIPING WITH MANUFACTURED BALL JOINTS SELECT LENGTH OF PIPING OFFSET USING "SEISMIC DRIFT" IN PLACE OF "EXPANSION PER JOINT MANUFACTURERS" SELECTION TABLE. SEISMIC DRIFT = 0.015 FT. PER FOOT OF HEIGHT.

f. DO NOT USE BRANCH LINES TO BRACE MAIN LINES.
g. TRAPEZE HANGERS MAY BE USED. PROVIDE FLEXIBILITY IN JOINTS WHERE PIPES PASS THROUGH BUILDING SEISMIC OR EXPANSION JOINTS, OR WHERE RIGIDLY SUPPORTED PIPES CONNECT TO EQUIPMENT WITH VIBRATION ISOLATORS.
h. A RIGID PIPING SYSTEM SHALL NOT BE BRACED TO DISSIMILAR PARTS OF A BUILDING OR TWO DISSIMILAR BUILDING SYSTEMS THAT MAY RESPOND IN A DIFFERENT MODE DURING AN EARTHQUAKE. EXAMPLES: WALL AND A ROOF; SOLID CONCRETE WALL AND A METAL DECK WITH LIGHTWEIGHT CONCRETE FILL.
i. PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALLS OR FLOORS TO ALLOW FOR ANTICIPATED DIFFERENTIAL MOVEMENTS.
j. AT VERTICAL PIPE RISERS, WHEREVER POSSIBLE, SUPPORT THE WEIGHT OF THE RISER AT A POINT OR POINTS ABOVE THE CENTER OF GRAVITY OF THE RISER. PROVIDE LATERAL GUIDES AT THE TOP AND BOTTOM OF THE RISER, AND AT INTERMEDIATE POINTS NOT TO EXCEED 30'–0" ON CENTER.
k. CAST IRON PIPE OF ALL TYPES, AND ANY OTHER PIPE JOINED WITH A SHIELD AND CLAMP ASSEMBLY WHERE THE TOP OF THE PIPE IS 12" OR MORE FROM SUPPORTING STRUCTURE SHALL BE BRACED ON EACH SIDE OF A CHANGE IN DIRECTION OF 90° OR MORE. RISER JOINTS SHALL BE BRACED OR STABILIZED BETWEEN FLOORS.
l. FOR GAS PIPING, THE BRACING DETAILS, SCHEDULES AND NOTES MAY BE USED EXCEPT THAT TRANSVERSE BRACING SHALL BE AT 20'–0" O.C. MAXIMUM AND LONGITUDINAL BRACING AT 40' – 0" O.C. MAXIMUM. ALSO 1", 1", 1", AND 2" DIAMETER PIPES SHALL BE BRACED THE SAME AS 2" DIAMETER PIPE IN THE SCHEDULE. (NO BRACING IS REQUIRED FOR PIPES–" DIAMETER AND SMALLER).
m. IT IS THE RESPONSIBILITY OF THE USER OF THE GUIDELINES TO ASCERTAIN THAT AN APPROPRIATE SIZE DEVICE BE SELECTED FOR EACH INDIVIDUAL PIECE OF EQUIPMENT.

C. EQUIPMENT RESTRAINTS:
a. MECHANICAL EQUIPMENT ANCHORAGES SUCH AS BOLTS, EXPANSION ANCHORS, SCREWS, ETC., SHALL COMPLY WITH THE FORCE LEVEL REQUIREMENTS ZONE 3 SEISMIC HAZARD.
b. RESTRAINING DEVICES MUST BE PLACED ON ALL SIDES OF THE EQUIPMENT BASE.
c. IT IS THE RESPONSIBILITY OF THE EQUIPMENT MANUFACTURER TO DESIGN HIS EQUIPMENT SO THAT THE STRENGTH AND ANCHORAGE OF THE INTERNAL COMPONENTS OF THE EQUIPMENT EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE UNIT ITSELF TO THE SUPPORTING STRUCTURE.
d. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ASCERTAIN THAT AN APPROPRIATE SIZE DEVICE BE SELECTED FOR EACH INDIVIDUAL PIECE OF EQUIPMENT.

10. ACCESS DOORS
A. WHEN NECESSARY TO GAIN ACCESS TO THE MECHANICAL SYSTEM THRU FINISHED WALLS OR CEILINGS, FURNISH METAL PANEL ACCESS DOORS OF PROPER SIZE, SUITABLE TO INSTALLATION CONDITIONS, FOR THE GENERAL CONTRACTOR TO INSTALL AND GIVE NECESSARY INFORMATION FOR PROPER LOCATION. NOTIFY GENERAL CONTRACTOR OF REQUIREMENTS PRIOR TO BIDDING.
B FIRE RATED WITH UL LABEL IF LOCATED IN A FIRE SEPARATION.
11. VALVES AND ACCESSORIES
A. RECORD ACTUAL LOCATIONS OF VALVES IN ALL MECHANICAL SYSTEMS ON PROJECT RECORD DRAWINGS.
B. PROVIDE VALVES AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
C. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
D. PROVIDE ACCESS WHERE VALVES AND FITTINGS ARE NOT EXPOSED.
E. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.
F. PROVIDE UNIONS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS.
G. INSTALL BRASS MALE ADAPTERS EACH SIDE OF VALVES IN COPPER PIPED SYSTEM. SWEAT SOLDER ADAPTERS TO PIPE.
H. INSTALL GATE, BALL OR BUTTERFLY VALVES FOR SHUT –OFF AND TO ISOLATE EQUIPMENT, PART OF SYSTEMS, OR VERTICAL RISERS.
I. PROVIDE GLOBE, BALL OR BUTTERFLY VALVES FOR THROTTLING, BYPASS, OR MANUAL FLOW CONTROL SERVICES.
J. PROVIDE CHECK VALVES ON DISCHARGE OF WATER PUMPS.
K. PROVIDE PLUG VALVES IN NATURAL GAS SYSTEMS FOR SHUT –OFF SERVICE.
L. PROVIDE BALANCING VALVES OR FLOW CONTROL VALVES IN WATER RECIRCULATING SYSTEMS WHERE INDICATED.
12. HEAT TRACE INSTALLATION
A. APPLY THE HEATING CABLES LINEARLY ON THE PIPE AFTER PIPING HAS BEEN SUCCESSFULLY PRESSURE TESTED. SECURE THE HEATER TO PIPING BEFORE INSULATION WITH CABLE TIES OR FIBERGLASS TAPE AT TWO–FOOT INTERVALS. POWER CONNECTION, END SEAL, SPLICE AND TEE KIT COMPONENTS SHALL BE APPLIED IN THE FIELD. WIRE AT THE ENDS OF CIRCUITS IS NOT TO BE TIED TOGETHER.
B. APPLY "ELECTRIC TRACED" SIGNS TO THE OUTSIDE OF THE THERMAL INSULATION AT TEN FOOT INTERVALS ALONG THE PIPE ON ALTERNATING SIDES.
C. AFTER INSTALLATION, AND BEFORE AND AFTER INSTALLING THE THERMAL INSULATION, SUBJECT HEATER TO TESTING USING A 2500 VDC MEGGER. MINIMUM INSULATION RESISTANCE SHOULD BE 20 TO 1000 MEGAOHMS REGARDLESS OF LENGTH.
D. THE INSTALLER SHALL PROVIDE RESISTANCE TEST FOR BOTH HEATING CABLE WIRES TO VERIFY THE CONNECTION OF ANY SPLICES OR TEES.
E. MECHANICAL CONTRACTOR IS RESPONSIBLE TO COORDINATE INSTALLATION OF HEAT TRACING WITH ELECTRICAL CONTRACTOR AND ALL SUBCONTRACTORS.
13. MECHANICAL IDENTIFICATION INSTALLATION
A. DEGREASE AND CLEAN SURFACES TO RECEIVE ADHESIVE FOR IDENTIFICATION MATERIALS.
B. PREPARE SURFACES IN ACCORDANCE WITH DIVISION 09 FOR STENCIL PAINTING.
C. PLASTIC NAMEPLATES: INSTALL WITH CORROSIVE –RESISTANT MECHANICAL FASTENERS, OR ADHESIVE.
D. PLASTIC OR METAL TAGS: INSTALL WITH CORROSIVE – RESISTANT CHAIN.
E. STENCIL PAINTING: APPLY IN ACCORDANCE WITH DIVISION 09.
F. PLASTIC PIPE MARKERS: INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
G. PLASTIC TAPE PIPE MARKERS: INSTALL COMPLETE AROUND PIPE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
H. UNDERGROUND PLASTIC PIPE MARKERS: INSTALL 6 TO 8 INCHES BELOW FINISHED GRADE, DIRECTLY ABOVE BURIED PIPE.
I. EQUIPMENT: IDENTIFY AIR HANDLING UNITS, PUMPS, HEAT TRANSFER EQUIPMENT, TANKS, AND WATER TREATMENT DEVICES WITH PLASTIC NAMEPLATES. SMALL DEVICES, SUCH AS IN –LINE PUMPS, MAY BE IDENTIFIED WITH PLASTIC OR METAL TAGS.
J. CONTROLS: IDENTIFY CONTROL PANELS AND MAJOR CONTROL COMPONENTS OUTSIDE PANELS WITH PLASTIC NAMEPLATES.
K. VALVES: IDENTIFY VALVES IN MAIN AND BRANCH PIPING WITH TAGS.
L. PIPING: IDENTIFY PIPING, CONCEALED OR EXPOSED, WITH PLASTIC PIPE MARKERS. IDENTIFY SERVICE, FLOW DIRECTION, AND PRESSURE. INSTALL IN CLEAR VIEW AND ALIGN WITH AXIS OF PIPING. LOCATE IDENTIFICATION NOT TO EXCEED 20 FEET ON STRAIGHT RUNS INCLUDING RISERS AND DROPS, ADJACENT TO EACH VALVE AND "T", AT EACH SIDE OF PENETRATION OF STRUCTURE OR ENCLOSURE, AND AT EACH OBSTRUCTION.DUCTWORK: IDENTIFY DUCTWORK WITH STENCILED PAINTING. IDENTIFY AS TO AIR HANDLING UNIT NUMBER, AND AREA SERVED. LOCATE IDENTIFICATION AT AIR HANDLING UNIT, AT EACH SIDE OF PENETRATION OF STRUCTURE OR ENCLOSURE, AND AT EACH OBSTRUCTION.
14. MOTORS
A. APPLICATION:
a. MOTORS DRAWING LESS THAN 250 WATTS AND INTENDED FOR INTERMITTENT SERVICE MAY BE GERMANE TO EQUIPMENT MANUFACTURER AND NEED NOT CONFORM TO THESE SPECIFICATIONS.
b. MOTORS SHALL BE OPEN DRIP –PROOF TYPE, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.
c. MOTORS WITH FRAME SIZES 143T AND LARGER SHALL BE ENERGY EFFICIENT TYPE.
d. SINGLE–PHASE MOTORS FOR SHAFT MOUNTED FANS AND CENTRIFUGAL PUMPS SHALL BE SPLIT PHASE TYPE.
e. SINGLE–PHASE MOTORS FOR SHAFT MOUNTED FANS OR BLOWERS SHALL BE PERMANENT SPLIT CAPACITOR TYPE.
f. SINGLE–PHASE MOTORS FOR AIR COMPRESSORS SHALL BE CAPACITOR START TYPE.
g. MOTORS LOCATED IN DIRECT DRIVE VANE–AXIAL FANS SHALL BE TOTALLY ENCLOSED TYPE.
h. MOTORS LOCATED IN EXTERIOR LOCATIONS SHALL BE TOTALLY ENCLOSED WEATHERPROOF EPOXY –SEALED TYPE.

15. MAINTAINING SERVICE
A. THE EXISTING BUILDING WILL REMAIN OCCUPIED DURING CONSTRUCTION.
B. ALL SERVICES SHALL BE MAINTAINED IN THE OCCUPIED AREAS OF THE BUILDING WITH A MINIMUM OF INTERRUPTION.
C. CONTRACTOR SHALL REPAIR OR REPLACE PROMPTLY ANY EXISTING UTILITIES DAMAGED BY THE CONTRACTOR'S OPERATION.
D. CONTRACTOR SHALL COORDINATE PHASING IF APPLICABLE OF CONSTRUCTION WORK WITH GENERAL CONTRACTOR AND SHALL ABIDE BY GENERAL CONTRACTOR'S PHASING SCHEDULE.
16. PRODUCT DELIVERY, STORAGE AND HANDLING
A. USE CARE IN TRANSPORTING, STORAGE AND HANDLING TO AVOID DAMAGE.
B. KEEP MATERIALS AND EQUIPMENT CLEAN, DRY AND FREE FROM HARMFUL AND HAZARDOUS CONDITIONS.
17. PROTECTION AND CLEANING
A. PROTECT ALL MATERIALS, EQUIPMENT, FIXTURES, PIPING AND VALVES FROM DAMAGE AND AGAINST RUST AND DIRTY CONDITIONS DURING PROGRESS OF THE JOB.
B. PROMPTLY REMOVE ALL WASTE MATERIAL AND RUBBISH AT THE END OF EACH WORKDAY.
C. CLEAN UP ALL EQUIPMENT AND FLUSH OUT AND CLEAN ALL PLUMBING FIXTURES AT COMPLETION OF JOB.
D. CLEAN OUT VENTILATION EQUIPMENT BOTH INSIDE AND OUT ON COMPLETION OF THE JOB. INSTALL CLEAN FILTERS.
E. FLUSH OUT ALL PIPING, CLEAN DIRT LEGS AND STRAINERS.
18. INSPECTION
A. DO NOT ALLOW ANY WORK TO BE COVERED UP OR ENCLOSED UNTIL INSPECTED, TESTED AND APPROVED BY ARCHITECT AND OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK.
B. SHOULD ANY WORK BE ENCLOSED OR COVERED UP BEFORE SUCH INSPECTION AND TEST, CONTRACTOR SHALL, AT ITS OWN EXPENSE, UNCOVER WORK, AND AFTER IT HAS BEEN INSPECTED, TESTED AND APPROVED, MAKE ALL REPAIRS AS NECESSARY TO RESTORE ALL WORK DISTURBED TO ITS ORIGINAL CONDITION.
19. TEMPORARY SYSTEMS
A. AIR SYSTEMS: DO NOT USE AIR SYSTEMS DURING CONSTRUCTION FOR TEMPORARY HEAT OR CONSTRUCTION VENTILATION. COVER DUCT AND GRILLE OPENINGS WITH TAPED–ON PLASTIC SHEET OR EQUIVALENT TO KEEP ALL CONSTRUCTION DUST OUT OF THE DUCTWORK.
B. TEMPORARY HEAT:
a. MAKE SEPARATE TEMPORARY HEATING SYSTEM AVAILABLE AND OPERATE AS EARLY AS PRACTICAL FOR TEMPORARY HEATING OF BUILDING DURING CONSTRUCTION.
b. FUEL AND POWER WILL BE THE RESPONSIBILITY OF CONTRACTOR.

20. OPERATING & MAINTENANCE INSTRUCTIONS
A. FOLLOWING INITIAL OPERATION OF MECHANICAL SYSTEMS AND PRIOR TO ACCEPTANCE BY THE OWNER, PERFORM THE FOLLOWING SERVICES:
a. AT LEAST TWO WEEKS PRIOR TO EACH INSTRUCTION PERIOD GIVE WRITTEN NOTIFICATION OF READINESS TO PROCEED TO THE ARCHITECT/ENGINEER AND THE OWNER, AND OBTAIN MUTUALLY ACCEPTABLE DATES.
b. CONDUCT DEMONSTRATIONS AND INSTRUCTIONS FOR THE OWNER'S REPRESENTATIVES, POINTING OUT REQUIREMENTS FOR SERVICING AND MAINTAINING EQUIPMENT AND SYSTEMS PROVIDED UNDER THIS CONTRACT.
c. IF REQUESTED BY THE ARCHITECT/ENGINEER, FURNISH QUALIFICATIONS OF CONTRACTORS' PERSONNEL IN CHARGE OF THE INSTRUCTION; FOREMAN POSITION IS MINIMUM ACCEPTABLE.
d. OWNER'S REPRESENTATIVE MAY INCLUDE PERSONNEL FROM OPERATIONS, FACILITIES ENGINEERING AND MAINTENANCE DEPARTMENTS.
e. INCLUDE PRELIMINARY DISCUSSION, INFORMATION FROM MAINTENANCE MANUAL AND CONTRACT DRAWINGS; CONDUCT TOURS OF THE NEW CONSTRUCTION, EXPLAINING MAINTENANCE, OPERATION AND ADJUSTMENT OF EACH PIECE OF EQUIPMENT.
f. MINIMUM DURATION OF INSTRUCTION PERIODS:
- HEATING, VENTILATING, AND AIR CONDITIONING; 8 HOURS
- CONTROLS; 16 HOURS

g. PROVIDE WRITTEN OUTLINE OF MATERIAL TO BE COVERED IN INSTRUCTION PERIODS FOR REVIEW TWO WEEKS MINIMUM PRIOR TO SESSIONS.
h. INSTRUCTION PERIODS SHALL OCCUR AFTER O&M MANUALS HAVE BEEN REVIEWED AND APPROVED AND SHALL INCORPORATE MANUALS IN THE COURSE MATERIAL.

21. FUNCTIONAL TESTING
A. PRIOR TO PERFORMING THE FUNCTIONAL TEST IN THE PRESENCE OF THE ENGINEER AND BUILDING OWNER'S REPRESENTATIVE, THE CONTRACTOR SHALL HAVE TESTED ALL MECHANICAL SYSTEMS, COMPONENTS AND CONTROLS TO FULLY PROVE FUNCTIONALITY. MAKE ALL FINAL CALIBRATIONS, ADJUSTMENTS AND REPAIRS PRIOR TO CALLING FOR FUNCTIONAL TEST TO BE WITNESSED.
B. PROVIDE FUNCTIONAL TEST OF ALL MECHANICAL SYSTEMS, COMPONENTS AND CONTROL SYSTEM. SYSTEMS AND COMPONENTS SHALL BE RUN THROUGH ALL MODES OF OPERATION DEMONSTRATING THAT SYSTEMS AND COMPONENTS ARE FULLY FUNCTIONAL. TEST SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER AND BUILDING OWNER'S REPRESENTATIVE. PROVIDE WRITTEN TEST PROCEDURE TWO WEEKS PRIOR TO SCHEDULED TEST. PROVIDE WRITTEN VERIFICATION OF TEST TO BE SIGNED BY OWNER'S REPRESENTATIVE. PROVIDE OWNER WITH COPY OF SIGNED VERIFICATION.
C. SHOULD SYSTEMS NOT FUNCTION PROPERLY IN FUNCTIONAL TEST WITNESSED BY ENGINEER OR SYSTEMS, IN–PART OR WHOLE, NOT READY AND/OR COMPLETE FOR TEST, CONTRACTOR SHALL REIMBURSE ENGINEER FOR TIME AND EXPENSES, MINIMUM OF $800/WORK DAY, REQUIRED TO WITNESS ADDITIONAL TESTS OF SYSTEMS OR COMPONENTS NOT PERFORMING ACCEPTABLY OR NOT COMPLETE FOR A FULL TEST. THIS PORTION OF THE BID CONTRACT SHALL BE DEEMED NON–CONFORMING IN FUNCTIONAL TEST IS NOT COMPLETED AS SCHEDULED. PAYMENT TO ENGINEER FOR THE NON–CONFORMING FUNCTIONAL TEST MUST BE MADE PRIOR TO ANY ADDITIONAL FUNCTIONAL TESTS.

22. PROJECT CLOSEOUT
A. REQUIREMENTS FOR FINAL INSPECTION:
a. ALL OF THE FOLLOWING ITEMS SHALL BE COMPLETED PRIOR TO FINAL INSPECTIONS. NO EXCEPTIONS WILL BE MADE AND NO APPROVAL FOR FINAL PAYMENT WILL BE MADE UNTIL ALL ITEMS ARE COMPLETED:
b. CLEANING EQUIPMENT AND PREMISES
c. PROOF OF FUNCTIONAL TESTING
d. OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS
e. OPERATOR TRAINING SESSIONS
f. TESTING, ADJUSTING AND BALANCING
g. APPROVALS OF ALL CODE AUTHORITIES AND BUILDING OFFICIALS
h. RECORD DRAWINGS ("AS–BUILT")
i. GUARANTEE

B. REFER TO DIVISION 01 FOR ADDITIONAL REQUIREMENTS.

PERMIT SET 08-15-2025

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www.beronaengineers.com

HERBERT N. RUSSELL
STATE OF WASHINGTON
44608
REGISTERED
PROFESSIONAL ENGINEER

SVCA
CLUBHOUSE HVAC
4 CLUBHOUSE CIR,
BELLINGHAM, WA, 98229

REVISIONS

NO	DATE	BY	DESCRIPTION
1	01/28/26	RR	AHU-2 Rev

TITLE

HVAC SPECIFICATONS

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M0.0.DWG
JOB NUMBER	2024.11

M0.3

AIR HANDLER UNIT (AHU-) SCHEDULE

TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL						NOTES
			EVAPORATOR	TOTAL COOL (BTUH)	SENS COOL (BTUH)	DESIGN FLOW (CFM)	O.A. FLOW (CFM)	ESP (IN WG)	VELOCITY (RPM)	HP	FEI	VOLTAGE	PHASE	MCA	BREAKER	WEIGHT (LBS)	DIMENSIONS (H"xL"xW")	
AHU-2A	LOWER FLOOR	SAMSUNG	AM096HEHDCG	96,000	74,000	2,500	-	1.25	-	-	-	208	1	5.9	15	200	18"x40"x48"	1-9
AHU-2B	LOWER FLOOR	SAMSUNG	AM096HEHDCG	96,000	74,000	2,500	-	1.25	-	-	-	208	1	5.9	15	200	18"x40"x48"	1-9

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. RFIELD ROUTE TO APPROVED DRAIN.
3. WITH R-32 REFRIGERANT.
4. TEMPERED OUTSIDE AIR PROVIDED BY 100% O.A.
5. PROVIDE W/ MERV-8 FILTER
6. CONNECT TO EXIST BUILDING CONTROL SYSTEM.
7. COOLING PROVIDED BY DX COIL FROM CU-2.
8. TO OPERATE SIMULTANEOUSLY.
9. HEATING PROVIDED BY SEPARATE EXISTING DUCT MOUNTED HOT WATER HEATING COIL.

SPLIT SYSTEM HEATPUMP (CU-) SCHEDULE

TAG	SERVES	MANUF.	MODEL	CAPACITY	CAPACITY	ELECTRICAL				EER	COP	REFRIG CIRCUITS	DIMENSIONS	WEIGHT	NOTES
				COOL (BTUH)	HEAT (BTUH)	VOLTAGE	PHASE	MCA	BREAKER				(H"xL"xW")		
CU-2	AHU-2A/ AHU-2B	SAMSUNG	AM192HCVGIG	192,000	206,000	460	3	34	40	11	3.55	2	66"x74"x30"	820	1,2,3,4,5

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. WITH R-32 REFRIGERANT.
3. W/ FIELD GFI RECEPTACLE
4. W/ LOW AMBIENT CONTROL TO 45 DEGREES F
5. VERIFY REFRIGERANT LIBE SIZE W/ SUPPLIER.

AHU-2A & 2B CONTROLS

- AHU-2A & AHU-2B TO OPERATE SIMULTANEOUSLY DURING OPERATING HOURS;
- FAN TO OPERATE ON BUILDING OCCUPANCY SCHEDULE.
- UPON CALL FOR HEATING, CONDENSING UNIT TO ENGAGE AND ACT AS PRIMARY HEATING SOURCE; DOWNSTREAM HEATING COIL VALVE TO OPEN WHEN DISCHARGE TEMPERATURE IS NOT MET.
- UPON CALL FOR COOLING, HEATING COIL VALVE TO CLOSE (IF OPEN) AND CONDENSING UNIT COOLING TO ENGAGE.

REFRIGERANT CONCENTRATION LIMIT (RCL) CALCULATIONS:

REFRIGERANT SHUT-OFF BOX LOCATED IN MECHANICAL ROOM
MECH ROOM VOLUME: 340 SQ FT X 10 FT= 3400 FT3
TOTAL REFRIG CHARGE FROM SYSTEM= 40 LBS

ALLOWABLE MAX RCL= 0.061 LB/FT3

RCL= 0.061 LB/FT3 X 3400 FT3= 207 LB

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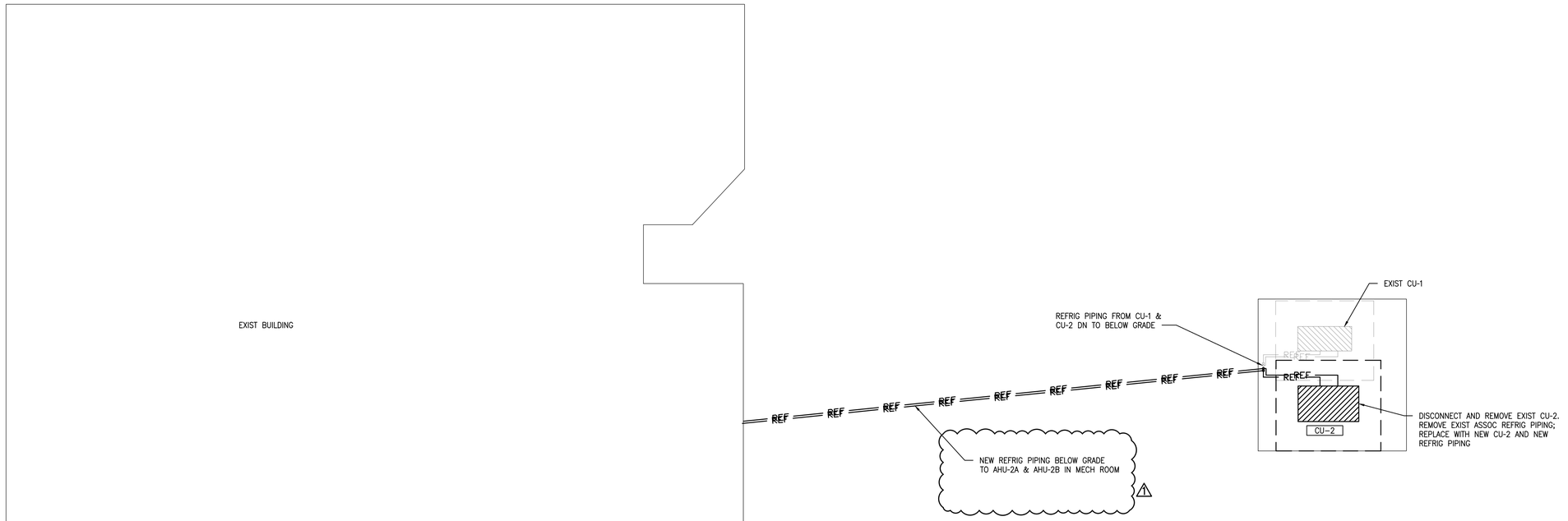
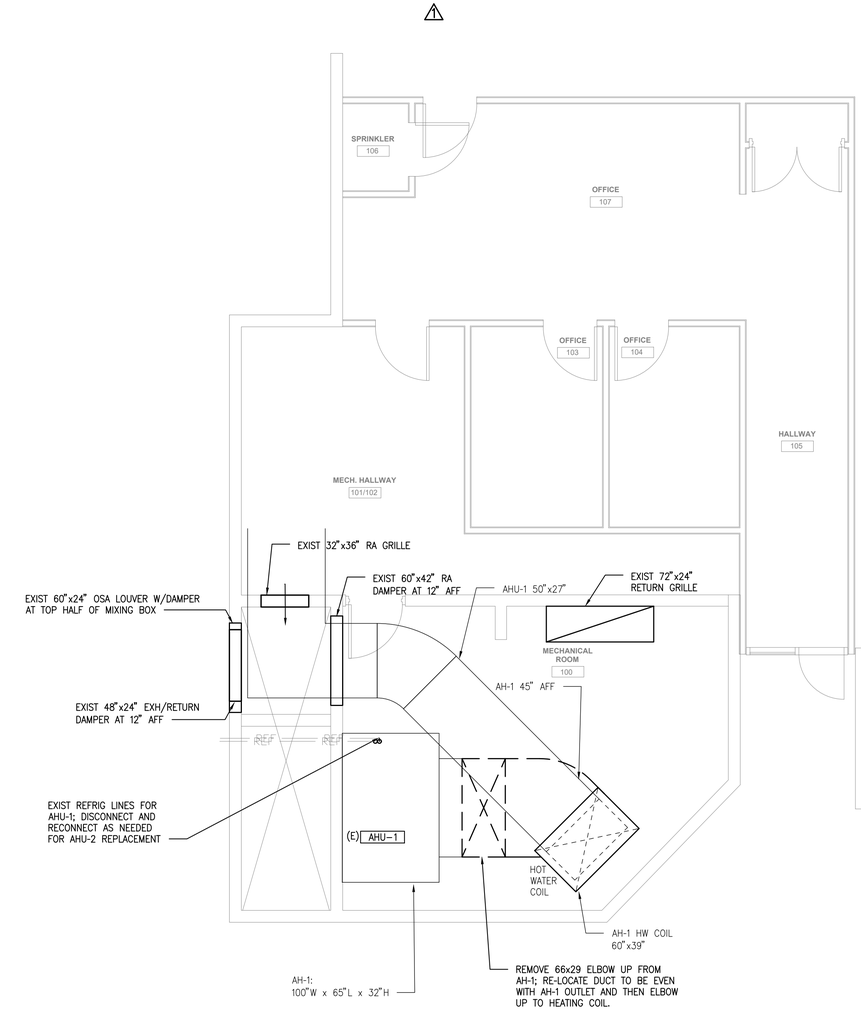
TITLE

HVAC SCHEDULES

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M1.0.DWG
JOB NUMBER	2024.11

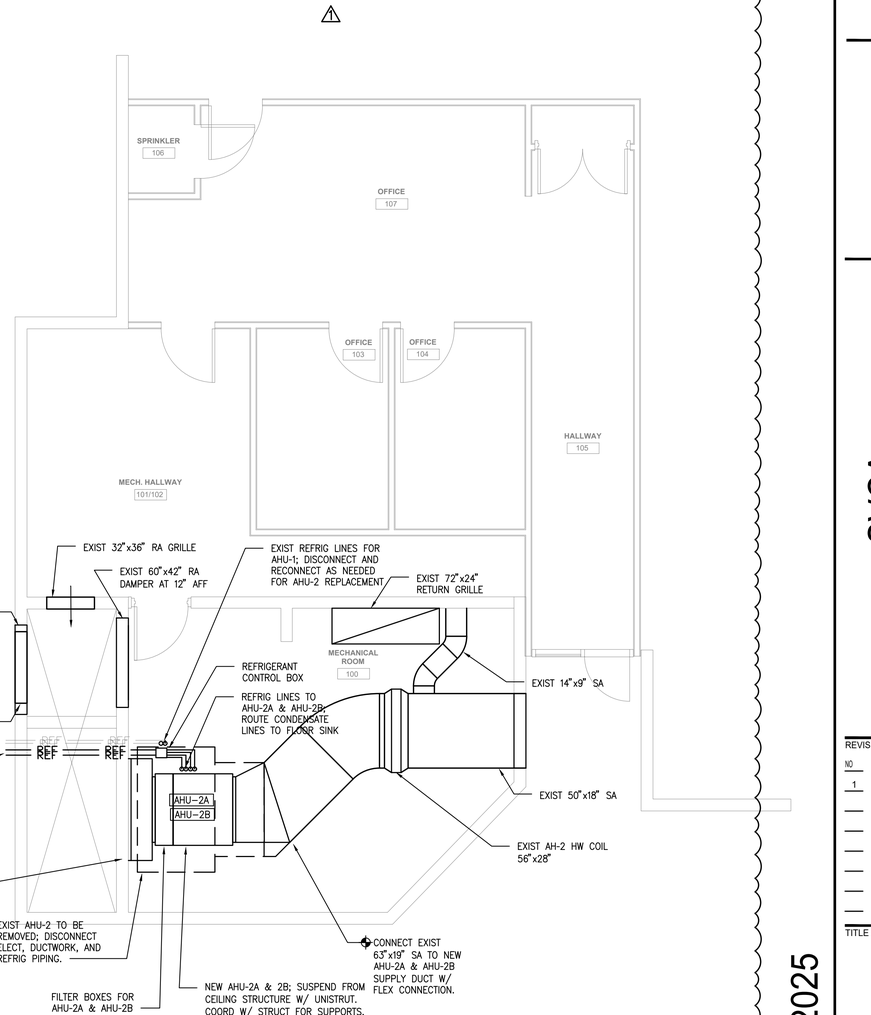
M1.0


EXIST BUILDING
EXIST BUILDING
REFRIG PIPING FROM CU-1 & CU-2 DN TO BELOW GRADE
EXIST CU-1
REF
REF
REF



HVAC FLOOR PLAN- AHU-1

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



HVAC FLOOR PLAN- AHU-2

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

PERMIT SET 08-15-2025

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BELLINGHAM, WA, 98229

REVISIONS

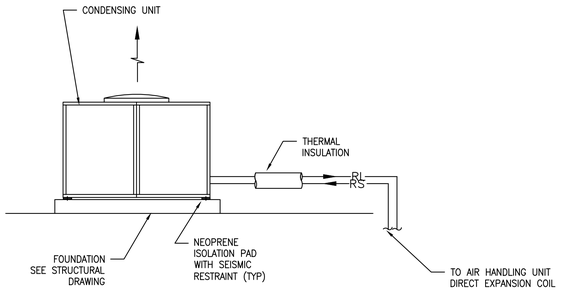
NO	DATE	BY	DESCRIPTION
1	01/28/26	RR	AHU-2 Rev

TITLE

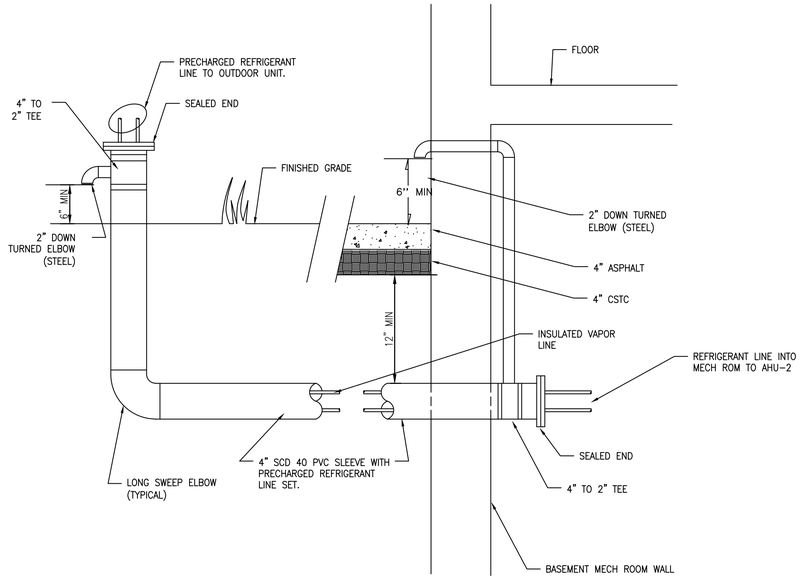
HVAC MECH ROOM PLAN

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.1.DWG
JOB NUMBER	2024.11

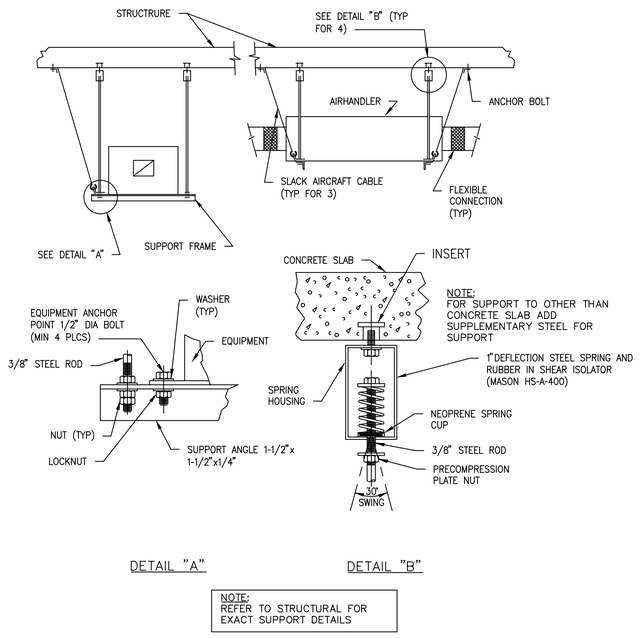
M2.1



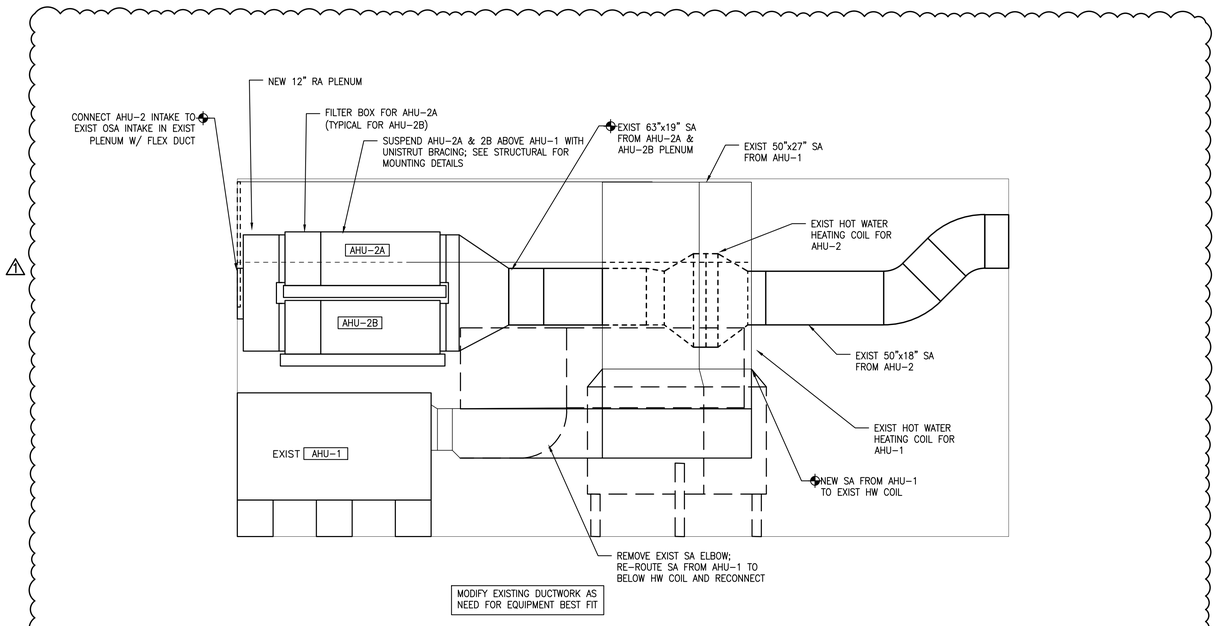
1 AIR COOLED CONDENSING DETAIL
SCALE: NONE



2 UNDERGROUND PIPING DETAIL
SCALE: NTS



3 AHU SUPPORT DETAIL
NOT TO SCALE



1

4 MECH ROOM HVAC SECTION
SCALE: NONE

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SVCA CLUBHOUSE HVAC

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PERMIT SET 08-15-2025

REVISIONS

NO	DATE	BY	DESCRIPTION
1	01/28/26	RR	AHU-2 Rev

TITLE

HVAC DETAILS

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M3.0.DWG
JOB NUMBER	2024.11

M3.0

PNW SERVICES, INC.

January 28th, 2026

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Quote Request – Clubhouse HVAC Replacement

Addendum #4 to the Bid Documents

A. This Addendum shall be considered part of the bid documents for the above-mentioned project, and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence.

Bid Form: No changes

Changes to Submittal Date: The bid date is changed to Monday, February 9th, 2026 at 5:00pm.

Changes to Drawings:

- The equipment package is being updated by the engineer. Once completed, a 5th addendum will be issued.

End of Addendum No. 4

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072.

January 18th, 2026

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Quote Request – Clubhouse HVAC Replacement

Addendum #3 to the Bid Documents

A. This Addendum shall be considered part of the bid documents for the above-mentioned project, and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence.

Bid Form: No changes

Changes to Submittal Date: The bid date is changed to Wednesday, January 28th, 2026 at 11:00am.

Changes to Drawings:

- The equipment package is being updated by the engineer. Once completed, a 4th addendum will be issued.

End of Addendum No. 3

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072.

January 8th, 2026

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Quote Request – Clubhouse HVAC Replacement

Addendum #2 to the Bid Documents

A. This Addendum shall be considered part of the bid documents for the above-mentioned project, and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence.

Bid Form: No changes

Changes to Submittal Date: The bid date is changed to Monday, January 19th, 2026 at 11:00am.

Changes to Drawings:

- The equipment package is being updated by the engineer. Once completed, a 3rd addendum will be issued.

End of Addendum No. 2

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072.

PNW SERVICES, INC.

December 23rd, 2025

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Quote Request – Clubhouse HVAC Replacement

Addendum #1 to the Bid Documents

A. This Addendum shall be considered part of the bid documents for the above-mentioned project, and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original bid documents, this Addendum shall govern and take precedence.

B. The engineer's estimate is updated to $120,000.00 for this scope of work.

C. The insulation on the existing unit was tested for asbestos. None was found, and attached for reference are the test results.

Bid Form: No changes

Changes to Submittal Date: No changes.

Changes to Drawings:

- Drawing M1.0 has R-410A refrigerant called out for the equipment. It is acceptable to substitute equivalent equipment with R-32 refrigerant. If R-32 refrigerant is used, the contractor shall include any changes in the as-built drawings provided to SVCA.

End of Addendum No. 1

Questions shall be directed to Tyler Andrews at tylera@pnwcivil.com or 360-739-2072.

Environmental Abatement Services Inc

SAMPLES

Date 12-19-2025
Name: Tyler Andrews
Phone # 360 739-2072
Asbestos Samples 4 Clubhouse Circle Bellingham WA 98229
Samples: AM12192025

On December 19th, 2025, I collect 3 samples from ducting in mechanical room at the above reference address for the purpose of determining the presence of any asbestos building materials that may contain asbestos for remodeling,

Title 40 Code of Federal Regulations (40 CFR), subpart M, section 61.141, established the allowable limit of asbestos in building material at 1% by weight. Materials containing more than 1 % asbestos are regulated and must be handled in accordance with Federal, State, and Local regulations.

Samples are based on 'visible and accessible materials and although reasonable effort was made to locate and test all suspect materials, some suspect materials may remain hidden in the walls or below floor underlayment or other areas until remodeling or renovation work makes them accessible. If other suspect materials are discovered during
Remodel activities will require testing prior to continuing work. There could be pipes or other materials found in the building while removing walls or floors that were not found during the testing of materials that were hidden.

3 bulk samples were collected and subsequently analyzed for asbestos content by Polarized light Microscopy with Stain Dispersion. All 3 samples contained NO asbestos detected,

This letter along with the attached material list and lab report will comprise the 'Asbestos Samples, for remodeling,
Please call if you have any questions.

Thank you,
Alfonso Mazcorro
AHERA BLG. INSPECTOR.
CERT:196088 (expiration Date, January-22-2026)

PO Box 375, 712 S Spruce ST
Burlington, WA 98233

Phone (360) 755-1085
Fax (360) 755-5145

Certificate of Completion

This is to certify that

Alfonso M. Mazcorro

has satisfactorily completed
8 hours of online refresher training as an

Asbestos Supervisor

to comply with the training requirements of

TSCA Title II, 29 CFR 1926.1101 & WAC 296-62 Part I-1 & 296-65

Asbestos Provider #121

196318
Certificate Number

Instructor: Sue Maas

Feb 6, 2025 Expires in 1 year.
Date(s) of Training

Exam Score: N/A
(if applicable)

terracon
Explore with us

- Facilities
- Environmental
- Geotechnical
- Materials

SEATTLE ASBESTOS TEST, LLC

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Cell & Text:206.369.6421, NVLAP Lab Code: 200768-0

www.seattleasbestostest.com, admin@seattleasbestostest.com

Project Manager:	Alfonso Mazcorro	Date Analyzed:	12/22/2025
Client:	Environmental Abatement Services, Inc.	Client Job#:	Tyler-PNW-SVS
Address:	P. O. Box 2503,Mount Vernon,WA 98273	Project Location:	4 Clubhouse Circle Bellingham WA98229
Tel:	360.755.1085	Laboratory batch#:	202511179
Date Report Issued:	12/22/2025	Samples Received:	3

Enclosed please find the test results for the bulk samples submitted to our laboratory for asbestos analysis. Analysis was performed using polarized light microscopy (PLM) in accordance with Test Method US EPA - 40 CFR Appendix E of Part 763, Interim Method of Determination of Asbestos in Bulk Insulation Samples and Test Method US EPA/600/R-93/116.

Percentages for this report are done by visual estimate and relate to the suggested acceptable error ranges by the method. Since variation in data increases as the quantity of asbestos decreases toward the limit of detection, the EPA recommends point counting for samples containing between <1% and 10% asbestos (NESHAP, 40 CFR Part 61). Statistically, point counting is a more accurate method. If you feel a point count might be beneficial, please feel free to call and request one.

The test results refer only to the samples or items submitted and tested. The accuracy with which these samples represent the actual materials is totally dependent on the acuity of the person who took the samples. This report must not be used by the client to claim product certification, approval, or endorsement by Seattle Asbestos Test, LLC, NVLAP, NIST, or any agency of the Federal government. The test report or calibration certificate shall not be reproduced except in full, without written approval of the laboratory. If the sample is inhomogeneous the sub-samples of the components are analyzed separately as layers.This report in its entirety consists of this cover leter, the customer sampling COC or data sheet, and the analytical report which is page numbered.

This report is highly confidential and will not be released without your consent. Samples are archived for 30 days after the analysis, and disposed of as hazardous waste thereafter.

Thank you for using our service and let us know if we can further assist you.

Sincerely

SZhang

Steve (Fanyao) Zhang
Approved Signatory

204-1119

SEATTLE ASBESTOS TEST, LLC

NVLAP Accredited, 200768-0

CHAIN OF CUSTODY

◉ Bulk Asbestos (PLM) ○ Point Count

Client Name Environmental Abatement Services

Address PO BOX 2503 **City** Mt Vernon **ST** WA **ZIP** 98273

Phone: Fax: Email: asbestoseas@aol.com

Project Location: 4 clubhouse circle Bellingham WA 98229 Project Manager: Alfonso Mazcorro

Turn Around Time 1 Day Number of Samples 3 Client Job # Tyler-PNW-SVS

SEQ#	CLIENT SAMPLE #	SAMPLE DESCRIPTION	LAB ID	A/R
1	AM121925-01	ducting fiberglass with cloth wrap		
2	AM121925-02	ducting fiberglass with cloth wrap		
3	AM121925-03	ducting fiberglass with cloth wrap		
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

	Print Name	Signature	Company Name	Date	Time
Sampled	Alfonso Mazcorro		E.A.S	12-19-25	1:20
Relinquished	Alfonso Mazcorro		E.A.S.	12-19-25	4:30
Delivered					
Received					
Analyzed					
Reported					

Reporting Methods: ☐ Phone ☐ Fax ☑ Email

Seattle Asbestos Test warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted and disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Seattle Asbestos Test accepts no legal responsibility for the purpose for which the client uses the test results. By signing on this form the clients agree to relieve Seattle Asbestos Test of any liability that may arise from the test results.

SEATTLE ASBESTOS TEST

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.9850, Cell & Text:206.369.6421, NVLAP Lab Code: 200768-0

ANALYTICAL LABORATORY REPORT

[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples; [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Alfonso Mazzorra | Client: Environmental Abatement Services, Inc. | Address: P. O. Box 2503,Mount Vernon,WA 98273

Job#: Tyler-PNW-SVS | Batch#: 202511179 | Date Received: 12/19/2025

Samples Rec'd: 3 | Date Analyzed: 12/22/2025 | Samples Analyzed: 3

Project Loc.: 4 Clubhouse Circle Bellingham WA98229

Analyzed by: Cici Xu / Steve (Fanyao) Zhang | Approved Signatory: Steve (Fanyao) Zhang, President

Lab ID	Client Sample ID	Layer	Description	%	Asbestos Fibers	Non-fibrous Components	%	Non-asbestos Fibers
1	AM121925-01	1	Tan mastic		None detected	Mastic/binder	4	Cellulose
		2	Silver foil		None detected	Foil/binder		None detected
		3	Tan paper with mastic and woven fibrous material		None detected	Filler, Mastic/binder	68	Cellulose, Glass fibers
		4	Yellow fibrous material		None detected	Filler	88	Glass fibers
2	AM121925-02	1	Tan mastic		None detected	Mastic/binder	2	Cellulose
		2	Silver foil		None detected	Foil/binder		None detected
		3	Tan paper with mastic and woven fibrous material		None detected	Filler, Mastic/binder	67	Cellulose, Glass fibers
		4	Yellow fibrous material		None detected	Filler	90	Glass fibers
3	AM121925-03	1	Tan mastic		None detected	Mastic/binder	3	Cellulose
		2	Silver foil		None detected	Foil/binder		None detected
		3	Tan paper with mastic and woven fibrous material		None detected	Filler, Mastic/binder	66	Cellulose, Glass fibers
		4	Yellow fibrous material		None detected	Filler	91	Glass fibers

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ilac-MRA

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200768-0

Seattle Asbestos Test, LLC

Lynnwood, WA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique on ISO/IEC 17025).

2025-10-01 through 2026-09-30

Effective Dates

DEPARTMENT OF COMMERCE · UNITED STATES OF AMERICA

For the National Voluntary Laboratory Accreditation Program

PNW SERVICES, INC.

December 17th, 2025

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Quote Request – Clubhouse HVAC Replacement

SVCA is requesting quotes for the Clubhouse HVAC Replacement project. One of the existing HVAC units in the Clubhouse will be replaced per the drawings by Sarah Brown Architecture + Design dated August 14th, 2025. Bid proposals are due by 11:00am on Friday, January 9th, 2026. To review the mechanical room in the Clubhouse, contractors need to schedule a time Monday thru Friday, 8:00am to 2:00pm. Please contact Mike Brock at mike.brock@suddenvalley.com or Matt Allbaugh at matt.allbaugh@suddenvalley.com to schedule any visits.

Summary of Work:

1. The project will go in front of SVCA's Board on Thursday, January 29th, 2026 for contract award. Notice to proceed is anticipated February 6th, 2026 or sooner upon contract execution.
2. SVCA's construction estimate for this project is approximately $110,000.00.
3. All questions shall be submitted to Tyler Andrews at tylera@pnwcivil.com by January 2nd, 2026.
4. All work is assumed to be completed under 1 mobilization.
5. All work shall be completed per the approved permit documents included with the bid package.
6. Contractor shall provide a schedule and submittals to SVCA within 7 calendar days of NTP.
7. SVCA's work hours are 8:00am – 7:00pm Monday through Friday, and 8:00am – 6:00pm Saturday. No work is allowed on Sundays.
8. SVCA will work with the contractor to provide adequate staging around the Clubhouse.
9. All permits will be by SVCA except electrical. Contractor will be responsible for coordinating necessary inspections, and getting the electrical permit.
10. Force account work to receive 15% markup.
11. This is a private project, and prevailing wages are not applicable.
12. Contractor shall warranty work for 1 year from final completion.
13. SVCA's standard construction contract is attached for review.

Scope of Work Clarifications:

- Bid Item #3 – Supply New Unit
    - This bid item covers purchasing the new HVAC unit. Installation of new unit is included in Bid Item #4.
    - If a deposit is required by the manufacturer to order the unit, SVCA will pay for this as materials on hand per manufacturer invoice to contractor. SVCA will cover the invoice amount only for deposit, and balance once the unit is delivered.

PNW SERVICES, INC.

- Bid Item #4 – New Unit Installation
  - This bid item covers all work required for installation of the new unit except electrical.

- Bid Item #6 – Exterior Trenching & Asphalt Patching
  - SVCA will trench, backfill, and complete site restoration for the contractor on the exterior.
  - Contractor is responsible under Bid Item #4 to install exterior pipes, penetrations, unit connections, etc. on the exterior.

Attachments:

1. Bid Form – 1 Page
2. Drawings – Sarah Brown Architecture + Design Dated 8-14-25 – 11 Pages
3. Whatcom County Building Permit Dated 9-22-25 – 15 Pages
4. SVCA Standard Contract – 12 Pages

Contractors are encouraged to independently visit the site; no formal pre-bid is scheduled. Bids are due by 11:00am on Friday, January 9th, 2026. Email bid submissions to tylera@pnwcivil.com.

PNW SERVICES, INC.

December 16th, 2025

Attn: Bidders

RE: Sudden Valley Community Association (SVCA)
Bid Form – Clubhouse HVAC Replacement

Bid submissions are due by 11:00am on Friday, January 9th, 2026. Email bid submissions to tylera@pnwcivil.com.

Firm Name:_____

Bid Schedule – Clubhouse HVAC Replacement					
Item #	Description	Quantity	Unit	Unit Price	Total
1	Mobilization	1	LS	$	$
2	Demolition	1	LS	$	$
3	HVAC – Supply New Unit	1	LS	$	$
4	HVAC – New Unit Installation	1	LS	$	$
5	Electrical	1	LS	$	$
6	Exterior Trenching & Asphalt Patching	1	LS	By SVCA	By SVCA
7	Minor Changes	1	EST.	$5,000.00	$5,000.00
	Subtotal				$
	WSST @ 8.8%				$
	Total w/ WSST				$

Acknowledgement of addendums: _____

By:_____ Date:_____
Signature of Authorized Person

Print Name & Title:_____

GENERAL NOTES

GENERAL NOTES

1. IN GENERAL, PLAN DIMENSIONS SHOWN ARE TO FACE OF STUD OR FACE OF CONCRETE, UNLESS OTHERWISE NOTED. DO NOT SCALE THESE DRAWINGS. USE CALCULATED DIMENSIONS ONLY. VERIFY ALL DIMENSIONS, DATUM AND LEVELS PRIOR TO CONSTRUCTION. NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
2. PERSONS USING THE INFORMATION IN THESE CONSTRUCTION DOCUMENTS WITHOUT PERMISSION OF THE ARCHITECT DOES SO AT THEIR OWN RISK AND BY SUCH AGREES TO INDEMNIFY THE ARCHITECT AS WELL AS ARCHITECT'S EMPLOYEES AND CONSULTANTS, AND TO HOLD HARMLESS FOR ANY INJURY OR LOSS OF DAMAGE THAT MAY OCCUR.
3. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ARCHITECT HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ARCHITECT.
4. THE CONTRACTOR SHALL HAVE AND MAINTAIN INSURANCE AS APPROVED BY THE BUILDING OWNER AND THE TENANT IF TENANT IS THE CONTRACTORS CLIENT.
5. CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES TO ENSURE THAT ALL PROPERTY IS PROTECTED DURING THIS CONSTRUCTION. ANY DAMAGE OR CHANGED CONDITIONS SHALL BE REPAIRED AND RESTORED TO A CONDITION EQUAL TO THAT EXISTING AT THE COMMENCEMENT OF THE WORK. CONTRACTOR SHALL RESTORE ANY DAMAGE AT HIS OWN EXPENSE. WHERE EXISTING WORK IS DAMAGES, CUT OR DEFACED DUE TO PERFORMANCE OF NEW WORK, THE CONTRACTOR SHALL PATCH AND REPAIR SAME TO MATCH ADJOINING SURFACES. REPAIRED FINISHES SHALL BE EXTENDED TO THE NEAREST VISUAL BREAK LINES SUCH AS CORNER, CEILING LINES, TOP OF BASE OR SIMILAR.
6. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO INITIATING THE WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
7. WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
8. ALL WORK SHALL COMPLY WITH THE 2009 IBC, IFC, IPC, IMC AS AMENDED BY WASH. STATE. PROJECT SHALL ALSO COMPLY W/ JURISDICTIONAL CODE AMENDMENTS BY THE LOCAL AGENCY. CONTRACTOR IS RESPONSIBLE FOR OBTAINING NECESSARY PERMITS & INSPECTIONS TO COMPLETE THE WORK. CONTRACTOR TO HAVE CURRENT VALID CITY OR COUNTY BUSINESS LICENSE PRIOR TO ISSUANCE OF PERMIT. WHEN REQUIRED BY LAW.
9. ERRORS, OMISSIONS AND DISCREPANCIES, IF ANY, SHALL BE REFERRED TO THE ARCHITECT IMMEDIATELY FOR DIRECTION OF HOW TO PROCEED.
10. VERIFY ALL ROUGH-IN DIMENSIONS FOR EQUIPMENT PROVIDED IN THE CONTRACT BY OTHERS PROVIDE ALL BLOCK-OUTS, BLOCKING, BACKING AND JACKS REQUIRED FOR DUCTS, PIPES, CONDUITS, EQUIPMENT, FIXTURES AND CABINETS. VERIFY SIZE AND LOCATION.
11. DO NOT SIGNIFICANTLY VARY OR MODIFY THE WORK SHOWN, EXCEPT UPON WRITTEN INSTRUCTIONS OF THE ARCHITECT.
12. VERIFY LOCATION OF ALL EXISTING UTILITIES INCLUDING BUT NOT LIMITED TO SEWER, SEPTIC, WATER, GAS, POWER AND TELEPHONE. CAP. MARK AND PROTECT.
13. DETAILS ARE INTENDED TO SHOW THE INTENT OF THE DESIGN, MINOR MODIFICATION MAY BE REQUIRED TO SUIT THE FIELD DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK OF THE CONTRACT.
14. PROVIDE CLOSURE, MEETING THE REQUIREMENTS OF ALL GOVERNING AUTHORITIES, AT RATED PARTITIONS, FLOORS, CEILINGS, AND ROOF LOCATIONS. ALL REQUIRED FIRE-RATED PARTITIONS SHALL BE CONTINUOUS FROM FLOOR TO UNDERSIDE OF STRUCTURE ABOVE.
15. NO BUILDING OR PORTION OF A BUILDING SHALL BE OCCUPIED OR USED FOR STORAGE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
16. THE CONTRACTOR SHALL CONSULT PLANS OF ALL TRADES, INCLUDING DESIGN-BUILD DOCUMENTS REQUIRED BY CONTRACT DOCUMENTS, TO VERIFY SIZE, WEIGHT, POWER, LOCATION AND OTHER REQUIREMENTS AND LOCATION OF THOSE ITEMS TO BE INSTALLED PRIOR TO COMMENCEMENT OF WORK.
17. ELECTRICAL, MECHANICAL AND PLUMBING: GENERAL CONTRACTOR TO PROVIDE ALL REQUIRED ENGINEERING, CALCULATIONS, FORMS, APPLY, PAY FOR & OBTAIN ALL REQUIRED PERMITS.
18. GENERAL CONTRACTOR SHALL BRING TO THE OWNER'S ATTENTION ANY DISCREPANCIES WITHIN THE CONTRACT DOCUMENTS, ACTUAL FIELD CONDITIONS AND ANY DESIGN AND LAYOUT CHANGES REQUIRED DUE TO ANY SPECIFIC EQUIPMENT SELECTIONS OR ANY OTHER REASON PRIOR TO PURCHASING EQUIPMENT AND MATERIAL.
19. PROVIDE BARRIER FREE SIGNAGE AT RESTROOMS.
20. MOUNT ALL SINKS AT 34" AFF, UNO. COUNTERS 34" AFF WHEN SINK COUNTER MOUNTED.
21. EXTERIOR BUILDING SIGNAGE IS NIC. CONTRACTOR TO PROVIDE POWER TO SIGN LOCATIONS.
22. THE ARCHITECT HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND/OR CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK. THE UNDERTAKING OF PERIODIC SITE VISITS BY THE ARCHITECT SHALL NOT BE CONSTRUED AS SUPERVISION OF ACTUAL CONSTRUCTION NOR MAKE HIM RESPONSIBLE FOR THE PERFORMANCE OF WORK BY THE CONTRACTOR OR CONTRACTOR'S EMPLOYEES, OR EMPLOYEES OF SUPPLIERS OR SUBCONTRACTORS, OR FOR ACCESS, VISITS, USE, WORK, TRAVEL OR OCCUPANCY BY ANY PERSON.
23. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.
24. THESE DRAWINGS ARE THE EXCLUSIVE PROPERTY OF THE ARCHITECT AND MAY BE REPRODUCED ONLY WITH THE WRITTEN PERMISSION OF THE ARCHITECT. AUTHORIZED REPRODUCTIONS MUST BEAR THE NAME OF THE ARCHITECT.
25. PROVIDE FIRE BLOCKING, DRAFT STOPS AND FIRE STOPS IN ATTICS, FLOORS AND WALL CAVITIES AS REQUIRED PER THE IBC.
26. CONTRACTOR SHALL RETAIN ONE SET OF THE PLANS TO NOTE AND DOCUMENT ALL CHANGES DURING CONSTRUCTION. THE SET SHALL BE A PART OF THE CONTRACTOR'S CLOSE-OUT PACKAGE TO THE OWNER. CLOSE- OUT PACKAGE SHALL INCLUDE (3) SET OF SHOP DRAWINGS, PRODUCT LITERATURE, EQUIPMENT WARRANTEE MANUALS.
27. CONTRACTOR SHALL PROVIDE SOLID BLOCKING, UNLESS NOTED OTHERWISE AS REQUIRED FOR NAILING OF ALL INTERIOR AND EXTERIOR TRIMS, FINISHES AND FIXTURES. THE CONTRACTOR SHALL PROVIDE FOR ALL THE NECESSARY FRAMING AND BRACING FOR THE INSTALLATION OF OWNER FURNISHED ITEMS.
28. CONTRACTOR SHALL ONLY PROCEED WITH WORK WHERE HAZARDOUS MATERIALS ARE PRESENT AFTER RECEIPT OF THE BUILDING OWNERS HAZARDOUS MATERIALS GOOD FAITH REPORT REQUIRED BY THE STATE. PRIOR TO ANY DEMOLITION VERIFY & PERFORM ADDITIONAL HAZARDOUS MATERIAL TESTING AS REQUIRED. LEGALLY REMOVE HAZARDOUS MATERIALS. PROVIDE LEGAL DOCUMENTATION. CONTRACTOR SHALL COMPLY WITH FEDERAL AND STATE RULES AND REGULATIONS WHEN HANDLING, REMOVING OR ENCAPSULATING HAZARDOUS MATERIALS ON THE PROJECT.
29. LEGALLY REMOVE & DISPOSE OF THE DEMOLITION AND CONSTRUCTION DEBRIS.
30. DIMENSIONS TO STUD FACE UNLESS NOTED AS "CLEAR" OR "CLR" WHICH MEANS TO FACE OF WALL FINISH.

SYMBOLS

- XXX — DETAIL REFERENCE
- X / XXX — BLDG SECTION
- X / XXX — WALL SECTION
- A / D XXX B / C — INTERIOR ELEVATION
- XXX / CITY — DOOR NUMBER
- XXX — ROOM NUMBER
- ELEVATION DATUM
- X — COLUMN GRID
- X — WALL TYPE
- POWER POLE
- CATCH BASIN
- D — STORM DRAIN MANHOLE
- S — SANITARY SEWER MANHOLE
- FIRE HYDRANT

ARCHITECTURAL ABBREVIATIONS

A.H.U.	AIR HANDLING UNIT
ALT.	ALTERNATE
A.V.	AUDIO / VISUAL
BLDG.	BUILDING
DIA.	DIAMETER
D.S.	DOWNSPOUT
ELEC.	ELECTRICAL
ELEV.	ELEVATOR
EXT.	EXTERIOR
F.E.	FIRE EXTINGUISHER
F.E.C.	FIRE EXTINGUISHER CABINET
F.F.	FINISH FLOOR
GA.	GAUGE
G.L.B.	GLUE LAMINATED BEAM
G.W.B.	GYPSUM WALLBOARD
HR.	HOUR
INSUL.	INSULATION
INT.	INTERIOR
MECH.	MECHANICAL
MISC.	MISCELLANEOUS
N.I.C.	NOT IN CONTRACT
O.C.	ON CENTER
OPP.	OPPOSITE
P.T.	PRESSURE TREATED
REF.	REFERENCE
RM.	ROOM
S.D.	SMOKE DETECTOR
SHT.	SHEET
SIM.	SIMILIAR
SS.	STAINLESS STEEL
ST.	STREET
STRUCT.	STRUCTURAL
T.O.C.	TOP OF CONCRETE
TS.	TUBE STEEL
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
W/	WITH
@	AT
&	AND

BUILDING OWNER

SUDDEN VALLEY COMMUNITY ASSOCIATION
4 CLUBHOUSE CIRCLE
BELLINGHAM, WA
CONTACT:

CONSULTANTS

ARCHITECT:
SARAH BROWN ARCHITECTURE + DESIGN
PROJECT ARCHITECT: SARAH BROWN
PH: (360) 920.5498
EMAIL: SARAH@SBARCHDESIGN.COM

STRUCTURAL ENGINEERING:
KINGWORKS
CONTACT: QUINN HANKS
PH: (360) 202.5211
EMAIL: QUINN@KING-WORKS.COM

MECHANICAL ENGINEERING:
BERONA ENGINEERS
CONTACT: ROB RUSSELL
PH: (425) 744.6033 EXT 102
EMAIL: ROB@BERONAENGINEERS.COM

CONTRACTOR

PNW CIVIL INC.
PO BOX 30498
BELLINGHAM, WA 98228
CONTACT: TYLER ANDREWS
PH: (360) 739-2072

BUILDING CODE REQUIREMENTS

2021 INTERNATIONAL BUILDING CODE, IEBC PRESCRIPTIVE COMPLIANCE METHOD & WA STATE AMENDMENTS.

PROJECT DESCRIPTION

PROJECT DESCRIPTION:	THIS PROJECT CONSISTS OF AN AHU REPLACEMENT IN EXISTING MECHANICAL ROOM
CONSTRUCTION TYPE:	V-B
OCCUPANCY:	GROUP : B-BUSINESS
AREA:	MAIN FLOOR: 8,101 SQ FT WO BASEMENT: 7,164 SQ FT
RESTROOMS:	NO WORK
FIRE SPRINKLERS:	SPRINKLED
FIRE ALARM:	PROVIDE & LOCATE FIRE ALARM NOTIFICATION APPLIANCE(S) STATION(S) AND SENSOR(S) AS REQUIRED BY FIRE DEPARTMENT

PROJECT NOTES

DEMOLITION NOTES:

1. LEGALLY REMOVE DEMOLITION DEBRIS FROM SITE.
2. PROTECT ALL STRUCTURAL MEMBERS AND COLUMNS.
3. DEMOLITION DEBRIS SHALL NOT BE ALLOWED TO DAMAGE OR OVERLOAD THE EXISTING STRUCTURE.

1 VICINITY MAP
SCALE: NTS

N

PROJECT ADDRESS

4 CLUBHOUSE CIRCLE
BELLINGHAM, WA 98229

LAND USE INFORMATION

PARCEL No.: 0301731; 3704082055100000

ABBREV. LEGAL DESCRIPTION:
BUSINESS PERSONAL PROPERTY ASSETS - SUDDEN VALLEY COMM ASSOC/ G&CC

THAT PTN OF TRACTS A-B LY WITHIN SEC 8 DAF-BEG AT SE COR OF LOT 13 SUDDEN VALLEY DIV 32-TH ALG ELY PLAT BNDRY ON FOL COURSES N 09 DEG 35'56" W 781.11 FT-TH N 15 DEG 53'34" E 170.39 FT-TH N 01 DEG 46'44" W 161.08 FT-TH N 15 DEG 56' 43" E 305.77 FT-TH N 20

PROPERTY CHARACTERISTICS

LAND USE:	72
TAX DIST:	1015 - 501 R L FSW LWWS
LEGAL ACRES:	73 ACRES

DRAWING INDEX

APPROVED PLANS SHALL BE KEPT ON SITE OF THE BUILDING OR WOR AT ALL TIMES DURING WHICH WORK IS AUTHORIZED. IBC SEC.107

PRE-CONSTRUCTION MEETING REQUIRED PRIOR TO CONSTRUCTION.
FOR INSPECTION REQUEST SCHEDULE THROUGH THE CUSTOMER SERVICES ON LINE PORTAL PRIOR TO 6PM.

ANY DEVIATION IN CONSTRUCTION FROM APPROVED PLANS REQUIRES PRIOR REVIEW AND APPROVAL

Address shall be placed on all new and existing buildings and shall be plainly visible from the street or road. IFC sec. 505.1

REQUEST FOR INSPECTION SHALL BE FILED WITH OUR OFFICE AT LEAST ONE WORKING DAY BEFORE SUCH INSPECTION IS DESIRED

INSECTION REQUEST: TO REQUEST AN INSPECTION SCHEDULE THROUGH THE CUSTOMER SERVICE ON LINE PORTAL

REVIEWED FOR CODE COMPLIANCE SUBJECT TO FIELD INSPECTIONS, CORRECTIONS AND PROVISIONS OF PLAN REVIEW

09/18/2025
PLANS EXAMINER, BLDG. SERVICES

Sarah Brown ARCHITECTURE + DESIGN
3222 EAGLERIDGE WAY, BELLINGHAM, WA 98226
C) 360.920.5498
E) SARAH@SBARCHDESIGN.COM

11122 REGISTERED ARCHITECT
Sarah Brown
SARAH J A BROWN
STATE OF WASHINGTON

CLUBHOUSE MECH. TI

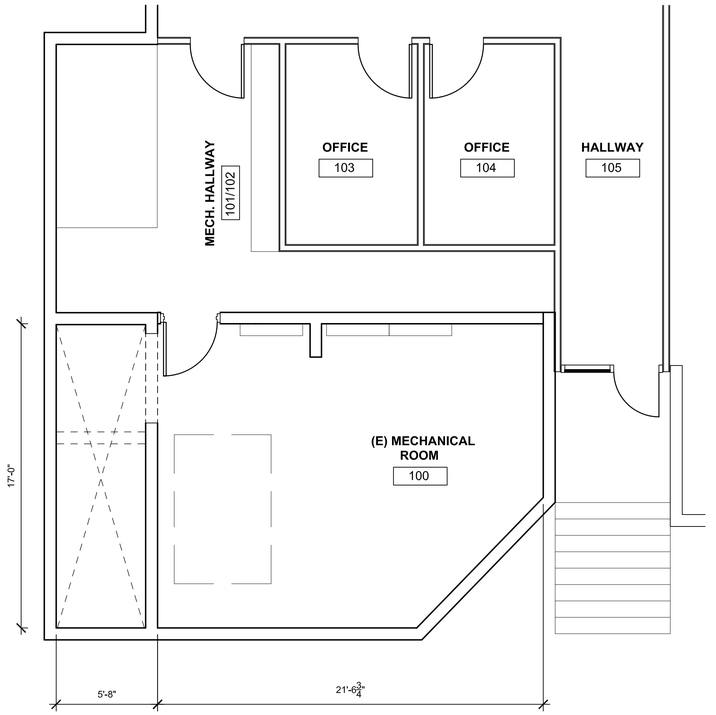
SUDDEN VALLEY COMMUNITY ASSOC.
4 CLUBHOUSE CIRCLE
BELLINGHAM, WA

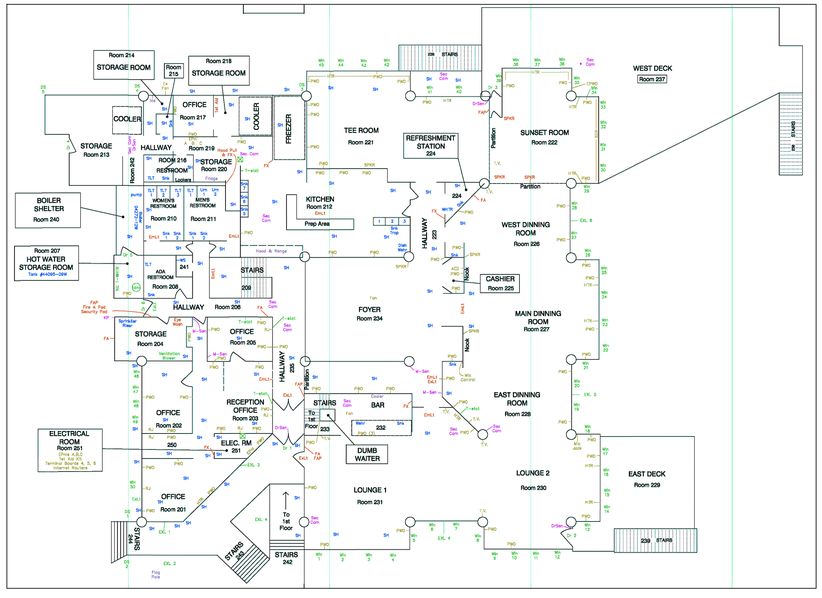
JOB NO: 202404.11
DATE: 08.14.2025

REV	ISSUED FOR	DATE

PROJECT INFO

A1.01





Sarah Brown
ARCHITECTURE + DESIGN

3222 EAGLERIDGE WAY, BELLINGHAM, WA 98226
C) 360.920.5498
E) SARAH@SBARCHDESIGN.COM

11122 REGISTERED ARCHITECT
Sarah Brown
SARAH J A BROWN
STATE OF WASHINGTON

CLUBHOUSE MECH. TI

SUDDEN VALLEY COMMUNITY ASSOC.
4 CLUBHOUSE CIRCLE
BELLINGHAM, WA

JOB NO: 202404.11
DATE: 08.14.2025

REV	ISSUED FOR	DATE

BUILDING & ENLARGED PLAN

A2.01

KINGWORKS STRUCTURAL ENGINEERS
600 Dupont St, Suite B
Bellingham, WA 98225
360.714.8260
www.king-works.com

AIR HANDLER INFO

AIR HANDLER UNIT (AHU-) SCHEDULE																		
TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL						NOTES
			EVAPORATOR	TOTAL COOL (BTUH)	SENS COOL (BTUH)	DESIGN FLOW (CFM)	O.A. FLOW (CFM)	ESP (IN WG)	VELOCITY (RPM)	HP	FEI	VOLTAGE	PHASE	FLA	BREAKER	WEIGHT (LBS)	DIMENSIONS (H"xW"xD")	
AHU-2	LOWER FLOOR	DAIKIN	CAH008GDBC	193,252	147,436	4,000	-	1.25	1,993	5.0	0.91	460	3	6.2	20	1078	34"x64"x58"	1-8

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. RFIELD ROUTE TO APPROVED DRAIN.
3. WITH R-410A REFRIGERANT.
4. TEMPERED OUTSIDE AIR PROVIDED BY 100% O.A. RTU-2.
5. PROVIDE W/ MERV-8 FILTER
6. CONNECT TO EXIST BUILDING CONTROL SYSTEM.
7. COOLING PROVIDED BY DX COIL FROM CU-2.
8. HEATING PROVIDED BY SEPARATE EXISTING DUCT MOUNTED HOT WATER HEATING COIL.

CLIP INFO

Crosby
WIRE ROPE CLIPS

G-450 U-BOLT CLIP

NEVER SADDLE A DEAD HORSE.

NEVER USE MALLEABLE CLIPS FOR ANY CRITICAL APPLICATION

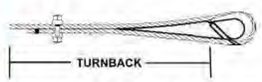
FOR ELEVATOR, PERSONNEL HOIST, AND SCAFFOLD APPLICATIONS, ANSI A17.1 AND A10.4 DO NOT RECOMMEND U-BOLT CLIPS. CROSBY RECOMMENDS FIST GRIP CLIPS FOR TIE OFF LINES FOR FALL PROTECTION.

G-429 FIST GRIP CLIP

16

SIZE (IN.)	NUMBER OF CLIPS	TURNBACK LENGTH (IN.)	TORQUE FT-LBS.	SIZE (IN.)	NUMBER OF CLIPS	TURNBACK LENGTH (IN.)	TORQUE FT-LBS.
1/8	2	3-1/4	4.5	3/16	2	4	30
3/16	2	3-3/4	7.5	1/4	2	4	30
1/4	2	4-3/4	15	5/16	2	5	30
5/16	2	5-1/4	30	3/8	2	5-1/4	45
3/8	2	6-1/2	45	7/16	2	6-1/2	65
7/16	2	7	65	1/2	3	11	65
1/2	3	11-1/2	65	9/16	3	12-3/4	130
9/16	3	12	95	5/8	3	13-1/2	130
5/8	3	12	95	3/4	3	16	225
3/4	4	18	130	1	5	37	225
1	5	26	225				

SOME STANDARDS MAY REQUIRE A MINIMUM OF 3 WIRE ROPE CLIPS, THE NUMBER OF CLIPS IS BASED UPON USING RRL OR RLL WIRE ROPE. 6 X 19 OR 6 X 36 CLASS, FC OR IWRC; IPS OR XIP, XXIP, ALSO APPLIES TO ROTATION - RESISTANT RRL WIRE ROPE. 8 X 19 CLASS, IPS, XIP, XXIP SIZES 1-3/4 INCH AND SMALLER. IF A PULLEY (SHEAVE) IS USED FOR TURNING BACK THE WIRE ROPE, ADD ONE ADDITIONAL CLIP. CLIPS ARE 80% EFFICIENT UNDER 1' AND 90% 1" AND ABOVE.



1 APPLY FIRST CLIP ONE BASE WIDTH FROM DEAD END

2 APPLY SECOND CLIP AS NEAR THIMBLE AS POSSIBE

3 APPLY ALL ADDITIONAL CLIPS EVENLY BETWEEN THE FIRST TWO

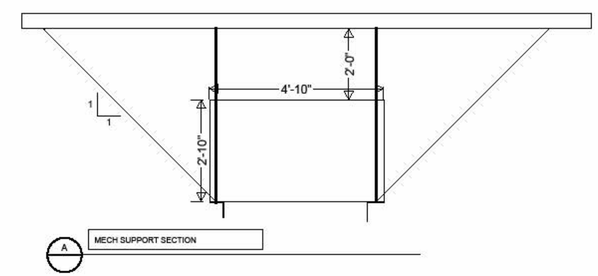
STRUCTURAL NOTES

DESIGN CRITERIA
Unit weight : 1078 lbs
Seismic design acceleration: Sds = 0.85
Seismic horizontal force (Fph): 397 lb
Seismic vertical force (Fpv): 183 lb
Overstrength factor for anchorage to concrete: 2.0

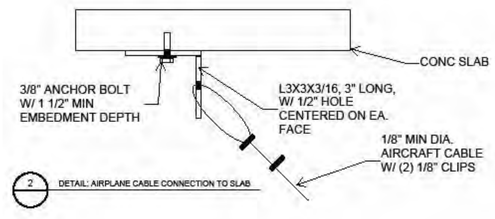
MATERIALS
- Pre-approved Epoxy for post-installed threaded rod or reinforcing in concrete base material: Simpson SET-3G.
- Anchor type shall be according to the drawings. All post-installed anchors installed in concrete shall have ICC-ES reports demonstrating IBC compliance for use in cracked concrete and for seismic loading. Substitutions not permitted without written permission by KW.

INSTALLATION: Post-installed anchor hole diameter, drilling depth, cleaning and installation procedure shall be in accordance with the current Manufacturer's Printed Installation Instructions (MPII) provided in the ICC/ES report. Holes shall be drilled with rotohammer equipment. Core-drilled holes are not permitted unless specifically noted otherwise.

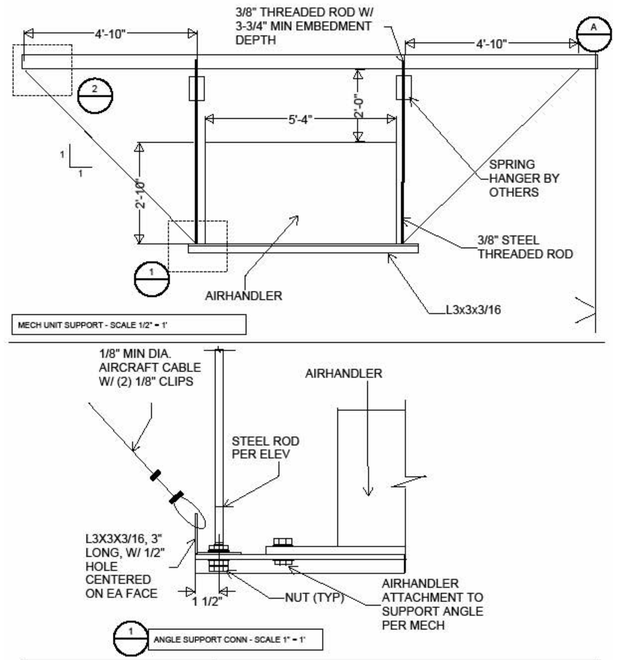
REINFORCEMENT LOCATIONS: All post-installed anchors shall be located to avoid drilling into reinforcement, unless specifically approved by the Engineer. Reinforcement shall be placed with consideration for locations of post-installed anchors. Do not damage reinforcing during drilling operations.



3 MECHANICAL SUPPORT SECTION
1/4" = 1'-0"



2 AIRPLANE CABLE CONNECTION
1/4" = 1'-0"



1 MECH UNIT SUPPORT
1/4" = 1'-0"

REV	Description	Date
	Revision Schedule	

NORTH. PLAN.

SCALE.
As indicated

PNW SV CLUBHOUSE
MECHANICAL

4 CLUBHOUSE CIRCLE
BELLINGHAM, WA 98229

Client Name

MECHANICAL UNIT SUPPORT

PROJECT#. 24153
DRAWN. JAndreasen CHECK. QHanks
ISSUED. 10/4/2024

S1.0

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GENERAL

NORTH ARROW

SECTION CALLOUT

DETAIL CALLOUT

POINT OF CONNECTION

REVISION NOTE

FLAG NOTE (CONSTRUCTION)

EF-3 — EQUIPMENT IDENTIFIER

LIGHT LINE WEIGHT INDICATES EXISTING WORK

BOLD LINE WEIGHT INDICATES NEW WORK

LIGHT DASHED LINES INDICATE WORK TO BE ABANDONED OR REMOVED

SLASHED LINES INDICATE EXISTING WORK TO BE DEMOLISHED

HVAC

CUBIC FEET PER MINUTE

CENTER LINE

ROUND DUCT INDICATOR

THERMOSTAT LINE

RISE — DIRECTION OF RISE FOR DUCT

24x12 — DUCT (FIRST FIGURE DENOTES VIEW SHOWN)

24x12 / 10x8 — SINGLE LINE DUCTWORK INDICATES DUCT WITH VIEW DIMENSION LESS THAN 12 INCHES

SUPPLY OR EXHAUST TAKEOFF

SUPPLY DUCT TURNING TOWARD, UP

SUPPLY DUCT TURNING AWAY

EXHAUST DUCT TURNING TOWARD, UP

EXHAUST DUCT TURNING AWAY

ROUND DUCT TURNING TOWARD, UP

ROUND DUCT TURNING AWAY

CONICAL WYE

CONICAL TEE

VOLUME DAMPER(VD)

FIRE SMOKE DAMPER(FSD)

MOTORIZED DAMPER(FD)

FIRE DAMPER(FD)

3-WAY SUPPLY DIFFUSER

2-WAY SUPPLY DIFFUSER

2-WAY CORNER SUPPLY DIFFUSER

1-WAY SUPPLY DIFFUSER

DOUBLE LINE, LINED DUCT/ ACOUSTIC DUCT

SINGLE LINE, LINED DUCT/ ACOUSTIC DUCT

TV — RECTANGULAR 90° ELBOW W/ TURNING VANES TYPICAL

30X20 / 18"ø — RECTANGLE TO ROUND FITTING

SOUND ATTENUATOR

ACCESS DOORS

FLEXIBLE DUCT

TS — THERMOSTAT OR TEMPERATURE SENSOR

T — THERMOSTAT OR TEMPERATURE SENSOR(CEILING)

DSD — DUCT SMOKE DETECTOR

DPT — DIFFERENTIAL PRESSURE TRANSDUCER

ROUND SUPPLY AIR DIFFUSER

ROUND SUPPLY AIR DIFFUSER WITH PORTION BLANKED OFF

HVAC (CONT.)

LINEAR SUPPLY AIR DIFFUSER

SQUARE SUPPLY AIR DIFFUSER

SQUARE RETURN AIR GRILLE

SQUARE EXHAUST AIR GRILLE

SIDEWALL SUPPLY AIR GRILLE OR REGISTER

SIDEWALL RETURN/EXHAUST AIR GRILLE OR REGISTER

AIR FLOW DIRECTION THRU DOOR GRILLE OR UNDERCUT

ABBREVIATIONS

AC	AIR CONDITIONING
ACF	AIR CURTAIN FAN
ADA	AMERICAN DISABILITIES ACT
AD	AREA DRAIN
ADJ	ADJACENT, ADJUST, ADJUSTABLE, ADJUSTMENT
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINED
ALIGN	ALIGNMENT
AP	ACCESS PANEL
APPROX	APPROXIMATELY
ARCH	ARCHITECTURAL
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
AVG	AVERAGE
BFF	BELOW FINISH FLOOR
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BPD	BACKFLOW PREVENTION DEVICE
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNITS PER HOUR
BV	BALANCING VALVE
CD	CEILING DIFFUSER
CFM	CUBIC FEET PER MINUTE
CG	CEILING GRILLE
CI	CAST IRON
CLG	CEILING
CO	CLEANOUT
CONN	CONNECT, CONNECTED, CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS, CONTINUATION
COORD	COORDINATE
CORR	CORRIDOR
COTG	CLEANOUT TO GRADE
CU FT	CUBIC FEET
CU IN	CUBIC INCHES
CW	COLD WATER
DB	DRY BULB TEMPERATURE
DCV	DEMAND CONTROL VENTILATION
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DEG	DEGREE
DET	DETAIL
DFU	DRAINAGE FIXTURE UNIT
DIA	DIAMETER
DIFF	DIFFERENTIAL, DIFFERENT, DIFFUSER
DIM	DIMENSION
DISCH	DISCHARGE
DN	DOWN
DOM	DOMESTIC
DR	DRAIN
DS	DOWNSPOUT
DSD	DUCT SMOKE DETECTOR
DWG	DRAWING
EA	EACH
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
EFF	EFFICIENCY
EG	EXHAUST GRILLE
ELECT	ELECTRICAL
ELEV	ELEVATION
EMERG	EMERGENCY
ENT	ENTERING
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
F	FAHRENHEIT
FC	FANCOIL
FCO	FLOOR CLEANOUT
FD	FIRE DAMPER, FLOOR DRAIN
FDC	FIRE DEPARTMENT CONNECTION
FIO	FURNISHED AND INSTALLED BY OWNER
FLA	FULL LOAD AMP
FLEX	FLEXIBLE
FLR	FLOOR
FOB	FLAT ON BOTTOM
FOIC	FURNISHED BY OWNER INSTALLED BY CONTRACTOR
FOT	FLAT ON TOP
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FSD	FIRE SMOKE DAMPER
FT	FOOT, FEET
FU	FIXTURE UNITS
G	GAS
GA	GAGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERAL
GND	GROUND
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GW	GREASE WASTE
H	HEIGHT, HIGH
HB	HOSE BIBB
HP	HORSEPOWER
HR	HOUR
HTG	HEATING
HVAC	HEATING VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HWC	HOT WATER CIRCULATING
HWR	HOT WATER HEATING RETURN
HWS	HOT WATER HEATING SUPPLY
HZ	HERTZ

ABBREVIATIONS (CONT.)

IBC	INTERNATIONAL BUILDING CODE
ID	INDIRECT DRAIN
IE	INVERT ELEVATION
IMC	INTERNATIONAL MECHANICAL CODE
IN	INCH
INSUL	INSULATE, INSULATION
IW	INDIRECT WASTE
KW	KILOWATT
KWH	KILOWATT HOUR
L	LENGTH
LAV	LAVATORY
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
LF	LINEAL FOOT
LVG	LEAVING
MA	MIXED AIR
MAX	MAXIMUM
MBH, MBTU	THOUSAND BRITISH THERMAL UNITS PER HOUR
MCA	MINIMUM CIRCUIT AMPACITY
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MOD	MOTOR OPERATED DAMPER
MTD	MOUNTED
MTG	MOUNTING
NA	NOT APPLICABLE
NC	NOISE CRITERIA
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OAC	OUTDOOR AIR CONDITIONER
OAT	OUTSIDE AIR TEMPERATURE
OD	OUTSIDE DIAMETER, OVERALL DIAMETER
OH	OVERHEAD
ORD	OVERFLOW ROOF DRAIN
OSA	OUTSIDE AIR
P	PUMP
PD	PRESSURE DROP, PIT DRAIN
PH	PHASE
POC	POINT OF CONNECTION
PRELIM	PRELIMINARY
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAGE
RA	RETURN AIR
RD	ROOF DRAIN
RECIRC	RECIRCULATING
RECT	RECTANGULAR
REF	REFERENCE
REG	REGULATOR
REQD	REQUIRED
RND	ROUND
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
RV	RELIEF VALVE
SAN	SANITARY
SCHED	SCHEDULE
SD	SUPPLY DIFFUSER
SF	SUPPLY FAN, SQUARE FEET
SG	SUPPLY GRILLE
SO	SCREENED OPENING
SOV	SHUT OFF VALVE
SP	STATIC PRESSURE
SPEC	SPECIFICATION
SPECD	SPECIFIED
SST	STAINLESS STEEL
SS	SOIL STACK, SANITARY SEWER
STRUCT	STRUCTURAL
SWG	SUPPLY WALL GRILLE
SWR	SUPPLY WALL REGISTER
TBD	TO BE DETERMINED
TEMP	TEMPERATURE, TEMPORARY
TSTAT	THERMOSTAT
THRU	THROUGH
TOD	TOP OF DUCT
TOP	TOP OF PIPE
TP	TRAP PRIMER
TS	TEMPERATURE SENSOR
TV	TURNING VANE
TW	TEMPERED WATER
TWR	TEMPERED WATER RECIRCULATE
TYP	TYPICAL
UPC	UNIFORM PLUMBING CODE
UTR	UP THRU ROOF
V	VENT
VAV	VARIABLE AIR VOLUME
VB	VACUUM BREAKER
VD	VOLUME DAMPER
VEL	VELOCITY
VERT	VERTICAL
VOL	VOLUME
VS	VENT STACK
VTR	VENT TO ROOF
W	WASTE
WCO	WALL CLEAN OUT
WB	WET BULB TEMPERATURE
WEF	WALL EXHAUST FAN
WG	WATER GAGE
WHA	WATER HAMMER ARRESTOR
W/	WITH
W/O	WITHOUT
WS	WASTE STACK
WT	WEIGHT
WSFU	WATER SUPPLY FIXTURE UNIT

DRAWING LIST

GENERAL NOTES:

1. COMPLETE INSTALLATION OF THE MECHANICAL SYSTEM SHALL BE PER THE LATEST ADOPTED VERSION OF INTERNATIONAL BUILDING CODE (IBC), INTERNATIONAL MECHANICAL CODE (IMC), WASHINGTON STATE ENERGY CODE (WSEC), UNIFORM PLUMBING CODE (UPC), INTERNATIONAL FUEL GAS CODE (IFGC), INTERNATIONAL FIRE CODE (IFC), NFPA AND HEALTH CODES AND REGULATIONS AS ADOPTED BY THE LOCAL JURISDICTIONS.
2. CONTRACTOR SHALL COORDINATE DIFFUSER, GRILLE AND REGISTER LOCATIONS AND DUCT ROUTING CLEARANCES WITH THE STRUCTURAL, REFLECTED CEILING AND LIGHTING PLANS.
3. MAKE ACCEPTABLE ACCESS PROVISIONS FOR REMOVAL OF FILTER AND MAINTENANCE FOR ALL INDOOR UNITS. REFER TO MANUFACTURER'S INSTALLATION GUIDE.
4. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE.
5. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR.
6. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE DOCUMENTS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
7. ALL GAS EQUIPMENT SHALL BE INSTALLED PER THEIR LISTINGS, IMC, UPC, IFGC AND LOCAL CODES.
8. ALL ROOF PENETRATIONS SHALL BE MINIMUM OF 5 FEET AWAY FROM THE AREA/OCCUPATION SEPARATION WALLS. ALL PIPE, DUCT AND CONDUIT PENETRATIONS THROUGH RATED ASSEMBLIES SHALL BE FIRE AND SMOKE STOPPED PER CODE.
9. ALL EQUIPMENT, DAMPERS, PIPING, AND ACCESSORIES IN CONCEALED SPACES REQUIRING ACCESS SHALL HAVE ACCESS DOORS. ALL ACCESS DOORS IN FIRE RATED STRUCTURE SHALL BE FIRE RATED. COORDINATE LOCATIONS WITH ARCHITECT. CONTRACTOR TO PROVIDE ACCESS DOORS.
10. ALL EQUIPMENT SHALL BE FREE FROM DEFECTS IN MATERIAL, WORKMANSHIP, AND SHALL BE OF THE KIND AND QUALITY DESCRIBED HEREIN.
11. COORDINATE WITH THE STRUCTURAL ENGINEER AND GENERAL CONTRACTOR TO PROVIDE STRUCTURAL SUPPORT AND SEISMIC RESTRAINTS FOR ALL EQUIPMENT.
12. ALL EQUIPMENT SHALL BE APPROVED FOR INSTALLATION IN THE STATE OF WASHINGTON AND SHALL HAVE ALL CERTIFICATIONS AND RATINGS REQUIRED TO MEET ALL ENERGY, POLLUTION, ENVIRONMENTAL, SEISMIC, ETC. CODES AND REGULATIONS.
13. VERIFY ALL THE MECHANICAL EQUIPMENT'S ELECTRICAL LOADS VOLTAGE/PHASE, ETC. WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING.
14. WHERE MULTIPLE RISERS OR HORIZONTAL LOOPS ARE USED, BALANCING VALVES IN THE RETURN LINES ARE REQUIRED. A CHECK VALVE SHALL BE PROVIDED IN EACH RETURN TO PREVENT TEMPORARY REVERSAL OF FLOW.
15. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY IMC, UPC, IBC, WASHINGTON STATE ENERGY CODE AND ALL APPLICABLE LOCAL AMENDMENTS.
16. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
17. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, ELECTRICAL WORK, ETC., SHOWN ON CONTRACT DOCUMENT DRAWINGS.
18. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
19. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE NEBB STANDARDS. AABC ACCEPTABLE PENDING AGENCY APPROVAL.
20. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
21. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
22. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
23. AIR AND FLUID FLOW RATES SHALL BE TESTED AND BALANCED WITHIN THE TOLERANCES DEFINED IN SPECIFICATIONS OR SHOWN ON PLANS. SYSTEMS SHALL BE BALANCED IN A MANNER TO FIRST MINIMIZE THROTTLING LOSSES, THEN ADJUSTED TO MEET DESIGN FLOW CONDITIONS.
24. RECORD DRAWINGS SHALL BE PROVIDED TO THE OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE AS REQUIRED BY SECTION C103.6 OF THE WSEC. THE DRAWINGS SHALL INDICATE THE LOCATION AND PERFORMANCE DATA OF EQUIPMENT, GENERAL CONFIGURATION OF DUCTWORK AND PIPING DISTRIBUTION SYSTEMS, INCLUDING FLOW RATES AS A MINIMUM, THAT HAVE BEEN DEVIATED FROM THESE DOCUMENTS. A COMPLETE RECORD OF CHANGES SHALL BE KEPT TO DATE ON A DAILY BASIS AND MADE ACCESSIBLE TO OWNER AND ENGINEER.

GENERAL HVAC NOTE:

1. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
2. LOCATE ALL TEMPERATURE, DEVICES IN DUCTWORK LOCATIONS WITH STRAIGHT SECTION OF DUCT UP AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
3. COORDINATE AND PROVIDE ALL DUCT TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT DIMENSIONS BEFORE FABRICATION.
4. ALL EQUIPMENT, DUCTWORK, ETC., SHALL BE SUPPORTED AS REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION, AND SEISMICALLY BRACED AS REQUIRED. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
5. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK, ACCESS DOORS, VOLUME DAMPERS, ETC. ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.
6. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'-0" (CENTERLINE) ABOVE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE ABOVE LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
7. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
8. PROVIDE ALL 90 DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.
9. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE (WITHIN TRUSSES), WITH SPACE FOR INSULATION IF REQUIRED.
10. MAXIMUM LENGTH OF FLEXIBLE DUCTS LOCATED ABOVE HARD CEILINGS SHALL BE AS CODE PERMITS BUT NO LONGER THAN 4 FEET.
11. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS ,INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

2021 WASHINGTON STATE ENERGY CODE (WSEC) NOTES

1. HVAC EQUIPMENT SHALL HAVE MINIMUM PERFORMANCE AT SPECIFIED RATING CONDITIONS NOT LESS THAN THE VALUES INDICATED IN TABLE C403.3.2(1) THRU C403.3.2(12) OF THE WSEC AND AS INDICATED ON THE CONTRACT DOCUMENTS.
2. PROVIDE DEADBAND BETWEEN HEATING/COOLING SPACE SENSOR SETPOINTS OF 5 DEGREES AS REQUIRED BY SECTION C403.4.1.2 OF THE WSEC OR AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
3. HVAC SYSTEMS SHALL BE EQUIPPED WITH AUTOMATIC CONTROLS CAPABLE OF ACCOMPLISHING SETBACK OR SHUTDOWN DURING UNOCCUPIED PERIODS AS REQUIRED BY SECTION C403.4.2 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
4. PROVIDE BALANCING DEVICES IN ALL BRANCH DUCTS AS REQUIRED BY SECTION C408.2.2 AND C408.2.2.1 OF THE WSEC AND AS INDICATED ON THE CONTRACT DOCUMENTS.
5. ALL DUCTWORK SHALL COMPLY WITH SMACNA STANDARDS FOR CONSTRUCTION OF GALVANIZED DUCTWORK. ALL DUCTWORK SHALL BE SEALED AS REQUIRED BY SECTION C403.10.1 "DUCT AND PLENUM INSULATION AND SEALING" OF THE WSEC. DUCT TAPE NOT ALLOWED.
6. ALL DUCTWORK SHALL BE INSULATED AS REQUIRED BY SECTION C403.10.1 "DUCT AND PLENUM INSULATION AND SEALING" OF THE WSEC.
7. ALL PIPING SHALL BE INSULATED AS REQUIRED BY SECTION C403.10.3 OF THE WSEC.
8. HEATING AND COOLING EQUIPMENT FANS SHALL BE SHUT OFF DURING UNOCCUPIED PERIODS AS REQUIRED BY SECTION C403.3.5.2 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
9. SUPPLY AIR AND WATER TEMPERATURES SHALL BE AUTOMATICALLY RESET AS REQUIRED IN SECTION C403.4.4 AND C403.6.4 OF THE WSEC OR AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
10. ALL AIR SYSTEMS SHALL BE PROVIDED WITH A 100% CAPABLE AIR ECONOMIZER CAPABILITY AS REQUIRED BY THE SECTION C403.5 OF THE WSEC AND AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
11. AIR ECONOMIZERS SHALL BE CAPABLE OF PROVIDING PARTIAL COOLING EVEN WHEN ADDITIONAL MECHANICAL COOLING IS REQUIRED TO MEET THE REMAINDER OF THE COOLING LOAD, AS REQUIRED IN SECTION 403.5.1 OF THE WSEC.
12. SIMULTANEOUS HEATING AND COOLING TO INDIVIDUAL ZONES SHALL BE PROHIBITED AS DESCRIBED IN THE TEMPERATURE CONTROL SEQUENCES EXCEPT WHERE PERMITTED IN SECTION C403.4.1, EXCEPTIONS 1 THROUGH 3 OF THE WSEC.
13. VARIABLE FREQUENCY DRIVES SHALL BE PROVIDED FOR VARIABLE FLOW HEATING AND AIR HANDLING SYSTEMS AS REQUIRED BY SECTION C403.2.3 OF THE WSEC AND AS DESCRIBED IN THE CONTRACT DOCUMENTS INCLUDING TEMPERATURE CONTROL SEQUENCES, IF PROVIDED.
14. MOTOR EFFICIENCY SHALL NOT BE LESS THAN THE MINIMUM CALLOUTS PER SECTION C405.8 OF THE WSEC FOR FULL LOAD EFFICIENCIES.
15. HVAC SYSTEMS SHALL BE BALANCED AS REQUIRED BY SECTION C408.2 OF THE WSEC.
16. OPERATION AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE OWNER AS REQUIRED BY SECTION C103.6.2 OF THE WSEC. AS A MINIMUM, THE MANUALS SHALL INCLUDE:
    - A. SUBMITTAL DATA.
    - B. OPERATION AND MAINTENANCE DATA FOR EQUIPMENT.
    - C. NAMES AND ADDRESSES OF SERVICE AGENCIES.
    - D. HVAC CONTROLS SYSTEM MAINTENANCE AND CALIBRATION INFORMATION.
17. COMMISSIONING SHALL BE PROVIDED AND A REPORT OF COMMISSIONING BE SUBMITTED TO THE OWNER AS REQUIRED BY SECTION C408 OF THE WSEC. AND CONTRACTOR SHALL SUBMIT FORM "FIGURE C408.1.4.1" COMMISSIONING COMPLIANCE CHECKLIST.
18. IF NOT SPECIFICALLY STATED ABOVE, CONTRACTOR SHALL COMPLY WITH THE WSEC ITEMS THAT DO APPLY TO THIS PROJECT.

APPLICABLE CODES

2021 INTERNATIONAL BUILDING CODE W/ WA STATE AMENDMENTS
2021 INTERNATIONAL MECHANICAL CODE WITH WA STATE AMENDMENTS
2021 WA STATE ENERGY CODE

GENERAL HVAC NOTES (CONT.)

12. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL VOLUME DAMPERS AND OTHER ITEMS LOCATED IN THE DUCTWORK WHICH REQUIRE SERVICE AND/OR INSPECTION.
13. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.
14. ALL OSA, RELIEF/EXHAUST AIR, AND RETURN AIR DAMPERS SHALL BE MOTORIZED CONTROL AND SHALL HAVE A MAX LEAKAGE OF 4CFM/FT² @ 1.0"WG IN ACCORDANCE W/ AMCA 500D.ACCEPTABLE ACCESS PROVISIONS FOR REMOVAL OF FILTER AND MAINTENANCE FOR ALL INDOOR UNITS.
15. ALL AIR DISTRIBUTION SUPPLY OUTLETS AND RETURN/EXHAUST INLETS SHALL HAVE VOLUME CONTROL DEVICES.
16. ALL 90 DEGREE TRUNK DUCT ELBOWS SHALL BE SMOOTH-ROUND OR SQUARE WITH TURNING VANES.
17. CONTRACTOR SHALL LOCATE AND COORDINATE EXACT LOCATION OF DUCTWORK WITHIN THE STRUCTURE AT SITE.
18. ALL FAN SYSTEMS WITH OVER 2000 CFM SHALL HAVE SMOKE/DUCT DETECTORS TO SHUT-DOWN FAN UPON DETECTION. DUCT/SMOKE DETECTORS FURNISHED AND INSTALLED BY ELECTRICAL AND WIRED BY ELECTRICAL. DUCT/SMOKE DETECTORS SHALL BE LISTED BY AN APPROVED AGENCY AND FOR INSTALLATION IN AIR DUCTS PER IMC.
19. ALL DUCT PENETRATIONS THROUGH RATED ENCLOSURES SHALL BE FIRE DAMPERED AND/OR SMOKE DAMPERED AS REQUIRED.
20. ALL MECHANICAL HEATING AND VENTILATION EQUIPMENT SHALL CONFORM TO SMACNA, LOCAL AND STATE REGULATIONS FOR SEISMIC RESTRAINT (INCLUDING PIPING AND DUCTWORK). COORDINATE WITH STRUCTURAL.
21. ALL RECTANGULAR DUCTWORK SIZES SHOWN ARE INSIDE CLEAR DIMENSIONS. SUPPLY AND RETURN DUCTWORK FOR HVAC TO HAVE 1" SOUNDLINING FOR THE FIRST 10 FEET FROM UNIT DISCHARGE OUTLET. ALL DUCT LINING TO MEET AND EXCEED MOLD, HUMIDITY, EROSION RESISTANT, ETC. TO MEET 1MC CHAPTER 6. ALL DUCTWORK TO BE CLASS-I AIR DUCTS. CLASS-II DUCTS SHALL NOT BE USED.
22. PROVIDE COMPLETE REFRIGERATION PIPING, INSULATION AND CONTROLS TO ALL MECHANICAL REFRIGERANT EQUIPMENT.

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SVCA CLUBHOUSE HVAC

4 CLUBHOUSE CIR,
BELLINGHAM, WA, 98229

REVISIONS

NO	DATE	BY	DESCRIPTION
-	--/--/--	-	-

TITLE

HVAC LEGENDS AND NOTES

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M0.0.DWG
JOB NUMBER	2024.11

PERMIT SET 08-15-2025

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MECHANICAL GENERAL PROVISIONS DIVISION 22 AND 23

PART 1 – GENERAL

1. SECTION INCLUDES
   A. BASIC GENERAL PROVISIONS SPECIFICALLY APPLICABLE TO DIVISION 23 SECTIONS, IN ADDITION TO DIVISION 1 – GENERAL REQUIREMENTS.
2. GENERAL REQUIREMENTS
   A. CONDITIONS:
      a. CONFORM TO ALL BIDDING REQUIREMENTS, GENERAL CONDITIONS AND AMENDMENTS TO THE GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS AND SPECIAL CONDITIONS AND GENERAL REQUIREMENTS, DIVISION 1, WHICH GOVERN THE WORK SPECIFIED HEREIN.
      b. THE CONTRACTOR IS OBLIGATED TO COMPLY WITH THE ABOVE IN ADDITION TO THE REQUIREMENTS OF THIS SECTION.
      c. MODIFICATIONS BY THIS SECTION DO NOT NULLIFY ANY OTHER PORTIONS OF THE ABOVE REFERENCED CONDITIONS.
   B. PLANS AND SPECIFICATIONS:
      a. PLANS AND SPECIFICATIONS SHALL BE TAKEN TOGETHER.
      b. CONTRACTOR SHALL PROVIDE ALL EQUIPMENT, MATERIALS AND WORK SHOWN ON THE PLANS AND/OR CALLED FOR IN THESE SPECIFICATIONS.
      c. PROVIDE WORK SPECIFIED AND NOT INDICATED ON PLANS, OR WORK INDICATED ON PLANS AND NOT SPECIFIED, AS THOUGH MENTIONED IN BOTH.
      d. WHEN DISCREPANCIES OCCUR BETWEEN PLANS AND SPECIFICATIONS OR WITHIN THE PLANS AND SPECIFICATIONS, THE ARCHITECT SHALL DETERMINE WHICH TAKES PRECEDENCE AND THE CONTRACTOR SHALL PERFORM THE SELECTED REQUIREMENT WITHOUT ADDITIONAL COST.
      e. MECHANICAL DRAWINGS:
         - MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND SHOW GENERAL ARRANGEMENT OF PIPING, DUCTWORK, EQUIPMENT, ETC. FOLLOW AS CLOSELY AS ACTUAL BUILDING CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT. BECAUSE OF SMALL SCALE OF MECHANICAL DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, AND ACCESSORIES, WHICH MAY BE REQUIRED.
         - CONSIDER ARCHITECTURAL, STRUCTURAL CIVIL, ACOUSTICAL, AND ELECTRICAL DRAWINGS PART OF THIS WORK INSOFAR AS THESE DRAWINGS FURNISH INFORMATION RELATING TO DESIGN AND CONSTRUCTION OF BUILDING.
         - INVESTIGATE ARCHITECTURAL AND STRUCTURAL AND FINISH CONDITIONS AFFECTING THIS WORK AND ARRANGE WORK ACCORDINGLY, PROVIDING SUCH FITTINGS, VALVES, AND ACCESSORIES REQUIRED MEETING CONDITIONS.
   C. READ AND BECOME FAMILIAR WITH BIDDING DOCUMENTS AND ALL OTHER DIVISIONS OF THIS SPECIFICATION AS THEY DO APPLY TO WORK IN DIVISION 23.
3. DEFINITIONS AND ABBREVIATIONS
   A. THE WORD "PROVIDE," AS USED IN DIVISION 23, MEANS "FURNISH AND INSTALL."
   B. THE WORD "CONTRACTOR," AS USED IN THESE SPECIFICATIONS, MEANS THE MECHANICAL CONTRACTOR.
   C. THE WORD "APPROVED," AS USED IN THESE SPECIFICATIONS, MEANS APPROVAL OF THE ARCHITECT.
   D. ABBREVIATIONS:
      - ABC – ASSOCIATED AIR BALANCE COUNCIL
      - AMCA – AIR MOVING AND CONDITIONING ASSOCIATION
      - ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
      - AHRI – AIR CONDITIONING, HEATING, AND REFRIGERATION INSTITUTE
      - ASHRAE – AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
      - ASME – AMERICAN SOCIETY OF MECHANICAL ENGINEERS
      - ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
      - AWWA – AMERICAN WATER WORKS ASSOCIATION
      - AWS – AMERICAN WELDING SOCIETY
      - CISPI – CAST IRON SOIL PIPE INSTITUTE
      - IBC – INTERNATIONAL BUILDING CODE
      - IMC – INTERNATIONAL MECHANICAL CODE
      - FM – FACTORY MUTUAL ENGINEERING CORPORATION
      - NEBB – NATIONAL ENVIRONMENTAL BALANCING BUREAU
      - NEC – NATIONAL ELECTRICAL CODE
      - NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
      - NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
      - OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
      - SEC – SEATTLE ENERGY CODE
      - SMACNA – SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC.
      - SBC – SEATTLE BUILDING CODE
      - SPC – SEATTLE PLUMBING CODE
      - SMC – SEATTLE MECHANICAL CODE
      - UL – UNDERWRITERS LABORATORY
      - UPC – UNIFORM PLUMBING CODE
      - WSEC – WASHINGTON STATE ENERGY CODE
4. CODES, PERMITS AND INSPECTIONS
   A. CODES: UNLESS OTHERWISE STATED OR SHOWN AS TO MEET OR EXCEED CODES. WORK SHALL BE INSTALLED AS A MINIMUM IN CONFORMITY WITH APPLICABLE LOCAL ORDINANCES AND STATUTES. STANDARDS AND SIZES, WHICH EXCEED PRECEDING REQUIREMENTS, SHALL BE INSTALLED AS DRAWN OR SPECIFIED. NOTHING IN THE SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT DEVIATION TO LESS THAN THE REQUIREMENTS OF GOVERNING CODES.
   B. CODES AND STANDARDS: APPLICABLE CODES AND STANDARDS SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO:
      a. UNIFORM PLUMBING CODE, BY INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS AND LOCAL AMENDMENTS.
      b. INTERNATIONAL MECHANICAL CODE, BY INTERNATIONAL CODE COUNCIL AND LOCAL AMENDMENTS.
      c. INTERNATIONAL BUILDING CODE, BY INTERNATIONAL CODE COUNCIL AND LOCAL AMENDMENTS.
      d. REQUIREMENTS OF OSHA, EPA AND WISHA.
      e. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND LOCAL AMENDMENTS.
      f. ASME CODES FOR BOILER AND PRESSURE VESSELS.
      g. SMACNA HVAC DUCT CONSTRUCTION STANDARDS, LATEST EDITION.
      h. ALL LOCAL AND STATE AMENDMENTS.
      i. REQUIREMENTS OF ALL AGENCIES HAVE JURISDICTIONAL AUTHORITY OVER INSTALLATION OF MECHANICAL SYSTEMS.
   C. AGENCIES HAVING JURISDICTIONAL AUTHORITY OVER MECHANICAL INSTALLATION.
      a. LOCAL MUNICIPAL BUILDING DEPARTMENT
      b. LOCAL SEWER AND WATER DISTRICT REQUIREMENTS
      c. STATE AND COUNTY DEPARTMENT OF HEALTH
      d. LOCAL FIRE MARSHAL
      e. STATE BOILER INSPECTOR
   D. PERMITS, FEES AND INSPECTIONS:
      a. CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PERMITS, FEES AND INSPECTIONS REQUIRED IN CONNECTION WITH THIS INSTALLATION. THE CONTRACTOR SHALL PRESENT THE OWNER WITH PROPERLY SIGNED CERTIFICATES OF FINAL INSPECTION BEFORE THE WORK WILL BE ACCEPTED.
      b. CONTRACTOR SHALL CALL FOR ALL INSPECTIONS BY LOCAL BUILDING OFFICIAL(S) WHEN THEY BECOME DUE, AND SHALL NOT COVER ANY WORK UNTIL APPROVED BY THESE GOVERNING AUTHORITIES.
      c. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS WITH UTILITY COMPANIES FOR WATER, GAS AND DRAINAGE SERVICES, ETC., ASSOCIATED WITH THE WORK AND INCLUDE REQUIRED PAYMENTS FOR METERS, PIPING, SERVICES, CONNECTION CHARGES AND MATERIALS FURNISHED AND INSTALLED BY UTILITY COMPANIES. WORK AND MATERIALS SHALL BE IN STRICT ACCORDANCE WITH RULES OF RESPECTIVE AUTHORITIES.
   E. UNDERWRITERS APPROVAL: WHERE UNDERWRITERS LABORATORY STANDARDS EXIST, ALL ITEMS OF ELECTRICAL EQUIPMENT OR ITEMS PARTIALLY COMPOSED OF ELECTRICAL EQUIPMENT SHALL CARRY UNDERWRITERS' LABORATORY LABEL EITHER FOR THE ENTIRE UNIT OR FOR THE ELECTRICAL PORTION OF THE EQUIPMENT. IF STANDARDS DO NOT EXIST, EQUIPMENT WILL BE APPROVED IF THE ITEM HAS BEEN SUBMITTED TO THE TESTING LABORATORY AND THE MANUFACTURER CERTIFIES COMPLIANCE WITH UNDERWRITERS LABORATORY STANDARDS ESTABLISHED FOR SIMILAR ITEMS.
   F. ASME CODE STAMP: ASME CODE STAMP REQUIRED ON ALL PRESSURE VESSELS AND RELIEF VALVES. CERTIFICATE REQUIRED FROM THE STATE BOILER INSPECTOR SHOWING APPROVAL OF THE EQUIPMENT AND ITS INSTALLATION.
5. WORK INCLUDED
   A. WORK UNDER THIS DIVISION SHALL INCLUDE FURNISHING ALL MATERIALS, LABOR, EQUIPMENT, TOOLS, APPLIANCES, HOISTING, SCAFFOLDING, SUPERVISION AND OVERHEAD FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK.
   B. ALL EQUIPMENT, MATERIALS AND PRODUCTS AS NOTED IN PART 2 OF EACH SECTION SHOULD BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
   C. PROVIDE ALL ADDITIONAL PIPING, DUCTS, CAPS AND VALVES NOT SHOWN ON DRAWINGS, TO MAINTAIN FULLY OPERATIONAL SYSTEMS DURING THE PROJECT AT NO ADDITIONAL COST TO THE OWNER.
   D. SOME EQUIPMENT MAY REQUIRE TEMPORARY INSTALLATION DURING ONE PHASE AND REQUIRE RELOCATION TO FINAL LOCATION UNDER ANOTHER PHASE. PROVIDE ALL ASSOCIATED LABOR AND MATERIALS TO ACCOMMODATE THIS PHASING.
   E. MECHANICAL SYSTEMS – INCLUDING BUT NOT LIMITED TO:
      a. PLUMBING SYSTEMS.
      b. AUTOMATIC SPRINKLER SYSTEMS.
      c. HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS.
      d. TEMPERATURE CONTROLS SYSTEM.
   F. DEMOLITION WHEN APPLICABLE:
      a. PERFORM ALL DEMOLITION OR INTERFACE WORK REQUIRED IN THE EXISTING BUILDING FOR THE REMOVAL OF OR INTERFACES WITH EXISTING MECHANICAL EQUIPMENT, DUCTWORK, TUBING, OR PIPING. RELOCATE OR MODIFY THE EXISTING PIPING, TUBING AND DUCTWORK AS REQUIRED BY ANY GENERAL CONSTRUCTION ALTERATIONS OR BY THE INSTALLATION OF NEW DUCTWORK, TUBING, OR PIPING IN THE EXISTING BUILDING.
      b. EXISTING MATERIALS, REMOVAL AND DISPOSITION:
         - SCOPE: FOR MECHANICAL ITEMS, WHICH REMAIN THE PROPERTY OF THE OWNER, REFER TO DRAWINGS.
         - IN COORDINATION WITH THE OWNER'S REPRESENTATIVES, THESE MATERIALS SHALL BE MADE AVAILABLE FOR THEIR INSPECTION AND DECISION AS TO WHETHER THE OWNER WILL RETAIN POSSESSION. ITEMS SELECTED FOR RETENTION SHALL BE DELIVERED TO A LOCATION ON THE PREMISES SELECTED BY THE OWNER AND TURNED OVER TO THEM. TAKE REASONABLE CARE TO AVOID DAMAGE TO THIS MATERIAL.
         - ALL MATERIAL NOT SELECTED FOR RETENTION BY THE OWNER AND THE CONTRACTOR SHALL DISPOSE OF DEBRIS.
      c. REUSE OF MATERIALS: DO NOT REUSE PIPING IN GENERAL, BUT CAST–IRON SOIL PIPE MAY BE REUSED IN NEW WORK IF OF PROPER ARRANGEMENT, WALL THICKNESS AND PRESSURE RATING.
      d. NOTIFY ARCHITECT OF DISCOVERY OF ANY HAZARDOUS MATERIALS SUCH AS ASBESTOS, ETC.
6. WORK SEQUENCE
   A. CONTRACTOR SHALL FOLLOW ALL PHASING FOR THIS PROJECT AS PROVIDED IN THE ARCHITECTURAL DRAWINGS WHEN APPLICABLE.
   B. INSTALL WORK IN STAGES TO ACCOMMODATE OWNER'S OCCUPANCY REQUIREMENTS DURING THE CONSTRUCTION PERIOD. COORDINATE MECHANICAL SCHEDULE AND OPERATIONS WITH OWNER.
7. QUALITY ASSURANCE
   A. REFERENCES HEREINAFTER IN DIVISION 23 OF THIS SPECIFICATION TO MATERIAL OR TYPE OF CONSTRUCTION ARE FOR THE PURPOSE OF ESTABLISHING A STANDARD OF QUALITY. ANY EQUIPMENT OR MATERIAL THAT IS PROPOSED BY THE CONTRACTOR AND IS NOT SPECIFICALLY IDENTIFIED IN THE CONTRACT DOCUMENTS SHALL REQUIRE ENGINEER'S APPROVAL.
   B. PROVIDE MATERIALS BEARING LEGIBLE MARKINGS SHOWING THE STANDARDS TO WHICH THEY CONFORM: I.E. ASTM, ANSI, COMMERCIAL STANDARDS, AMCA, ARI, ETC.
   C. WHERE SPECIFICALLY NOTED, PROVIDE MANUFACTURERS' CERTIFICATION THAT MATERIALS MEET OR EXCEED MINIMUM REQUIREMENTS SPEC. CERTIFICATION SHALL BE SIGNED AND DATED BY MANUFACTURER'S EXECUTIVE OR AUTHORIZED REPRESENTATIVE.
   D. MAKE COMPLETE INSTALLATION, CONNECTING TO ALL EQUIPMENT SHOWN ON THE CONTRACT DOCUMENTS, PLANS, OR CALLED FOR IN THE SPECIFICATIONS. CONTRACTOR TO PROVIDE ALL EXTRA DAMPERS AND VALVES AS REQUIRED AND "NOT SHOWN ON PLANS" TO OBTAIN DESIGN CRITERIA AS REQUIRED BY THE BALANCING CONTRACTOR.
   E. ALL WORK, MATERIAL AND EQUIPMENT TO BE FREE OF DEFECT.
8. SUBSTITUTIONS A. MANUFACTURERS:
   A. THE USE OF BRAND NAMES IS FOR THE PURPOSE OF DESCRIPTION AND ESTABLISHING LEVEL OF QUALITY AND DOES NOT ELIMINATE THE REQUIREMENTS OF MEETING SPECIFICATIONS.
   B. MANUFACTURERS LISTED IN CONTRACT DOCUMENTS ARE APPROVED TO BID THE PROJECT FOR THE ITEMS INDICATED WITHOUT OBTAINING PRIOR APPROVAL. OTHER MANUFACTURERS DESIRING TO BID THE PROJECT REQUIRE PRIOR APPROVAL.
   C. THE PRIOR APPROVAL LISTING OF A MANUFACTURER DOES NOT NECESSARILY MEAN THAT THE PRODUCTS OF THAT MANUFACTURER ARE EQUAL TO THOSE SPECIFIED. THE LISTING IS ONLY AN INDICATION OF THOSE MANUFACTURERS WHICH MAY BE CAPABLE OF MANUFACTURING; OR HAVE IN THE PAST MANUFACTURED, ITEMS EQUIVALENT TO OR EXCEEDS THOSE SPECIFIED, AND IS INTENDED TO AID THE CONTRACTOR IN IDENTIFYING MANUFACTURERS.
   D. EXCEPTIONS: OTHER BRANDS NOT ACCEPTED WHERE AN ITEM OR CLASS OF MATERIAL IS SPECIFIED EXCLUSIVELY BY TRADE NAME AND FOLLOWED BY THE WORD ONLY.
   E. THE APPROVAL OF A MANUFACTURER APPLIES TO THE MANUFACTURER ONLY AND DOES NOT RELIEVE THE CONTRACTOR FROM THE RESPONSIBILITY OF MEETING ALL APPLICABLE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
   F. REQUESTS FOR SUBSTITUTIONS (PRIOR APPROVALS) SHALL BE FURNISHED NO LATER THAN 10 WORKING DAYS PRIOR TO BID DATE OR REQUEST MAY NOT BE CONSIDERED. ALL SUBSTITUTION REQUESTS REVIEWED AND ACCEPTED WILL BE DESCRIBED AND LISTED IN AN ADDENDUM ISSUED PRIOR TO BID DATE. PRIOR APPROVALS ARE FOR MANUFACTURERS ONLY AND NOT SPECIFIC STYLES OR MODELS OF EQUIPMENT OR MATERIALS AND DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
9. PLANS AND SPECIFICATIONS
   A. THE CONTRACT DOCUMENTS, DRAWINGS AND SPECIFICATIONS ARE INTENDED TO COVER THE WORK, UNLESS OTHERWISE INDICATED. PROVIDE MATERIALS, WHICH ARE NECESSARY FOR THE PROPER COMPLETION OF THE INSTALLATION OR OPERATION OF THE EQUIPMENT.
   B. THE DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW EXACT OR COMPLETE PIPING AND DUCTWORK CONFIGURATIONS OR THE NECESSARY NUMBER AND TYPES OF FITTINGS. INCLUDE LABOR AND MATERIALS REQUIRED TO COMPLETE THE WORK.
   C. MINOR DEVIATIONS:
      a. CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE EXTENT AND GENERAL ARRANGEMENT OF SYSTEMS. GENERALLY FOLLOW THE LAYOUTS SHOWN AND COORDINATE THE INSTALLATION OF WORK WITH THAT OF THE OTHER TRADES.
      b. MINOR DEVIATIONS MAY BE MADE ON THE JOB WITH THE WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER, PROVIDED NO ADDITIONAL CHARGES WILL BE MADE TO THE OWNER FOR SUCH DEVIATION.
10. WORKMANSHIP
    A. THE CONTRACTOR SHALL PROVIDE COMPLETED SYSTEMS WITH A NEAT AND FINISHED APPEARANCE. IF, IN THE JUDGMENT OF THE ENGINEER, ANY PORTION OF THE WORK HAS NOT BEEN PERFORMED IN A WORKMANLIKE MANNER OR IS LEFT IN A ROUGH, UNFINISHED STATE, THE CONTRACTOR WILL BE REQUIRED TO REMOVE, REINSTALL OR REPLACE SAME AND PATCH AND PAINT SURROUNDING SURFACES IN A MANNER ACCEPTABLE TO THE ENGINEER, WITHOUT ADDITIONAL COST TO THE OWNER.
11. SAFETY AND PROTECTION
    A. SAFETY MEASURES TO BE TAKEN: THE ENGINEER HAS NOT BEEN RETAINED OR COMPENSATED TO PROVIDE DESIGN AND CONSTRUCTION REVIEW SERVICES RELATING TO THE CONTRACTOR'S SAFETY PRECAUTIONS OR TO MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED FOR THE CONTRACTOR TO PERFORM HIS WORK. THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK.
    B. HEAD PROTECTION: PROVIDE HEAD PROTECTION WHERE DUCT ANGLES, PIPE HANGERS, EQUIPMENT SUPPORT ANGLES, ETC., ARE EXPOSED IN WALKWAYS, OR IN ACCESS WAYS FOR ANY MAINTENANCE. COVER ALL SUCH POTENTIALLY INJURIOUS PROTRUSIONS OCCURRING LESS THAN 7'–0" ABOVE THE FLOOR WITH PADDING. PADDING SHALL BE SECURELY AND PERMANENTLY FASTENED AND FINISHED COMPARABLE TO ADJACENT FINISHES.
12. RESPONSIBILITY AND GUARANTEES
    A. WITHOUT ADDITIONAL COST TO OWNER, CORRECT ALL DEFECTS AND FAILURES DISCOVERED WITHIN ONE YEAR FROM DATE OF FINAL ACCEPTANCE EXCEPT WHEN, IN THE OPINION OF THE ENGINEER, SUCH CONDITION IS DUE TO NEGLECT OR CARELESSNESS OF THOSE OTHER THAN THE CONTRACTOR.
    B. THE GUARANTEE OF THE CONTRACTOR IS INDEPENDENT OF SHORTER TIME LIMITS BY ANY MANUFACTURER OF EQUIPMENT HE HAS FURNISHED.
    C. MAKE ALL NECESSARY ADJUSTMENTS DURING FIRST YEAR OF OPERATION.
    D. THE PRESENCE OF AN INSPECTOR DURING ANY CONSTRUCTION DOES NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR DEFECTS DISCOVERED AFTER COMPLETION OF THE WORK.
13. SERVICE A. WHERE REQUIRED BY THE SPECIFICATIONS, EQUIPMENT SUCH AS PACKAGED AIR CONDITIONERS, FURNACES, ETC. SHALL BE FURNISHED AND INSTALLED UNDER SUPERVISION OF FACTORY–TRAINED REPRESENTATIVE.

PART 2 – PRODUCTS

1. SUBMITTALS
   A. GENERAL: CONFORM TO DIVISION 1, WITH ADDITIONAL REQUIREMENTS AS INDICATED BELOW.
   B. PRODUCT DATA, DESIGN DATA:
      a. PROCESS: SUBMIT COMPLETE MECHANICAL SUBMITTAL IN MULTIPLE COMPLETE PACKAGES AS FOLLOWS. INCOMPLETE, PIECE–MEAL SUBMITTALS WILL NOT BE ACCEPTED, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED. ALLOW MINIMUM 10 WORKDAYS FOR EACH SUBMITTAL REVIEW.
         - ALL MECHANICAL SPECIFICATION SECTIONS, INCLUDING MATERIALS AND EQUIPMENT.
         - MATERIALS SHOP AND FIELD INSTALLATION DRAWINGS.
         - MATERIALS AND SHOP DRAWINGS.
      b. BINDING AND FORMAT: BIND IN THREE–RING BINDER(S). LABEL FRONT OF BINDER(S) WITH NAME OF PROJECT, NAME OF OWNER, YEAR OF COMPLETION; TITLE MECHANICAL SUBMITTALS, NAMES OF ENGINEER AND MECHANICAL CONTRACTOR, AND VOLUME NO. (IF APPLICABLE). LABEL BACK EDGE OF BINDER WITH TITLE, NAME OF PROJECT, OWNER, YEAR OF COMPLETION, AND VOLUME NO. (IF APPLICABLE). FOLD DRAWINGS TO 8"SIZE AND BIND AS ABOVE (WITH REINFORCING AT PUNCHED HOLES) OR PLACE IN CLEAR PLASTIC HOLDER DESIGNED FOR THREE–RING BINDERS.
         - INCLUDE OVERALL TABLE OF CONTENTS OF ITEMS SUBMITTED, ORGANIZED BY SPECIFICATION SECTION.
         - INCLUDE HEAVY, TABBED DIVIDER SHEET FOR EACH SPECIFICATION SECTION, WITH SPECIFICATION SECTION NUMBER AND TITLE ON TAB. INCLUDE TABLE OF CONTENTS FOR EACH SPECIFICATION SECTION, INCLUDING CATALOG NUMBERS OR DRAWING NUMBERS IF APPROPRIATE.
         - O & M MANUAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
      c. CONTENTS:
         - INCLUDE COMPLETE SUBMITTAL INFORMATION DESCRIBED UNDER PRODUCT DATA, DESIGN DATA IN THIS SECTION.
         - INCLUDE INSTALLATION INSTRUCTIONS, OPERATION AND MAINTENANCE INFORMATION, START–UP INSTRUCTIONS, AND SPARE PARTS LISTS.
         - INCLUDE NAMES, ADDRESS, TELEPHONE NUMBERS, AND FAX NUMBERS OF MANUFACTURERS AND VENDORS OF MATERIALS AND EQUIPMENT.
         - INCLUDE INFORMATION ON THE SPECIFIC EQUIPMENT INSTALLED FOR THIS PROJECT.
      d. ELECTRONIC COPY ACCEPTED
   G. RECORD DRAWINGS:
      a. GENERAL
         - CORRECTIONS AND CHANGES MADE DURING THE PROGRESS OF THE WORK SHALL BE NEATLY RECORDED AS ACTUALLY INSTALLED, INCLUDING ALL CHANGE ORDERS, RFI'S, ETC.
         - ONE SET OF PRINTS SHOWING THIS INFORMATION (IN RED), SHALL BE KEPT UP TO DATE AT ALL TIMES. THESE MARKED PRINTS SHALL BE KEPT AT THE JOB SITE AND IN RED.
         - AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL OBTAIN AUTOCAD V 2000, OF CONTRACT DRAWINGS. DRAWING FILES SHALL BE CORRECTED BY THE CONTRACTOR TO INDICATE ALL CHANGES AND CORRECTIONS MADE DURING THE PROJECT.
         - UPON COMPLETION, HE SHALL SUBMIT THE CORRECTED AUTOCAD DRAWING FILES PLUS 2 PLOT COPIES, TO THE ARCHITECT FOR REVIEW.
         - QUALITY OF WORKMANSHIP MUST BE CLEARLY LEGIBLE AND BE CONSISTENT WITH INDUSTRY DRAFTING STANDARDS. DRAWINGS PROVIDED LACKING THESE STANDARDS WILL NOT BE ACCEPTED.
      b. LAYOUT OF FIELD INSTALLATION DRAWINGS BY CONTRACTOR:
         - FOR ALL WORK IN MECHANICAL (FURNACE AND DOMESTIC HOTWATER HEATER) ROOMS, CONTRACTOR SHALL PREPARE ADDITIONAL DETAIL DRAWINGS TO SCALE SIMILAR TO THAT OF THE BIDDING DRAWINGS, PREPARED ON MYLAR PAPER SAME SIZE AS CONTRACT DRAWINGS AND SHALL WITH THESE LAYOUTS, COORDINATE HIS WORK WITH THE DRAWINGS AS TO THE AREA IT APPLIES. SEE 2.1.C.a. ABOVE.
         - SUBMIT THESE DRAWINGS TO THE ARCHITECT FOR REVIEW, BEFORE COMMENCING SHOP FABRICATION OR ERECTION IN THE FIELD. AT COMPLETION OF THE PROJECT, INCLUDE A SET OF SUCH DRAWINGS WITH EACH SET OF RECORD DRAWINGS AND CAD FILES FOR OWNER'S PURPOSES.
      c. ELECTRONIC COPY ACCEPTED
   H. CERTIFICATIONS: SUBMIT WRITTEN CERTIFICATIONS FROM THE GOVERNING BUILDING AUTHORITIES STATING THAT WORK HAS BEEN INSPECTED, ACCEPTED, AND COMPLIES WITH APPLICABLE CODES AND ORDINANCES.
2. CUTTING & PATCHING
   A. CUTTING:
      d. DO CUTTING, CORE–DRILLING AND SIMILAR WORK REQUIRED FOR INSTALLATION OF SYSTEMS UNDER DIVISION 22 AND 23.
      e. THROUGH CONCRETE SLABS OR WALLS, ALL ROUND HOLES SHALL BE CORE DRILLED WITH A DIAMOND DRILL AND ALL RECTANGULAR OPENINGS SHALL BE CUT WITH A DIAMOND SAW. CONTRACTOR SHALL MAKE PROVISIONS FOR WATER, CAPTURE WHEN WORKING ABOVE OCCUPIED SPACES OR AREAS SUBJECT TO WATER DAMAGE.
      f. CUT NO STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ARCHITECT/ENGINEER.
      g. DRILLING AND CUTTING OF CONCRETE AND OTHER WORK WHICH MAKES OBJECTIONABLE NOISE IN OCCUPIED BUILDING SHALL BE PERFORMED AT TIMES AS COORDINATED WITH THE OWNER BEFORE DOING THE WORK.
   B. PATCHING OF FINISHED BUILDING ELEMENTS AFTER MECHANICAL INSTALLATION SHALL BE IN ACCORDANCE WITH DIVISION 01, NOT BY DIVISION 23 SUBCONTRACTOR.
3. EXCAVATION AND BACKFILL
   A. CONTRACTOR SHALL DO ALL EXCAVATION AND BACKFILL REQUIRED FOR DIVISION 22 AND 23 WORK, INCLUDING ANY NECESSARY SHEATHING AND PUMPING.
   B. TRENCH BOTTOMS AND SHELVES SHALL BE CUT TO SUIT REQUIRED GRADES OF MECHANICAL WORK.
   C. PIPING SHALL REST ON UNDISTURBED EARTH OR PEA GRAVEL.
   D. BELL HOLES SHALL BE PROVIDED FOR ALL BELL AND HUB OR MECHANICAL JOINT PIPING.
   E. AFTER WORK HAS BEEN INSPECTED, TESTED AND APPROVED, ALL EXCAVATION SHALL BE BACKFILLED IN LAYERS OF APPROXIMATELY 8 INCHES, EACH LAYER MOISTENED AS DIRECTED AND PNEUMATICALLY TAMPED TO MINIMUM COMPACTION OF 90 PERCENT.
   F. JETTING OR FLOODING WILL NOT BE PERMITTED.
   G. RESTORE ALL SURFACES TO ORIGINAL CONDITION, PROPERLY INSTALLED TO ELIMINATE ANY SETTLEMENT AND SATISFACTORY TO ARCHITECT.
   H. REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF PIPES PASSING THROUGH OR NEAR FOOTINGS AND FOUNDATIONS.
4. PLATES AND ISOLATORS
   A. PLATES:
      a. CHROME PLATED, STAMPED OR CAST BRASS.
      b. GRINNELL FIGURE 10 OR BEATON CORBIN.
   B. ISOLATORS:
      a. STONEMAN TRISOLATOR, NO. 100 FOR STEEL PIPE, NO. 500 FOR COPPER TUBE.
      b. LINK–SEAL TYPE MODEL LS OR PYRO–PAC.
      c. PROCO PRODUCTS INC., PEN.SEAL.
5. SLEEVES
   A. SLEEVES FOR PIPES THROUGH NON –FIRE RATED FLOORS: FORM WITH 18 GAGE GALVANIZED STEEL.
   B. SLEEVES FOR PIPES THROUGH NON –FIRE RATED BEAMS, WALLS, FOOTINGS, AND POTENTIALLY WET FLOORS: FORM WITH STEEL PIPE OR 18 GAGE GALVANIZED STEEL.
   C. SLEEVES FOR PIPES THROUGH FIRE RATED AND FIRE RESISTIVE FLOORS AND WALLS, AND FIREPROOFING: PREFABRICATED FIRE RATED SLEEVES INCLUDING SEALS, UL LISTED.
   D. SLEEVES FOR ROUND DUCTWORK: FORM WITH GALVANIZED STEEL.
   E. SLEEVES FOR RECTANGULAR DUCTWORK: FORM WITH GALVANIZED.
   F. SIZE SLEEVES LARGE ENOUGH TO ALLOW FOR MOVEMENT DUE TO EXPANSION AND CONTRACTION. PROVIDE FOR CONTINUOUS INSULATION WRAPPING.
   G. STUFFING INSULATION: GLASS FIBER TYPE, NON -COMBUSTIBLE.
   H. CAULK: ACRYLIC SEALANT OF QUALITY SPECIFIED IN DIVISION 07.
6. FIRE–RATED PENETRATION SEALS
   A. MANUFACTURERS:
      a. 3M FIRE BARRIER PENETRATION SEALING SYSTEM.
      b. THOMAS & BETTS FLAME SAFE FIRE STOP.
      c. CHASE FOAM FIRE STOP SYSTEM.
      d. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
      e. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSTITUTED EQUIPMENT OR MATERIALS FITTING THE AVAILABLE SPACE AND FOR ANY IMPACTS TO OTHER TRADES.
      f. FURNISH WALL WRAP, PARTITIONS, CAPS OR OTHER ACCESSORIES AS REQUIRED.
   B. REQUIREMENTS:
      a. ALL MATERIALS TO COMPLY WITH UL 1479 (ASTM E–814).
      b. THE FIRE RATING OF THE SEALANT SHALL BE AT LEAST THAT OF THE FLOOR, WALL OR CEILING INTO WHICH IT IS INSTALLED.
7. FLASHING
   A. METAL FLASHING: 26 GAGE GALVANIZED STEEL.
   B. LEAD FLASHING: 5 LB/SQ FT SHEET LEAD FOR WATERPROOFING; ONE LB/SQ FT SHEET LEAD FOR SOUNDPROOFING.
   C. FLEXIBLE FLASHING: 47 MIL THICK SHEET, COMPATIBLE WITH ROOFING.
   D. CAPS: STEEL, 22–GAGE MINIMUM; 16 GAGES AT FIRE RESISTANT ELEMENTS.
8. INSERTS
   A. CONCRETE CONSTRUCTION
      a. GRINNELL FIG. 282, OR SUPER M–732, UNISTRUT P–3521. MICHIGAN 353.
      b. CHANNEL INSERT UNISTRUT P–3200, MICHIGAN CONCT. WITH END CAPS AND CARDBOARD FILLER STRIPS.
   B. FRAME CONSTRUCTION:
      a. FLATTENED LAG SCREW WITH COUPLING OR SOCKET TO MATCH.
      b. ANGLE CLIP BOLTED OR SCREWED WITH COUPLING OR SOCKET TO MATCH.
      c. USE LAG SCREWS OR DRIVE SCREWS FOR EXTENSION BAR; NAILING NOT PERMISSIBLE
   C. BRACKETS: SHELF BRACKET UNISTRUT P–1000 WITH P–1332 CORNER SUPPORT, MICHIGAN A–12 OR SUPER STRUT A–1200 WITH AB–214 CORNER SUPPORT.
   D. POWER DRIVEN INSERTS ALLOWED ONLY ON ARCHITECTS APPROVAL.
   E. EXPANSION SHIELDS: DIAMOND, RAWL PLUG, STAR, PHILLIPS OR CINCH ANCHOR MANUFACTURE.
9. SUPPORTS AND ANCHORS
   A. GENERAL:
      a. FURNISH HANGER AND SUPPORT INSERTS AND SLEEVES FOR PLACEMENT INTO FORMWORK TO SERVE EQUIPMENT SUPPLIED UNDER OTHER SECTIONS BUT INSTALLED BY THIS CONTRACTOR.
      b. SUBMITTALS: INDICATE HANGER AND SUPPORT FRAMING AND ATTACHMENT METHODS.
   B. PIPE HANGERS AND SUPPORTS:
      a. HANGERS FOR PIPE SIZES 1/2 TO 1 - 1/2 INCH: GALVANIZED STEEL, ADJUSTABLE SWIVEL, LOOP HANGER.
      b. HANGERS FOR PIPE SIZES 2 TO 4 INCHES AND COLD PIPE SIZES 6 INCHES AND OVER: CARBON STEEL, ADJUSTABLE, CLEVIS.
      c. HANGERS FOR HOT PIPE SIZES 6 INCHES AND OVER: ADJUSTABLE STEEL YOKE, CAST IRON ROLL, DOUBL

MECHANICAL GENERAL PROVISIONS CONTD.

BE BY COUPLING MANUFACTURER.

F. SPRING–LOADED CHECK VALVES:
   a. IRON BODY, BRONZE TRIM, STAINLESS STEEL SPRING, RENEWABLE COMPOSITION DISC, SCREWED, WAFER, OR FLANGED ENDS.
   b. CHECK VALVES IN MECHANICAL COUPLING SYSTEMS, I.E., VICTAULIC, ETC., MAY BE BY COUPLING MANUFACTURER.

G. BACKFLOW PREVENTERS:
   a. MANUFACTURERS:
      - WATTS.
      - CMB INDUSTRIES; FEBCO DIV.
      - ZURN INDUSTRIES INC; WILKINS DIV.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS AND APPROVED BY LOCAL JURISDICTION MAY BE CONSIDERED.
   b. DOUBLE CHECK VALVE:
      - 2" AND UNDER; BRONZE BODY, RUBBER CHECK VALVES, STAINLESS STEEL CHECK SEATS, SHAFTS AND FLANGE BOLTS, BRONZE BALL VALVE TEST COCKS, BRONZE BALL VALVE SHUT–OFFS, STRAINER, THREADED CONNECTIONS, 175 PSI PRESSURE RATING.
      - 2–1/2" AND OVER; EPOXY COATED IRON BODY, BRONZE TRIM, STAINLESS STEEL INTERNAL PARTS, REMOVABLE BRONZE SEATS, GATE VALVE SHUT–OFFS, STRAINER, FLANGED ENDS, 175 PSI PRESSURE RATING.
   c. REDUCED PRESSURE TYPE:
      - 2" AND UNDER; BRONZE BODY, RUBBER CHECK VALVES WITH REDUCED PRESSURE ZONE, STAINLESS STEEL CHECK SEATS, SHAFTS AND FLANGE BOLTS, BRONZE BALL VALVE TEST COCKS, BRONZE BALL VALVE SHUT–OFFS, STRAINER, THREADED CONNECTIONS, 175 PSI PRESSURE RATING.
      - 2–1/2" AND OVER; EPOXY COATED IRON BODY, BRONZE TRIM, STAINLESS STEEL INTERNAL PARTS, REMOVABLE BRONZE SEATS, GATE VALVE SHUT–OFFS, STRAINER, FLANGED ENDS, 175 PSI PRESSURE RATING.

C. WATER PRESSURE REDUCING VALVES:
   a. UP TO 2 INCHES
      - BRONZE BODY, STAINLESS STEEL AND BRONZE INTERNAL PARTS, FABRIC REINFORCED DIAPHRAGM, INTEGRAL STRAINER, THERMAL EXPANSION BY–PASS, THREADED ENDS.
      - WATTS U5B, OR APPROVED.
   b. OVER 2 INCHES:
      - CAST IRON BODY, BRONZE FITTED, NYLON REINFORCED ELASTOMERIC DIAPHRAGM AND SEAT DISC, FLANGED, PILOT OPERATED, ADJUSTABLE CLOSING SPEED, COPPER CONTROL TUBING WITH BRASS FLARED–END FITTINGS.
      - WATTS ACV, CLA–VAL, CASH OR APPROVED.

D. RELIEF VALVES:
   a. MANUFACTURERS:
      - WATTS.
      - B&G.
      - AMTROL.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. BRONZE BODY, TEFLON SEAT, STEEL STEM AND SPRINGS, AUTOMATIC, DIRECT TEMPERATURE AND PRESSURE ACTUATED, CAPACITIES ASME CERTIFIED AND LABELED.

E. CALIBRATED BALANCING VALVES:
   a. ADJUSTABLE ORIFICE TYPE:
      - MANUFACTURERS:
        - ARMSTRONG MODEL CBV.
        - DAN FOSS.
        - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
      - GENERAL:
        - VALVES SHALL BE Y–PATTERN, EQUAL PERCENTAGE GLOBE STYLE PROVIDING PRECISE FLOW MEASUREMENT, PRECISE FLOW BALANCING AND POSITIVE DRIP TIGHT SHUT–OFF.
        - VALVES SHALL HAVE MULTI–TURN ADJUSTMENT: MINIMUM 720°.
        - VALVES SHALL HAVE MEANS OF LOCKING IN BALANCED POSITION.
        - FURNISH VALVES WITH PREFORMED INSULATION WITH COVER.
      - CONSTRUCTION:
        - UP TO 2" SIZE: BRASS OR BRONZE BODY WITH THREAD OR SWEAT CONNECTIONS, BRONZE STEM WITH RESIN OR PFTE DISC, AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
        - 2½" TO 12" SIZE: DUCTILE IRON BODY WITH GROOVED END OR FLANGED CONNECTIONS, BRONZE VALVE STEM AND PLUG DISC, TWO 1/4" TEMPERATURE AND PRESSURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
   b. FIXED ORIFICE TYPE:
      - MANUFACTURERS:
        - FDI "FLOWSET".
        - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
      - GENERAL:
        - VALVES SHALL BE BALL STYLE WITH INTEGRAL FIXED VENTURI PROVIDING PRECISE FLOW MEASUREMENT, PRECISE FLOW BALANCING AND POSITIVE DRIP TIGHT SHUT–OFF.
        - VALVES SHALL HAVE 90° ADJUSTMENT WITH MEMORY STOP.
        - VALVES SHALL HAVE MEANS OF LOCKING IN BALANCED POSITION.
      - CONSTRUCTION:
        - UP TO 3" SIZE: BRONZE BODY WITH UNION ON INLET, THREAD OR SWEAT CONNECTIONS, STAINLESS STEEL OR BRASS BALL WITH TFE SEAT RINGS AND TWO, … PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
        - 4" TO 8" SIZE: DUCTILE OR CAST IRON BODY WITH GROOVED END OR FLANGED CONNECTIONS, BRONZE VALVE STEM AND PLUG DISC AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.

F. AUTOMATIC FLOW CONTROL VALVES:
   a. MANUFACTURERS
      - IMI HYDRONIC.
      - GRISWOLD CONTROLS.
      - HAYS FLUID CONTROL.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. CONSTRUCTION:
      - FLOW CONTROL ELEMENT(S): ONE OR MORE BRASS AND/OR STAINLESS STEEL ORIFI AND SPRING.
      - UP TO 3"SIZE: DUCTILE IRON, CAST IRON, BRASS OR WROUGHT COPPER VALVE BODY, THREADED OR SWEAT CONNECTIONS, RATED ANSI CLASS 125. TWO, PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, AND ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
      - 4" TO 12" SIZE: DUCTILE IRON, STEEL OR BRONZE VALVE BODY, FLANGED OR GROOVED CONNECTIONS, RATED ANSI GLASS 150. TWO, PRESSURE/TEMPERATURE TEST PORTS WITH EXTENSIONS AND NORDEL CHECK VALVES WITH GASKETED CAPS, AND ADDITIONAL DRAIN CONNECTIONS.
   c. CALIBRATION:
      - CONTROL FLOW WITHIN PLUS OR MINUS 10 PERCENT OF SELECTED RATING OVER OPERATING PRESSURE RANGE OF AT LEAST 10 TIMES MINIMUM PRESSURE REQUIRED FOR CONTROL.
      - MAXIMUM ALLOWABLE MINIMUM PRESSURE FOR OPERATING RANGE; 3.5 PSIG.

G. STRAINERS:
   a. MANUFACTURERS:
      - WATTS.
      - ARMSTRONG.
      - SPIRAX/SARCO.
      - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
   b. SIZE 2 INCH AND UNDER: SCREWED BRASS OR IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 1/32 INCH STAINLESS STEEL PERFORATED SCREEN.
   c. SIZE 2 –1/2 INCH TO 4 INCH: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, Y PATTERN WITH 3/64 INCH STAINLESS STEEL PERFORATED SCREEN.
   d. SIZE 5 INCH AND LARGER: FLANGED IRON BODY FOR 175 PSIG WORKING PRESSURE, BASKET PATTERN WITH 1/8 INCH STAINLESS STEEL PERFORATED SCREEN.
   e. PROVIDE NIPPLE AND BLOWDOWN VALVE WITH PLUG ON ALL STRAINERS 1" PIPE SIZE AND LARGER.

13. HEAT TRACE FOR FREEZE PROTECTION
A. MANUFACTURERS:
   a. BASIS FOR DESIGN: RAYCHEM XL–TRACE.
   b. SUBSTITUTE MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
   c. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
   d. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSTITUTED EQUIPMENT OR MATERIALS FITTING THE AVAILABLE SPACE AND FOR ANY IMPACTS TO OTHER TRADES.

B. CONSTRUCTION:
   a. THE SELF–REGULATING HEATER SHALL CONSIST OF TWO (2) 16 AWG TINNED–COPPER BUS WIRES EMBEDDED IN PARALLEL IN A SELF–REGULATING POLYMER CORE THAT VARIES ITS POWER OUTPUT TO RESPOND TO TEMPERATURE ALL ALONG ITS LENGTH, ALLOWING THE HEATER TO BE CROSSED OVER ITSELF WITHOUT OVERHEATING, TO BE USED DIRECTLY ON METALLIC OR PLASTIC PIPE, AND TO BE CUT TO LENGTH IN THE FIELD.
   b. THE HEATER SHALL BE COVERED BY A RADIATION CROSS–LINKED MODIFIED POLYOLEFIN DIELECTRIC JACKET.
   c. TO PROVIDE A GROUND PATH AND TO ENHANCE THE HEATING CABLE'S RUGGEDNESS, THE HEATER SHALL HAVE AN OUTER BRAID OF TINNED–COPPER AND AN OUTER JACKET OF MODIFIED POLYOLEFIN (–CR).

C. REQUIREMENTS:
   a. SYSTEM SHALL MEET REQUIREMENTS OF CURRENT NATIONAL ELECTRIC CODE (NEC), SECTION 427.
   b. THE HEATER SHALL OPERATE ON LINE VOLTAGE OF 120 VOLTS WITHOUT THE USE OF TRANSFORMERS.
   c. IN ORDER TO PROVIDE ENERGY CONSERVATION AND TO PREVENT OVERHEATING, THE HEATER SHALL HAVE A SELF–REGULATING FACTOR OF A LEAST 90 PERCENT. THE SELF–REGULATION FACTOR IS DEFINED AS THE PERCENTAGE REDUCTION, WITHOUT THERMOSTATIC CONTROL, OF THE HEATER OUTPUT GOING FROM 40°F PIPE TEMPERATURE OPERATION TO 150°F PIPE TEMPERATURE OPERATION. PROVIDE SUFFICIENT HEAT CABLE, AS SIZED IN ACCORDANCE WITH FOLLOWING TABLE TO KEEP THE PIPE SURFACE AT 40°F WITH 10°F OUTDOOR AMBIENT TEMPERATURE. THE REQUIRED HEATER OUTPUT RATING IS IN WATTS PER FOOT AT 50°F. (HEATER SELECTION BASED ON 1" FIBERGLASS INSULATION ON METAL PIPING).

HEAT TRACE WATTAGE BASED ON AMBIENT TEMPERATURE				
PIPE SIZE	MINIMUM AMBIENT TEMPERATURE			
	10°F	0°F	-10°F	-20°F
1/2 - 3 INCH	5 WATT	5 WATT	5 WATT	5 WATT
4 INCH	5 WATT	5 WATT	5 WATT	8 WATT
6 INCH	5 WATT	8 WATT	8 WATT	8 WATT
8 INCH	8 WATT	8 WATT	2-5 WATT	2-8 WATT
10 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT
12 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT
14 INCH	8 WATT	2-5 WATT	2-8 WATT	2-8 WATT

D. COMPONENTS:
   a. ALL HEATING CABLE COMPONENTS SHALL BE UL LISTED FOR USE AS PART OF THE SYSTEM TO PROVIDE PIPE FREEZE PROTECTION. COMPONENT ENCLOSURES SHALL BE RATED NEMA 4X TO PREVENT WATER INGRESS AND CORROSION.
   b. INSTALLATION SHALL NOT REQUIRE THE INSTALLING CONTRACTOR TO CUT INTO THE HEATING CABLE CORE TO EXPOSE THE BUS WIRES.
   c. CONNECTION SYSTEMS REQUIRING THE INSTALLING CONTRACTOR STRIP THE BUS WIRES, OR WHICH USE CRIMPS OR TERMINAL BLOCKS SHALL NOT BE ACCEPTABLE.
   d. ALL COMPONENTS THAT MAKE AN ELECTRICAL CONNECTION SHALL BE RE–ENTERABLE FOR SERVICING.
   e. NO COMPONENT SHALL USE SILICONE TO SEAL THE ELECTRICAL CONNECTIONS.
   f. PROVIDE INDICATOR SIGNAL LIGHT TO VERIFY ELECTRICAL POWER AT BEGINNING OF CIRCUIT ON DOWNSTREAM SIDE OF THERMOSTAT.

E. CONTROLS:
   a. THE SYSTEM SHALL BE CONTROLLED BY A SWITCH EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   b. –OR–
   c. THE SYSTEM SHALL BE CONTROLLED BY A BULB–SENSING THERMOSTAT SET AT 40°F EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   d. THERMOSTAT TO INCLUDE NEMA 4X ENCLOSURE, SP–ST SWITCH AND THREE FOOT CAPILLARY AND BULB.
      - –OR– THE SYSTEM SHALL BE CONTROLLED BY AN AMBIENT SENSING THERMOSTAT SET AT 40°F EITHER DIRECTLY OR THROUGH AN APPROPRIATE CONTRACTOR.
   e. THERMOSTAT TO INCLUDE NEMA 4X ENCLOSURE, [STAINLESS STEEL PROBE SENSOR AND SP–ST SWITCH.][SP–ST SWITCH AND THREE FOOT CAPILLARY AND BULB.]

14. ELECTRIC MOTORS
A. MANUFACTURERS:
   a. THE FOLLOWING MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
      - RELIANCE.
      - BALDOR.
      - CENTURY.
      - GENERAL ELECTRIC.
   b. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
   c. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SUBSTITUTED EQUIPMENT OR MATERIALS FITTING THE AVAILABLE SPACE AND FOR ANY IMPACTS TO OTHER TRADES.

B. GENERAL:
   a. SUBMITTALS: SUBMIT TEST RESULTS VERIFYING NOMINAL EFFICIENCY AND POWER FACTOR FOR THREE PHASE MOTORS ONE (1) HORSEPOWER AND LARGER.
   b. OPERATION & MAINTENANCE DATA: INCLUDE ASSEMBLY DRAWINGS, BEARING DATA INCLUDING REPLACEMENT SIZES, AND LUBRICATION INSTRUCTIONS.
   c. QUALIFICATIONS: COMPANY SPECIALIZING IN MANUFACTURE OF ELECTRIC MOTORS FOR HVAC AND PLUMBING USE, AND THEIR ACCESSORIES, WITH MINIMUM THREE YEARS DOCUMENTED PRODUCT DEVELOPMENT, TESTING, AND MANUFACTURING EXPERIENCE.
   d. REGULATORY REQUIREMENTS:
   e. CONFORM TO APPLICABLE ELECTRICAL CODE.
   f. CONFORM TO LOCAL ENERGY CODE.
   g. PROTECT MOTORS STORED ON SITE FROM WEATHER AND MOISTURE BY MAINTAINING FACTORY COVERS AND SUITABLE WEATHER –PROOF COVERING. FOR EXTENDED OUTDOOR STORAGE, REMOVE MOTORS FROM EQUIPMENT AND STORE SEPARATELY.
   h. PROVIDE MINIMUM FIVE YEAR MANUFACTURER'S WARRANTY UNDER PROVISIONS OF DIVISION 23.

C. CONSTRUCTION AND REQUIREMENTS:
   a. ELECTRICAL SERVICE: REFER TO DIVISION 26 FOR REQUIRED ELECTRICAL CHARACTERISTICS.
   b. MOTORS: DESIGN FOR CONTINUOUS OPERATION IN 40°C ENVIRONMENT, AND FOR TEMPERATURE RISE IN ACCORDANCE WITH ANSI/NEMA MG 1 LIMITS FOR INSULATION CLASS, SERVICE FACTOR, AND MOTOR ENCLOSURE TYPE.
   c. EXPLOSION –PROOF MOTORS: UL APPROVED AND LABELED FOR HAZARD CLASSIFICATION, WITH OVER TEMPERATURE PROTECTION.
   d. VISIBLE NAMEPLATE: INDICATING MOTOR HORSEPOWER, VOLTAGE, PHASE, CYCLES, RPM, FULL LOAD AMPS, LOCKED ROTOR AMPS, FRAME SIZE, MANUFACTURER'S NAME AND MODEL NUMBER, SERVICE FACTOR, POWER FACTOR, EFFICIENCY.
   e. MOTORS POWERED BY VARIABLE FREQUENCY DRIVES (VFDS) SHALL HAVE MINIMUM 1.15 SERVICE FACTOR AND SHALL HAVE CLASS F, OR BETTER, INSULATION.
   f. SINGLE PHASE MOTORS: □DRIP –PROOF ENCLOSURE: CLASS A (50°C TEMPERATURE RISE) INSULATION, NEMA SERVICE FACTOR, PRELUBRICATED SLEEVE OR BALL BEARINGS.
      - ENCLOSED MOTORS: CLASS A (50°C TEMPERATURE RISE) INSULATION, 1.0 SERVICE FACTOR, PRELUBRICATED BALL BEARINGS.
   g. SPLIT PHASE MOTORS:
      - STARTING TORQUE: LESS THAN 150 PERCENT OF FULL LOAD TORQUE.
      - STARTING CURRENT: UP TO SEVEN TIMES FULL LOAD CURRENT.
      - BREAKDOWN TORQUE: APPROXIMATELY 200 PERCENT OF FULL LOAD TORQUE.
      - PERMANENT –SPLIT CAPACITOR MOTORS:
      - STARTING TORQUE: EXCEEDING ONE FOURTH OF FULL LOAD TORQUE.
      - STARTING CURRENT: UP TO SIX TIMES FULL LOAD CURRENT.
      - MULTIPLE SPEED: THROUGH TAPPED WINDINGS.
   h. CAPACITOR START MOTORS:
      - STARTING TORQUE: THREE TIMES FULL LOAD TORQUE.
      - STARTING CURRENT: LESS THAN FIVE TIMES FULL LOAD CURRENT.
      - PULL –UP TORQUE: UP TO 350 PERCENT OF FULL LOAD TORQUE.
      - BREAKDOWN TORQUE: APPROXIMATELY 250 PERCENT OF FULL LOAD TORQUE.
      - MOTORS: CAPACITOR IN SERIES WITH STARTING WINDING; CAPACITOR –START/CAPACITOR –RUN MOTORS SHALL HAVE TWO CAPACITORS IN PARALLEL WITH RUN CAPACITOR REMAINING IN CIRCUIT AT OPERATING SPEEDS.
   i. THREE PHASE MOTORS:
      - STARTING TORQUE: BETWEEN ONE AND ONE AND ONE –HALF TIMES FULL LOAD TORQUE.
      - STARTING CURRENT: SIX TIMES FULL LOAD CURRENT.
      - POWER OUTPUT, LOCKED ROTOR TORQUE, BREAKDOWN OR PULLOUT TORQUE: NEMA DESIGN B CHARACTERISTICS.
      - DESIGN, CONSTRUCTION, TESTING, AND PERFORMANCE: CONFORM TO ANSI/NEMA MG 1 FOR DESIGN B MOTORS.
      - INSULATION SYSTEM: NEMA CLASS F OR BETTER.
      - TESTING PROCEDURE: IN ACCORDANCE WITH ANSI/IEEE 112, TEST METHOD B. LOAD TEST MOTORS TO DETERMINE FREEDOM FROM ELECTRICAL OR MECHANICAL DEFECTS AND COMPLIANCE WITH PERFORMANCE DATA.
      - MOTOR FRAMES: NEMA STANDARD T –FRAMES OF STEEL, ALUMINUM, OR CAST IRON WITH END BRACKETS OF CAST IRON OR ALUMINUM WITH STEEL INSERTS.
      - BEARINGS: GREASE LUBRICATED ANTI –FRICTION BALL BEARINGS WITH HOUSINGS EQUIPPED WITH PLUGGED PROVISION FOR RELUBRICATION, RATED FOR MINIMUM AFBMA 9, L –10 LIFE OF 200,000 HOURS. CALCULATE BEARING LOAD WITH NEMA MINIMUM V – BELT PULLEY WITH BELT CENTER LINE AT END OF NEMA STANDARD SHAFT EXTENSION. STAMP BEARING SIZES ON NAMEPLATE.
      - SOUND POWER LEVELS: TO ANSI/NEMA MG 1.
      - PART WINDING START WHERE INDICATED: USE PART OF WINDING TO REDUCE LOCKED ROTOR STARTING CURRENT TO APPROXIMATELY 60 PERCENT OF FULL WINDING LOCKED ROTOR CURRENT WHILE PROVIDING APPROXIMATELY 50 PERCENT OF FULL WINDING LOCKED ROTOR TORQUE.
      - WEATHERPROOF EPOXY SEALED MOTORS (WHERE INDICATED): EPOXY SEAL WINDINGS USING VACUUM AND PRESSURE WITH ROTOR AND STARTER SURFACES PROTECTED WITH EPOXY ENAMEL. BEARINGS SHALL BE DOUBLE SHIELDED WITH WATERPROOF NON –WASHING GREASE.
      - NOMINAL EFFICIENCY: MEET OR EXCEED VALUES IN SCHEDULES AT FULL LOAD AND RATED VOLTAGE WHEN TESTED IN ACCORDANCE WITH ANSI/IEEE 112.
      - NOMINAL POWER FACTOR: MEET OR EXCEED VALUES IN SCHEDULES AT FULL LOAD AND RATED VOLTAGE WHEN TESTED IN ACCORDANCE WITH ANSI/IEEE 112.
   j. TEAO, C–FACED MOTORS, THREE PHASE POWER:
      - DIRECT DRIVE AIROVER MOTORS REQUIRED FOR VANE AXIAL FANS, CLASS F INSULATION.
      - MOTORS SHALL HAVE DUAL RATING ON NAMEPLATE FOR STILL AIR AND AIROVER OPERATION.

D. NEMA OPEN MOTOR SERVICE FACTORS:

HP	3600 RPM	1800 RPM	1200 RPM	900 RPM
1/6 - 1/3	1.35	1.35	1.35	1.35
1/2	1.25	1.25	1.25	1.15
3/4	1.25	1.25	1.15	1.15
1-1/4	1.15	1.15	1.15	1.15
1-1/2 - 150	1.15	1.15	1.15	1.15

E. MINIMUM NOMINAL FULL LOAD EFFICIENCY OF ENERGY EFFICIENT MOTORS:

	OPEN			CLOSED		
HP	3600 RPM	1800 RPM	1200 RPM	3600 RPM	1800 RPM	1200 RPM
1.0	-	82.5%	80.0%	75.5%	82.5%	80.0%
1.5	82.5%	84.0%	84.0%	82.5%	84.0%	85.5%
2.0	84.0%	84.0%	85.5%	84.0%	84.0%	86.5%
3.0	84.0%	86.5%	85.5%	85.5%	87.5%	87.5%
5.0	85.5%	87.5%	87.5%	87.5%	87.5%	87.5%
7.5	87.5%	88.5%	88.5%	88.5%	89.5%	89.5%
10	88.5%	89.5%	90.2%	89.5%	89.5%	89.5%
15	89.5%	91.0%	90.2%	90.2%	91.0%	90.2%
20	90.2%	91.0%	91.0%	90.2%	91.0%	90.2%
25	91.0%	91.7%	91.7%	91.0%	92.4%	91.7%
30	91.0%	92.4%	92.4%	91.0%	92.4%	91.7%

15. MECHANICAL–ELECTRICAL INTERFACE
A. SEPARATION OF WORK BETWEEN TRADES AND SUBCONTRACTORS IS NOT WITHIN THE SCOPE OF THESE SPECIFICATIONS. THE FOLLOWING IS PROPOSED FOR ASSISTANCE IN BIDDING ONLY.
B. UNLESS OTHERWISE INDICATED, MECHANICAL EQUIPMENT AND CONTROLS ARE SUGGESTED TO BE FURNISHED, INSTALLED AND WIRED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE; COORDINATE ALL WORK WITH DIVISION 26, ELECTRICAL:

MECHANICAL EQUIPMENT AND CONTROLS				
ITEM	POWER FURNISHED BY:	CONTROL INSTALLED BY:	POWER WIRING BY:	CONTROL WIRING BY:
EQUIPMENT MOTORS:	M	M	E	M
MAGNETIC MOTOR STARTERS AUTOMATICALLY CONTROLLED WITH OR WITHOUT HOA SWITCHES:	E	E	E	M
MAGNETIC MOTOR STARTERS MANUALLY CONTROLLED:	E	E	E	E
FURNISHED W/ MECH. EQUIPMENT, FACTORY-MOUNTED:	M	M	E	M
FURNISHED W/MECH. EQUIPMENT, FOR FIELD MOUNTING:	M	E	E	M
DISCONNECT SWITCHES, MANUAL MOTOR STARTERS, THERMAL OVERLOAD SWITCHES:	E	E	E	-
VALVES, FLOAT CONTROLS, DAMPER MOTORS, EP AND PE SWITCHES, OTHER MISCELLANEOUS	M	M	M	M
DIVISION 23 CONTROLS	E	M	-	M
M = DIVISION 23, MECHANICAL E = DIVISION 26, ELECTRICAL				

C. MECHANICAL–ELECTRICAL COORDINATION
   a. CHECK MECHANICAL AND ELECTRICAL DRAWINGS AND SPECIFICATIONS TO ASSURE PROPER LOCATION AND ELECTRICAL CHARACTERISTICS OF OUTLETS SERVING MECHANICAL AND ELECTRICAL EQUIPMENT.
   b. ADVISE THE ARCHITECT/ENGINEER OF ANY MODIFICATIONS REQUIRED TO SUIT EQUIPMENT FURNISHED.
   c. PROVIDE FUNCTIONAL TEST OF CONTROL SYSTEM, AIR DISTRIBUTION SYSTEM AND ALL MECHANICAL COMPONENTS. TEST TO BE CONDUCTED IN THE PRESENCE OF THE BUILDING OWNER'S REPRESENTATIVE. WRITTEN VERIFICATION OF TEST TO BE SIGNED BY OWNER'S REPRESENTATIVE. THE TESTS SHALL VERIFY THAT ALL SYSTEMS ARE FUNCTIONAL AND OPERATIONAL PRIOR TO SUBSTANTIAL COMPLETION. ANY WORK NOT PASSING THE TESTS SHALL BE CORRECTED IMMEDIATELY.
   d. EXCEPT AS NOTED OTHERWISE, MOTOR STARTERS AND OTHER MEANS FOR OPERATION AND CONTROL OF EQUIPMENT ARE PROVIDED UNDER DIVISION 23, MECHANICAL.

D. WIRING
   a. POWER WIRING IS IN DIVISION 26.
   b. PROVIDE UNDER DIVISION 23 ALL CONTROL WIRING, LINE OR LOW VOLTAGE, THROUGH THE COILS OF THE MAGNETIC STARTERS AND RELAYS AND THROUGH THE CONTACTS OF THERMOSTATS AND OTHER PILOT DEVICES.
   c. PROVIDE UNDER DIVISION 23 CONDUIT FOR ALL LINE VOLTAGE CONTROL WIRING AND EXPOSED LOW VOLTAGE WIRING IN MECHANICAL ROOMS AND CEILING PLENUMS.
   d. PROVIDE FLEXIBLE CONDUIT REQUIRED ON SHORT RUNS TO EQUIPMENT SUBJECT TO VIBRATION, I.E., MOTORS, FANS.
   e. MOUNT STARTERS, DISCONNECTS AND PANELS ON WALLS WHERE PRACTICAL, NOT ON EQUIPMENT OR ON STAND FROM FLOOR.
   f. PROVIDE ELECTRICAL EQUIPMENT FURNISHED UNDER THIS SECTION OF SPECIFICATIONS IN STRICT ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.

PART 3 – EXECUTION

1. PROJECT/SITE CONDITIONS
   A. EXAMINE PREMISES AND UNDERSTAND THE CONDITIONS, WHICH MAY AFFECT PERFORMANCE OF WORK OF THIS DIVISION BEFORE SUBMITTING PROPOSALS FOR THIS WORK. NO SUBSEQUENT ALLOWANCE FOR TIME OR MONEY WILL BE CONSIDERED FOR ANY CONSEQUENCE RELATED TO FAILURE TO EXAMINE SITE CONDITIONS.
   B. PREPARE DRAWINGS SHOWING PROPOSED REARRANGEMENT OF WORK TO MEET PROJECT CONDITIONS, INCLUDING CHANGES TO WORK SPECIFIED IN OTHER SECTIONS. OBTAIN PERMISSION OF ARCHITECT/ENGINEER BEFORE PROCEEDING.
   C. REFER TO RECORD DRAWINGS.
2. GENERAL COORDINATION AND INSTALLATION
   A. INFORM OTHER TRADES THRU GENERAL CONTRACTOR AS TO REQUIREMENTS FOR SLEEVES, BOXES, OTHER OPENINGS, AND EMBEDDED ITEMS. COORDINATE WITH OTHER TRADES IN ORDER TO MAINTAIN JOB PROGRESS SCHEDULE AND TO AVOID CONFLICTS IN THE INSTALLATION OF WORK BY OTHER TRADES.
   B. FURNISH AND INSTALL PIPE SLEEVES AND EMBEDDED ITEMS REQUIRED UNDER DIVISION 23.
   C. CONTRACTOR SHALL BECOME THOROUGHLY ACQUAINTED WITH THE WORK INVOLVED AND SHALL VERIFY AT THE SITE ALL MEASUREMENTS NECESSARY FOR THE PROPER INSTALLATION OF HIS WORK.
   D. CONTRACTOR SHALL REFER TO ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR BUILDING CONSTRUCTION AND OTHER DETAILS WHICH AFFECT THE MECHANICAL INSTALLATION AND SHALL CONFER WITH THOSE TRADES FOR FINISH ADJACENT TO HIS WORK AND ARRANGE TO HAVE VISIBLE PORTIONS OF HIS WORK (SUCH AS ACCESS DOORS, GRILLES, ETC.) FIT IN AND HARMONIZE WITH THE FINISH IN A MANNER SATISFACTORY TO THE ARCHITECT.
   E. CEILING HEIGHTS: REFER TO ARCHITECTURAL DRAWINGS FOR CEILING HEIGHT REQUIREMENTS.
   F. ACCESSIBILITY OF EQUIPMENT: EQUIPMENT, COILS, VALVES, DAMPERS, ETC. SHALL BE INSTALLED SO AS TO BE ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR, AND ACCESS CLEARANCES SHALL COMPLY WITH ALL APPLICABLE CODES AND AS RECOMMENDED BY RESPECTIVE MANUFACTURER.
   G. BELTS, PULLEYS, COUPLINGS, PROJECTING SET SCREWS, KEYS AND OTHER ROTATING PARTS WHICH MAY POSE A DANGER TO PERSONNEL, SHALL BE FULLY ENCLOSED OR GUARDED IN ACCORDANCE WITH OSHA REGULATIONS.
   H. PROVIDE OFFSETS AROUND ALL ELECTRICAL PANELS (AND SIMILAR ELECTRICAL EQUIPMENT) TO MAINTAIN SPACE CLEAR ABOVE AND BELOW PANEL TO STRUCTURE AND CLEARANCE OF 3 FEET DIRECTLY IN FRONT OF PANEL. EXCEPT WHERE INDICATED OTHERWISE OR REQUIRED BY NEC TO BE MORE.
3. PLATES AND ISOLATORS
   A. PLATES:
      a. INSTALL WHERE PIPES PASS THROUGH FINISHED CEILINGS AND FLOORS.
   B. ISOLATORS:
      a. MODEL 100 OR 500 FOR PIPING THRU FRAME WALLS.
      b. MODEL LS FOR PIPING THRU CONCRETE WALLS AND FLOORS.
      c. PYRO–PAC IF FLOOR OR WALL IS FIRE RATED.
4. SLEEVES
   A. INSTALL 20 GAGE GALVANIZED SLEEVES FOR PIPING THRU CONCRETE FLOORS ABOVEGROUND AND THRU MASONRY, PLASTERED AND FRAME WALLS. CLEARANCE AROUND PIPE FOR INSTALLATION OF ISOLATORS AND SEALS.IRON PIPE SLEEVES FOR PIPING THRU CONCRETE WALLS AND BEAMS. GROUT AROUND SLEEVES THRU WALLS.
   B. IRON PIPE SLEEVES THRU CONCRETE FLOORS IN MECHANICAL ROOMS, IN TOILET ROOMS AND OTHER AREAS WITH CONCRETE FLOORS SUBJECT TO FLOODING AND MOPPING. SET TO EXTEND 1" ABOVE FINISHED FLOORS. SEALED OR CAULK. NO FLOOR PLATES.
   C. WHERE COVERING IS SPECIFIED, MAKE SLEEVES OR CORES PROPER SIZE TO ALLOW FOR ISOLATORS THRU WALLS AND UNFINISHED FLOORS.
   D. EXCEPT AS NOTED IN THE FOREGOING, CUT SLEEVES FLUSH WITH SURFACE.
   E. SLEEVE PIPES PASSING THRU WALLS OR FLOORS IN FINISHED AREAS, THRU STONEMAN TRISOLATORS, OR LINK–SEAL TYPE LS OR PYRO–SEAL OR 3M FIRE BARRIER FS–195, TO EXTEND THRU BOTH FACES OF THE WALL OR FLOOR. CAULK AROUND SLEEVES TO PREVENT SOUND TRANSMISSION.
   F. WHERE SLEEVES ARE OVERSIZE THRU FIRE SEPARATIONS, FILL VOID WITH DOW CORNING 3–6548 SILICONE RTV FOAM, LINK–SEAL PYRO–SEAL, FLAME–SAFE FIRE RETARDANT COMPOUND, OR EQUAL.
   G. BORE OPENINGS FOR PIPES THRU CONCRETE AND MASONRY, USING DIAMOND CORE DRILL WHERE SLEEVING NOT DONE DURING CONSTRUCTION. H. MAKE ALL HOLES THRU PLENUMS AIRTIGHT.
5. FIRE–RATED PENETRATION SEALS
   A. INSTALL IN ACCORDANCE WITH IBC.
   B. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR SEALING FITTINGS AND BARRIER SEALING SYSTEMS.
6. FLASHING
   A. PROVIDE FLEXIBLE FLASHING AND METAL COUNTERFLASHING WHERE PIPING AND DUCTWORK PENETRATE WEATHER OR WATERPROOFED WALLS, FLOORS, AND ROOFS.
   B. FLASH VENT AND SOIL PIPES PROJECTING 3 INCHES MINIMUM ABOV

MECHANICAL GENERAL PROVISIONS CONTD.

AN INDIVIDUAL HANGER.
•• ON ALL PIPING–" AND SMALLER.

c. VERTICAL PIPING:
- ATTACHMENT – VERTICAL PIPING SHALL BE SECURED AT SUFFICIENTLY CLOSE INTERVALS TO KEEP THE PIPE IN ALIGNMENT AND CARRY THE WEIGHT OF THE PIPE AND CONTENTS. STACKS SHALL BE SUPPORTED AT THEIR BASES AND IF OVER 2 STORIES IN HEIGHT OR 24' AT EVERY 12' BY APPROVED METAL FLOOR CLAMPS.
- SCREWED PIPE – SCREWED PIPE (I.P.S.) SHALL BE SUPPORTED AT NOT LESS THAN EVERY OTHER STORY HEIGHT OR 24'.
- COPPER TUBING – COPPER TUBING SHALL BE SUPPORTED AT EACH STORY FOR PIPING 1" AND LARGER DIAMETER, AND AT NOT MORE THAN 6 FOOT INTERVALS FOR PIPING 1" AND SMALLER IN DIAMETER
- PIPES OF OTHER APPROVED MATERIAL SHALL BE SUPPORTED IN ACCORDANCE WITH THEIR APPROVED INSTALLATION STANDARDS.

d. HORIZONTAL PIPING:
- SUPPORTS – HORIZONTAL OR LESS THAN 90° FROM HORIZONTAL, PIPING SHALL BE SUPPORTED AT SUFFICIENTLY CLOSE INTERVALS TO KEEP IT IN ALIGNMENT AND PREVENT SAGGING.
- SCREWED PIPE – SCREWED PIPE (I.P.S.) OR FLANGED PIPE SHALL BE SUPPORTED AT APPROXIMATELY 10 FOOT INTERVALS.
- COPPER TUBING – COPPER TUBING SHALL BE SUPPORTED AT APPROXIMATELY 6 FOOT INTERVALS FOR TUBING 1" AND SMALLER IN DIAMETER AND 10 FOOT INTERVALS FOR TUBING 2" AND LARGER IN DIAMETER.
- PIPES OF OTHER APPROVED MATERIALS SHALL BE SUPPORTED IN ACCORDANCE WITH THEIR APPROVED INSTALLATION STANDARDS.

e. BRACE SPACING:
- TRANSVERSE BRACINGS AT 40' – 0" O.C. MAXIMUM UNLESS OTHERWISE NOTED.
- LONGITUDINAL BRACINGS AT 80' – 0" O.C. MAXIMUM UNLESS OTHERWISE NOTED. WHEN THERMAL EXPANSION OR CONTRACTION IS INVOLVED, PROVIDE LONGITUDINAL BRACINGS AT ANCHOR POINTS. THE LONGITUDINAL BRACES AND THE CONNECTIONS MUST BE CAPABLE OF RESISTING THE FORCE INDUCED BY EXPANSION AND CONTRACTION.
- TRANSVERSE BRACING FOR ONE PIPE SECTION MAY ALSO ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED PERPENDICULAR TO IT, IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE OF SIMILAR SIZE.
- FOR THREADED PIPING THE FLEXIBILITY MAY BE PROVIDED BY THE INSTALLATION OF SWING JOINTS. IN WELDED OR SOLDER JOINT PIPING, THE FLEXIBILITY SHALL BE PROVIDED BY EXPANSION LOOPS OR MANUFACTURED FLEXIBLE CONNECTORS. FOR PIPING WITH MANUFACTURED BALL JOINTS SELECT LENGTH OF PIPING OFFSET USING "SEISMIC DRIFT" IN PLACE OF "EXPANSION PER JOINT MANUFACTURERS" SELECTION TABLE. SEISMIC DRIFT = 0.015 FT. PER FOOT OF HEIGHT.

f. DO NOT USE BRANCH LINES TO BRACE MAIN LINES.
g. TRAPEZE HANGERS MAY BE USED. PROVIDE FLEXIBILITY IN JOINTS WHERE PIPES PASS THROUGH BUILDING SEISMIC OR EXPANSION JOINTS, OR WHERE RIGIDLY SUPPORTED PIPES CONNECT TO EQUIPMENT WITH VIBRATION ISOLATORS.
h. A RIGID PIPING SYSTEM SHALL NOT BE BRACED TO DISSIMILAR PARTS OF A BUILDING OR TWO DISSIMILAR BUILDING SYSTEMS THAT MAY RESPOND IN A DIFFERENT MODE DURING AN EARTHQUAKE. EXAMPLES: WALL AND A ROOF; SOLID CONCRETE WALL AND A METAL DECK WITH LIGHTWEIGHT CONCRETE FILL.
i. PROVIDE LARGE ENOUGH PIPE SLEEVES THROUGH WALLS OR FLOORS TO ALLOW FOR ANTICIPATED DIFFERENTIAL MOVEMENTS.
j. AT VERTICAL PIPE RISERS, WHEREVER POSSIBLE, SUPPORT THE WEIGHT OF THE RISER AT A POINT OR POINTS ABOVE THE CENTER OF GRAVITY OF THE RISER. PROVIDE LATERAL GUIDES AT THE TOP AND BOTTOM OF THE RISER, AND AT INTERMEDIATE POINTS NOT TO EXCEED 30'–0" ON CENTER.
k. CAST IRON PIPE OF ALL TYPES, AND ANY OTHER PIPE JOINED WITH A SHIELD AND CLAMP ASSEMBLY WHERE THE TOP OF THE PIPE IS 12" OR MORE FROM SUPPORTING STRUCTURE SHALL BE BRACED ON EACH SIDE OF A CHANGE IN DIRECTION OF 90° OR MORE. RISER JOINTS SHALL BE BRACED OR STABILIZED BETWEEN FLOORS.
l. FOR GAS PIPING, THE BRACING DETAILS, SCHEDULES AND NOTES MAY BE USED EXCEPT THAT TRANSVERSE BRACING SHALL BE AT 20'–0" O.C. MAXIMUM AND LONGITUDINAL BRACING AT 40' – 0" O.C. MAXIMUM. ALSO 1", 1", 1", AND 2" DIAMETER PIPES SHALL BE BRACED THE SAME AS 2" DIAMETER PIPE IN THE SCHEDULE. (NO BRACING IS REQUIRED FOR PIPES–" DIAMETER AND SMALLER).
m. IT IS THE RESPONSIBILITY OF THE USER OF THE GUIDELINES TO ASCERTAIN THAT AN APPROPRIATE SIZE DEVICE BE SELECTED FOR EACH INDIVIDUAL PIECE OF EQUIPMENT.

C. EQUIPMENT RESTRAINTS:
a. MECHANICAL EQUIPMENT ANCHORAGES SUCH AS BOLTS, EXPANSION ANCHORS, SCREWS, ETC., SHALL COMPLY WITH THE FORCE LEVEL REQUIREMENTS ZONE 3 SEISMIC HAZARD.
b. RESTRAINING DEVICES MUST BE PLACED ON ALL SIDES OF THE EQUIPMENT BASE.
c. IT IS THE RESPONSIBILITY OF THE EQUIPMENT MANUFACTURER TO DESIGN HIS EQUIPMENT SO THAT THE STRENGTH AND ANCHORAGE OF THE INTERNAL COMPONENTS OF THE EQUIPMENT EXCEEDS THE FORCE LEVEL USED TO RESTRAIN AND ANCHOR THE UNIT ITSELF TO THE SUPPORTING STRUCTURE.
d. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ASCERTAIN THAT AN APPROPRIATE SIZE DEVICE BE SELECTED FOR EACH INDIVIDUAL PIECE OF EQUIPMENT.

10. ACCESS DOORS
A. WHEN NECESSARY TO GAIN ACCESS TO THE MECHANICAL SYSTEM THRU FINISHED WALLS OR CEILINGS, FURNISH METAL PANEL ACCESS DOORS OF PROPER SIZE, SUITABLE TO INSTALLATION CONDITIONS, FOR THE GENERAL CONTRACTOR TO INSTALL AND GIVE NECESSARY INFORMATION FOR PROPER LOCATION. NOTIFY GENERAL CONTRACTOR OF REQUIREMENTS PRIOR TO BIDDING.
B. FIRE RATED WITH UL LABEL IF LOCATED IN A FIRE SEPARATION.

11. VALVES AND ACCESSORIES
A. RECORD ACTUAL LOCATIONS OF VALVES IN ALL MECHANICAL SYSTEMS ON PROJECT RECORD DRAWINGS.
B. PROVIDE VALVES AND ACCESSORIES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
C. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.
D. PROVIDE ACCESS WHERE VALVES AND FITTINGS ARE NOT EXPOSED.
E. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT INVERTED.
F. PROVIDE UNIONS DOWNSTREAM OF VALVES AND AT EQUIPMENT OR APPARATUS CONNECTIONS.
G. INSTALL BRASS MALE ADAPTERS EACH SIDE OF VALVES IN COPPER PIPED SYSTEM. SWEAT SOLDER ADAPTERS TO PIPE.
H. INSTALL GATE, BALL OR BUTTERFLY VALVES FOR SHUT –OFF AND TO ISOLATE EQUIPMENT, PART OF SYSTEMS, OR VERTICAL RISERS.
I. PROVIDE GLOBE, BALL OR BUTTERFLY VALVES FOR THROTTLING, BYPASS, OR MANUAL FLOW CONTROL SERVICES.
J. PROVIDE CHECK VALVES ON DISCHARGE OF WATER PUMPS.
K. PROVIDE PLUG VALVES IN NATURAL GAS SYSTEMS FOR SHUT –OFF SERVICE.
L. PROVIDE BALANCING VALVES OR FLOW CONTROL VALVES IN WATER RECIRCULATING SYSTEMS WHERE INDICATED.

12. HEAT TRACE INSTALLATION
A. APPLY THE HEATING CABLES LINEARLY ON THE PIPE AFTER PIPING HAS BEEN SUCCESSFULLY PRESSURE TESTED. SECURE THE HEATER TO PIPING BEFORE INSULATION WITH CABLE TIES OR FIBERGLASS TAPE AT TWO–FOOT INTERVALS. POWER CONNECTION, END SEAL, SPLICE AND TEE KIT COMPONENTS SHALL BE APPLIED IN THE FIELD. WIRE AT THE ENDS OF CIRCUITS IS NOT TO BE TIED TOGETHER.
B. APPLY "ELECTRIC TRACED" SIGNS TO THE OUTSIDE OF THE THERMAL INSULATION AT TEN FOOT INTERVALS ALONG THE PIPE ON ALTERNATING SIDES.
C. AFTER INSTALLATION, AND BEFORE AND AFTER INSTALLING THE THERMAL INSULATION, SUBJECT HEATER TO TESTING USING A 2500 VDC MEGGER. MINIMUM INSULATION RESISTANCE SHOULD BE 20 TO 1000 MEGAOHMS REGARDLESS OF LENGTH.
D. THE INSTALLER SHALL PROVIDE RESISTANCE TEST FOR BOTH HEATING CABLE WIRES TO VERIFY THE CONNECTION OF ANY SPLICES OR TEES.
E. MECHANICAL CONTRACTOR IS RESPONSIBLE TO COORDINATE INSTALLATION OF HEAT TRACING WITH ELECTRICAL CONTRACTOR AND ALL SUBCONTRACTORS.

13. MECHANICAL IDENTIFICATION INSTALLATION
A. DEGREASE AND CLEAN SURFACES TO RECEIVE ADHESIVE FOR IDENTIFICATION MATERIALS.
B. PREPARE SURFACES IN ACCORDANCE WITH DIVISION 09 FOR STENCIL PAINTING.
C. PLASTIC NAMEPLATES: INSTALL WITH CORROSIVE –RESISTANT MECHANICAL FASTENERS, OR ADHESIVE.
D. PLASTIC OR METAL TAGS: INSTALL WITH CORROSIVE – RESISTANT CHAIN.
E. STENCIL PAINTING: APPLY IN ACCORDANCE WITH DIVISION 09.
F. PLASTIC PIPE MARKERS: INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
G. PLASTIC TAPE PIPE MARKERS: INSTALL COMPLETE AROUND PIPE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
H. UNDERGROUND PLASTIC PIPE MARKERS: INSTALL 6 TO 8 INCHES BELOW FINISHED GRADE, DIRECTLY ABOVE BURIED PIPE.
I. EQUIPMENT: IDENTIFY AIR HANDLING UNITS, PUMPS, HEAT TRANSFER EQUIPMENT, TANKS, AND WATER TREATMENT DEVICES WITH PLASTIC NAMEPLATES. SMALL DEVICES, SUCH AS IN –LINE PUMPS, MAY BE IDENTIFIED WITH PLASTIC OR METAL TAGS.
J. CONTROLS: IDENTIFY CONTROL PANELS AND MAJOR CONTROL COMPONENTS OUTSIDE PANELS WITH PLASTIC NAMEPLATES.
K. VALVES: IDENTIFY VALVES IN MAIN AND BRANCH PIPING WITH TAGS.
L. PIPING: IDENTIFY PIPING, CONCEALED OR EXPOSED, WITH PLASTIC PIPE MARKERS. IDENTIFY SERVICE, FLOW DIRECTION, AND PRESSURE. INSTALL IN CLEAR VIEW AND ALIGN WITH AXIS OF PIPING. LOCATE IDENTIFICATION NOT TO EXCEED 20 FEET ON STRAIGHT RUNS INCLUDING RISERS AND DROPS, ADJACENT TO EACH VALVE AND "T", AT EACH SIDE OF PENETRATION OF STRUCTURE OR ENCLOSURE, AND AT EACH OBSTRUCTION.DUCTWORK: IDENTIFY DUCTWORK WITH STENCILED PAINTING. IDENTIFY AS TO AIR HANDLING UNIT NUMBER, AND AREA SERVED. LOCATE IDENTIFICATION AT AIR HANDLING UNIT, AT EACH SIDE OF PENETRATION OF STRUCTURE OR ENCLOSURE, AND AT EACH OBSTRUCTION.

14. MOTORS
A. APPLICATION:
a. MOTORS DRAWING LESS THAN 250 WATTS AND INTENDED FOR INTERMITTENT SERVICE MAY BE GERMANE TO EQUIPMENT MANUFACTURER AND NEED NOT CONFORM TO THESE SPECIFICATIONS.
b. MOTORS SHALL BE OPEN DRIP –PROOF TYPE, EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE.
c. MOTORS WITH FRAME SIZES 143T AND LARGER SHALL BE ENERGY EFFICIENT TYPE.
d. SINGLE–PHASE MOTORS FOR SHAFT MOUNTED FANS AND CENTRIFUGAL PUMPS SHALL BE SPLIT PHASE TYPE.
e. SINGLE–PHASE MOTORS FOR SHAFT MOUNTED FANS OR BLOWERS SHALL BE PERMANENT SPLIT CAPACITOR TYPE.
f. SINGLE–PHASE MOTORS FOR AIR COMPRESSORS SHALL BE CAPACITOR START TYPE.
g. MOTORS LOCATED IN DIRECT DRIVE VANE–AXIAL FANS SHALL BE TOTALLY ENCLOSED TYPE.
h. MOTORS LOCATED IN EXTERIOR LOCATIONS SHALL BE TOTALLY ENCLOSED WEATHERPROOF EPOXY –SEALED TYPE.

15. MAINTAINING SERVICE
A. THE EXISTING BUILDING WILL REMAIN OCCUPIED DURING CONSTRUCTION.
B. ALL SERVICES SHALL BE MAINTAINED IN THE OCCUPIED AREAS OF THE BUILDING WITH A MINIMUM OF INTERRUPTION.
C. CONTRACTOR SHALL REPAIR OR REPLACE PROMPTLY ANY EXISTING UTILITIES DAMAGED BY THE CONTRACTOR'S OPERATION.
D. CONTRACTOR SHALL COORDINATE PHASING IF APPLICABLE OF CONSTRUCTION WORK WITH GENERAL CONTRACTOR AND SHALL ABIDE BY GENERAL CONTRACTOR'S PHASING SCHEDULE.

16. PRODUCT DELIVERY, STORAGE AND HANDLING
A. USE CARE IN TRANSPORTING, STORAGE AND HANDLING TO AVOID DAMAGE.
B. KEEP MATERIALS AND EQUIPMENT CLEAN, DRY AND FREE FROM HARMFUL AND HAZARDOUS CONDITIONS.

17. PROTECTION AND CLEANING
A. PROTECT ALL MATERIALS, EQUIPMENT, FIXTURES, PIPING AND VALVES FROM DAMAGE AND AGAINST RUST AND DIRTY CONDITIONS DURING PROGRESS OF THE JOB.
B. PROMPTLY REMOVE ALL WASTE MATERIAL AND RUBBISH AT THE END OF EACH WORKDAY.
C. CLEAN UP ALL EQUIPMENT AND FLUSH OUT AND CLEAN ALL PLUMBING FIXTURES AT COMPLETION OF JOB.
D. CLEAN OUT VENTILATION EQUIPMENT BOTH INSIDE AND OUT ON COMPLETION OF THE JOB. INSTALL CLEAN FILTERS.
E. FLUSH OUT ALL PIPING, CLEAN DIRT LEGS AND STRAINERS.

18. INSPECTION
A. DO NOT ALLOW ANY WORK TO BE COVERED UP OR ENCLOSED UNTIL INSPECTED, TESTED AND APPROVED BY ARCHITECT AND OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK.
B. SHOULD ANY WORK BE ENCLOSED OR COVERED UP BEFORE SUCH INSPECTION AND TEST, CONTRACTOR SHALL, AT ITS OWN EXPENSE, UNCOVER WORK, AND AFTER IT HAS BEEN INSPECTED, TESTED AND APPROVED, MAKE ALL REPAIRS AS NECESSARY TO RESTORE ALL WORK DISTURBED TO ITS ORIGINAL CONDITION.

19. TEMPORARY SYSTEMS
A. AIR SYSTEMS: DO NOT USE AIR SYSTEMS DURING CONSTRUCTION FOR TEMPORARY HEAT OR CONSTRUCTION VENTILATION. COVER DUCT AND GRILLE OPENINGS WITH TAPED–ON PLASTIC SHEET OR EQUIVALENT TO KEEP ALL CONSTRUCTION DUST OUT OF THE DUCTWORK.
B. TEMPORARY HEAT:
a. MAKE SEPARATE TEMPORARY HEATING SYSTEM AVAILABLE AND OPERATE AS EARLY AS PRACTICAL FOR TEMPORARY HEATING OF BUILDING DURING CONSTRUCTION.
b. FUEL AND POWER WILL BE THE RESPONSIBILITY OF CONTRACTOR.

20. OPERATING & MAINTENANCE INSTRUCTIONS
A. FOLLOWING INITIAL OPERATION OF MECHANICAL SYSTEMS AND PRIOR TO ACCEPTANCE BY THE OWNER, PERFORM THE FOLLOWING SERVICES:
a. AT LEAST TWO WEEKS PRIOR TO EACH INSTRUCTION PERIOD GIVE WRITTEN NOTIFICATION OF READINESS TO PROCEED TO THE ARCHITECT/ENGINEER AND THE OWNER, AND OBTAIN MUTUALLY ACCEPTABLE DATES.
b. CONDUCT DEMONSTRATIONS AND INSTRUCTIONS FOR THE OWNER'S REPRESENTATIVES, POINTING OUT REQUIREMENTS FOR SERVICING AND MAINTAINING EQUIPMENT AND SYSTEMS PROVIDED UNDER THIS CONTRACT.
c. IF REQUESTED BY THE ARCHITECT/ENGINEER, FURNISH QUALIFICATIONS OF CONTRACTORS' PERSONNEL IN CHARGE OF THE INSTRUCTION; FOREMAN POSITION IS MINIMUM ACCEPTABLE.
d. OWNER'S REPRESENTATIVE MAY INCLUDE PERSONNEL FROM OPERATIONS, FACILITIES ENGINEERING AND MAINTENANCE DEPARTMENTS.
e. INCLUDE PRELIMINARY DISCUSSION, INFORMATION FROM MAINTENANCE MANUAL AND CONTRACT DRAWINGS; CONDUCT TOURS OF THE NEW CONSTRUCTION, EXPLAINING MAINTENANCE, OPERATION AND ADJUSTMENT OF EACH PIECE OF EQUIPMENT.
f. MINIMUM DURATION OF INSTRUCTION PERIODS:
- HEATING, VENTILATING, AND AIR CONDITIONING; 8 HOURS
- CONTROLS; 16 HOURS

g. PROVIDE WRITTEN OUTLINE OF MATERIAL TO BE COVERED IN INSTRUCTION PERIODS FOR REVIEW TWO WEEKS MINIMUM PRIOR TO SESSIONS.
h. INSTRUCTION PERIODS SHALL OCCUR AFTER O&M MANUALS HAVE BEEN REVIEWED AND APPROVED AND SHALL INCORPORATE MANUALS IN THE COURSE MATERIAL.

21. FUNCTIONAL TESTING
A. PRIOR TO PERFORMING THE FUNCTIONAL TEST IN THE PRESENCE OF THE ENGINEER AND BUILDING OWNER'S REPRESENTATIVE, THE CONTRACTOR SHALL HAVE TESTED ALL MECHANICAL SYSTEMS, COMPONENTS AND CONTROLS TO FULLY PROVE FUNCTIONALITY. MAKE ALL FINAL CALIBRATIONS, ADJUSTMENTS AND REPAIRS PRIOR TO CALLING FOR FUNCTIONAL TEST TO BE WITNESSED.
B. PROVIDE FUNCTIONAL TEST OF ALL MECHANICAL SYSTEMS, COMPONENTS AND CONTROL SYSTEM. SYSTEMS AND COMPONENTS SHALL BE RUN THROUGH ALL MODES OF OPERATION DEMONSTRATING THAT SYSTEMS AND COMPONENTS ARE FULLY FUNCTIONAL. TEST SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER AND BUILDING OWNER'S REPRESENTATIVE. PROVIDE WRITTEN TEST PROCEDURE TWO WEEKS PRIOR TO SCHEDULED TEST. PROVIDE WRITTEN VERIFICATION OF TEST TO BE SIGNED BY OWNER'S REPRESENTATIVE. PROVIDE OWNER WITH COPY OF SIGNED VERIFICATION.
C. SHOULD SYSTEMS NOT FUNCTION PROPERLY IN FUNCTIONAL TEST WITNESSED BY ENGINEER OR SYSTEMS, IN–PART OR WHOLE, NOT READY AND/OR COMPLETE FOR TEST, CONTRACTOR SHALL REIMBURSE ENGINEER FOR TIME AND EXPENSES, MINIMUM OF $800/WORK DAY, REQUIRED TO WITNESS ADDITIONAL TESTS OF SYSTEMS OR COMPONENTS NOT PERFORMING ACCEPTABLY OR NOT COMPLETE FOR A FULL TEST. THIS PORTION OF THE BID CONTRACT SHALL BE DEEMED NON–CONFORMING IN FUNCTIONAL TEST IS NOT COMPLETED AS SCHEDULED. PAYMENT TO ENGINEER FOR THE NON–CONFORMING FUNCTIONAL TEST MUST BE MADE PRIOR TO ANY ADDITIONAL FUNCTIONAL TESTS.

22. PROJECT CLOSEOUT
A. REQUIREMENTS FOR FINAL INSPECTION:
a. ALL OF THE FOLLOWING ITEMS SHALL BE COMPLETED PRIOR TO FINAL INSPECTIONS. NO EXCEPTIONS WILL BE MADE AND NO APPROVAL FOR FINAL PAYMENT WILL BE MADE UNTIL ALL ITEMS ARE COMPLETED:
b. CLEANING EQUIPMENT AND PREMISES
c. PROOF OF FUNCTIONAL TESTING
d. OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS
e. OPERATOR TRAINING SESSIONS
f. TESTING, ADJUSTING AND BALANCING
g. APPROVALS OF ALL CODE AUTHORITIES AND BUILDING OFFICIALS
h. RECORD DRAWINGS ("AS–BUILT")
i. GUARANTEE

B. REFER TO DIVISION 01 FOR ADDITIONAL REQUIREMENTS.

PERMIT SET 08-15-2025

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REVISIONS

NO	DATE	BY	DESCRIPTION
-	--/--/--	-	-

TITLE

HVAC SPECIFICATONS

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M0.0.DWG
JOB NUMBER	2024.11

M0.3

AIR HANDLER UNIT (AHU-) SCHEDULE

TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL						NOTES
			EVAPORATOR	TOTAL COOL (BTUH)	SENS COOL (BTUH)	DESIGN FLOW (CFM)	O.A. FLOW (CFM)	ESP (IN WG)	VELOCITY (RPM)	HP	FEI	VOLTAGE	PHASE	FLA	BREAKER	WEIGHT (LBS)	DIMENSIONS (H"xW"xD")	
AHU-2	LOWER FLOOR	DAIKIN	CAH008GDBC	193,252	147,436	4,000	-	1.25	1,993	5.0	0.91	460	3	6.2	20	1078	34"x64"x58"	1-8

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. RFIELD ROUTE TO APPROVED DRAIN.
3. WITH R-410A REFRIGERANT.
4. TEMPERED OUTSIDE AIR PROVIDED BY 100% O.A. RTU-2.
5. PROVIDE W/ MERV-8 FILTER
6. CONNECT TO EXIST BUILDING CONTROL SYSTEM.
7. COOLING PROVIDED BY DX COIL FROM CU-2.
8. HEATING PROVIDED BY SEPARATE EXISTING DUCT MOUNTED HOT WATER HEATING COIL.

SPLIT SYSTEM CONDENSING UNIT (CU-) SCHEDULE

TAG	SERVES	MANUF.	MODEL	CAPACITY	ELECTRICAL				EER	REFRIG CIRCUITS	DIMENSIONS	WEIGHT	NOTES
				COOL (BTUH)	VOLTAGE	PHASE	MCA	BREAKER			(H"xW"xD")		
CU-2	AHU-2	DAIKIN	RCS020D	267,981	208	3	96.5	125	12.3	2	55"x99"x58"	1891	1,2,3,4,5

NOTES:
1. POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
2. WITH R-410A REFRIGERANT.
3. W/ FIELD GFI RECEPTACLE
4. W/ LOW AMBIENT CONTROL TO 45 XDEGREES
5. TWO 1-3/8" SUCTION LINES, TWO 5/8" LIQUID LINES

AHU-2 CONTROLS
FAN TO OPERATE ON BUILDING OCCUPANCY SCHEDULE.
UPON CALL FOR HEATING, CONDENSING UNIT TO BE DISENGAGED AND HEATING COIL VALVE TO OPEN.
UPON CALL FOR COOLING, HEATING COIL VALVE TO CLOSE AND CONDENSING UNIT TO ENGAGE.

PERMIT SET 08-15-2025

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SVCA
CLUBHOUSE HVAC
4 CLUBHOUSE CIR,
BELLINGHAM, WA, 98229

REVISIONS

NO	DATE	BY	DESCRIPTION
-	--/--/--	-	-

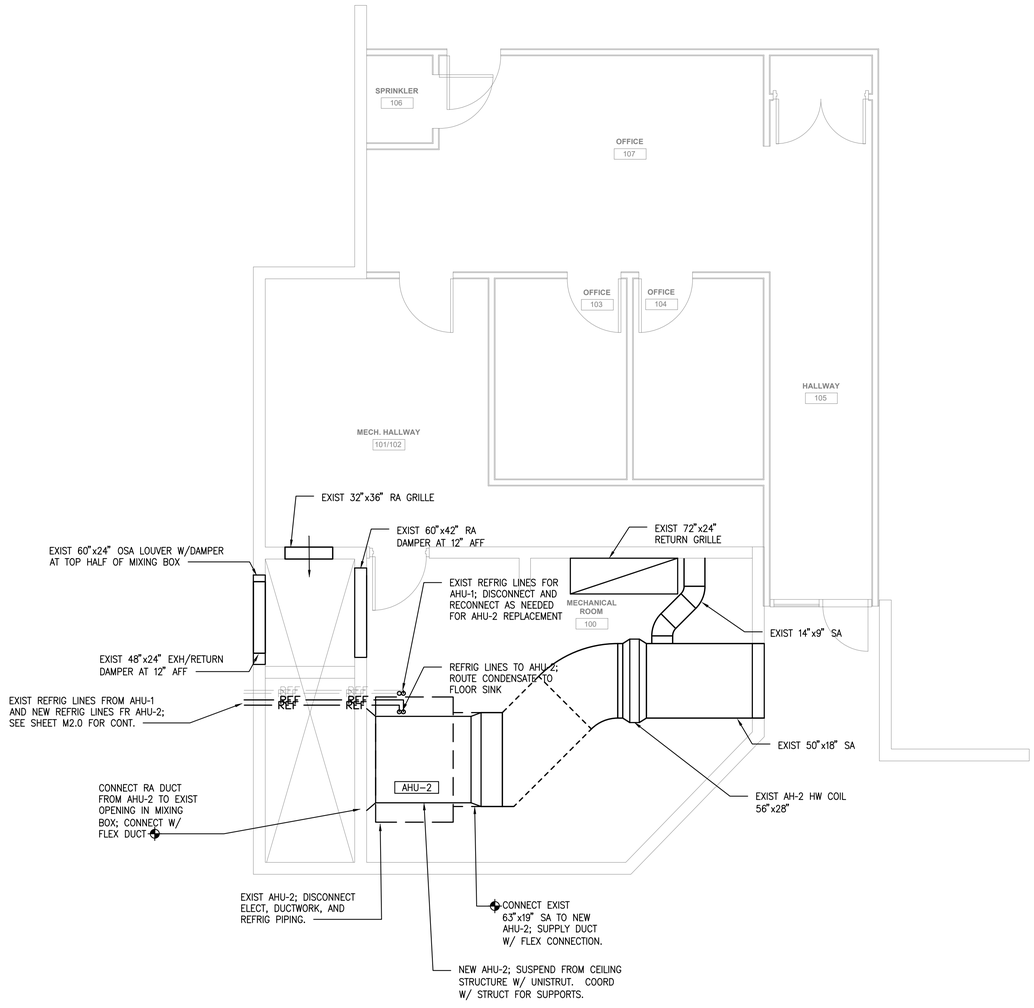
TITLE

HVAC SCHEDULES

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M1.0.DWG
JOB NUMBER	2024.11

M1.0


EXIST BUILDING
EXIST CU-1
REFRIG PIPING FROM CU-1 & CU-2 DN TO BELOW GRADE
REF
REF
REF



HVAC FLOOR PLAN

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

N

PERMIT SET 08-15-2025

BERONA ENGINEERS, INC.
8021 State Avenue
Marysville, WA 98270
p (425)744-6033
www.beronaengineers.com

HERBERT N. RESSEL
STATE OF WASHINGTON
44608
REGISTERED
PROFESSIONAL ENGINEER

SVCA
CLUBHOUSE HVAC
4 CLUBHOUSE CIR,
BELLINGHAM, WA, 98229

REVISIONS

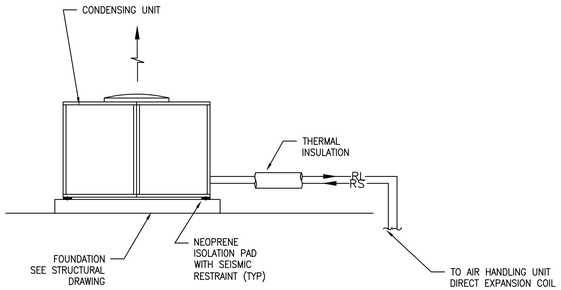
NO	DATE	BY	DESCRIPTION
-	--/--/--	-	-

TITLE

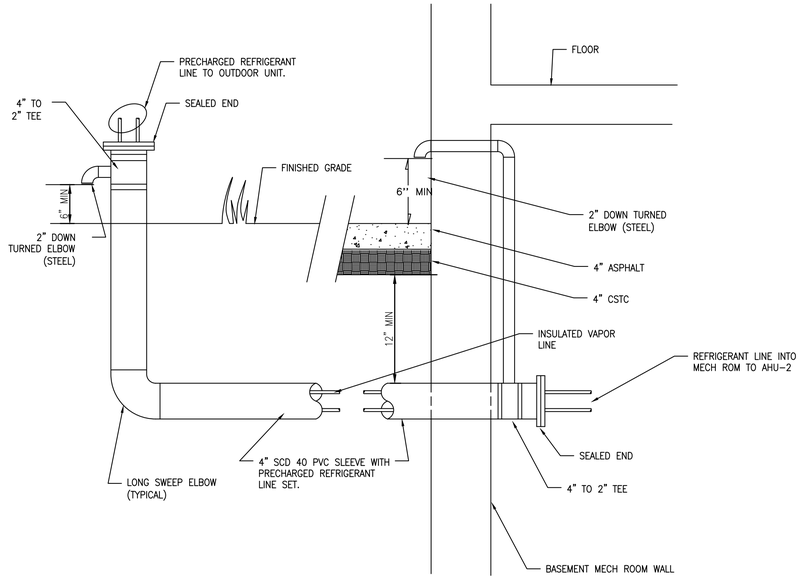
HVAC MECH ROOM PLAN

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.1.DWG
JOB NUMBER	2024.11

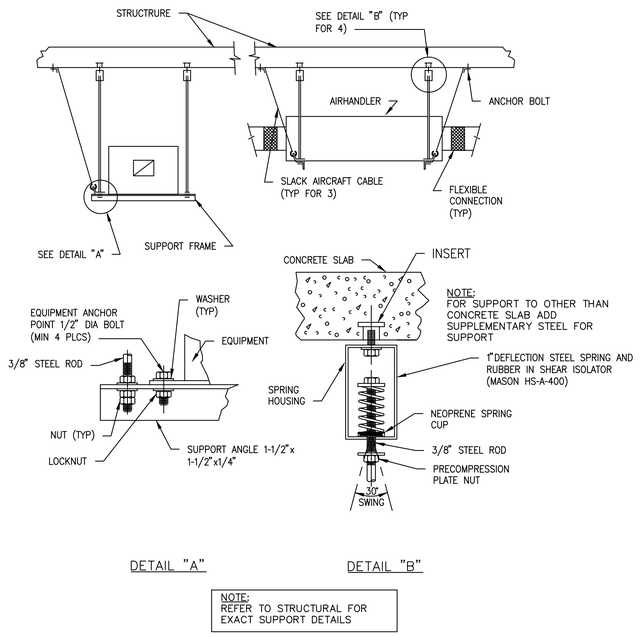
M2.1



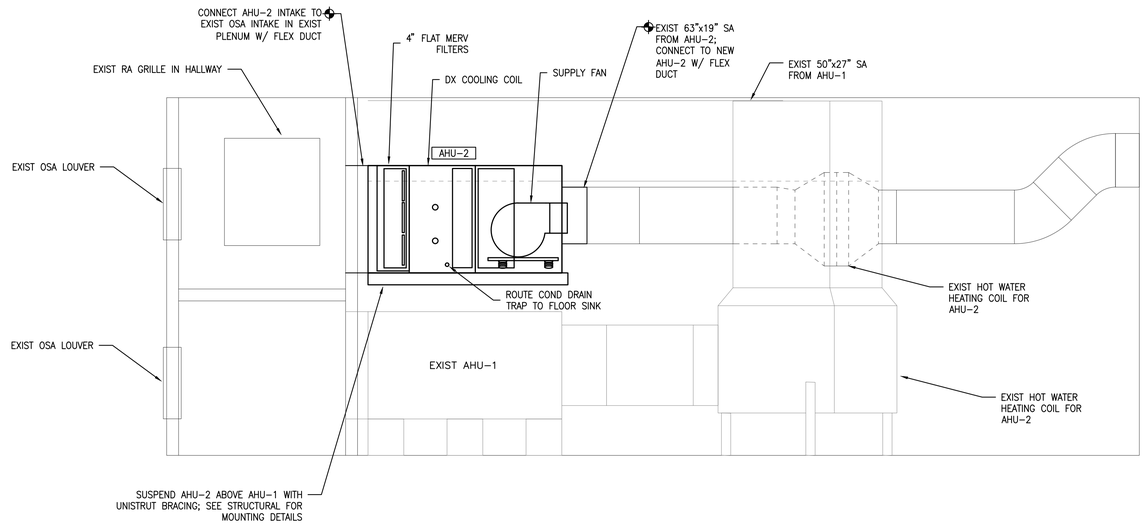
1 AIR COOLED CONDENSING DETAIL
SCALE: NONE



2 UNDERGROUND PIPING DETAIL
SCALE: NTS



3 AHU SUPPORT DETAIL
NOT TO SCALE



4 MECH ROOM HVAC SECTION
SCALE: NONE

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4 CLUBHOUSE CIR,
BELLINGHAM, WA, 98229

PERMIT SET 08-15-2025

REVISIONS

NO	DATE	BY	DESCRIPTION
-	--/--/--	-	-

TITLE

HVAC DETAILS

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M3.0.DWG
JOB NUMBER	2024.11

M3.0

Whatcom County
Planning and Development Services
5280 Northwest Drive
Bellingham, WA 98226
Phone 360-778-5900
Inspection 360-778-5902
epermits@co.whatcom.wa.us

Permit

Permit Number: **MEC-C2025-00014**

Permit Type: **Mechanical (Commercial)**

Commercial Mechanical

Work Classification: ***New***

Permit Status: **Issued**

Issue Date: **09/22/2025**

Location Address

4 CLUBHOUSE CIR, Bellingham, WA 98229

Parcel Number

3704082055100000

Contacts

Sudden Valley Community Association — **Owner**
4 CLUBHOUSE CIR, Bellingham, WA 98229
(360)296-6497
GREG.WADDEN@SUDDENVALLEY.COM

SARAH BROWN — **Owner**
3222 EAGLERIDGE WAY, BELLINGHAM, WA 98226
(360)920-5498
sarah@sbarchdesign.com

Tyler Andrews — **Contractor**
PO Box 30498, Bellingham, WA 98228
accounting@pnwcivil.com
PNWCICI834C2 02/22/2027

Construction Permit Details

Proposed Work: Replacement of existing Air Handling Unit (AHU) and Condensing Unit (CU) and replace with new.

Building Info

Heat Sources: Electric, NATG

Site or Approval Info

Other Mechanical Equipment

Inspections

Inspection Type	Inspection Card (call inspections in the order they appear below)
Standard Inspections	***Contractors, please call or schedule your inspection in this ord***
Rough HVAC	
Final Mechanical	

POST THIS PERMIT ONSITE WITH THE APPROVED PLANS
COMPLIANCE WITH ALL INSPECTIONS AND CONDITIONS REQUIRED PRIOR TO OCCUPANCY

ALL INSPECTIONS SHOULD BE SCHEDULED A MIMIMUM OF 1 BUSINESS DAY IN ADVANCE
Please schedule Inspections on the County's Permitting Portal

https://www.whatcomcounty.us/4547/Customer-Service-Portal

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Permit

Permit Number: **MEC-C2025-00014**

Permit Type: **Mechanical (Commercial)**

Commercial Mechanical

Work Classification: ***New***

Permit Status: **Issued**

Issue Date: **09/22/2025**

Condition Name	
1	**FM - Address Posting** Address shall be posted, per the Whatcom Sign Standards, where the driveway meets the main/private road or where approve by WCFMO.
2	**BS - IRC/IBC ANY DEVIATION** IBC/IRC - Any deviation in construction from approved plans requires prior review and approval by Whatcom County Planning and Development Building Services and Land Use Departments.
3	**BS - IRC/IBC PLANS & INSP RECORD** Approved plans shall be kept on the building or work site at all times during which the work authorized thereby is in progress. Work requiring a permit shall not be commenced until the Inspection Record Card is posted or otherwise made available in a convenient location. (IRC Sections R105.7 & R106.3.1 / IBC Sections 105.7 & 107.3.1)
4	**BS - IRC/IBC WORK SITE POSTING** The established address for the proposed work site shall be posted on a substantial, weather-resistant sign in a location readily visible from the public way. In all cases, when applicable, the sign shall also include the corresponding division and/or lot number. NO EXCEPTIONS. Sign lettering must have sufficient contrast from the sign background. Lettering must be clear, readable and large enough to be discernible from a passing vehicle. Signs are required to be posted prior to any inspection requests and shall remain visible for the duration of the project construction.
5	**BS - IRC/IBC APPV TO CONSTRUCT** IRC/IBC - Approved to construct, subject to field inspections, special inspections, corrections and provisions of plan review.

POST THIS PERMIT ONSITE WITH THE APPROVED PLANS
COMPLIANCE WITH ALL INSPECTIONS AND CONDITIONS REQUIRED PRIOR TO OCCUPANCY

ALL INSPECTIONS SHOULD BE SCHEDULED A MIMIMUM OF 1 BUSINESS DAY IN ADVANCE
Please schedule Inspections on the County's Permitting Portal

https://www.whatcomcounty.us/4547/Customer-Service-Portal

Mechanical Permit Application

Whatcom County Planning and Development Services
Received
By: NBruner
Date: 08/19/2025

Whatcom County Planning & Development Services
5280 Northwest Drive, Bellingham, WA 98226-9097
360-778-5900, 360-778-5901 Fax
www.whatcomcounty.us

(Permit#) MEC_____-_____

*Please submit this application as a PDF to **epermits@co.whatcom.wa.us** or mail to 5280 Northwest Drive, Bellingham, WA 98226*

Worksite Information

Address: 4 CLUBHOUSE CIRCLE

Geo ID/Parcel# 0301731; 3704082055100000

Subdivision Name_____
Div.#_____ Blk.#_____ Lot#_____

Residential ☐ Commercial ☑

Applicant / Contact Person

Name: SARAH BROWN ARCHITECTURE + DESIGN

Address: 3222 EAGLERIDGE WAY

City: BELLINGHAM State: WA

Zip: 98226 Phone: 360.920.5498

E-Mail: SARAH@SBARCHDESIGN.COM

Owner

Name: SUDDEN VALLEY COMMUNITY ASSOCIATIC

Address: 4 CLUBHOUSE CIRCLE

City: BELLINGHAM State: WA

Zip:_____ Phone:_____

E-Mail:_____

Contractor

Name: TYLER ANDREWS

Business Name: PNW CIVIL

License#_____

Expiration Date:_____

Type

New ☐ Replacement ☑ Conversion ☐

Heat Source

☐ Electric ☑ Natural Gas ☐ Propane
☐ Solar ☐ Geothermal ☐ Wind
☐ Wood ☐ Oil

Mechanical Equipment

Type of Equipment	Number	Type of Equipment	Number
Air Handling Unit	1	Heat Recovery Unit	
Attic / Crawlspace Fan		Hot Water Heater (Gas Only)	
Boiler / Compressor		Mechanical System Pumps	
Chimney: liner/flue/vent		Pool or Spa Heater	
Type 1 Hood and Duct System		Propane Tank (Site Plan Required)	
Type 2 Hood and Duct System		Range Hood / Exhaust Fan	
Clothes Dryer		Refrigeration Equipment	
Ductwork or Venting		Roof Top HVAC (Complex)	
Gas Fireplace		Solid Wood Burning Appliance	
Gas Piping Residential		Ventilation Fan	
Gas Piping Commercial		Other:	
Generator			24.00
Heating Appliance < 100,000 BTU		*Subtotal of Calculated Fees	
Heating Appliance > 100,000 BTU		Basic Permit Fee	+$40.00
Heat Pump	1	**Total**	64.00

*Calculate your subtotal based on the fee schedule on the next page.

***Mobile Homes** require Mechanical Permits from the State Department of Labor & Industries.*
Whatcom County will only issue Mechanical Permits for propane tanks and associated gas piping.

Sarah Brown
Applicant Signature

08.18.2025
Date

Mechanical Permit Fees
Updated April 12, 2023

Fee	Amount	UFS#
Basic Permit Fee	$40	8310
Air Handling Unit	$12	8425
Attic / Crawlspace Fan	$15	8309
Boiler / Compressor up to 165,000 BTU	$16	8322
Boiler / Compressor up to 330,000 BTU	$29	8323
Boiler / Compressor up to 1,165,000 BTU	$39	8324
Boiler / Compressor up to 3,300,000 BTU	$57	8325
Boiler / Compressor > 3,300,000 BTU	$94	8327
Chimney: liner/flue/vent	$15	8309
Type 1 Hood and Duct System	Varies - Based on Project Valuation	
Type 2 Hood and Duct System	Varies - Based on Project Valuation	
Clothes Dryer	$15	8309
Ductwork or Venting	$15	8309
Gas Fireplace	$15	8309
Gas Piping - Residential	$8	8405
Gas Piping – Commercial (per fixture)	$12	8406
Generator	$15	8309
Heating Appliance < 100,000 BTU	$16	8312
Heating Appliance > 100,000 BTU	$20	8313
Heat Pump	$12	8404
Heat Recovery Unit	Varies - Based on Project Valuation	
Hot Water Heater (Gas Only)	$15	8309
Mechanical System Pumps	Varies - Based on Project Valuation	
Pool or Spa Heater	$15	8309
Propane Tank	$16	8407
Range Hood / Exhaust Fan	$15	8309
Refrigeration Equipment	Varies - Based on Project Valuation	
Roof Top HVAC (Complex)	Varies - Based on Project Valuation	
Solid Wood Burning Appliance (wood, pellet, coal)	$12	8426
Ventilation Fan - Residential	$10	8424
Ventilation Fan - Commercial	$15	8309

Additional Plan Review (1/2 hr minimum)	$120/hour	8306
Inspections - Other	$120/hour	8308
Inspections - After Hours (base+$120/hr after 2 hrs)	$240	8307

Note: Per UFS 2843 all permits and applications are subject to a 3% Technology fee. The 3% fee is calculated on the permit/application fees due.

*Please submit this application as a PDF to **epermits@co.whatcom.wa.us** or mail to 5280 Northwest Drive, Bellingham, WA 98226*

MECHANICAL COMPLIANCE SUMMARY

2021 WSEC Compliance Forms for Comme cial Buildings including Group R2, R3 & R4 over 3 stories and all R1

Project & Applicant Information	**Project Title**	Sudden Valley Clubhouse - 2021 WSEC	For Building Department Use: REVIEWED FOR COMPLIANCE	**Date: Aug 15, 2025**
	Project Address	4 Clubhouse Circle Bellingham, WA 98229		
	Applicant Name	Robert Russell		
	Applicant Phone	425-744-6033		
	Applicant Email	robr@beronaengineers.com		

Fo questions a out this report, contact WSEC Commercial Technical Support at 360-539-5300 or via email at com.techsupport@waene gycodes.com

General Occupancy	All Comme cial		**General Building Use Type**	Entmt/Assembly, Sports/Culture Club	**Building Cond. Floor Area**	9,800
General Project Types	Alte ation	**New Building or Addition Mechanical Scope**		**Alteration Mechanical Scope** Single Zone Systems & Equipment	**Project Cond. Floor Area**	9,800
					Floors Above Grade	2
					Compliance Method	General Prescriptive
Mechanical Project Description	Replace existing condensing unit and air handler with new of same size. Heating is served by existing hot water coils in ductwork downstream of airhandler. ventilation provided by existing economizer.					

Mechanical Compliance Scope and Method	**Project Type**	**Mechanical Scope**	**Economizer Exception(s) Applied?**	**DOAS Ventilation Provided?**	**Higher Equipment Efficiency Option Applied?**	**Equipment Efficiency Compliance Verification**
	Alteration	Single Zone Systems & Equipment	No	No	NA	**COMPLIES**
Additional Ener y Efficiency (AEC) Measures Included	No mechanical additional energy efficiency measures included in p oject		**Load Management (LDM) Measures Included**		No mechanical load management measures included in project	
Additional Efficiency Credits Included (AEC)						
Does building include occupancy classifications requiring DOAS?	No		**Does project include DOAS equipment?**			No
Based on project scope do TSPR requirements apply?	No		**Do all systems comply with Appendix D standard reference design or qualify for an exception to TSPR?**			No

Scope & Space Conditioning	**ALTERATION - SINGLE ZONE SYSTEMS & EQUIPMENT**	**Compliance Verification**	**COMPLIES**

Single Zone Air Systems Category - Condensin unit

Air Systems Summary Information

System/Equip ID	Quantity of Items	Supply Airflow Control	Ventilation Standard	Ventilation CFM (Total if Multiple Items)	Ventilation Air Source	Paired with DOAS	Ventilation energy recovery	Energy Recovery Efficiency (%)
CU-2								

Air Systems & Equipment - Cooling

System/ Equip ID	Coolin System/Equip Type	Specific Type	Cooling Capacity per item (Btu/h)	Econo Full Load Multiplier (Full/IPLV)	Required Cooling Efficiency (Code Min & Econo)	Proposed Cooling Efficiency	CE Units	Efficiency Compliance Verification
CU-2	Condensing unit, ai cooled		267,000		10.5	12.3	EER	COMPLIES

Air Systems & Equipment Details

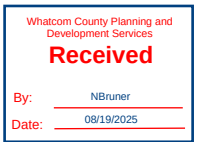
System/Equip ID	Discrete Area(s) Served	Location In Project Documents - Plan/Detail #	System/Equip Compliance Path

CU-2	First Floor	ALL	General Prescriptive
	System/Equip ID for a single or multiple items?: Single item		
	WSEC Equip Efficiency Reference Table - Cooling: Table C403.3.2(1) Unitary Air Conditioners & Condensing Units		

Kingworks
STRUCTURAL ENGINEERS
600 Dupont St * Ste B
Bellingham, WA 98225
360-714-8260 www.king-works.com

JOB TITLE	SVA CLUBHOUSE		142
JOB NO.	24153	**SHEET NO.**	1
CALCULATED BY	HH	**DATE**	
CHECKED BY	KQH	**DATE**	9/24/24

CS2021 Ver 2023-03-04 www.struware.com



REVIEWED FOR COMPLIANCE

STRUCTURAL CALCULATIONS

FOR

SUDDEN VALLEY ASSOCIATION CLUBHOUSE

4 CLUBHOUSE CIR
Bellingham, WA 98229

Code:	International Building Code 2021		Risk Category:	II
Loads:	mechanical unit = 1078#			
			Isnow=	1.00
	Wind:	N/A		
	Seismic:	Ss=97% g / S1=34.1% g / SDC=0	Ieq=	1.00
Soils:	Basis:	IBC Presumptive		
	Allowable Bearing Stress:		N/A	
	Lateral Soil Loads (Active / At Rest):		N/A	

Description:

Design is for a new HVAC unit that will be hung from an existing structural slab.

KINGWORKS STRUCTURAL ENGINEERS
600 Dupont St, Suite B
Bellingham, WA 98225
360.714.8260
www.king-works.com

JOB TITLE SVA CLUBHOUSE

JOB NO. 24153 SHEET NO.
CALCULATED BY HH DATE
CHECKED BY KQH DATE 9/24/24

UNIT INFO: W = 1078 lb
AIR-SIDE HVAC

ASCE Ch 13.3 FOR SEISMIC FORCES

HORIZONTAL FORCE

$$F_p = \frac{0.4\, a_p\, S_{DS}\, W_p}{R_p / I_p}\left(1 + 2\frac{z}{h}\right) \qquad (13.3\text{-}1)$$

$S_{DS} = 0.85$
$a_p = 2.5$
$W_p = 1078\ lb$
$R_p = 6$
$I_p = 1.0$
$\Omega = 2.0$
$z = 8'$
$h = 10'$

$$F_p = \frac{0.4(2.5)(0.85)(1078\ lb)\left(1 + 2(10/8)\right)}{6/1.0} = \boxed{397\ lb}$$

VERTICAL FORCE

$$F_{pv} = \pm 0.2\, S_{DS}\, W_p$$

$$F_{pv} = \pm 0.2\,(0.85)(1078\ lb)$$

$$\boxed{F_{pv} = 183\ lb}$$

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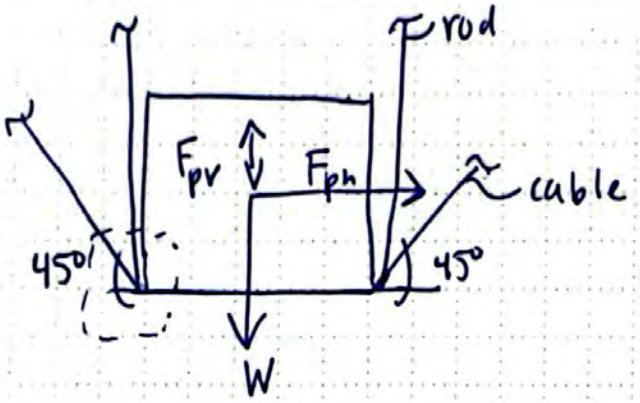
Bellingham, WA 98225
360.714.8260
www.king-works.com

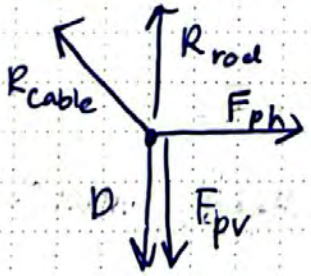
JOB TITLE SVA CLUBHOUSE

JOB NO. 24153 SHEET NO.
CALCULATED BY HH DATE
CHECKED BY KQH DATE 9/24/24



(4) CABLES / RODS: ANALYZE ROD + CABLE

HORIZONTAL FORCE + DOWNWARD VERTICAL



$\frac{1078\,lb}{4} = 270\,lb$

$\frac{397\,lb}{2} = 199\,lb$

2 BRACES IN TENSION

$\frac{183\,lb}{4} = 46\,lb$

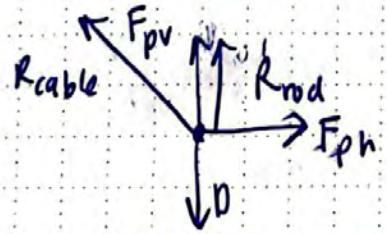
FIND
R_{cable}, R_{rod}

LRFD: WORST CASE W/ DOWNWARD F_{pv}

1.2D + E ⇒ $R_{rod} = (1.2)(270) + (46) - 281\cos 45 = 171\ lb$ (TENSION)

$R_{cable} = 199\,lb / \sin 45 = 281\,lb$

WORST CASE W/ UPWARD F_{pv}



DESIGN CABLE FOR 281 lb, ROD FOR +171 lb / −2 lb

0.9D + E ⇒ $R_{cable} = 199\,lb / \sin 45 = 281\,lb$

$R_{rod} = (0.9)(270) - 46 - 281\cos 45 = -2\ lb$ (COMPRESSION)

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JOB TITLE SVA CLUBHOUSE

JOB NO. 24153 SHEET NO.
CALCULATED BY HH DATE
CHECKED BY KQH DATE 9/24/24

CHECK ROD:

A36 STEEL, 3/8" DIA.

$AREA = \pi r^2 = \pi\left(\frac{(3/8)}{2}\right)^2 = 0.11\ in^2$

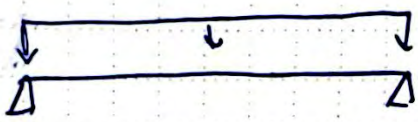
LRFD STRENGTH

$0.9 F_y A_g = 0.9(36 ksi)(0.11 in^2) = 3.6\ k \gg 171\ lb$

ROD O.K. FOR TENSION

CHECK ANGLE SUPPORTS:

L3x3x3/16 S=0.433 F_y = 36 ksi



$w = \left(\frac{1078}{2}\right)/5'4" = 101\ lb/ft$

$l = 5'8"$

$M_{max} = \frac{wl^2}{8} = \frac{(101\ lb/ft)(5.66\ ft)^2}{8}$

$M_{max} = 404\ lb\text{-}ft = 4848\ lb\text{-}in$

$f_{max} = \frac{M_{max}}{S} = \frac{4848\ lb\text{-}in}{0.433\ in^3} = 11{,}200\ \frac{lb}{in^2}$

MOMENT DEMAND FROM VERTICAL EQ LOAD:

$w = \left(\frac{183\ lb}{2}\right)/5.33\ ft = 17.2\ lb/ft$

$M_{max} = \frac{wl^2}{8} = \frac{(17.2\ lb/ft)(5.66\ ft)^2}{8} = 68.7\ lb\text{-}ft = 825\ lb\text{-}in$

$f_{max} = \frac{825\ lb\text{-}in}{0.433\ in^3} = 1905\ lb/in^2$

$1.2D + E = 1.2(11200\ lb/in^2) + 1905\ lb/in^2 = 15.35\ ksi = f_{max}$

$\frac{f_{max}}{f_y} = \frac{15.35\ ksi}{36\ ksi} = 0.43$ O.K.

SIMPSON Strong-Tie

Anchor Designer™ for Concrete Software
Version 3.3.2404.1

JOB TITLE	SVA CLUBHOUSE		
JOB NO.	24153	**SHEET NO.**	
CALCULATED BY	HH	**DATE**	
CHECKED BY	KQH	**DATE**	9/24/24

1.Project information

Project description:
Location:
Fastening description:

Comment:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-19
Units: Imperial units

Anchor Information:
Anchor type: Bonded anchor
Material: F1554 Grade 36
Diameter (inch): 0.375
Effective Embedment depth, h_{ef} (inch): 2.375
Code report: ICC-ES ESR-4057
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 3.63
c_{ac} (inch): 4.75
C_{min} (inch): 1.75
S_{min} (inch): 1.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 4.50
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: Supplementary reinforcement not present
Supplemental edge reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Hole condition: Dry concrete
Inspection: Continuous
Temperature range, Short/Long: 150/110°F
Reduced installation torque (for AT-3G): Not applicable
Ignore 6do requirement: Not applicable
Build-up grout pad: No

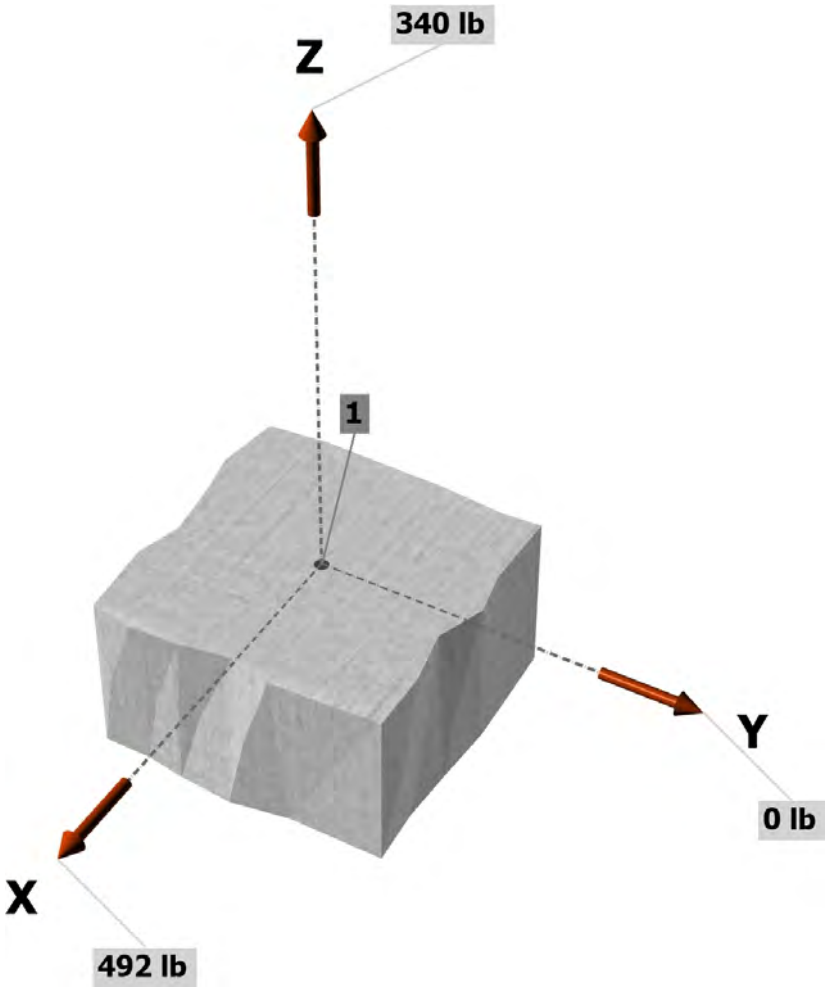
Recommended Anchor
Anchor Name: SET-3G™ - SET-3G w/ 3/8"Ø F1554 Gr. 36
Code Report: ICC-ES ESR-4057

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: Yes
Anchors subjected to sustained tension: Yes
Ductility section for tension: 17.10.5.2 not applicable
Ductility section for shear: 17.10.6.2 not applicable
Ω_0 factor: not set
Apply entire shear load at front row: Yes
Anchors only resisting wind and/or seismic loads: No

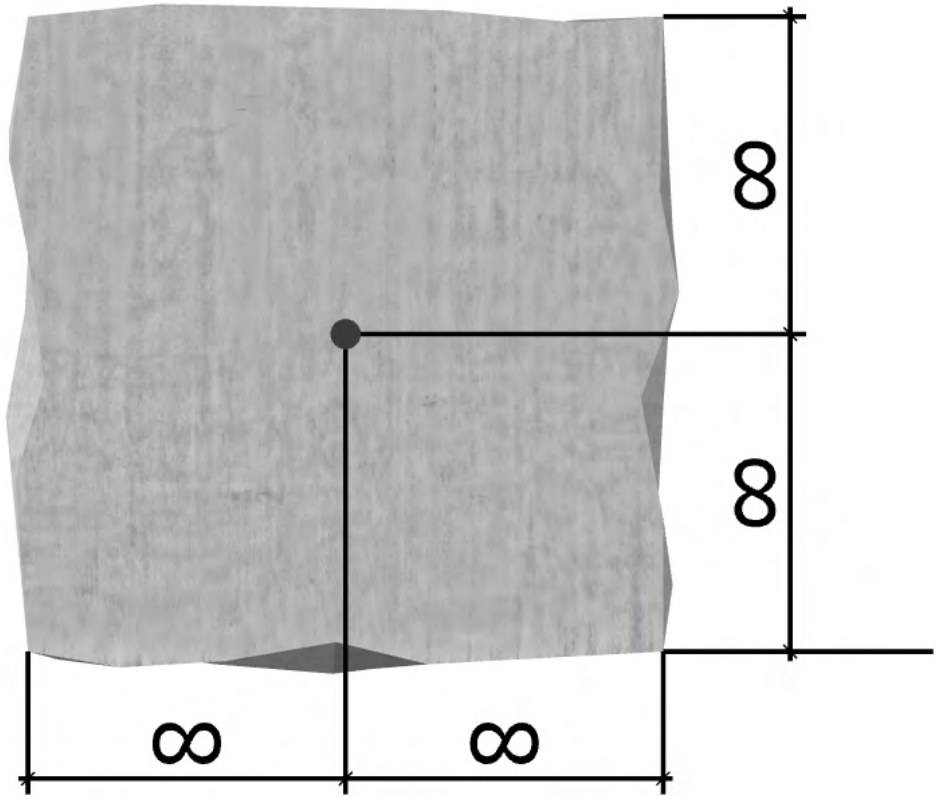
Strength level loads:

N_{ua} [lb]: 340
V_{uax} [lb]: 492
V_{uay} [lb]: 0

<Figure 1>



<Figure 2>



3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	340.0	492.0	0.0	492.0
Sum	340.0	492.0	0.0	492.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 340
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

4. Steel Strength of Anchor in Tension (Sec. 17.6.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
4525	0.75	3394

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.6.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.6.2.2.1)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
17.0	1.00	2500	2.375	3111

$0.75\phi N_{cb} = 0.75\phi \, (A_{Nc} / A_{Nco}) \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.5.1.2 & Eq. 17.6.2.1a)

A_{Nc} (in^2)	A_{Nco} (in^2	$c_{a,min}$ (in)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	$0.75\phi N_{cb}$ (lb)
50.77	50.77	-	1.000	1.00	1.000	3111	0.65	1517

6. Adhesive Strength of Anchor in Tension (Sec. 17.6.5)

$\tau_{k,cr} = \tau_{k,cr} f_{short\text{-}term} K_{sat} (f'_c / 2{,}500)^n \alpha_{N,seis}$

$\tau_{k,cr}$ (psi)	$f_{short\text{-}term}$	K_{sat}	$\alpha_{N,seis}$	f'_c (psi)	n	$\tau_{k,cr}$ (psi)
1448	1.00	1.00	1.00	2500	0.24	1448

$N_{ba} = \lambda_a \tau_{cr} \pi d_a h_{ef}$ (Eq. 17.6.5.2.1)

λ_a	τ_{cr} (psi)	d_a (in)	h_{ef} (in)	N_{ba} (lb)
1.00	1448	0.38	2.375	4051

$0.75\phi N_a = 0.75\phi \, (A_{Na} / A_{Na0}) \Psi_{ed,Na} \Psi_{cp,Na} N_{ba}$ (Sec. 17.5.1.2 & Eq. 17.6.5.1a)

A_{Na} (in^2)	A_{Na0} (in^2)	c_{Na} (in)	$c_{a,min}$ (in)	$\Psi_{ed,Na}$	$\Psi_{p,Na}$	N_{a0} (lb)	ϕ	$0.75\phi N_a$ (lb)
120.53	120.53	5.49	-	1.000	1.000	4051	0.65	1975

$\phi N_{sust} = 0.55\phi N_{ba}$ (Eq. 17.5.2.2)

ϕ	N_{ba}(lb)	ϕN_{sust} (lb)
0.65	4051	1448

8. Steel Strength of Anchor in Shear (Sec. 17.7.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\alpha_{V,seis}$	$\phi_{grout} \alpha_{V,seis} \phi V_{sa}$ (lb)

2715	1.0	0.65	0.75	1324

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.7.3)

$\phi V_{cp} = \phi \min|k_{cp}N_a ; k_{cp}N_{cb}| = \phi \min|k_{cp}(A_{Na} / A_{Na0})\Psi_{ed,Na}\Psi_{cp,Na}N_{ba} ; k_{cp}(A_{Nc} / A_{Nco})\Psi_{ed,N}\Psi_{c,N}\Psi_{cp,N}N_b|$ (Sec. 17.5.1.2 & Eq. 17.7.3.1a)

k_{cp}	A_{Na} (in^2)	A_{Na0} (in^2)	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	N_{ba} (lb)	N_a (lb)
1.0	120.53	120.53	1.000	1.000	4051	4051

A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	N_{cb} (lb)	ϕ	ϕV_{cp} (lb)
50.77	50.77	1.000	1.000	1.000	3111	3111	0.70	2178

11. Results

Interaction of Tensile and Shear Forces (Sec. 17.8)

Tension	Factored Load, N_{ua} (lb)	Design Strength, øN_n (lb)	Ratio	Status
Steel	340	3394	0.10	Pass
Concrete breakout	340	1517	0.22	Pass
Adhesive	340	1975	0.17	Pass
Adhesive (sustained)	**340**	**1448**	**0.23**	**Pass (Governs)**

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status
Steel	**492**	**1324**	**0.37**	**Pass (Governs)**
Pryout	492	2178	0.23	Pass

Interaction check	$N_{ua}/\phi N_n$	$V_{ua}/\phi V_n$	Combined Ratio	Permissible	Status
Sec. 17.8.2	0.00	0.37	37.2%	1.0	Pass

SET-3G w/ 3/8"Ø F1554 Gr. 36 with hef = 2.375 inch meets the selected design criteria.

12. Warnings

- Per designer input, the tensile component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor tensile force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.10.5.2 for tension need not be satisfied – designer to verify.

- Per designer input, the shear component of the strength-level earthquake force applied to anchors does not exceed 20 percent of the total factored anchor shear force associated with the same load combination. Therefore the ductility requirements of ACI 318 17.10.6.2 for shear need not be satisfied – designer to verify.

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

CONSTRUCTION CONTRACT

This Construction Contract, including all appendices, (the "Contract") is made and entered into by and between Owner and Contractor on the date of the last signature below for the construction of the project described below.

OWNER

Owner's Name	Sudden Valley Community Association
Address	ATTN: General Manager 4 Clubhouse Circle Bellingham, WA 98229
Telephone Number	(360) 734-6490

CONTRACTOR

Contractor's Name	
Address	
Telephone Number	
Contractor's Authorized Representative	
Federal Identification Number	
Registration Number	
Washington UBI Number	

For and in consideration of the Contract Price noted below, subject to the terms and conditions contained herein, Contractor agrees to perform the following work (the "Work") in a timely and workmanlike manner, including supplying all necessary supervision, materials, equipment, supplies, and skilled and sufficient workforce to fully, completely, and faithfully comply with all the terms and conditions of this Contract.

1. PROJECT. The Project is described as follows:

Project Name:_____

Project Location:_____

_____

_____

2. WORK. The Contractor agrees to perform the following Work in accordance with all applicable laws, codes, and industry standards to construct the Project as follows:

_____

_____

_____

(Insert and list above a precise description of the Work covered by this Subcontract, referring to the numbers of drawings and pages and/or sections of specifications including any applicable addenda and/or alternates, etc.)

3. CONTRACT DOCUMENTS. In addition to this Contract and the enclosed Standard Contract General Conditions, the Contract Documents for this Contract consist of:

Description of Document	Date

Any conflicting provisions in the Construction Documents shall be interpreted harmoniously if possible or, in the event they cannot be reconciled, then they shall be interpreted in the manner most favorable to the Owner, and the interpretation shall be governed in the following priority:

i. This Contract;
ii. Any drawings and/or specifications provided by the Owner;
iii. Any Change Orders executed by and between the Owner and Contractor after execution of this Contract; and
iv. The Contractor's Proposal.

4. CONTRACT PRICE. The Owner shall pay the Contractor $_____, plus Washington State sales tax, for all Work completed in conformance with this Contract and the Construction Documents.

5. TIME OF PERFORMANCE. The Contractor shall commence construction no later than _____ (the "Commencement Date"), and Contractor shall complete all Work within ____ days of the Commencement Date (the "Contract Time"). The parties agree that time is of the essence of this Contract and the Owner will suffer damage and be put to additional expenses in the event that the Contractor does not have the Work substantially complete by the end of the Contract Time.

☐ (CHECK IF APPLICABLE) Because it is difficult to accurately compute the amount of such costs and damages, the Contractor hereby covenants and agrees to pay to the Owner liquidated damages of $____ per day for each day that expires after the time set forth above, which the Contractor and Owner agree reasonably approximates Owner's actual damages.

6. INSURANCE. Contractor shall purchase and maintain insurance in the following amounts on a per occurrence and aggregate basis naming the Owner as an additional insured by endorsement. All such insurance shall be primary to any coverage carried by Owner. Contractor shall provide Owner evidence of such coverage prior to commencing the Work.

	Per Occurrence Coverage	Aggregate Coverage
General Commercial Liability	$1,000,000	$2,000,000
Automobile Liability	$250,000 or such higher amount as Contractor currently carries	NA

7. GENERAL CONDITIONS. The Standard Contract General Conditions (the "General Conditions") are attached hereto are incorporated herein by this reference.

8. REPRESENTATIONS. The Owner and the Contractor represent and warrant that the following statements are true and accurate:

THIS CONTRACT CONTAINS AN INDEMNIFICATION OF CERTAIN LIABILITIES AND A WAIVER OF CONTRACTOR'S TITLE 51 RCW IMMUNITY.

IN WITNESS WHEREOF, Owner and Contractor have executed this Contract, effective the date of the last authorized signature below.

OWNER:

SUDDEN VALLEY COMMUNITY ASSOCIATION

_____

Date: _____

CONTRACTOR:

_____

By: _____

Its: _____

Date: _____

STANDARD CONTRACT GENERAL CONDITIONS

A. **Subcontractors and Lien Releases**. Contractor shall, upon request of Owner, provide a list of all subcontractors and suppliers of Contractor. Owner may request partial lien releases for all partial payments and a final lien release for the final payment to each subcontractor.

B. **Scheduling**. Owner shall give Contractor advance notice of anticipated starting date for Contract Work. Contractor shall start Work on the date agreed to by Owner and Contractor and shall complete the several portions and the whole of the Work herein described at such times as reasonably specified by the Owner in order to allow Owner to timely complete the Project. Contractor shall cooperate with Owner and other contractors hired by Owner to coordinate Work with other Contractors.

C. **Payment**. Contractor shall receive progress payments on a monthly basis for Work approved by Owner and all materials to be used on the Project which have been stored on site by Contractor. Contractor shall make applications for payment on a monthly basis by submitting a bill by the _____ day of the month (the fifth (5th) day of the month if not so stated). Applications for payment submitted by the Contractor shall indicate the percentage of completion of each portion of the Contractor's Work as of the end of the period covered by the application for payment. Contractor shall be paid for Work completed to date from Owner's last progress billing date. Owner shall withhold 5% retention from each progress payment. Retainage shall be paid within __ days after the latest of the following: (i) Owner's approval of completion of the Work, (ii) close out of all paperwork required herein and (iii) receipt of required lien releases.

The Owner shall pay the approved amounts within _____ days (thirty (30) days if not so stated) of the date on which the application for payment is received.

Final payment for Work under this Contract shall be made within _____ days (thirty (30) days if not so stated) after Owner has approved the completion of the Work and Contractor has fulfilled each of its obligations under this Contract. As a prerequisite for any payment, Contractor shall provide, in a form satisfactory to Owner, partial lien releases, claim waivers and affidavits of payment from Contractor and its lower-tier subcontractors and suppliers of any tier, for the completed portions of Contractor's Work. Before issuance of the final payment, the Contractor shall submit evidence satisfactory to Owner that all payrolls, bills for materials and equipment, and all known indebtedness connected with the Contractor's Work have been satisfied. Contractor shall provide Owner with a signed lien release before receiving final payment.

Contractor shall be entitled to payment by Owner of all undisputed amounts. In the event that the Owner disputes an amount, the Owner may withhold fifty percent (50%) of the disputed amount. Owner shall provide a written explanation of the reason for the dispute with the payment.

Owner shall be entitled, but not required, to issue two-party checks in the name of the Contractor and any of Contractor's subcontractors or suppliers, union(s) for which Contractor's employees are members, any union trust fund, medical fund or pension fund for which Contractor's employees are members.

Contractor may invoice for materials delivered to the jobsite and receive payment as outlined above. Materials delivered to the site, and not installed, shall be paid at invoice cost. Contractor shall pay its own subcontractors and suppliers all sums owed them within ten (10)

days of receipt of payment from or on behalf of Owner. Contractor agrees that no assignment of any payment otherwise due under this Contract shall be effective without first securing the express approval of any assignee to the limitations contained in this subsection.

D. **Change Orders**. Owner may, without invalidating this Contract, order in writing extra Work or make changes by altering, adding to, or deducting from the Work and the Contract price and time shall be adjusted accordingly. All such Work shall be executed under the conditions hereof. All Change Orders shall be in writing and signed by the Owner and Contractor. The Owner shall not be liable for any additional Work performed by Contractor unless such additional Work has been incorporated into a Change Order. **NO ORAL INSTRUCTIONS AUTHORIZING A CHANGE IN THE WORK, ADJUSTMENT IN THE CONTRACT SUM, MAXIMUM CONTRACT SUM, OR ADJUSTMENT IN THE CONTRACT TIME SHALL BE VALID OR BINDING ON THE OWNER**.

If additional Work has been fully accepted by Owner, payment shall be made to Contractor with the next regular payment as provided herein. Contractor acknowledges that, unless expressly stated otherwise within a written Change Order, any change in the Contract Price and Time effected through a written Change Order shall constitute full and final payment and accord and satisfaction for any and all cost incurred (including, but not limited to, home office and field overhead and profit), labor performed, material and equipment furnished, and any delay, acceleration, or loss of efficiency associated with or arising out of the change in the Work.

E. **Nature of Work**. Contractor has conducted a full examination of all relevant plans and specifications and is not aware of any defects or mistakes in the applicable plans and specifications that would make the Work not buildable according to the applicable plans and specifications, for the Contract Price provided herein and in the time provided for herein. Contractor has satisfied itself as to the nature and location of the Work, the character, kind and quantity of material to be encountered, the character, kind and quantity of equipment needed, the location, conditions and other matters which can in any matter affect the Work under this Contract agreement and acknowledges that Contractor has had a reasonable opportunity to examine the site.

F. **Contractor Employer**. Contractor has the status of “employer” as defined by the Industrial Insurance, Workers’ Compensation, Unemployment Compensation, Social Security, and other similar acts of the federal, state, and local government. Contractor shall withhold from its payroll applicable Social Security taxes, Workers’ Compensation and Unemployment Compensation contributions and any other lawfully required withholding and pay the same; Owner shall be in no way liable as an employer of, or on account of, any employees of Contractor.

G. **Permits & Taxes**. Contractor shall obtain and pay for all permits, fees, and licenses necessary for the performance of this Contract and shall pay any and all federal, state, and local taxes, applicable to the Work to be performed under this Contract. Contractor shall also be responsible for payment of state sales/use taxes applicable to the Work of Contractor.

H. **Contractor Property**. Materials delivered by or for Contractor and intended to be incorporated into the construction hereunder shall remain on the jobsite and shall become property of Owner upon incorporation into the Work. Contractor may repossess any surplus materials remaining at the completion of the Contract; provided, Contractor shall not charge Owner for any repossessed materials. All scaffolding, apparatus, ways, works, tools, equipment, machinery, and plans brought upon the premises by Contractor shall remain

Contractor's property. It shall be Contractor's responsibility to unload, store, and protect its property to bear the risk of loss thereof.

Materials delivered by or for Contractor and intended to be incorporated into the construction hereunder shall remain on the site and shall become property of Owner upon incorporation into the Work, but Contractor may repossess any surplus materials remaining at the completion of the contract; provided, however, Contractor shall not charge Owner for any repossessed materials. All scaffolding, apparatus, ways, works, machinery, and plants brought upon the premises by Contractor shall remain Contractor's property. It shall be Contractor's responsibility to unload, store, and protect its materials, to bear the risk of loss thereof and to protect such material against loss until actually incorporated into the Work and until the Work is accepted.

I. **Default and Takeover**. Upon three (3) calendar days' written notice to Contractor, Owner may terminate this Contract in whole or in part for Owner's convenience and/or at its option. Contractor's remedy for such convenience or optional termination is limited to the following: (1) payment pursuant to the terms of this Contract for all Work properly performed prior to termination; (2) partial payment for lump sum items of Work on the basis of the percent complete of such items at the time of termination; and (3) Contractor's reasonable close-out costs. In no event shall Contractor be entitled to any compensation for loss of anticipated profits or unallocated overhead on Work not performed.

Contractor shall be in default of this Contract if it refuses or fails to supply enough properly-skilled workers or materials, refuses or fails to make prompt payment to subcontractors or suppliers of labor, materials or services, fails to correct, replace, or re-execute faulty or defective Work done or materials furnished, disregards the law, ordinances, rules, regulations or orders of any public authority having jurisdiction, files for bankruptcy, or materially breaches this Contract. If Contractor fails to correct the default and maintain the corrected condition within not less than three (3) working days of receipt of written notice of the default, then Owner, without prejudice to any rights or remedies otherwise available to it, shall have the right to terminate this Contract in writing and thereafter either perform the Work itself or obtain another Contractor to perform the Work. All of the costs incurred by Owner shall be charged to Contractor and Owner shall have the right to deduct such expenses from monies due or to become due Contractor. Contractor shall be liable for the payment of any expenses incurred by Owner in excess of the unpaid balance of the Contract Price.

In the event of an emergency including, but not limited to, the imminent potential damage to persons or property requires immediate repair Owner shall be entitled to conduct such repairs without providing advance written notice of the same to Contractor. Owner shall issue written notification to Contractor of such emergency repairs within five (5) days after making such repairs. Contractor shall be solely responsible for the cost of all such emergency repairs.

If Owner's termination for default is later deemed to be wrongful, without cause, or otherwise unjustified, the parties agree that the termination automatically converts to a termination for convenience and Contractor agrees that its remedies for such wrongful termination shall be limited to those provided in the termination for convenience.

If Contractor files or otherwise becomes subject to bankruptcy proceedings, Owner and Contractor agree that any delay attendant to the assumption or rejection of the Contract by the bankruptcy Trustee or a debtor-in-possession will be prejudicial to Owner. Consequently, Contractor, to minimize delay and to mitigate damages and/or other prejudice suffered by

Owner, hereby stipulates to a notice period of ten (10) calendar days for Owner's motion to require Trustee or debtor-in-possession to assume or reject the Contract.

J. **Unit Price**. In the event this Contract contains unit price items, it is understood and agreed that any quantities mentioned are approximations only and subject to change as required by the Contract or as ordered and directed by Owner.

K. **Material Quality**. Materials condemned by Owner as failing to conform to the Contract shall, upon notice from Owner, be immediately removed by Contractor. Failure of Owner to immediately condemn any Work or materials as installed shall not in any way waive Owner's right to object thereto to any subsequent time.

L. **Job Damage**. Damage caused by Contractor, its subcontractors or suppliers, or any subcontractor or supplier of any tier, to Work other than its own shall be reported immediately to Owner and Contractor shall be responsible for its repair. Damage caused by Owner to Work of Contractor shall be reported immediately to Contractor and Owner shall be responsible for its repair.

M. **Safety**. Contractor and its subcontractors shall take all reasonably necessary safety precautions pertaining to its Work and its Work performance, including compliance with applicable laws, ordinances, regulations and orders issued by a public authority, whether federal, state, local or other, OSHA (Federal Occupational Safety and Health Administration) / DOSH (Washington State Division of Occupational Safety and Health) / WISHA (Washington Industrial Safety and Health Act), and any safety measures requested by Contractor. Contractor shall at all times be responsible for providing a safe jobsite and be responsible for the Work performance and safety of all employees, personnel, equipment and materials within Contractor's or its subcontractors' care, custody or control. Contractor and its subcontractors shall furnish all required safety equipment for its Work and ensure all of their employees and subcontractors' employees have and wear personal protective equipment in compliance with applicable OSHA/DOSH/WISHA requirements.

Contractor certifies that it and its subcontractors are registered contractors. Contractor certifies that it and its subcontractors maintain a written Accident Prevention Plan and a Project-specific safety plan in compliance with applicable OSHA/DOSH/WISHA regulations. Contractor's Accident Prevention Plan should address subcontractor's role and responsibilities pertaining to safety on the Project, training and corrective action and be tailored to safety and health requirements for the Work involved. Contractor shall have and enforce a disciplinary action schedule in the event safety violations are discovered. When and as requested by Owner, Contractor shall provide information regarding safety matters.

Contractor shall promptly provide Owner with written notice of safety hazard(s) or violation(s) found on the Project or of any injury to its or its subcontractors' workers incurred on the Project.

Contractor agrees to defend, indemnify and hold Owner harmless from all OSHA/DOSH/WISHA claims, demands, proceedings, violations, penalties, assessments or fines that arise out of or relate to Contractor's failure to comply with any safety-related laws, ordinances, rules, regulations, orders or its obligations hereunder. Owner may charge against the sums otherwise owing to Contractor the Amount of the fine and the fees, costs and expenses incurred by Owner in the defense of the claims, citation and/or fine arising from or relating to the Contractor's above-referenced failure.

N. **Housekeeping and Cleanup**. Contractor shall regularly remove all refuse, waste and debris produced by its operation. Refuse shall not be permitted to accumulate to the extent that it interferes with free access to the Project or creates a safety hazard. Avoidance of safety hazards through good housekeeping is an important part of Contractor's obligations. In the event Contractor or its subcontractor fails or refuses to meet these requirements, Owner may remove refuse and charge all costs to the Subcontract, provided that Contractor has received twenty-four (24) hours or one (1) full working day, whichever is greater, prior written notice. In the event Owner determines emergency conditions exist, Owner may proceed as above without prior notice.

Contractor shall comply with all applicable hazardous waste regulations under federal, state or local laws. Contractor shall provide Owner with all Safety Data Sheets ("SDS") for any and all hazardous substances covered under all applicable laws before commencing Work, and all SDS shall comply with OSHA's Hazard Communication Standard. Contractor shall, prior to commencing Work, inform Owner of its intent to use any hazardous substances at the Project and shall continuously update Owner of any new hazardous substance brought to the Project during performance of the Work. Failure to comply with this paragraph may result in fines and damages being assessed to Contractor. Contractor shall defend, indemnify and hold Owner harmless from any and all costs and expenses, including attorneys' fees, arising from the use or discharge of any hazardous substance by Contractor at or off the Project site.

O. **Release and Hold Harmless – Damage to Equipment**. Contractor hereby releases, discharges and agrees to hold Owner harmless from any damage either to the Contractor's property or rented equipment which is caused in whole or in part by the negligence of Contractor, its agents, employees or subcontractors.

P. **Insurance**. Contractor shall obtain and keep in force during the term of this Contract and the applicable Statutes of Repose and Limitations period, commercial general liability insurance with dollar limits and coverage equal to, or greater than the types and amounts of coverage noted at the front of this Contract. Such insurance shall be "occurrence-based" and shall include contractual liability coverage applicable to the indemnity provisions of this Contract and "completed operations" coverage. Contractor shall furnish to Owner evidence of this insurance including the provision regarding notice of cancellation or reduction in coverage. Such evidence of insurance shall be in the form of an Insurance Certificate issued by an insurer satisfactory to Owner and shall provide for not less than thirty (30) days prior written notice to Owner of cancellation or reduction in coverage. In the event Contractor fails to maintain any and all insurance required by this Contract during the entire life of this Contract, Owner may at its option, and without waiver of other available remedies, purchase such insurance in the name of Contractor and deduct the cost of same from payments due Contractor.

Contractor shall provide insurance that: (1) names Owner as an additional insured for liability arising out of the Contractor's Work, including completed operations losses, without qualification, limitation or reservation; (2) is endorsed to be primary and noncontributory with any insurance maintained by Owner; (3) does not contain a "cross liability" or similar exclusion that would bar coverage for claims between or among insureds; (4) contains a severability of interest provision in favor of Owner; and (5) contains a waiver of subrogation against Owner. Before commencing work, Contractor shall provide a copy of the additional insured endorsement to Owner as evidence of additional insured status.

Owner makes no representations that the required minimum amount of insurance is adequate to protect Contractor. The procuring and/or carrying of insurance shall not limit Contractor's obligation or liability pursuant to this Contract or as a matter of law.

Q. **Workers' Compensation**. Contractor shall furnish to Owner evidence that its workers are covered by applicable workers' compensation coverage.

R. **Subcontractors**. Contractor shall, upon request of Owner, provide a list of all subcontractors and suppliers of Contractor. With regard to all subcontractors retained by the Contractor, the Contractor agrees (i) to be primarily responsible for any Work performed by such subcontractor and to ensure that such Work is timely completed in the manner required herein; (ii) to ensure that invoices submitted by subcontractor comply with the requirements for invoices submitted by Contractor to Owner; (iii) that Contractor shall be solely responsible to make any necessary repairs or to perform punch-list items caused by subcontractor's Work; and (iv) to ensure that subcontractor complies with all the obligations of Contractor set forth herein and to be primarily responsible for any non-compliance. Contractor shall be solely responsible for paying subcontractor any amounts due to it. Owner may request partial lien releases for all partial payments and a final lien release for the final payment to each subcontractor. Contractor agrees to release Owner and to hold Owner harmless from any and all claims by subcontractor for payment.

S. **Disputes and Back Charges**. In the event of a dispute between Owner and Contractor, Contractor agrees to proceed with the Work in accordance with the requirements of this Contract, pending settlement of the dispute.

T. **Indemnification**. To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless the Owner and its agents and employees from and against claims, damages, losses and expenses, including, but not limited to attorneys' and expert's fees, (collectively a "claim") arising out of or resulting from performance of the Contractor's Work under this Contract. Such obligation shall not be construed to negate, abridge, or otherwise reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this paragraph.

Contractor's duty to indemnify Owner shall not apply to liability for damages arising out of claims caused by or resulting in whole from the negligence of Owner or its agents or employees. Contractor's duty to indemnify Owner for liability for damages arising out of claims caused by or resulting from the concurrent negligence of: (a) Owner, its agents or employees, and (b) Contractor, its agents, employees and lower-tier subcontractors or suppliers of any tier shall apply only to the extent of negligence of Contractor, its agents, employees and lower-tier subcontractors or supplier of any tier.

CONTRACTOR SPECIFICALLY AND EXPRESSLY WAIVES ANY IMMUNITY THAT MAY BE GRANTED IT UNDER THE WASHINGTON STATE INDUSTRIAL INSURANCE ACT, TITLE 51 RCW. FURTHER, THE INDEMNIFICATION OBLIGATION UNDER THIS CONTRACT SHALL NOT BE LIMITED IN ANY WAY BY ANY LIMITATION ON THE AMOUNT OR TYPE OF DAMAGES, COMPENSATION OR BENEFITS PAYABLE TO OR FOR ANY THIRD PARTY UNDER WORKERS' COMPENSATION ACTS, DISABILITY BENEFITS ACTS, OR OTHER EMPLOYEE BENEFITS ACTS PROVIDED CONTRACTOR'S WAIVER OF IMMUNITY BY THE PROVISIONS OF THIS PARAGRAPH EXTENDS ONLY TO CLAIMS AGAINST CONTRACTOR BY OWNER, AND DOES NOT INCLUDE, OR EXTEND TO, ANY CLAIMS BY CONTRACTOR'S EMPLOYEES DIRECTLY AGAINST CONTRACTOR.

Contractor's Initials _____

Contractor agrees that its defense and indemnity obligations to Owner under this Contract survive any limitation imposed by any statute of repose or limitation including but not limited to RCW 4.16.300, 4.16.310, or 4.16.326, and Contractor hereby waives any and all defenses under any statue of repose or limitations. Contractor further agrees that any statute of limitation on a claim by Owner pursuant to this provision shall not begin to run until Owner discovers that Contract has breached either its duty to defend or its duty to indemnify, whichever occurs first.

U. **Warranty**. The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new, unless otherwise required or permitted by the Contract, that the Work of this Contract will be performed in a workmanlike manner and free from defects not inherent in the quality required or permitted, will comply with all applicable codes and regulations, will be consistent with industry standards, and that the Work will conform to the requirements of the Contract. This warranty shall be in addition to and not in limitation of any other warranty or remedy required by law or the Contract. This warranty shall extend for the longer of the period of (i) the warranty normally given by Contractor for the Work in its ordinary course of business, (ii) the warranty period set forth in the Quote or other documents sent to Owner, or (iii) one (1) year from the date of substantial completion of the Work or occupancy of the Project by Owner, whichever occurs first. The warranty shall not apply to any damage or loss to the Work occasioned by Owner's failure to perform ordinary and reasonable maintenance during the warranty period or any written notice of defects received after the one (1) year period. Owner shall promptly notify Contractor in writing of all warranty claims and allow Contractor reasonable access to the Project to correct or repair the Work.

V. **Contract Controls**. Except for the Scope of Work and Warranty provisions specifically incorporated herein by the Contract, any terms or conditions attached to or incorporated into Contractor's proposal, quote, or other document shall not apply to the Contract. The Contract shall be solely and exclusively governed by the terms and conditions set forth in the Contract and these Standard Contract General Conditions.

W. **Wage and Other Payments**. Contractor shall comply with all state and federal wage laws and, upon request, provide proof of the same to Owner. In addition, if Contractor's employees are members of a union, then Contractor shall pay when due all obligations due under the collective bargaining agreement or other agreement, including but not limited to, medical benefits, dental benefits, pension benefits and the like.

X. **Notices**. All notices, demands, requests, consents and approvals which may or are required to be given by any party to any other party hereunder shall be in writing and shall be deemed to have been duly given if delivered personally, sent by facsimile, emailed, sent by a nationally recognized overnight delivery service, or if mailed or deposited in the United States mail and sent by registered or certified mail, return receipt requested, postage prepaid to the address provided in this Contract or to such other address as either party hereto may from time-to-time designate in writing and deliver in a like manner. All notices shall be deemed complete upon actual receipt or refusal to accept delivery. Electronic transmission of any signed original document and retransmission of any signed electronic transmission shall be the same as delivery of an original document.

Y. **Claims**. As a condition precedent to any right to recover for any instances of interruption, disruption, extra work, additional work, changed work, delay, hindrance and/or

efficiency loss of any nature whatsoever in Contractor's Work (collectively "Impact"), believed by Contractor to be caused by the acts or omissions of Owner, Architect/Engineer or the employees or agents of any of them, Contractor must provide written notice to Owner in the manner required by this Contract within five (5) days after occurrence of the Impact. Such written notice shall identify the cause of the Impact, the party Contractor believes is responsible for the Impact, and a rough order of magnitude as to the extra cost and/or time resulting from the Impact. FAILURE OF CONTRACTOR TO PROVIDE TIMELY WRITTEN NOTICE, AS PROVIDED IN THIS PARAGRAPH, SHALL RESULT IN AN ABSOLUTE WAIVER AND FORFEITURE OF CONTRACTOR'S RIGHT TO RECOVER ANY ADDITIONAL COST OR TIME RESULTING FROM THE IMPACT.

In the event Contractor believes it is entitled to receive compensation and/or time due to damages from Impact(s), Contractor's Statement of Claim (setting forth in detail the entitlement and quantum basis for Contractor's claim with supporting data and/or the entitlement basis to support an extension of time) shall be delivered to Owner within fifteen (15) days of its Written Notice of Impact, or within sufficient time to allow Owner to comply with the notice and claim requirements of the Main Contract (whichever is sooner). FAILURE OF CONTRACTOR TO TIMELY PROVIDE ITS STATEMENT OF CLAIM FOR AN INCREASE IN THE CONTRACT AMOUNT OR FOR AN EXTENSION OF TIME SHALL RESULT IN AN ABSOLUTE WAIVER OF CONTRACTOR'S CLAIM AND ANY RIGHT TO RECOVER ADDITIONAL COST OR TIME RESULTING FROM THE IMPACT.

Owner does not waive the requirement for timely written notice and/or timely written submission of the Statement of Claim unless Owner's waiver is unequivocal, explicit, and in writing.

Z. **Mediation**. Claims, disputes, or other matters in controversy arising out of or related to this Contract, except those waived, shall be subject to mediation as a condition precedent to the institution of legal or equitable proceedings by either party. This requirement may be waived by Owner.

AA. **Arbitration / Litigation**. At Owner's sole option, all claims, disputes, and other matters in question between Contractor and Owner arising out of, or relating to, this Agreement shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining or by an arbitrator mutually agreed upon by the parties. In the event of arbitration, Contractor and Owner agree to be bound by the findings and award of such arbitration finally and without recourse to any court of law other than for the enforcement of the arbitrator's decision. If the Owner does not select Arbitration as the means of dispute resolution, all claims, disputes and other matters in question between Contractor and Owner arising out of, or relating to, this Agreement shall be decided by an action filed exclusively in the Superior Court of Whatcom County, Washington. The substantially prevailing party in any arbitration or litigation shall be entitled to an award of its attorneys' fees, costs and expert fees.

BB. **Governing Law**. This Agreement and the right of the parties hereto shall be governed by and construed in accordance with the laws of the State of Washington and the parties agree that in any such action venue shall lie exclusively in Whatcom County, Washington, regardless of where the Project is located. Both parties expressly waive their right to a jury trial.

CC. **Amendment**. No modification, termination or amendment of this Contract may be made except by written Contract signed by all parties.

DD. **Waiver**. Failure by Owner or Contractor to insist upon the strict performance of any covenant, duty agreement, or condition of this Contract or to exercise any right or remedy consequent upon a breach thereof shall not constitute a waiver of any such breach or any other covenant, agreement, term or condition. Any waiver must be expressly made in writing and signed by the waiving party.

EE. **Severability**. In case any one or more of the provisions contained in this Agreement shall, for any reason, be held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision hereof, and this Agreement shall be construed as if such invalid, illegal or unenforceable provision had never been contained herein.

FF. **Neutral Authorship**. Each of the provisions of this Agreement has been reviewed and negotiated, and represents the combined work product of both parties hereto. No presumption which would interpret the provisions of this Agreement in favor of or against the party preparing the same shall be applicable in connection with the construction or interpretation of any of the provisions of this Agreement.

GG. **Captions**. The captions of this Contract are for convenience and reference only and in no way define, limit, or describe the scope or intent of this Contract.

HH. **Entire Agreement**. The entire agreement between the parties hereto is contained in this Agreement; and this Agreement supersedes all of their previous understandings and agreements, written and oral, with respect to this transaction, including any proposal for services. Owner shall not be liable to Contractor or to any third party for any representations, made by any person, concerning the Work or the terms of this Agreement, except to the extent that the same are expressed in this Agreement. No modification, termination or amendment of this Agreement may be made except by written agreement signed by both parties.

BOARD OF DIRECTORS MEMO

To: **Sudden Valley Community Association Board of Directors**

From: **Jo Anne Jensen, General Manager**

Date: **February 26, 2026**

Subject: **Capital Request – Marina Tennis Court Refurbishment Design & Permitting**

Purpose
The purpose of this memo is to request funding for the first phase of the Marina Tennis Court Refurbishment project.

Background
The marina tennis and basketball courts are in disrepair: The asphalt has major cracks, the striping is faded, the nets are in poor condition, and the fence needs to be replaced. The 2026 Capital Budget – CRRRF includes $348,401 for repair of the courts and $33,903 for the replacement of the fence.

This project will include:

- Asphalt repairs;
- Asphalt overlay with tennis court surfacing material as the top layer;
- Layout and marking for two tennis courts, double-striped for pickleball, and a basketball area;
- New fencing around the perimeter and between the tennis and basketball areas;
- New access path from the parking lot to the courts.

Analysis
Phase 1 of this project will complete design and permitting. Once design is complete, the project will be brought back to the board for complete project funding prior to being issued for bid. Construction is planned for summer 2026.

Phase 1 Cost Summary	
Engineering and Permit Application – Impact Design	$10,500
Permit Fees Allowance	$3,000
Survey Allowance	$3,000
Project Management – PNW Services, Inc. (20 hrs)	$2,700
Subtotal	$19,200
10% Contingency	$1,920
Total	**$21,120**

Requests
I request that the SVCA Board of Directors authorize $21,120.00 in funding for phase 1 of the marina tennis court refurbishment project.

Motions
I move that the SVCA Board of Directors authorize $21,120.00 in funding for phase 1 of the marina tennis court refurbishment project.

Approvals
Approved: _____ Not Approved: _____ SVCA Board of Directors

Signed: _____ Date: _____

January 31st, 2026

Sudden Valley Community Association
Attn: Jo Anne Jensen
4 Clubhouse Circle
Bellingham, WA 98229

RE: Project Scope Letter
Marina Tennis Court Improvements

PNW is providing this overall project scope letter to SVCA for the Marina Tennis Courts Improvement project. SVCA's 2026 capital budget includes $348,401.00 for improvements to the tennis courts, and an additional $33,903.00 for improvements to the tennis courts fence. The existing courts are well aged, the asphalt has major cracks, stripping is faded, nets are in poor condition, and the fence needs replacement. The scope of this project will include:

- Asphalt repairs
- Asphalt overlay with tennis court surfacing material on top
- Layout and new markings for 2 tennis courts double stripped for pickleball, and a basketball area.
- New fence around the perimeter and dividing the tennis courts from the basketball area.
- New access trail to the courts from the parking lot.

Phase 1 of this project will complete design and permitting. Once design is complete the project will be brought back to SVCA for complete project funding prior to being issued for bid. Construction is planned to occur during summer, 2026.

Summary of anticipated Phase 1 costs:

- Impact Design – Engineering & Permit Application – Proposal Attached dated January 30th, 2026	$10,500.00
- Permit Fees Allowance – Whatcom County	$3,000.00
- Survey Allowance	$3,000.00
- Project Management – PNW Services, Inc. – 20 Hours Allowance	$2,700.00
Subtotal	$19,200.00
WSST @ 8.8%	N/A
10% Contingency	$1,920.00
Total w/ WSST	$21,120.00

Please let me know if you have any questions, or if you would like any further information.

Sincerely,

Tyler Andrews
President

IMPACT DESIGN

Sudden Valley Community Association

Marina Tennis Court Resurfacing Permitting

January 30, 2026

Tyler Andrews
PNW Services, Inc.
PO Box 30498
Bellingham, WA 98228
360-739-2072

Thank you for the opportunity to submit a proposal to provide engineering and permitting assistance for a marina tennis court resurfacing project for the Sudden Valley Community Association. We propose to conduct the engineering and permitting assistance for this project on a Not To Exceed basis in accordance with the rate sheets attached and our budget of **$10,500.**

Scope of Work:

Tennis Court Resurfacing Engineering Plans and Specifications ($7,000)

We will prepare 100% construction documents for this improvement project. This will include the following sheets in the engineering plan set stamped by a professional engineer in Washington State:

- Cover Sheet and General Notes
- Existing Conditions Map
    - A map will be created without survey information using aerial photo and field measurements.
- Proposed Tennis/Pickleball/Basketball Court Striping Layout
- Proposed Tennis/Pickleball/Basketball Court Resurfacing Plan
    - This will include sections of asphalt that will need to be patched and replaced, and an overlay plan with an asphalt thickness schedule as needed. A site visit will be performed to determine the areas of asphalt that need to be replaced by inspection.
- Temporary Erosion and Sedimentation Control Plan
- Stormwater Pollution Prevention Plan
- Asphalt and Acrylic Resurfacing Details and Specifications
- Special detail for the net posts

It is assumed that a stormwater treatment system design or tree retention plan will not be required by Whatcom County for this project. We can provide this additional service on a Time and Materials basis as requested by SVCA.

Shoreline Substantial Development Permit ($3,500)

We will prepare the Shoreline Substantial Development permit on the behalf of Sudden Valley Community Association to provide for the proposed improvement project. We will prepare all the application requirements to accompany the Shoreline Substantial Development Permit submittal, including:

- Project Narrative,
- Preliminary Traffic & Concurrency Information form,
- Preliminary Stormwater Proposal,
- Mailing list of property owners in the area.

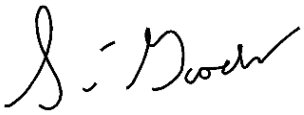
Excluded Scope: Land survey work, geotechnical work, architectural design, structural engineering, landscape design, title reports, construction support, as-builts, and dry utilities coordination are not included in this scope.

Please sign and date below as a formal acceptance of this proposal. We are excited to be working on your project.

_____ _____

Name Date

Respectfully,



Scott Goodall, MS, PE
Principal - Impact Design, LLC

IMPACT DESIGN

2025 Rate Sheet

Office	Hourly Rate
Principal Engineer	$140
Design Engineer	$125
Engineering Technician	$110
Design Technician	$100
CAD Technician	$75

Field	Hourly Rate
Construction Inspection	$90
Drone Pilot (UAV Certified)	$90
Photogrammetry Technician	$75

Sub-Consultants	**15% Markup**
Equipment	**15% Markup**
Travel Expenses	**15% Markup**
Mileage	**$0.50 / Mile**

BOARD OF DIRECTORS MEMO

To: **Sudden Valley Community Association Board of Directors**

From: **Jo Anne Jensen, General Manager**

Date: **February 26, 2026**

Subject: **Approval Request –Funding for Legal Support of WUCIOA Revisions**

Purpose
The purpose of this memo is to request funding for legal support of revisions to SVCA Bylaws and Rules & Regulations that are needed to bring these documents into compliance with WUCIOA changes to WA State regulations governing HOAs.

Background
On July 1, 2018, the Washington Uniform Common Interest Ownership Act (RCW 64.90) took effect. Best known by its acronym, WUCIOA, this legislation replaces the Homeowner Association Act that formerly governed SVCA. Even though the law was passed in 2018, it did not immediately affect SVCA because it did not apply to HOAs formed before the law took effect. Some of the provisions of WUCIOA became effective for SVCA in July 2025, however, and a few more will take effect on January 1, 2026. On January 1, 2028, the remaining provisions of WUCIOA will take effect and the transition envisioned by the WA State legislature in 2018 will be fully implemented.

On February 12th, the board adopted a resolution that affirmed to the community that SVCA's practices comply with the legal requirements for HOAs. SVCA's Bylaws and Rules & Regulations provide members and staff with instructions for how to live in and manage the Association. If these instructions don't align with the current practices of the Association, significant confusion will result.

Changes to the Bylaws must be approved by a vote of the membership. SVCA proposes to revise the current Bylaws so that they align with WUCIOA provisions in time to present the revisions to the membership at the 2026 AGM. Because the Rules & Regulations must align with the Bylaws, this document will also be revised.

Analysis
SVCA's legal counsel, Richard Davis, has estimated the time he will need to draft revisions and then work with SVCA's Document Review Committee to achieve a Bylaws document that is both compliant with state law and customized to the needs of the Sudden Valley Community. His estimate was $7,500 for this work. To ensure that there is enough funding to cover revisions to the Rules & Regulations also, I am requesting $10,000 in funding from the Undesignated Reserve Fund.

Requests
I request that the SVCA Board of Directors authorize $10,000 from the UDR Fund to be used for costs arising from the revision of SVCA's Bylaws and Rules & Regulations documents.

Motions

I move that the SVCA Board of Directors authorize $10,000 from the UDR Fund to be used for costs arising from the revision of SVCA's Bylaws and Rules & Regulations documents.

Approvals

Approved: _____ Not Approved: _____ SVCA Board of Directors

Signed: _____ Date: _____

BOARD OF DIRECTORS MEMO

To: **Sudden Valley Community Association Board of Directors**

From: **Jo Anne Jensen, General Manager**

Date: **February 26, 2026**

Subject: **Approval Request –Changes to Rules & Regulations**

Purpose
The purpose of this memo is to request board approval for proposed changes to the Rules & Regulations.

Background
SVCA's current Rules & Regulations includes two different sections that can be applied to properties that are deemed to be "unsightly, unkempt, cluttered." Sections 1.11 and 2.1 seem to be duplicative. I tried to research why both sections were considered necessary, but could not find any information in SVCA files. My best guess is that section 1.11 refers to developed lots and 2.1 refers to undeveloped lots. If that is the case, then the apparent duplication makes sense.

The two sections call for different timelines for abatement and different fine structures. The table below compares the current elements of the two sections:

Section 1.11.2	Section 2.1
Definition of Violation: *"Maintains, permits, allows, or suffers property, structures, or vehicles that are deemed to be unsightly, unkempt, cluttered, in a state of disrepair, or to be a nuisance shall correct or abate such unacceptable condition(s) without unreasonable delay, upon notification of such violation and the requirement to abate it, when given by a representative of the Sudden Valley Community Association.*	Definition of Violation: *Each property owner shall maintain his/her property in clean condition, free of trash, unused building materials, combustible brush and materials that would tend to attract vermin or rodents and other debris.*
How to Abate: *"Such correction or abatement may include removal, acceptable storage, renovation, repair, or any other method of correction or abatement that is acceptable to the Sudden Valley Community Association."*	How to Abate: *"The property owner(s) shall be responsible for the removal and clean up of dead or hazardous trees, brush, or limbs on his/her property.* *Lots and common areas shall be kept clear of rubbish, trash, garbage, brush piles, vermin or rodent attracting materials and other waste. Such items must be disposed of properly."*

Timeline: *"Abatement shall, in all instances, begin at the earliest possible opportunity, but shall be completed in a timeframe that is acceptable to the Sudden Valley Community Association,* *(a) Corrective or abatement action to houses, structures, or property must begin within five (5) calendar days of notification and be fully completed within thirty (30) days of notification to the property owner or person in control or possession of the property.* *(b) Vehicle-related violations must be initiated within forty-eight (48) hours and be completely abated within five (5) days of notification."*	Timeline: *"Owners will be notified when a situation pertaining to either of the above needs their immediate attention. Where no action has been taken after fifteen (15) days following notification of the owner twenty-four (24) hours in the event of a potential physical or health hazard), SVCA may arrange, perform, or contract any work necessary to correct a violation of this section, whereupon the owner shall be billed for the expense."*
Penalty: *"Any violation of this rule shall subject the violator to a penalty of:* (a) *For property or vehicle-related violations, a notice of violation in the amount of $100 per day shall be assessed for the first (1st) ten (10) days for failure to initiate responsive action, or to complete the corrective or abatement action once initiated. The penalty shall increase to $200 per day for the second (2nd) ten (10) days that timely action is not taken and shall increase to $300 per day for the third (3rd) ten (10) days and until the violation is fully abated."*	Penalty: " The owners will be given a second (2nd) notice of violation before clean-up work is commenced by Sudden Valley. In the event that the violation is not cured by the owner after the second (2nd) notice, the owner(s) will be subject to a penalty of $250 for the first (1st) offense and $500 for a subsequent offense."
Discretion: "*The implementation of penalties may be delayed for a period up to ten (10) days by the General Manager, or his/her designee, upon a showing of a substantial effort to comply with the corrective or necessary action orders for houses or structures, or five (5) days for vehicles starting the day following the final date by which corrective action was to have been completed."*	Discretion: None

Analysis

Proposed Change #1

Because section 2.1 refers to "property" without clarification that it refers to an undeveloped lot, it is

unclear which section applies to properties that have trash, building materials, or other debris stored in the open. By changing “property” to “undeveloped lot,” the differences between the two sets of instructions for abatement, timeline, and penalties seem logical and it is clear which instructions should be used for different situations.

Proposed Change #2
I believe it is also necessary to add the same discretionary clause to section 2.1 to ensure that there is parity in the approaches to penalties.

Proposed Change #3
Regarding the fines applied to developed vs undeveloped lots, the undeveloped lot fines are capped at $250 for the first occurrence and $500 for each subsequent occurrence. There is no cap for the developed lot fines. Instead, the fines continue to increase based on the time taken to bring the property into compliance. If the violation is not abated for 30 days, the total fines assessed would be $6,000. Continuing to wait for the homeowner to correct the issue has not led to good outcomes, despite the threat of significant fines. Adding the “right to cure” language from section 2.1 to section 1.11 would give the Association the ability to fix a situation that is deemed hazardous or that has not been fixed after the 30 day period. Specifically:

> *Where no action has been taken after thirty(30) days following notification of the owner (forty-eight (48) hours in the event of a potential physical or health hazard), SVCA may arrange, perform, or contract any work necessary to correct a violation of this section, whereupon the owner shall be billed for the expense*.

The proposed changes are shown in context in an attachment to this memo.

Requests
I request that the SVCA Board of Directors approve the proposed changes to the Rules & Regulations and the addition of the fines described in section 1.11 and 2.1 to SVCA’s Fees 7 Fines Schedule..**Motions**

I move that the SVCA Board of Directors approve the proposed changes to the Rules & Regulations and the addition of the fines described in section 1.11 and 2.1 to SVCA’s Fees 7 Fines Schedule.

Approvals
Approved: _____ Not Approved: _____ SVCA Board of Directors

Signed: _____ Date: _____

1.11. Disorderly House, Property, Vehicle, or Conduct Rule

1.11.1. Purpose – The purpose of this rule is to protect the health, safety, welfare, and/or tranquility of the residents of Sudden Valley, or any portion thereof, by requiring:

(a) The elimination, removal, restoration, or repair of houses, structures, property or vehicles which are deemed by the Sudden Valley Community Association to be unsightly, unkempt or cluttered with refuse, trash, debris, or otherwise unacceptable items.

(b) The securing of unsecured property or structures that are left open to the uncontrolled entry of others that is deemed to be unsafe, a nuisance, or inappropriate under the circumstances.

(c) The removal of vehicles that are abandoned, unsightly and open to public view, in a state of disrepair, or that are disabled for an unreasonable period.

(d) The termination of activities, behaviors, actions or acts that are unreasonably loud, obnoxious, unruly, offensive, or disruptive to the public peace and/or safety, or that are inconsistent with the health, safety, order, or peaceful enjoyment of neighbors or residents, or the Sudden Valley Community.

1.11.2. Correction or Abatement Required – Any property owner, or other person in control or possession of a house, structure, property or vehicle, who:

(a) Maintains, permits, allows, or suffers property, structures, or vehicles that are deemed to be unsightly, unkempt, cluttered, in a state of disrepair, or to be a nuisance shall correct or abate such unacceptable condition(s) without unreasonable delay, upon notification of such violation and the requirement to abate it, when given by a representative of the Sudden Valley Community Association. Such correction or abatement may include removal, acceptable storage, renovation, repair, or any other method of correction or abatement that is acceptable to the Sudden Valley Community Association.

(b) Engages in, permits, allows, or suffers activity, behavior, action, or acts that are unreasonably loud, obnoxious, unruly, or disruptive to the peace, tranquility, or that are inconsistent with the health, safety, order, or peaceful enjoyment of neighbors, residents or the Sudden Valley Community, shall terminate, correct, or abate such unacceptable activity, behavior, action, or act without unreasonable delay upon notification of such violation and the requirement to terminate the same, when given by a representative of the Sudden Valley Community Association. Such response shall include the immediate termination of the unacceptable activity, behavior, action or acts.

1.11.3. Timely Response – Abatement shall, in all instances, begin at the earliest possible opportunity, but shall be completed in a timeframe that is acceptable to the Sudden Valley Community Association.

(a) Corrective or abatement action to houses, structures or property must begin within five (≤5) calendar days of notification and be fully completed within thirty (≤30) days of notification to the property owner or person in control or possession of the property.

(b) Vehicle-related violations must be initiated within forty-eight (≤48) hours and be completely abated within five (≤5) days of notification.

(c) Disruptive or unsafe conduct, behavior, or acts shall be terminated immediately, without delay, or as soon as is reasonably possible, at the discretion of the Sudden Valley Community Association.

1.11.4. Penalty for Violation – Any violation of this Rule shall subject the violator to a penalty of:

(a) For property or vehicle related violations, a notice of violation in the amount of $100 per day shall be assessed for the first (1st) ten (10) days for failure to initiate responsive action, or to complete the corrective or abatement action once initiated. The penalty shall increase to $200 per day for the second (2nd) ten (10) days that timely action is not taken and shall increase to $300 per day for the third (3rd) ten (10) days and until the violation is fully abated.

(1) The implementation of penalties may be delayed for a period up to ten (≤10) days by the General Manager, or his/her designee, upon a showing of a substantial effort to comply with the corrective or necessary action orders for houses or structures, or five (≤5) days for vehicles, starting the day following the final date by which corrective action was to have been completed.

~~(1)~~(2) Where no action has been taken after thirty (30) days following notification of the owner (forty-eight (48) hours in the event of a potential physical or health hazard), SVCA may arrange, perform or contract any work necessary to correct a violation of this section, whereupon the owner shall be billed for the expense.

(b) For behavior, conduct, or act related violations, a notice of violation in the amount of $100 shall be assessed for the first (1st) violation upon discovery or report. The penalty shall increase to $200 for repeated violations on the same day or within forty-eight (≤48) hours. The penalty shall increase to $500 per violation after the receipt or discovery of five or more (5+) similar violations.

(1) The initial penalty shall begin after a warning of violation has been delivered to the property owner, or other person at the location of the violation, and where the unacceptable behavior, conduct, act(s) or action(s) has not ceased within a reasonable period. A reasonable period shall generally be at least fifteen (15+) minutes. Subsequent violations shall be actionable where the unacceptable conduct continues after one (1) hour following the first (1st) penalty is assessed, reoccurs within a specific time period or after a minimum of one (1+) hour.

1.11.5. Administrative Relief – Discretion – The Sudden Valley Community Association, in the person of the General Manager, or his/her designee may, at his/her discretion, extend the abatement time period or grace periods as circumstances warrant, and may suspend penalties or portions thereof, upon a showing of good cause by the property owner that such suspension is reasonable and warranted.

1.11.6. Appeals – Appeals of Violations of this Rule shall be addressed to the Appeals Committee of the Sudden Valley Community Association.

1.11.7. Legal Action – The General Manager shall be authorized to pursue such legal remedies as may be necessary for the full and effective

enforcement of these rules for persistent or unresponsive violators, including nonmembers.

2. Use and Maintenance of ~~Separately Owned Property~~Undeveloped Lots:

2.1. Each property owner shall maintain his/her ~~property~~ undeveloped lot in clean condition, free of trash, unused building materials, combustible brush and materials that would tend to attract vermin or rodents and other debris.

2.1.1. The property owner(s) shall be responsible for the removal and clean up of dead or hazardous trees, brush or limbs on his/her ~~property~~undeveloped lot.

2.1.2. Undeveloped l~~L~~ots ~~and common areas~~ shall be kept clear of rubbish, trash, garbage, brush piles, vermin or rodent attracting materials and other waste. Such items must be disposed of properly.

2.1.3. Owners will be notified when a situation pertaining to either of the above needs their immediate attention. Where no action has been taken after fifteen (15) days following notification of the owner (twenty-four (24) hours in the event of a potential physical or health hazard), SVCA may arrange, perform or contract any work necessary to correct a violation of this section, whereupon the owner shall be billed for the expense.

2.1.4. The owner(s) will be given a second (2nd) notice of violation before clean-up work is commenced by Sudden Valley. In the event that the violation is not cured by the owner after the second (2nd) notice, the owner(s) will be subject to a penalty of $250 for the first (1st) offense and $500 for a subsequent offense.

2.1.5. Administrative Relief – Discretion – The Sudden Valley Community Association, in the person of the General Manager, or his/her designee may, at his/her discretion, extend the abatement time period or grace periods as circumstances warrant, and may suspend penalties or portions thereof, upon a showing of good cause by the property owner that such suspension is reasonable and warranted.

~~2.1.4.~~