



# Sudden Valley Community Association

1850 Lake Whatcom Boulevard, Bellingham WA 98229  
360-734-5320 www.suddenvalley.com

## 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 – 2026 Road Repairs**

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### Purpose

The purpose of this memo is to request funding for the planned 2026 road repair projects.

### Background

In February 2025, the board approved \$41,888 in funding for the design and permitting of road repair projects to be completed in 2026. Engineering was completed by Impact Design, and permits are being submitted to Whatcom County. We are now requesting funding to put the planned projects out to bid and complete the work during the construction window of June 1<sup>st</sup> through September 30th.

### Analysis

The 2026 Capital Budget – Roads includes four roads for asphalt repairs:

- Appaloosa Court -- \$38,339
  - Yearling Place -- \$98,067
  - Misty Ridge Court -- \$32,853
  - Fields Park Place -- \$24,315
- |       |           |
|-------|-----------|
| Total | \$193,574 |
|-------|-----------|

In addition to these road repairs, the 2026 budget identifies 24 culverts scheduled for replacement. One of these culverts, Culvert 25, is a large box culvert and the replacement budget is \$594,880. At this time, Impact Design and SVCA staff agree that the condition of Culvert 25 has not degraded since the 2024 inspection and recommend that SVCA push off the replacement to 2030. The culvert will be monitored by staff and re-inspected in 2028 as part of the five-year renewal of the ten-year roads and drainage plan. The remaining 23 culverts are recommended for replacement as scheduled, and the budget includes \$235,140 for this work.

Drawings for the road improvements and culvert replacements are attached for reference. A separate engineer’s estimate has not been completed as the amounts in the 2026 budget were based on Impact Design’s estimates in the Ten-Year Roads & Drainage Plan and it is believed that these estimates are still valid.

### Request

I request that the SVCA Board of Directors approve the allocation of \$428,714 from the Roads Reserve Fund for the completion of the four road repair and 23 culvert replacement projects proposed for completion in 2026.

**Motion**

I move that the Board of Directors approve the allocation of \$428,714 from the Roads Reserve Fund for the completion of the four road repair and 23 culvert replacement projects proposed for completion in 2026.

**Approvals**

Recommended: \_\_\_\_\_ Not Recommended \_\_\_\_\_ Finance Committee

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Jean Maixner, Treasurer

Approved: \_\_\_\_\_ Not Approved: \_\_\_\_\_ SVCA Board of Directors

Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Keith McLean, Board President



February 10<sup>th</sup>, 2026

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

RE: Project Scope Letter  
**2026 Roads Project**

PNW is providing this overall project scope letter to SVCA for the 2026 Roads project. On February 27<sup>th</sup>, 2025 SVCA approved a capital request for the design and permitting to be completed. Engineering has been completed by Impact Design, and permit applications are being submitted to Whatcom County. SVCA's 2026 capital budget identifies 4 roads for asphalt repairs with a budget of \$193,573.00. These include:

- Appaloosa Court
- Yearling Place
- Misty Ridge
- Fields Park Place

In addition, there are 23 culverts proposed for replacement with a budget of \$235,140.00. The total budget available is \$428,713.00. Culvert 25 is proposed to be monitored and shifted out.

The drawings for the road improvements and culvert replacements are attached for reference. A separate engineer's estimate hasn't been completed as the identified amounts in the 2026 capital budget are believed to be accurate. At this time, we are requesting funding approval, and once approved the project will be issued for bid. After bidding, the project will be brought back to SVCA for contract award.

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

Sincerely,

Tyler Andrews  
President

# SUDDEN VALLEY MAINTENANCE NOAS



## CONTACT INFORMATION:

**CLIENT**  
 PNW SERVICES, INC.  
 PO BOX 30498  
 BELLINGHAM, WA 98228  
 425-954-9614

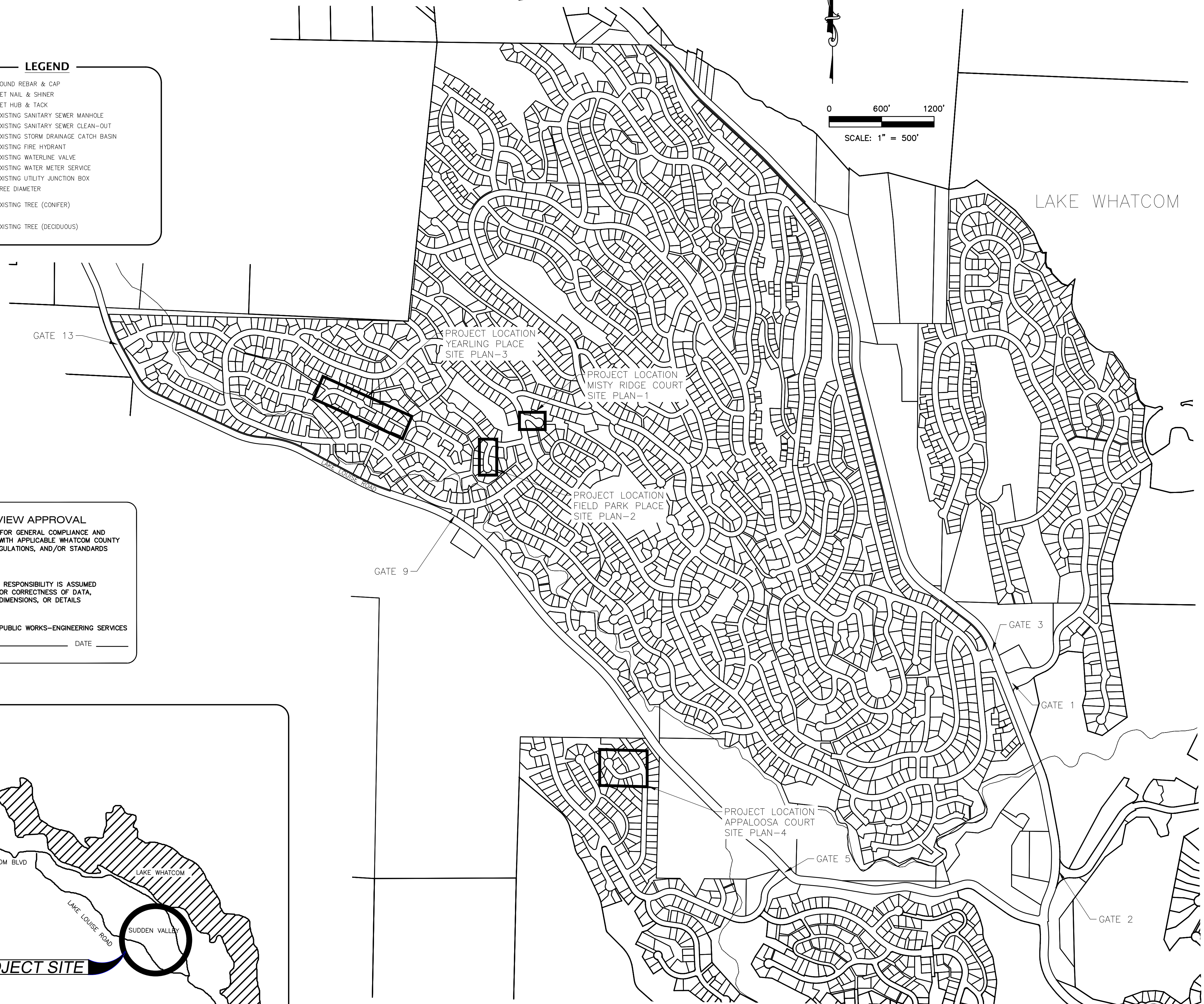
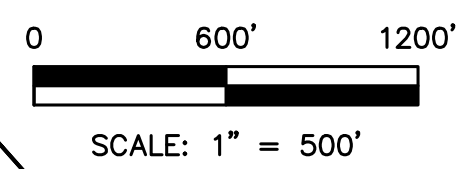
**ENGINEER**  
 SCOTT GOODALL, P.E.  
 IMPACT DESIGN, LLC  
 5426 BARRETT ROAD  
 SUITE A103  
 FERDALE, WA 98248  
 (360) 389-8138  
 SCOTT@BOLD-IMPACT.COM

## SHEET INDEX:

- C1 COVER SHEET
- C2 NOA DESCRIPTIONS
- C3 KEYMAP
- C4 SITE PLAN-1
- C5 SITE PLAN-2
- C6 SITE PLAN-3
- C7 SITE PLAN-4
- C8 DETAILS
- C9 DETAILS
- C10 DETAILS

## LEGEND

- FOUND REBAR & CAP
- SET NAIL & SHINER
- SET HUB & TACK
- EXISTING SANITARY SEWER MANHOLE
- ⊙ EXISTING SANITARY SEWER CLEAN-OUT
- EXISTING STORM DRAINAGE CATCH BASIN
- ⊕ EXISTING FIRE HYDRANT
- ⊗ EXISTING WATERLINE VALVE
- ⊞ EXISTING WATER METER SERVICE
- ⊠ EXISTING UTILITY JUNCTION BOX
- 12" ∅ TREE DIAMETER
- ★ EXISTING TREE (CONIFER)
- EXISTING TREE (DECIDUOUS)



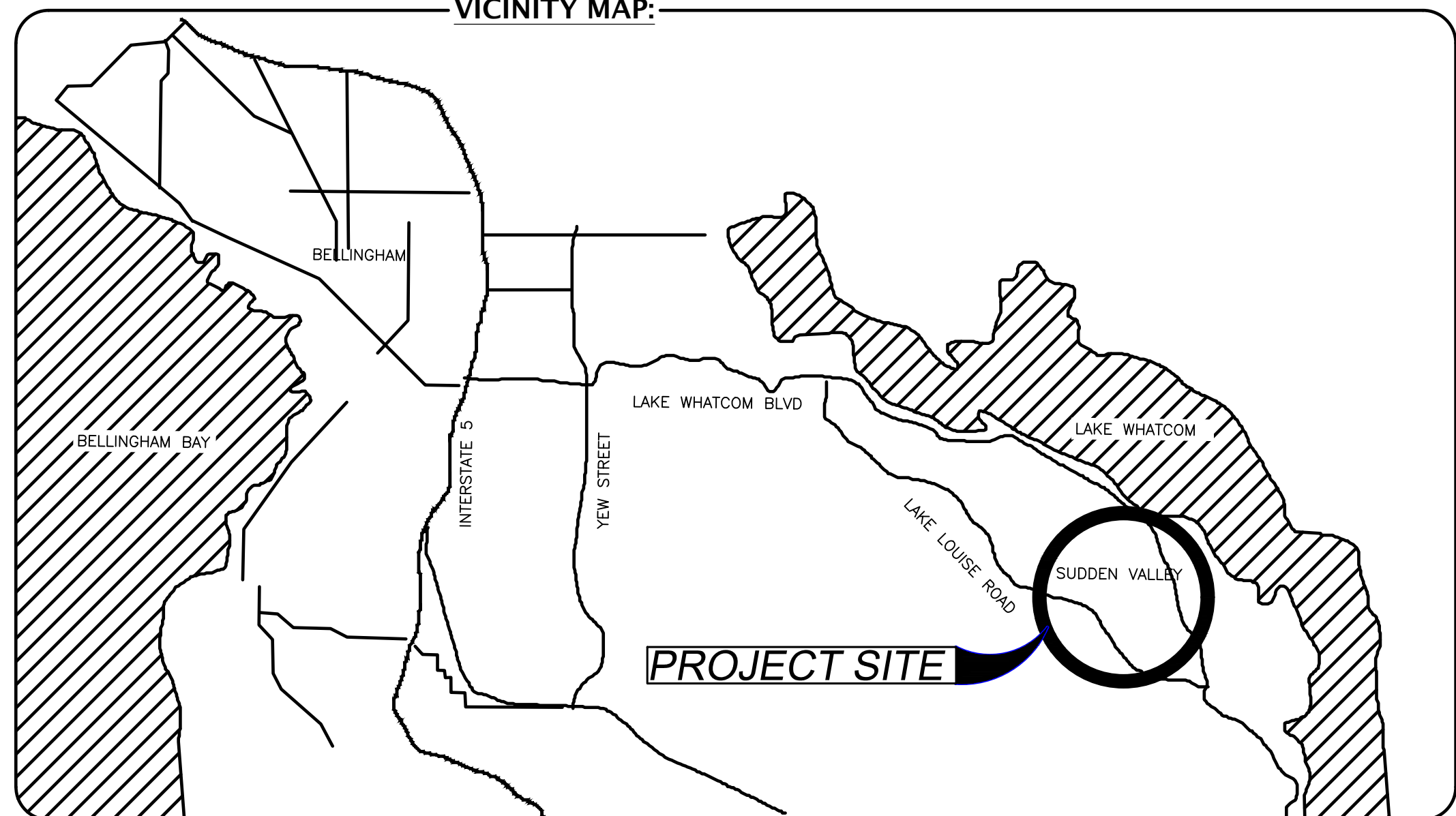
**REVIEW APPROVAL**  
 REVIEW IS FOR GENERAL COMPLIANCE AND  
 CONSISTENCY WITH APPLICABLE WHATCOM COUNTY  
 CODES, REGULATIONS, AND/OR STANDARDS



NO RESPONSIBILITY IS ASSUMED  
 FOR CORRECTNESS OF DATA,  
 DIMENSIONS, OR DETAILS

DEPARTMENT OF PUBLIC WORKS-ENGINEERING SERVICES  
 BY \_\_\_\_\_ DATE \_\_\_\_\_

## VICINITY MAP:



2.3.2026

SVCA ROAD REPAIR NOAS 2026  
 COVER SHEET  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
 25055  
 DESIGNED/DRAWN BY:  
 ABB  
 CHECKED BY:  
 SIG  
 ISSUE DATE:  
 2.3.2026

C1  
 OF:  
 C1-C9

Z:\Users\p\Documents\25055 svca road repair noas 2026\NOAS\25055 SVCA ROAD REPAIR NOAS 2026 1.6.2026.dwg Feb 03, 2026 - 10:34am

OVERVIEW

Misty Ridge Court					
Start of Repairs: Polo Park Dr, 53' wide			SITE PLAN-1		
Station	Repair Type	Dimension	Feature	Dimension	Location
0+00	Feather Grind	Width x 20'			
0+15	Grind and Repair	6'x32'			
0+77	Grind and Repair	9'x35'			
1+12	Grind and Repair	Width of Road			Left
1+36	Feather Grind		Driveway	23'	Right
1+42	Grind and Repair	End			
1+42	Grind and Repair	8'x18'			
1+49	Feather Grind		Driveway	21'	Left
1+74	Raise F&G		Manhole		
1+82	Feather Grind		Driveway	10'	Left
1+88	Feather Grind		Driveway	20'	Right
2+05	<b>End of Road</b>				

Yearling Place					
Start of Repairs: Edge of Lost Lake Lane, 53' wide			SITE PLAN-3		
Station	Repair Type	Dimension	Feature	Dimension	Location
0+00	Feather Grind	Width x 20'			
0+24	Replace Bkue Button Marker		Hydrant		Right
0+68	Feather Grind		Driveway	19'	Right
1+20	Feather Grind		Gravel Driveway	30'	Left
1+84	Feather Grind		Driveway	27'	Left
1+96	Feather Grind		Driveway	26'	Right
2+36	Feather Grind		Driveway	28'	Left
2+43	Feather Grind		Driveway	22'	Right
2+73	Raise F&G		Manhole		
3+11	Feather Grind		Driveway	22'	Left
3+74	Feather Grind		Driveway	24'	Left
3+75	Feather Grind		Driveway	22'	Right
4+09	Feather Grind		Driveway	22'	Right
4+36	Feather Grind		Driveway	22'	Left
4+38	Raise F&G		Manhole		
4+60			Island	10'x15'	
4+86	Feather Grind		Driveway	27'	Left
5+09	Replace Bkue Button Marker		Hydrant		Right
5+23	Pothole Repair	76'x5'			Left
5+46	Feather Grind		Driveway	23'	Right
6+01	Feather Grind		Driveway	21'	Right
6+24	Feather Grind		Driveway	21'	Left
6+42	Raise F&G		Manhole		
6+54	Grind and Repair	Start			
6+76	Feather Grind		Driveway	22'	Right
7+36	Feather Grind		Gravel Driveway	36'	Right
7+90	Feather Grind		Gravel Driveway	54'	Right
8+02	Pothole Repair	Start			
8+20	Pothole Repair	End			
9+07	Grind and Repair	End			
9+71	<b>End of Road</b>				

Fields Park Place					
Start of Repairs: Edge of Huckleberry CT, 66' wide			SITE PLAN-2		
Station	Repair Type	Dimension	Feature	Dimension	Location
0+50	Feather Grind	Width x 20'			
0+43	Feather Grind		Gravel Driveway	20'	Left
0+70	Grind and Repair	Width x 42'			
0+70	Feather Grind		Gravel Driveway	21'	Right
1+06	Replace Blue Button Marker		Hydrant		Left
1+25	Feather Grind		Driveway	23'	Left
1+25	Feather Grind		Driveway	20'	Right
1+54	Feather Grind		Driveway	20'	Right
1+89	Raise F&G		Manhole		
2+32			Island	132.7 SF	
2+58	Feather Grind		Driveway	21'	Right
2+58	Feather Grind		Gravel Driveway	16'	Left
2+58	<b>End of Road</b>				

Appaloosa Court					
Start of Repairs: Edge of Pinto Lane, 46' wide			SITE PLAN-4		
Station	Repair Type	Dimension	Feature	Dimension	Location
0+00	Feather Grind	Width x 20'			
0+30	Grind and Repair	Start			
0+49	Pothole repair	8'x9'			
1+24	Raise F&G		Manhole		
1+32	Pothole Repair	17'x12'			
1+90	Pothole Repair	23'x9'			
2+65	Replace Blue Button Marker		Hydrant		Left
2+42	Feather Grind		Start of Driveway	25'	Right
2+71	Raise F&G		Manhole		
2+92	Add Asphalt berm	33'	Start of Driveway		Right
3+44	Grind and Repair	End			
4+05	Feather Grind		Driveway	16'	Right
4+05	Feather Grind		Driveway	23'	Left
4+05	<b>End of Road</b>				

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5426 BARETT ROAD, SUITE A103  
360-389-8138 WWW.BOLD-IMPACT.COM



2.3.2026

SVCA ROAD REPAIR NOAS 2026  
NOA DESCRIPTIONS  
SUDDEN VALLEY  
WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

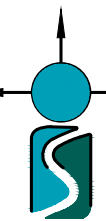
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DESIGNED/DRAWN BY:  
ABB

CHECKED BY:  
SIG

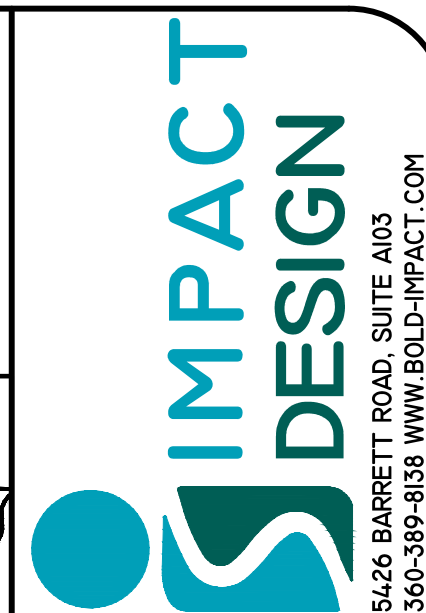
ISSUE DATE:  
2.3.2026

C2  
OF:  
C1-C9



# SUDDEN VALLEY MAINTENANCE NOAS

0 600' 1200'  
SCALE: 1" = 500'



2.3.2026

**SVCA ROAD REPAIR NOAS 2026  
OVERVIEW**  
SUDDEN VALLEY  
WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

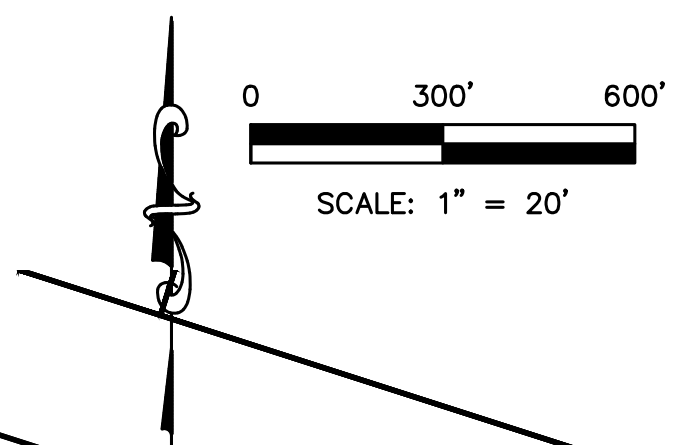
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DESIGNED/DRAWN BY:  
**ABB**  
CHECKED BY:  
**SIG**  
ISSUE DATE:  
**2.3.2026**

**C3**  
OF:  
**C1-C9**

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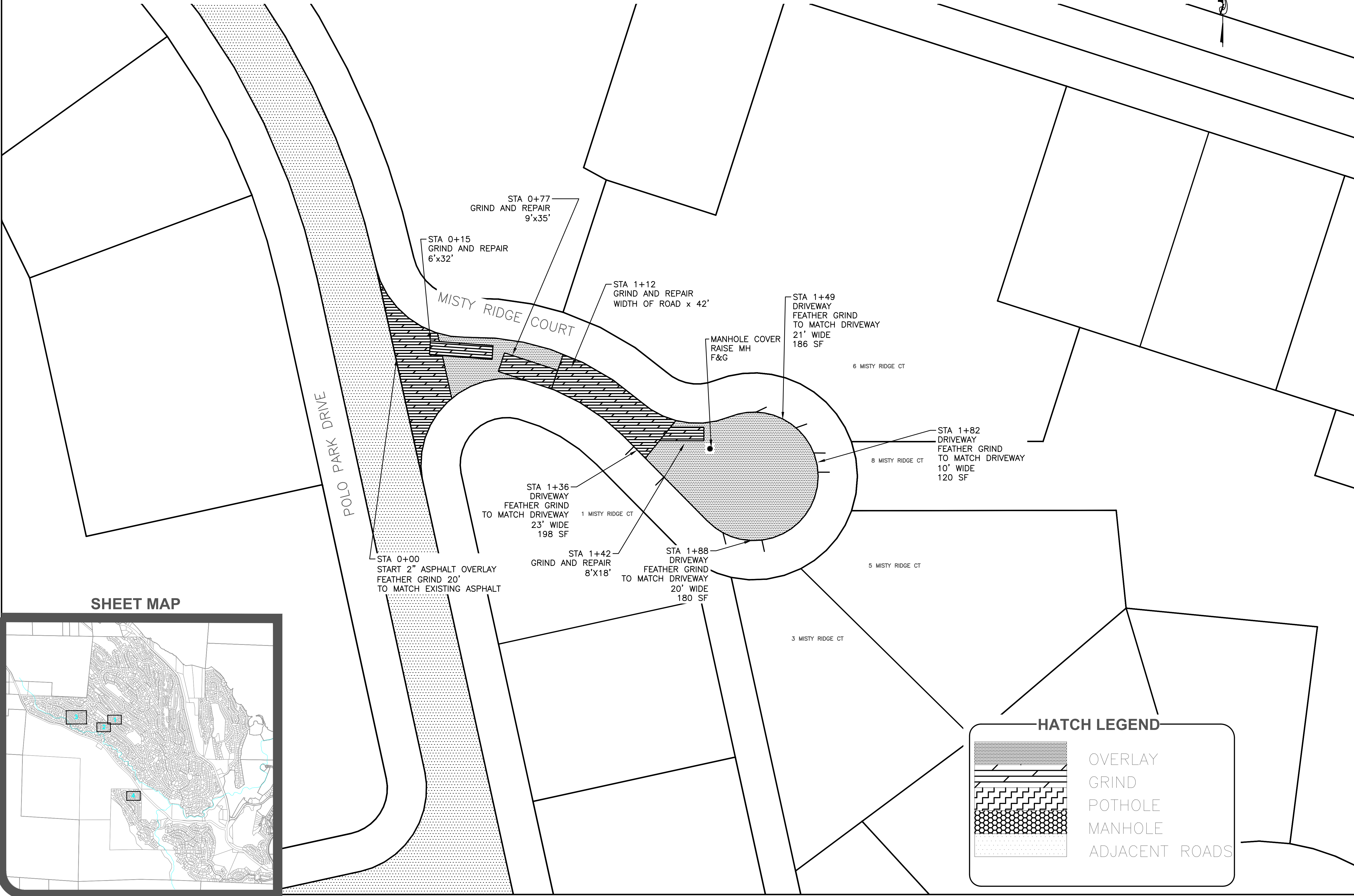


**SUDDEN VALLEY MAINTENANCE NOA'S**  
**SITE PLAN-1**

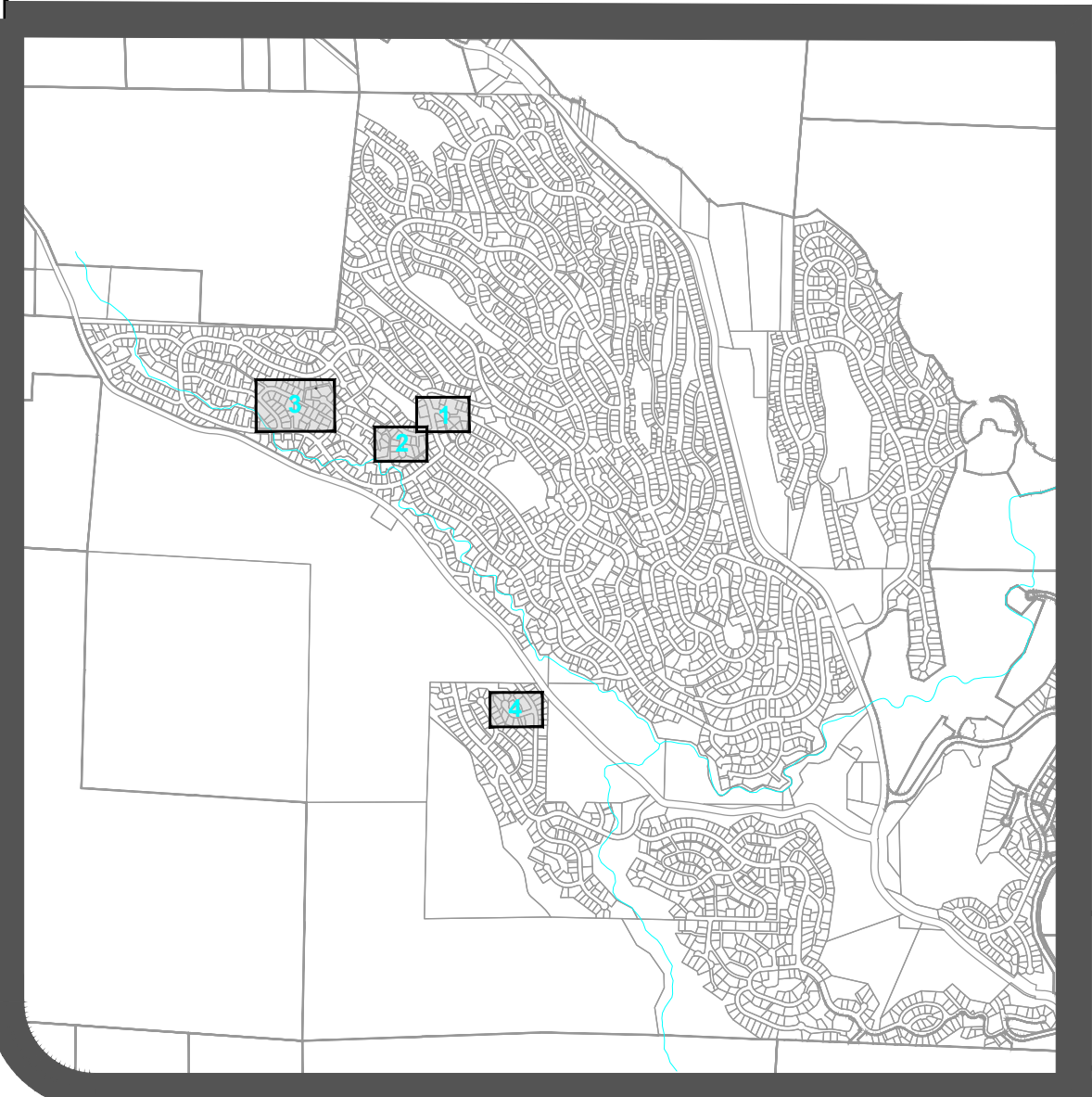


2.3.2026

**SVCA ROAD REPAIR NOAS 2026**  
**SITE PLAN-1**  
 MISTY RIDGE COURT  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON



**SHEET MAP**



**HATCH LEGEND**

- OVERLAY
- GRIND
- POTHOLE
- MANHOLE
- ADJACENT ROADS

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REV	DATE	BY	DESCRIPTION

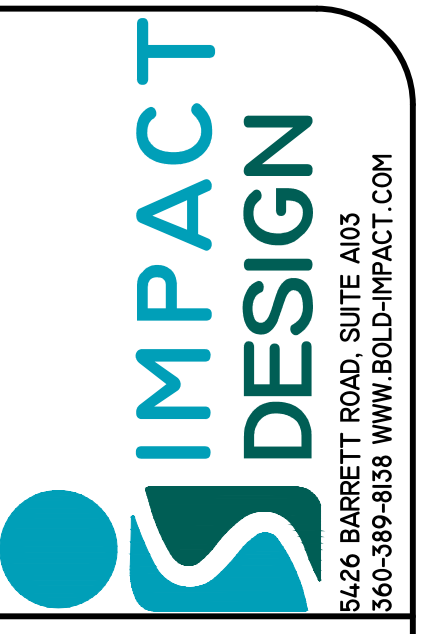
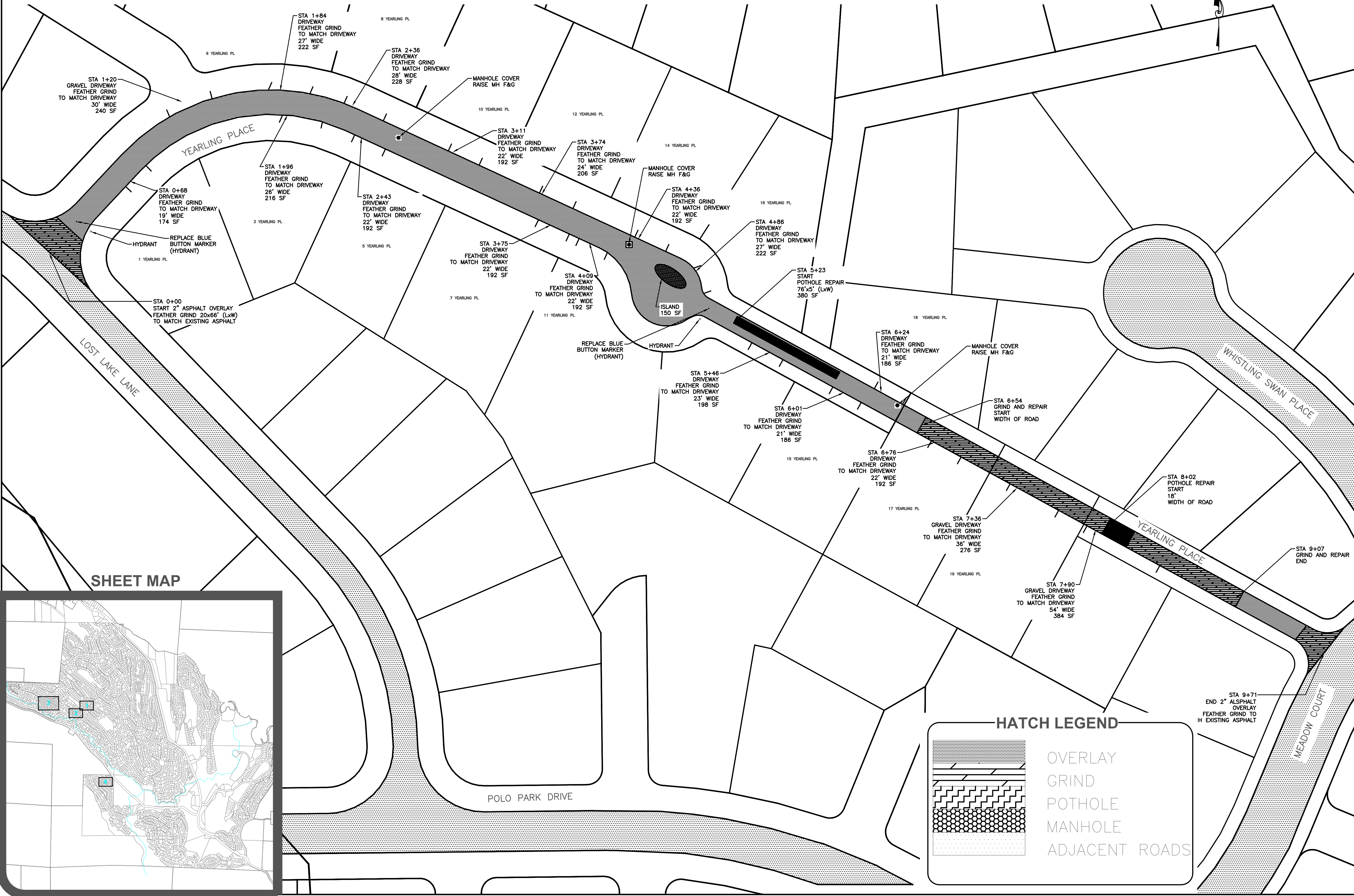
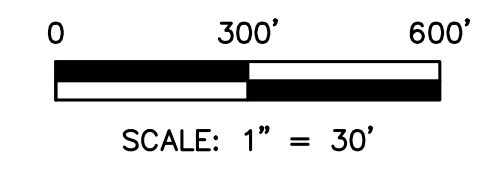
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 CHECKED BY: SIG  
 ISSUE DATE: 2.3.2026

C4  
 OF: C1-C9



# SUDDEN VALLEY MAINTENANCE NOA'S

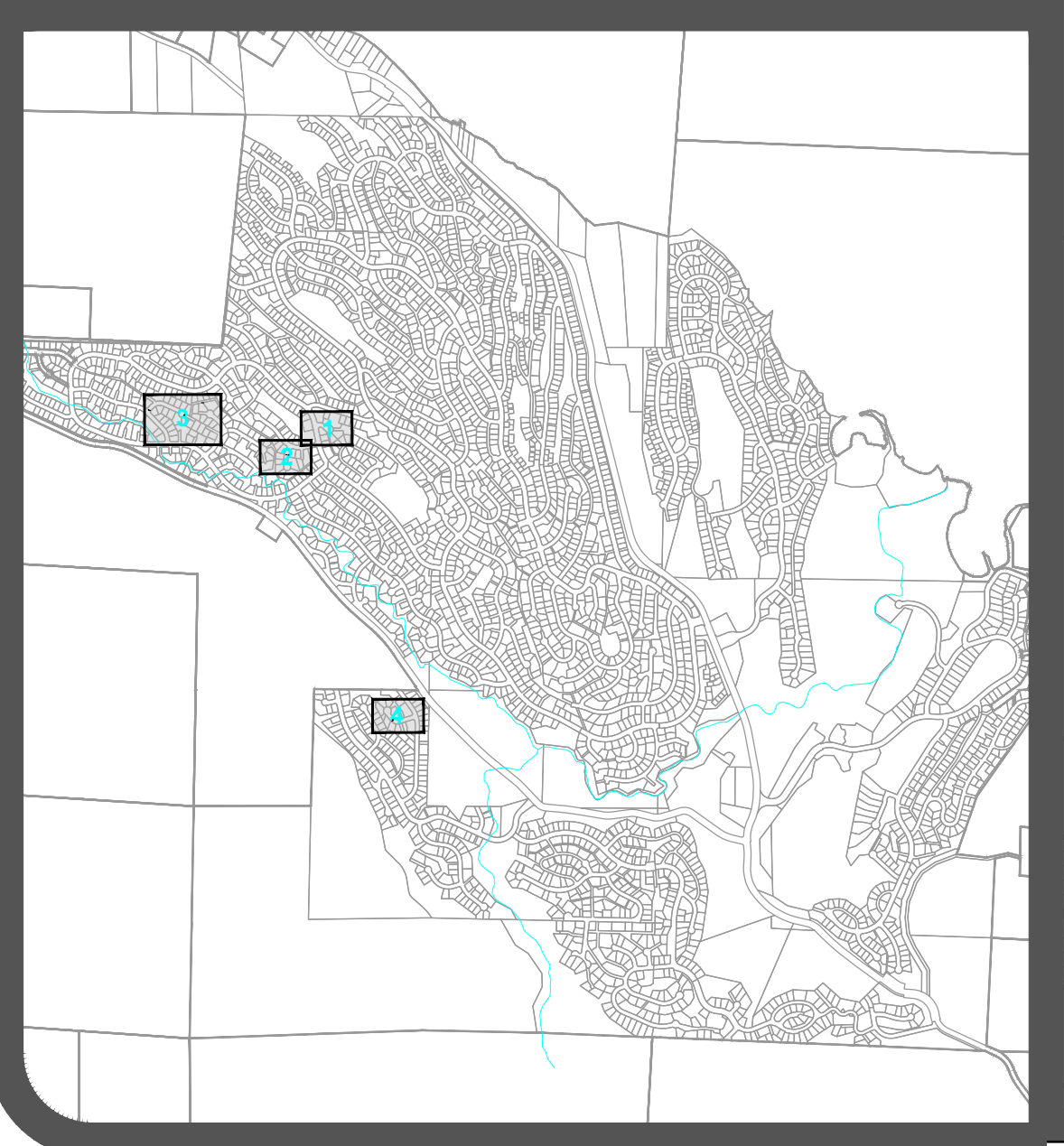
## SITE PLAN-3



2.3.2026

SVCA ROAD REPAIR NOAS 2026  
 SITE PLAN-3  
 YEARLING PLACE  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

### SHEET MAP



HATCH LEGEND	
	OVERLAY
	GRIND
	POTHOLE
	MANHOLE
	ADJACENT ROADS

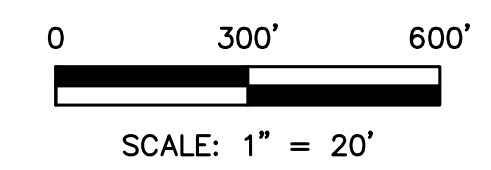
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ISSUE DATE:	2.3.2026
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OF:	C1-C9

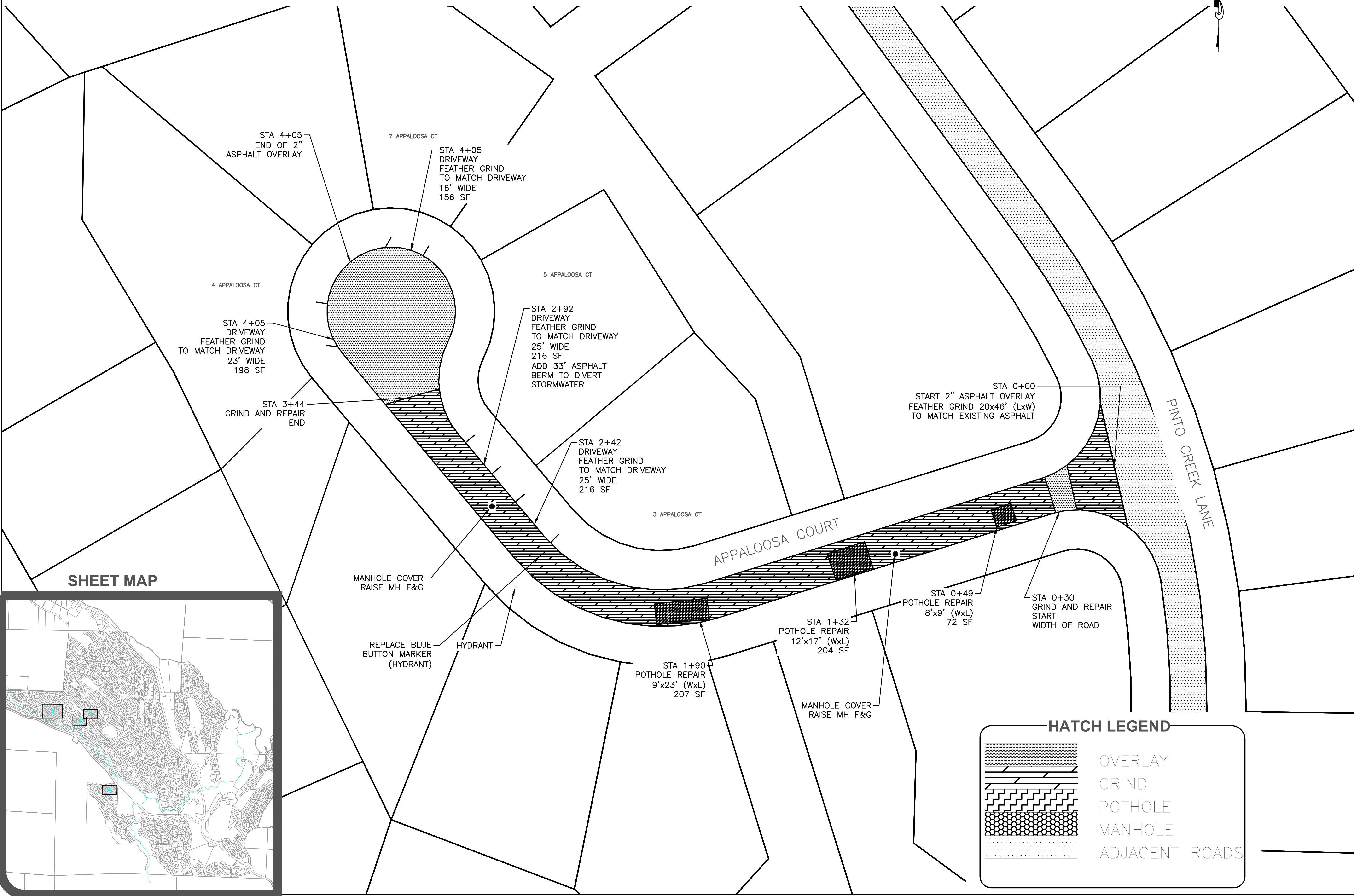
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**SUDDEN VALLEY MAINTENANCE NOA'S**  
**SITE PLAN-4**

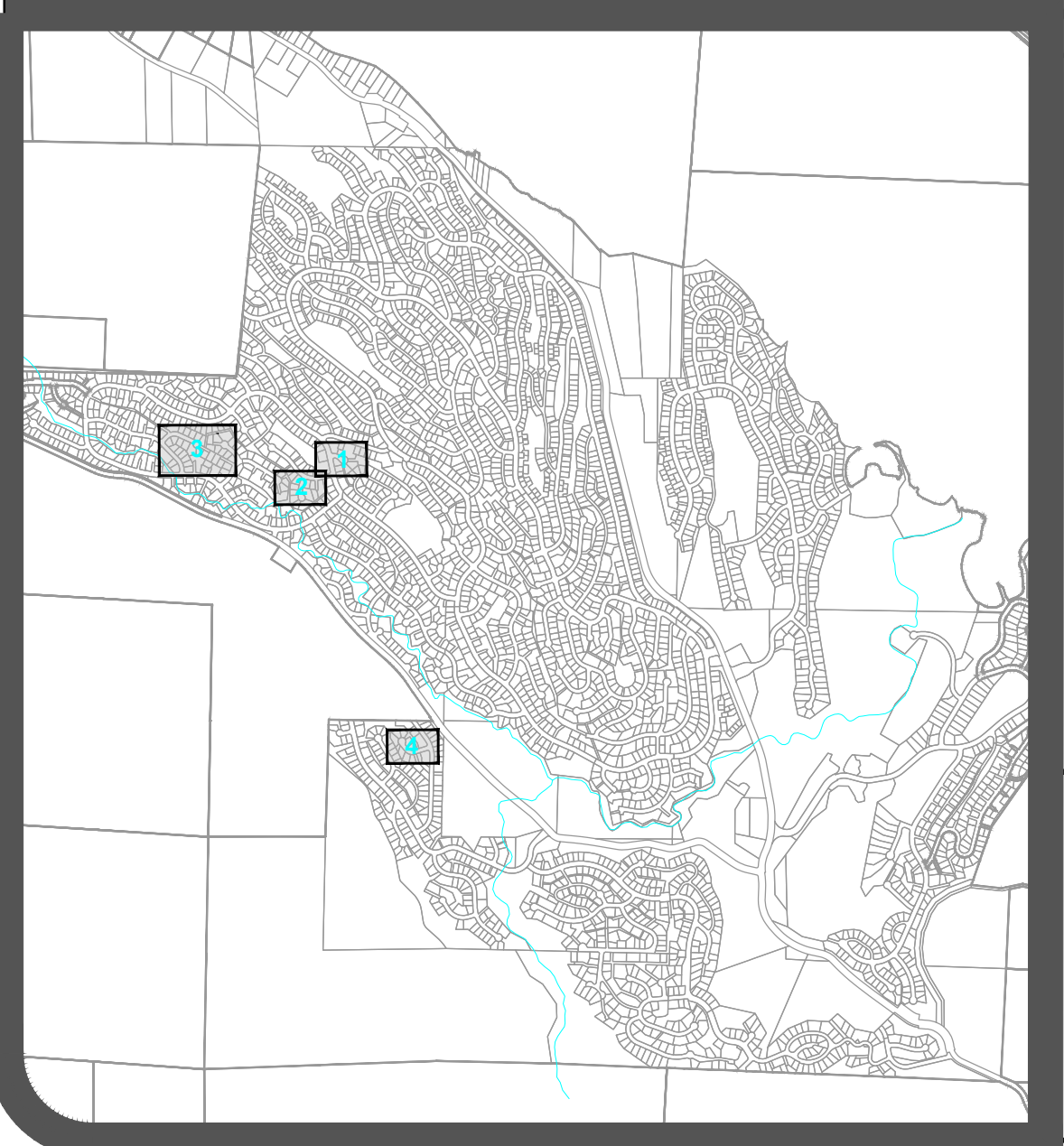


2.3.2026

**SVCA ROAD REPAIR NOAS 2026**  
**SITE PLAN-4**  
 SITE PLAN-4  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON



**SHEET MAP**



**HATCH LEGEND**

- OVERLAY
- GRIND
- POTHOLE
- MANHOLE
- ADJACENT ROADS

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
25055

DESIGNED/DRAWN BY:  
ABB

CHECKED BY:  
SIG

ISSUE DATE:  
2.3.2026

**C7**  
 OF:  
**C1-C9**

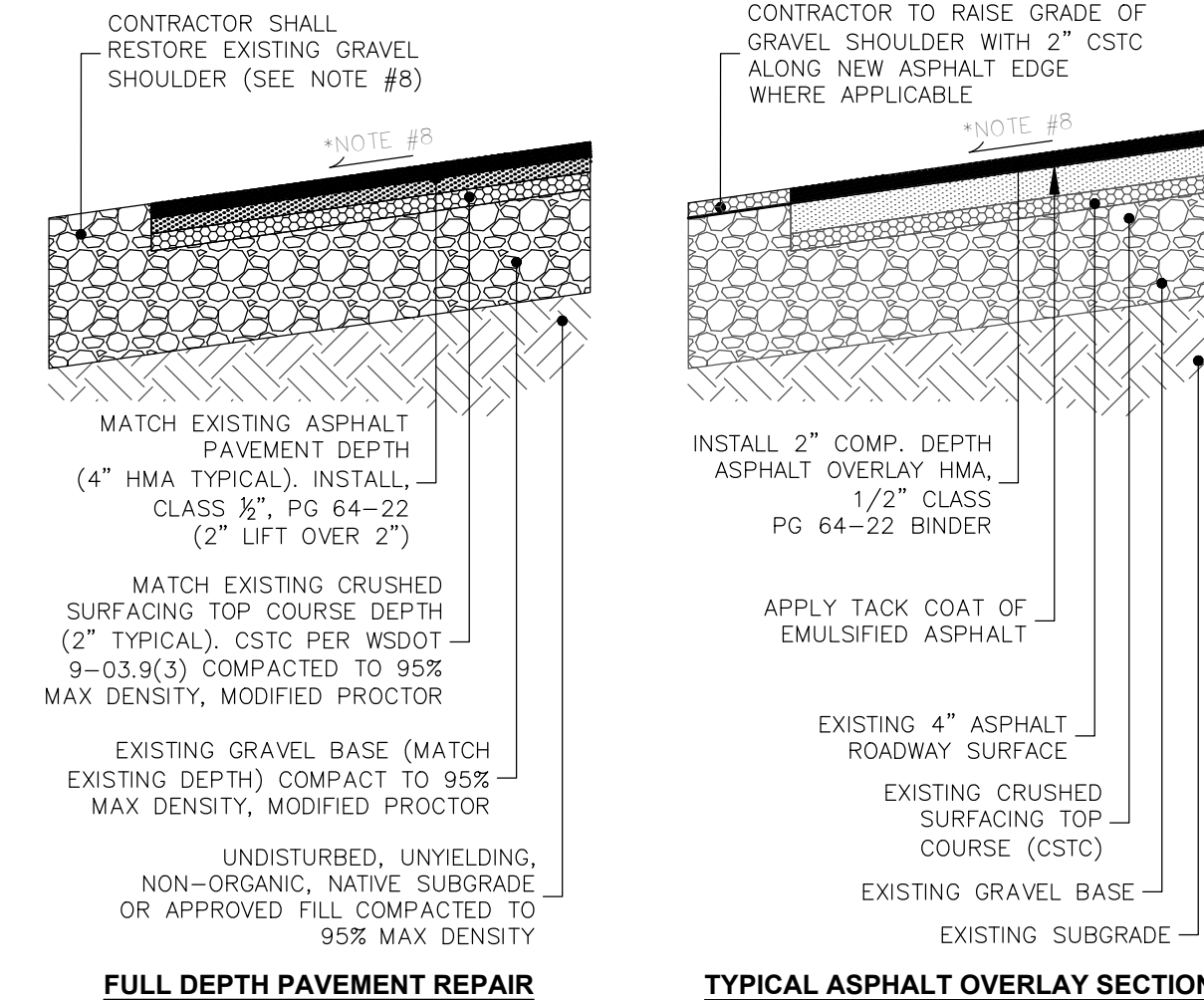
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# SUDDEN VALLEY MAINTENANCE NOA'S

## ASPHALT PAVEMENT REPLACEMENT & MAINTENANCE NOTES:

- ALL DEPTHS REPRESENT COMPACTED THICKNESSES.
- ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE PREVISIONS OF APWA "STANDARD SPECIFICATIONS" AND SHALL CONFORM TO THE REQUIREMENTS OF WHATCOM COUNTY ENGINEER DEPARTMENT.
- AN EQUIVALENT ASPHALT TREATED BASE MAY BE SUBSTITUTED FOR THE GRAVEL BASE AND CRUSHED ROCK UPON APPROVAL OF THE COUNTY ENGINEER.
- PROVIDE/APPLY GRIND AND PETRO-TAC DETAIL AT TRANSITION FROM EXISTING ROADWAY SURFACE TO THE OVERLAY SURFACE. THE GRIND AND PETRO-TAC SHALL BE 5" MINIMUM OR GREATER BASED ON EXTENT OF GRIND BACK INTO EXISTING PAVEMENT IN ORDER TO MAINTAIN/MATCH EXISTING 2% CROSS SLOPE. ANOTHER OPTION IS TO PROVIDE 40.0' GRIND TO GENERATE 0.1" RISE PER 10' PAVEMENT
- AT POTHOLE LOCATIONS SAWCUT 4" DEPTH AND INSTALL 4" COMPACTED DEPTH HMA, 1/2" CLASS PG 64-22 BINDER OR MATCH EXISTING PAVEMENT GRADE/DEPTH.
- ASPHALT SEAM SEALANT REQUIRED AT NEW TO OLD ASPHALT INTERFACE, TYPICAL. INSTALL IMMEDIATELY AFTER FINAL ASPHALT LIFT (LIMIT WATER SEEPAGE INTO SEAM AT ALL TIMES).
- CONTRACTOR SHALL RESTORE EXISTING GRAVEL SHOULDER OR INSTALL NEW GRAVEL BASE SHOULDER (1.0' MINIMUM WIDTH) WHERE APPLICABLE (SUCH AS ALONG GRIND AND OVERLAY ASPHALT PAVEMENT OR WHERE CURRENT PAVEMENT IS NOT CONFINED (EDGE PROTECTED) BY GRAVEL SHOULDER. 24" GRAVEL SHOULDER IS PREFERRED BUT GRADES AND ADJACENT DITCH LAYOUT MAY NOT ALLOW EXTENSION OF SHOULDER TO PREFERRED WIDTH.
- MAINTAIN EXISTING PAVEMENT FLOW PATTERNS TO DRAINAGE DITCH(S) AND OR CATCH BASIN(S).
- CONTRACTOR SHALL SWEEP/CLEAN ROAD PRIOR TO OVERLAY/TAC.



## PAVEMENT REPAIR/MAINTENANCE ALTERNATIVES

NTS

## BMP T5.13 NOTES

ESTABLISH A MINIMUM SOIL QUALITY AND DEPTH IS NOT THE SAME AS PRESERVATION OF NATURALLY OCCURRING SOIL AND VEGETATION. HOWEVER, ESTABLISHING A MINIMUM SOIL QUALITY AND DEPTH WILL PROVIDE IMPROVED ON-SITE MANAGEMENT OF STORMWATER FLOW AND WATER QUALITY. SOIL ORGANIC MATTER CAN BE ATTAINED THROUGH NUMEROUS MATERIALS SUCH AS COMPOST, COMPOSTED WOODY MATERIAL, BIOSOLIDS AND FOREST PRODUCT RESIDUALS. IT IS IMPORTANT THAT THE MATERIALS USED TO MEET THE SOIL QUALITY AND DEPTH BMP BE APPROPRIATE AND BENEFICIAL TO THE PLANT COVER TO BE ESTABLISHED. LIKEWISE, IT IS IMPORTANT THAT IMPORTED TOPSOILS IMPROVE SOIL CONDITIONS AND DO NOT HAVE AN EXCESSIVE PERCENT OF CLAY FINES. THIS BMP CAN BE CONSIDERED INFEASIBLE ON TILL SOIL SLOPES GREATER THAN 33 PERCENT.

## DESIGN GUIDELINES

**SOIL RETENTION:** RETAIN, IN AN UNDISTURBED STATE, THE DUFF LAYER AND NATIVE TOPSOIL TO THE MAXIMUM EXTENT PRACTICABLE, IN ANY AREAS REQUIRING GRADING REMOVE AND STOCKPILE THE DUFF LAYER AND TOPSOIL ON SITE IN A DESIGNATED, CONTROLLED AREA, NOT ADJACENT TO PUBLIC RESOURCES AND CRITICAL AREAS, TO BE REAPPLIED TO OTHER PORTIONS OF THE SITE WHERE FEASIBLE.

**SOIL QUALITY:** ALL AREAS SUBJECT TO CLEARING AND GRADING THAT HAVE NOT BEEN COVERED BY IMPERVIOUS SURFACE, INCORPORATED INTO A DRAINAGE FACILITY OR ENGINEERED AS STRUCTURAL FILL OR SLOPE SHALL, AT PROJECT COMPLETION, DEMONSTRATE THE FOLLOWING:

- A TOPSOIL LAYER WITH A MINIMUM ORGANIC MATTER CONTENT OF 10% DRY WEIGHT IN PLANTING BEDS, AND 5% ORGANIC MATTER CONTENT IN TURF AREAS, AND A PH FROM 6.0 TO 8.0 OR MATCHING THE PH OF THE UNDISTURBED SOIL. THE TOPSOIL LAYER DEPTH SHALL BE PER PLAN. SUBSOILS BELOW THE TOPSOIL LAYER SHOULD BE SCARIFIED AT LEAST 4 INCHES WITH SOME INCORPORATION OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS, WHERE FEASIBLE.
  - MULCH PLANTING BEDS WITH 4 INCHES OF WOOD CHIP MULCH. USE COMPOST AND OTHER MATERIALS THAT MEET THESE ORGANIC CONTENT REQUIREMENTS:
    - THE ORGANIC CONTENT FOR "PRE-APPROVED" AMENDMENT RATES CAN BE MET ONLY USING COMPOST MEETING THE COMPOST SPECIFICATION FOR BIORETENTION (BMP T7.30), WITH THE EXCEPTION THAT THE COMPOST MAY HAVE UP TO 35% BIOSOLIDS OR MANURE. THE COMPOST MUST ALSO HAVE AN ORGANIC MATTER CONTENT OF 40% TO 65%, AND A CARBON TO THE NITROGEN RATIO BELOW 25:1. THE CARBON TO NITROGEN RATION MAY BE AS HIGH 35:1 FOR PLANTING COMPOSED ENTIRELY OF PLANTS NATIVE TO THE PUGET SOUND LOWLANDS REGION.
    - CALCULATED AMENDMENT RATES MAY BE MET THROUGH USE OF COMPOSTED MATERIALS MEETING (A.) ABOVE, OR OTHER ORGANIC MATERIALS AMENDED TO MEET THE CARBON TO NITROGEN RATIO REQUIREMENTS, AND MEETING THE CONTAMINANT STANDARDS OF GRADE A COMPOST.
- THE RESULTING SOIL SHOULD BE CONDUCTIVE TO THE TYPE OF VEGETATION TO BE ESTABLISHED.

IMPLEMENTATION OPTIONS: THE SOIL QUALITY DESIGN GUIDELINES LISTED ABOVE CAN BE MET BY USING ONE OF THE METHODS LISTED:

- LEAVE UNDISTURBED NATIVE VEGETATION AND SOIL, AND PROTECT FROM COMPACTION DURING CONSTRUCTION.
- IMPORT TOPSOIL (TOPSOIL "A")
- CONSTRUCT TOPSOIL ON-SITE (TOPSOIL "B") -- AMEND EXISTING SITE TOPSOIL OR SUBSOIL EITHER AT DEFAULT "PRE-APPROVED" RATES BASED ON TESTS OF THE SOIL AMENDMENT.
- STOCKPILE EXISTING TOPSOIL DURING GRADING, AND REPLACED IT PRIOR TO PLANTING. STOCKPILED TOPSOIL MUST ALSO BE AMENDED IF NEEDED TO MEET THE ORGANIC MATTER OR DEPTH REQUIREMENTS, EITHER AT A DEFAULT "PRE-APPROVED" RATE OR AT A CUSTOM CALCULATED RATE.

SEE SITE SPECIFIC SOIL SPECIFICATIONS: MORE THAN ONE METHOD MAY BE USED ON DIFFERENT PORTIONS OF THE SAME SITE. SOIL THAT ALREADY MEETS THE DEPTH AND ORGANIC MATTER QUALITY STANDARDS, AND IS NOT COMPACTED, DOES NOT NEED TO BE AMENDED.

## SITE SPECIFIC SPECIFICATIONS

**TOPSOIL "A"/IMPORTED TOPSOIL:** IMPORTED TOPSOIL SHALL BE LAWN & GARDEN MIX OR SIMILAR TOPSOIL AS SUPPLIED FROM GREEN EARTH TECHNOLOGY, LLC (360.354.4936) OR APPROVED EQUAL. IMPORTED TOPSOIL SHALL BE FREE OF NOXIOUS WEED MATERIAL (SEEDS, RHIZOMES, AND/OR ROOTS). IMPORTED TOPSOIL SHALL BE FREE OF DELETERIOUS MATERIALS, ROCKS, AND DEBRIS WHICH WILL NOT PASS THROUGH THREE-QUARTER INCH 3/4" SCREEN. THE COMPONENTS OF THE SOIL MUST BE EVENLY DISTRIBUTED THROUGHOUT THE TOPSOIL MIX.

## TOPSOIL "B"/CONSTRUCTED TOPSOIL:

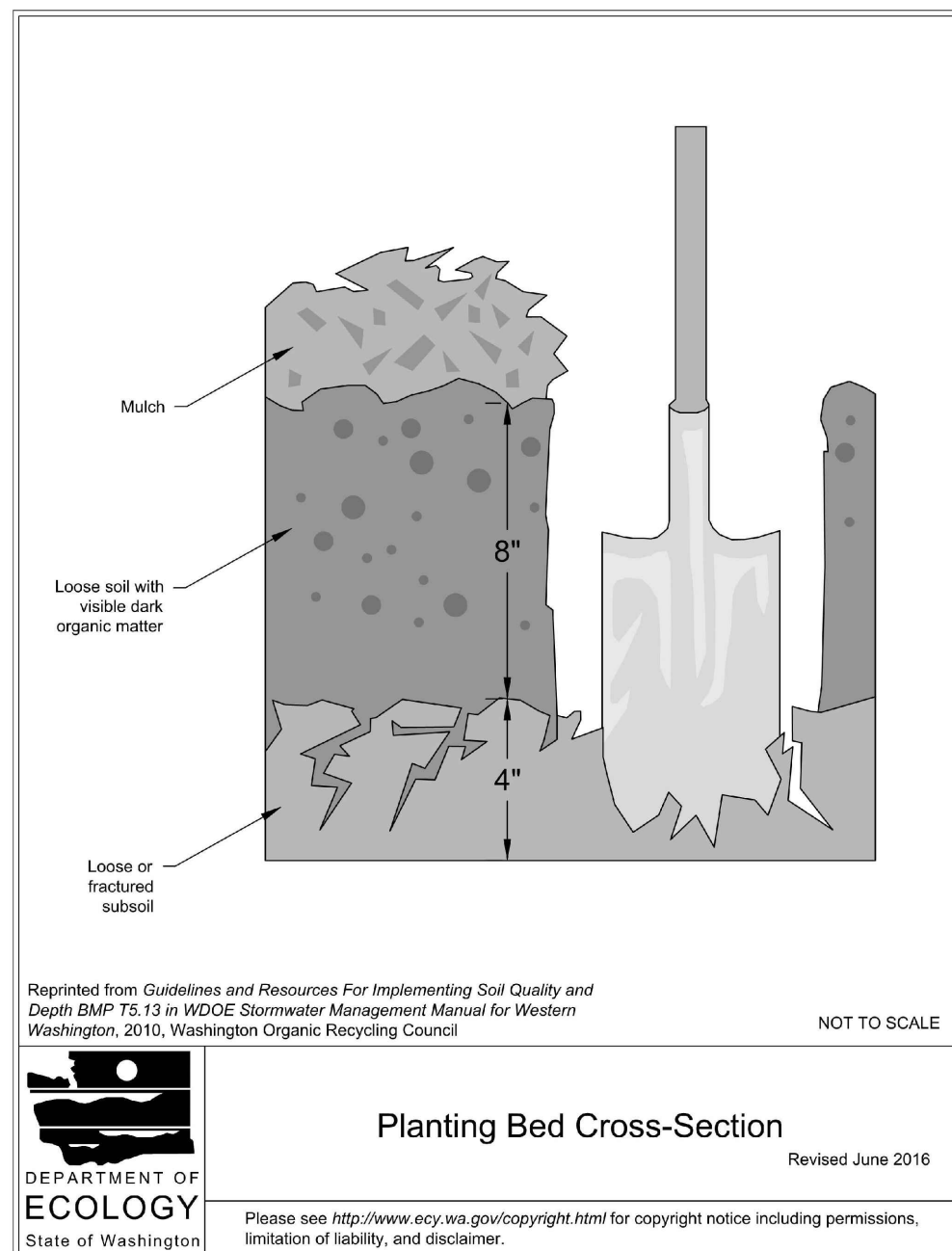
CONTRACTOR SHALL CONSTRUCT TOPSOIL B ON-SITE USING COMBINATION OF NATIVE TOPSOIL AND IMPORTED COMPOST. NATIVE TOPSOIL SHALL BE TAKEN FROM VEGETATED/LANDSCAPE AREAS WITHIN PROJECT WORK LIMITS. THE TOP TWELVE (12") OF THE SOIL COLUMN SHALL BE USED IN THE TOPSOIL B MIX AND STOCKPILED IN DESIGNATED AREA(S). STOCKPILED MATERIAL SHALL BE FREE OF NOXIOUS WEEDS. TOPSOIL B SHALL BE FREE OF NOXIOUS WEED MATERIAL (SEEDS, RHIZOMES, AND/OR ROOTS). TOPSOIL B SHALL BE FREE OF DELETERIOUS MATERIALS, ROCKS, AND DEBRIS WHICH WILL NOT PASS THROUGH 3/4" SCREEN. DESIGN INTENT IS TO INCLUDE ROCK OR ORGANIC MATERIAL IN THE TOPSOIL LAYER SO AS TO CREATE MACRO PORES AND ORGANIC MATTER RESERVES. NATIVE SOIL TO IMPORTED COMPOST RATIO SHALL BE THREE TO ONE (3 NATIVE SOIL : 1 COMPOST). THE COMPONENTS OF THE CONSTRUCTED TOPSOIL MUST BE EVENLY DISTRIBUTED THROUGHOUT THE TOPSOIL MIX.

## TOPSOIL "C"/AMENDED SOIL:

CONTRACTOR SHALL LOOSEN (DO NOT TILL) CLEARED LANDSCAPE AREAS WITH EXCAVATOR TEETH OR CLEARING/GRUB RACK ADAPTER FOR EXCAVATOR TO MEET 8" MINIMUM LOOSE DEPTH REQUIREMENT. TILLING DOES NOT MEET THE LOOSENING DEPTH REQUIREMENT. TILLING TO OCCURE AFTER A 2" LAYER OF "G.E.T. COMPOST". THE COMPOST SHALL BE INCORPORATED INTO UPPER 4" OF DISTURBED SOIL. THE COMPOST SHALL BE FROM YARD TRIMMINGS OR SIMILAR ORGANIC MATTER COMPOSTED THROUGH AEROBIC DECOMPOSITION AS AVAILABLE AT GREEN EARTH TECHNOLOGY, LLC (360.354.4936) OR APPROVED EQUAL. IMPORTED COMPOST SHALL BE COMPOSTED IN ACCORDANCE WITH WAC 173-350-220 AND FREE OF NOXIOUS WEED MATERIAL. PROVIDE ONE-GALLON (1-GALLON) SAMPLE AND SOURCE FOR APPROVAL BY ARCHITECT PRIOR TO DELIVERY TO SITE.

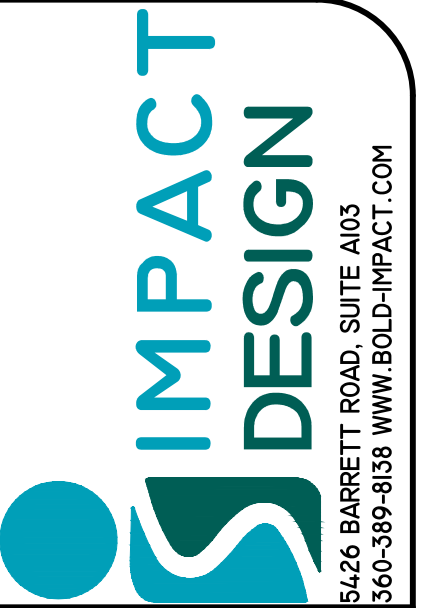
GROWING MEDIUM/TOPSOIL A, B, AND C SHALL CONFORM TO THE FOLLOWING SOIL CHARACTERISTICS:

- SOIL QUALITY -- ALL AREAS SUBJECT TO CLEARING AND GRADING THAT HAVE NOT BEEN COVERED BY IMPERVIOUS SURFACE, INCORPORATED INTO A DRAINAGE FACILITY OR ENGINEERED AS STRUCTURAL FILL OR SLOPE SHALL, AT PROJECT COMPLETION, DEMONSTRATE:
  - CONSTRUCTION MATERIAL(S) SHALL NOT BE PRESENT.
  - SOIL MEDIA SHALL HAVE A SANDY-LOAM TO LOAM TEXTURE PER USDA TEXTURAL TRIANGLE. CLAY CONTENT SHALL NOT EXCEED 5%. TOPSOIL MIXTURE SHALL BE 60%-70% SANDY-LOAM (GRADATION PER ASTM D 422) AND 30%-40% COMPOST BY VOLUME (ORGANIC MATTER CONTENT OF 5%-10% BY WEIGHT). THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES.
  - SUBSOILS BELOW THE TOPSOIL LAYER SHALL BE SCARIFIED TO 4" WITH SOME INCORPORATION OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS. (THE INTENT IS TO PROVIDE A LOOSE PLANTING MEDIUM WITH TOTAL DEPTH OF LOOSENED SOIL THAT VARIES BASED ON THE SUBGRADE AND PREVIOUS LAND USE TYPE. SEE SOIL PREPARATION SPECIFICATIONS 32-9400 (UNLESS OTHERWISE NOTED ON THE LANDSCAPE PLANS).
  - TOPSOIL AND LOOSENED SUBSOIL DEPTH OF 12" AS SHOWN IN IMAGE TO LEFT IS MINIMUM AND IS REQUIRED TO BE GREATER THAN 12" WHEN PREVIOUS/EXISTING SUBGRADE IS EITHER COMPACTED, GLACIAL TILL, CLAY, OR PURE GRAVEL OR PIT-RUN.
  - COMPOST OR OTHER MATERIAL USED FOR SOIL AMENDMENTS (ORGANIC MATTER CONTENT) SHALL BE "COMPOSTED MATERIALS" IN WAC 173-350-220. THE COMPOST MUST ALSO HAVE ORGANIC MATTER CONTENT 35% TO 65% AND A CARBON TO NITROGEN RATIO BELOW 25:1 OR 35:1.



## BMP T5.13 POST-CONSTRUCTION SOIL QUALITY AND DEPTH

NTS



2.3.2026

SVCA ROAD REPAIR NOAS 2026

DETAILS-1

SUDDEN VALLEY  
WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

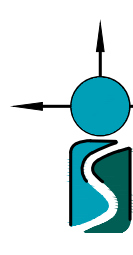
PROJECT NUMBER:  
25055

DESIGNED/DRAWN BY:  
ABB

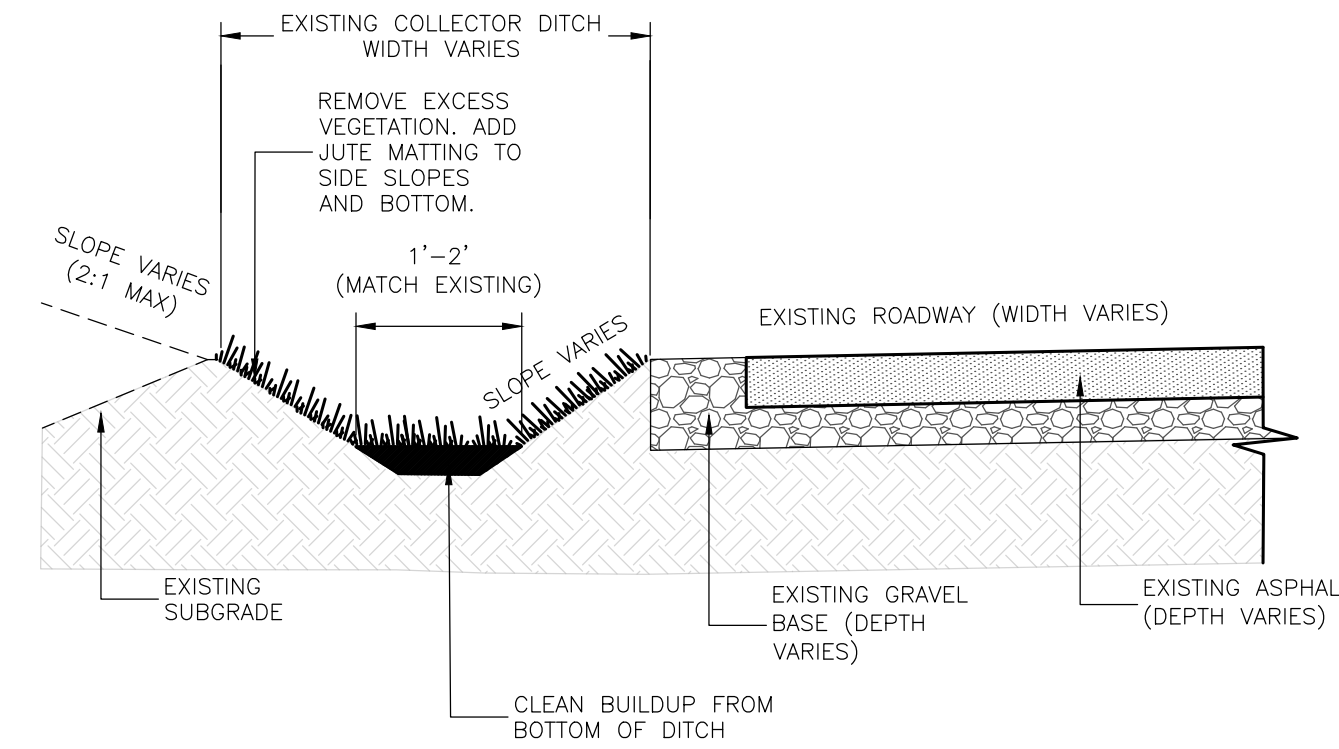
CHECKED BY:  
SIG

ISSUE DATE:  
2.3.2026

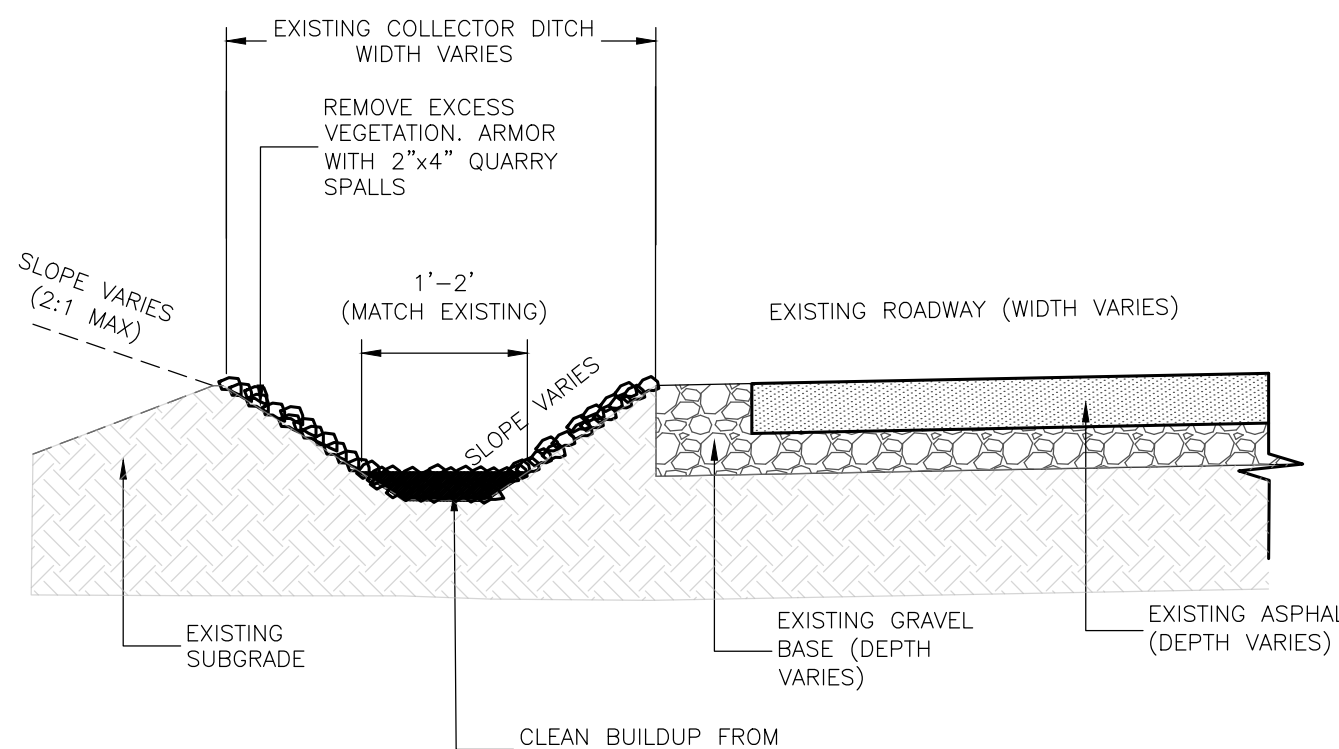
C8  
OF:  
C1-C9



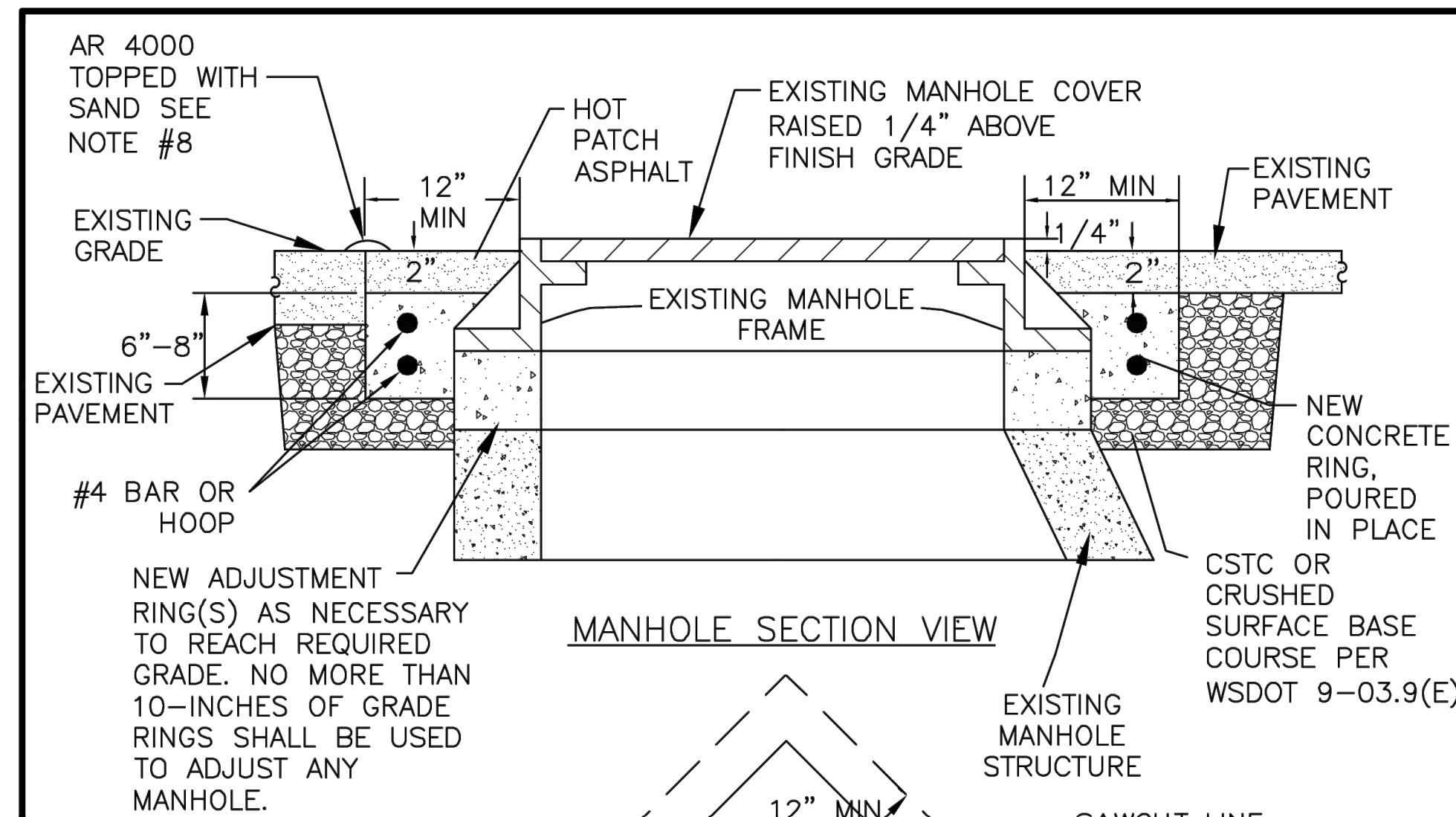
# SUDDEN VALLEY MAINTENANCE NOA'S



**DITCH CLEANING TYPE 1**  
NOT TO SCALE

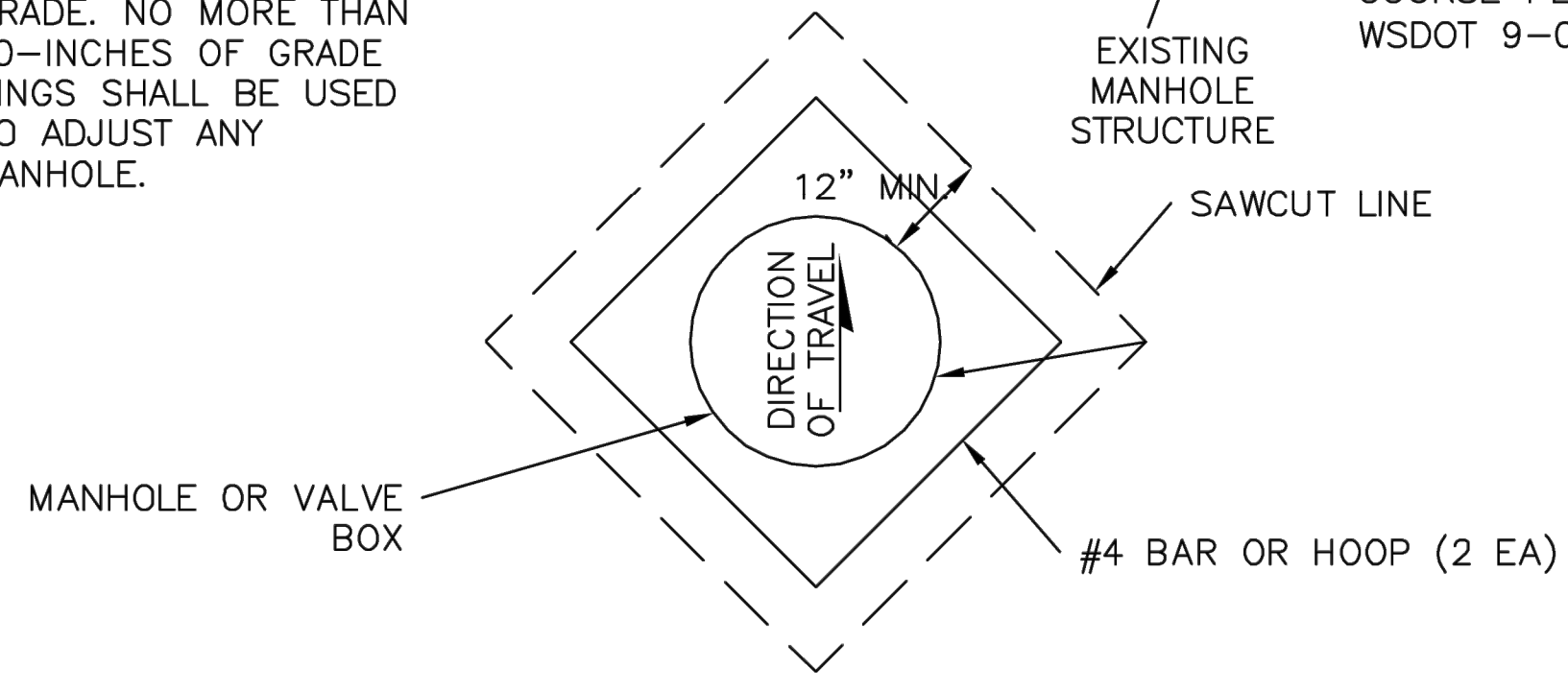


**DITCH CLEANING TYPE 2**  
NOT TO SCALE



NEW ADJUSTMENT RING(S) AS NECESSARY TO REACH REQUIRED GRADE. NO MORE THAN 10-INCHES OF GRADE RINGS SHALL BE USED TO ADJUST ANY MANHOLE.

**MANHOLE SECTION VIEW**



**PLAN VIEW**

**Notes**

1. All manhole frames and covers shall be removed, cleaned and raised to finished grade.
2. Cut the asphalt or remove shoulder ballast in a diamond pattern around the structure casting to be adjusted (with minimum 12-inches between casting and saw-cut line).
3. Remove the fill material within the cut pavement or shoulder area to 8 inches below finish grade, or to expose adjustment ring.
4. Place the casting at the finish grade.
5. Casting shall be placed so that the smooth edge diamond pattern is oriented with the flow of traffic.
6. All joints shall be grouted with material conforming to WSDOT 9-20.3(2).
7. Place Portland Cement Concrete to within the top 2 inches of finish grade.
8. Apply tack to the structure casting, cut pavement, and PC concrete.
9. Place and compact 2 inches hot mix asphalt patch to finish grade.
10. Seal pavement joints with hot AR4000 and top with sand.

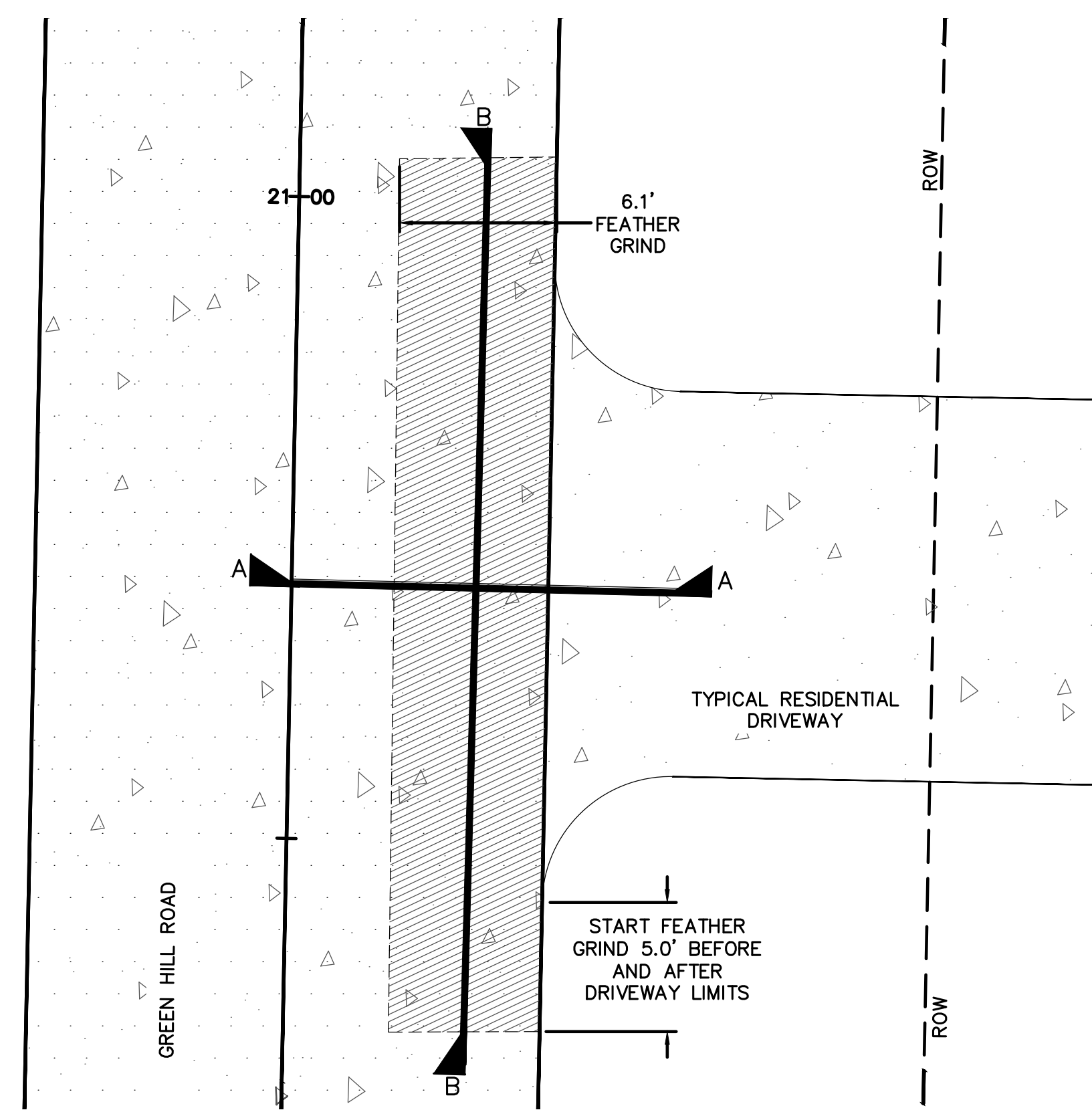


MANHOLE RIM & VALVE BOX RE-ADJUSTMENT

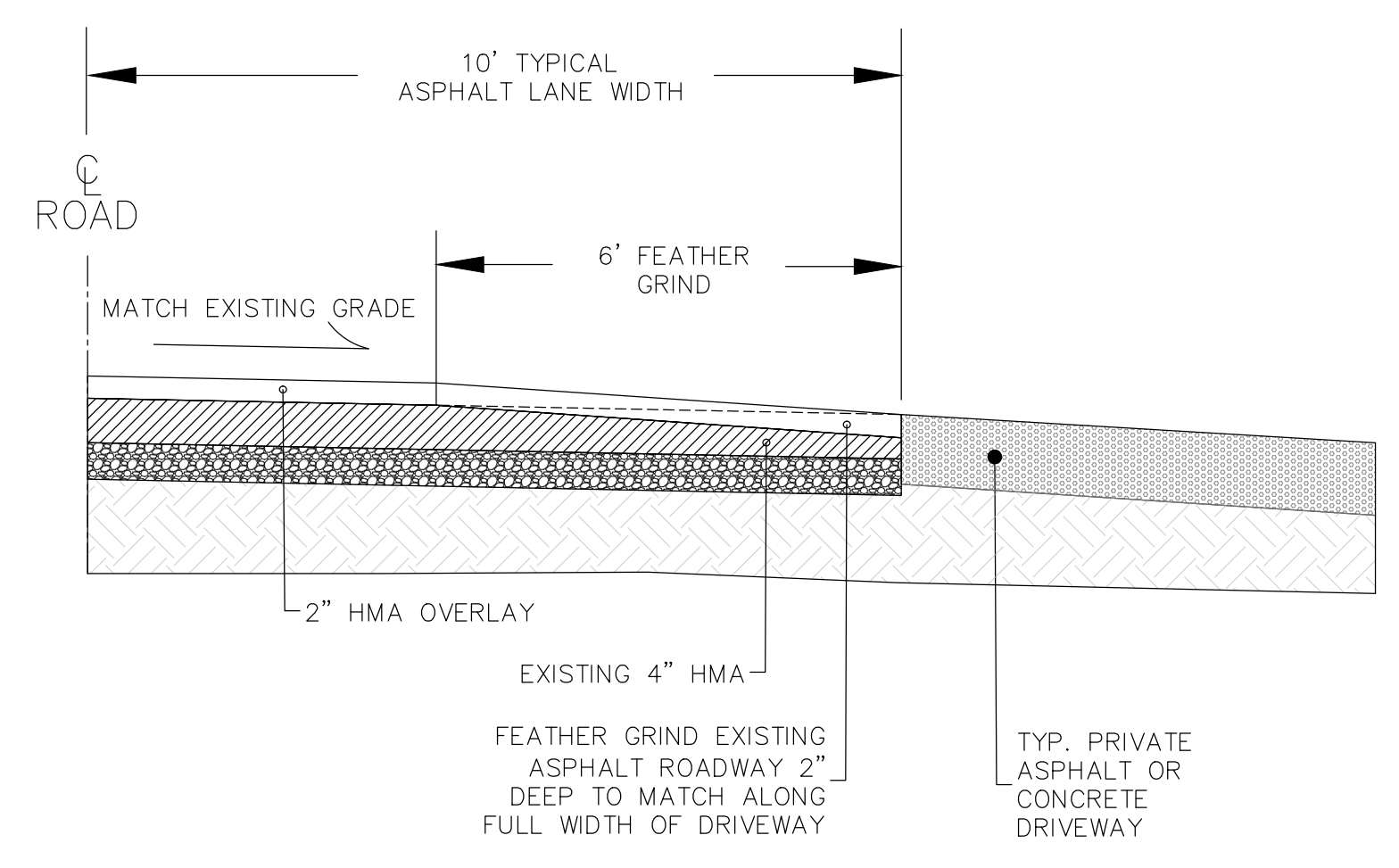
STANDARD DETAIL

**S19**

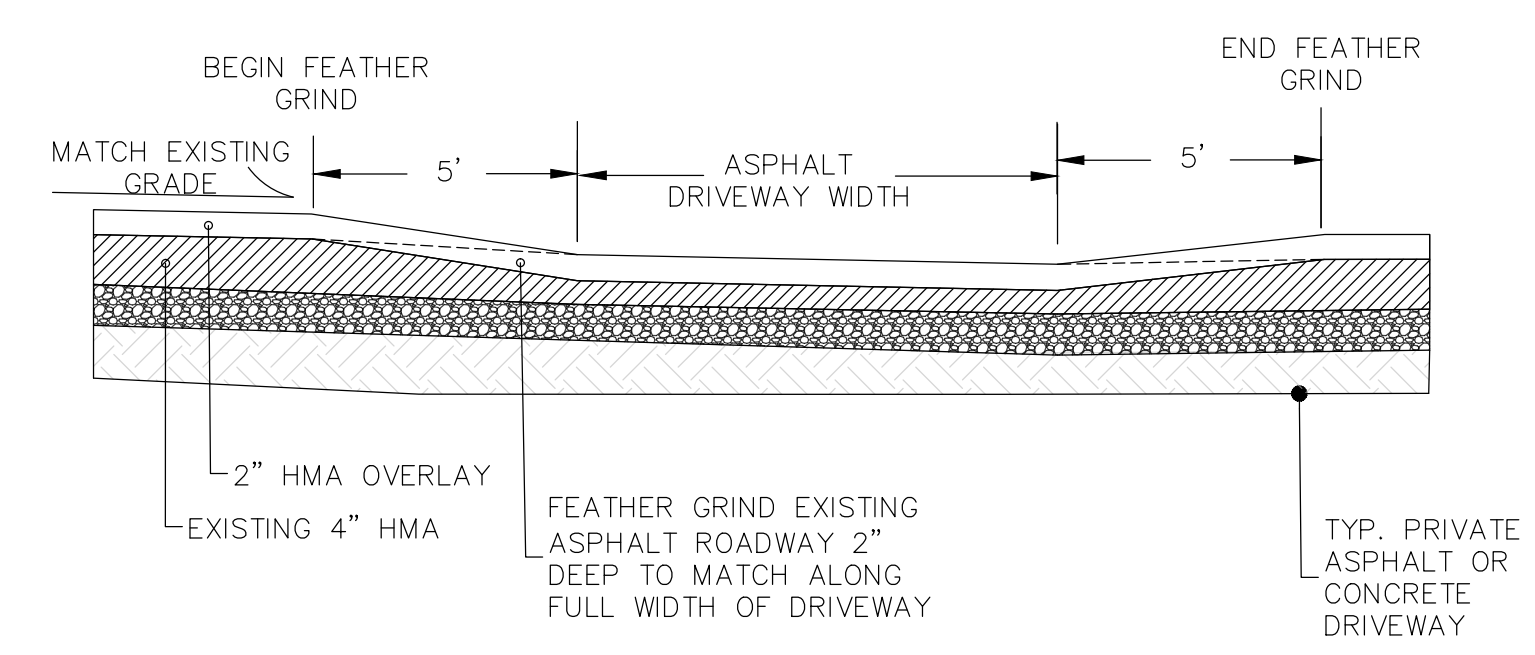
3/11/2020



**ASPHALT OVERLAY FEATHER GRIND AT DRIVEWAYS PLAN VIEW**  
1"=5'



**ASPHALT OVERLAY FEATHER GRIND AT DRIVEWAYS SECTION A-A**  
NOT TO SCALE



**ASPHALT OVERLAY FEATHER GRIND AT DRIVEWAYS SECTION B-B**  
NOT TO SCALE



2.3.2026

**SVCA ROAD REPAIR NOAS 2026  
DETAILS-2**

**SUDDEN VALLEY  
WHATCOM COUNTY, WASHINGTON**

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
**25055**

DESIGNED/DRAWN BY:  
**ABB**

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**SIG**

ISSUE DATE:  
**2.3.2026**

**C9**  
OF:  
**C1-C9**

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# SUDDEN VALLEY MAINTENANCE NOA'S



## CONTACT INFORMATION:

**CLIENT**  
 PNW SERVICES, INC.  
 PO BOX 30498  
 BELLINGHAM, WA 98228  
 425-954-9614

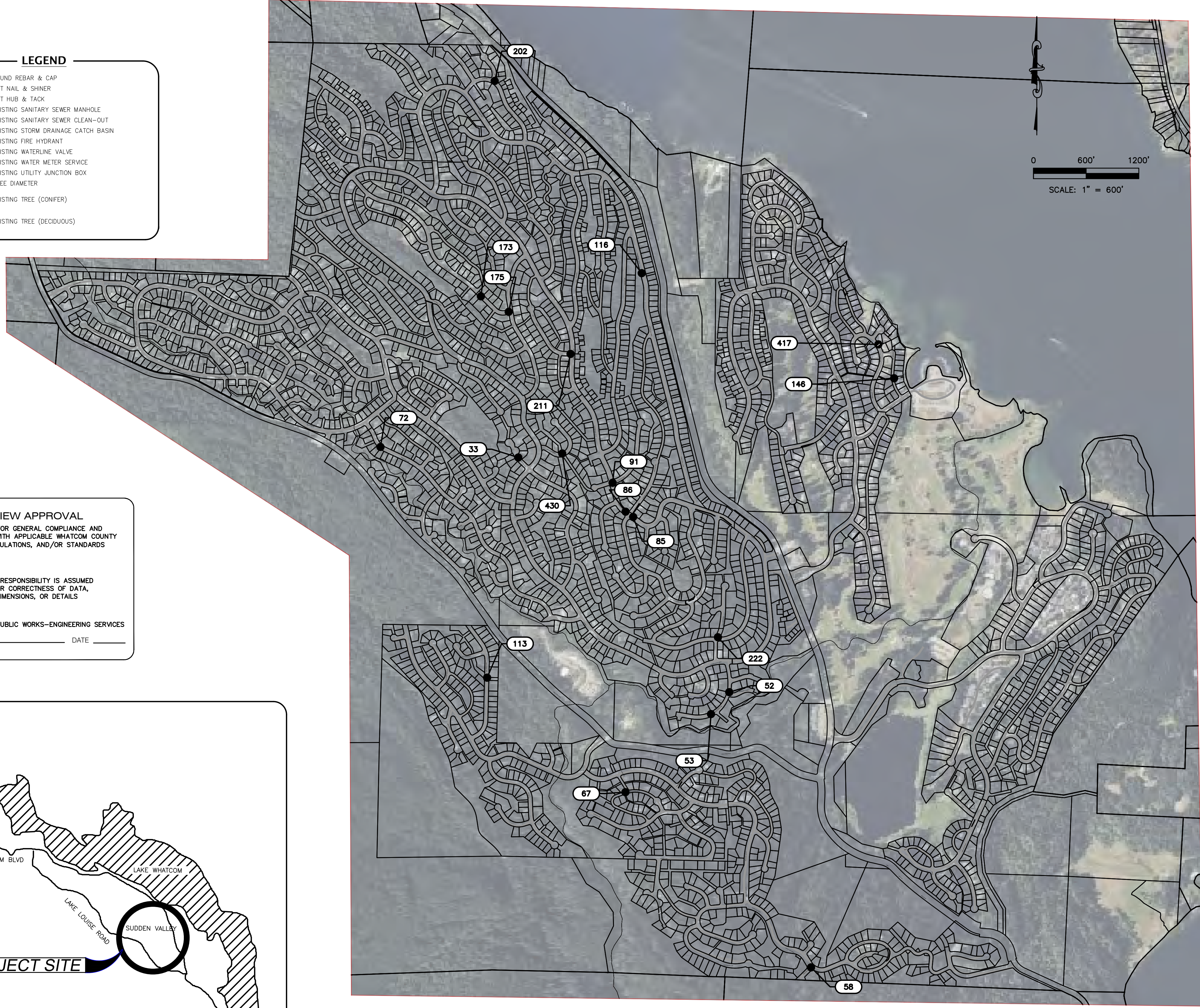
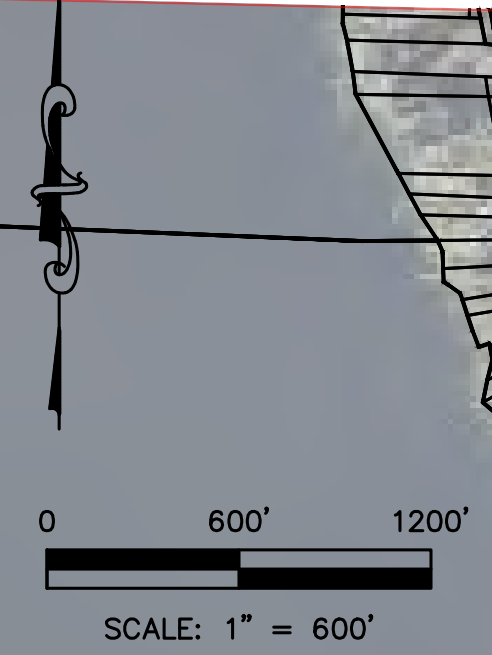
**ENGINEER**  
 SCOTT GOODALL, P.E.  
 IMPACT DESIGN, LLC  
 5426 BARRETT ROAD  
 SUITE A103  
 FERNDALE, WA 98248  
 (360) 389-8138  
 SCOTT@BOLD-IMPACT.COM

## SHEET INDEX:


- C1 COVER SHEET
- C2 NOA DESCRIPTIONS
- C3 KEYMAP
- C4 SITE PLAN-1
- C5 SITE PLAN-2
- C6 SITE PLAN-3
- C7 SITE PLAN-4
- C8 SITE PLAN-5
- C9 SITE PLAN-6
- C10 SITE PLAN-7
- C11 SITE PLAN-8
- C12 SITE PLAN-9
- C13 SITE PLAN-10
- C14 SITE PLAN-11
- C15 SITE PLAN-12
- C16 SITE PLAN-13
- C17 SITE PLAN-14
- C18 SITE PLAN-15
- C19 SITE PLAN-16
- C20 DETAILS
- C21 DETAILS (NEW)
- C22 DETAILS (OLD)

## LEGEND

- FOUND REBAR & CAP
- SET NAIL & SHINER
- SET HUB & TACK
- EXISTING SANITARY SEWER MANHOLE
- ⊙ EXISTING SANITARY SEWER CLEAN-OUT
- EXISTING STORM DRAINAGE CATCH BASIN
- ⊕ EXISTING FIRE HYDRANT
- ⊗ EXISTING WATERLINE VALVE
- ⊘ EXISTING WATER METER SERVICE
- ⊚ EXISTING UTILITY JUNCTION BOX
- 12" ∅ TREE DIAMETER
- ★ EXISTING TREE (CONIFER)
- EXISTING TREE (DECIDUOUS)



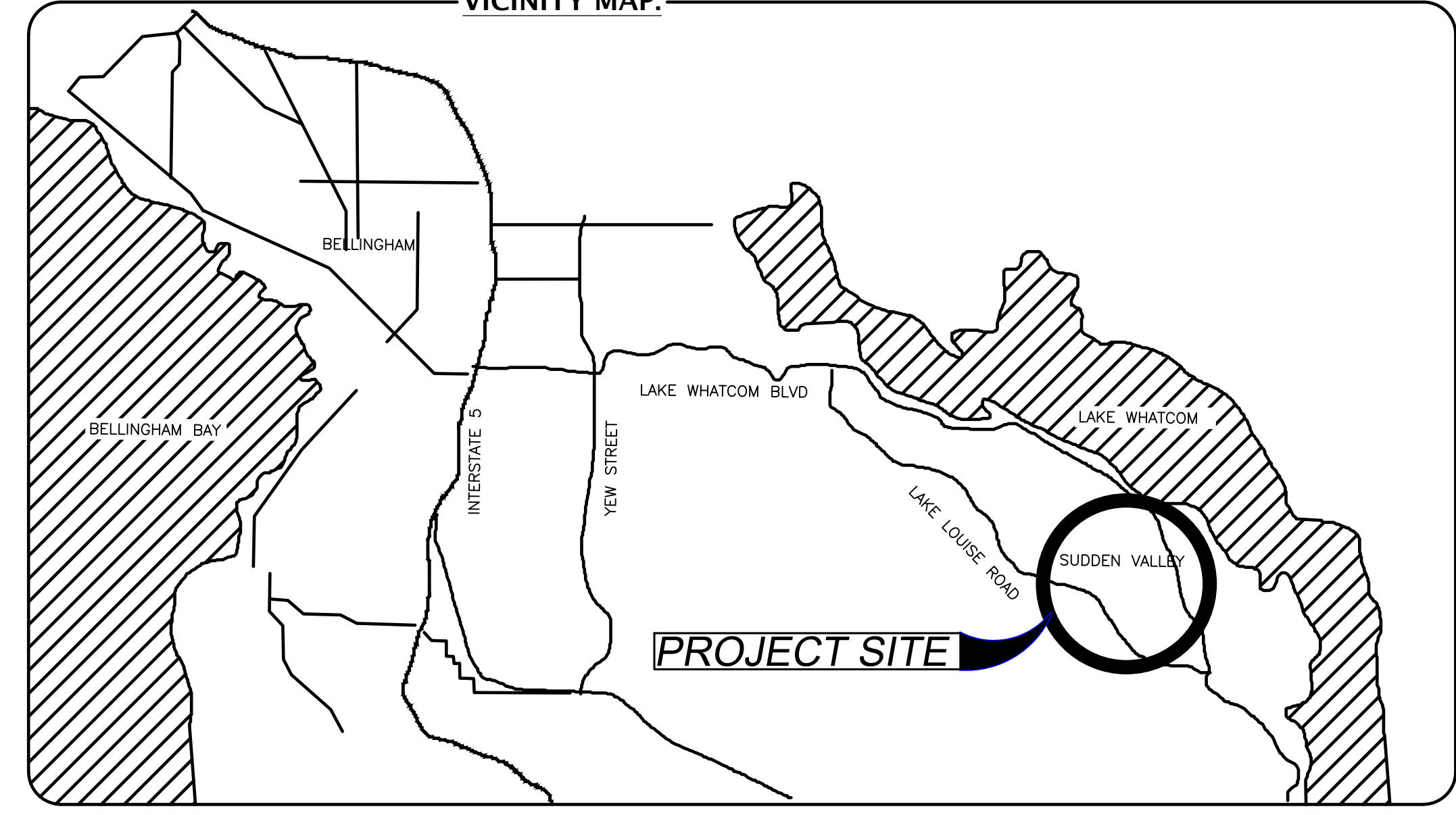
**REVIEW APPROVAL**  
 REVIEW IS FOR GENERAL COMPLIANCE AND  
 CONSISTENCY WITH APPLICABLE WHATCOM COUNTY  
 CODES, REGULATIONS, AND/OR STANDARDS


 NO RESPONSIBILITY IS ASSUMED  
 FOR CORRECTNESS OF DATA,  
 DIMENSIONS, OR DETAILS

DEPARTMENT OF PUBLIC WORKS-ENGINEERING SERVICES

BY \_\_\_\_\_ DATE \_\_\_\_\_

## VICINITY MAP:



1.19.2026

**SVCA CULVERT MAINTENANCE NOA'S**  
**COVER SHEET**  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
**25013**

DESIGNED/DRAWN BY:  
**ABB**

CHECKED BY:  
**SIG**

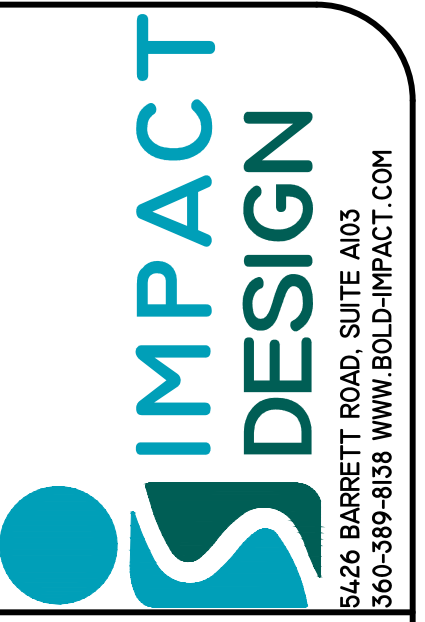
ISSUE DATE:  
**1.19.2026**

**C1**  
 OF:  
**C1-C20**

OVERVIEW

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2026 MAINTENANCE NOA DESCRIPTIONS



1.19.2026

SVCA CULVERT MAINTENANCE NOA'S  
NOA DESCRIPTIONS  
SUDDEN VALLEY  
WHATCOM COUNTY, WASHINGTON

General Information		Site Information				Culvert Details								
Culvert ID	Zone Number	Road Name	Approximate Address	Nearest Intersection	Distance and Direction to Nearest Intersection	Culvert Length (ft.)	Culvert Diameter (in.)	Culvert Material	Culvert Material (NEW)	Repair Material	Size of Repair (SF)	Driveway/Roadway	SHEET NUMBER	Stream Name
33	Zone 3A	Holly View Way	35 Holly View Way	Sudden Valley Dr	100ft/Southerly	24	12	CMP	CPP	Asphalt	60	ROAD	C13	N/A
52	Zone 3A	Austin Ck Ln	7 Austin Ck Ln	Newberry Ct	at Intersection	25	12	CMP	CPP	Asphalt	75	ROAD	C17	N/A
53	Zone 3A	Austin Ck Ln	20 Austin Creek Ln	Sudden Valley Dr	.1m/Northerly	16	12	CMP	CPP	Asphalt	111	ROAD	C17	N/A
58	Zone 5	Louis View Dr	1 Catkin Ct	Catkin Ct	200ft/Northerly	16	12	CMP	CPP	Asphalt	60	ROAD	C20	N/A
67	Zone 5	Sweetclover Cir	12 Sweetclover Cir	Rosebud Pl	at Intersection	16	12	Inlet-Concrete Pipe/Outlet-CMP	CPP	Asphalt	36	ROAD	C18	N/A
72	Zone 9	Honeycomb Ln	12 Honeycomb Ln	Polo Park Dr	250ft/Northerly	26	12	CMP/CPP	CPP	Asphalt	66	ROAD	C12	N/A
85	Zone 3D	Sudden Valley Dr	46 Sudden Valley Dr	Rocky Ridge Dr	at Intersection	30	12	CMP	CPP	Asphalt	78	ROAD	C14	N/A
86	Zone 3D	Sudden Valley Dr	50 Sudden Valley Dr	Rocky Ridge Dr	at Intersection	36	12	CMP	CPP	Asphalt	111	ROAD	C14	N/A
91	Zone 3D	Inglewood Pl	8 Inglewood Pl	Sudden Valley Dr	at Intersection	36	12	CMP	CPP	Asphalt	96	ROAD	C14	N/A
113	Zone 5	Pinto Creek Ln	19 Pinto Creek Ln	Appaloosa Ct	250ft/Northerly	28	18	HDPE	24" CPP	Asphalt	48	ROAD	C16	Un-named Crk
116	Zone 3D	Harbor View Dr	87 Harbor View Dr	Cascade Ln	.1m/Northerly	26	18	CMP	CPP	Asphalt	66	ROAD	C7	N/A
146	Zone 1	Spinnaker Ln	6 Spinnaker Ln	Marina Dr	200ft/Southerly	20	12	CMP/CPP	CPP	Asphalt	48	ROAD	C10	N/A
173	Zone 3B	Highwood Cir	10 Stable Ln	Stable Ln	at Intersection	46	12	CPP/CMP	CPP	Asphalt	120	ROAD	C6	N/A
175	Zone 3B	Stable Ln	1 Stable Ln	Lost Fork Ln	at Intersection	40	12	CMP	CPP	Asphalt	105	ROAD	C6	N/A
202	Zone 3C	Plum Ln	1 Autumn Vista Pl	Autumn Vista Pl	at Intersection	21	12	CMP	CPP	Asphalt	51	ROAD	C5	N/A
211	Zone 3C	Basin View Cir	93B Sudden Valley Dr	Sudden Valley Dr	at Intersection	40	12	CMP	CPP	Asphalt	105	ROAD	C11	N/A
222	Zone 3A	Ridge Crest Way	6 Ridge Crest Way	Valley Crest Way	at Intersection	45	12	CMP	CPP	Asphalt	120	ROAD	C15	N/A
417	Zone 1	Longshore Ln	20 Longshore Ln	Spinnaker Ln	75ft/Southerly	24	12	Green PVC/CMP	CPP	Asphalt	54	ROAD	C9	N/A
430	Zone 3A	Berrywood Pl	5 Berrywood Pl	Sudden Valley Dr	200ft/Northerly	22	12	CMP	CPP	Asphalt	51	ROAD	C13	N/A

REV	DATE	DESCRIPTION

PROJECT NUMBER:  
25013  
DESIGNED/DRAWN BY:  
ABB  
CHECKED BY:  
SIG  
ISSUE DATE:  
1.19.2026

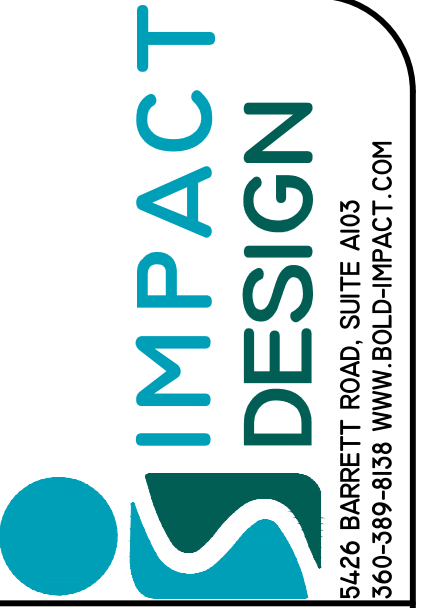
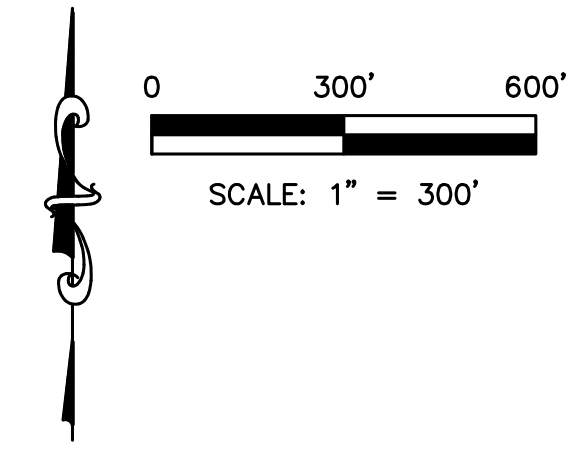
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C1-C20

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**SUDDEN VALLEY MAINTENANCE NOA'S**  
**SITE PLAN-1**

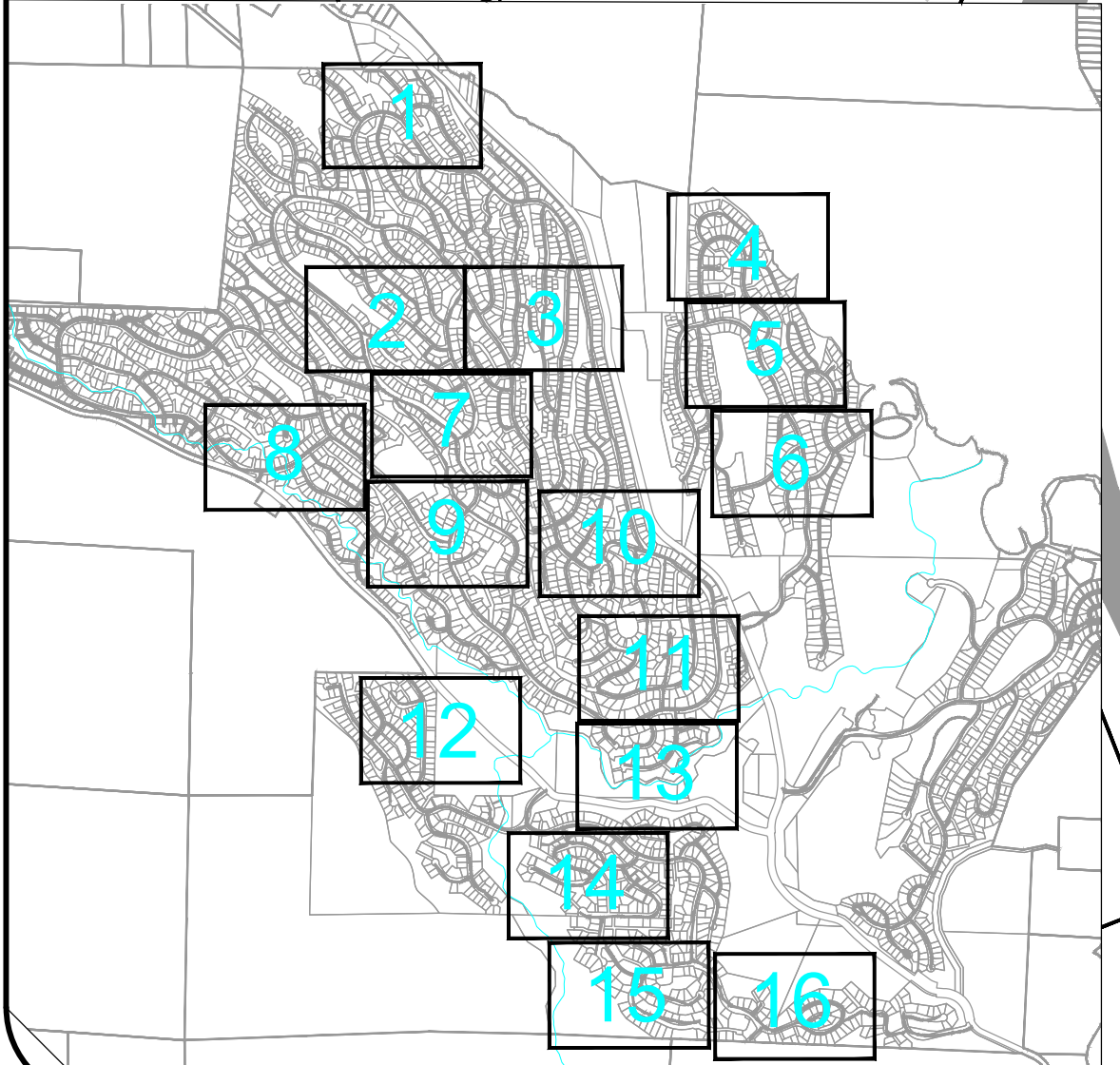


1.19.2026

**SVCA CULVERT MAINTENANCE NOA'S**  
**SITE PLAN-1**  
CULVERT 202  
SUDDEN VALLEY  
WHATCOM COUNTY, WASHINGTON



CULVERT 202:  
ZONE 3C  
REMOVE AND REPLACE 33 LF OF EXISTING  
FAILING 12"Ø CMP. ROADWAY CULVERT.  
WITH 12"Ø CPP. MATCH EXISTING INVERT  
ELEVATIONS. PROVIDE PIPE END TREATMENT  
AS PER STANDARD DETAIL. BACKFILL WITH  
CRUSHED SURFACING TOP COURSE AND  
GRAVEL PIPE BEDDING PER DETAIL.  
RESTORE EXISTING ROADWAY SURFACE PER  
STANDARD DETAIL.



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REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
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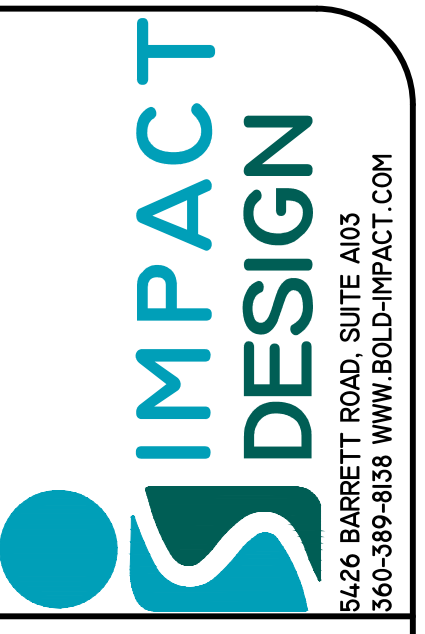
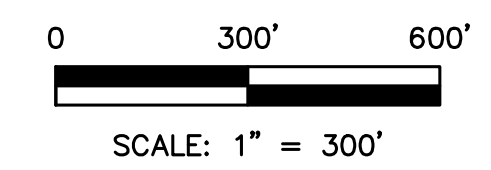
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**SIG**

ISSUE DATE:  
**1.19.2026**

**C4**  
OF:  
**C1-C20**

**SUDDEN VALLEY MAINTENANCE NOA'S**  
**SITE PLAN-2**



1.19.2026

**SVCA CULVERT MAINTENANCE NOA'S**  
**SITE PLAN-2**  
 CULVERT 173, 175.1, 175.2  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

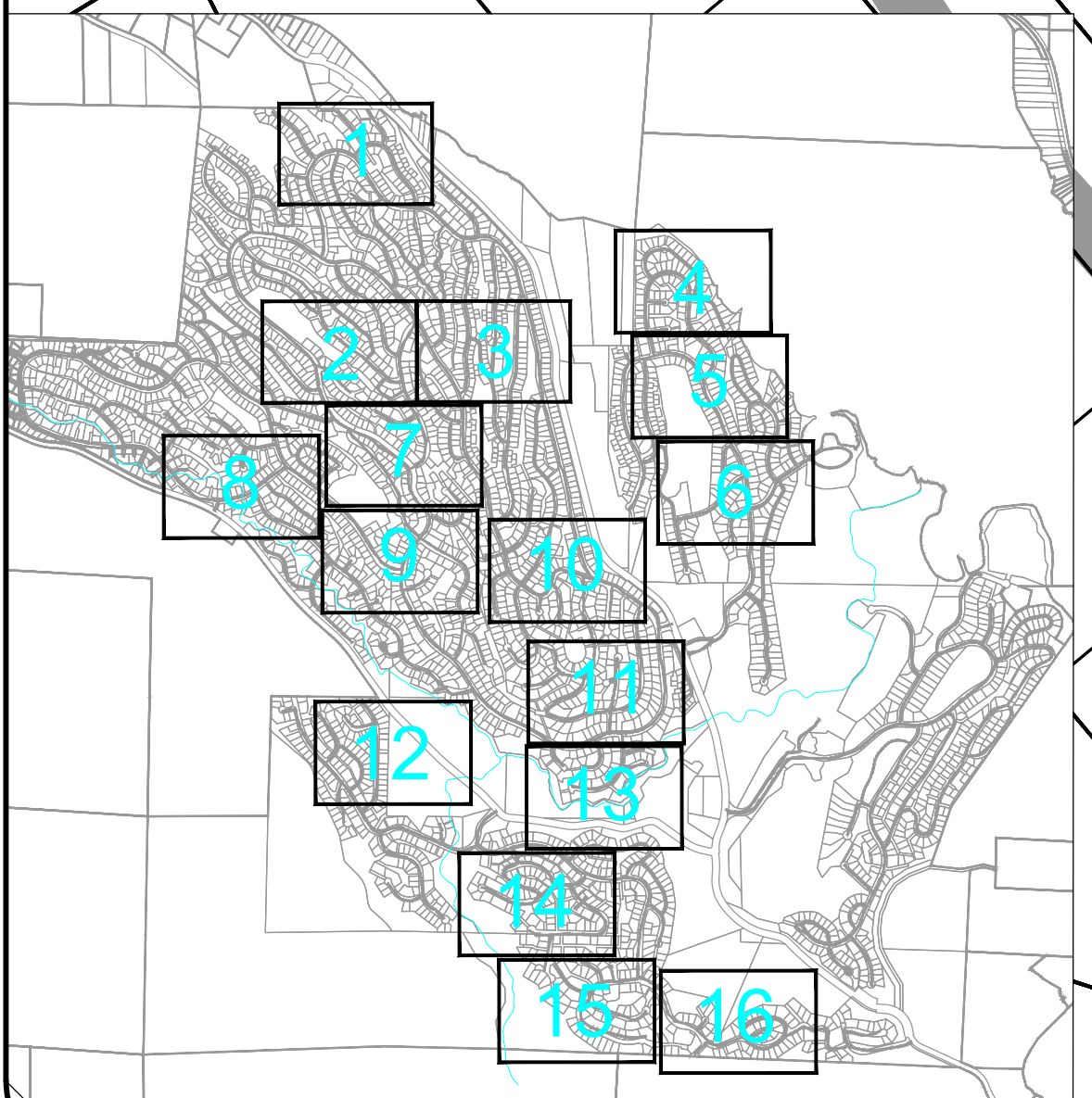
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PROJECT NUMBER:  
25013  
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ABB  
 CHECKED BY:  
SIG  
 ISSUE DATE:  
1.19.2026

C5  
 OF:  
 C1-C20

**CULVERT 173:**  
 ZONE 3B  
 REMOVE AND REPLACE 46 LF OF EXISTING FAILING 12"Ø CMP/CPP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.

**CULVERT 175:**  
 ZONE 3B  
 REMOVE AND REPLACE 52 LF OF EXISTING FAILING 12"Ø CMP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.

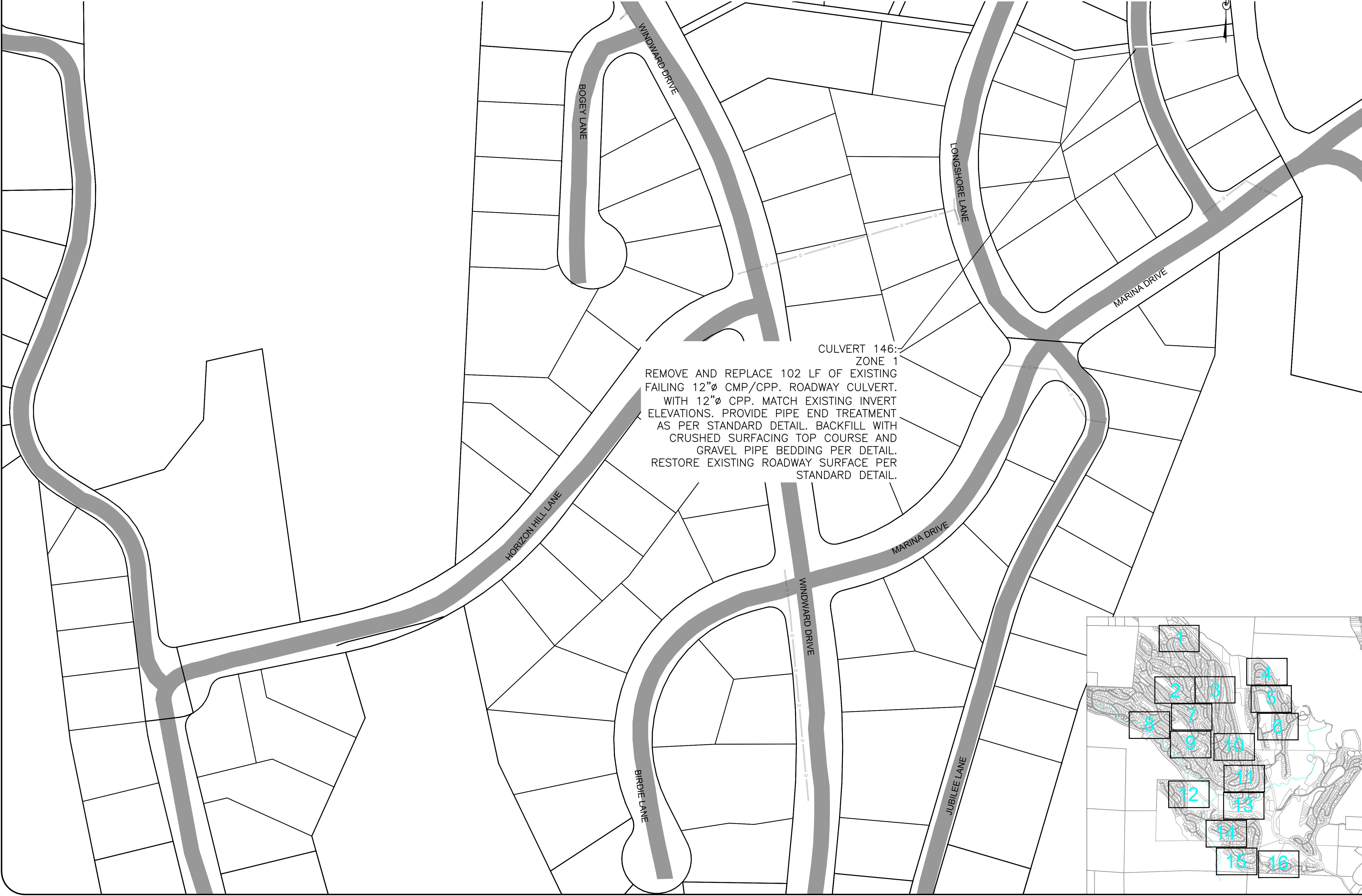
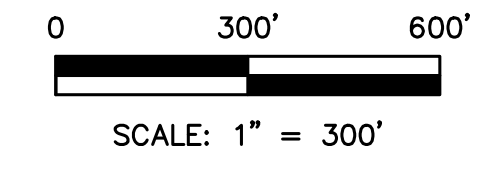


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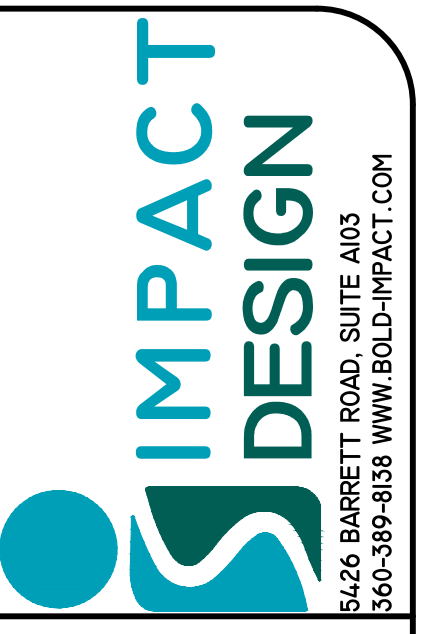
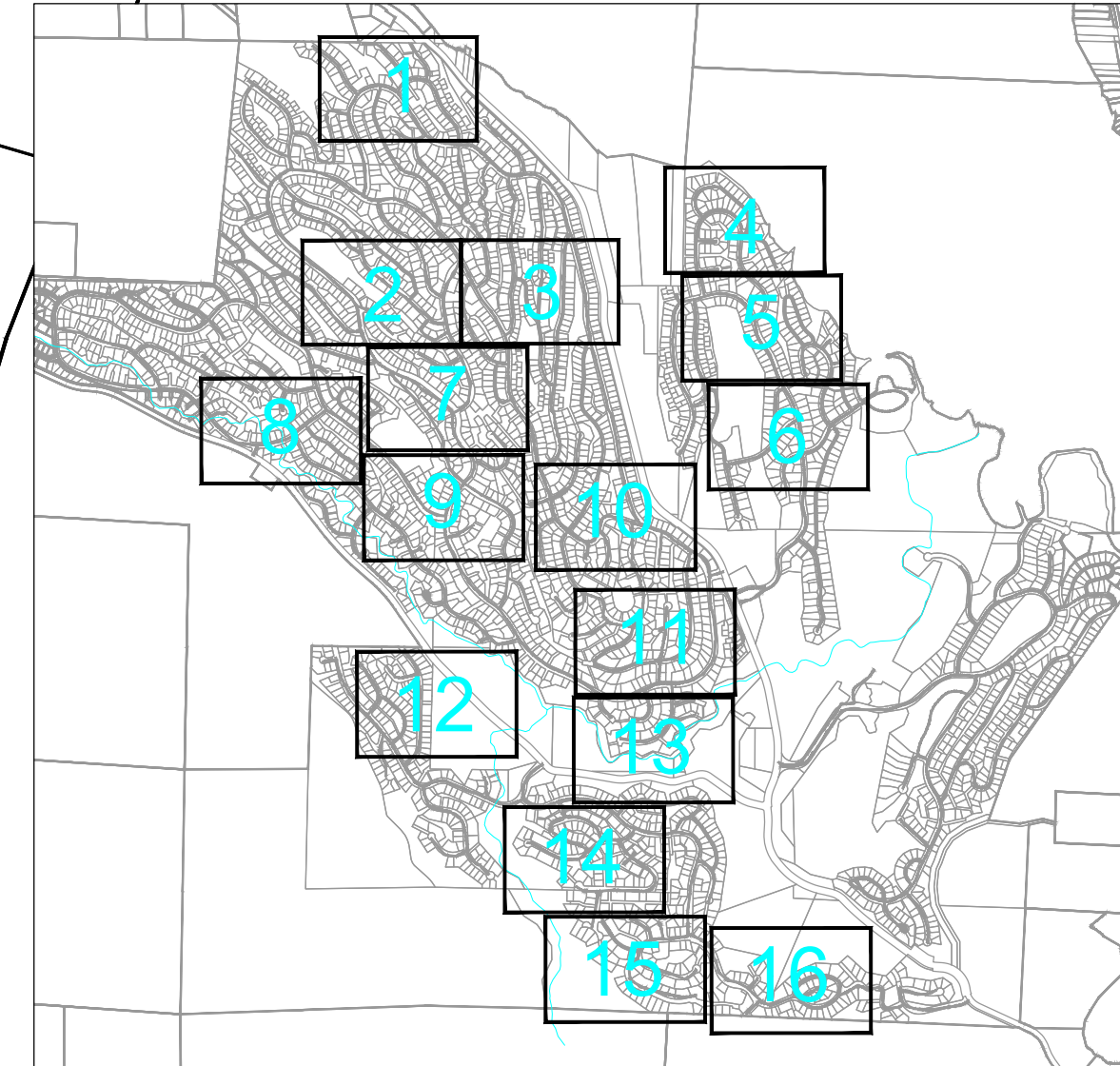




**SUDDEN VALLEY MAINTENANCE NOA'S**  
**SITE PLAN-5**



CULVERT 146:  
 ZONE 1  
 REMOVE AND REPLACE 102 LF OF EXISTING FAILING 12"Ø CMP/CPP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.



1.19.2026

SVCA CULVERT MAINTENANCE NOA'S  
 SITE PLAN-5  
 CULVERT 146  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
25013

DESIGNED/DRAWN BY:  
ABB

CHECKED BY:  
SIG

ISSUE DATE:  
1.19.2026

C8  
OF:  
C1-C20

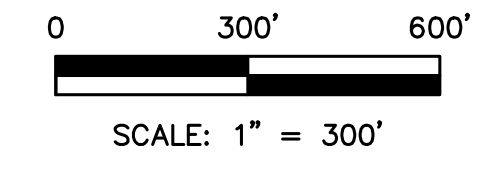
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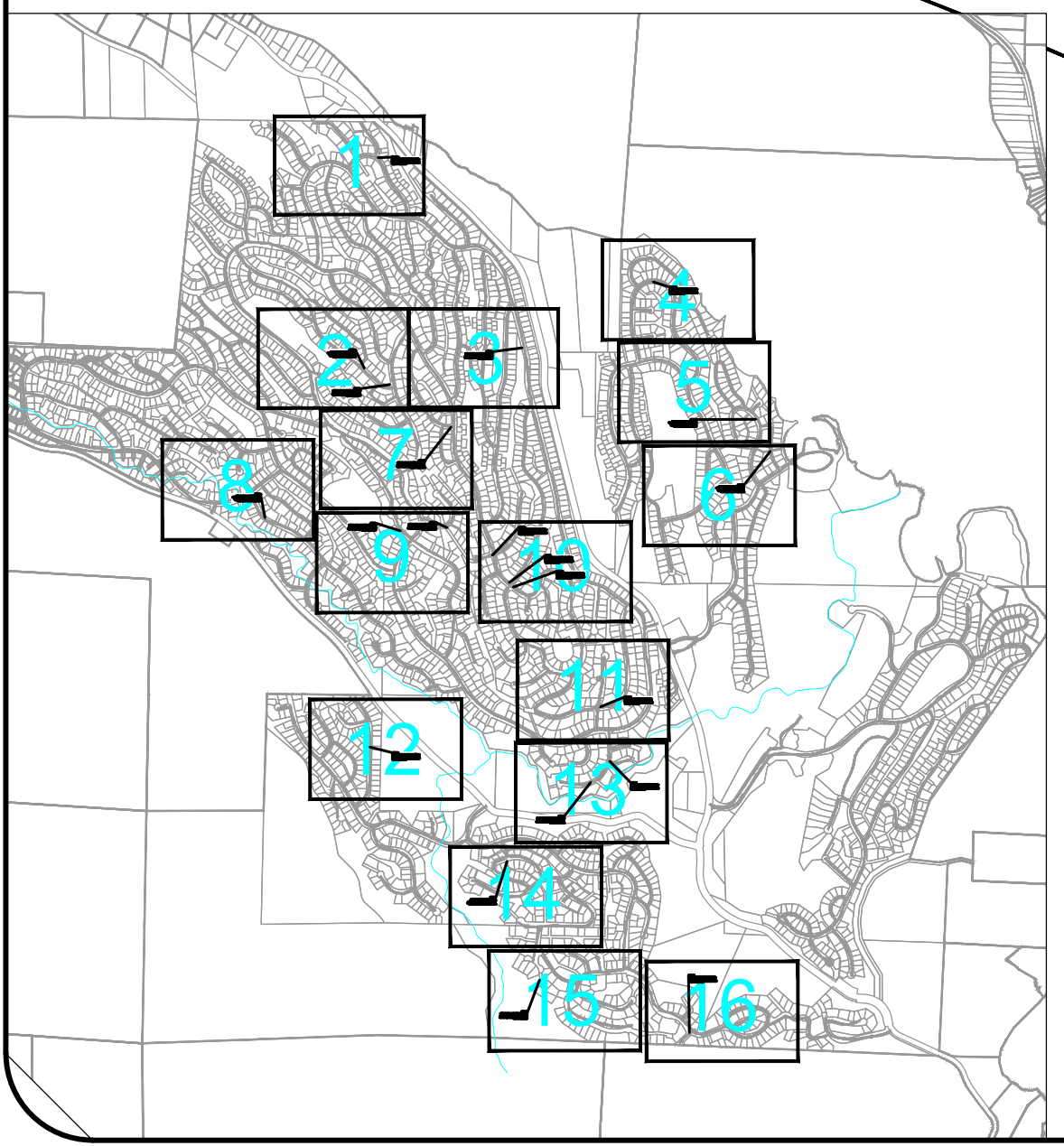


# SUDDEN VALLEY MAINTENANCE NOA'S

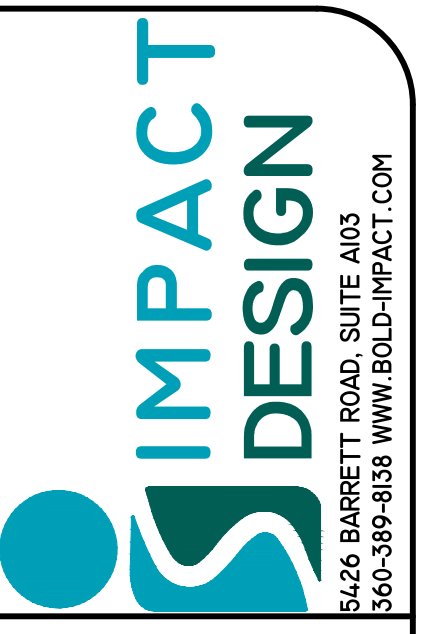
## SITE PLAN-7



CULVERT 72:  
 ZONE 9  
 REMOVE AND REPLACE 34 LF OF EXISTING FAILING 12"Ø CMP/CPP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.



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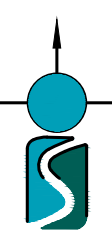
SVCA CULVERT MAINTENANCE NOA'S  
 SITE PLAN-7  
 CULVERT 72  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER: 25013  
 DESIGNED/DRAWN BY: ABB  
 CHECKED BY: SIG  
 ISSUE DATE: 1.19.2026

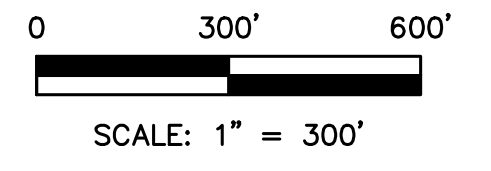
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 OF: C1-C20





# SUDDEN VALLEY MAINTENANCE NOA'S

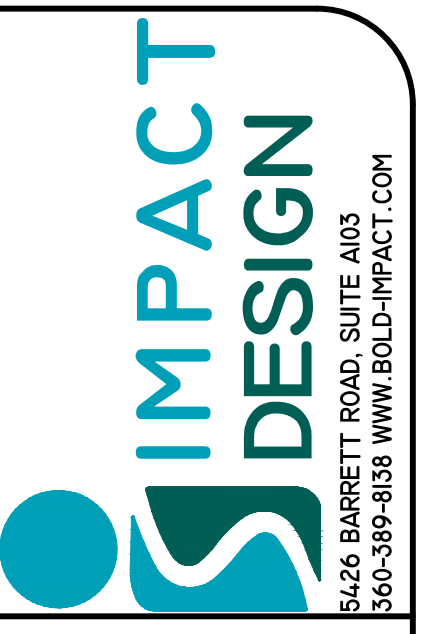
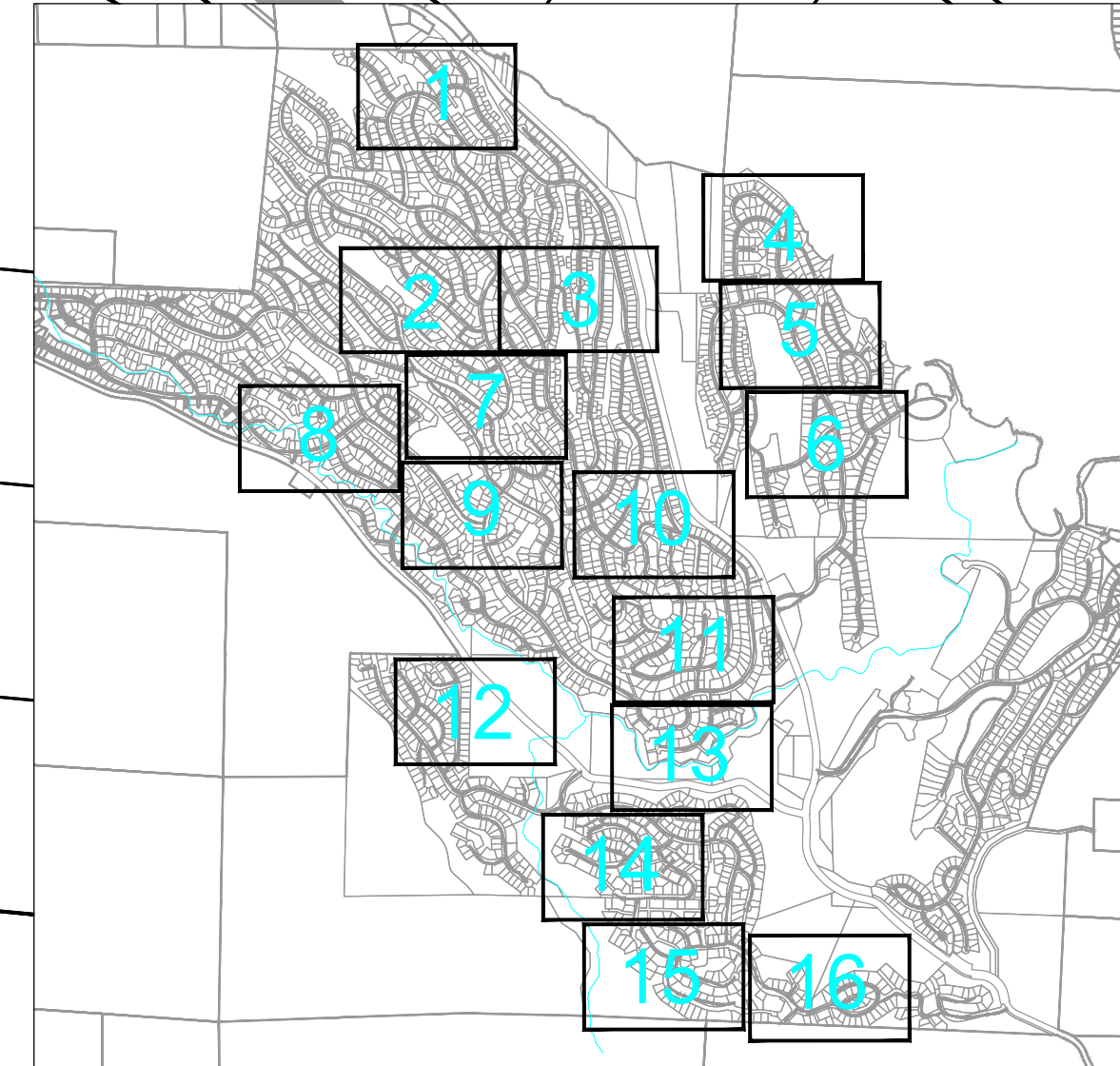
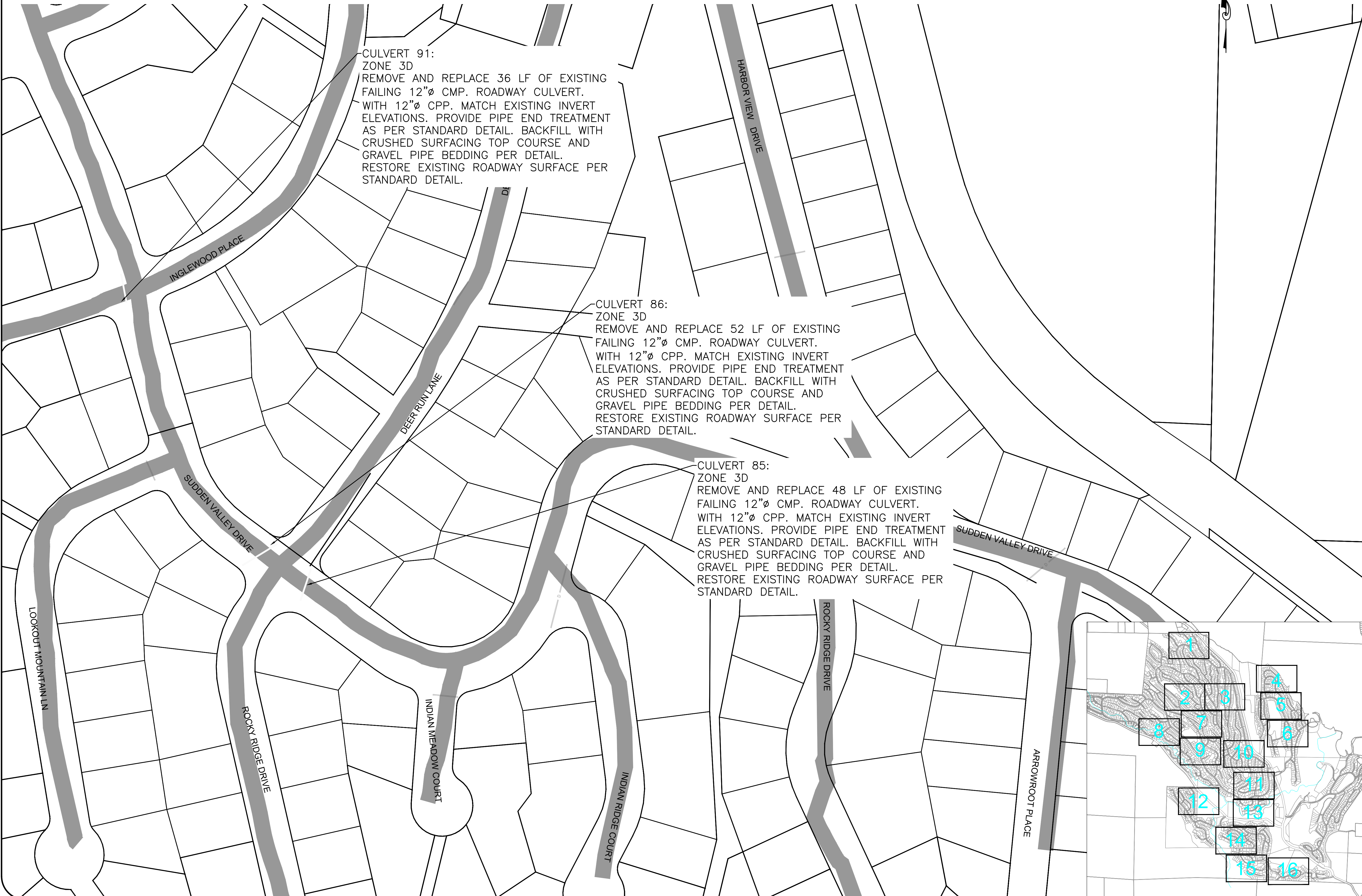
## SITE PLAN-9



CULVERT 91:  
 ZONE 3D  
 REMOVE AND REPLACE 36 LF OF EXISTING FAILING 12"Ø CMP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.

CULVERT 86:  
 ZONE 3D  
 REMOVE AND REPLACE 52 LF OF EXISTING FAILING 12"Ø CMP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.

CULVERT 85:  
 ZONE 3D  
 REMOVE AND REPLACE 48 LF OF EXISTING FAILING 12"Ø CMP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.



1.19.2026

SVCA CULVERT MAINTENANCE NOA'S  
 SITE PLAN-9  
 CULVERT 91, 86, 85  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

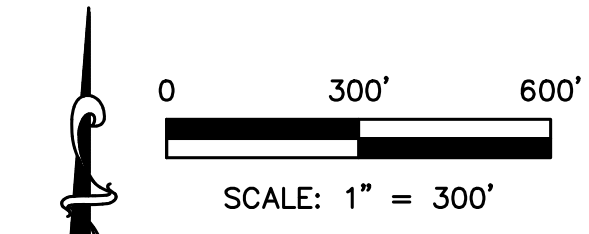
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PROJECT NUMBER: 25013  
 DESIGNED/DRAWN BY: ABB  
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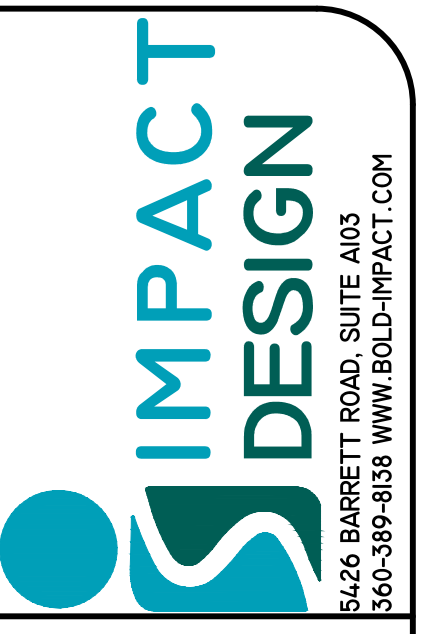
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 OF: C1-C20

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**SUDDEN VALLEY MAINTENANCE NOA'S**  
**SITE PLAN-10**



**CULVERT 222:**  
 ZONE 3A  
 REMOVE AND REPLACE 57 LF OF EXISTING FAILING 12"Ø CMP. ROADWAY CULVERT. WITH 12"Ø CPP. MATCH EXISTING INVERT ELEVATIONS. PROVIDE PIPE END TREATMENT AS PER STANDARD DETAIL. BACKFILL WITH CRUSHED SURFACING TOP COURSE AND GRAVEL PIPE BEDDING PER DETAIL. RESTORE EXISTING ROADWAY SURFACE PER STANDARD DETAIL.



1.19.2026

**SVCA CULVERT MAINTENANCE NOA'S**  
**SITE PLAN-10**  
 CULVERT 50, 222  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER: 25013  
 DESIGNED/DRAWN BY: ABB  
 CHECKED BY: SIG  
 ISSUE DATE: 1.19.2026

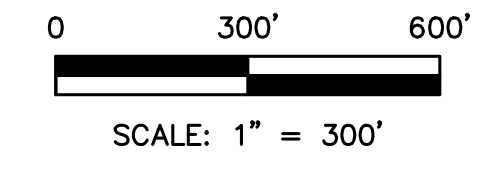
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**SUDDEN VALLEY MAINTENANCE NOA'S**  
**SITE PLAN-13**



1.19.2026

**SVCA CULVERT MAINTENANCE NOA'S**  
**SITE PLAN-13**  
 CULVERT 67  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
25013

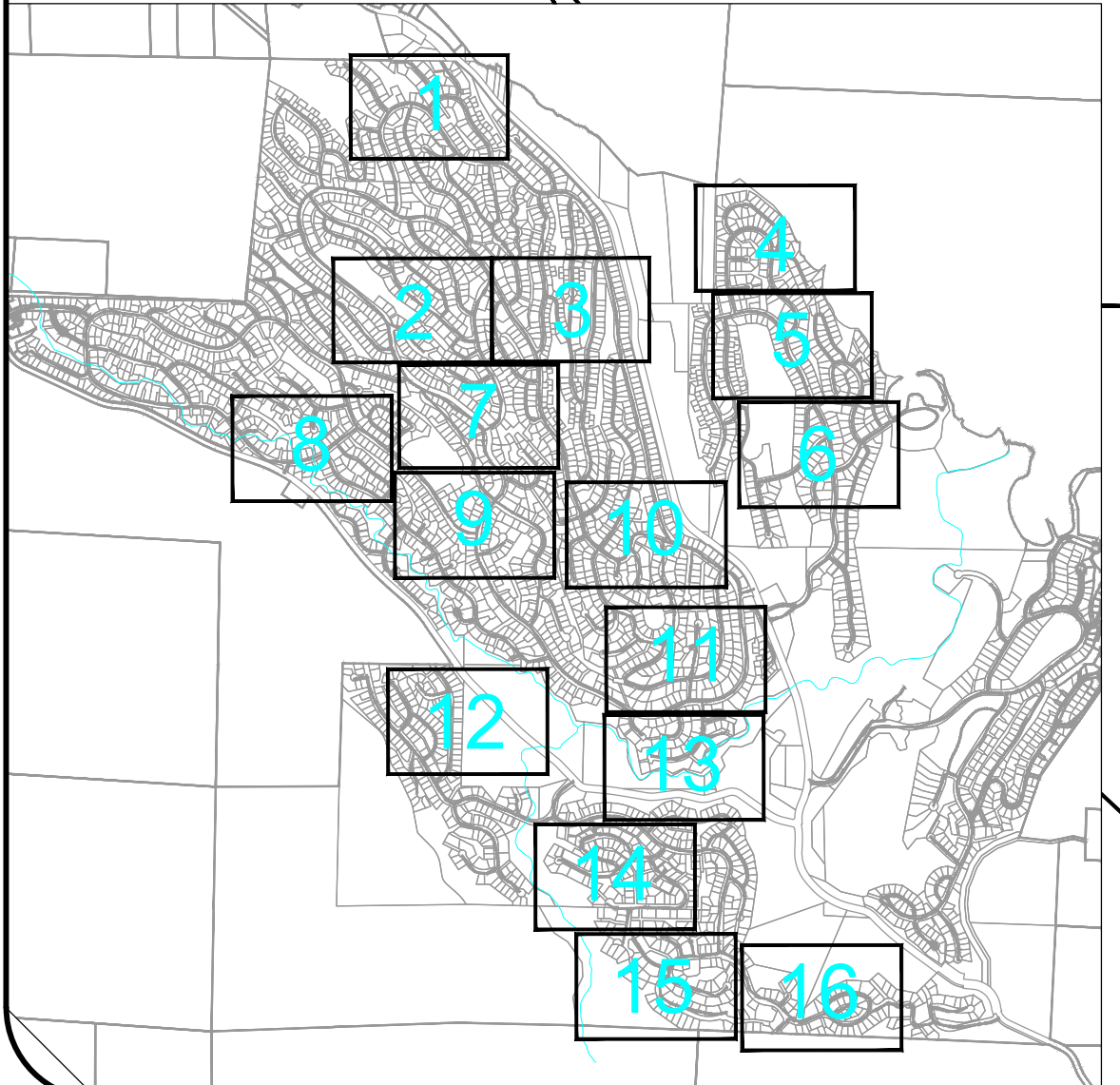
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CHECKED BY:  
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ISSUE DATE:  
1.19.2026

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OF:  
C1-C20

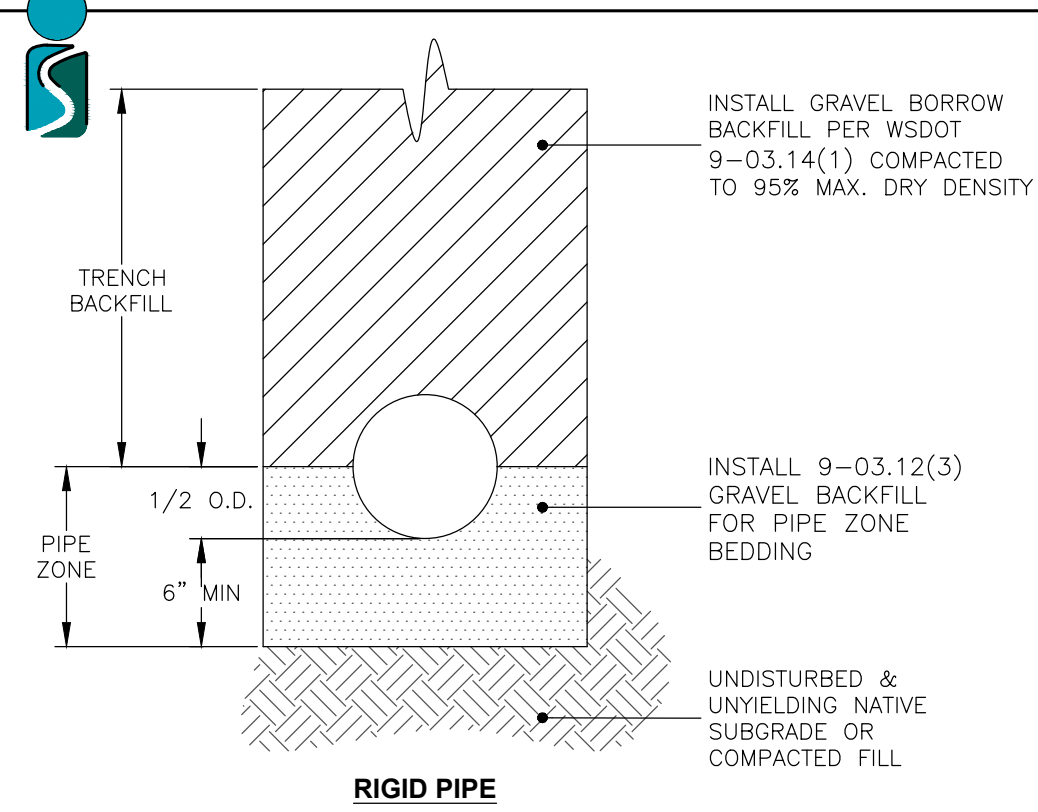
CULVERT 67:-  
 ZONE 5  
 REMOVE AND REPLACE 20 LF OF EXISTING  
 FAILING 12"Ø CONCRETE PIPE/CMP.  
 ROADWAY CULVERT. WITH 12"Ø CPP. MATCH  
 EXISTING INVERT ELEVATIONS. PROVIDE PIPE  
 END TREATMENT AS PER STANDARD DETAIL.  
 BACKFILL WITH CRUSHED SURFACING TOP  
 COURSE AND GRAVEL PIPE BEDDING PER  
 DETAIL. RESTORE EXISTING ROADWAY  
 SURFACE PER STANDARD DETAIL.



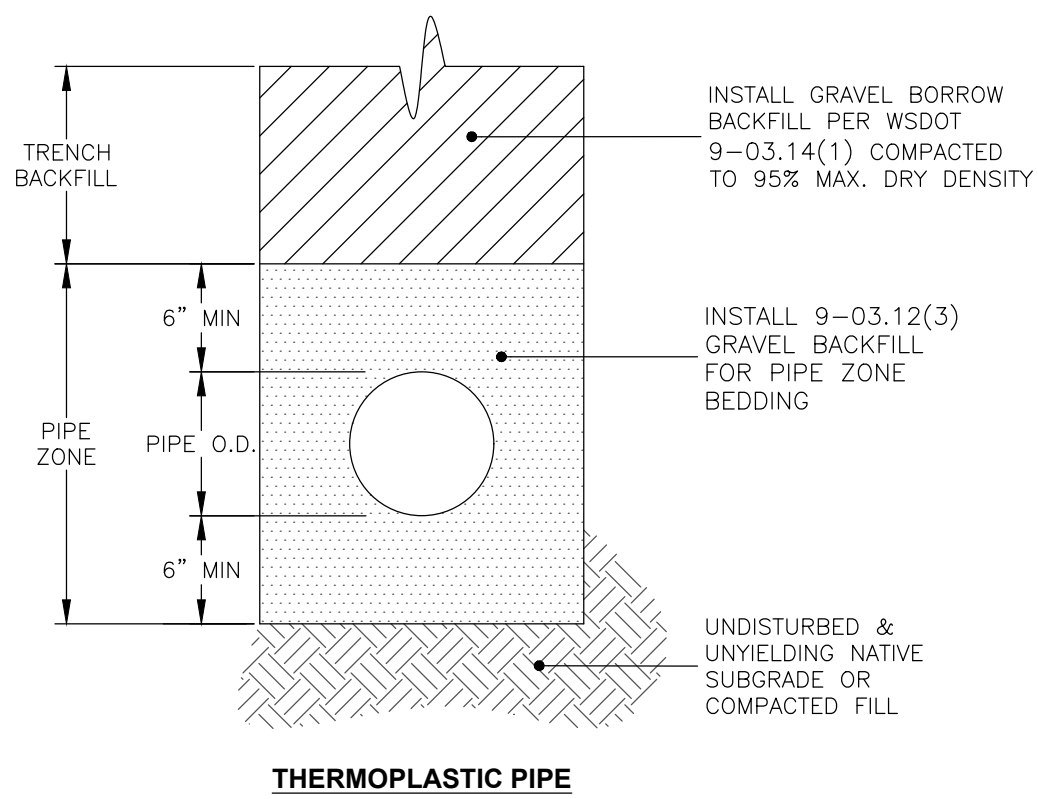
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# SUDDEN VALLEY MAINTENANCE NOA'S



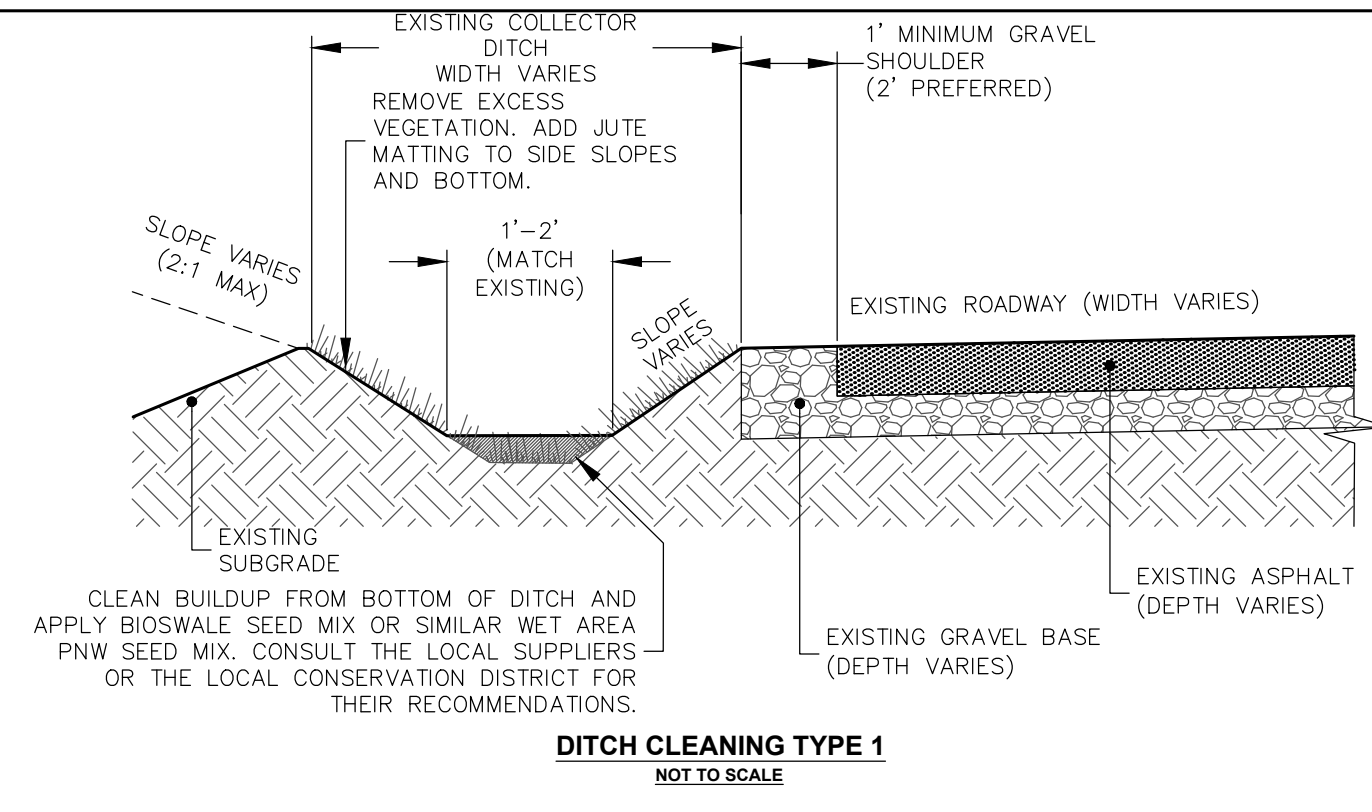
RIGID PIPE



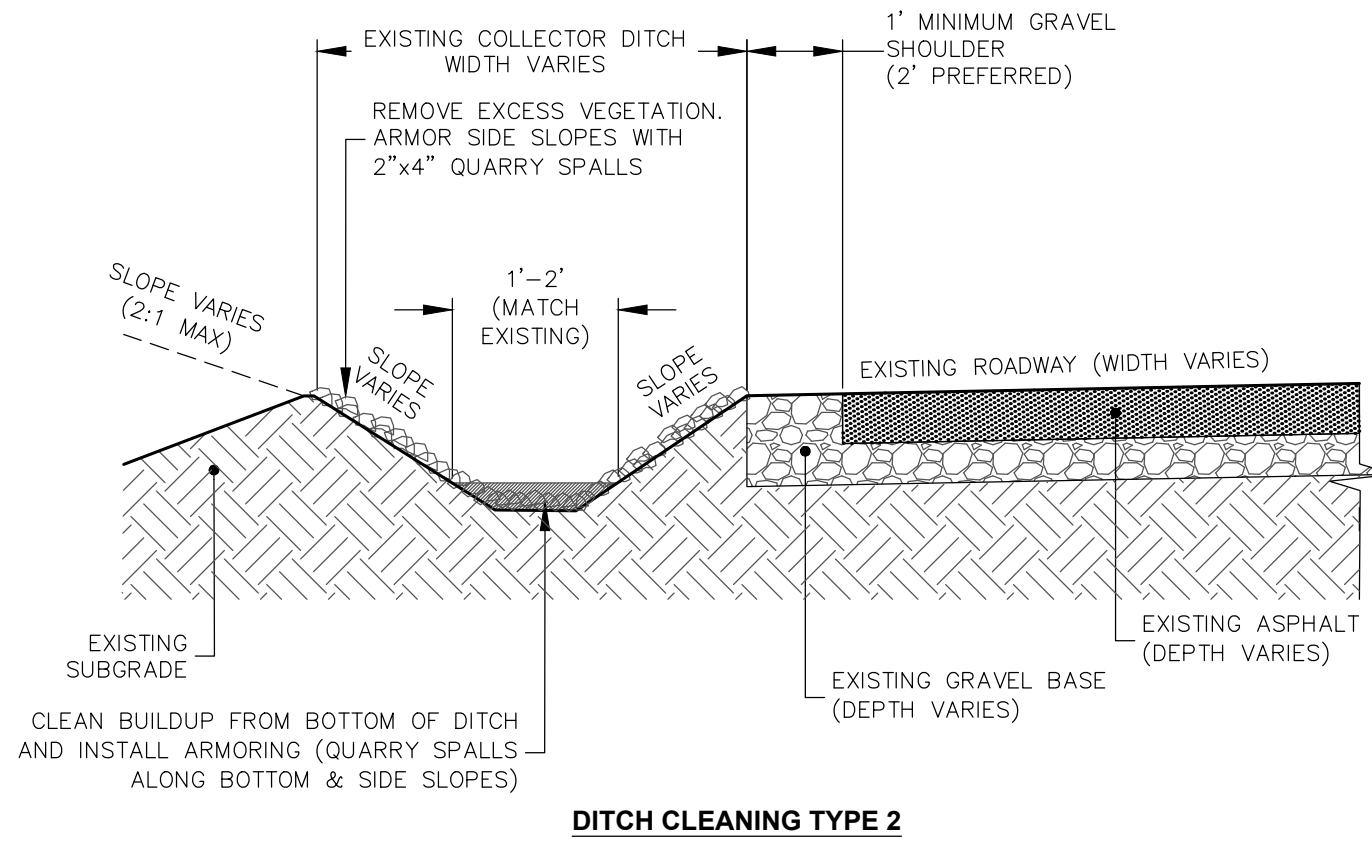
THERMOPLASTIC PIPE

## PIPE BEDDING & BACKFILL SPECIFICATIONS

NTS



DITCH CLEANING TYPE 1  
NOT TO SCALE



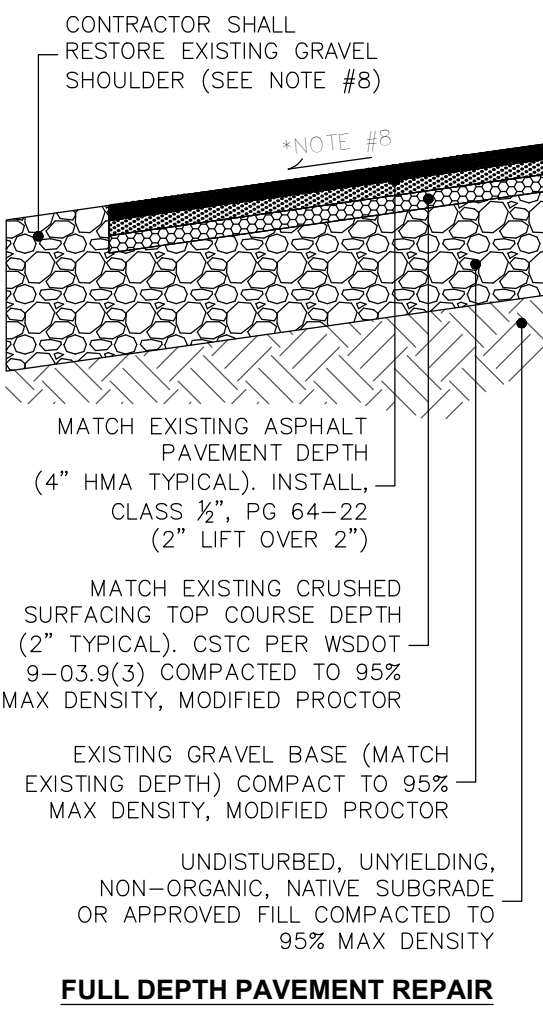
DITCH CLEANING TYPE 2

## DITCH MAINTENANCE

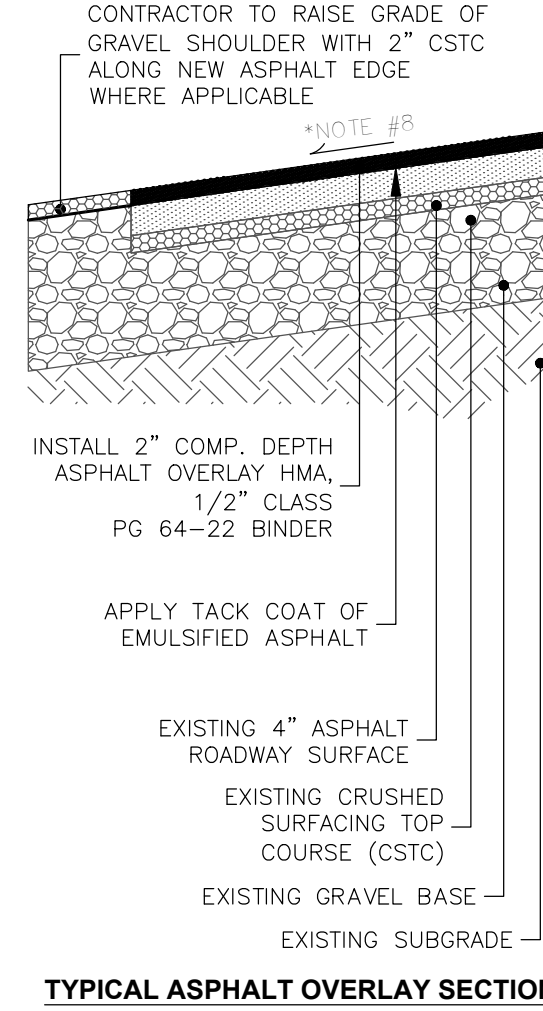
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## ASPHALT PAVEMENT REPLACEMENT & MAINTENANCE NOTES:

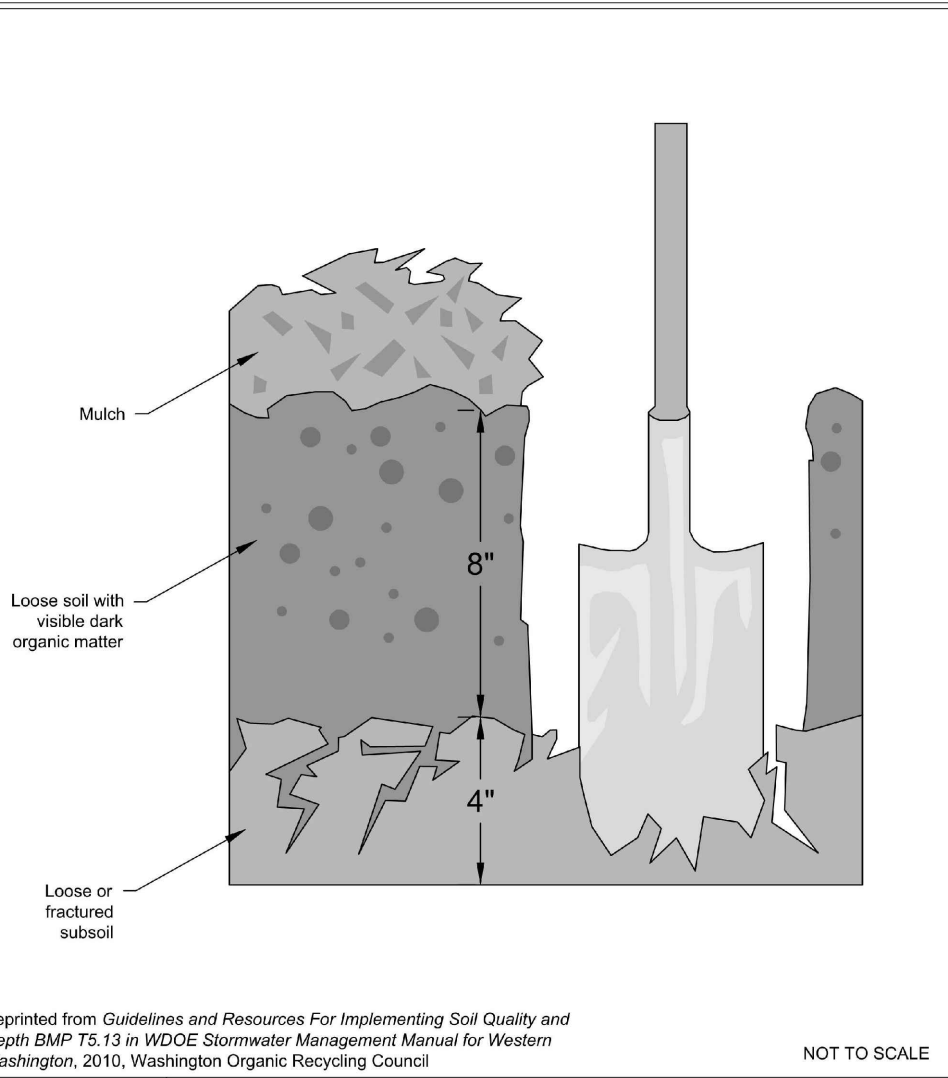
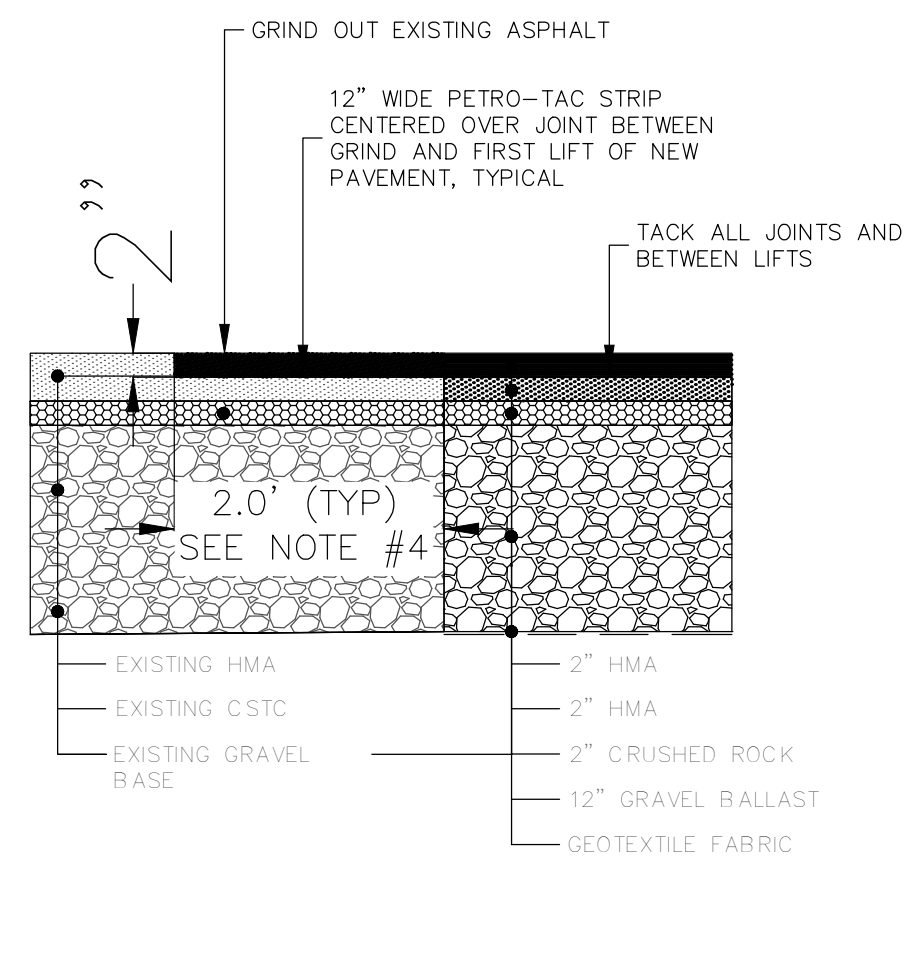
- ALL DEPTHS REPRESENT COMPACTED THICKNESSES.
- ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE PREVISIONS OF APWA "STANDARD SPECIFICATIONS" AND SHALL CONFORM TO THE REQUIREMENTS OF WHATCOM COUNTY ENGINEER DEPARTMENT.
- AN EQUIVALENT ASPHALT TREATED BASE MAY BE SUBSTITUTED FOR THE GRAVEL BASE AND CRUSHED ROCK UPON APPROVAL OF THE COUNTY ENGINEER.
- PROVIDE/APPLY GRIND AND PETRO-TAC DETAIL AT TRANSITION FROM EXISTING ROADWAY SURFACE TO THE OVERLAY SURFACE. THE GRIND AND PETRO-TAC SHALL BE 5' MINIMUM OR GREATER BASED ON EXTENT OF GRIND BACK INTO EXISTING PAVEMENT IN ORDER TO MAINTAIN/MATCH EXISTING 2% CROSS SLOPE. ANOTHER OPTION IS TO PROVIDE 40.0' GRIND TO GENERATE 0.1' RISE PER 10' PAVEMENT
- AT POT HOLE LOCATIONS SAWCUT 4" DEPTH AND INSTALL 4" COMPACTED DEPTH HMA, 1/2" CLASS PG 64-22 BINDER OR MATCH EXISTING PAVEMENT GRADE/DEPTH.
- ASPHALT SEAM SEALANT REQUIRED AT NEW TO OLD ASPHALT INTERFACE, TYPICAL. INSTALL IMMEDIATELY AFTER FINAL ASPHALT LIFT (LIMIT WATER SEEPAGE INTO SEAM AT ALL TIMES).
- CONTRACTOR SHALL RESTORE EXISTING GRAVEL SHOULDER OR INSTALL NEW GRAVEL BASE SHOULDER (1.0' MINIMUM WIDTH) WHERE APPLICABLE (SUCH AS ALONG GRIND AND OVERLAY ASPHALT PAVEMENT OR WHERE CURRENT PAVEMENT IS NOT CONFINED (EDGE PROTECTED) BY GRAVEL SHOULDER. 24" GRAVEL SHOULDER IS PREFERRED BUT GRADES AND ADJACENT DITCH LAYOUT MAY NOT ALLOW EXTENSION OF SHOULDER TO PREFERRED WIDTH.
- MAINTAIN EXISTING PAVEMENT FLOW PATTERNS TO DRAINAGE DITCH(S) AND OR CATCH BASIN(S).



FULL DEPTH PAVEMENT REPAIR



TYPICAL ASPHALT OVERLAY SECTION



Planting Bed Cross-Section

NOT TO SCALE



Reprinted from Guidelines and Resources For Implementing Soil Quality and Depth BMP T5.13 in WDOE Stormwater Management Manual for Western Washington, 2010, Washington Organic Recycling Council

Revised June 2016

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## BMP T5.13 NOTES

ESTABLISH A MINIMUM SOIL QUALITY AND DEPTH IS NOT THE SAME AS PRESERVATION OF NATURALLY OCCURRING SOIL AND VEGETATION. HOWEVER, ESTABLISHING A MINIMUM SOIL QUALITY AND DEPTH WILL PROVIDE IMPROVED ON-SITE MANAGEMENT OF STORMWATER FLOW AND WATER QUALITY. SOIL ORGANIC MATTER CAN BE ATTAINED THROUGH NUMEROUS MATERIALS SUCH AS COMPOST, COMPOSTED WOODY MATERIAL, BIOSOLIDS AND FOREST PRODUCT RESIDUALS. IT IS IMPORTANT THAT THE MATERIALS USED TO MEET THE SOIL QUALITY AND DEPTH BMP BE APPROPRIATE AND BENEFICIAL TO THE PLANT COVER TO BE ESTABLISHED. LIKEWISE, IT IS IMPORTANT THAT IMPORTED TOPSOILS IMPROVE SOIL CONDITIONS AND DO NOT HAVE AN EXCESSIVE PERCENT OF CLAY FINES. THIS BMP CAN BE CONSIDERED INFEASIBLE ON TILL SOIL SLOPES GREATER THAN 33 PERCENT.

## DESIGN GUIDELINES

SOIL RETENTION: RETAIN, IN AN UNDISTURBED STATE, THE DUFF LAYER AND NATIVE TOPSOIL TO THE MAXIMUM EXTENT PRACTICABLE, IN ANY AREAS REQUIRING GRADING REMOVE AND STOCKPILE THE DUFF LAYER AND TOPSOIL ON SITE IN A DESIGNATED CONTROLLED AREA, NOT ADJACENT TO PUBLIC RESOURCES AND CRITICAL AREAS, TO BE REAPPLIED TO OTHER PORTIONS OF THE SITE WHERE FEASIBLE.

SOIL QUALITY: ALL AREAS SUBJECT TO CLEARING AND GRADING THAT HAVE NOT BEEN COVERED BY IMPERVIOUS SURFACE, INCORPORATED INTO A DRAINAGE FACILITY OR ENGINEERED AS STRUCTURAL FILL OR SLOPE SHALL, AT PROJECT COMPLETION, DEMONSTRATE THE FOLLOWING:

- A TOPSOIL LAYER WITH A MINIMUM ORGANIC MATTER CONTENT OF 10% DRY WEIGHT IN PLANTING BEDS, AND 5% ORGANIC MATTER CONTENT IN TURF AREAS, AND A PH FROM 6.0 TO 8.0 OR MATCHING THE PH OF THE UNDISTURBED SOIL. THE TOPSOIL LAYER DEPTH SHALL BE PER PLAN. SUBSOILS BELOW THE TOPSOIL LAYER SHOULD BE SCARIFIED AT LEAST 4 INCHES WITH SOME INCORPORATION OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS, WHERE FEASIBLE.
- MULCH PLANTING BEDS WITH 4 INCHES OF WOOD CHIP MULCH. USE COMPOST AND OTHER MATERIALS THAT MEET THESE ORGANIC CONTENT REQUIREMENTS:
  - THE ORGANIC CONTENT FOR "PRE-APPROVED" AMENDMENT RATES CAN BE MET ONLY USING COMPOST MEETING THE COMPOST SPECIFICATION FOR BIORETENTION (BMP T7.30), WITH THE EXCEPTION THAT THE COMPOST MAY HAVE UP TO 35% BIOSOLIDS OR MANURE. THE COMPOST MUST ALSO HAVE AN ORGANIC MATTER CONTENT OF 40% TO 65%, AND A CARBON TO THE NITROGEN RATIO BELOW 25:1. THE CARBON TO NITROGEN RATIO MAY BE AS HIGH 35:1 FOR PLANTING COMPOSED ENTIRELY OF PLANTS NATIVE TO THE PUGET SOUND LOWLANDS REGION.
  - CALCULATED AMENDMENT RATES MAY BE MET THROUGH USE OF COMPOSTED MATERIALS MEETING (A) ABOVE, OR OTHER ORGANIC MATERIALS AMENDED TO MEET THE CARBON TO NITROGEN RATIO REQUIREMENTS, AND MEETING THE CONTAMINANT STANDARDS OF GRADE A COMPOST.

THE RESULTING SOIL SHOULD BE CONDUCTIVE TO THE TYPE OF VEGETATION TO BE ESTABLISHED.

IMPLEMENTATION OPTIONS: THE SOIL QUALITY DESIGN GUIDELINES LISTED ABOVE CAN BE MET BY USING ONE OF THE METHODS LISTED:

- LEAVE UNDISTURBED NATIVE VEGETATION AND SOIL, AND PROTECT FROM COMPACTION DURING CONSTRUCTION.
- IMPORT TOPSOIL (TOPSOIL "A")
- CONSTRUCT TOPSOIL ON-SITE (TOPSOIL "B") -- AMEND EXISTING SITE TOPSOIL OR SUBSOIL EITHER AT DEFAULT "PRE-APPROVED" RATES BASED ON TESTS OF THE SOIL AMENDMENT.
- STOCKPILE EXISTING TOPSOIL DURING GRADING, AND REPLACED IT PRIOR TO PLANTING. STOCKPILED TOPSOIL MUST ALSO BE AMENDED IF NEEDED TO MEET THE ORGANIC MATTER OR DEPTH REQUIREMENTS, EITHER AT A DEFAULT "PRE-APPROVED" RATE OR AT A CUSTOM CALCULATED RATE.

SEE SITE SPECIFIC SOIL SPECIFICATIONS: MORE THAN ONE METHOD MAY BE USED ON DIFFERENT PORTIONS OF THE SAME SITE. SOIL THAT ALREADY MEETS THE DEPTH AND ORGANIC MATTER QUALITY STANDARDS, AND IS NOT COMPACTED, DOES NOT NEED TO BE AMENDED.

## SITE SPECIFIC SPECIFICATIONS

TOPSOIL "A"/IMPORTED TOPSOIL: IMPORTED TOPSOIL SHALL BE LAWN & GARDEN MIX OR SIMILAR TOPSOIL AS SUPPLIED FROM GREEN EARTH TECHNOLOGY, LLC (360.354.4936) OR APPROVED EQUAL. IMPORTED TOPSOIL SHALL BE FREE OF NOXIOUS WEED MATERIAL (SEEDS, RHIZOMES, AND/OR ROOTS). IMPORTED TOPSOIL SHALL BE FREE OF DELETERIOUS MATERIALS, ROCKS, AND DEBRIS WHICH WILL NOT PASS THROUGH THREE-QUARTER INCH 3/4" SCREEN. THE COMPONENTS OF THE SOIL MUST BE EVENLY DISTRIBUTED THROUGHOUT THE TOPSOIL MIX.

## TOPSOIL "B"/CONSTRUCTED TOPSOIL:

CONTRACTOR SHALL CONSTRUCT TOPSOIL B ON-SITE USING COMBINATION OF NATIVE TOPSOIL AND IMPORTED COMPOST. NATIVE TOPSOIL SHALL BE TAKEN FROM VEGETATED/LANDSCAPE AREAS WITHIN PROJECT WORK LIMITS. THE TOP TWELVE (12") OF THE SOIL COLUMN SHALL BE USED IN THE TOPSOIL B MIX AND STOCKPILED IN DESIGNATED AREA(S). STOCKPILED MATERIAL SHALL BE FREE OF NOXIOUS WEED MATERIAL (SEEDS, RHIZOMES, AND/OR ROOTS). TOPSOIL B SHALL BE FREE OF DELETERIOUS MATERIALS, ROCKS, AND DEBRIS WHICH WILL NOT PASS THROUGH 3/4" SCREEN. DESIGN INTENT IS TO INCLUDE ROCK OR ORGANIC MATERIAL IN THE TOPSOIL LAYER SO AS TO CREATE MACRO PORES AND ORGANIC MATTER RESERVES. NATIVE SOIL TO IMPORTED COMPOST RATIO SHALL BE THREE TO ONE (3 NATIVE SOIL : 1 COMPOST). THE COMPONENTS OF THE CONSTRUCTED TOPSOIL MUST BE EVENLY DISTRIBUTED THROUGHOUT THE TOPSOIL MIX.

## TOPSOIL "C"/AMENDED SOIL:

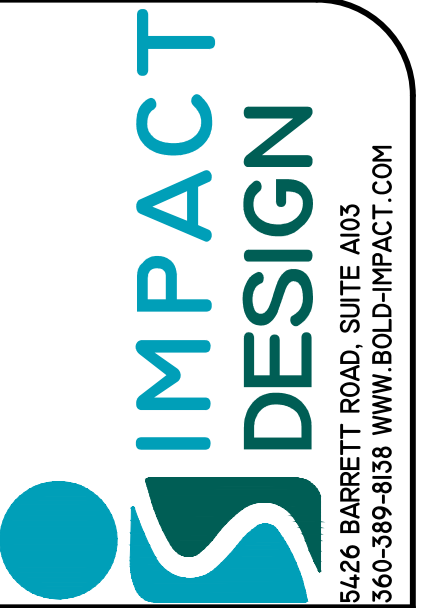
CONTRACTOR SHALL LOOSEN (DO NOT TILL) CLEARED LANDSCAPE AREAS WITH EXCAVATOR TEETH OR CLEARING/GRUB RACK ADAPTER FOR EXCAVATOR TO MEET 8" MINIMUM LOOSE DEPTH REQUIREMENT. TILLING DOES NOT MEET THE LOOSENING DEPTH REQUIREMENT. TILLING TO OCCURE AFTER A 2" LAYER OF "G.E.T. COMPOST". THE COMPOST SHALL BE INCORPORATED INTO UPPER 4" OF DISTURBED SOIL. THE COMPOST SHALL BE FROM YARD TRIMMINGS OR SIMILAR ORGANIC MATTER COMPOSTED THROUGH AEROBIC DECOMPOSITION AS AVAILABLE AT GREEN EARTH TECHNOLOGY, LLC (360.354.4936) OR APPROVED EQUAL. IMPORTED COMPOST SHALL BE COMPOSTED IN ACCORDANCE WITH WAC 173-350-220 AND FREE OF NOXIOUS WEED MATERIAL. PROVIDE ONE-GALLON (1-GALLON) SAMPLE AND SOURCE FOR APPROVAL BY ARCHITECT PRIOR TO DELIVERY TO SITE.

GROWING MEDIUM/TOPSOIL A, B, AND C SHALL CONFORM TO THE FOLLOWING SOIL CHARACTERISTICS:

- SOIL QUALITY - ALL AREAS SUBJECT TO CLEARING AND GRADING THAT HAVE NOT BEEN COVERED BY IMPERVIOUS SURFACE, INCORPORATED INTO A DRAINAGE FACILITY OR ENGINEERED AS STRUCTURAL FILL OR SLOPE SHALL, AT PROJECT COMPLETION, DEMONSTRATE:
  - CONSTRUCTION MATERIAL(S) SHALL NOT BE PRESENT.
  - SOIL MEDIA SHALL HAVE A SANDY-LOAM TO LOAM TEXTURE PER USDA TEXTURAL TRIANGLE. CLAY CONTENT SHALL NOT EXCEED 5%. TOPSOIL MIXTURE SHALL BE 60%-70% SANDY-LOAM (GRADATION PER ASTM D 422) AND 30%-40% COMPOST BY VOLUME (ORGANIC MATTER CONTENT OF 5%-10% BY WEIGHT). THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES.
  - SUBSOILS BELOW THE TOPSOIL LAYER SHALL BE SCARIFIED TO 4" WITH SOME INCORPORATION OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS. (THE INTENT IS TO PROVIDE A LOOSE PLANTING MEDIUM WITH TOTAL DEPTH OF LOOSENEED SOIL THAT VARIES BASED ON THE SUBGRADE AND PREVIOUS LAND USE TYPE. SEE SOIL PREPARATION SPECIFICATIONS 32-9400 (UNLESS OTHERWISE NOTED ON THE LANDSCAPE PLANS).
  - TOPSOIL AND LOOSENEED SUBSOIL DEPTH OF 12" AS SHOWN IN IMAGE TO LEFT IS MINIMUM AND IS REQUIRED TO BE GREATER THAN 12" WHEN PREVIOUS EXISTING SUBGRADE IS EITHER COMPACTED, GLACIAL TILL, CLAY, OR PURE GRAVEL OR PIT-RUN.
  - COMPOST OR OTHER MATERIAL USED FOR SOIL AMENDMENTS (ORGANIC MATTER CONTENT) SHALL BE "COMPOSTED MATERIALS" IN WAC 173-350-220. THE COMPOST MUST ALSO HAVE ORGANIC MATTER CONTENT 35% TO 65% AND A CARBON TO NITROGEN RATIO BELOW 25:1 OR 35:1.

## BMP T5.13 POST-CONSTRUCTION SOIL QUALITY AND DEPTH

NTS



1.19.2026

SVCA CULVERT MAINTENANCE NOA'S

DETAILS

SUDDEN VALLEY  
WHATCOM COUNTY, WASHINGTON

REV	DATE	BY	DESCRIPTION

PROJECT NUMBER:  
25013

DESIGNED/DRAWN BY:  
ABB

CHECKED BY:  
SIG

ISSUE DATE:  
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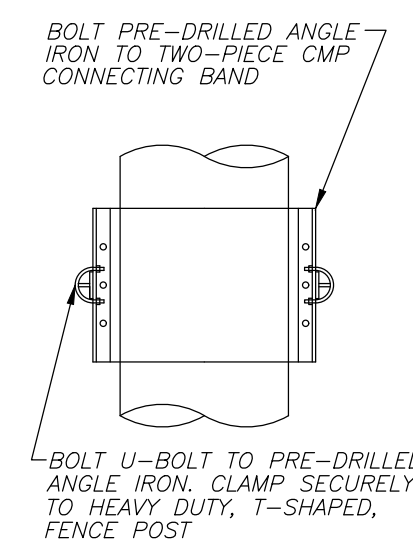
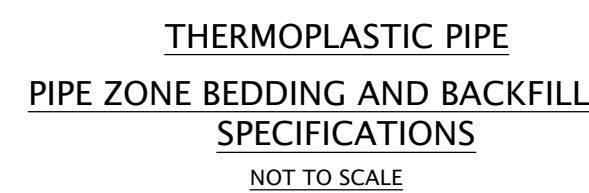
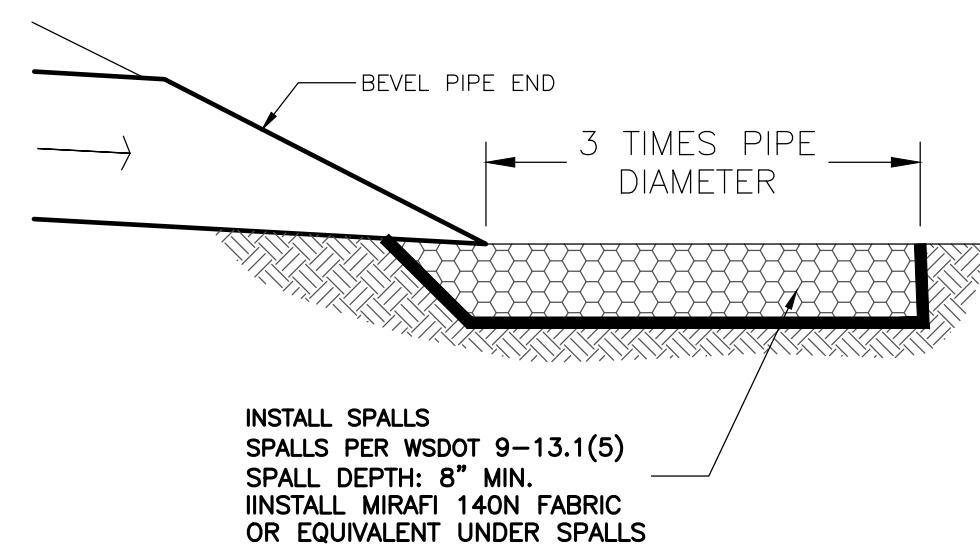
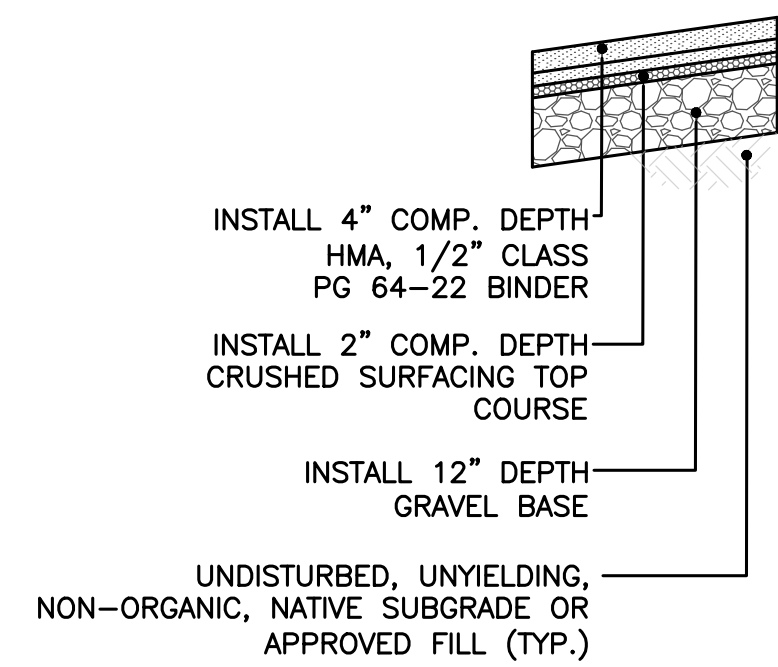
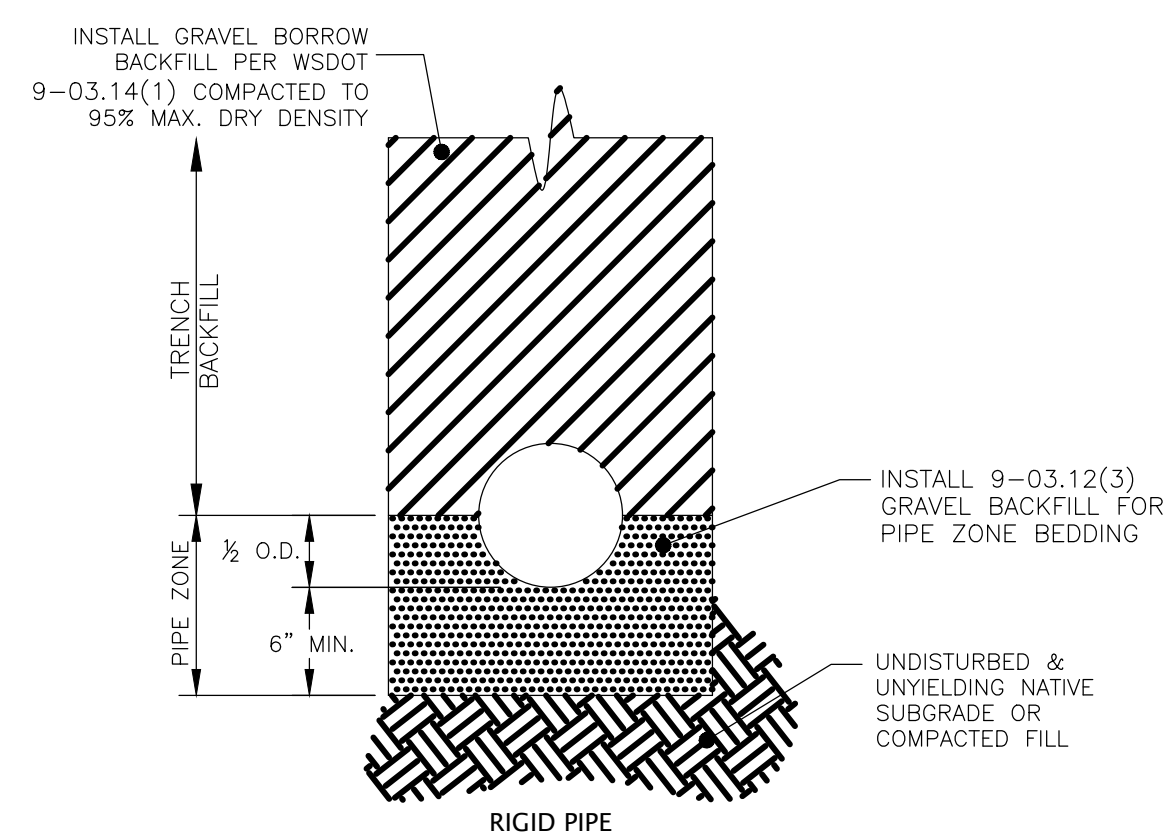
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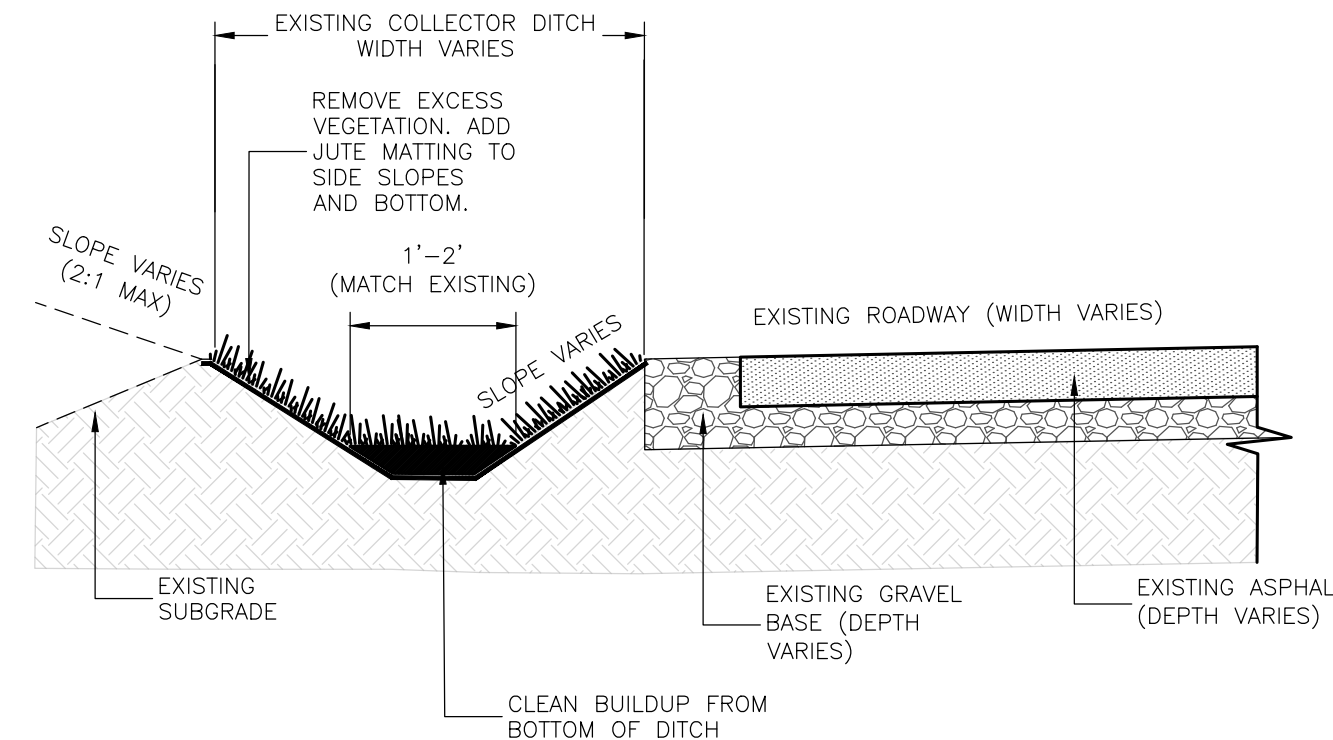
# SUDDEN VALLEY MAINTENANCE NOA'S

## GENERAL NOTES

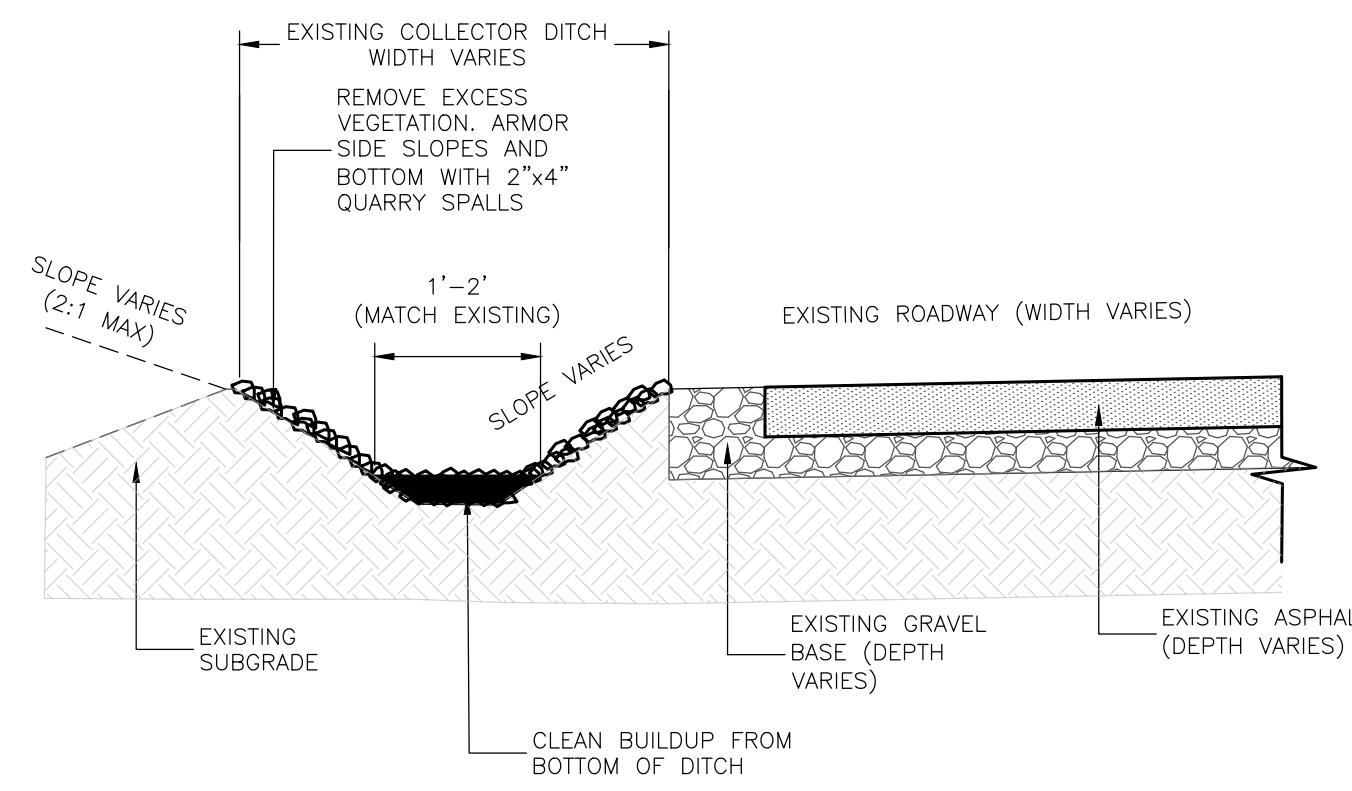
1. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT WSDOT/APWA STANDARD SPECIFICATIONS.
2. NORMAL WORKING HOURS ARE 8:00 AM. TO 7:00 PM., MONDAY THROUGH FRIDAY. WORK DURING HOLIDAYS, WEEKENDS, AND OUTSIDE THE NORMAL WORK HOURS REQUIRES PRIOR ARRANGEMENTS AND APPROVAL.
3. THE CONTRACTOR SHALL CONTACT UTILITY LOCATION SERVICE 48 HOURS PRIOR TO STARTING WORK AT (800) 424-5555 OR 811.
4. A COPY OF THE DRAWINGS MUST BE ON THE JOBS SITE WHENEVER WORK IS IN PROCESS.
5. ALL TESTING REQUIRED FOR THE WORK SHALL BE THE RESPONSIBILITY OF THE OWNER.
6. THE CONTRACTOR SHALL RESTORE ALL PRIVATE AND PUBLIC PROPERTY DISTURBED BY THE WORK IMMEDIATELY AFTER CONSTRUCTION. THE CONTRACTOR SHALL NOT LEAVE ANY PART OF THE ROAD USED BY OTHERS UN-PASSABLE WITHOUT NOTIFICATIONS AND AGREEMENT OF OTHER USERS.
7. ALL CUT AND FILL SLOPES SHALL BE MULCHED AND SEEDED FOR EROSION CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SLOPE EROSION UNTIL VEGETATION IS FIRMLY ESTABLISHED.
8. CONTRACTOR SHALL SWEEP AND REMOVE ALL DEBRIS TRACKED ONTO EXISTING ROADS DURING ALL PHASES OF CONSTRUCTION.
9. THE CONTRACTOR SHALL INFORM THE ENGINEER OF RECORD OR REPRESENTATIVE AND OBTAIN APPROVAL FOR ANY PROPOSED CHANGES IN PLANS PRIOR TO IMPLEMENT.
10. TRAFFIC CONTROL IS TO BE MAINTAINED IN ACCORDANCE WITH WSDOT/APWA STANDARD SPECIFICATIONS.



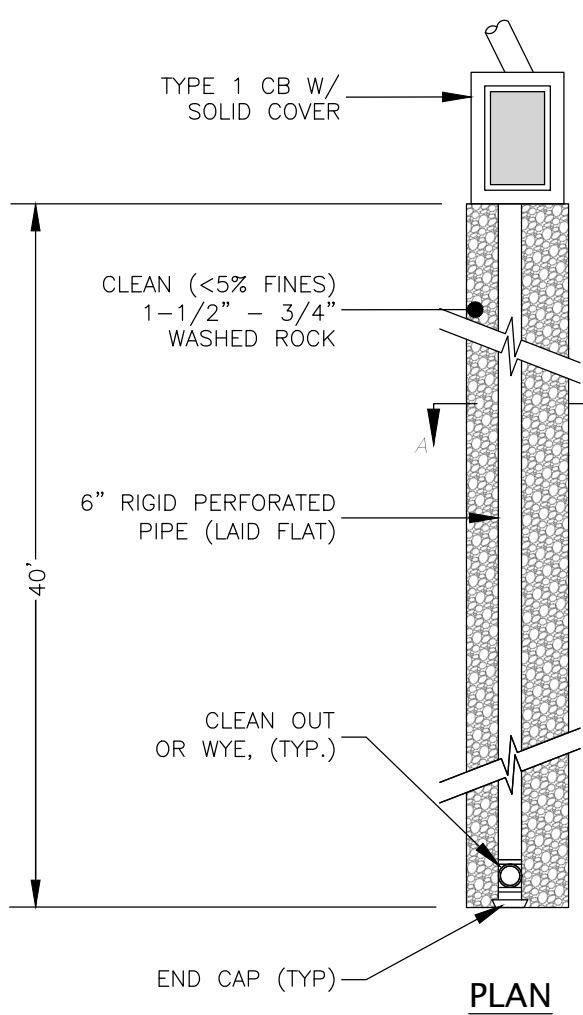
DRISCOPE PIPE ANCHOR DETAIL NOT TO SCALE



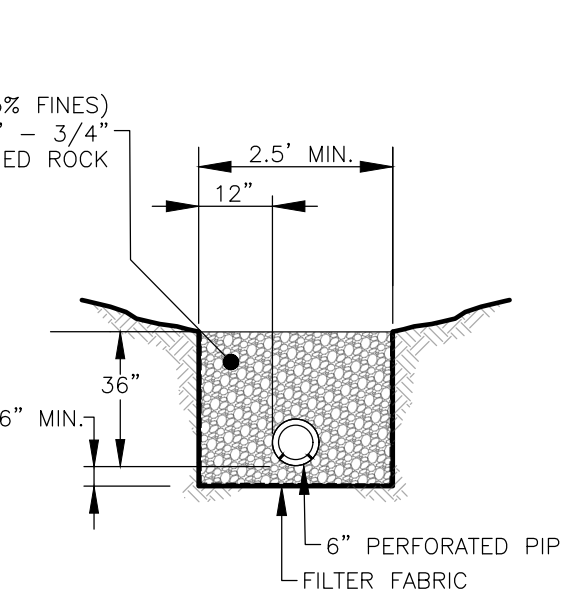
DITCH CLEANING TYPE 1 NOT TO SCALE



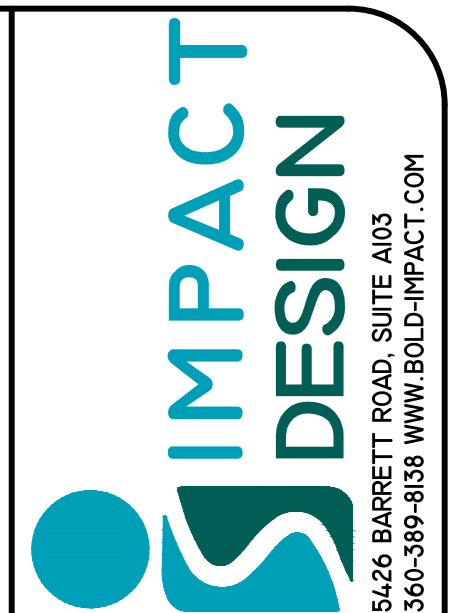
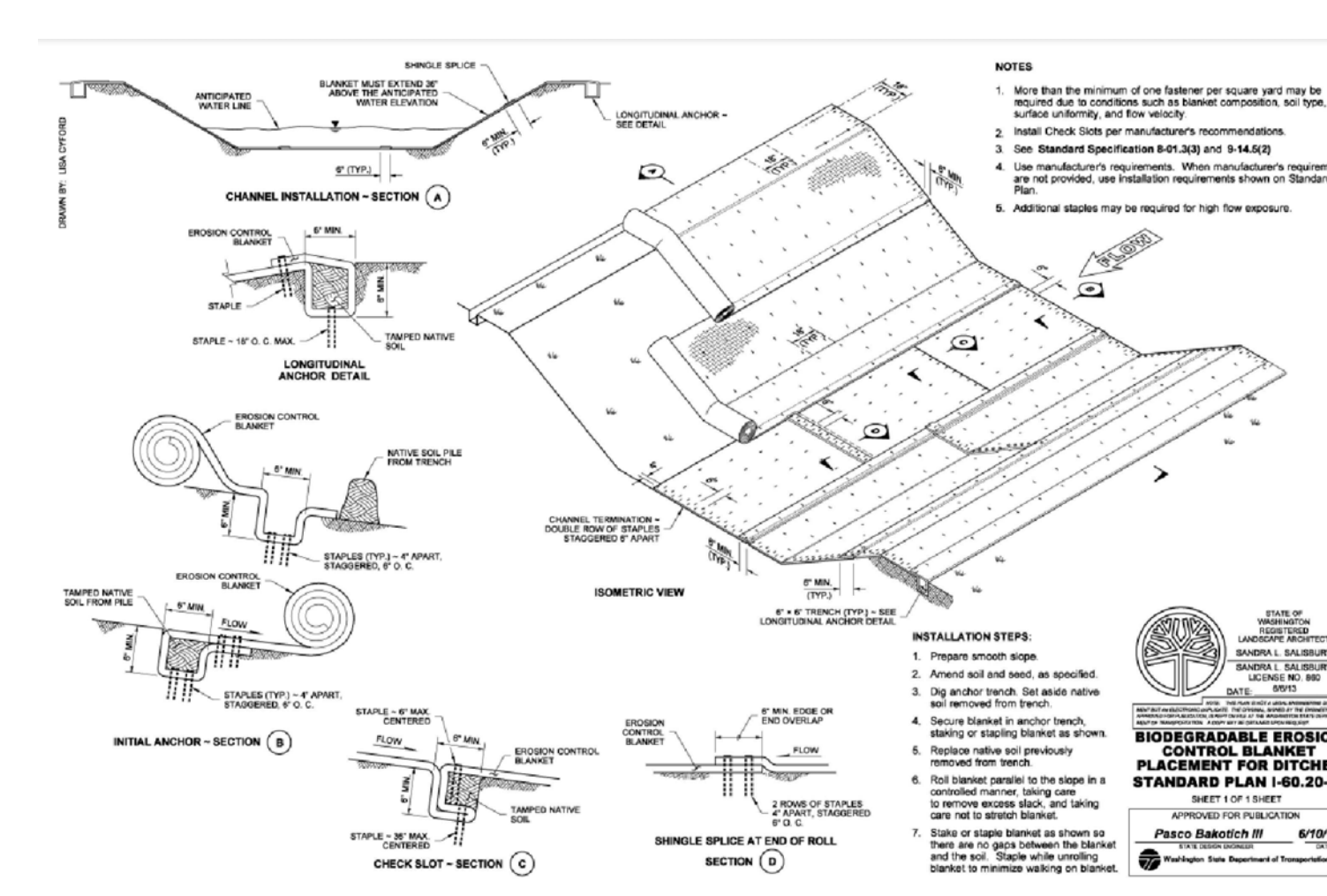
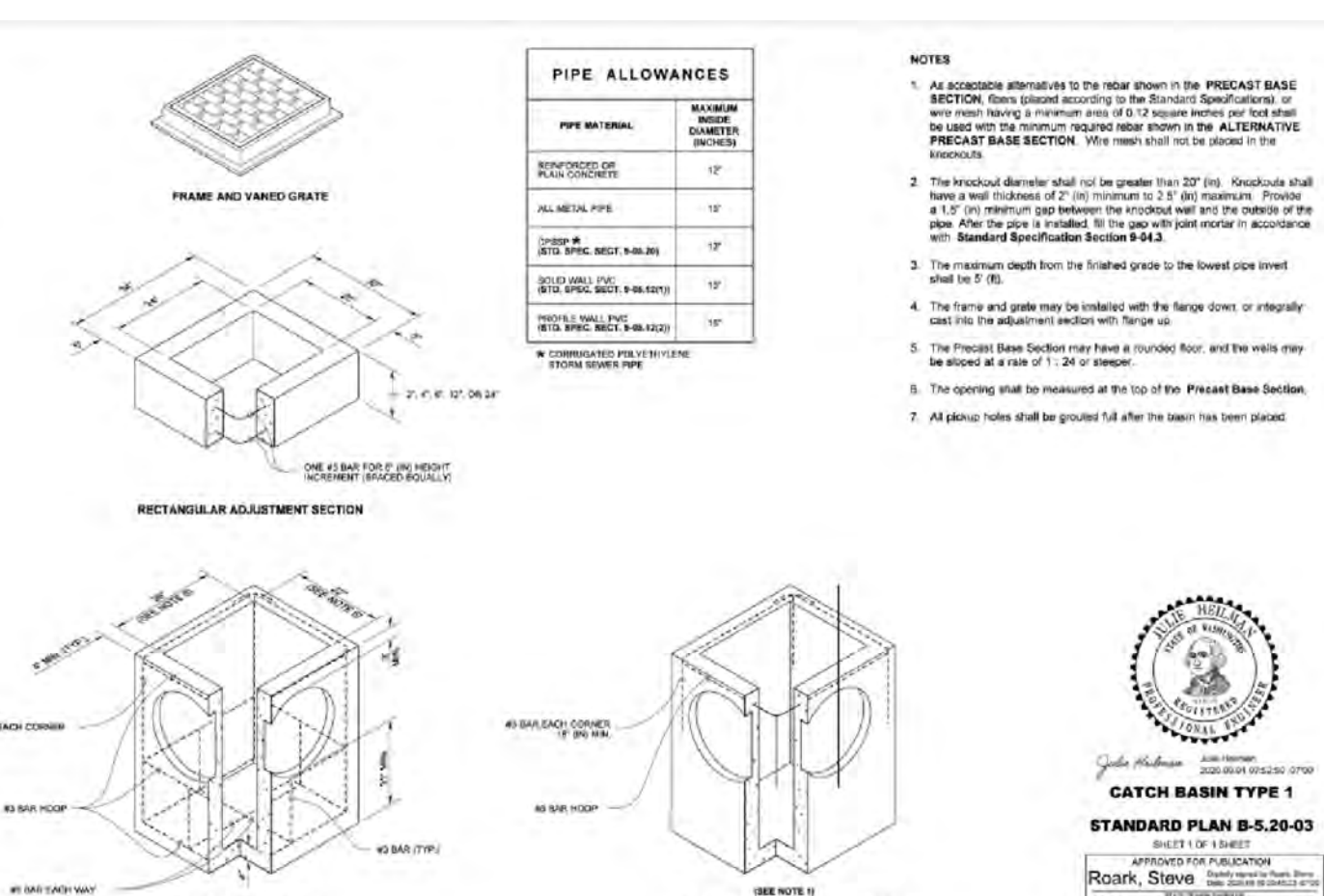
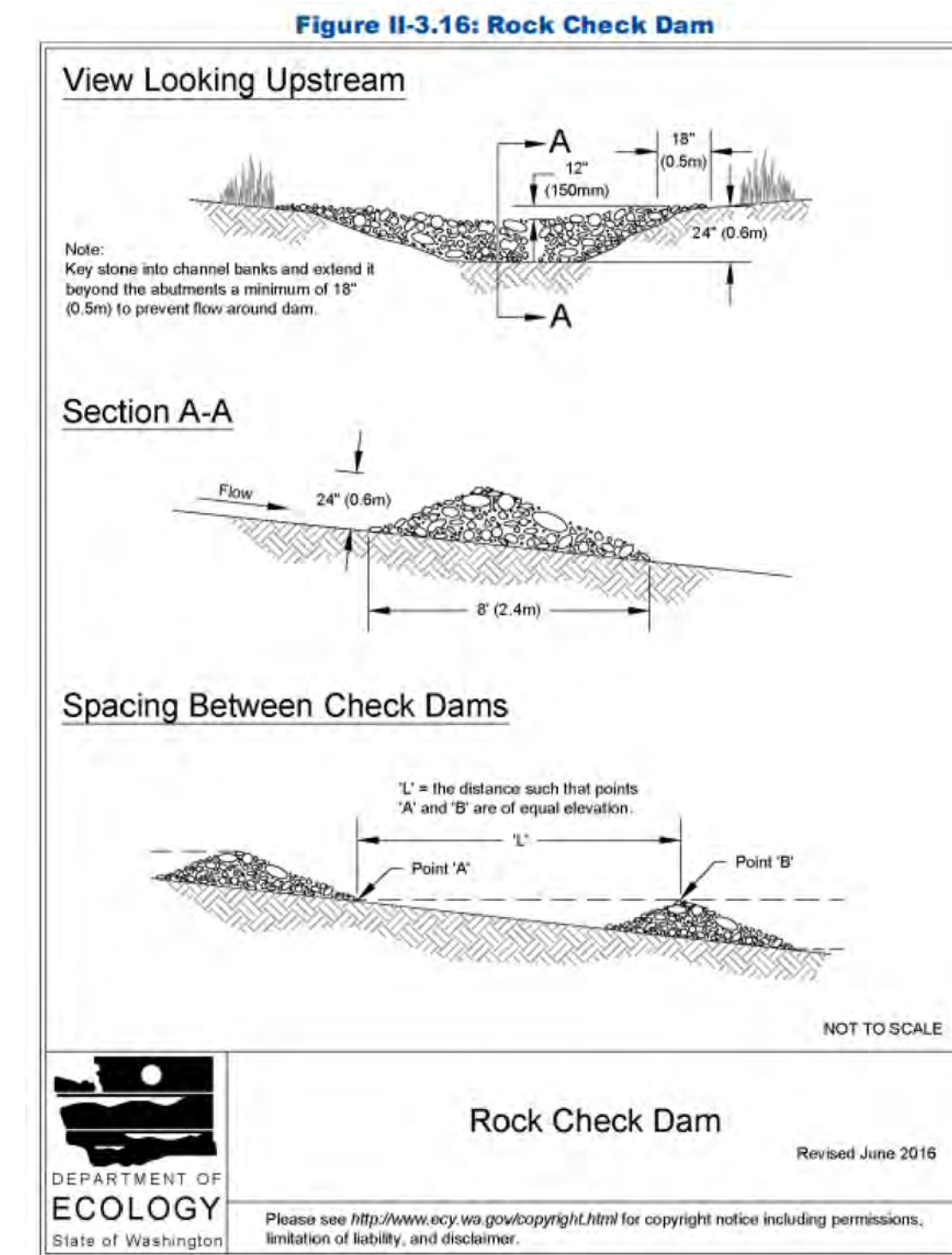
DITCH CLEANING TYPE 2 NOT TO SCALE



INFILTRATION TRENCH NOT TO SCALE



SECTION A-A



1.19.2026

SVCA CULVERT MAINTENANCE NOA'S  
 DETAILS  
 SUDDEN VALLEY  
 WHATCOM COUNTY, WASHINGTON

REV	DATE	DESCRIPTION

PROJECT NUMBER: 25013  
 DESIGNED/DRAWN BY: ABB  
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 C20  
 OF: C1-C20

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## Sudden Valley Community Association

1850 Lake Whatcom Boulevard, Bellingham WA 98229  
360-734-5320 www.suddenvalley.com

# 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

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### 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, \$123,803.79 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



February 10<sup>th</sup>, 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 17<sup>th</sup>, 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 28<sup>th</sup>, 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 13<sup>th</sup>, 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.



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

Sincerely,

Tyler Andrews  
President

**February 9, 2026 - Bid Tabulation**

**Project: Clubhouse HVAC Replacement**

Item #	Description	Quantity	Unit	Lynden Sheet Metal		Barron Heating & AC		Engineers Estimate	
				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	\$	-
	Exterior Trenching & Asphalt								
6	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	\$	-
	<b>Subtotal</b>				<b>\$139,977.00</b>		<b>\$218,454.17</b>	<b>\$</b>	<b>130,000.00</b>
	<b>WSST @ 8.8%</b>				<b>\$ 12,317.98</b>		<b>\$ 19,223.97</b>	<b>\$</b>	<b>11,440.00</b>
	<b>Total w/ WSST</b>				<b>\$152,294.98</b>		<b>\$237,678.14</b>	<b>\$</b>	<b>141,440.00</b>



December 16<sup>th</sup>, 2025

Attn: Bidders

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

Bid submissions are due by 11:00am on Friday, January 9<sup>th</sup>, 2026. Email bid submissions to [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com).

Firm Name: LSM Heating, Plumbing and Electrical

<b>Bid Schedule – Clubhouse HVAC Replacement</b>					
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
	<b>Subtotal</b>				\$ 139,977.00
	<b>WSST @ 8.8%</b>				\$ 12,317.98
	<b>Total w/ WSST</b>				\$ 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: PNW SERVICES-ATTN: TYLER	PHONE: 360-739-2072	DATE: 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:

### 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 \_\_\_\_\_



December 16<sup>th</sup>, 2025

Attn: Bidders

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

Bid submissions are due by 11:00am on Friday, January 9<sup>th</sup>, 2026. Email bid submissions to [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com).

Firm Name: Barron Heating and Air Conditioning, Inc.

<b>Bid Schedule – Clubhouse HVAC Replacement</b>					
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
	<b>Subtotal</b>				\$218,454.17
	<b>WSST @ 8.8%</b>				\$ 19,223.97
	<b>Total w/ WSST</b>				\$237,678.14

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

By: \_\_\_\_\_  
Signature of Authorized Person

Date: 2-9-2026

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



February 4<sup>th</sup>, 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 9<sup>th</sup>, 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](mailto:tylera@pnwcivil.com) or 360-739-2072.

## GENERAL NOTES

### GENERAL NOTES

- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL HAVE AND MAINTAIN INSURANCE AS APPROVED BY THE BUILDING OWNER AND THE TENANT IF TENANT IS THE CONTRACTORS CLIENT.
- 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 DAMAGED, CUT OR DEFACTED 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.
- CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO INITIATING THE WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
- WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
- ALL WORK SHALL COMPLY WITH THE 2009 IBC, IPC, 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.
- ERRORS, OMISSIONS AND DISCREPANCIES, IF ANY, SHALL BE REFERRED TO THE ARCHITECT IMMEDIATELY FOR DIRECTION OF HOW TO PROCEED.
- VERIFY ALL ROOM-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.
- DO NOT SIGNIFICANTLY VARY OR MODIFY THE WORK SHOWN, EXCEPT UPON WRITTEN INSTRUCTIONS OF THE ARCHITECT.
- VERIFY LOCATION OF ALL EXISTING UTILITIES INCLUDING BUT NOT LIMITED TO SEWER, SEPTIC, WATER, GAS, POWER AND TELEPHONE. CAP, MARK AND PROTECT.
- 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.
- 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.
- NO BUILDING OR PORTION OF A BUILDING SHALL BE OCCUPIED OR USED FOR STORAGE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- 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.
- ELECTRICAL, MECHANICAL AND PLUMBING: GENERAL CONTRACTOR TO PROVIDE ALL REQUIRED ENGINEERING, CALCULATIONS, FORMS, APPLY, PAY FOR & OBTAIN ALL REQUIRED PERMITS.
- 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.
- PROVIDE BARRIER FREE SIGNAGE AT RESTROOMS.
- MOUNT ALL SINKS AT 34" AFF. UNO. COUNTERS 34" AFF WHEN SINK COUNTER MOUNTED.
- EXTERIOR BUILDING SIGNAGE IS NIC. CONTRACTOR TO PROVIDE POWER TO SIGN LOCATIONS.
- 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.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.
- 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.
- PROVIDE FIRE BLOCKING, DRAFT STOPS AND FIRE STOPS IN ATTICS, FLOORS AND WALL CAVITIES AS REQUIRED PER THE IBC.
- 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 WARRANTIES MANUALS.
- 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.
- 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.
- LEGALLY REMOVE & DISPOSE OF THE DEMOLITION AND CONSTRUCTION DEBRIS.
- DIMENSIONS TO STUD FACE UNLESS NOTED AS "CLEAR" OR "CLR" WHICH MEANS TO FACE OF WALL FINISH.

## SYMBOLS

	DETAIL REFERENCE
	BLDG SECTION
	WALL SECTION
	INTERIOR ELEVATION
	DOOR NUMBER
	ROOM NUMBER
	ELEVATION DATUM
	COLUMN GRID
	WALL TYPE
	POWER POLE
	CATCH BASIN
	STORM DRAIN MANHOLE
	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.	SIMILAR
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:

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



## 1 VICINITY MAP

SCALE: NTS



## 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 ALS 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

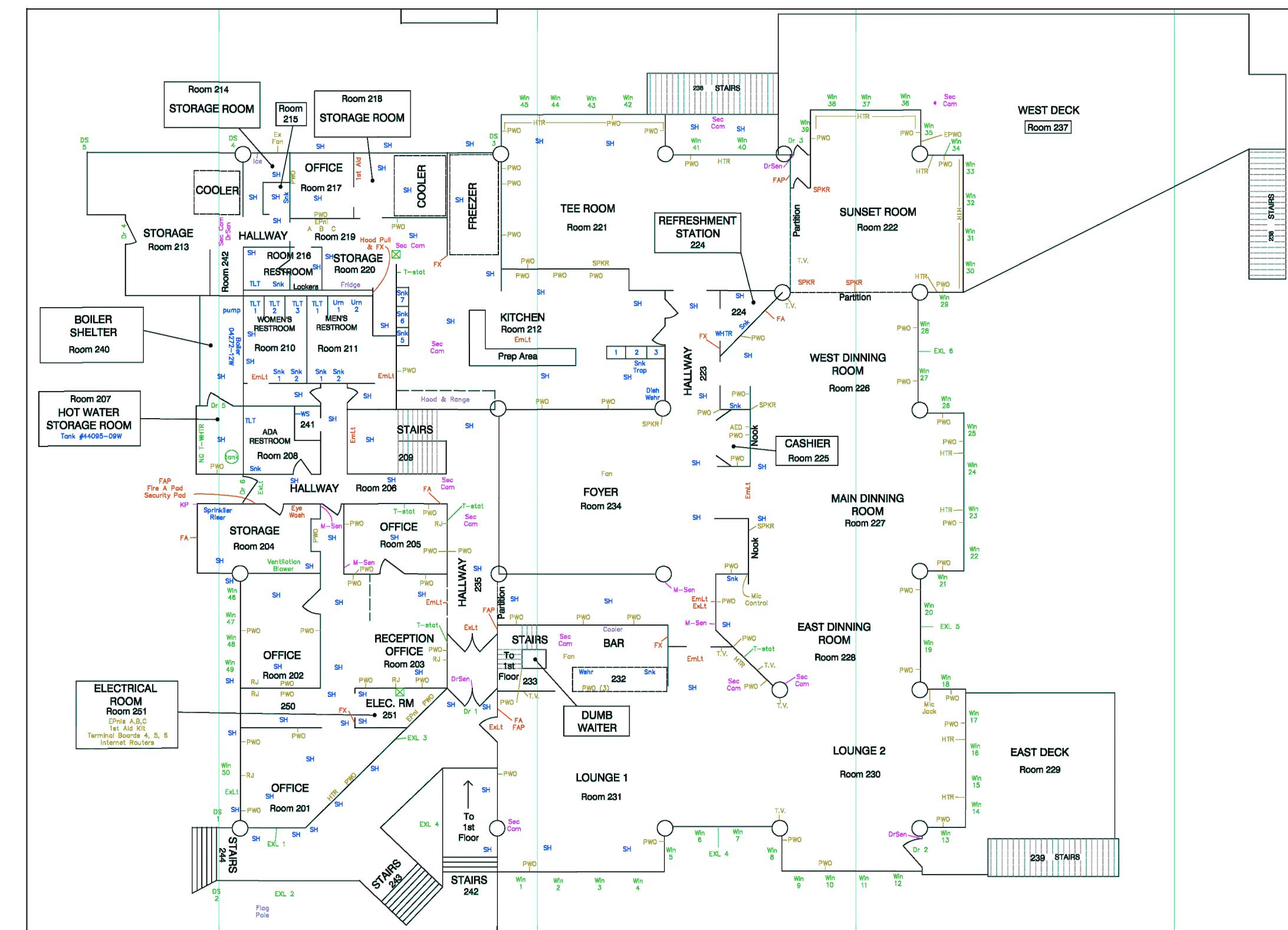
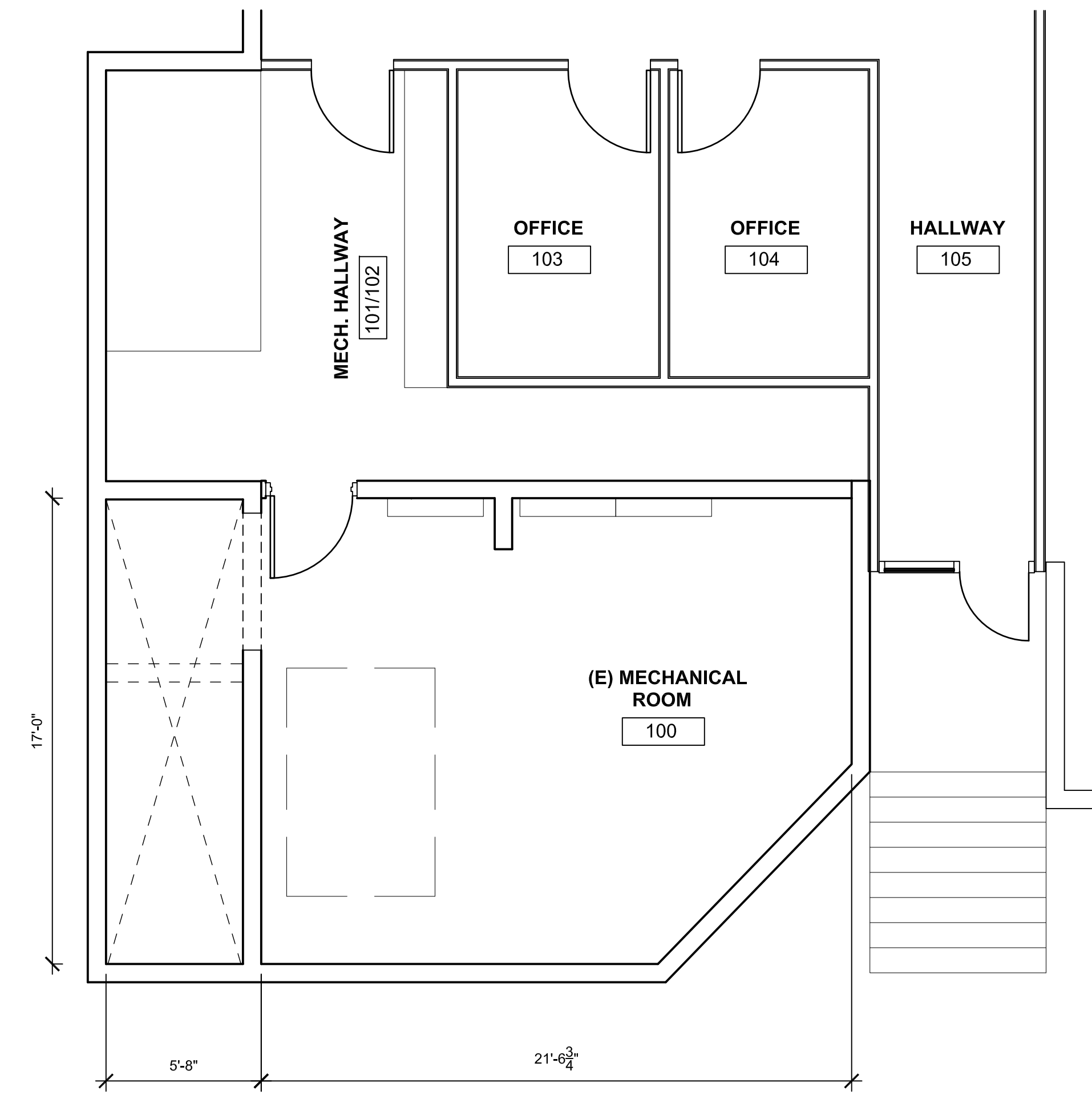
## DRAWING INDEX

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M3.0	HVAC DETAILS

## PROJECT INFO

JOB NO: 202404.11  
DATE: 08.14.2025

REV ISSUED FOR DATE



## 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



## AIR HANDLER INFO

AIR HANDLER UNIT (AHU-) SCHEDULE																		
TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL				WEIGHT (LBS)	DIMENSIONS (H"xW"xD")	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			
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:
- POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
  - RFIELD ROUTE TO APPROVED DRAIN.
  - WITH R-410A REFRIGERANT.
  - TEMPERED OUTSIDE AIR PROVIDED BY 100% O.A. RTU-2.
  - PROVIDE W/ MERV-8 FILTER
  - CONNECT TO EXIST BUILDING CONTROL SYSTEM.
  - COOLING PROVIDED BY DX COIL FROM CU-2.
  - HEATING PROVIDED BY SEPARATE EXISTING DUCT MOUNTED HOT WATER HEATING COIL.

## CLIP INFO

**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**

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 POSSIBLE

**3** APPLY ALL ADDITIONAL CLIPS EVENLY BETWEEN THE FIRST TWO

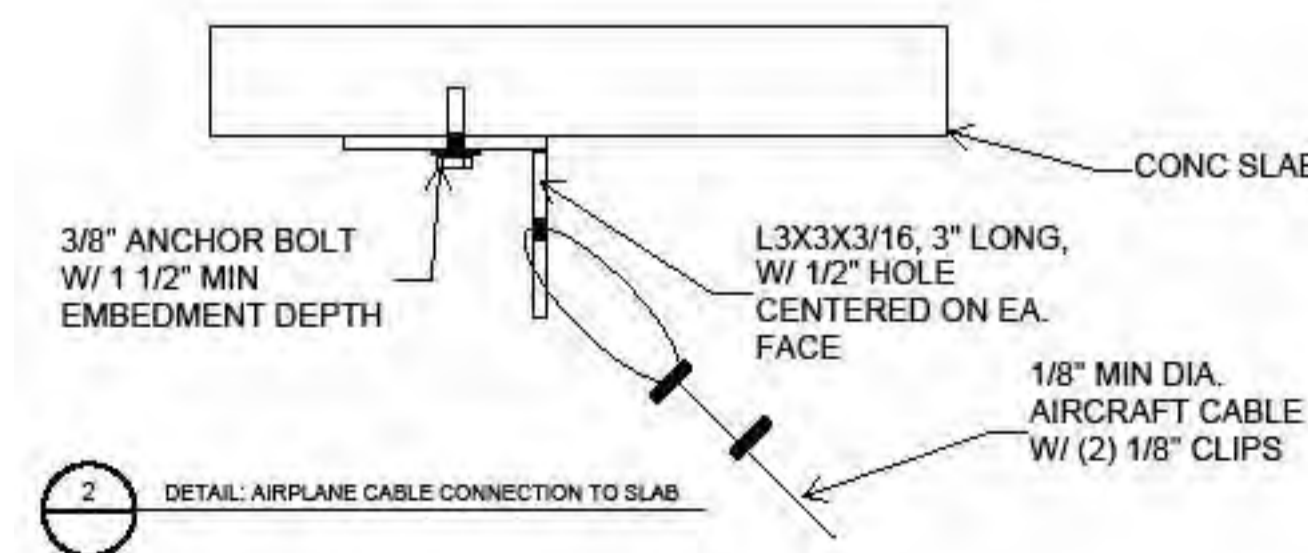
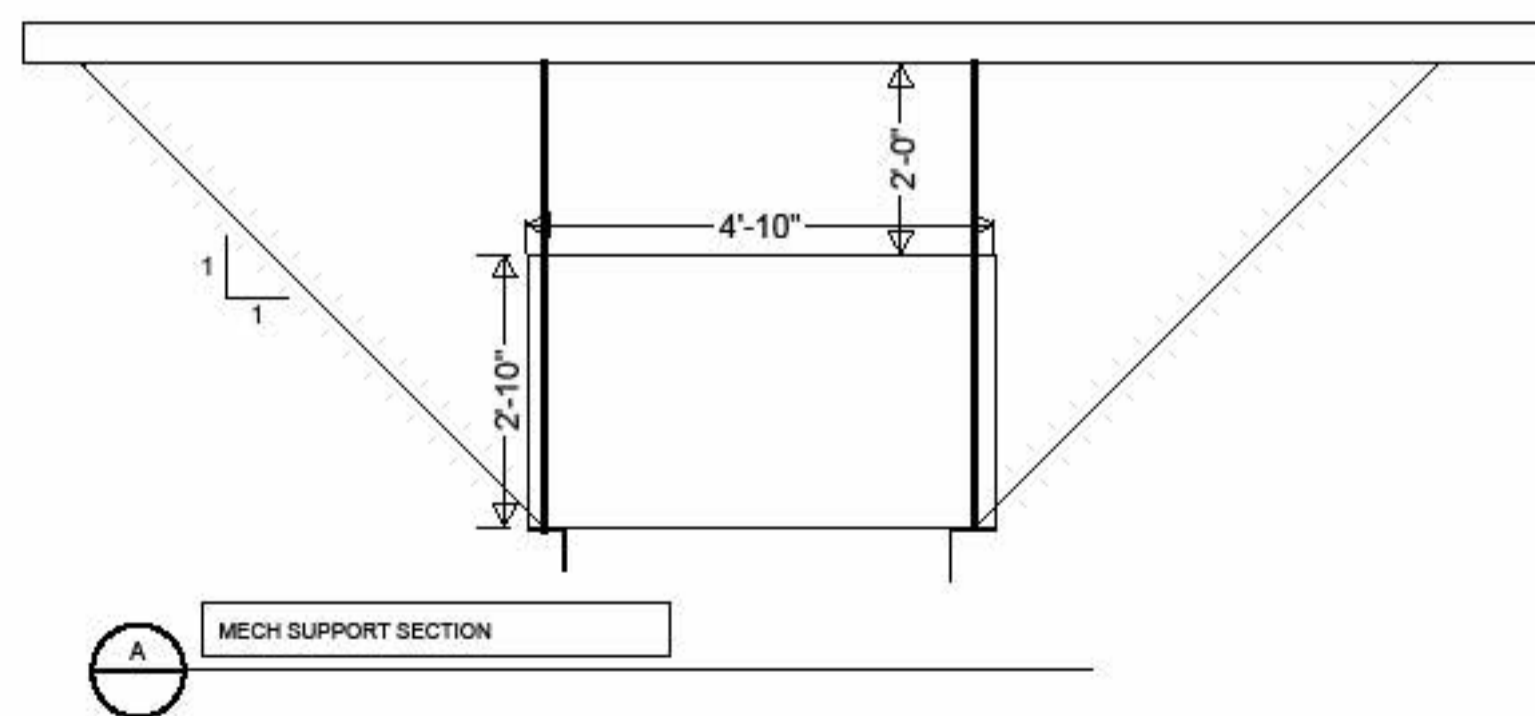
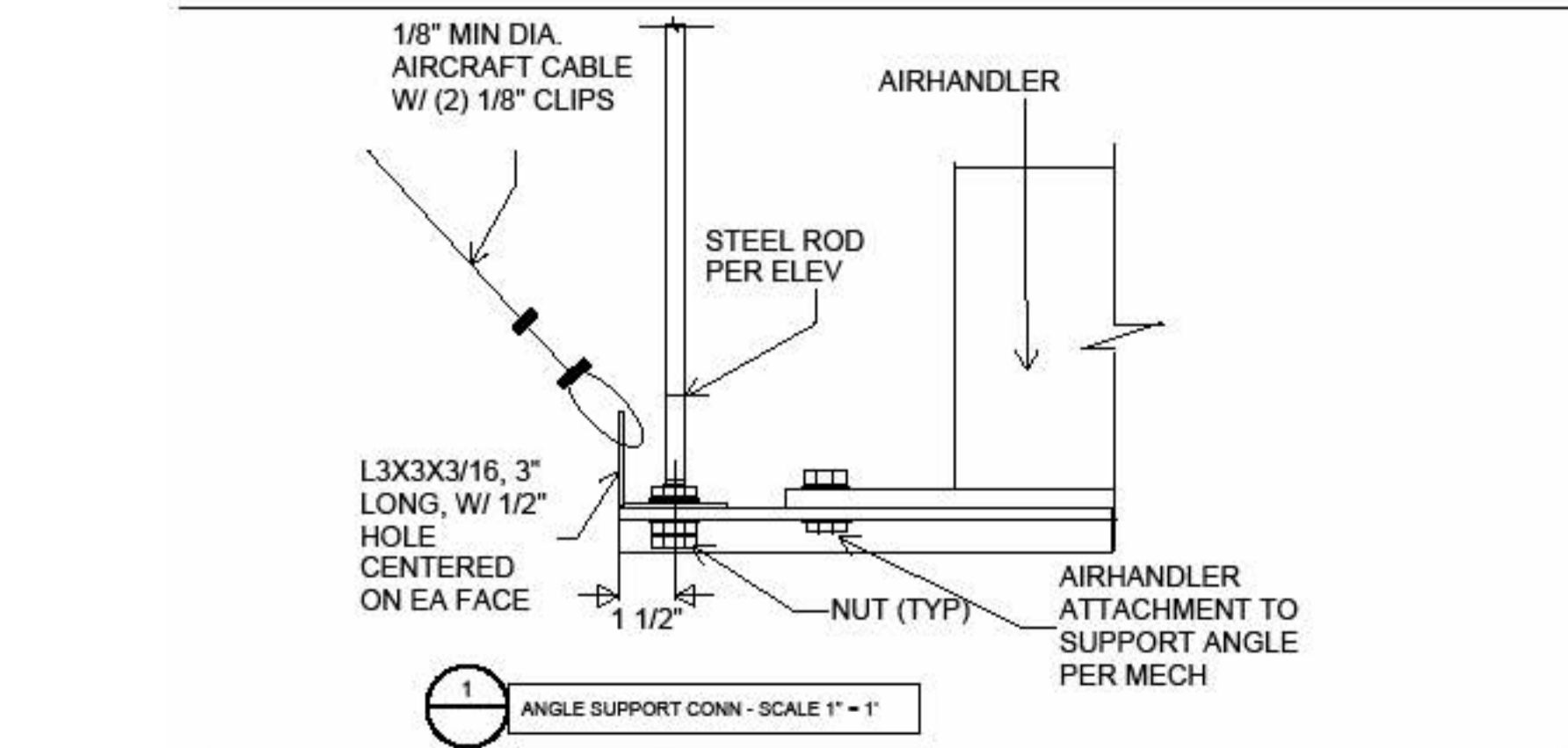
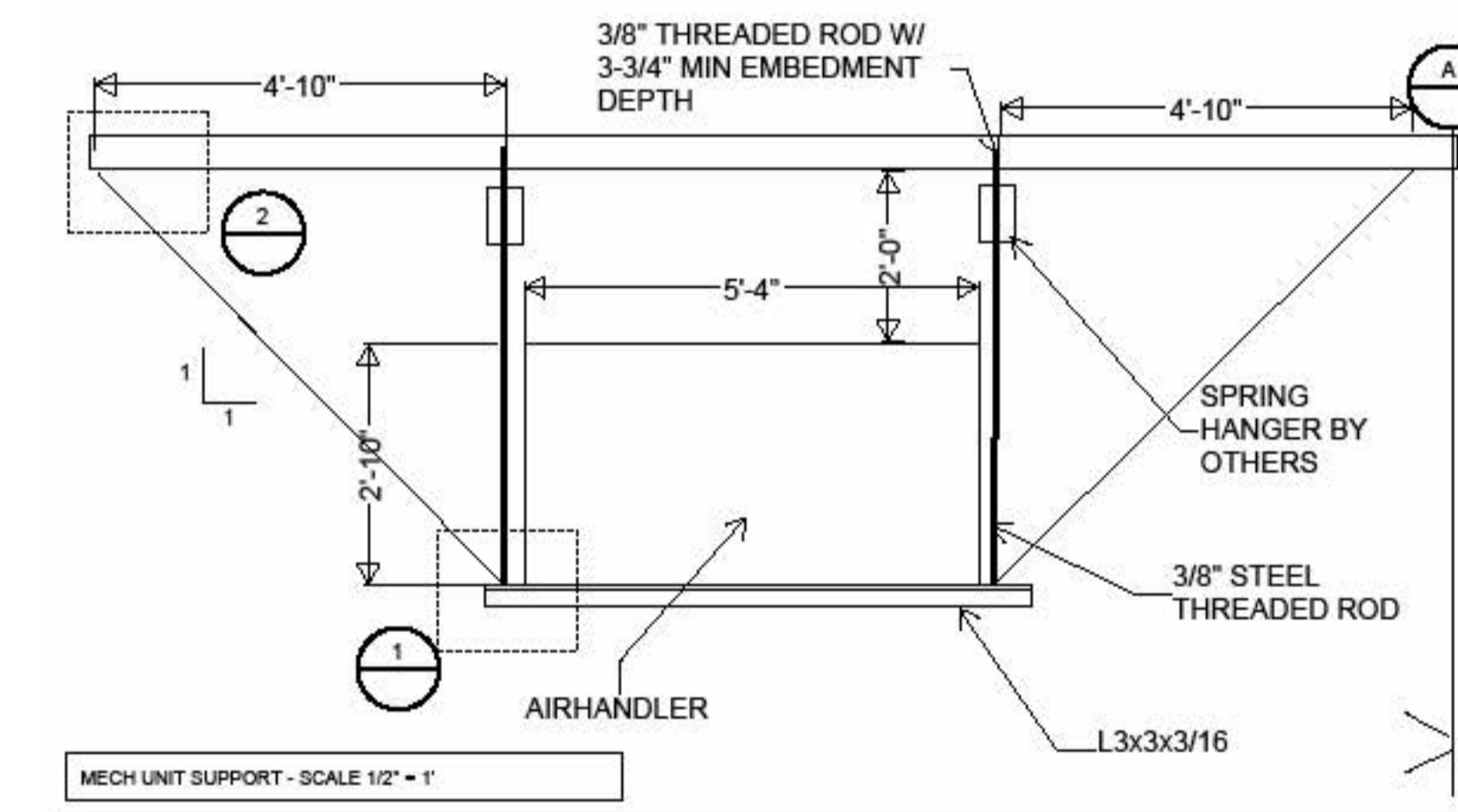
### STRUCTURAL NOTES

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 ICCES 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	

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NORTH	PLAN
-------	------

SCALE:  
As indicated  
PNW SV CLUBHOUSE  
MECHANICAL

4 CLUBHOUSE CIRCLE  
BELLINGHAM, WA 98229  
Client Name

MECHANICAL UNIT  
SUPPORT

PROJECT#	24153
DRAWN	JAndresen
CHECK	QHanks
ISSUED	10/4/2024

**S1.0**



# 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, 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.
  - d. MECHANICAL DRAWINGS:
    - a. 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.
    - b. 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.
    - c. 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
  - SMC – SEATTLE PLUMBING CODE
  - SMC – SEATTLE MECHANICAL CODE
  - UL – UNDERWRITERS LABORATORY
  - UPC – UNIFORM PLUMBING CODE
  - WSEC – WASHINGTON STATE ENERGY CODE
- E. 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 TO 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 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

## PART 2 – PRODUCTS

1. SUBMITTALS
- A. GENERAL: CONFORM TO DIVISION 1, WITH ADDITIONAL REQUIREMENTS AS INDICATED 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. AMENDMENTS TO 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 OCCUPIED 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.
- B. SUBSTITUTIONS 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 WORK 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 ACCESSWAYS 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 WARRANTIES
- 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 NEGLIGENCE 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.

## 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.
  - b. MATERIAL SHOP AND FIELD INSTALLATION DRAWINGS.
    - MATERIALS AND SHOP DRAWINGS.
  - c. BINDING AND FORMAT: BIND IN THREE-RING BINDER(S). LABEL FRONT OF BINDER(S) WITH NAME OF PROJECT, NAME OF OWNER, YEAR OF COMPLETION; 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.
    - SUBMITTAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
  - d. INCLUDE SUBMITTAL DATA ON MATERIALS AND EQUIPMENT AS INDICATED IN INDIVIDUAL SPECIFICATION SECTIONS. DO NOT ORDER, FABRICATE OR INSTALL UNTIL REVIEWED/ACCEPTED BY ARCHITECT/ENGINEER. INCLUDE DESCRIPTIVE BULLETINS, DATA SHEETS, CATALOG CUTS, DIAGRAMS, COMPLETE DIMENSIONAL DRAWINGS, AND OTHER ADDITIONAL INFORMATION AS REQUIRED.
- 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 CHASES.
    - UTILITY TUNNELS.
    - FILTER ASSEMBLIES.
  - b. FABRICATION AND INSTALLATION DRAWINGS SHALL BE PRODUCED AND SHOW COMPLETE DIMENSIONED INSTALTION 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.
  - e. TEST REPORTS AND CERTIFICATES: SUBMIT IN ONE COMPREHENSIVE PACKAGE PRIOR TO SUBSTANTIAL COMPLETION.
  - f. 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.
  9. DRILLING AND CUTTING OF CONCRETE AND OTHER WORK WHICH MAKES OBJECTIVE 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 EXCEPT WHERE SHOWN OTHERWISE.
  - 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. MINIMUM 1/8" THICK FOR 10 OR BEATON CORBIN.
  - B. ISOLATORS:
    - a. STONEMAN TRIULATOR, 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 FOR PIPES THROUGH NON-FIRE RATED FLOORS: FORM WITH 18 GAGE GALVANIZED STEEL.
  6. SLEEVES FOR PIPES THROUGH NON-FIRE RATED BEAMS, WALLS, FOOTINGS, AND POTENTIALLY WET FLOORS: FORM WITH STEEL PIPE OR 18 GAGE GALVANIZED STEEL.
  7. 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 STEEL. SIZE SLEEVES LARGE ENOUGH TO ALLOW FOR MOVEMENT DUE TO EXPANSION AND CONTRACTION. PROVIDE FORM 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 FIRE SAFETY 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.
  - B. 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. ANGL 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 BE EMBEDDED 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, DOUBLE HANGER.
    - d. MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS; CAST IRON ROLL AND STAND FOR HOT PIPE SIZES 6 INCHES AND OVER.
    - e. HANGERS AND SUPPORTS EXPOSED TO WEATHER OR WET CONDITIONS SHALL BE GALVANIZED.
    - f. WALL SUPPORT FOR PIPE SIZES TO 3 INCHES: CAST IRON HOOK.
    - g. WALL SUPPORT FOR PIPE SIZES 4 INCHES AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP; ADJUSTABLE STEEL YOKE AND CAST IRON ROLL FOR HOT PIPE SIZES 6 INCHES AND OVER.
    - h. VERTICAL SUPPORT:
      - TYPE A: STEEL RISER CLAMP.
      - TYPE B: STEEL RISER CLAMP WITH SPRING ISOLATION.
      - TYPE C: VIBRATION ISOLATOR MANUFACTURER SHALL PROVIDE PIPE GUIDES CONSISTING OF A TELESCOPIC ARRANGEMENT OF TWO SIZES OF STEEL TUBING SEPARATED BY A MINIMUM HALF-INCH THICKNESS OF HEAVY DUTY NEOPRENE AND DUCK OR NEOPRENE ISOLATION MATERIAL. HEIGHT OF THE GUIDES SHALL BE PRESET WITH A SHEAR PIN TO ALLOW VERTICAL MOTION DUE TO PIPE EXPANSION/CONTRACTION. GUIDES SHALL BE TYPE GDA AS MANUFACTURED BY MASON INDUSTRIES, INC., OR APPROVED.
      - TYPE D: VIBRATION ISOLATOR MANUFACTURER SHALL PROVIDE ALL DIRECTIONAL ACoustICAL PIPE ANCHORS CONSISTING OF A TELESCOPIC ARRANGEMENT OF TWO SIZES OF STEEL TUBING SEPARATED BY A MINIMUM HALF INCH THICKNESS OF HEAVY DUTY NEOPRENE AND DUCK OR NEOPRENE ISOLATION MATERIAL. ALL DIRECTIONAL ANCHORS OR GUIDES SHALL BE TYPE ADA AS MANUFACTURED BY MASON INDUSTRIES, INC., OR APPROVED.
  - i. FLOOR SUPPORT FOR PIPE SIZES TO 4 INCHES AND ALL COLD PIPE SIZES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCKNUT NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
  - j. FLOOR SUPPORT FOR HOT PIPE SIZES 6 INCHES AND OVER: ADJUSTABLE CAST IRON ROLL AND STAND, STEEL SCREWS, AND CONCRETE PIER OR STEEL SUPPORT.
  - k. COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
  - l. SHIELD FOR INSULATED PIPING 2 INCHES AND SMALLER: 18 GAGE GALVANIZED STEEL SHIELD OVER INSULATION IN 180 DEGREE SEGMENTS, MINIMUM 12 INCHES LONG AT PIPE SUPPORT.
  - m. SHIELD FOR INSULATED PIPING 2 1/2 INCHES AND LARGER (EXCEPT COLD WATER PIPING): PIPE COVERING PROTECTIVE SADDLES.
  - n. SHIELDS FOR INSULATED COLD WATER PIPING 2 -1/2 INCHES AND LARGER:

## ARCHITECT/ENGINEER.

9. DRILLING AND CUTTING OF CONCRETE AND OTHER WORK WHICH MAKES OBJECTIVE 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 EXCEPT WHERE SHOWN OTHERWISE.
- 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. MINIMUM 1/8" THICK FOR 10 OR BEATON CORBIN.
- B. ISOLATORS:
  - a. STONEMAN TRIULATOR, 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 FOR PIPES THROUGH NON-FIRE RATED FLOORS: FORM WITH 18 GAGE GALVANIZED STEEL.
6. SLEEVES FOR PIPES THROUGH NON-FIRE RATED BEAMS, WALLS, FOOTINGS, AND POTENTIALLY WET FLOORS: FORM WITH STEEL PIPE OR 18 GAGE GALVANIZED STEEL.
7. 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 STEEL. SIZE SLEEVES LARGE ENOUGH TO ALLOW FOR MOVEMENT DUE TO EXPANSION AND CONTRACTION. PROVIDE FORM 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 FIRE SAFETY 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.
- B. 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. ANGL 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 BE EMBEDDED 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, DOUBLE HANGER.
  - d. MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS; CAST IRON ROLL AND STAND FOR HOT PIPE SIZES 6 INCHES AND OVER.
  - e. HANGERS AND SUPPORTS EXPOSED TO WEATHER OR WET CONDITIONS SHALL BE GALVANIZED.
  - f. WALL SUPPORT FOR PIPE SIZES TO 3 INCHES: CAST IRON HOOK.
  - g. WALL SUPPORT FOR PIPE SIZES 4 INCHES AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP; ADJUSTABLE STEEL YOKE AND CAST IRON ROLL FOR HOT PIPE SIZES 6 INCHES AND OVER.
  - h. VERTICAL SUPPORT:
    - TYPE A: STEEL RISER CLAMP.
    - TYPE B: STEEL RISER CLAMP WITH SPRING ISOLATION.
    - TYPE C: VIBRATION ISOLATOR MANUFACT

# MECHANICAL GENERAL PROVISIONS CONTD.

- BE BY COUPLING MANUFACTURER.
- F. SPRING-LOADED CHECK VALVES:
- a. IRON BODY, BRONZE TRIM, STAINLESS STEEL SPRING, RENEWABLE COMPOUND DISC, SCREWED, WATER, OR FLANGED ENDS.
  - b. CHECK VALVES IN MECHANICAL COUPLING SYSTEMS, I.E., VICTAULG, ETC., MAY BE BY COUPLING MANUFACTURER.
- G. BACKFLOW PREVENTERS:
- a. MANUFACTURERS:
    - WATTS.
    - OMB INDUSTRIES; FEBCO DV.
    - 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.
- H. 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 USB, 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.
- I. 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.
- J. 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 PTFE DISC, AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDREL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
      - 2" 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 NORDREL 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 NORDREL 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 NORDREL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
  - c. AUTOMATIC FLOW CONTROL VALVES:
    - a. MANUFACTURERS:
      - MI 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 ORIFICE AND SPRINGS.
      - 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 NORDREL 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 CLASS 150. TWO, PRESSURE/TEMPERATURE TEST PORTS WITH EXTENSIONS AND NORDREL 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.
  - d. 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	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.]
- F. 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:
    - CONFORM TO APPLICABLE ELECTRICAL CODE.
    - CONFORM TO LOCAL ENERGY CODE.
  - e. 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.
  - f. 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.
    - BREAKDOWN TORQUE: APPROXIMATELY 200 PERCENT OF FULL LOAD TORQUE.
- 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.
- i. 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.
- j. 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 AFMA 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.
- k. 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:
- | HP  | OPEN     |          |          | CLOSED   |          |          |
|-----|----------|----------|----------|----------|----------|----------|
|     | 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%    |

M = DIVISION 23, MECHANICAL  
E = DIVISION 26, ELECTRICAL

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

- 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.
  - D. GENERAL COORDINATION AND INSTALLATION
    - 1. INFORM OTHER TRADES THRU GENERAL CONTRACTOR AS TO REQUIREMENTS FOR SLEEVES, BOOTS, 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.
    - 2. FURNISH AND INSTALL PIPE SLEEVES AND EMBEDDED ITEMS REQUIRED UNDER DIVISION 23.
    - 3. 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.
    - 4. 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:
    - 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 LCS 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 WORKED ONE INCH MINIMUM INTO HUB, 8 INCHES MINIMUM CLEAR ON SIDES WITH 24 X 24 INCHES SEET SIZE. FOR PIPES THROUGH OUTSIDE WALLS, TURN FLANGES BACK INTO WALL AND CAULK, METAL COUNTERFLASH AND SEAL.
  - C. FLASH FLOOR DRAINS IN FLOORS WITH TOPPING OVER FINISHED AREAS WITH LEAD, 10 MIL CLEAR ON SIDES WITH MINIMUM 36 X 36 INCH SHEET SIZE. FASTEN FLASHING TO DRAIN CLAMP DEVICE.
  - D. SEAL FLOOR, SHOWER AND MOP SINK DRAINS, ETC., WATERTIGHT TO ADJACENT MATERIALS.
  - E. PROVIDE ACOUSTICAL LEAD FLASHING AROUND DUCTS AND PIPES PENETRATING EQUIPMENT ROOMS, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS FOR SOUND CONTROL.
- F. PROVIDE CURBS FOR MECHANICAL ROOF INSTALLATIONS 6 INCH MINIMUM HIGH ABOVE ROOFING SURFACE. FLEXIBLE SHEET FLASH AND COUNTERFLASH WITH SHEET METAL; SEAL WATERTIGHT.
- 7. INSERTS
  - A. PROVIDE INSERTS TO GENERAL CONTRACTOR FOR PLACEMENT IN CONCRETE FORMWORK.
  - B. PROVIDE INSERTS FOR SUSPENDING HANGERS FROM REINFORCED CONCRETE SLABS PREFORMED HOLLOW CORE PLANKS AND SIDES OF REINFORCED CONCRETE BEAMS.
  - C. PROVIDE HOOKED ROD TO CONCRETE REINFORCEMENT SECTION FOR INSERTS CARRYING PIPE OVER 4 INCHES.
  - D. WHERE CONCRETE SLABS FORM FINISHED CEILING, PROVIDE INSERTS TO BE FLUSH WITH CONCRETE SLAB.
  - E. WHERE INSERTS ARE OMITTED, DRILL THROUGH CONCRETE SLAB FROM BELOW AND PROVIDE THRU -BOLT SQUARE STEEL PLATE AND NUT. OBTAIN APPROVAL OF STRUCTURAL ENGINEER PRIOR TO DRILLING OF ANY STRUCTURAL MEMBERS.
- 8. SUPPORTS AND ANCHORS
  - A. PIPE ANCHORS AND SUPPORTS:
    - a. INSTALL HANGERS TO PROVIDE MINIMUM 1/2 INCH SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
    - b. PLACE A HANGER WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.
    - c. USE HANGERS WITH 1 - 1/2 INCH MINIMUM VERTICAL ADJUSTMENT.
    - d. HANGER RODS EXPOSED TO WEATHER OR WET CONDITIONS SHALL BE COATED WITH PAINT OR OTHER COATING TO PREVENT RUST.
    - e. SUPPORT HORIZONTAL CAST IRON PIPE ADJACENT TO EACH HUB, WITH 5 FEET MAXIMUM SPACING BETWEEN HANGERS.
    - f. SUPPORT VERTICAL PIPING AT EVERY OTHER FLOOR UNLESS SPECIFIED OTHERWISE. SUPPORT VERTICAL CAST IRON PIPE AT EACH FLOOR AT HUB.
    - g. WHERE TWO OR MORE PIPES INSTALLED IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE OR TRAPEZE HANGERS.
    - h. SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.
  - B. SUPPORT HORIZONTAL PIPING AS REQUIRED BY THE UNIFORM PLUMBING CODE, 1997 EDITION, SECTION 314, TABLES 3-1 AND 3-2.
  - C. ROOFTOP PIPE SUPPORTS: PILLOW BLOCK PIPE SUPPORTS BY MIRO INDUSTRIES INC.
  - D. EQUIPMENT BASES AND SUPPORTS:
    - a. PROVIDE EQUIPMENT BASES OF CONCRETE TYPE SPECIFIED IN SECTIONS.
    - b. PROVIDE TEMPLATES, ANCHOR BOLTS, AND ACCESSORIES FOR MOUNTING AND ANCHORING EQUIPMENT.
    - c. CONSTRUCT SUPPORT OF STEEL MEMBERS. BRACE AND FASTEN WITH FLANGES BOLTED TO STRUCTURE.
    - d. PROVIDE RIGID ANCHORS FOR PIPES AFTER VIBRATION ISOLATION COMPONENTS ARE INSTALLED.
- 9. SEISMIC BRACING AND SUPPORTS
  - A. BRACING OF DUCTS:
    - a. ALL BRACING SHALL BE DESIGNED AND INSTALLED FOR ZONE 3 SEISMIC HAZARD.
    - b. BRACE ALL RECTANGULAR DUCTS 6 SQ. FT. OF AREA AND LARGER. BRACE ALL ROUND DUCTS 28" IN DIAMETER AND LARGER.
    - c. BRACE SPACING:
      - TRANSVERSE BRACING TO OCCUR 30' - 0" O.C. MAXIMUM. (EXCEPT RECTANGULAR DUCTS 61" AND LARGER IN EITHER DIRECTION MAY BE BRACED AT 32' - 0" O.C.)
      - TRANSVERSE BRACING SHALL BE INSTALLED AT EACH DUCT TURN AND AT EACH END OF A DUCT RUN.
      - LONGITUDINAL BRACING SHALL OCCUR AT 60' - 0" O.C. MAXIMUM. TRANSVERSE BRACING FOR ONE DUCT SECTION MAY ALSO ACT AS LONGITUDINAL BRACING FOR A DUCT SECTION CONNECTED PERPENDICULAR TO IT, IF THE BRACING IS INSTALLED WITHIN FOUR FEET OF THE INTERSECTION OF BOTH DUCTS AND BRACING IS SIZED FOR THE

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 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 TIE 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 MEGOHMS 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:
- d. 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.



**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 MO.0.DWG
JOB NUMBER	2024.11

**MO.3**

**PERMIT SET 08-15-2025**



**AIR HANDLER UNIT (AHU-) SCHEDULE**

TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL				WEIGHT (LBS)	DIMENSIONS (H"xL"xW")	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			
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		ELECTRICAL				EER	COP	REFRIG CIRCUITS	DIMENSIONS (H"xL"xW")	WEIGHT	NOTES
				COOL (BTUH)	HEAT (BTUH)	VOLTAGE	PHASE	MCA	BREAKER						
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

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

**REVISIONS**

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

TITLE

**HVAC SCHEDULES**

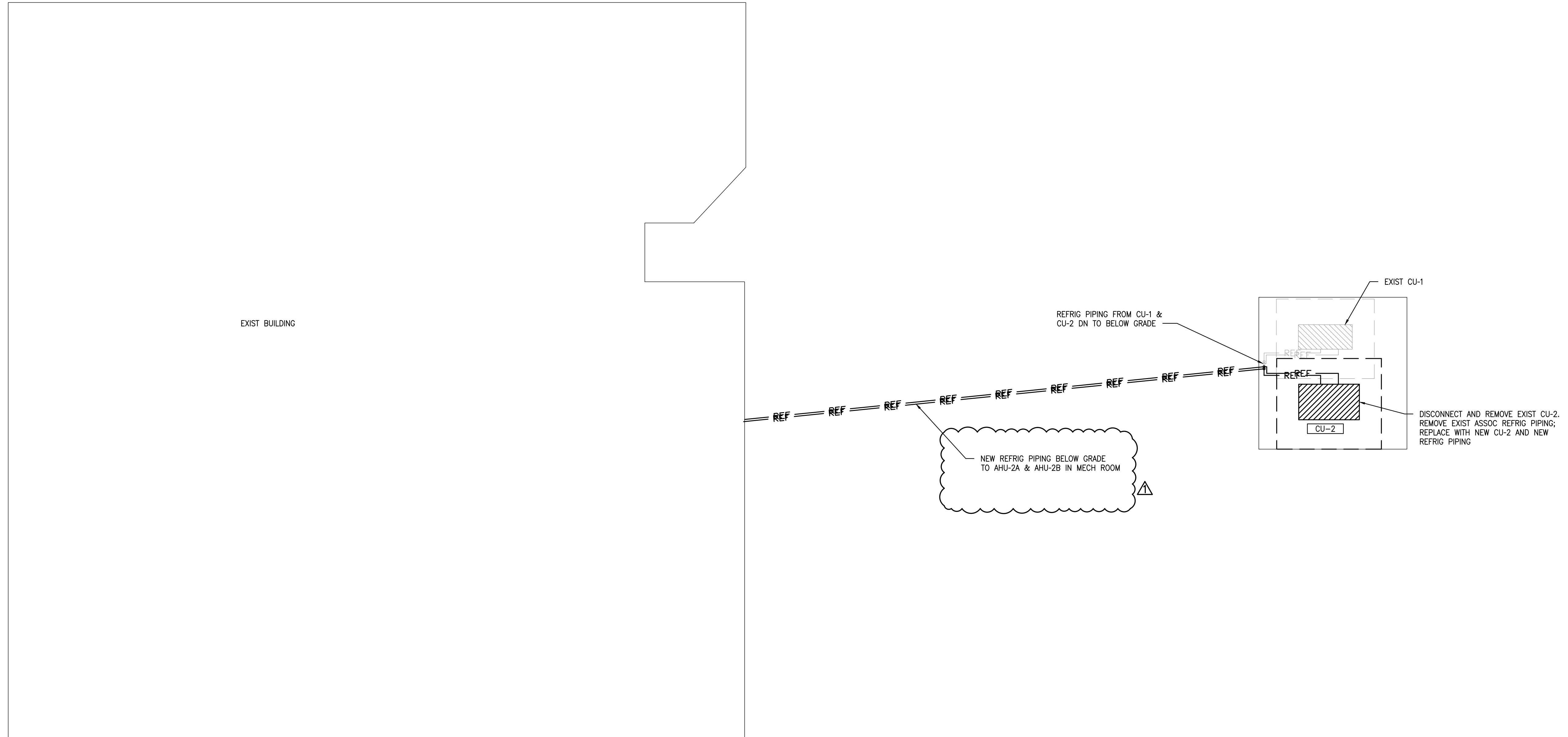
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CHECKED	RR
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CADD FILE	2024.11 M1.0.DWG
JOB NUMBER	2024.11

**M1.0**

**PERMIT SET 08-15-2025**

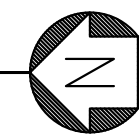


**SVCA**  
**CLUBHOUSE HVAC**  
4 CLUBHOUSE CIR,  
BELLINGHAM, WA, 98229



**HVAC SITE PLAN**

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



REVISIONS

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

TITLE

**HVAC SITE PLAN**

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.0.DWG
JOB NUMBER	2024.11

**M2.0**

**PERMIT SET 08-15-2025**



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

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

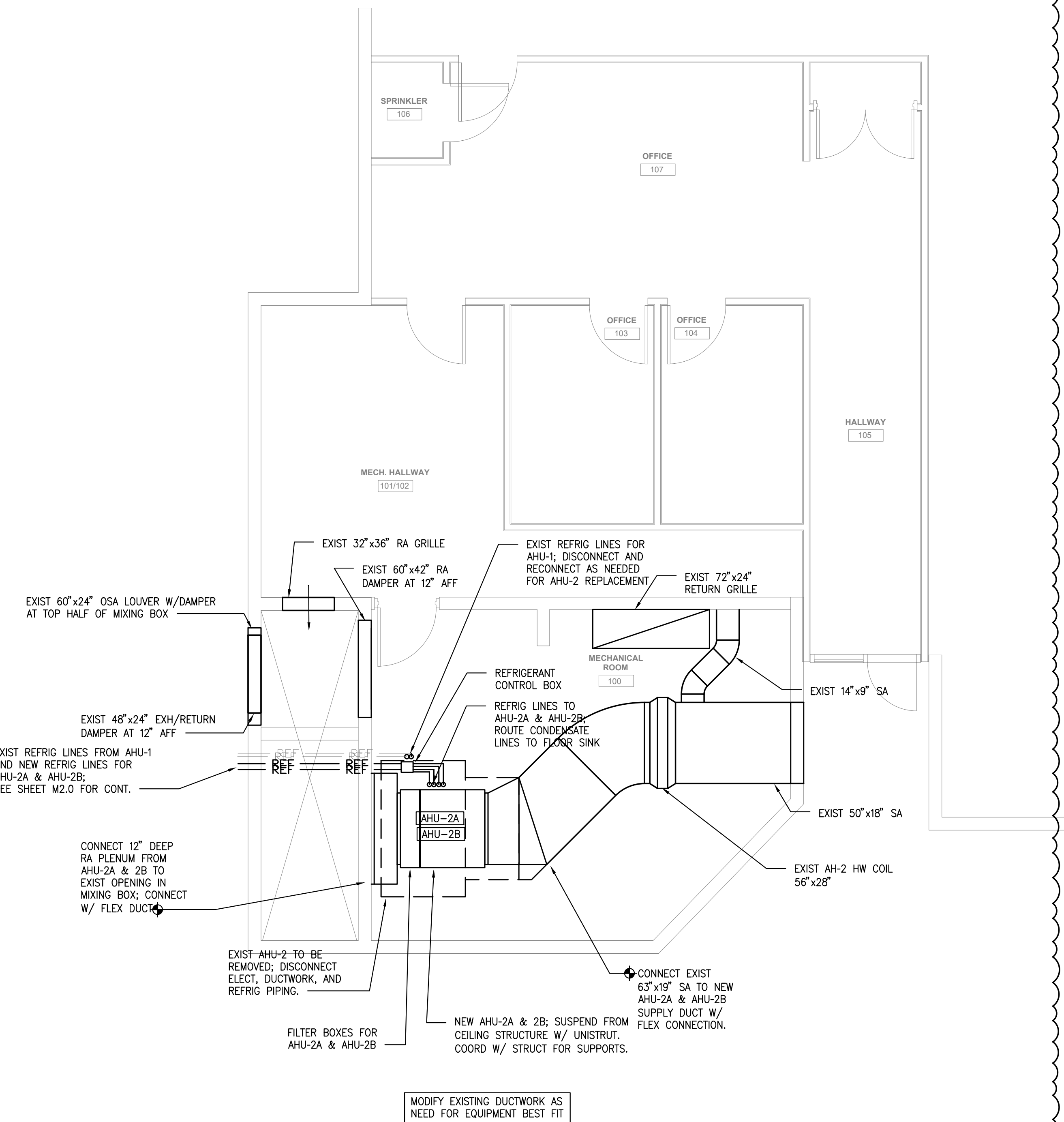
TITLE

**HVAC MECH**  
**ROOM PLAN**

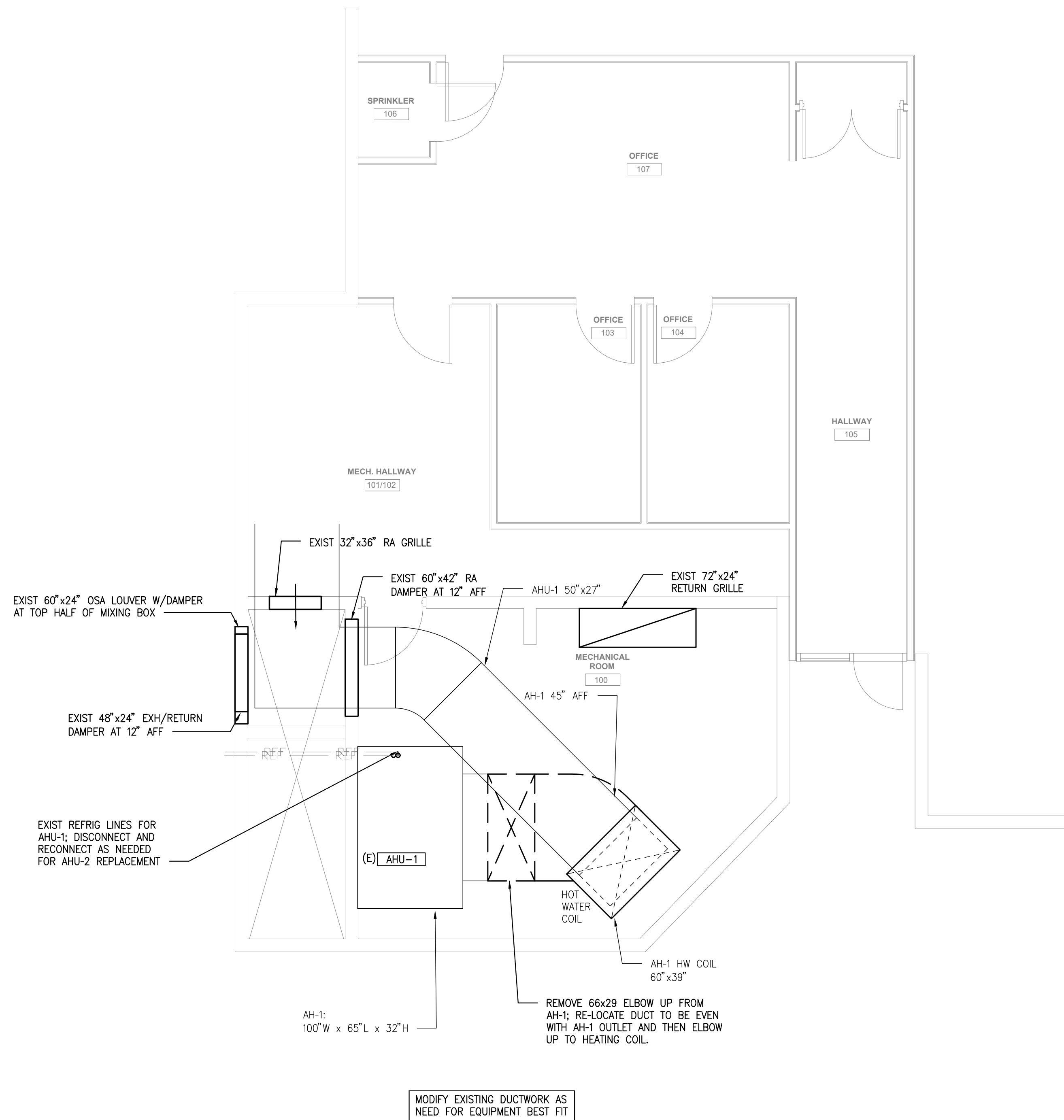
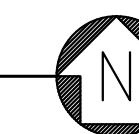
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JOB NUMBER	2024.11

**M2.1**

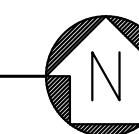
**PERMIT SET 08-15-2025**

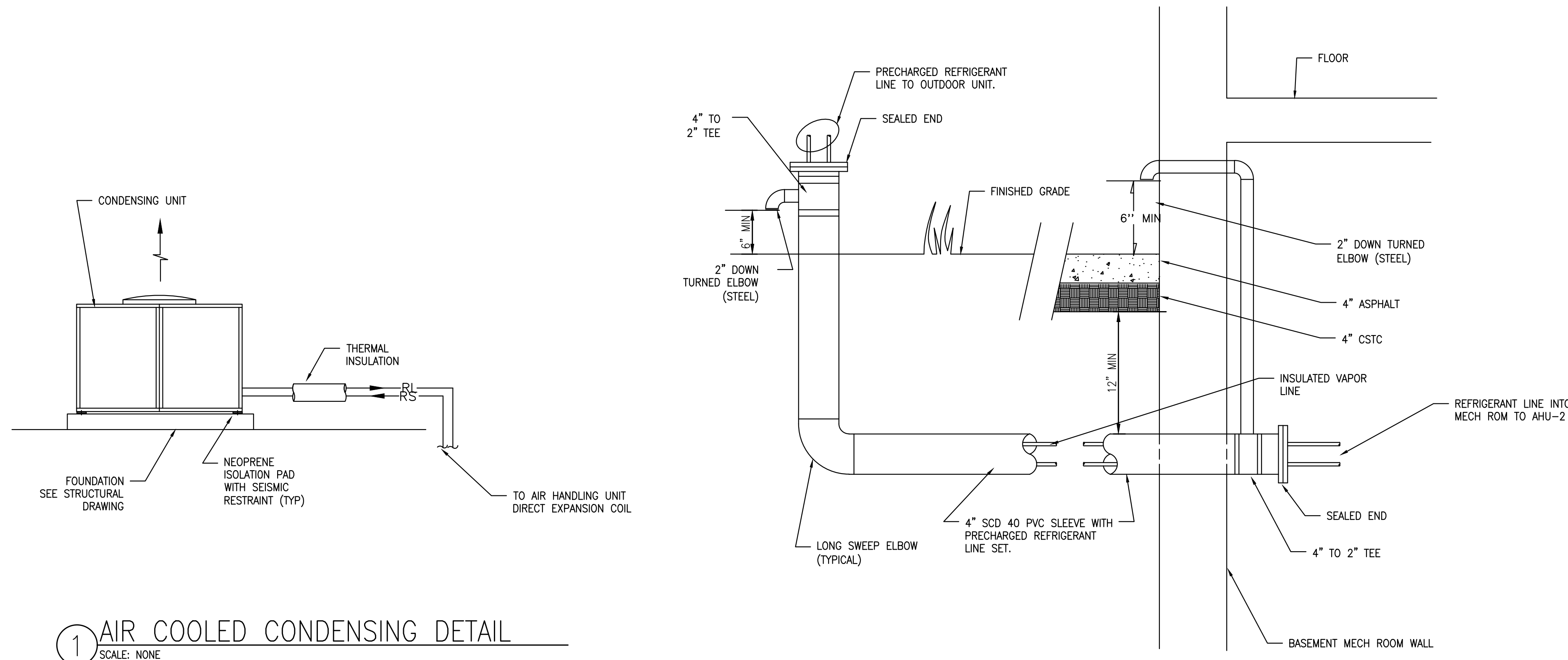


HVAC FLOOR PLAN- AHU-2  
SCALE: 1/4" = 1'-0"

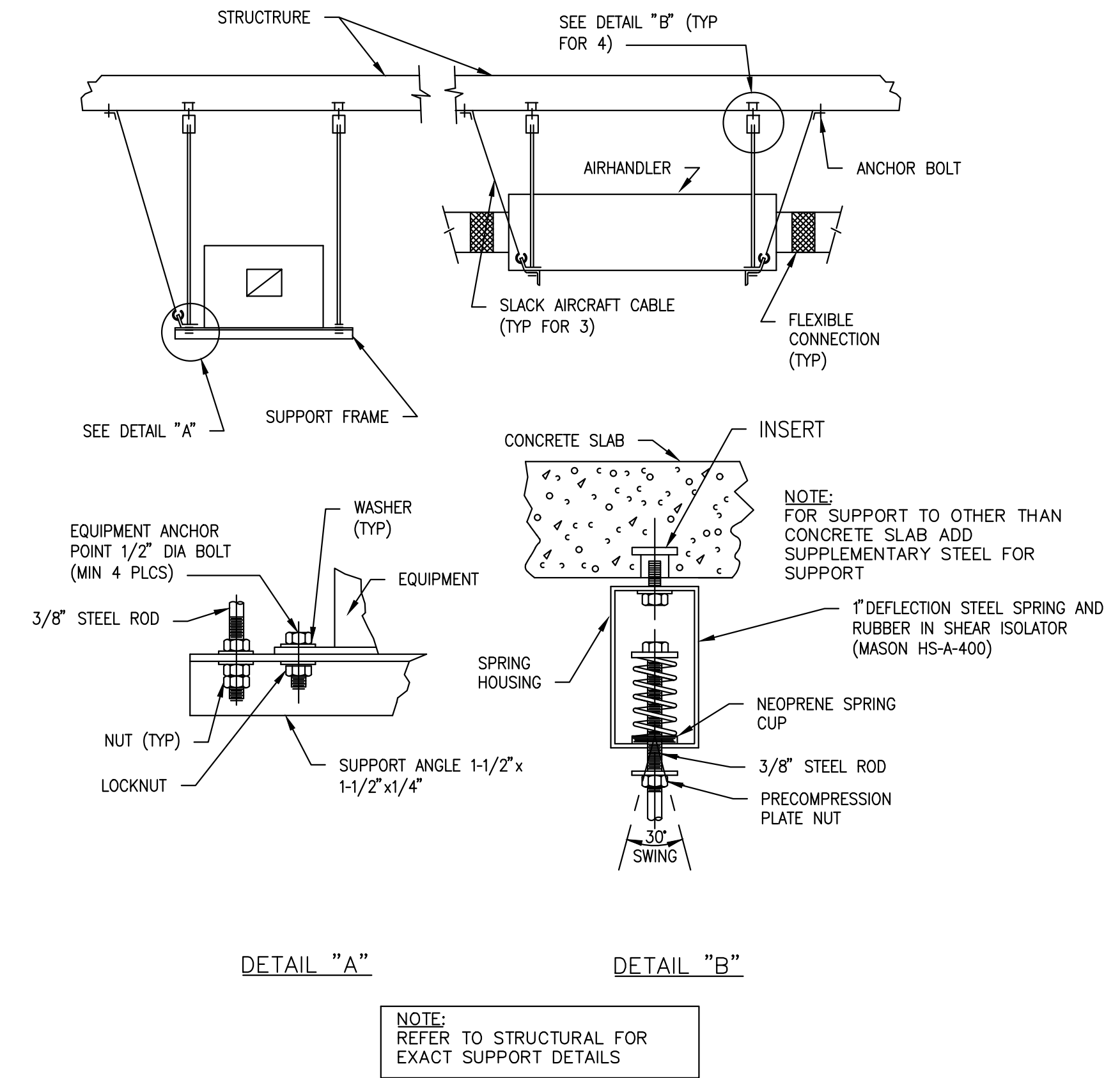


HVAC FLOOR PLAN- AHU-1  
SCALE: 1/4" = 1'-0"



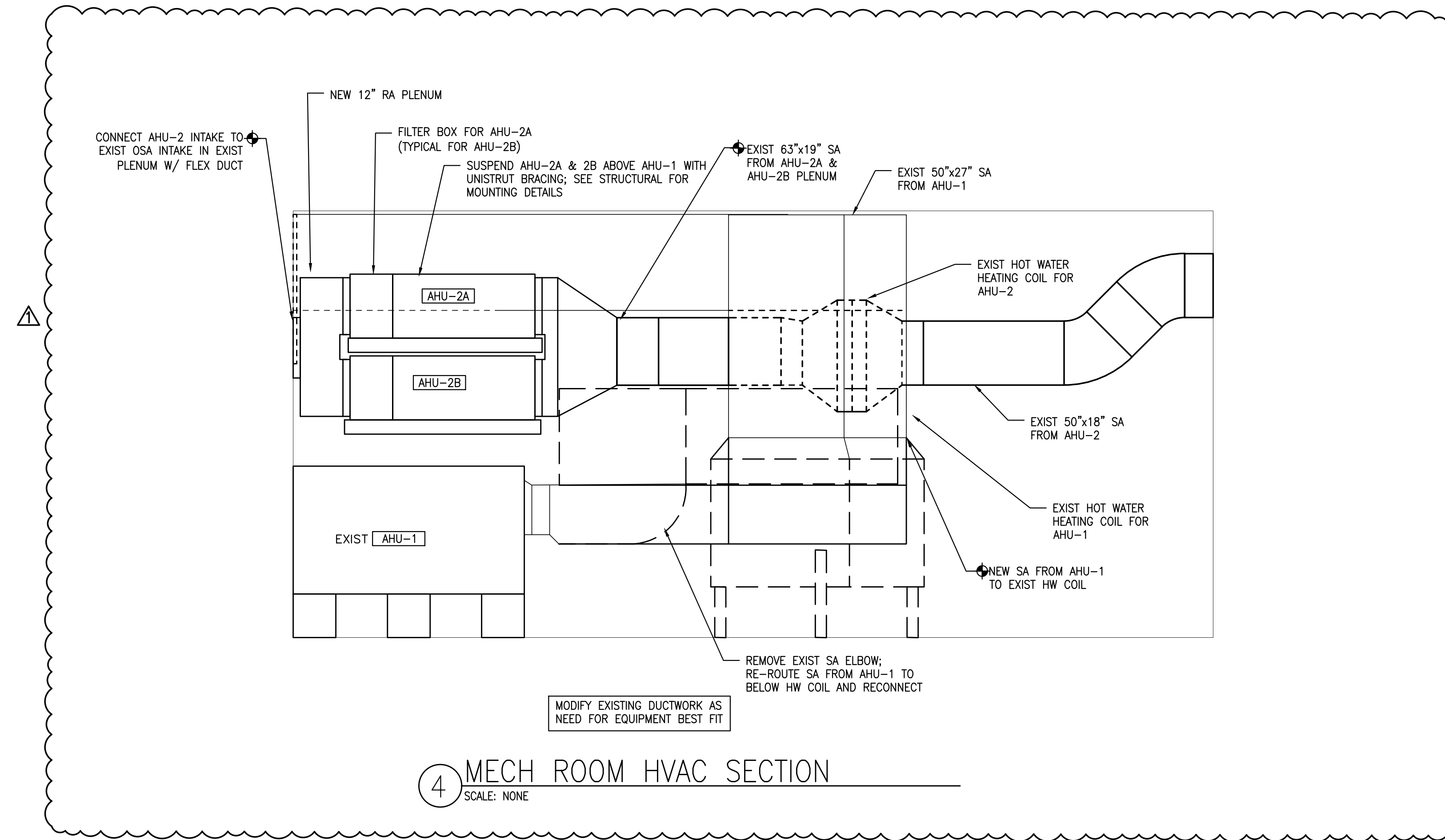


**1 AIR COOLED CONDENSING DETAIL**  
 SCALE: NONE



**3 AHU SUPPORT DETAIL**  
 NOT TO SCALE

**2 UNDERGROUND PIPING DETAIL**  
 SCALE: NTS



**4 MECH ROOM HVAC SECTION**  
 SCALE: NONE

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

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**

**PERMIT SET 08-15-2025**



January 28<sup>th</sup>, 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 9<sup>th</sup>, 2026 at 5:00pm per Addendum #4.

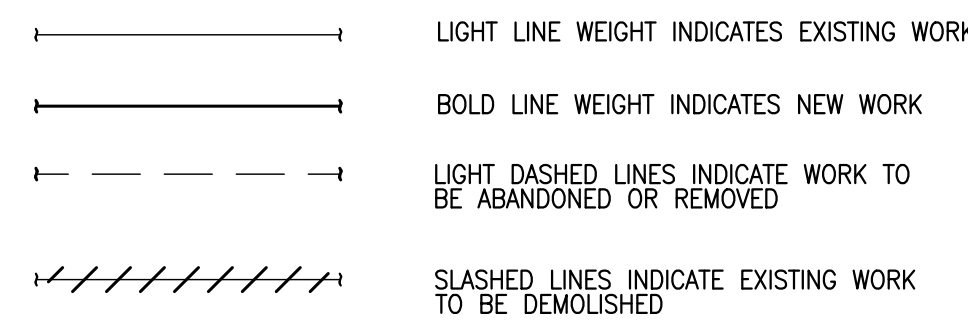
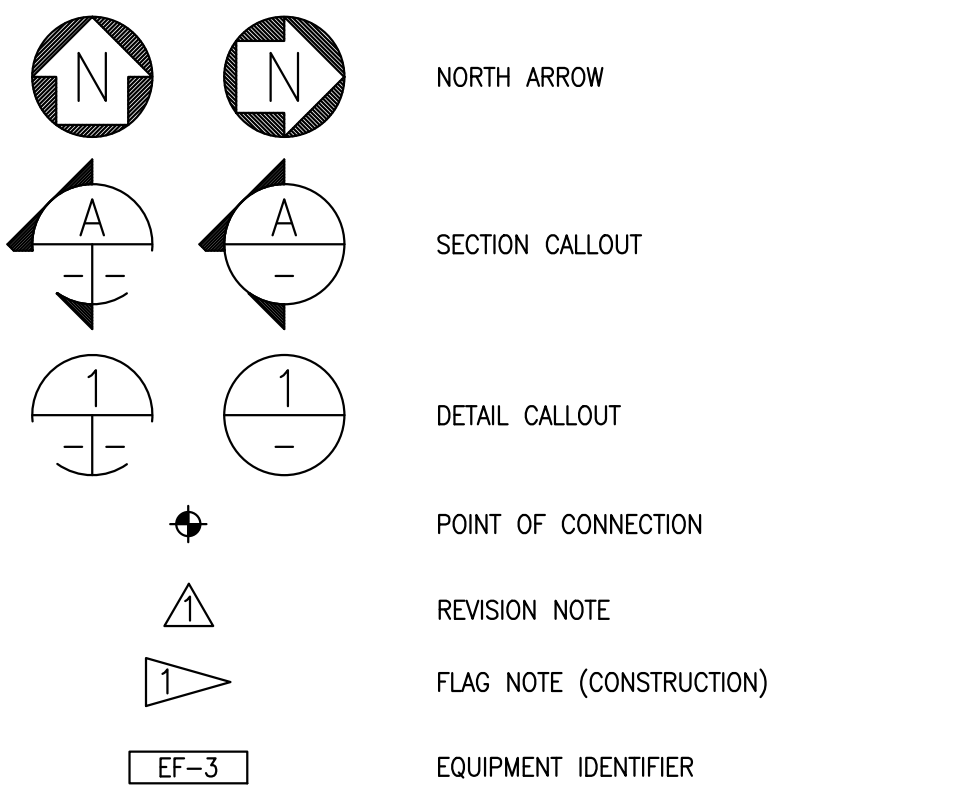
**Changes to Drawings:**

- New set of drawings issued per attached – 8 pages.

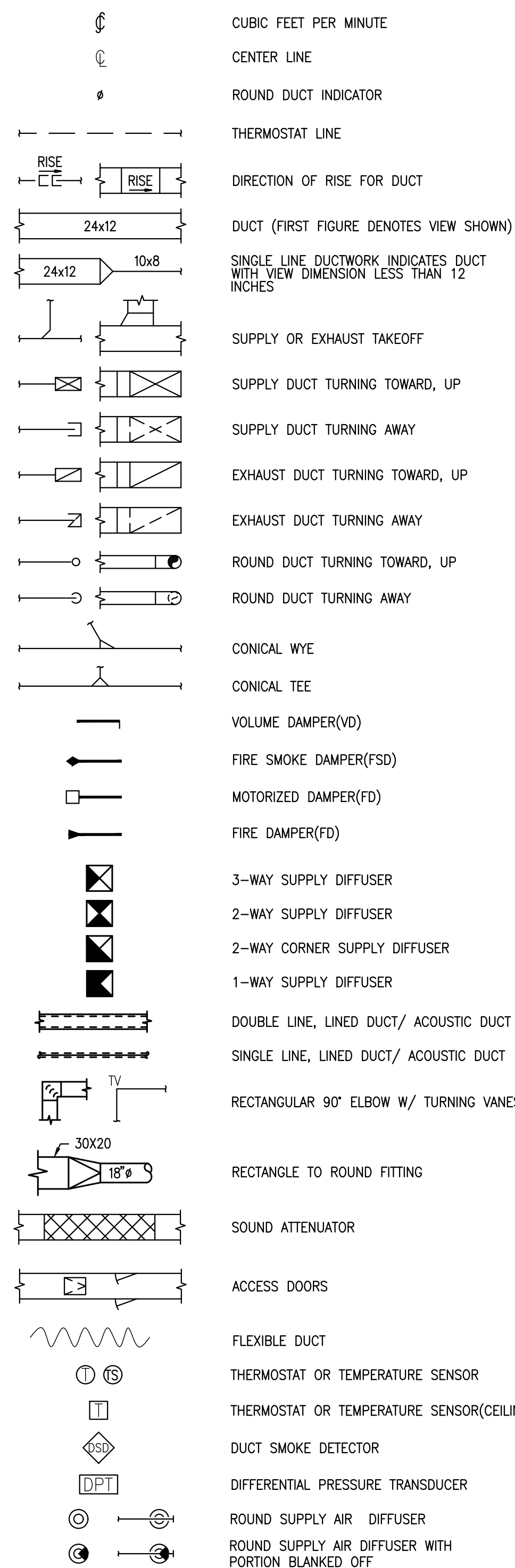
**End of Addendum No. 5**

Questions shall be directed to Tyler Andrews at [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com) or 360-739-2072.

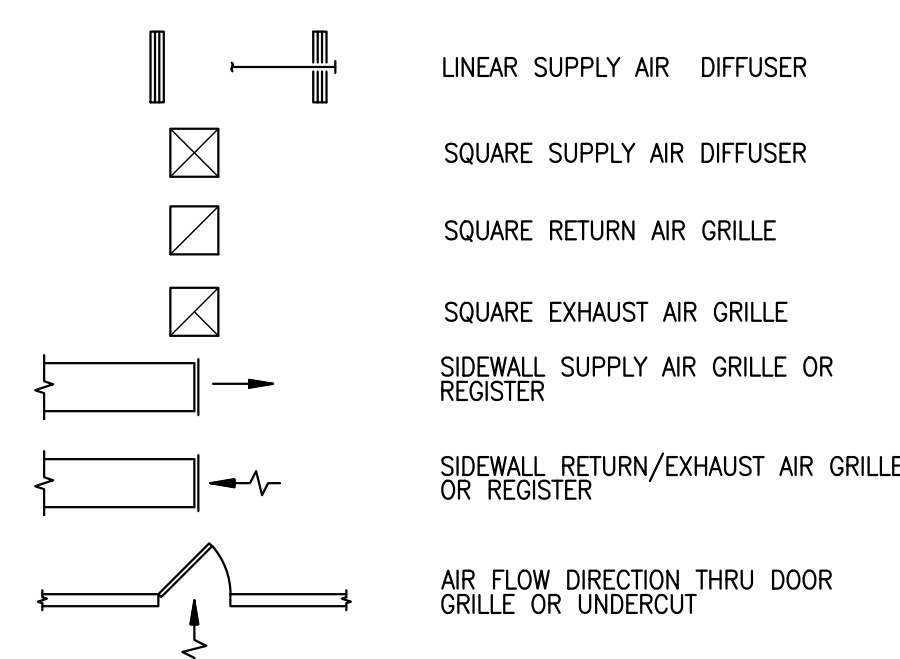
GENERAL



HVAC



HVAC (CONT.)



ABBREVIATIONS

Table of HVAC abbreviations including AC, ACF, ADA, AD, ADJ, AFF, AI, ALIGN, AP, APPROX, ARCH, ASME, AVG, BFF, BHP, BLDG, BOD, BOP, BPD, BTU, BTUH, BV, CD, CFM, CG, CI, CLG, CO, CONN, CONST, CONT, COORD, CORR, COTG, CU, FT, CU, IN, CW, DB, DCV, DCA, DEG, DET, DFU, DIA, DIFF, DIM, DISCH, DN, DOM, DR, DRS, DSD, DWG, EA, EAT, EF, EFF, EG, ELECT, ELEV, EMERG, ENT, EXH, EXIST, EXP, F, FCO, FD, FDC, FIO, FLA, FLEX, FLR, FOB, FOIC, FOT, FPM, FPS, FSD, FT, FU, G, GAL, GALV, GC, GEN, GND, GPH, GPM, GW, H, HB, HP, HR, HTG, HVAC, HW, HWC, HWR, HWS, HZ.

ABBREVIATIONS (CONT.)

Table of general abbreviations including IBC, ID, IE, IMC, IN, INSUL, IW, KW, KWH, L, LAV, LAT, LBS, LINEAL, LF, LVG, MA, MAX, MBTU, MCA, MCC, MD, MECH, MFR, MIN, MISC, MOD, MTD, MTG, NA, NC, NIC, NTS, OAC, OAT, OD, OH, ORD, OSA, P, PD, PH, POC, PRELIM, PRESS, PRV, PSI, PSIG, RA, RD, RCIRC, RECT, REF, REG, REQD, RND, RFPBP, RPM, RV, SAN, SCHED, SD, SF, SG, SO, SOV, DIA, DIFF, DIM, DISCH, DN, DOM, DR, DRS, DSD, DWG, TD, TSTAT, THRU, TOD, TOP, TP, TS, TV, TW, TWR, TYP, UP, UTR, V, VAV, VB, VD, VEL, VERT, VOL, VS, VTR, W, WCO, WB, WG, WHA, W/, W/O, WS, WT, WSFU, M0.0, M0.1, M0.2, M0.3, M1.0, M2.0, M2.1, M3.0.

DRAWING LIST table with columns for drawing number and description.

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, 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 RISERS 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 CEILING 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. 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/FT @ 1.0"WG IN ACCORDANCE W/ AMCA 500.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" SOUNDING FOR THE FIRST 10 FEET FROM UNIT DISCHARGE OUTLET. ALL DUCT LINING TO MEET AND EXCEED MOLD, HUMIDITY, EROSION RESISTANT, ETC. TO MEET IMC 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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REVISIONS table with columns for NO, DATE, BY, DESCRIPTION

HVAC LEGENDS AND NOTES

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PERMIT SET 08-15-2025

# 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, WHEN DISCREPANCIES OCCUR ON 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.
    - d. MECHANICAL DRAWINGS:
      - a. 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.
      - b. 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.
      - c. 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
      - AWMA - 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
      - SMC - 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 OWNERS 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 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. ALL WORK OF 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.
    - 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.
    - NOTIFY ARCHITECT OF DISCOVERY OF ANY HAZARDOUS MATERIALS SUCH AS ASBESTOS, ETC.
- G. 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. 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 SHALL 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.
  - b. MATERIAL SHOP AND FIELD INSTALLATION DRAWINGS.
    - MATERIALS AND SHOP DRAWINGS.
  - c. BINDING AND FORMAT: BIND IN THREE-RING BINDER(S). LABEL FRONT OF BINDER(S) WITH NAME OF PROJECT, NAME OF OWNER, YEAR OF COMPLETION; 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.
    - SUBMITTAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
  - d. INCLUDE SUBMITTAL DATA ON MATERIALS AND EQUIPMENT AS INDICATED IN INDIVIDUAL SPECIFICATION SECTIONS. DO NOT ORDER, FABRICATE OR INSTALL UNTIL REVIEWED/ACCEPTED BY ARCHITECT/ENGINEER. INCLUDE DESCRIPTIVE BULLETINS, DATA SHEETS, CATALOG CUTS, DIAGRAMS, COMPLETE DIMENSIONAL DRAWINGS, AND OTHER ADDITIONAL INFORMATION AS REQUIRED.
- 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 CHASES.
    - 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 SHOWING FINISHED FLOOR, 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.
  - e. TEST REPORTS AND CERTIFICATES: SUBMIT IN ONE COMPREHENSIVE PACKAGE PRIOR TO SUBSTANTIAL COMPLETION.
  - f. BALANCING AND TESTING REPORTS: SUBMIT FOR REVIEW.
- D. OPERATIONS 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.
- E. ELECTRONIC COPY ACCEPTED
- F. 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.
9. 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.
- EXCAVATION AND BACKFILL
  - A. CONTRACTOR SHALL DO ALL EXCAVATION AND BACKFILL REQUIRED FOR DIVISION 22 AND 23 CONSTRUCTION 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.
- 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.
- JETTING OR FLOODING WILL NOT BE PERMITTED.
- RESTORE ALL SURFACES TO ORIGINAL CONDITION, PROPERLY INSTALLED TO ELIMINATE ANY SETTLEMENT AND SATISFACTORY TO ARCHITECT.
- REFER TO STRUCTURAL DRAWINGS FOR DETAILS OF PIPES PASSING THROUGH OR NEAR FOOTINGS AND FOUNDATIONS.
- PLATES AND ISOLATORS
  - A. PLATES:
    - o. CHROME PLATED, STAMPED OR CAST BRASS.
  - B. ISOLATORS:
    - o. STONEMAN TRIULATOR, NO. 100 FOR STEEL PIPE, NO. 500 FOR COPPER TUBE.
    - o. LINK-SEAL TYPE MODEL LS OR PYRO-PAC.
    - o. PROCO PRODUCTS INC., PEN-SEAL.
- SLEEVES FOR PIPES THROUGH NON - FIRE RATED FLOORS: FORM WITH 18 GAGE GALVANIZED STEEL.
- SLEEVES FOR PIPES THROUGH NON - FIRE RATED BEAMS, WALLS, FOOTINGS, AND POTENTIALLY WET FLOORS: FORM WITH STEEL PIPE OR 18 GAGE GALVANIZED STEEL.
- SLEEVES FOR PIPES THROUGH FIRE RATED AND FIRE RESISTIVE FLOORS AND WALLS, AND FIREPROOFING: PREFABRICATED FIRE RATED SLEEVES INCLUDING SEALS, UL LISTED.
- SLEEVES FOR ROUND DUCTWORK: FORM WITH GALVANIZED STEEL.
- SLEEVES FOR RECTANGULAR DUCTWORK: FORM WITH GALVANIZED.
- SIZE SLEEVES LARGE ENOUGH TO ALLOW FOR MOVEMENT DUE TO EXPANSION AND CONTRACTION. PROVIDE FOR CONTINUOUS INSULATION WRAPPING.
- STUFFING INSULATION: GLASS FIBER TYPE, NON - COMBUSTIBLE.
- CAULK: ACRYLIC SEALANT OF QUALITY SPECIFIED IN DIVISION 07.
- FIRE-RATED PENETRATION SEALS
  - A. MANUFACTURERS:
    - o. 3M FIRE BARRIER PENETRATION SEALING SYSTEM.
    - o. THOMAS & BETTS FIRE SAFETY FIRE STOP.
    - o. CHASE FOAM FIRE STOP SYSTEM.
    - o. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
  - B. 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:
  - o. ALL MATERIALS TO COMPLY WITH UL 1479 (ASTM E-814).
  - o. THE FIRE RATING OF THE SEALANT SHALL BE AT LEAST THAT OF THE FLOOR, WALL OR CEILING INTO WHICH IT IS INSTALLED.
- 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.
- INSERTS
  - A. CONCRETE CONSTRUCTION
    - o. GRINNELL FIG. 282, OR SUPER M-732, UNISTRUT P-3521. MICHIGAN 353.
    - o. CHANNEL INSERT UNISTRUT P-3200, MICHIGAN CONCT. WITH END CAPS AND CARDBOARD FILLER STRIPS.
  - B. FRAME CONSTRUCTION
    - o. FLATTENED HEX SCREW WITH COUPLING OR SOCKET TO MATCH.
    - o. ANGLU CLIP BOLTED OR SCREWED WITH COUPLING OR SOCKET TO MATCH.
    - o. 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 ARCHITECT'S APPROVAL.
- EXPANSION SHIELDS: DIAMOND, RAWL PLUG, STAR, PHILLIPS OR CINCH ANCHOR MANUFACTURE.
- SUPPORTS AND ANCHORS
  - A. GENERAL:
    - o. FURNISH HANGER AND SUPPORT INSERTS AND SLEEVES FOR PLACEMENT INTO FORMWORK TO BE SUPPLIED UNDER OTHER SECTIONS BUT INSTALLED BY THIS CONTRACTOR.
    - o. SUBMITTALS: INDICATE HANGER AND SUPPORT FRAMING AND ATTACHMENT METHODS.
  - B. PIPE HANGERS AND SUPPORTS:
    - o. HANGERS FOR PIPE SIZES 1/2 TO 1 - 1/2 INCH: GALVANIZED STEEL, ADJUSTABLE SWIVEL, LOOP HANGER.
    - o. HANGERS FOR PIPE SIZES 2 TO 4 INCHES AND COLD PIPE SIZES 6 INCHES AND OVER: CARBON STEEL, ADJUSTABLE, CLEVIS.
    - o. HANGERS FOR HOT PIPE SIZES 6 INCHES AND OVER: ADJUSTABLE STEEL YOKE, CAST IRON ROLL, DOUBLE HANGER.
    - o. MULTIPLE OR TRAPEZE HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS; CAST IRON ROLL AND STAND FOR HOT PIPE SIZES 6 INCHES AND OVER.
    - o. HANGERS AND SUPPORTS EXPOSED TO WEATHER OR WET CONDITIONS SHALL BE GALVANIZED.
    - o. WALL SUPPORT FOR PIPE SIZES TO 3 INCHES: CAST IRON HOOK.
    - o. WALL SUPPORT FOR PIPE SIZES 4 INCHES AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP; ADJUSTABLE STEEL YOKE AND CAST IRON ROLL FOR HOT PIPE SIZES 6 INCHES AND OVER.
  - h. VERTICAL SUPPORT:
    - TYPE A: STEEL RISER CLAMP.
    - TYPE B: STEEL RISER CLAMP WITH SPRING ISOLATION.
    - TYPE C: VIBRATION ISOLATOR MANUFACTURER SHALL PROVIDE PIPE GUIDES CONSISTING OF A TELESCOPIC ARRANGEMENT OF TWO SIZES OF STEEL TUBING SEPARATED BY A MINIMUM HALF-INCH THICKNESS OF HEAVY DUTY NEOPRENE AND DUCK OR NEOPRENE ISOLATION MATERIAL. HEIGHT OF THE GUIDES SHALL BE PRESET WITH A SHEAR PIN TO ALLOW VERTICAL MOTION DUE TO PIPE EXPANSION/CONTRACTION. GUIDES SHALL BE TYPE GDA AS MANUFACTURED BY MASON INDUSTRIES, INC., OR APPROVED.
    - TYPE D: VIBRATION ISOLATOR MANUFACTURER SHALL PROVIDE ALL DIRECTIONAL ACOUSTICAL PIPE ANCHORS CONSISTING OF A TELESCOPIC ARRANGEMENT OF TWO SIZES OF STEEL TUBING SEPARATED BY A MINIMUM HALF INCH THICKNESS OF HEAVY DUTY NEOPRENE AND DUCK OR NEOPRENE ISOLATION MATERIAL. ALL DIRECTIONAL ANCHORS OR GUIDES SHALL BE TYPE ADA AS MANUFACTURED BY MASON INDUSTRIES, INC., OR APPROVED.
- i. FLOOR SUPPORT FOR PIPE SIZES TO 4 INCHES AND ALL COLD PIPE SIZES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCKNUT NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
- j. FLOOR SUPPORT FOR HOT PIPE SIZES 6 INCHES AND OVER: ADJUSTABLE CAST IRON ROLL AND STAND, STEEL SCREWS, AND CONCRETE PIER OR STEEL SUPPORT.
- k. COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
- l. SHIELD FOR INSULATED PIPING 2 INCHES AND SMALLER: 18 GAGE GALVANIZED STEEL SHIELD OVER INSULATION IN 180 DEGREE SEGMENTS, MINIMUM 12 INCHES LONG AT PIPE SUPPORT.
- m. SHIELD FOR INSULATED PIPING 2 1/2 INCHES AND LARGER (EXCEPT COLD WATER PIPING): PIPE COVERING PROTECTIVE SADDLES.
- n. SHIELDS FOR INSULATED COLD WATER PIPING 2 - 1/2 INCHES AND LARGER:

- HARD BLOCK NON CONDUCTING SADDLES IN 90 DEGREE SEGMENTS, 12 INCH MINIMUM LENGTH, BLOCK THICKNESS SAME AS INSULATION THICKNESS.
  - SHIELDS FOR VERTICAL COPPER PIPE RISERS: SHEET LEAD.
  - HANGER RODS: STEEL HANGER RODS: THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUS THREADED.
  - EQUIPMENT CURBS:
    - a. FABRICATE CURBS IN MECHANICAL ROOMS OF POURED IN PLACE CONCRETE, 4" HIGH.
    - b. 4" HIGH STEEL REINFORCING THROUGHOUT CURB AS REQUIRED TO SUSTAIN SEISMIC LOADS OF EQUIPMENT SUPPORTED.
  - FABRICATION:
    - a. DESIGN HANGERS WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
    - b. PROVIDE COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.
    - c. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.
  - ACCESS DOORS
    - A. MANUFACTURERS:
      - o. HART & COOLEY LLC/WILCOX.
      - o. J.L. INDUSTRIES.
      - o. GREENHECK.
      - o. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
    - B. FURNISH TO GENERAL CONTRACTOR HINGED METAL PANEL ACCESS DOORS OF PROPER SIZE, SUITABLE TO INSTALLATION CONDITIONS, WITH CONCEALED SPRING HINGES AND FLUSH SCREWDRIVER OPERATED LOCKS. FIRE RATED WITH UL LABEL IF LOCATED IN A REQUIRED FIRE SEPARATION.
      - o. 12" X 12" AT FIRE DAMPER, MINIMUM SIZE.
      - o. 8" X 12" AT CONCEALED DAMPER QUADRANT OR REGULATOR, MINIMUM SIZE.
      - o. STYLE AND SIZE AS REQUIRED FOR CEILING OR WALL CONSTRUCTION AND LARGE ENOUGH TO ALLOW RESETTING FUSIBLE LINKS OR OTHER WORK AS NECESSARY.
  - MECHANICAL SUBCONTRACTOR SHALL FURNISH ALL REQUIRED ACCESS DOORS FOR ACCESS TO MECHANICAL SYSTEM THROUGH BUILDING FINISH WORK. INSTALLATION OF ACCESS DOORS INTO FINISHED WALLS AND CEILINGS NOT IN MECHANICAL.
  - MECHANICAL IDENTIFICATION
    - A. GENERAL:
      - o. SUBMIT LIST OF WORDING, SYMBOLS, LETTER SIZE, AND COLOR CODING FOR MECHANICAL IDENTIFICATION.
      - o. SUBMIT VALVE CHART AND SCHEDULE, INCLUDING VALVE TAG NUMBER, LOCATION, FUNCTION, AND VALVE MANUFACTURER'S NAME AND MODEL NUMBER.
    - B. MANUFACTURERS:
      - o. THE FOLLOWING MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
        - BRADY.
        - SETON.
        - MARKING SERVICES INCORPORATED.
      - o. 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.
    - C. MATERIALS:
      - o. COLOR: UNLESS SPECIFIED OTHERWISE, CONFORM WITH ANSI/ASME A13.1.
      - o. PLASTIC NAMEPLATES: LAMINATED THREE LAYER PLASTIC WITH ENGRAVED BLACK LETTERS ON LIGHT CONTRASTING BACKGROUND COLOR.
      - o. PLASTIC TAGS: LAMINATED THREE LAYER PLASTIC WITH ENGRAVED BLACK LETTERS ON LIGHT CONTRASTING BACKGROUND COLOR. TAG SIZE MINIMUM 1 - 1/2 INCH DIAMETER ROUND OR SQUARE.
      - o. METAL TAGS: BRASS WITH STAMPED LETTERS; TAG SIZE MINIMUM 1 - 1/2 INCH DIAMETER ROUND WITH SMOOTH EDGES.
- STENCILS: WITH CLEAN CUT SYMBOLS AND LETTERS OF FOLLOWING SIZE:
- | OUTSIDE DIAMETER OF INSULATION OR PIPE | LENGTH OF COLOR FIELD | SIZE OF LETTERS |
|--|-----------------------|-----------------|
| 3/4" - 1-1/4"                          | 0"-8"                 | 0'-0 1/2"       |
| 1-1/2" - 2"                            | 0"-8"                 | 0'-0 3/4"       |
| 2-1/2" - 6"                            | 1"-0"                 | 0'-1 1/4"       |
| 8" - 10"                               | 2"-0"                 | 0'-2 1/2"       |
| OVER 10"                               | 2"-8"                 | 0'-3 1/2"       |
| DUCTWORK AND EQUIPMENT                 | -                     | 0'-2 1/2"       |
- e. STENCIL PAINT: IN ACCORDANCE WITH SECTION 09900, SEMI -/GLOSS ENAMEL.
  - f. PLASTIC PIPE MARKERS: FACTORY FABRICATED, FLEXIBLE, SEMI -RIGID PLASTIC, PREFORMED TO FIT AROUND PIPE OR PIPE COVERING; MINIMUM INFORMATION INDICATING FLOW DIRECTION ARROW AND FLUID BEING CONVEYED.
  - g. PLASTIC TAPE PIPE MARKERS: FLEXIBLE, VINYL FILM TAPE WITH PRESSURE SENSITIVE ADHESIVE BACKING AND PRINTED MARKINGS.
  - h. UNDERGROUND PLASTIC PIPE MARKERS: BRIGHT COLORED CONTINUOUSLY PRINTED PLASTIC RIBBON TAPE OF NOT LESS THAN 6 INCH WIDE BY 4 MIL THICK, MANUFACTURED FOR DIRECT BURIAL SERVICE.
  - VALVES AND ACCESSORIES
    - A. GENERAL VALVES:
      - o. MANUFACTURERS:
        - MILWAUKEE.
        - NIBCO.
        - STOCKHAM.
        - HAM

# MECHANICAL GENERAL PROVISIONS CONTD.

- BE BY COUPLING MANUFACTURER.
- F. SPRING-LOADED CHECK VALVES:
    - a. IRON BODY, BRONZE TRIM, STAINLESS STEEL SPRING, RENEWABLE COMPACTION DISC, SCREWED, WATER, 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 DV.
      - 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.
  - H. 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 USB, 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.
  - I. 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.
  - J. 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 PTFE DISC, AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
        - 2" 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 THE 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.
    - c. AUTOMATIC FLOW CONTROL VALVES:
      - MANUFACTURERS
        - IMI HYDRONIC.
        - GRISWOLD CONTROLS.
        - HAYS FLUID CONTROL.
        - OTHER MANUFACTURERS OFFERING EQUIVALENT PRODUCTS MAY BE CONSIDERED.
      - CONSTRUCTION:
        - FLOW CONTROL ELEMENT(S): ONE OR MORE BRASS AND/OR STAINLESS STEEL ORIFICE 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 CLASS 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.
  - K. 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:
      - BASIS FOR DESIGN: RAYCHEM XL-TRACE.
      - SUBSTITUTE MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
      - PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
    - b. 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	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° 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.]
- F. 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:
      - CONFORM TO APPLICABLE ELECTRICAL CODE.
      - CONFORM TO LOCAL ENERGY CODE.
    - e. 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.
    - f. 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.
- i. 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.
- j. 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 AFMA 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.
- k. 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:

HP	OPEN			CLOSED		
	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%

- 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:

ITEM	MECHANICAL EQUIPMENT AND CONTROLS			
	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, BOWTS, 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 WORKED ONE INCH MINIMUM INTO HUB, 8 INCHES MINIMUM CLEAR ON SIDES WITH 24 X 24 INCHES SEET SIZE. FOR PIPES THROUGH OUTSIDE WALLS, TURN FLANGES BACK INTO WALL AND CAULK, METAL COUNTERFLASH AND SEAL.
  - C. FLASH FLOOR DRAINS IN FLOORS WITH TOPPING OVER FINISHED AREAS WITH LEAD, 10 MIL CLEAR ON SIDES WITH MINIMUM 36 X 36 INCH SHEET SIZE. FASTEN FLASHING TO DRAIN CLAMP DEVICE.
  - D. SEAL FLOOR, SHOWER AND MOP SINK DRAINS, ETC., WATERTIGHT TO ADJACENT MATERIALS.
  - E. PROVIDE ACOUSTICAL LEAD FLASHING AROUND DUCTS AND PIPES PENETRATING EQUIPMENT ROOMS, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS FOR SOUND CONTROL.
- F. PROVIDE CURBS FOR MECHANICAL ROOF INSTALLATIONS 6 INCH MINIMUM HIGH ABOVE ROOFING SURFACE. FLEXIBLE SHEET FLASH AND COUNTERFLASH WITH SHEET METAL; SEAL WATERTIGHT.
7. INSERTS
  - A. PROVIDE INSERTS TO GENERAL CONTRACTOR FOR PLACEMENT IN CONCRETE FORMWORK.
  - B. PROVIDE INSERTS FOR SUSPENDING HANGERS FROM REINFORCED CONCRETE SLABS PREFORMED HOLLOW CORE PLANKS AND SIDES OF REINFORCED CONCRETE BEAMS.
  - C. PROVIDE HOOKED ROD TO CONCRETE REINFORCEMENT SECTION FOR INSERTS CARRYING PIPE OVER 4 INCHES.
  - D. WHERE CONCRETE SLABS FORM FINISHED CEILING, PROVIDE INSERTS TO BE FLUSH WITH CONCRETE.
  - E. WHERE INSERTS ARE OMITTED, DRILL THROUGH CONCRETE SLAB FROM BELOW AND PROVIDE THRU -BOLT SQUARE STEEL PLATE AND NUT. OBTAIN APPROVAL OF STRUCTURAL ENGINEER PRIOR TO DRILLING OF ANY STRUCTURAL MEMBERS.
8. SUPPORTS AND ANCHORS
  - A. PIPE ANCHORS AND SUPPORTS:
    - a. INSTALL HANGERS TO PROVIDE MINIMUM 1/2 INCH SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
    - b. PLACE A HANGER WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.
    - c. USE HANGERS WITH 1 - 1/2 INCH MINIMUM VERTICAL ADJUSTMENT.
    - d. HANGER RODS EXPOSED TO WEATHER OR WET CONDITIONS SHALL BE COATED WITH PAINT OR OTHER COATING TO PREVENT RUST.
    - e. SUPPORT HORIZONTAL CAST IRON PIPE ADJACENT TO EACH HUB, WITH 5 FEET MAXIMUM SPACING BETWEEN HANGERS.
    - f. SUPPORT VERTICAL PIPING AT EVERY OTHER FLOOR UNLESS SPECIFIED OTHERWISE. SUPPORT VERTICAL CAST IRON PIPE AT EACH FLOOR AT HUB.
    - g. WHERE TWO OR MORE PIPES INSTALLED IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE OR TRAPEZE HANGERS.
    - h. SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.
  - B. SUPPORT HORIZONTAL PIPING AS REQUIRED BY THE UNIFORM PLUMBING CODE, 1997 EDITION, SECTION 314, TABLES 3-1 AND 3-2.
  - C. ROOFTOP PIPE SUPPORTS: PILLOW BLOCK PIPE SUPPORTS BY MICO INDUSTRIES INC.
  - D. EQUIPMENT BASES AND SUPPORTS:
    - a. PROVIDE EQUIPMENT BASES OF CONCRETE TYPE SPECIFIED IN SECTIONS.
    - b. PROVIDE TEMPLATES, ANCHOR BOLTS, AND ACCESSORIES FOR MOUNTING AND ANCHORING EQUIPMENT.
    - c. CONSTRUCT SUPPORT OF STEEL MEMBERS. BRACE AND FASTEN WITH FLANGES BOLTED TO STRUCTURE.
    - d. PROVIDE RIGID ANCHORS FOR PIPES AFTER VIBRATION ISOLATION COMPONENTS ARE INSTALLED.





**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		ELECTRICAL				EER	COP	REFRIG CIRCUITS	DIMENSIONS (H"xL"xW")	WEIGHT	NOTES
				COOL (BTUH)	HEAT (BTUH)	VOLTAGE	PHASE	MCA	BREAKER						
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

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

**PERMIT SET 08-15-2025**

REVISIONS

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

TITLE

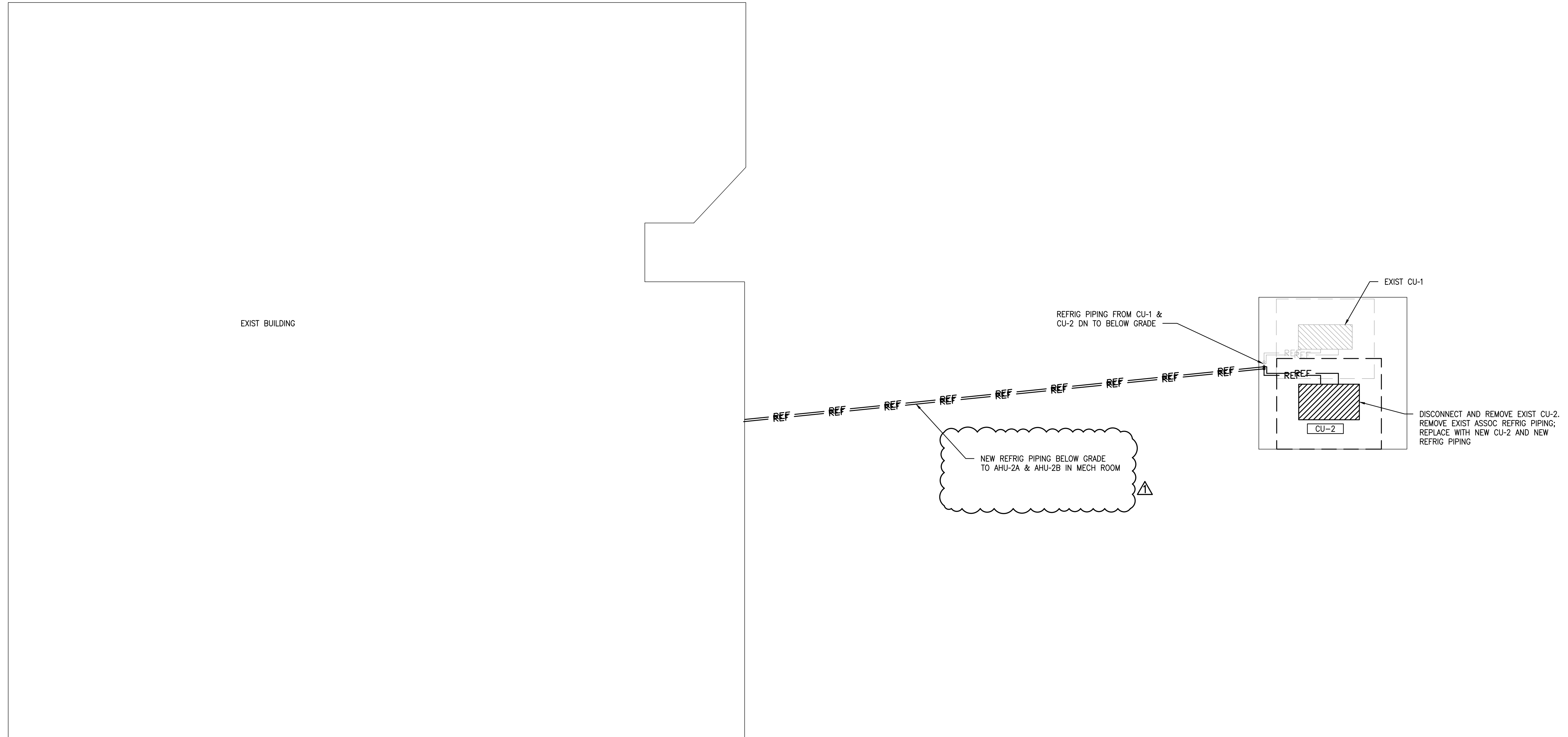
**HVAC SCHEDULES**

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

**M1.0**



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



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

TITLE

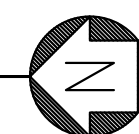
**HVAC SITE PLAN**

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.0.DWG
JOB NUMBER	2024.11

**M2.0**

**HVAC SITE PLAN**

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



**PERMIT SET 08-15-2025**



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

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

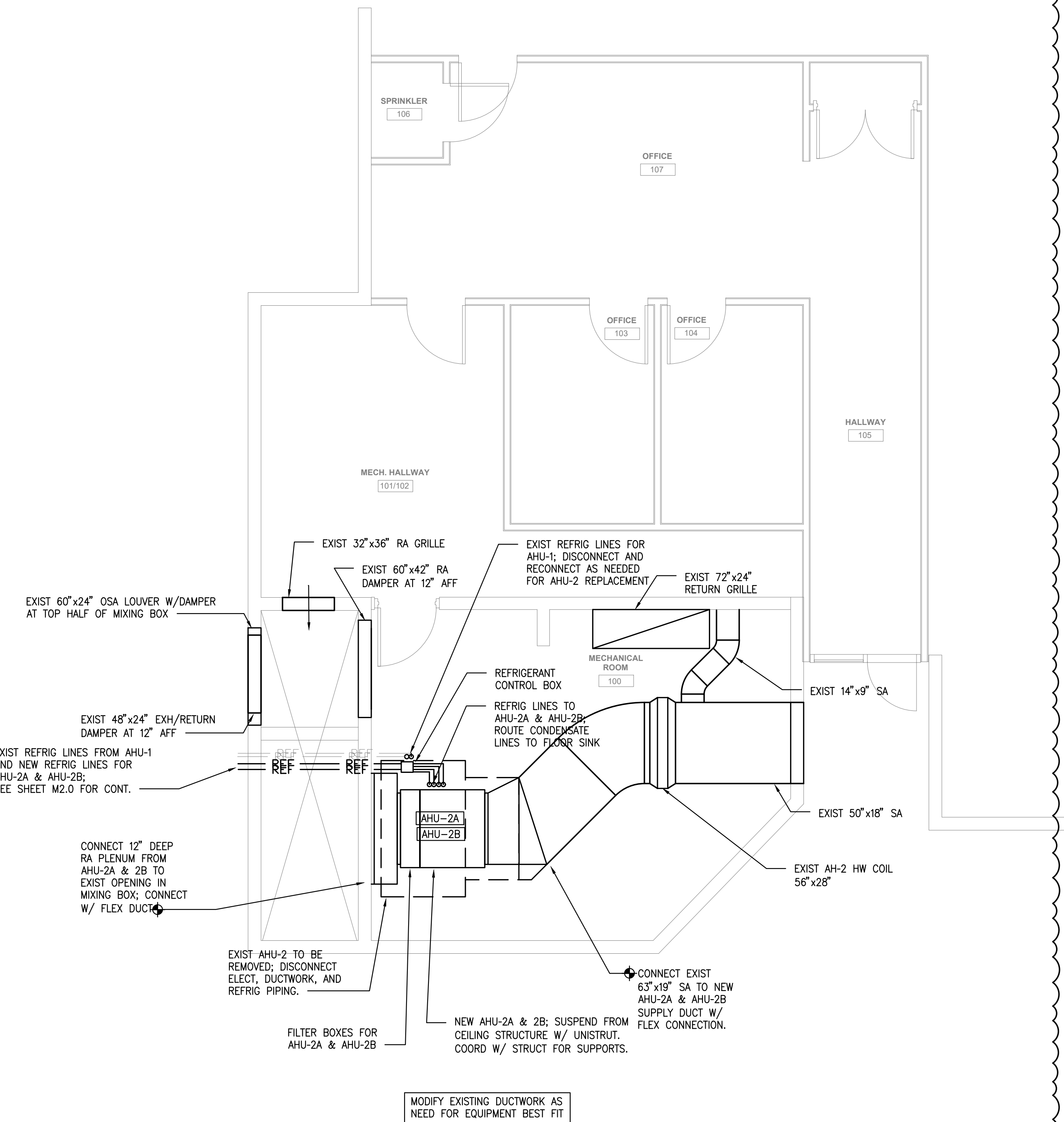
TITLE

**HVAC MECH**  
**ROOM PLAN**

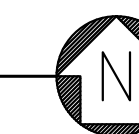
DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.1.DWG
JOB NUMBER	2024.11

**M2.1**

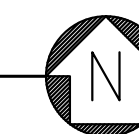
**PERMIT SET 08-15-2025**

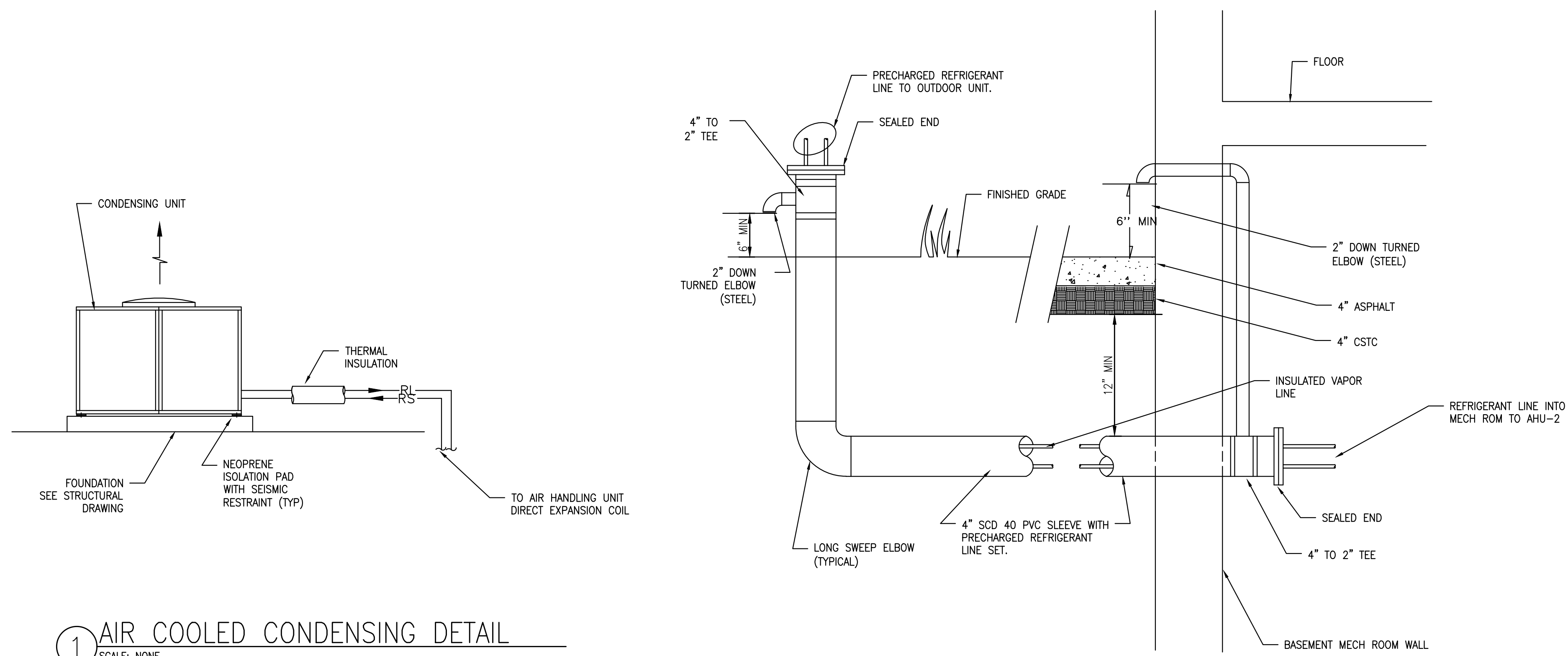
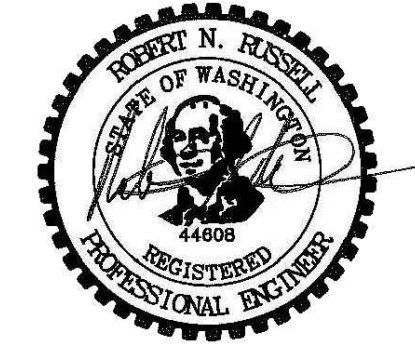


HVAC FLOOR PLAN- AHU-2  
SCALE: 1/4" = 1'-0"

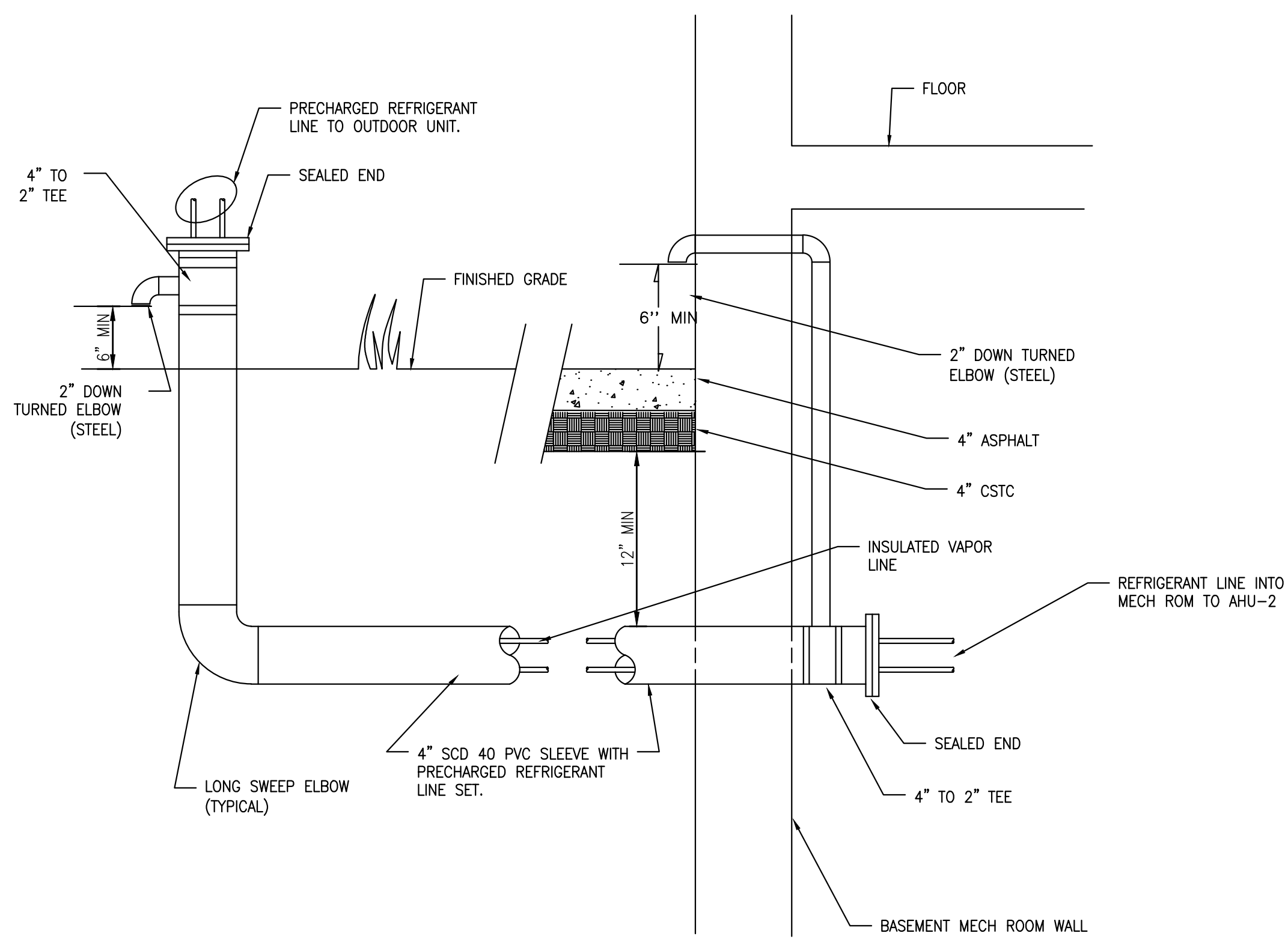


HVAC FLOOR PLAN- AHU-1  
SCALE: 1/4" = 1'-0"

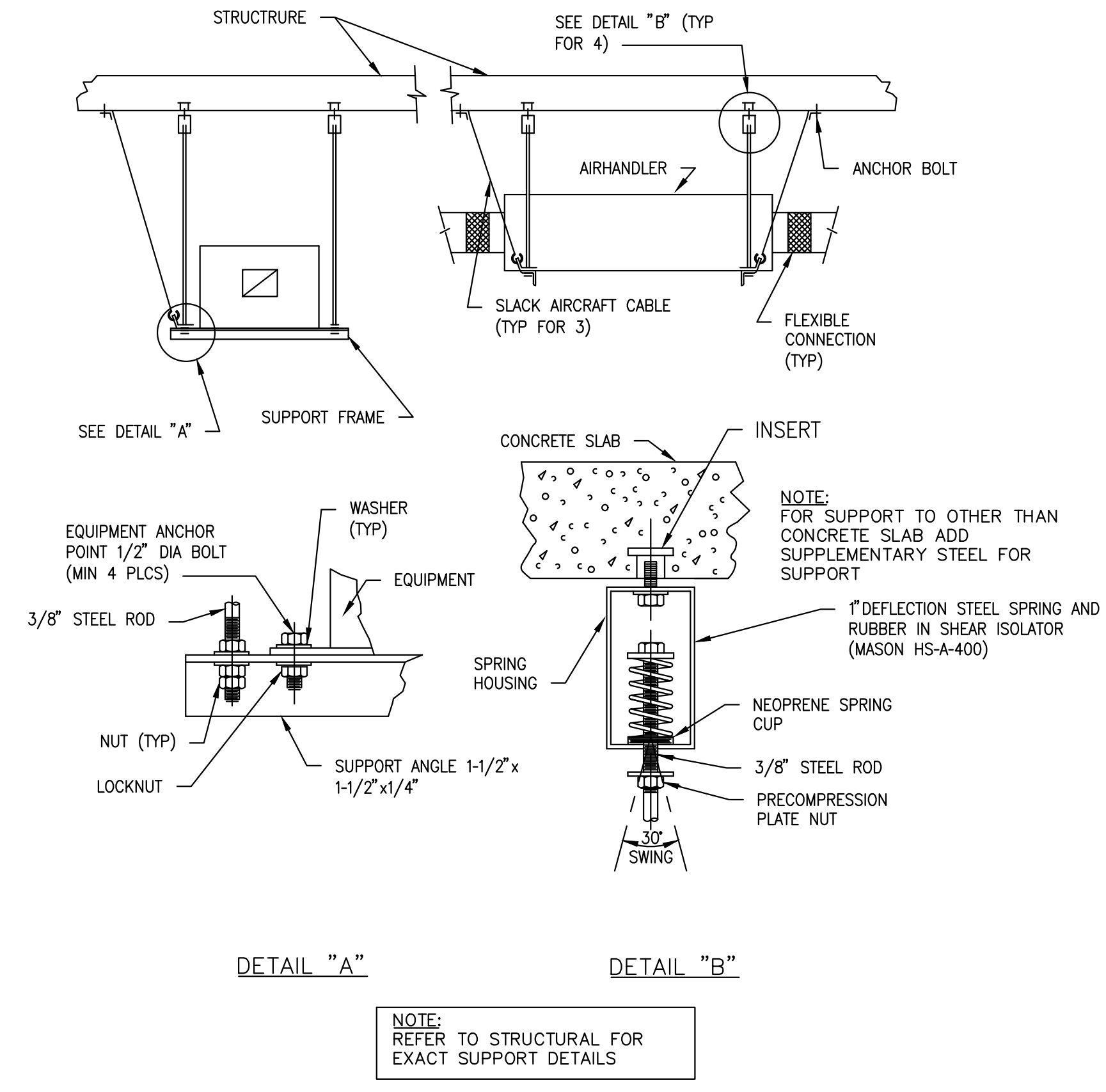




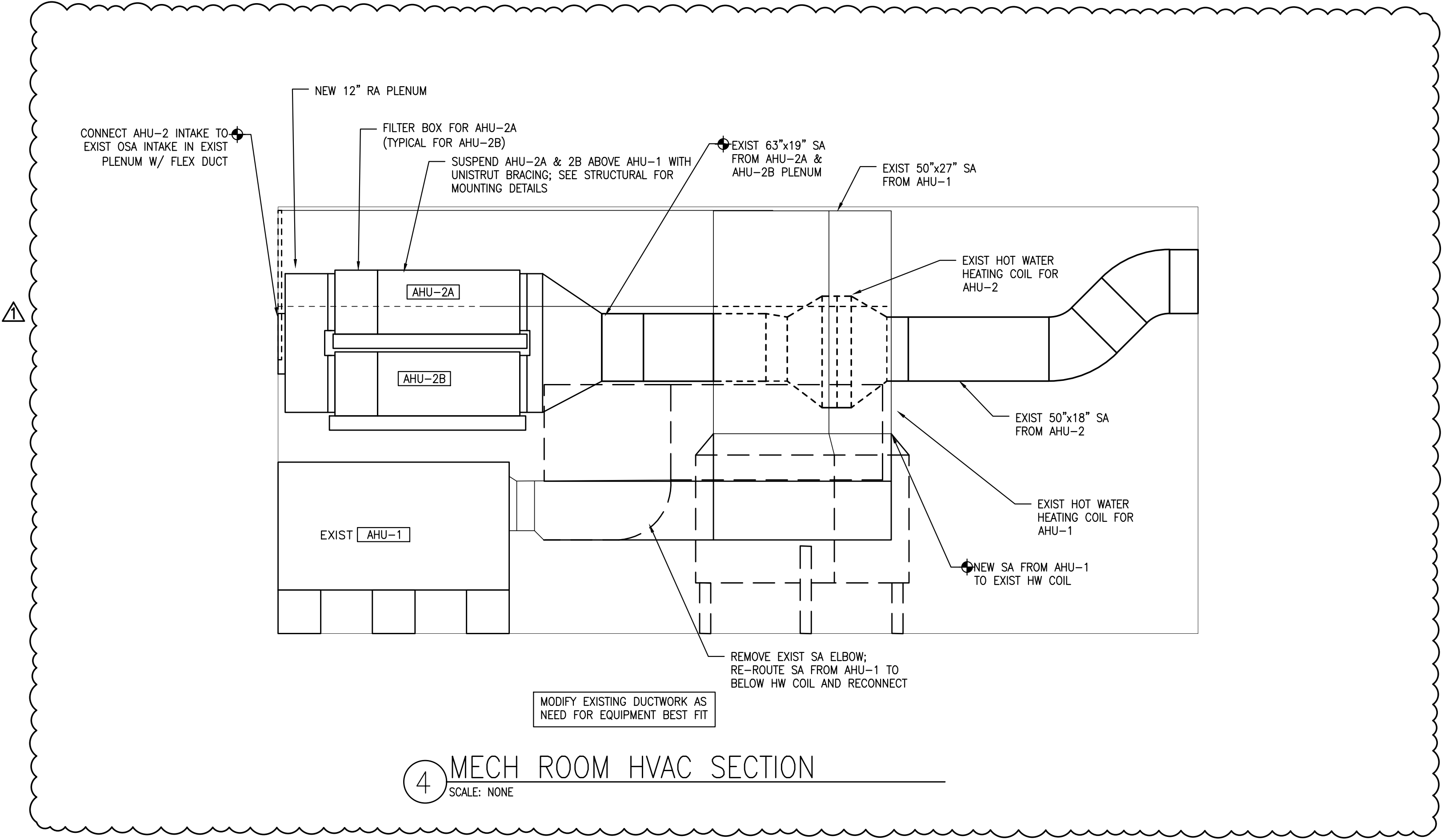
**1 AIR COOLED CONDENSING DETAIL**  
 SCALE: NONE



**2 UNDERGROUND PIPING DETAIL**  
 SCALE: NTS



**3 AHU SUPPORT DETAIL**  
 NOT TO SCALE



**4 MECH ROOM HVAC SECTION**  
 SCALE: NONE

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

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

**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**

**PERMIT SET 08-15-2025**



January 28<sup>th</sup>, 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 9<sup>th</sup>, 2026 at 5:00pm.

**Changes to Drawings:**

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

**End of Addendum No. 4**

Questions shall be directed to Tyler Andrews at [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com) or 360-739-2072.



January 18<sup>th</sup>, 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 28<sup>th</sup>, 2026 at 11:00am.

**Changes to Drawings:**

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

**End of Addendum No. 3**

Questions shall be directed to Tyler Andrews at [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com) or 360-739-2072.



January 8<sup>th</sup>, 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 19<sup>th</sup>, 2026 at 11:00am.

**Changes to Drawings:**

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

**End of Addendum No. 2**

Questions shall be directed to Tyler Andrews at [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com) or 360-739-2072.



December 23<sup>rd</sup>, 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](mailto:tylera@pnwcivil.com) or 360-739-2072.

# **Environmental Abatement Services Inc**

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## **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

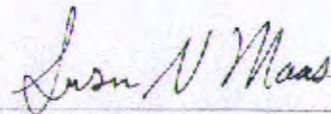
This is to certify that

**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)



- Facilities
- Environmental
- Geotechnical
- Materials

## SEATTLE ASBESTOS TEST, LLC

Lynnwood Laboratory: 19701 Scriber Lake Road, Suite 103, Lynnwood, WA 98036, Tel: 425.673.8850, Cell & Text: 206.368.6421, NVLAP Lab Code: 200768-0

[www.seattleasbestos.com](http://www.seattleasbestos.com), [admin@seattleasbestos.com](mailto:admin@seattleasbestos.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 WA 98229
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 letter, 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



Steve (Fanyao) Zhang  
Approved Signatory

**CHAIN OF CUSTODY**

Bulk Asbestos (PLM)

Point Count

Client Name Environmental Abatement Services


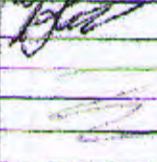
Address PO BOX 2503 City Mt Vernon ST WA ZIP 98273

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.

204-11179

# 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

Disclaimer: 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.

## ANALYTICAL LABORATORY REPORT

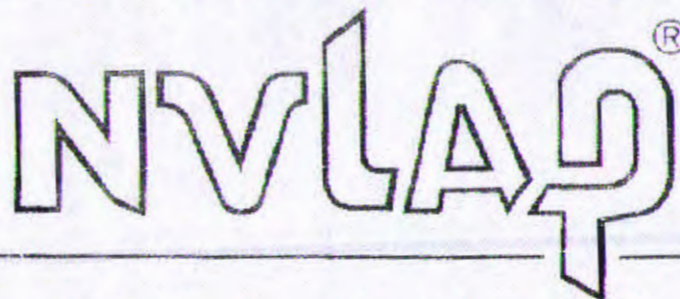
[PLM] EPA – 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples;  
 [PLM] EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Attn.: Alfonso Mazcorro      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      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



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## Certificate of Accreditation to ISO/IEC 17025:2017

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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 Communiqué on ISO/IEC 17025).*

---

2025-10-01 through 2026-09-30

*Effective Dates*



A handwritten signature in black ink, which appears to read "Robert Kueh".

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*For the National Voluntary Laboratory Accreditation Program*



December 17<sup>th</sup>, 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 14<sup>th</sup>, 2025. Bid proposals are due by 11:00am on Friday, January 9<sup>th</sup>, 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](mailto:mike.brock@suddenvalley.com) or Matt Allbaugh at [matt.allbaugh@suddenvalley.com](mailto: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 29<sup>th</sup>, 2026 for contract award. Notice to proceed is anticipated February 6<sup>th</sup>, 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](mailto:tylera@pnwcivil.com) by January 2<sup>nd</sup>, 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
  - o This bid item covers purchasing the new HVAC unit. Installation of new unit is included in Bid Item #4.
  - o 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.



- Bid Item #4 – New Unit Installation
  - o This bid item covers all work required for installation of the new unit except electrical.
  
- Bid Item #6 – Exterior Trenching & Asphalt Patching
  - o SVCA will trench, backfill, and complete site restoration for the contractor on the exterior.
  - o 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 9<sup>th</sup>, 2026. Email bid submissions to [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com).



December 16<sup>th</sup>, 2025

Attn: Bidders

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

Bid submissions are due by 11:00am on Friday, January 9<sup>th</sup>, 2026. Email bid submissions to [tylera@pnwcivil.com](mailto:tylera@pnwcivil.com).

Firm Name: \_\_\_\_\_

<b>Bid Schedule – Clubhouse HVAC Replacement</b>					
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
	<b>Subtotal</b>				\$
	<b>WSST @ 8.8%</b>				\$
	<b>Total w/ WSST</b>				\$

Acknowledgement of addendums: \_\_\_\_\_

By: \_\_\_\_\_  
Signature of Authorized Person

Date: \_\_\_\_\_

Print Name & Title: \_\_\_\_\_

## GENERAL NOTES

### GENERAL NOTES

- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL HAVE AND MAINTAIN INSURANCE AS APPROVED BY THE BUILDING OWNER AND THE TENANT IF TENANT IS THE CONTRACTORS CLIENT.
- 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 DAMAGED, CUT OR DEFACTED 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.
- CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO INITIATING THE WORK. NOTIFY ARCHITECT OF ANY DISCREPANCIES.
- WHERE A CONSTRUCTION DETAIL IS NOT SHOWN OR NOTED, THE DETAIL SHALL BE THE SAME AS FOR OTHER SIMILAR WORK.
- ALL WORK SHALL COMPLY WITH THE 2009 IBC, IPC, 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.
- ERRORS, OMISSIONS AND DISCREPANCIES, IF ANY, SHALL BE REFERRED TO THE ARCHITECT IMMEDIATELY FOR DIRECTION OF HOW TO PROCEED.
- VERIFY ALL ROOM-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.
- DO NOT SIGNIFICANTLY VARY OR MODIFY THE WORK SHOWN, EXCEPT UPON WRITTEN INSTRUCTIONS OF THE ARCHITECT.
- VERIFY LOCATION OF ALL EXISTING UTILITIES INCLUDING BUT NOT LIMITED TO SEWER, SEPTIC, WATER, GAS, POWER AND TELEPHONE. CAP, MARK AND PROTECT.
- 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.
- 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.
- NO BUILDING OR PORTION OF A BUILDING SHALL BE OCCUPIED OR USED FOR STORAGE PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
- 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.
- ELECTRICAL, MECHANICAL AND PLUMBING: GENERAL CONTRACTOR TO PROVIDE ALL REQUIRED ENGINEERING, CALCULATIONS, FORMS, APPLY, PAY FOR & OBTAIN ALL REQUIRED PERMITS.
- 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.
- PROVIDE BARRIER FREE SIGNAGE AT RESTROOMS.
- MOUNT ALL SINKS AT 34" AFF. UNO. COUNTERS 34" AFF WHEN SINK COUNTER MOUNTED.
- EXTERIOR BUILDING SIGNAGE IS NIC. CONTRACTOR TO PROVIDE POWER TO SIGN LOCATIONS.
- 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.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.
- 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.
- PROVIDE FIRE BLOCKING, DRAFT STOPS AND FIRE STOPS IN ATTICS, FLOORS AND WALL CAVITIES AS REQUIRED PER THE IBC.
- 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 WARRANTIES MANUALS.
- 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.
- 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.
- LEGALLY REMOVE & DISPOSE OF THE DEMOLITION AND CONSTRUCTION DEBRIS.
- DIMENSIONS TO STUD FACE UNLESS NOTED AS "CLR" OR "CLR" WHICH MEANS TO FACE OF WALL FINISH.

## SYMBOLS

	DETAIL REFERENCE
	BLDG SECTION
	WALL SECTION
	INTERIOR ELEVATION
	DOOR NUMBER
	ROOM NUMBER
	ELEVATION DATUM
	COLUMN GRID
	WALL TYPE
	POWER POLE
	CATCH BASIN
	STORM DRAIN MANHOLE
	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.	SIMILAR
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

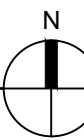
### DEMOLITION NOTES:

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



## VICINITY MAP

SCALE: NTS



## 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 ALS 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

A1.01	TITLE PAGE & PROJECT INFORMATION
A2.01	BUILDING & ENLARGED PLANS
S1.0	MECHANICAL UNIT SUPPORT
M0.0	HVAC LEGENDS & NOTES
M0.1	HVAC SPECIFICATIONS
M0.2	HVAC SPECIFICATIONS
M0.3	HVAC SPECIFICATIONS
M1.0	HVAC SCHEDULES
M2.0	HVAC SITE PLAN
M2.1	HVAC MECH ROOM PLAN
M3.0	HVAC DETAILS

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

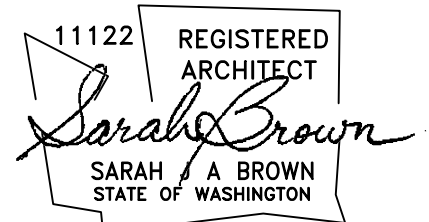
REQUEST FOR INSPECTION SHALL BE FILED WITH OUR OFFICE AT LEAST ONE WORKING DAY BEFORE SUCH INSPECTION IS DESIRED

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

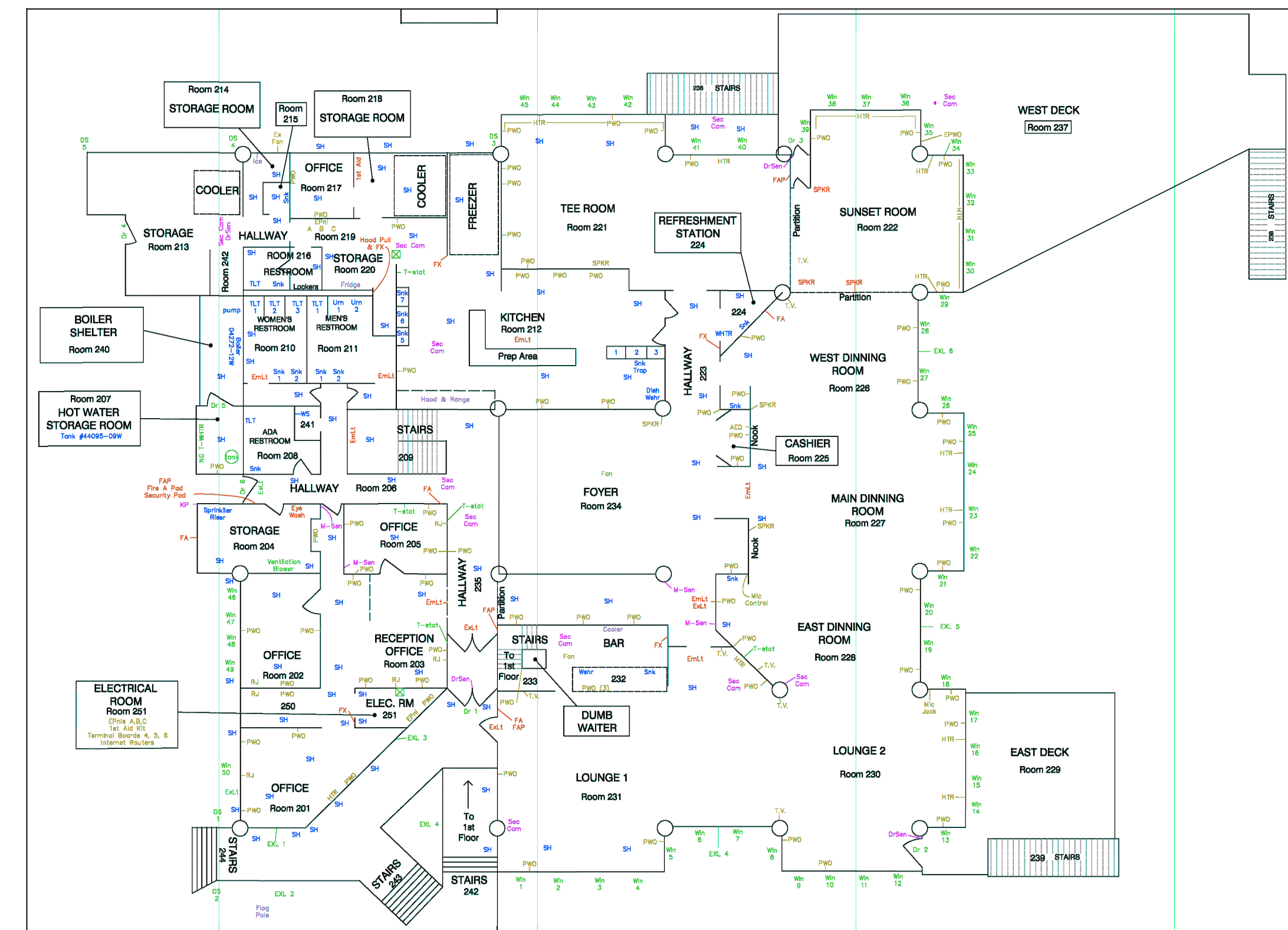
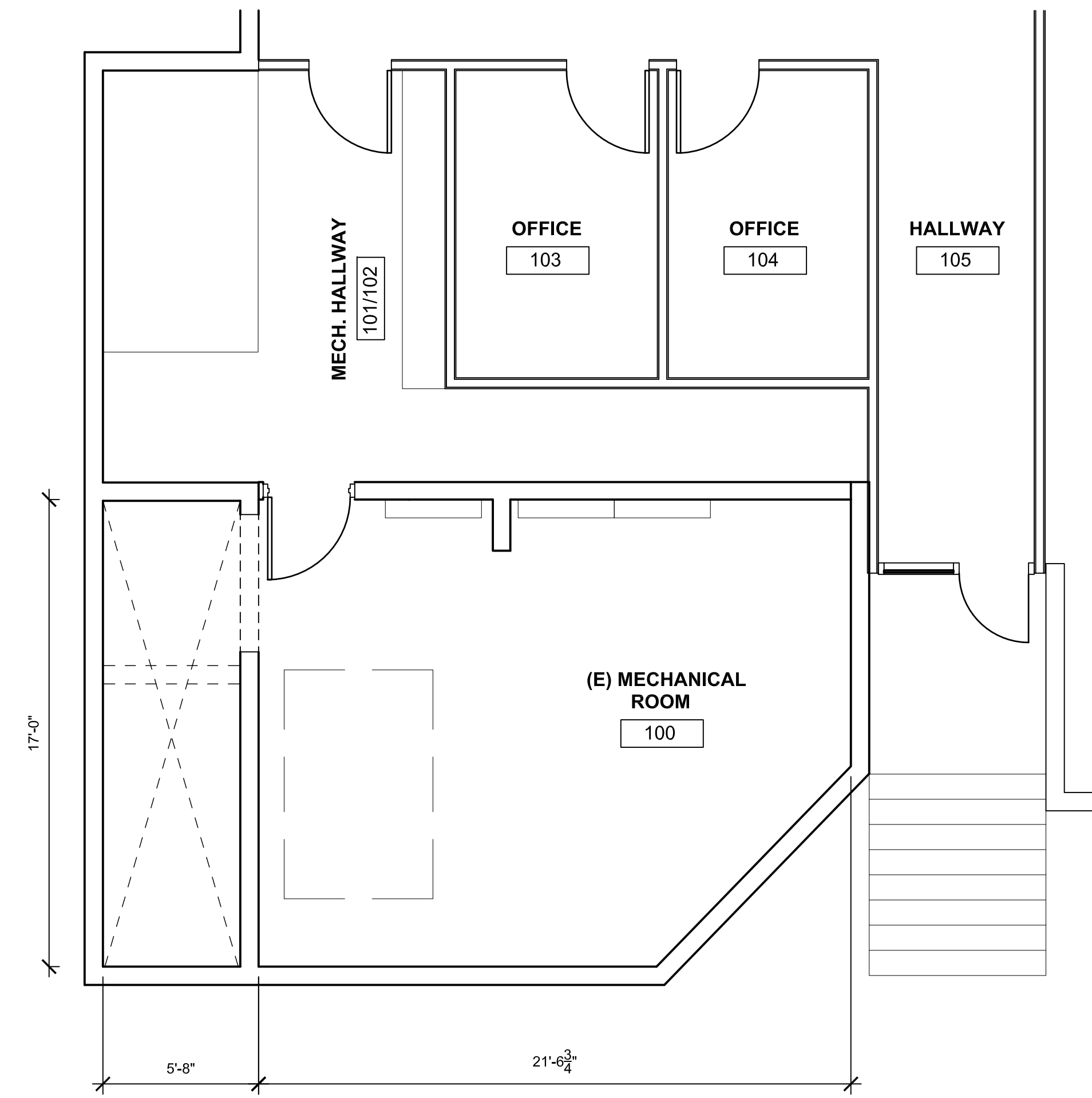
PLANS EXAMINER, BLDG. SERVICES



## PROJECT INFO

JOB NO: 202404.11  
 DATE: 08.14.2025

REV ISSUED FOR DATE



## 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



## AIR HANDLER INFO

AIR HANDLER UNIT (AHU-) SCHEDULE																		
TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL				WEIGHT (LBS)	DIMENSIONS (H"xW"xD")	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			
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** **G-450 U-BOLT CLIP** **16**

**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**

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 POSSIBLE

**3** APPLY ALL ADDITIONAL CLIPS EVENLY BETWEEN THE FIRST TWO

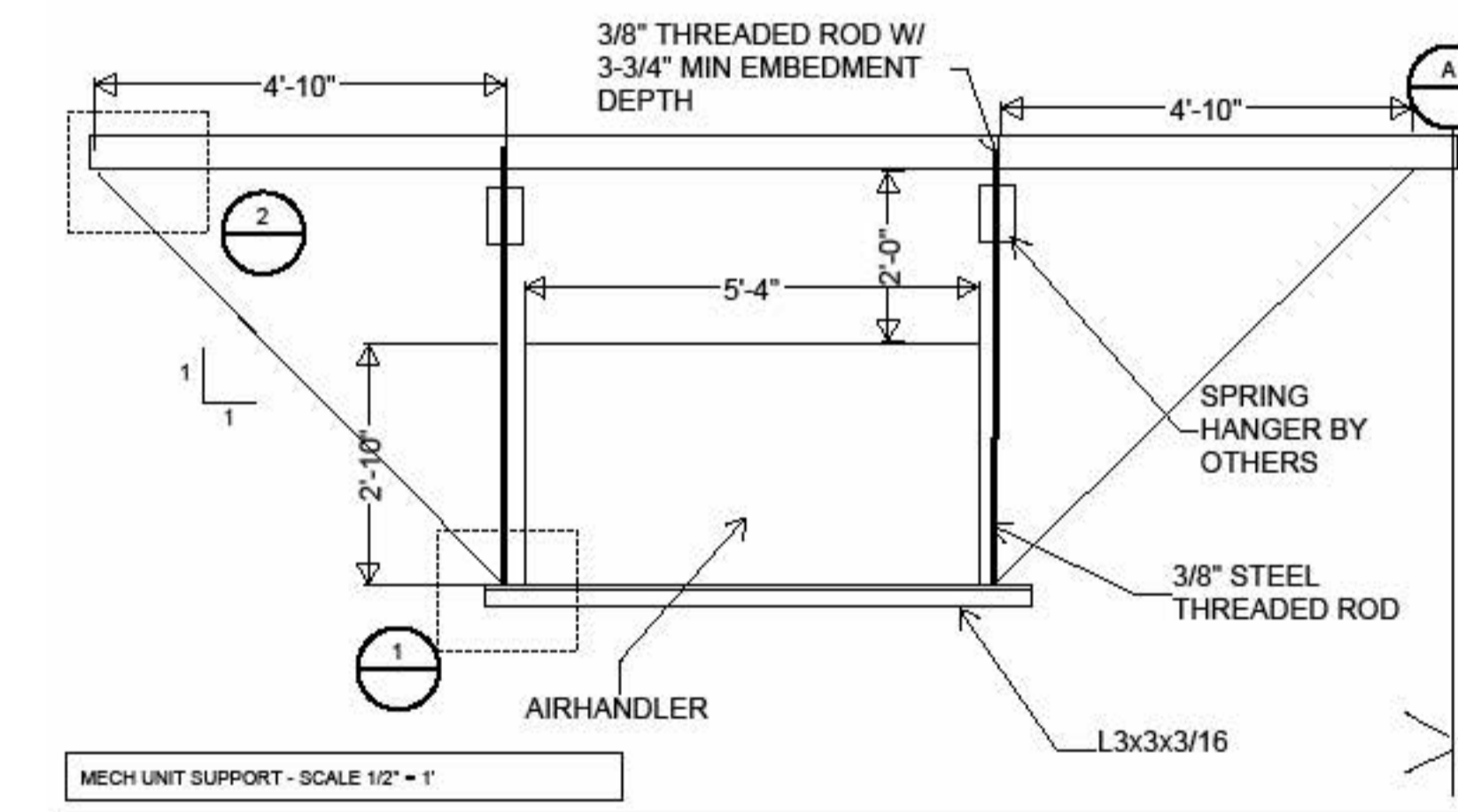
### STRUCTURAL NOTES

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

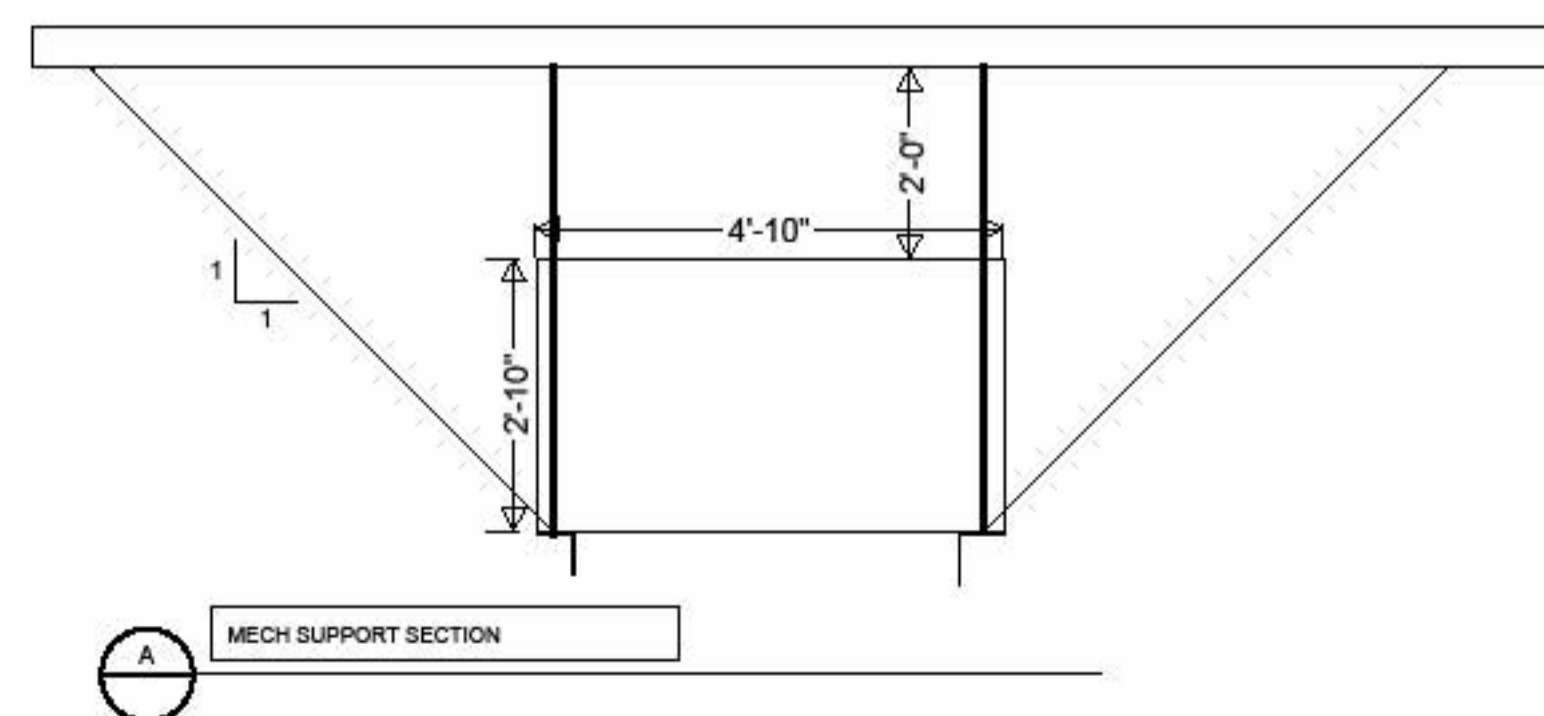
MATERIALS  
 - Pre-approved Epoxy for post-installed threaded rod or reinforcing in concrete base material: Simpson SET-3G.  
 - Anchor type shall be according to the drawings. All post-installed anchors installed in concrete shall have ICC-ES reports demonstrating IBC compliance for use in cracked concrete 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 ICCES report. Holes shall be drilled with rotohammer equipment. Core-drilled holes are not permitted unless specifically noted otherwise.

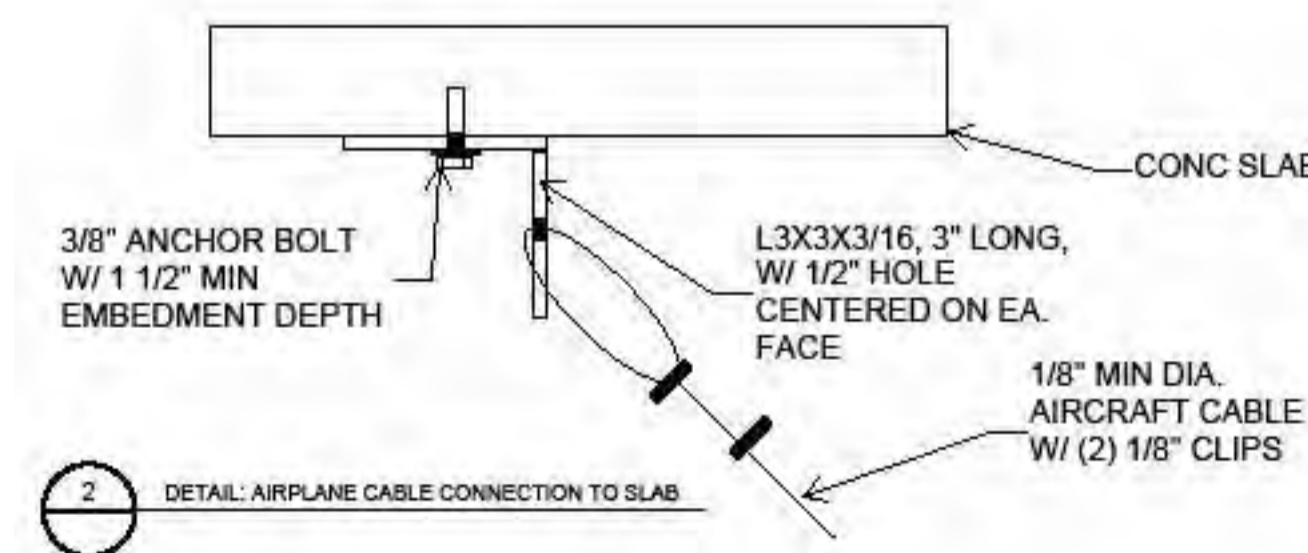
REINFORCEMENT LOCATIONS: All post-installed anchors shall be located to avoid drilling into reinforcement, unless specifically approved by the Engineer. Reinforcement shall be placed with consideration for locations of post-installed anchors. Do not damage reinforcing during drilling operations.



① MECH UNIT SUPPORT  
1/4" = 1'-0"



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



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

REV	Description	Date
Revision Schedule		

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NORTH	PLAN
SCALE: As indicated	
PROJECT: PNW SV CLUBHOUSE MECHANICAL	

4 CLUBHOUSE CIRCLE  
 BELLINGHAM, WA 98229  
 Client Name

### MECHANICAL UNIT SUPPORT

PROJECT:	24153
DRAWN:	JAndresen
CHECK:	QHanks
ISSUED:	10/4/2024

**S1.0**



# 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, WHEN DISCREPANCIES OCCUR IN 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.
  - d. MECHANICAL DRAWINGS:
    - a. 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.
    - b. CONSIDER ARCHITECTURAL, STRUCTURAL, CIVIL, ACUSTICAL, AND ELECTRICAL DRAWINGS PART OF THIS WORK INsofar AS THESE DRAWINGS FURNISH INFORMATION RELATING TO DESIGN AND CONSTRUCTION OF BUILDING.
    - c. 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
  - AWMA – AMERICAN WATER WORKS ASSOCIATION
  - AWS – AMERICAN WELDING SOCIETY
  - CISPI – CAST IRON SOIL PIPE INSTITUTE
  - IBC – INTERNATIONAL BUILDING CODES
  - 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
  - SMC – 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 TO 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 OWNERS 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 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. AMEND 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.
    - 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.
    - 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.
- B. SUBSTITUTIONS 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 AND 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; 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.
      - SUBMITTAL WILL NOT BE ACCEPTED UNLESS IT CONFORMS TO THESE REQUIREMENTS, AND WILL BE RETURNED TO CONTRACTOR UNREVIEWED.
    - c. INCLUDE SUBMITTAL DATA ON MATERIALS AND EQUIPMENT AS INDICATED IN INDIVIDUAL SPECIFICATION SECTIONS. DO NOT ORDER, FABRICATE OR INSTALL UNTIL REVIEWED/ACCEPTED BY ARCHITECT/ENGINEER. INCLUDE DESCRIPTIVE BULLETINS, DATA SHEETS, CATALOG CUTS, DIAGRAMS, COMPLETE DIMENSIONAL DRAWINGS, AND OTHER ADDITIONAL INFORMATION AS REQUIRED.
  - 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 CHASES.
      - 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 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. OPERATING 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.
9. DRILLING AND CUTTING OF CONCRETE AND OTHER WORK WHICH MAKES OBJECTECTIONABLE 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 CONSTRUCTION INCLUDING ANY NECESSARY SHEDDING 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. 1/2" x 1/2" x 1/2" OR BEATON CORBIN.
  - B. ISOLATORS:
    - a. STONEMAN TRIOLATOR, 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 FOR PIPES THROUGH NON-FIRE RATED FLOORS: FORM WITH 18 GAGE GALVANIZED STEEL.
  6. SLEEVES FOR PIPES THROUGH NON-FIRE RATED BEAMS, WALLS, FOOTINGS, AND POTENTIALLY WET FLOORS: FORM WITH STEEL PIPE OR 18 GAGE GALVANIZED STEEL.
  7. 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 STEEL. 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 FIRE SAFETY 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-G 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. ANGLU 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 ARCHITECT'S 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 BE 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, DOUBLE HANGER.
    - d. MULTIPLE OR TRAPEZOID HANGERS: STEEL CHANNELS WITH WELDED SPACERS AND HANGER RODS; CAST IRON ROLL AND STAND FOR HOT PIPE SIZES 6 INCHES AND OVER.
    - e. HANGERS AND SUPPORTS EXPOSED TO WEATHER OR WET CONDITIONS SHALL BE GALVANIZED.
    - f. WALL SUPPORT FOR PIPE SIZES TO 3 INCHES: CAST IRON HOOK.
    - g. WALL SUPPORT FOR PIPE SIZES 4 INCHES AND OVER: WELDED STEEL BRACKET AND WROUGHT STEEL CLAMP; ADJUSTABLE STEEL YOKE AND CAST IRON ROLL FOR HOT PIPE SIZES 6 INCHES AND OVER.
    - h. VERTICAL SUPPORT:
      - TYPE A: STEEL RISER CLAMP.
      - TYPE B: STEEL RISER CLAMP WITH SPRING ISOLATION.
      - TYPE C: VIBRATION ISOLATOR MANUFACTURER SHALL PROVIDE PIPE GUIDES CONSISTING OF A TELESCOPIC ARRANGEMENT OF TWO SIZES OF STEEL TUBING SEPARATED BY A MINIMUM HALF-INCH THICKNESS OF HEAVY DUTY NEOPRENE AND DUCK OR NEOPRENE ISOLATION MATERIAL. HEIGHT OF THE GUIDES SHALL BE PRESET WITH A SHEAR PIN TO ALLOW VERTICAL MOTION DUE TO PIPE EXPANSION/CONTRACTION. GUIDES SHALL BE TYPE GDA AS MANUFACTURED BY MASON INDUSTRIES, INC., OR APPROVED.
      - TYPE D: VIBRATION ISOLATOR MANUFACTURER SHALL PROVIDE ALL DIRECTIONAL ACUSTICAL PIPE ANCHORS CONSISTING OF A TELESCOPIC ARRANGEMENT OF TWO SIZES OF STEEL TUBING SEPARATED BY A MINIMUM HALF INCH THICKNESS OF HEAVY DUTY NEOPRENE AND DUCK OR NEOPRENE ISOLATION MATERIAL. ALL DIRECTIONAL ANCHORS OR GUIDES SHALL BE TYPE ADA AS MANUFACTURED BY MASON INDUSTRIES, INC., OR APPROVED.
  - i. FLOOR SUPPORT FOR PIPE SIZES TO 4 INCHES AND ALL COLD PIPE SIZES: CAST IRON ADJUSTABLE PIPE SADDLE, LOCKNUT NIPPLE, FLOOR FLANGE, AND CONCRETE PIER OR STEEL SUPPORT.
  - j. FLOOR SUPPORT FOR HOT PIPE SIZES 6 INCHES AND OVER: ADJUSTABLE CAST IRON ROLL AND STAND, STEEL SCREWS, AND CONCRETE PIER OR STEEL SUPPORT.
  - k. COPPER PIPE SUPPORT: CARBON STEEL RING, ADJUSTABLE, COPPER PLATED.
  - l. SHIELD FOR INSULATED PIPING 2 INCHES AND SMALLER: 18 GAGE GALVANIZED STEEL SHIELD OVER INSULATION IN 180 DEGREE SEGMENTS, MINIMUM 12 INCHES LONG AT PIPE SUPPORT.
  - m. SHIELD FOR INSULATED PIPING 2 1/2 INCHES AND LARGER (EXCEPT COLD WATER PIPING): PIPE COVERING PROTECTIVE SADDLES.
  - n. SHIELDS FOR INSULATED COLD WATER PIPING 2 -1/2 INCHES AND LARGER:

- HARD BLOCK NON CONDUCTING SADDLES IN 90 DEGREE SEGMENTS, 12 INCH MINIMUM LENGTH, BLOCK THICKNESS SAME AS INSULATION THICKNESS.
- a. SHIELDS FOR VERTICAL COPPER PIPE RISERS: SHEET LEAD.
  - C. HANGER RODS: STEEL HANGER RODS: THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUS THREADED.
  - D. EQUIPMENT CURBS:
    - a. FABRICATE CURBS IN MECHANICAL ROOMS OF POURED IN PLACE CONCRETE, 4" HIGH.
    - b. 4" HIGH STEEL REINFORCING THROUGHOUT CURB AS REQUIRED TO SUSTAIN SEISMIC LOADS OF EQUIPMENT SUPPORTED.
  - E. FABRICATION:
    - a. DESIGN HANGERS WITHOUT DISENGAGEMENT OF SUPPORTED PIPE.
    - b. PROVIDE COPPER PLATED HANGERS AND SUPPORTS FOR COPPER PIPING.
    - c. PRIME COAT EXPOSED STEEL HANGERS AND SUPPORTS. HANGERS AND SUPPORTS LOCATED IN CRAWL SPACES, PIPE SHAFTS, AND SUSPENDED CEILING SPACES ARE NOT CONSIDERED EXPOSED.
  10. ACCESS DOORS
  - A. MANUFACTURERS:
    - a. HART & COOLEY LLC/WILCOOR.
    - b. J.L. INDUSTRIES.
    - c. GREENHECK.
    - d. PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
  - B. FURNISH TO GENERAL CONTRACTOR HINGED METAL PANEL ACCESS DOORS OF PROPER SIZE, SUITABLE TO INSTALLATION CONDITIONS, WITH CONCEALED SPRING HINGES AND FLUSH SCREWDRIVER OPERATED LOCKS. FIRE RATED WITH UL LABEL IF LOCATED IN A REQUIRED FIRE SEPARATION.
    - a. 12" x 12" AT FIRE DAMPER, MINIMUM SIZE.
    - b. 8" x 12" AT CONCEALED DAMPER QUADRANT OR REGULATOR, MINIMUM SIZE.
    - c. STYLE AND SIZE AS REQUIRED FOR CEILING OR WALL CONSTRUCTION AND LARGE ENOUGH TO ALLOW RESETTING FUSIBLE LINKS OR OTHER WORK AS NECESSARY.
  - C. MECHANICAL SUBCONTRACTOR SHALL FURNISH ALL REQUIRED ACCESS DOORS FOR ACCESS TO MECHANICAL SYSTEM THROUGH BUILDING FINISH WORK. INSTALLATION OF ACCESS DOORS INTO FINISHED WALLS AND CEILINGS NOT IN MECHANICAL.
  11. MECHANICAL IDENTIFICATION
  - A. GENERAL:
    - a. SUBMIT LIST OF WORDING, SYMBOLS, LETTER SIZE, AND COLOR CODING FOR MECHANICAL IDENTIFICATION.
    - b. SUBMIT VALVE CHART AND SCHEDULE, INCLUDING VALVE TAG NUMBER, LOCATION, FUNCTION, AND SCHEDULE MANUFACTURER'S NAME AND MODEL NUMBER.
  - B. MANUFACTURERS:
    - a. THE FOLLOWING MANUFACTURERS MAY BE CONSIDERED SUBJECT TO REVIEW.
      - BRADY.
      - SETON.
      - MARKING SERVICES INCORPORATED.
    - 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.
  - C. MATERIALS:
    - a. COLOR: UNLESS SPECIFIED OTHERWISE, CONFORM WITH ANSI/ASME A13.1.
    - b. PLASTIC NAMEPLATES: LAMINATED THREE LAYER PLASTIC WITH ENGRAVED BLACK LETTERS ON LIGHT CONTRASTING BACKGROUND COLOR.
    - c. PLASTIC TAGS: LAMINATED THREE LAYER PLASTIC WITH ENGRAVED BLACK LETTERS ON LIGHT CONTRASTING BACKGROUND COLOR. TAG SIZE MINIMUM 1 -1/2 INCH DIAMETER ROUND OR SQUARE.
    - d. METAL TAGS: BRASS WITH STAMPED LETTERS; TAG SIZE MINIMUM 1 -1/2 INCH DIAMETER ROUND WITH SMOOTH EDGES.

### STENCILS: WITH CLEAN CUT SYMBOLS AND LETTERS OF FOLLOWING SIZE:

OUTSIDE DIAMETER OF INSULATION OR PIPE	LENGTH OF COLOR FIELD	SIZE OF LETTERS
3/4" - 1-1/4"	0'-8"	0'-0 1/2"
1-1/2" - 2"	0'-8"	0'-0 3/4"
2-1/2" - 6"	1'-0"	0'-1 1/4"
8" - 10"	2'-0"	0'-2 1/2"
OVER 10"	2'-8"	0'-3 1/2"
DUCTWORK AND EQUIPMENT	-	0'-2 1/2"

- e. STENCIL PAINT: IN ACCORDANCE WITH SECTION 09900, SEMI -/GLOSS ENAMEL.
- f. PLASTIC PIPE MARKERS: FACTORY FABRICATED, FLEXIBLE, SEMI -RIGID PLASTIC, PREFORMED TO FIT AROUND PIPE OR PIPE COVERING; MINIMUM INFORMATION INDICATING FLOW DIRECTION ARROW AND FLUID BEING CONVEYED.
- g. PLASTIC TAPE PIPE MARKERS: FLEXIBLE, VINYL FILM TAPE WITH PRESSURE SENSITIVE ADHESIVE BACKING AND PRINTED MARKINGS.
- h. UNDERGROUND PLASTIC PIPE MARKERS: BRIGHT COLORED CONTINUOUSLY PRINTED PLASTIC RIBBON TAPE OF NOT LESS THAN 6 INCH WIDE BY 4 MIL THICK, MANUFACTURED FOR DIRECT BURIAL SERVICE.
12. VALVES AND ACCESSORIES
- A. GENERAL:
  - a. MANUFACTURERS:
    - MILWAUKEE.
    - NIBCO.
    - STOCKHAM.
    - HAMMOND.
    - PROPOSED SUBSTITUTIONS SHALL MEET OR EXCEED ALL REQUIREMENTS OF THESE SPECIFICATIONS.
  - b. GENERAL:
    - MANUFACTURER'S NAME AND PRESSURE RATING MARKED ON VALVE BODY.
    - ACCEPT VALVES AND ACCESSORIES ON SITE IN SHIPPING CONTAINERS WITH LABELING IN PLACE.
    - PROVIDE TEMPORARY PROTECTIVE COATING ON CAST IRON AND STEEL VALVES.
    - PROVIDE TEMPORARY END CAPS AND CLOSURES ON VALVES AND ACCESSORIES. MAINTAIN IN PLACE UNTIL INSTALLATION.
  - c. GATE VALVES:
    - a. UP TO AND INCLUDING 2 INCHES: BRONZE BODY, BRONZE TRIM, NON-RISING STEM, HANDWHEEL, INSIDE SCREW, SINGLE WEDGE DISC, SOLDER OR THREADED ENDS, 125 LB. SWP.
    - b. OVER 2 INCHES: IRON BODY, BRONZE TRIM, RISING STEM, HANDWHEEL, OS&Y, SINGLE WEDGE, FLANGED ENDS, 125 LB. SWP.
    - c. BALL VALVES:
      - a. UP TO AND INCLUDING 2 INCHES: BRONZE ONE PIECE BODY, STAINLESS STEEL BALL, TEFLON SEATS AND STUFFING BOX RING, LEVER HANDLE, SOLDER OR THREADED ENDS WITH UNION, 600 LB. WOG.
      - e. OVER 2 INCHES: CAST STEEL BODY, CHROME PLATED STEEL BALL, TEFLON SEAT AND STUFFING BOX SEALS, LEVER HANDLE, FLANGED.
    - d. UP TO AND INCLUDING 2 INCHES: BRONZE BODY, BRONZE TRIM, RISING STEM, HANDWHEEL, INSIDE SCREW, RENEWABLE COMPOSITION DISC, SOLDER OR SCREWED ENDS, WITH BACK SEATING CAPACITY REPAKABLE UNDER PRESSURE.
    - b. OVER 2 INCHES: IRON BODY, BRONZE TRIM, RISING STEM, HANDWHEEL, OS&Y, PLUG -TYPE DISC, FLANGED ENDS, RENEWABLE SEAT AND DISC.
  - d. BUTTERFLY VALVES:
    - a. UP TO AND INCLUDING 2 INCHES: BRONZE BODY, STAINLESS STEEL DISC, VITON SEAT, THREADED ENDS.
    - b. OVER 2 INCHES: CAST OR DUCTILE IRON BODY, ALUMINUM BRONZE DISC, RESILIENT REPLACEABLE EPDM SEAT, LUG ENDS FOR DUCTILE IRON BODY AND WATER FOR CAST IRON BODY, EXTENDED NECK.
  - E. SWING CHECK VALVES:
    - a. UP TO AND INCLUDING 2 INCHES: BRONZE SWING DISC 5° SEATED, SOLDER OR SCREWED ENDS, 125 LB. SWP.
    - b. OVER 2 INCHES: IRON BODY, BRONZE TRIM, SWING DISC, RENEWABLE DISC AND SEAT, FLANGED ENDS, 125 LB. SWP.
    - c. CHECK VALVES IN MECHANICAL COUPLING SYSTEMS, I.E., VICTAULIC, ETC., MAY

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

REVISIONS			
NO	DATE	BY	DESCRIPTION

# MECHANICAL GENERAL PROVISIONS CONTD.

- BE BY COUPLING MANUFACTURER.
- F. SPRING-LOADED CHECK VALVES:
  - a. IRON BODY, BRONZE TRIM, STAINLESS STEEL SPRING, RENEWABLE COMPOUND DISC, SCREWED, WATER, OR FLANGED ENDS.
  - b. CHECK VALVES IN MECHANICAL COUPLING SYSTEMS, I.E., VICTAULG, ETC., MAY BE BY COUPLING MANUFACTURER.
- G. BACKFLOW PREVENTERS:
  - a. MANUFACTURERS:
    - WATTS.
    - OMB INDUSTRIES; FEBCO DV.
    - 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.
- H. 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 USB, 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 PTFE DISC, AND TWO, 1/4" PRESSURE/TEMPERATURE TEST PORTS WITH NORDEL CHECK VALVES AND GASKETED CAPS, ADDITIONAL PORTS FOR DRAIN CONNECTIONS.
      - 2" 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:
    - MI 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 ORIFICE 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 CLASS 150.
    - TWO, PRESSURE/TEMPERATURE TEST PORTS WITH EXTENSIONS AND NORDEL CHECK VALVES WITH GASKETED CAPS, AND ADDITIONAL DRAIN CONNECTIONS.

- 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.

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	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° 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.]

- 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:
    - CONFORM TO APPLICABLE ELECTRICAL CODE.
    - CONFORM TO LOCAL ENERGY CODE.
  - e. 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.
  - f. 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° 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 AFMA 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	1.35
1/2	1.25	1.25	1.25	1.25	1.15
3/4	1.25	1.25	1.15	1.15	1.15
1-1/4	1.15	1.15	1.15	1.15	1.15
1-1/2 - 150	1.15	1.15	1.15	1.15	1.15

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

HP	OPEN			CLOSED		
	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%

- 5. 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.
  - D. GENERAL COORDINATION AND INSTALLATION
    - INFORM OTHER TRADES THRU GENERAL CONTRACTOR AS TO REQUIREMENTS FOR SLEEVES, BOWTS, 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.
    - FURNISH AND INSTALL PIPE SLEEVES AND EMBEDDED ITEMS REQUIRED UNDER DIVISION 23.
    - 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.
    - 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:
    - 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 WORKED ONE INCH MINIMUM INTO HUB, 8 INCHES MINIMUM CLEAR ON SIDES WITH 24 X 24 INCHES SEET SIZE. FOR PIPES THROUGH OUTSIDE WALLS, TURN FLANGES BACK INTO WALL AND CAULK, METAL COUNTERFLASH AND SEAL.
  - C. FLASH FLOOR DRAINS IN FLOORS WITH TOPPING OVER FINISHED AREAS WITH LEAD, 10 MIL CLEAR ON SIDES WITH MINIMUM 36 X 36 INCH SHEET SIZE. FASTEN FLASHING TO DRAIN CLAMP DEVICE.
  - D. SEAL FLOOR, SHOWER AND MOP SINK DRAINS, ETC., WATERTIGHT TO ADJACENT MATERIALS.
  - E. PROVIDE ACOUSTICAL LEAD FLASHING AROUND DUCTS AND PIPES PENETRATING EQUIPMENT ROOMS, INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS FOR SOUND CONTROL.
- F. PROVIDE CURBS FOR MECHANICAL ROOF INSTALLATIONS 6 INCH MINIMUM HIGH ABOVE ROOFING SURFACE. FLEXIBLE SHEET FLASH AND COUNTERFLASH WITH SHEET METAL; SEAL WATERTIGHT.
- 7. INSERTS
  - A. PROVIDE INSERTS TO GENERAL CONTRACTOR FOR PLACEMENT IN CONCRETE FORMWORK.
  - B. PROVIDE INSERTS FOR SUSPENDING HANGERS FROM REINFORCED CONCRETE SLABS PREFORMED HOLLOW CORE PLANKS AND SIDES OF REINFORCED CONCRETE BEAMS.
  - C. PROVIDE HOOKED ROD TO CONCRETE REINFORCEMENT SECTION FOR INSERTS CARRYING PIPE OVER 4 INCHES.
  - D. WHERE CONCRETE SLABS FORM FINISHED CEILING, PROVIDE INSERTS TO BE FLUSH WITH CONCRETE SLAB.
  - E. WHERE INSERTS ARE OMITTED, DRILL THROUGH CONCRETE SLAB FROM BELOW AND PROVIDE THRU -BOLT SQUARE STEEL PLATE AND NUT. OBTAIN APPROVAL OF STRUCTURAL ENGINEER PRIOR TO DRILLING OF ANY STRUCTURAL MEMBERS.
- 8. SUPPORTS AND ANCHORS
  - A. PIPE ANCHORS AND SUPPORTS:
    - INSTALL HANGERS TO PROVIDE MINIMUM 1/2 INCH SPACE BETWEEN FINISHED COVERING AND ADJACENT WORK.
    - PLACE A HANGER WITHIN 12 INCHES OF EACH HORIZONTAL ELBOW.
    - USE HANGERS WITH 1 - 1/2 INCH MINIMUM VERTICAL ADJUSTMENT.
    - HANGER RODS EXPOSED TO WEATHER OR WET CONDITIONS SHALL BE COATED WITH PAINT OR OTHER COATING TO PREVENT RUST.
    - SUPPORT HORIZONTAL CAST IRON PIPE ADJACENT TO EACH HUB, WITH 5 FEET MAXIMUM SPACING BETWEEN HANGERS.
    - SUPPORT VERTICAL PIPING AT EVERY OTHER FLOOR UNLESS SPECIFIED OTHERWISE. SUPPORT VERTICAL CAST IRON PIPE AT EACH FLOOR AT HUB.
    - WHERE TWO OR MORE PIPES INSTALLED IN PARALLEL AND AT SAME ELEVATION, PROVIDE MULTIPLE OR TRAPEZE HANGERS.
    - SUPPORT RISER PIPING INDEPENDENTLY OF CONNECTED HORIZONTAL PIPING.
  - B. SUPPORT HORIZONTAL PIPING AS REQUIRED BY THE UNIFORM PLUMBING CODE, 1997 EDITION, SECTION 314, TABLES 3-1 AND 3-2.
  - C. ROOFTOP PIPE SUPPORTS: PILLOW BLOCK PIPE SUPPORTS BY MICRO INDUSTRIES INC.
  - D. EQUIPMENT BASES AND SUPPORTS:
    - PROVIDE EQUIPMENT BASES OF CONCRETE TYPE SPECIFIED IN SECTIONS.
    - PROVIDE TEMPLATES, ANCHOR BOLTS, AND ACCESSORIES FOR MOUNTING AND ANCHORING EQUIPMENT.
    - CONSTRUCT SUPPORT OF STEEL MEMBERS. BRACE AND FASTEN WITH FLANGES BOLTED TO STRUCTURE.
    - PROVIDE RIDG ANCHORS FOR PIPES AFTER VIBRATION ISOLATION COMPONENTS ARE INSTALLED.
- 9. SEISMIC BRACING AND SUPPORTS
  - A. BRACING OF DUCTS:
    - ALL BRACING SHALL BE DESIGNED AND INSTALLED FOR ZONE 3 SEISMIC HAZARD.
    - BRACE ALL RECTANGULAR DUCTS 6 SQ. FT. OF AREA AND LARGER. BRACE ALL ROUND DUCTS 28" IN DIAMETER AND LARGER.
    - BRACE SPACING:
      - TRANSVERSE BRACING TO OCCUR 30' - 0" O.C. MAXIMUM. (EXCEPT RECTANGULAR DUCTS 61" AND LARGER IN EITHER DIRECTION MAY BE BRACED AT 32' - 0" O.C.)
      - TRANSVERSE BRACING SHALL BE INSTALLED AT EACH DUCT TURN AND AT EACH END OF A DUCT RUN.
      - LONGITUDINAL BRACING SHALL OCCUR AT 60' - 0" O.C. MAXIMUM. TRANSVERSE BRACING FOR ONE DUCT SECTION MAY ALSO ACT AS LONGITUDINAL BRACING FOR A DUCT SECTION CONNECTED PERPENDICULAR TO IT, IF THE BRACING IS INSTALLED WITHIN FOUR FEET OF THE INTERSECTION OF BOTH DUCTS AND BRACING IS SIZED FOR THE LARGER DUCT. DUCT JOINTS SHALL CONFORM TO SMACNA DUCT CONSTRUCTION STANDARD. ALL JOINTS IN DUCT SECTIONS SHALL PROVIDE A POSITIVE FASTENING TOGETHER OF THE SECTION.
    - NO BRACING IS REQUIRED IF THE TOP OF THE DUCT IS SUSPENDED 12" OR LESS FROM THE SUPPORTING STRUCTURAL MEMBER AND ATTACHED TO TOP OF DUCT.
    - A GROUP OF DUCTS MAY BE COMBINED INTO A LARGER SIZE FRAME USING THE OVERALL DIMENSIONS WITH MAXIMUM WEIGHT FOR SELECTION OF THE MEMBERS.
    - WALLS (INCLUDING GYP-BOARD NON-BEARING PARTITIONS) WHICH HAVE DUCTS RUNNING THROUGH THEM MAY REPLACE A TYPICAL TRANSVERSE BRACE. PROVIDE SOLID BLOCKINGS AROUND DUCT PENETRATION AT STUD WALL CONSTRUCTION.
    - DUCTS AND P

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 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 TIE 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 MEGOHMS 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:

- c. 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.



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

REVISIONS			
NO	DATE	BY	DESCRIPTION
-	-	-	-

TITLE

**HVAC**  
**SPECIFICATONS**

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

**MO.3**

**PERMIT SET 08-15-2025**



AIR HANDLER UNIT (AHU-) SCHEDULE																		
TAG	SERVES	MANUF.	MODEL	CAPACITY		FAN				MOTOR		ELECTRICAL				WEIGHT (LBS)	DIMENSIONS (H"xW"xD")	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			
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:
- POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
  - RFIELD ROUTE TO APPROVED DRAIN.
  - WITH R-410A REFRIGERANT
  - TEMPERED OUTSIDE AIR PROVIDED BY 100% O.A. RTU-2.
  - PROVIDE W/ MERV-8 FILTER
  - CONNECT TO EXIST BUILDING CONTROL SYSTEM.
  - COOLING PROVIDED BY DX COIL FROM CU-2.
  - 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 (H"xW"xD")	WEIGHT	NOTES
				COOL (BTUH)	VOLTAGE	PHASE	MCA	BREAKER						
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:
- POWER WIRING, CONDUIT AND DISCONNECT BY E.C.
  - WITH R-410A REFRIGERANT.
  - W/ FIELD GFI RECEPTACLE
  - W/ LOW AMBIENT CONTROL TO 45 XDEGREES
  - 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.

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

REVISIONS			
NO	DATE	BY	DESCRIPTION
-	-	-	-

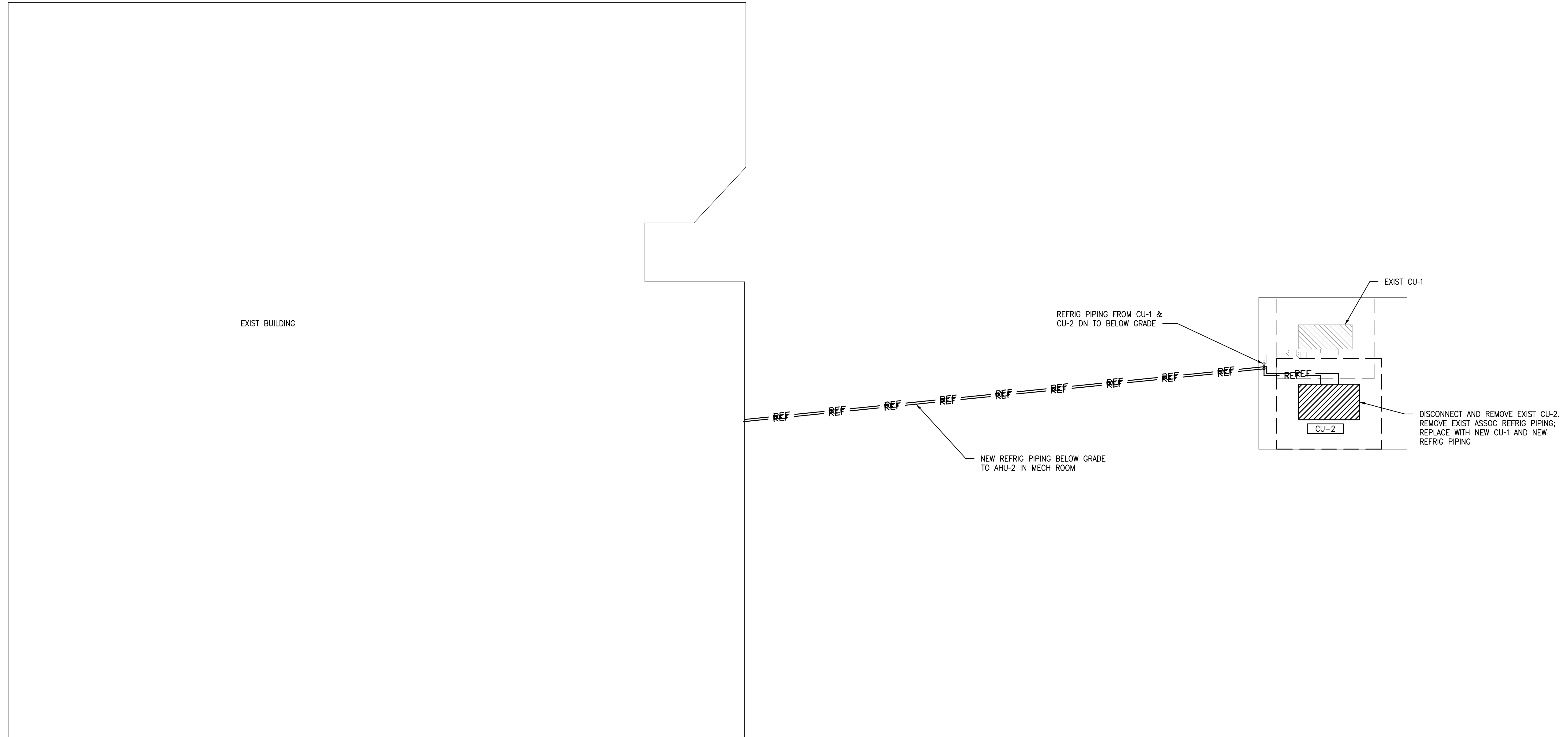
TITLE	
<b>HVAC</b>	<b>SCHEDULES</b>
DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M1.0.DWG
JOB NUMBER	2024.11

**M1.0**

**PERMIT SET 08-15-2025**



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



REVISIONS

NO	DATE	BY	DESCRIPTION
-	-	-	-

TITLE

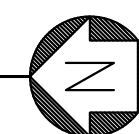
**HVAC SITE PLAN**

DESIGNED	RR
DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.0.DWG
JOB NUMBER	2024.11

**M2.0**

**HVAC SITE PLAN**

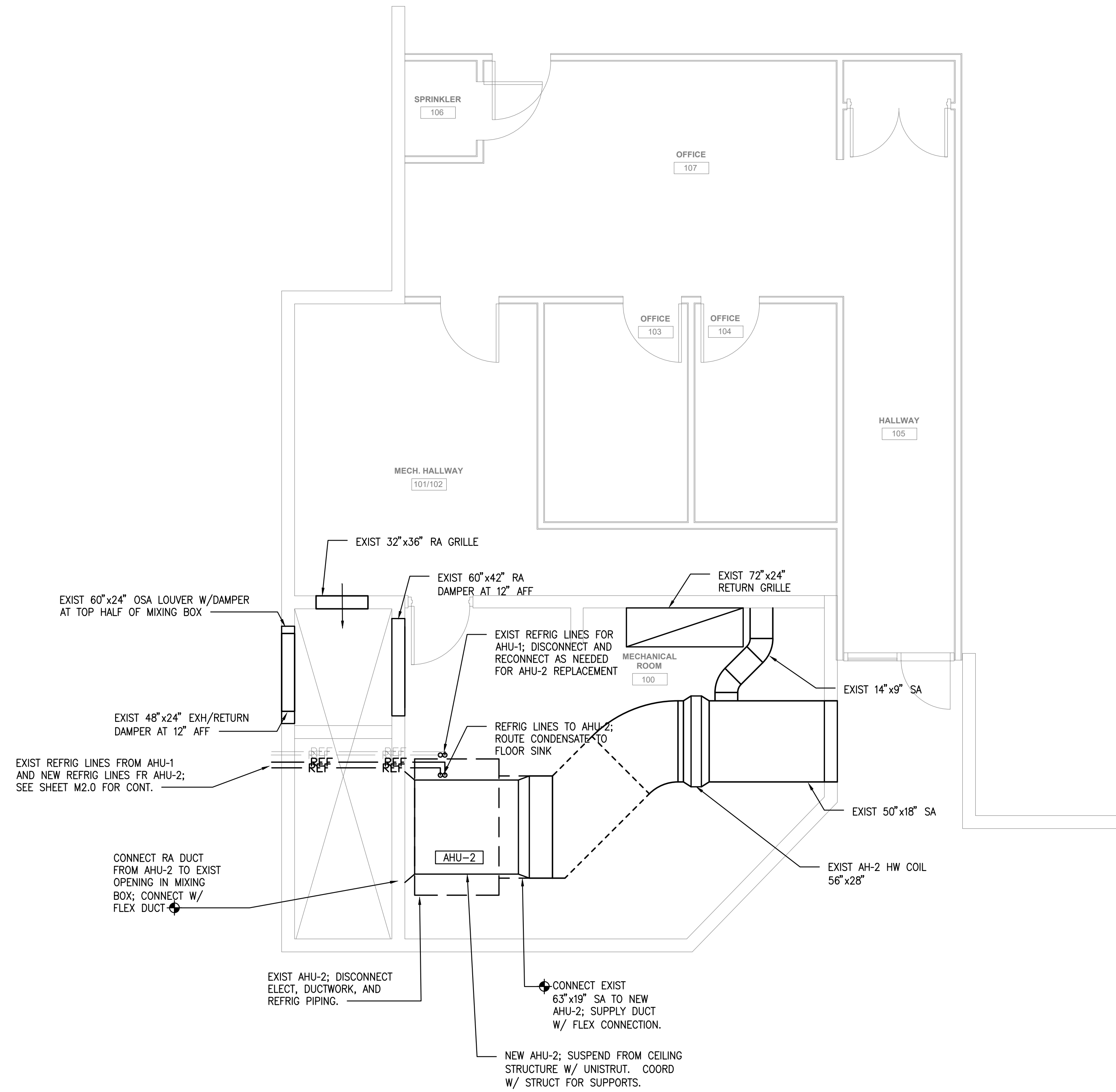
SCALE: 1/8" = 1'-0"



**PERMIT SET 08-15-2025**

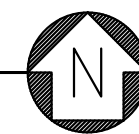


**SVCA**  
**CLUBHOUSE HVAC**  
4 CLUBHOUSE CIR,  
BELLINGHAM, WA, 98229



HVAC FLOOR PLAN

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



REVISIONS			
NO	DATE	BY	DESCRIPTION
-	-	-	-

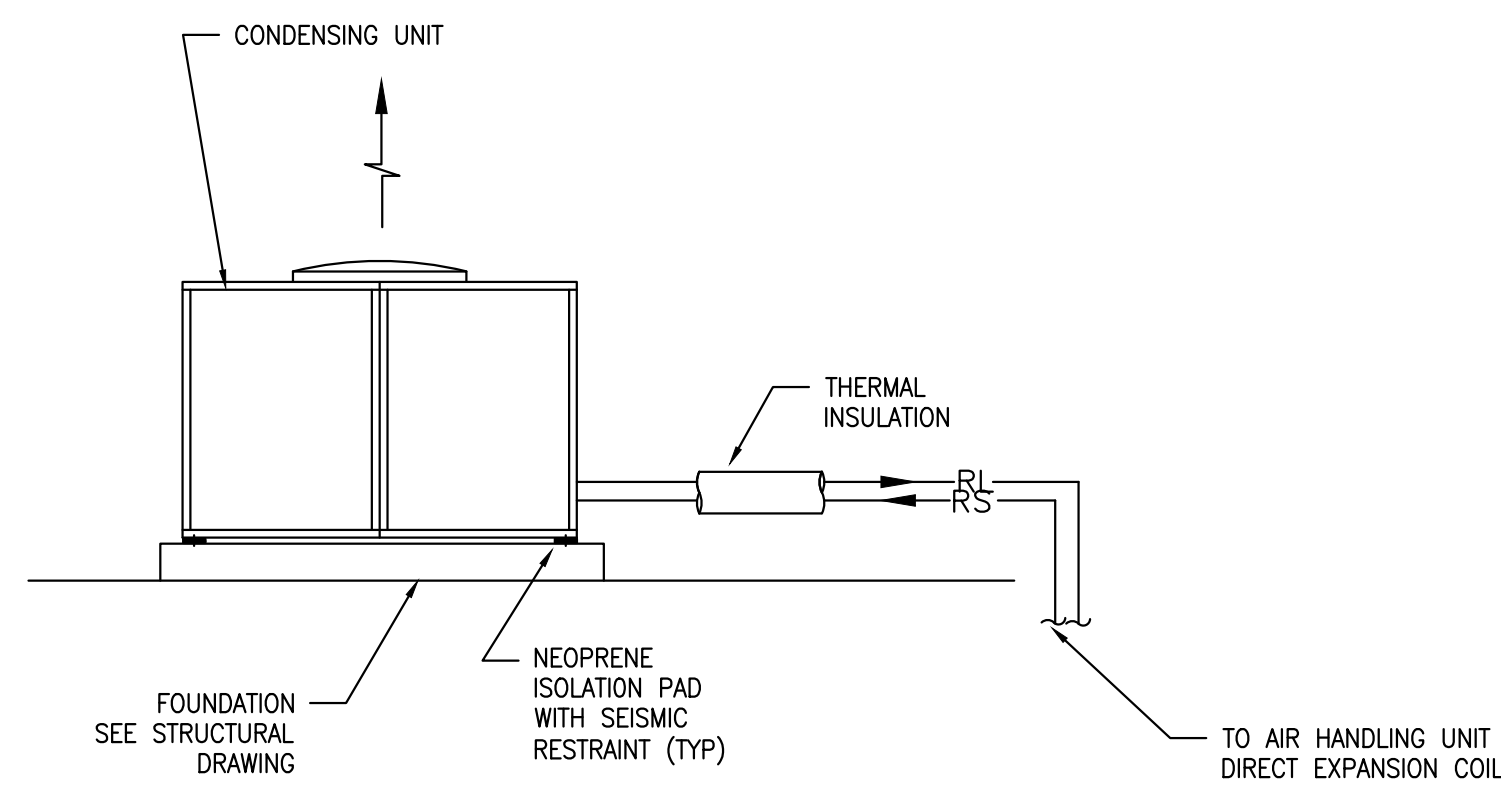
TITLE

**HVAC MECH ROOM PLAN**

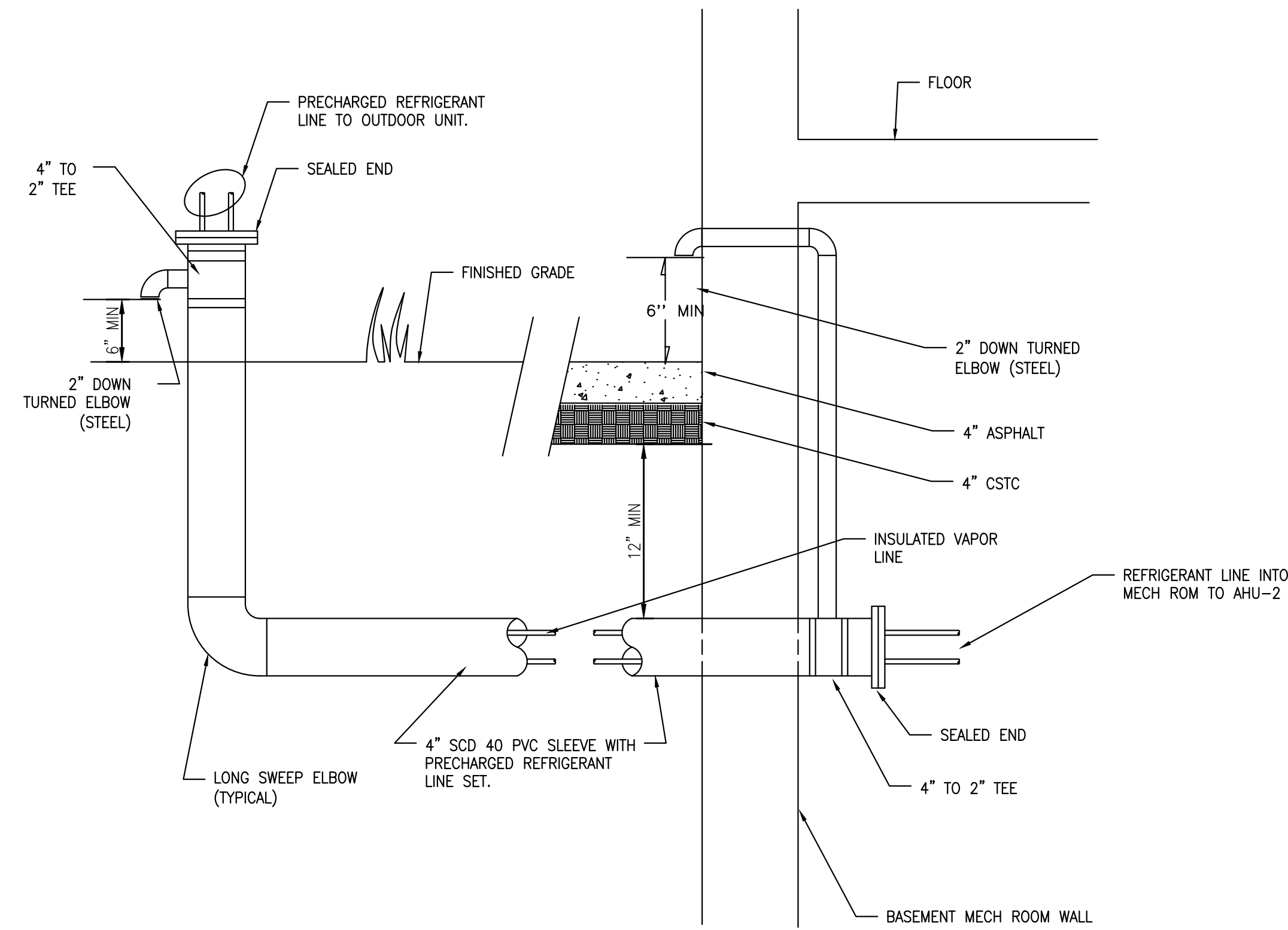
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DRAWN	KB
CHECKED	RR
DATE	08/15/2025
CADD FILE	2024.11 M2.1.DWG
JOB NUMBER	2024.11

**M2.1**

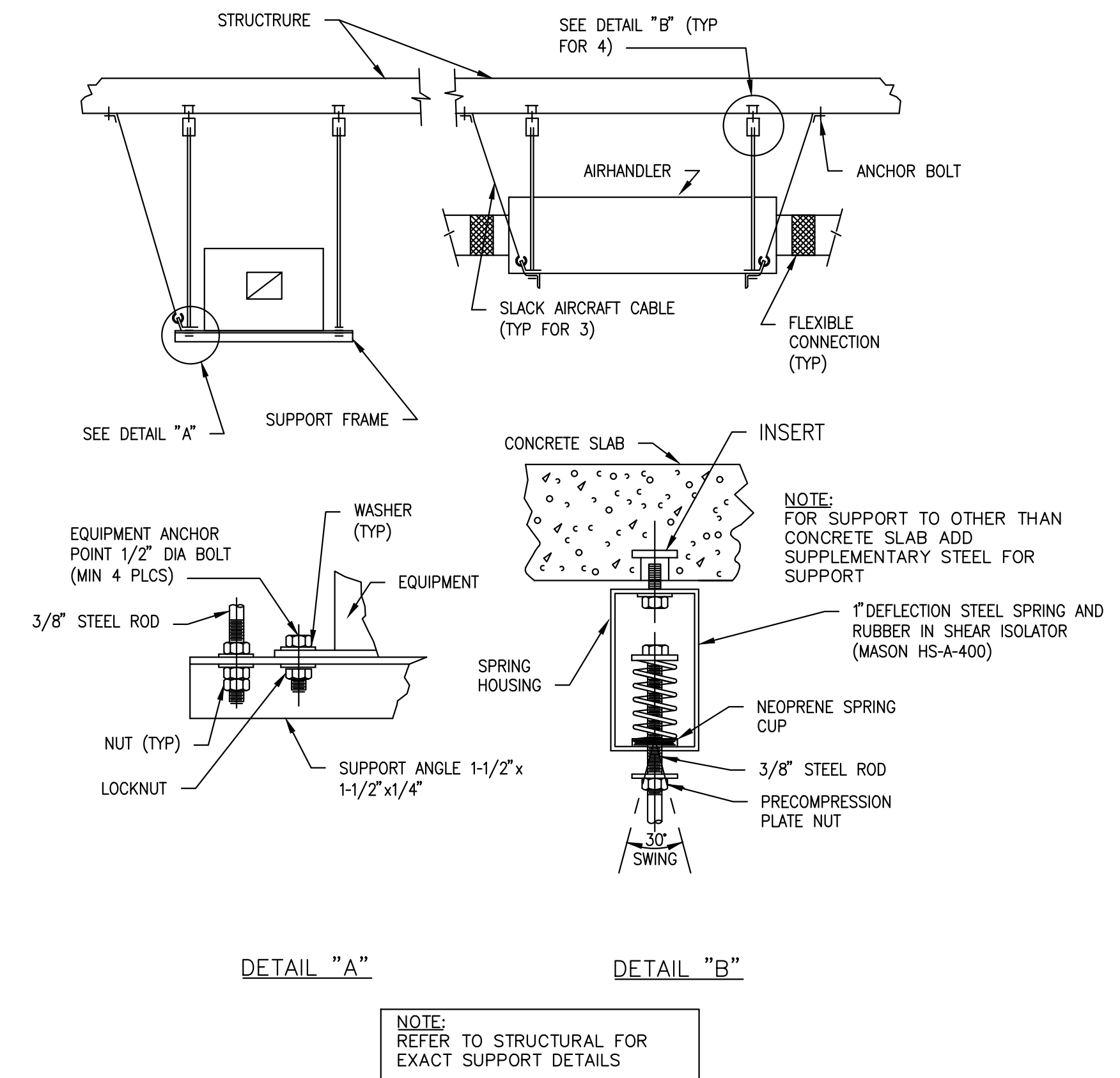
**PERMIT SET 08-15-2025**



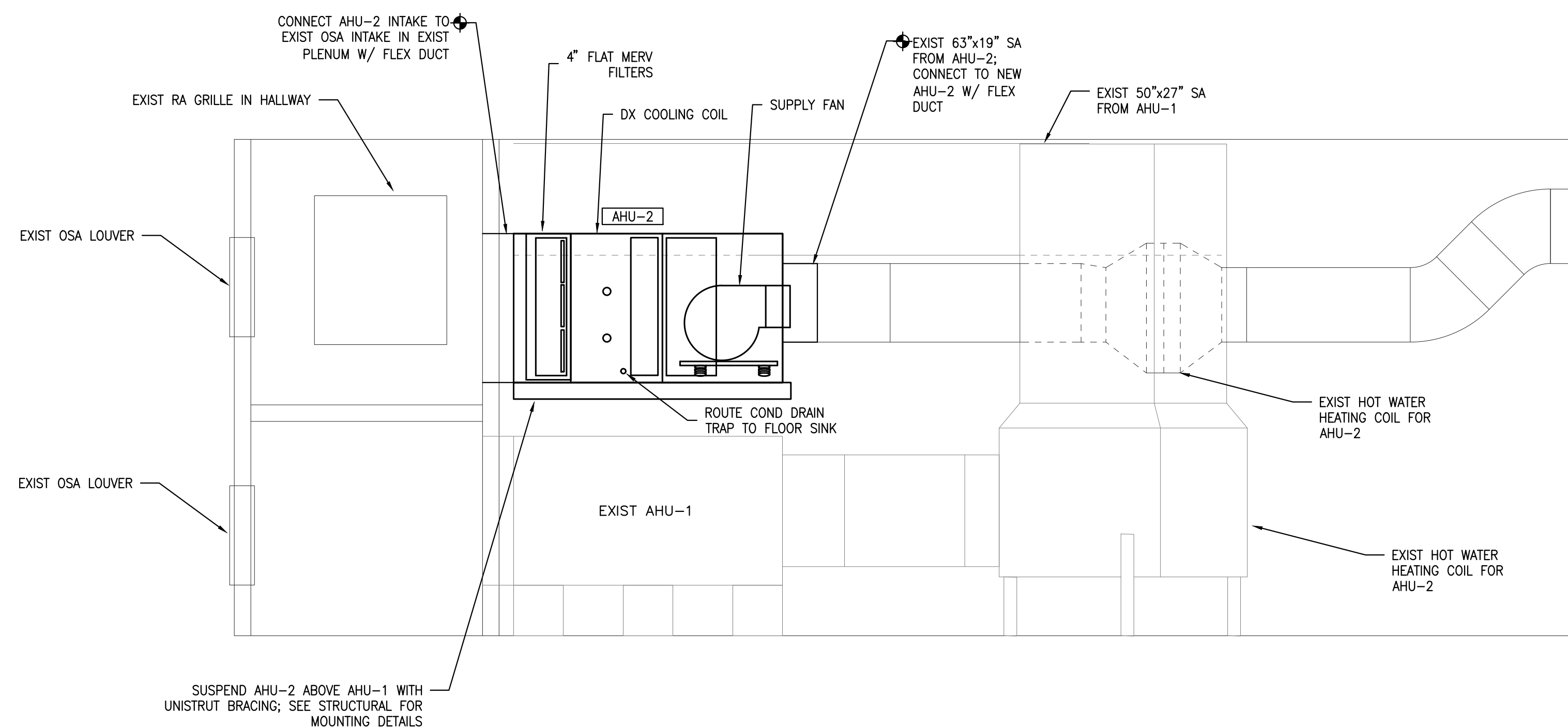
1 AIR COOLED CONDENSING DETAIL  
 SCALE: NONE



2 UNDERGROUND PIPING DETAIL  
 SCALE: NTS



3 AHU SUPPORT DETAIL  
 NOT TO SCALE



4 MECH ROOM HVAC SECTION  
 SCALE: NONE

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

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**

PERMIT SET 08-15-2025



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 Status: **Issued**

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

Permit Type: **Mechanical (Commercial)**

Commercial Mechanical

Work Classification: **New**

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

**Location Address**

**4 CLUBHOUSE CIR, Bellingham, WA 98229**

**Parcel Number**

**3704082055100000**

**Contacts**

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

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

Tyler Andrews  
 PO Box 30498, Bellingham, WA 98228  
 accounting@pnwcivil.com  
 PNWCIC1834C2  
 02/22/2027  
**Contractor**

**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)

<b>Standard Inspections</b>	<i>Contractors, please call or schedule your inspection in this ord</i>
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>



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**

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

Permit Status: **Issued**

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** IRC/IBC - 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.
- P **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

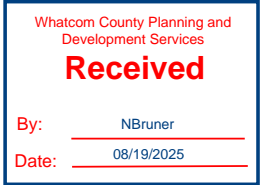
ALL INSPECTIONS SHOULD BE SCHEDULED A MIMIMUM OF 1 BUSINESS DAY IN ADVANCE  
 Please schedule Inspections on the County's Permitting Portal

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

# Mechanical Permit Application



Whatcom County Planning & 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](mailto:epermits@co.whatcom.wa.us) or mail to 5280 Northwest Drive, Bellingham, WA 98226

<p style="text-align: center;"><b><u>Worksite Information</u></b></p> <p>Address: _____</p> <p>Geo ID/Parcel# _____</p> <p>Subdivision Name _____</p> <p>Div. # _____ Blk. # _____ Lot# _____</p> <p>Residential <input type="checkbox"/> Commercial <input type="checkbox"/></p>	<p style="text-align: center;"><b><u>Type</u></b></p> <p>New <input type="checkbox"/> Replacement <input type="checkbox"/> Conversion <input type="checkbox"/></p> <p style="text-align: center;"><b><u>Heat Source</u></b></p> <p><input type="checkbox"/> Electric <input type="checkbox"/> Natural Gas <input type="checkbox"/> Propane</p> <p><input type="checkbox"/> Solar <input type="checkbox"/> Geothermal <input type="checkbox"/> Wind</p> <p><input type="checkbox"/> Wood <input type="checkbox"/> Oil</p>																																																																
<p style="text-align: center;"><b><u>Applicant/Contact Person</u></b></p> <p>Name: _____</p> <p>Address: _____</p> <p>City: _____ State: _____</p> <p>Zip: _____ Phone: _____</p> <p>E-Mail: _____</p>	<p style="text-align: center;"><b><u>Mechanical Equipment</u></b></p> <table border="1" style="width:100%; border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #d3d3d3;"> <th>Type of Equipment</th> <th>Number</th> <th>Type of Equipment</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Air Handling Unit</td> <td></td> <td>Heat Recovery Unit</td> <td></td> </tr> <tr> <td>Attic / Crawlspace Fan</td> <td></td> <td>Hot Water Heater (Gas Only)</td> <td></td> </tr> <tr> <td>Boiler / Compressor</td> <td></td> <td>Mechanical System Pumps</td> <td></td> </tr> <tr> <td>Chimney: liner/flue/vent</td> <td></td> <td>Pool or Spa Heater</td> <td></td> </tr> <tr> <td>Type 1 Hood and Duct System</td> <td></td> <td>Propane Tank (Site Plan Required)</td> <td></td> </tr> <tr> <td>Type 2 Hood and Duct System</td> <td></td> <td>Range Hood / Exhaust Fan</td> <td></td> </tr> <tr> <td>Clothes Dryer</td> <td></td> <td>Refrigeration Equipment</td> <td></td> </tr> <tr> <td>Ductwork or Venting</td> <td></td> <td>Roof Top HVAC (Complex)</td> <td></td> </tr> <tr> <td>Gas Fireplace</td> <td></td> <td>Solid Wood Burning Appliance</td> <td></td> </tr> <tr> <td>Gas Piping Residential</td> <td></td> <td>Ventilation Fan</td> <td></td> </tr> <tr> <td>Gas Piping Commercial</td> <td></td> <td>Other:</td> <td></td> </tr> <tr> <td>Generator</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Heating Appliance &lt; 100,000 BTU</td> <td></td> <td>*Subtotal of Calculated Fees</td> <td></td> </tr> <tr> <td>Heating Appliance &gt; 100,000 BTU</td> <td></td> <td>Basic Permit Fee</td> <td>+\$40.00</td> </tr> <tr style="background-color: #d3d3d3;"> <td>Heat Pump</td> <td></td> <td><b>Total</b></td> <td></td> </tr> </tbody> </table> <p style="text-align: center; font-size: small;">*Calculate your subtotal based on the fee schedule on the next page.</p>	Type of Equipment	Number	Type of Equipment	Number	Air Handling Unit		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				Heating Appliance < 100,000 BTU		*Subtotal of Calculated Fees		Heating Appliance > 100,000 BTU		Basic Permit Fee	+\$40.00	Heat Pump		<b>Total</b>	
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<p style="text-align: center;"><b><u>Owner</u></b></p> <p>Name: _____</p> <p>Address: _____</p> <p>City: _____ State: _____</p> <p>Zip: _____ Phone: _____</p> <p>E-Mail: _____</p>																																																																	
<p style="text-align: center;"><b><u>Contractor</u></b></p> <p>Name: _____</p> <p>Business Name: _____</p> <p>License# _____</p> <p>Expiration Date: _____</p>																																																																	

***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**

<b>Fee</b>	<b>Amount</b>	<b>UFS#</b>
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](mailto:epermits@co.whatcom.wa.us) or mail to 5280 Northwest Drive, Bellingham, WA 98226*



# MECHANICAL COMPLIANCE SUMMARY

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

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<b>Project &amp; Applicant Information</b>	<b>Project Title</b>	Sudden Valley Clubhouse - 2021 WSEC	<b>REVIEWED FOR COMPLIANCE</b>	<b>Date: Aug 15, 2025</b>
	<b>Project Address</b>	4 Clubhouse Circle Bellingham, WA 98229		
	<b>Applicant Name</b>	Robert Russell		
	<b>Applicant Phone</b>	425-744-6033		
	<b>Applicant Email</b>	robr@beronaengineers.com		

For questions about this report, contact WSEC Commercial Technical Support at 360-539-5300 or via email at com.techsupport@waenergycodes.com

<b>General Occupancy</b>	All Commercial		<b>General Building Use Type</b>	Entmt/Assembly, Sports/Culture Club		<b>Building Cond. Floor Area</b>	9,800
<b>General Project Types</b>	Alteration	<b>New Building or Addition Mechanical Scope</b>		<b>Alteration Mechanical Scope</b>	Single Zone Systems & Equipment	<b>Project Cond. Floor Area</b>	9,800
						<b>Floors Above Grade</b>	2
						<b>Compliance Method</b>	General Prescriptive
<b>Mechanical Project Description</b>	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
<b>Additional Energy Efficiency (AEC) Measures Included</b>	No mechanical additional energy efficiency measures included in project		<b>Load Management (LDM) Measures Included</b>		No mechanical load management measures included in project	
<b>Additional Efficiency Credits Included (AEC)</b>						
<b>Does building include occupancy classifications requiring DOAS?</b>	No	<b>Does project include DOAS equipment?</b>				No
<b>Based on project scope do TSPR requirements apply?</b>	No	<b>Do all systems comply with Appendix D standard reference design or qualify for an exception to TSPR?</b>				No

<b>Scope &amp; Space Conditioning</b>	<b>ALTERATION - SINGLE ZONE SYSTEMS &amp; EQUIPMENT</b>	<b>Compliance Verification</b>	<b>COMPLIES</b>
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## Single Zone Air Systems Category - Condensing 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	Cooling 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, air 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?: <a href="#">Single item</a>		
	WSEC Equip Efficiency Reference Table - Cooling: <a href="#">Table C403.3.2(1) Unitary Air Conditioners &amp; Condensing Units</a>		



**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#  
 Wind: N/A Isnow= 1.00  
 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.

Page	Item
1	Title Page
2-9	calculations



UNIT INFO:  $W = 1078 \text{ lb}$   
AIR-SIDE HVAC

ASCE CH 13.3 FOR SEISMIC FORCES

HORIZONTAL FORCE

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

$$S_{DS} = 0.85$$

$$a_p = 2.5$$

$$W_p = 1078 \text{ lb}$$

$$R_p = 6$$

$$I_p = 1.0$$

$$\Omega = 2.0$$

$$z = 8'$$

$$h = 10'$$

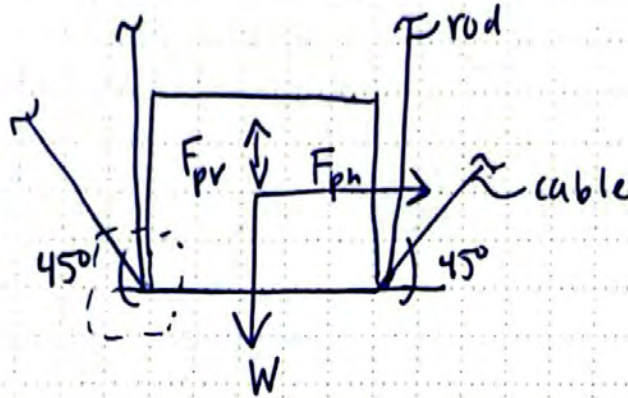
$$F_p = \frac{0.4(2.5)(0.85)(1078 \text{ lb})}{6/1.0} \left(1 + 2 \frac{8}{10}\right) = \boxed{397 \text{ lb}}$$

VERTICAL FORCE

$$F_{pv} = \pm 0.2 S_{ps} W_p$$

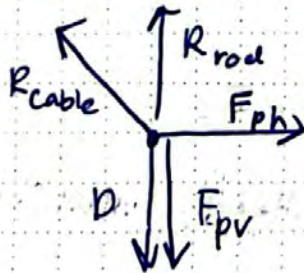
$$F_{pv} = \pm 0.2 (0.85) (1078 \text{ lb})$$

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



(4) CABLES/RODS: ANALYZE ROD + CABLE

HORIZONTAL FORCE + DOWNWARD VERTICAL



FIND  
 $R_{cable}, R_{rod}$

2 BRACES  
IN TENSION

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

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

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

LRFD: WORST CASE W/DOWNWARD  $F_{pv}$

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

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

WORST CASE W/UPWARD  $F_{pv}$



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

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

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

CHECK ROD:

A36 STEEL, 3/8" DIA.

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

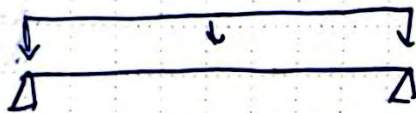
LRFD STRENGTH

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

ROD O.K. FOR TENSION

CHECK ANGLE SUPPORTS:

L3 x 3 x 3/16 S = 0.433 F<sub>y</sub> = 36 ksi



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

$$l = 5'8"$$

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

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

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

MOMENT DEMAND FROM VERTICAL EQ LOAD:

$$w = \frac{(183 \text{ lb})}{5.33 \text{ ft}} = 17.2 \text{ lb/ft}$$

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

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

$$1.2D + E = 1.2 (11,200 \text{ lb/in}^2) + 1905 \text{ lb/in}^2 = 15.35 \text{ ksi} = f_{\text{max}}$$

$$\frac{f_{\text{max}}}{f_y} = \frac{15.35 \text{ ksi}}{36 \text{ ksi}} = 0.43 \quad \underline{\underline{0.43}}$$



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

$\Omega_0$  factor: not set

Apply entire shear load at front row: Yes

Anchors only resisting wind and/or seismic loads: No

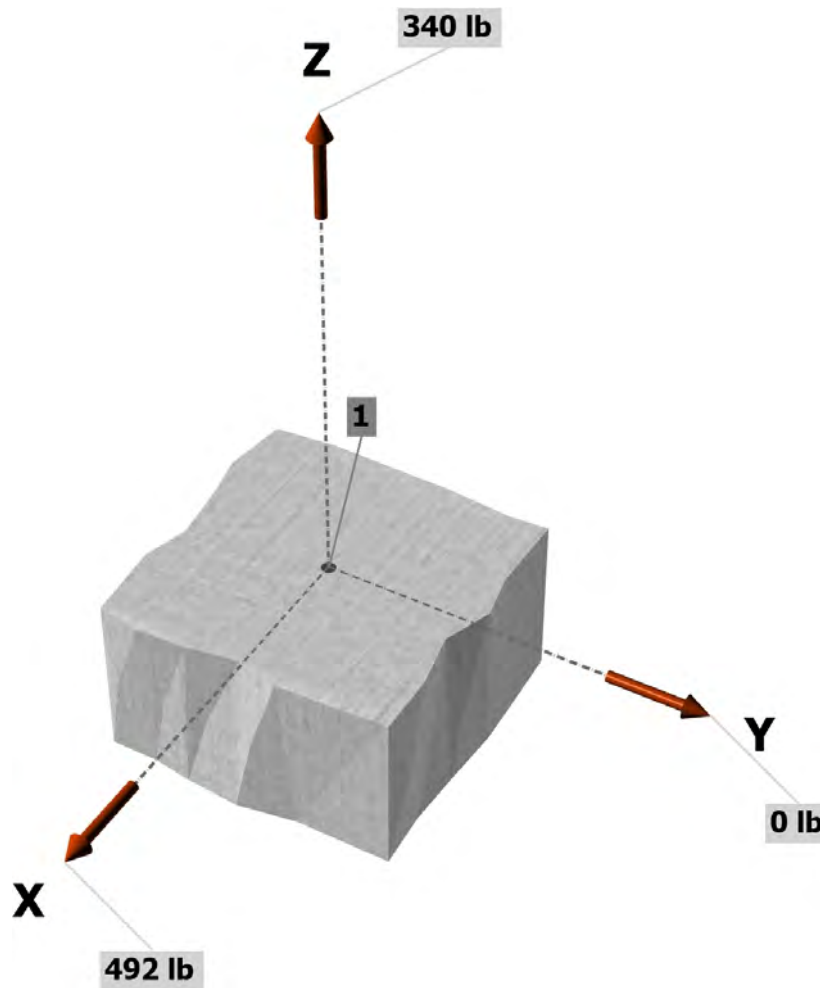
Strength level loads:

$N_{ua}$  [lb]: 340

$V_{uax}$  [lb]: 492

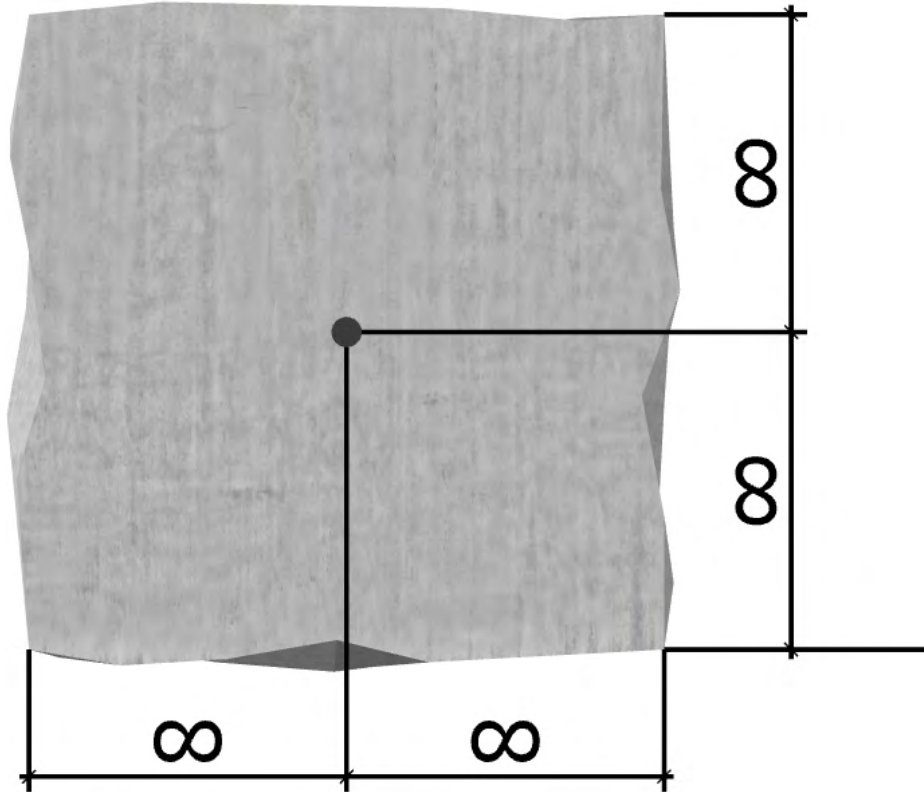
$V_{uay}$  [lb]: 0

<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)	$\phi$	$\phi N_{sa}$ (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)

$K_c$	$\lambda_a$	$f'_c$ (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 <sup>2</sup> )	$A_{Nco}$ (in <sup>2</sup> )	$c_{a,min}$ (in)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	$N_b$ (lb)	$\phi$	$0.75 \phi N_{cb}$ (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)**

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

$\tau_{k,cr}$ (psi)	$f_{short-term}$	$K_{sat}$	$\alpha_{N,seis}$	$f'_c$ (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)

$\lambda_a$	$\tau_{cr}$ (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 <sup>2</sup> )	$A_{Na0}$ (in <sup>2</sup> )	$c_{Na}$ (in)	$c_{a,min}$ (in)	$\Psi_{ed,Na}$	$\Psi_{cp,Na}$	$N_{a0}$ (lb)	$\phi$	$0.75 \phi N_a$ (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)

$\phi$	$N_{ba}$ (lb)	$\phi N_{sust}$ (lb)
0.65	4051	1448

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

$V_{sa}$ (lb)	$\phi_{grout}$	$\phi$	$\alpha_{V,seis}$	$\phi_{grout} \alpha_{V,seis} \phi V_{sa}$ (lb)
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Input data and results must be checked for agreement with the existing circumstances, the standards and guidelines must be checked for plausibility.



2715 1.0 0.65 0.75 1324

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

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

$k_{cp}$	$A_{Na}$ (in <sup>2</sup> )	$A_{Na0}$ (in <sup>2</sup> )	$\psi_{ed,Na}$	$\psi_{cp,Na}$	$N_{ba}$ (lb)	$N_a$ (lb)
1.0	120.53	120.53	1.000	1.000	4051	4051

$A_{Nc}$ (in <sup>2</sup> )	$A_{Nco}$ (in <sup>2</sup> )	$\psi_{ed,N}$	$\psi_{c,N}$	$\psi_{cp,N}$	$N_b$ (lb)	$N_{cb}$ (lb)	$\phi$	$\phi V_{cp}$ (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, $\phi N_n$ (lb)	Ratio	Status
Steel	340	3394	0.10	Pass
Concrete breakout	340	1517	0.22	Pass
Adhesive	340	1975	0.17	Pass
<b>Adhesive (sustained)</b>	<b>340</b>	<b>1448</b>	<b>0.23</b>	<b>Pass (Governs)</b>

Shear	Factored Load, $V_{ua}$ (lb)	Design Strength, $\phi V_n$ (lb)	Ratio	Status
<b>Steel</b>	<b>492</b>	<b>1324</b>	<b>0.37</b>	<b>Pass (Governs)</b>
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:

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(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.

	<b>Per Occurrence Coverage</b>	<b>Aggregate Coverage</b>
<b>General Commercial Liability</b>	\$1,000,000	\$2,000,000
<b>Automobile Liability</b>	\$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:**

**CONTRACTOR:**

SUDDEN VALLEY COMMUNITY  
ASSOCIATION

\_\_\_\_\_

\_\_\_\_\_

Date: \_\_\_\_\_

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 statute 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.