



ALASKA RAILROAD CORPORATION

SEWARD ENGINE HOUSE ROOF REPLACEMENT

APRIL 2022

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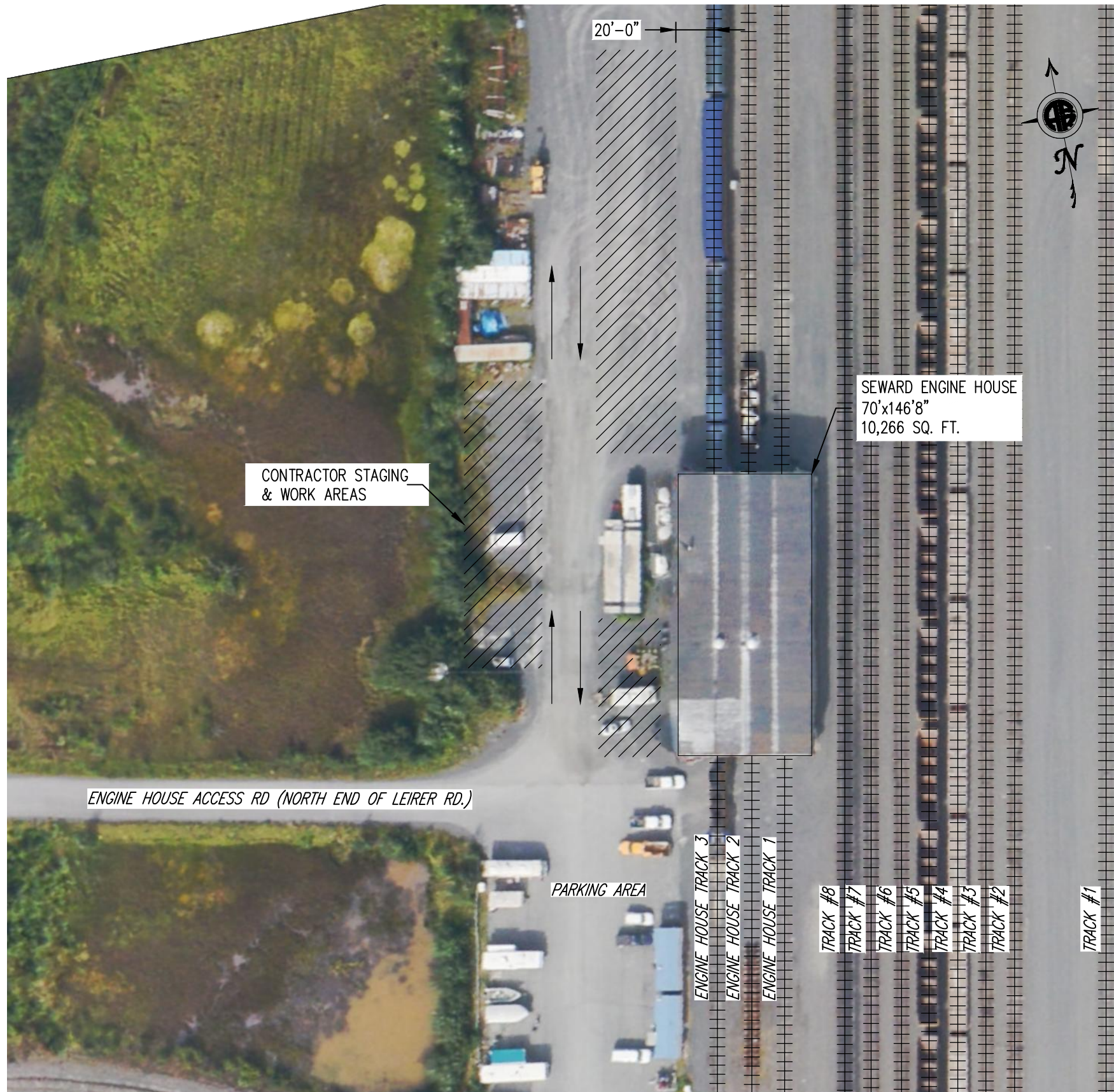


PROJECT LOCATION;
SEWARD, ALASKA

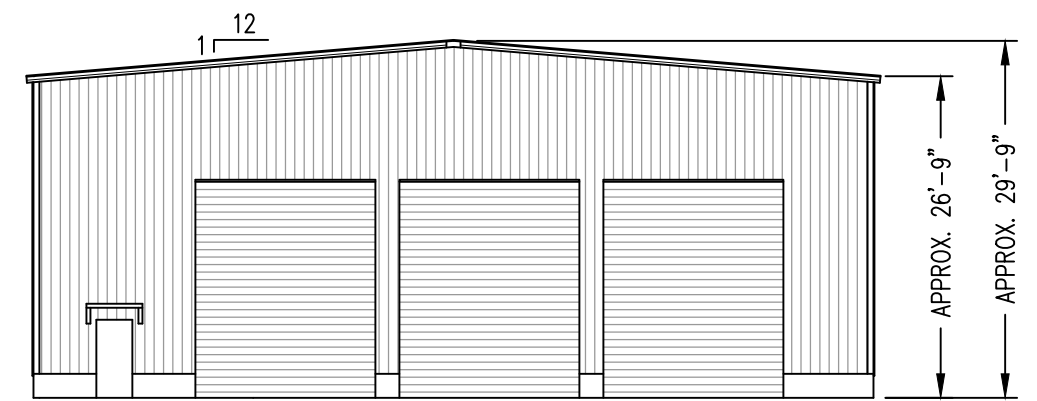
ALASKA MAP

NOT TO SCALE

ALASKA RAILROAD CORPORATION ENGINEERING SERVICES <small>P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500</small>		
PROJECT :		
SEWARD ENGINE HOUSE ROOF REPLACEMENT		
TITLE:		
TITLE SHEET		
DESIGNED BY: ARRC	SCALE : AS NOTED	AFE NO.:
DRAWN BY: CDL	DATE : APRIL 2022	ACAD FILE:
CHECKED BY: ARRC		DWG NO.
APPROVED BY: ARRC		1 OF 8



A SITE PLAN
2 NO SCALE



B SOUTH ELEVATION
2 NO SCALE

SAFETY:

MANDATORY MINIMUM PERSONAL PROTECTIVE EQUIPMENT (PPE):

ALL CONTRACTOR PERSONNEL SHALL AT ALL TIMES WEAR AT LEAST:

- HARD HATS
- SAFETY GLASSES
- SAFETY TOE WORK BOOTS
- REFLECTIVE VESTS

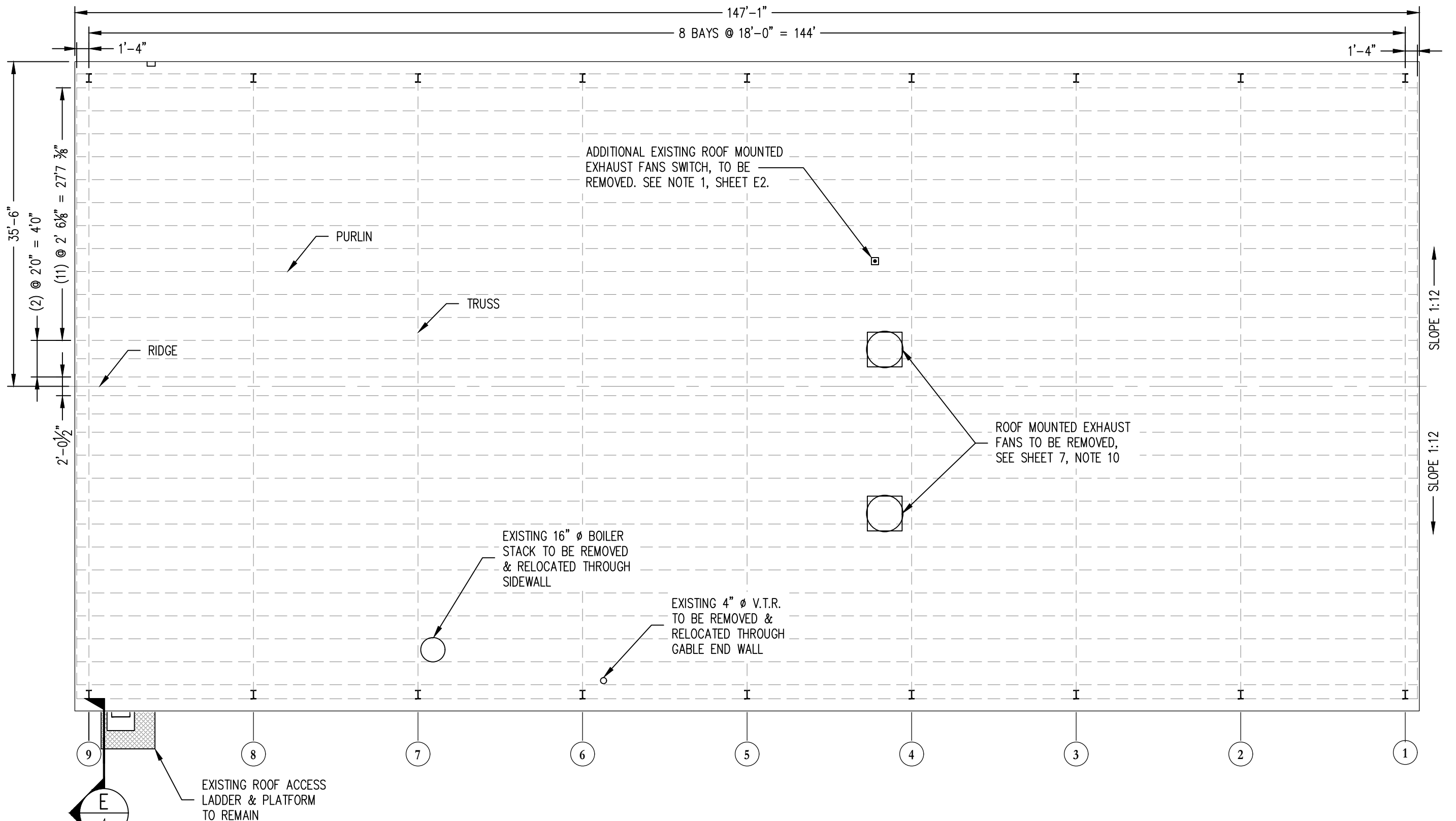
CONTRACTOR SHALL HAVE AND COMPLY WITH AN OSHA APPROVED FALL PROTECTION PLAN AT ALL TIMES. ALL WORKERS SHALL ATTEND A PRE-CONSTRUCTION SAFETY MEETING WITH ALASKA RAILROAD. THE CONTRACTOR MUST COMPLY WITH THE ARRC CONTRACTOR SAFETY GUIDELINES.

ALL WORK WITHIN 20' OF TRACKS MUST BE COORDINATED WITH THE ALASKA RAILROAD.

THE CONTRACTOR SHALL PROVIDE ARRC WITH A SCHEDULE OF PROPOSED WORK ACTIVITIES TO INCLUDE PERIODS WHICH THE CONTRACTOR INTENDS TO USE EQUIPMENT THAT HAS THE POTENTIAL TO FOUL ARRC TRACKS. ALL WORK THAT HAS THE POTENTIAL TO FOUL ARRC TRACKS MUST BE PLANNED AND SCHEDULED IN ACCORDANCE WITH THE ARRC FLAGGING & INSPECTION POLICY.

ALASKA RAILROAD CORPORATION ENGINEERING SERVICES <small>P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500</small>		
PROJECT :		
SEWARD ENGINE HOUSE ROOF REPLACEMENT		
TITLE:		
SITE PLAN		
DESIGNED BY: ARRC	SCALE : AS NOTED	AFE NO.:
DRAWN BY: CDL	DATE : APRIL 2022	ACAD FILE:
CHECKED BY: ARRC		DWG NO.
APPROVED BY: ARRC		2 OF 8


P:\Engineering\Buildings\MP 002 Seward\Bldg-31 Engine House - Round House\2022 Roofing\2022 Seward Engine House IMP Roof2.dwg VPort: 03 EXIST. ROOF PLAN Plot Style: 750C-Half.ctb



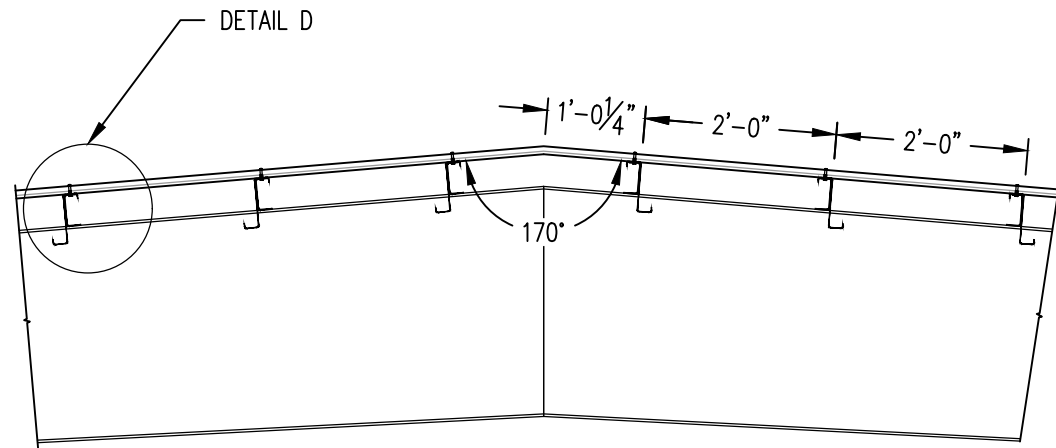
A EXISTING ROOF PLAN
3 NO SCALE



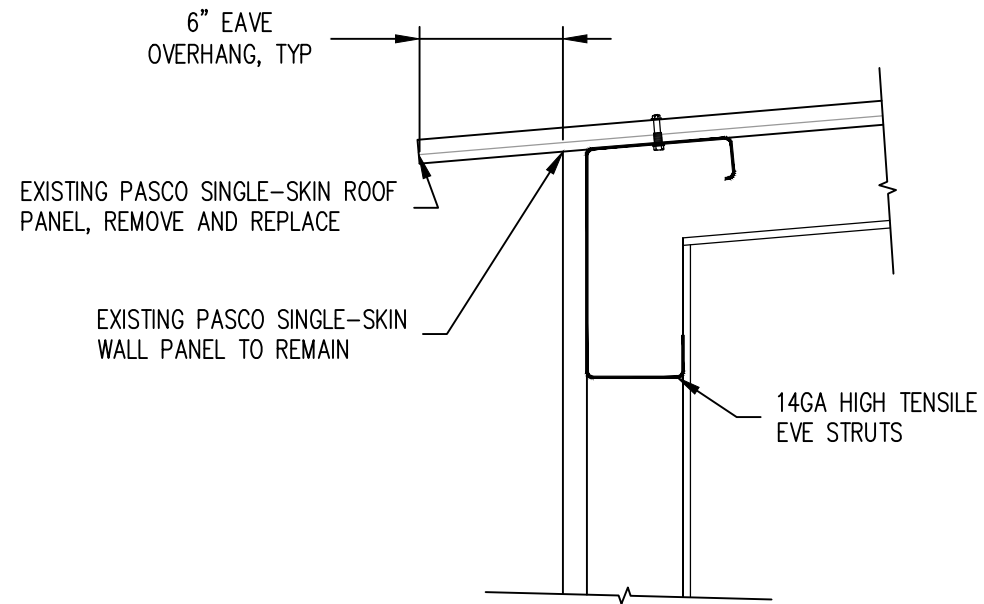
REV.	DATE	BY	REVISION

 ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500			
PROJECT :			
SEWARD ENGINE HOUSE ROOF REPLACEMENT			
TITLE:			
EXISTING ROOF PLAN			
DESIGNED BY: ARRC	SCALE : AS NOTED	AFE NO.:	
DRAWN BY: CDL	DATE : APRIL 2022	ACAD FILE:	
CHECKED BY: ARRC		DWG NO.	
APPROVED BY: ARRC		3 OF 8	

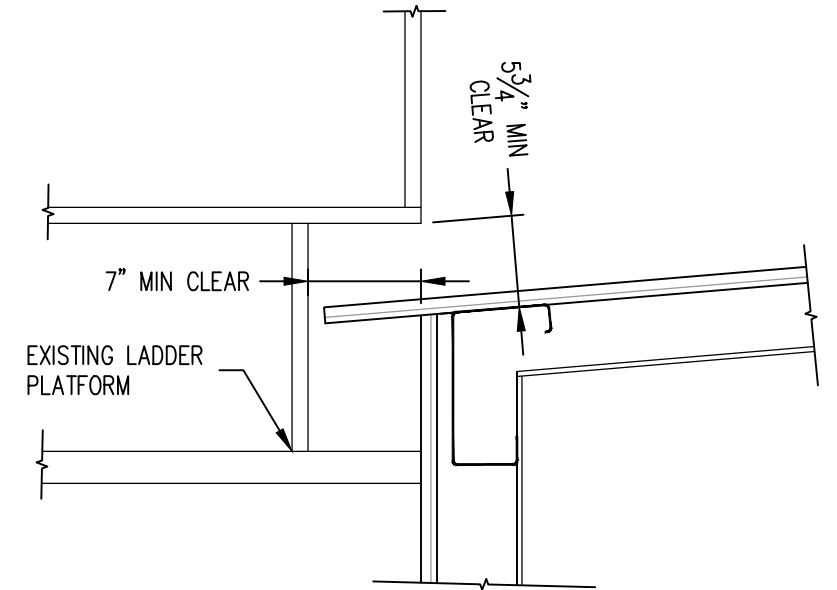
P:\Engineering\Buildings\MP 002 Seward\Bldg-31 Engine House - Round House\2022 Roofing\2022 Seward Engine House IMP Roof.dwg VPort: 04 DETAILS-EXIST Plot Style: 750C-Half.ctb



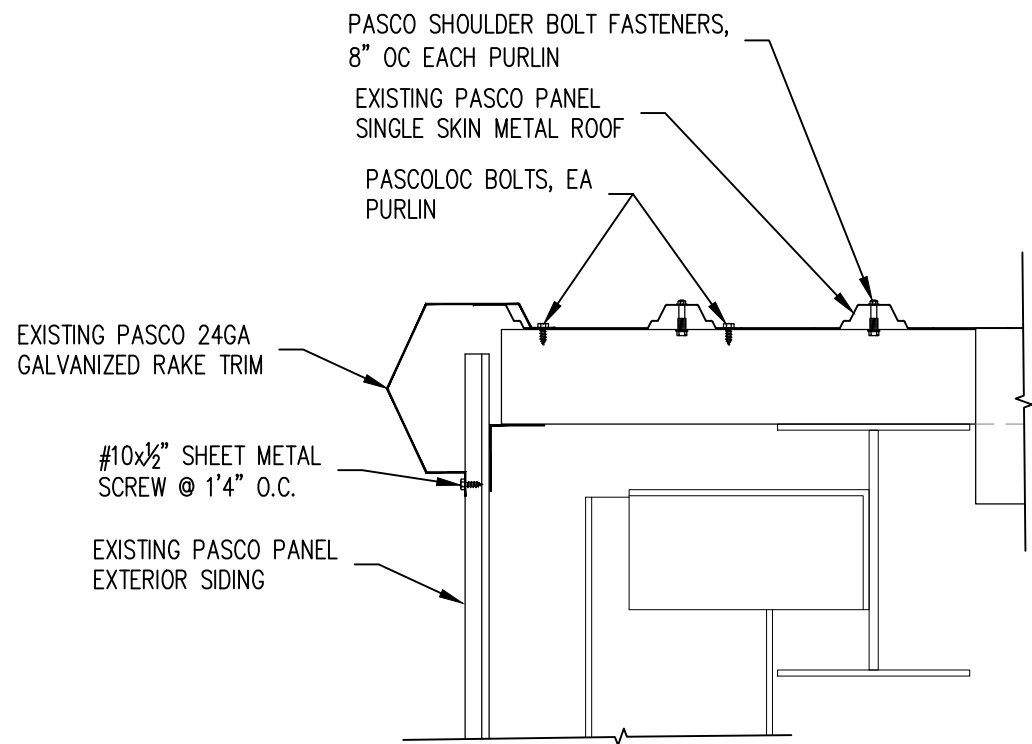
A SECTION AT RIDGE
4 NO SCALE



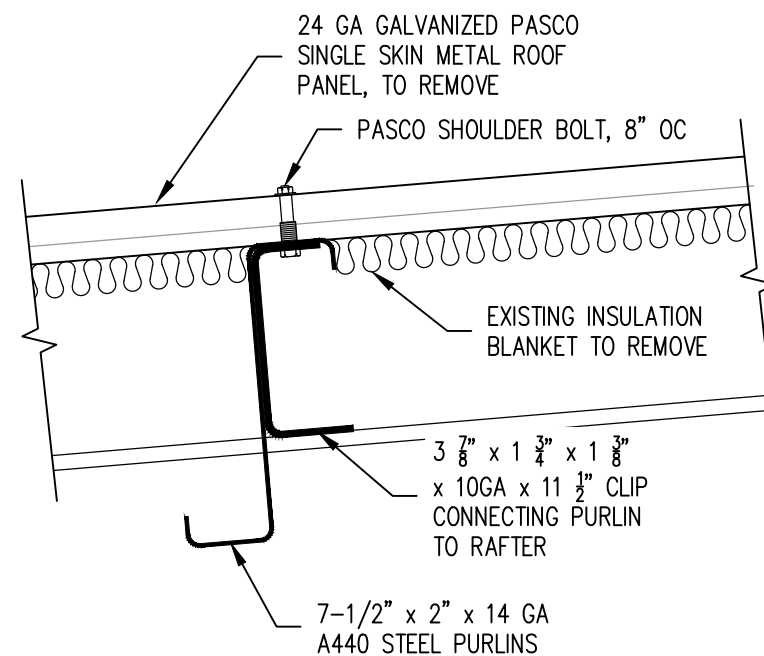
B SECTION AT EAVE
4 NO SCALE



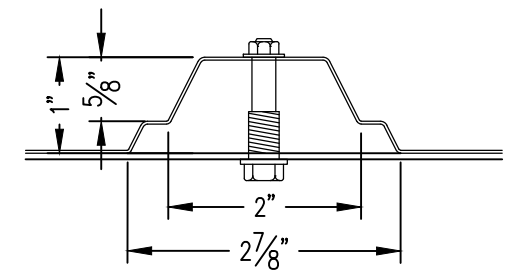
E EAVE SECTION AT LADDER
4 NO SCALE



C SECTION AT RAKE
4 NO SCALE



D TYPICAL PURLIN AT RAFTER
4 NO SCALE

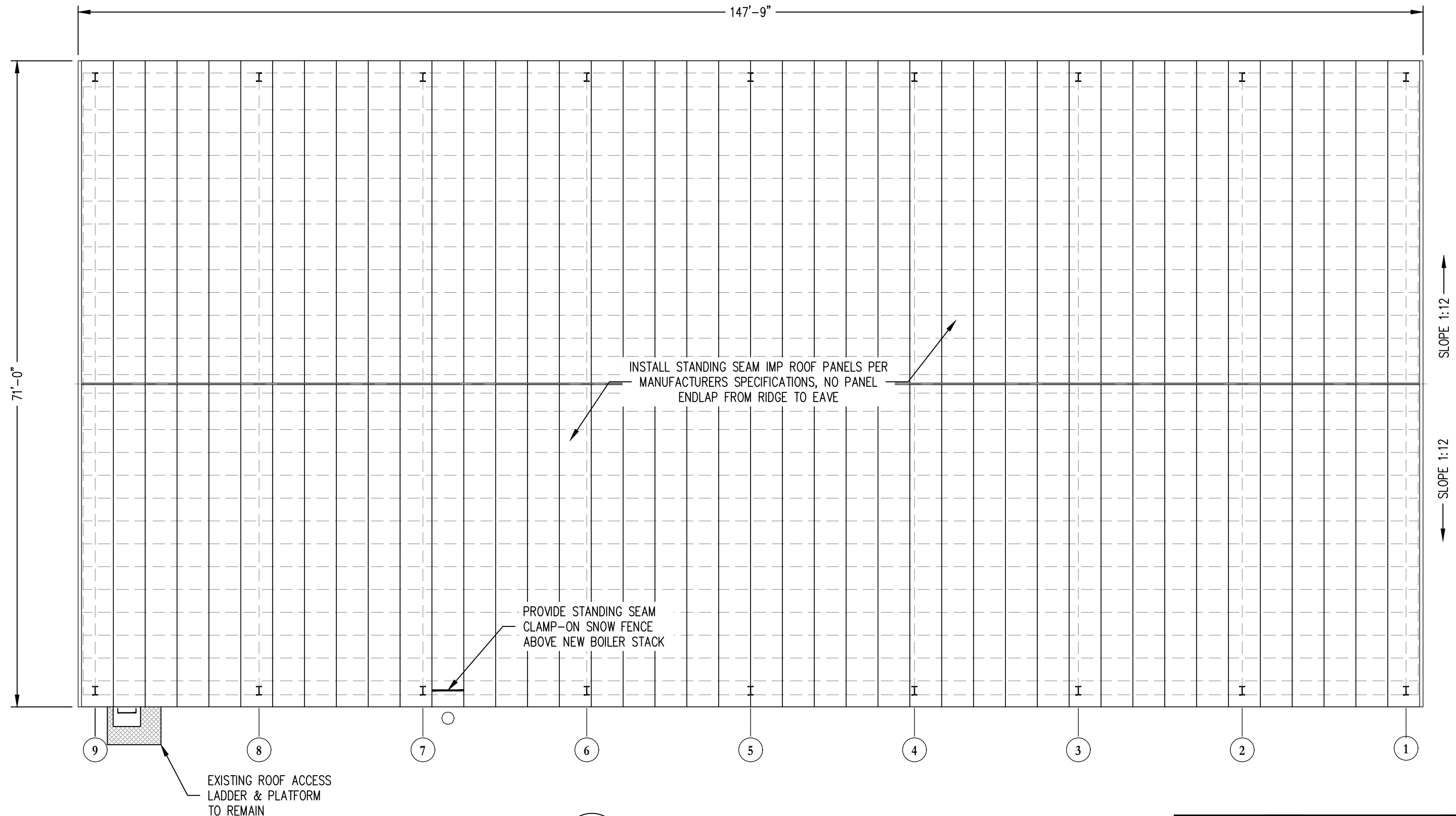


F EXISTING PASCO PANEL PROFILE
4 NO SCALE

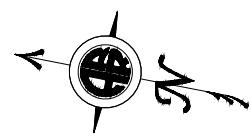
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ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500		
PROJECT :		
SEWARD ENGINE HOUSE ROOF REPLACEMENT		
TITLE:		
EXISTING ROOF DETAILS		
DESIGNED BY: ARRC	SCALE : AS NOTED	AFE NO.:
DRAWN BY: CDL	DATE : APRIL 2022	ACAD FILE:
CHECKED BY: ARRC		DWG NO.
APPROVED BY: ARRC		4 OF 8


P:\Engineering\Buildings\MP 002 Seward\Bldg-31 Engine House - Round House\2022 Roofing\2022 Seward Engine House IMP Roof2.dwg VPort: 05 REPLACE ROOF PLAN Plot Style: 7500-Half.ctb



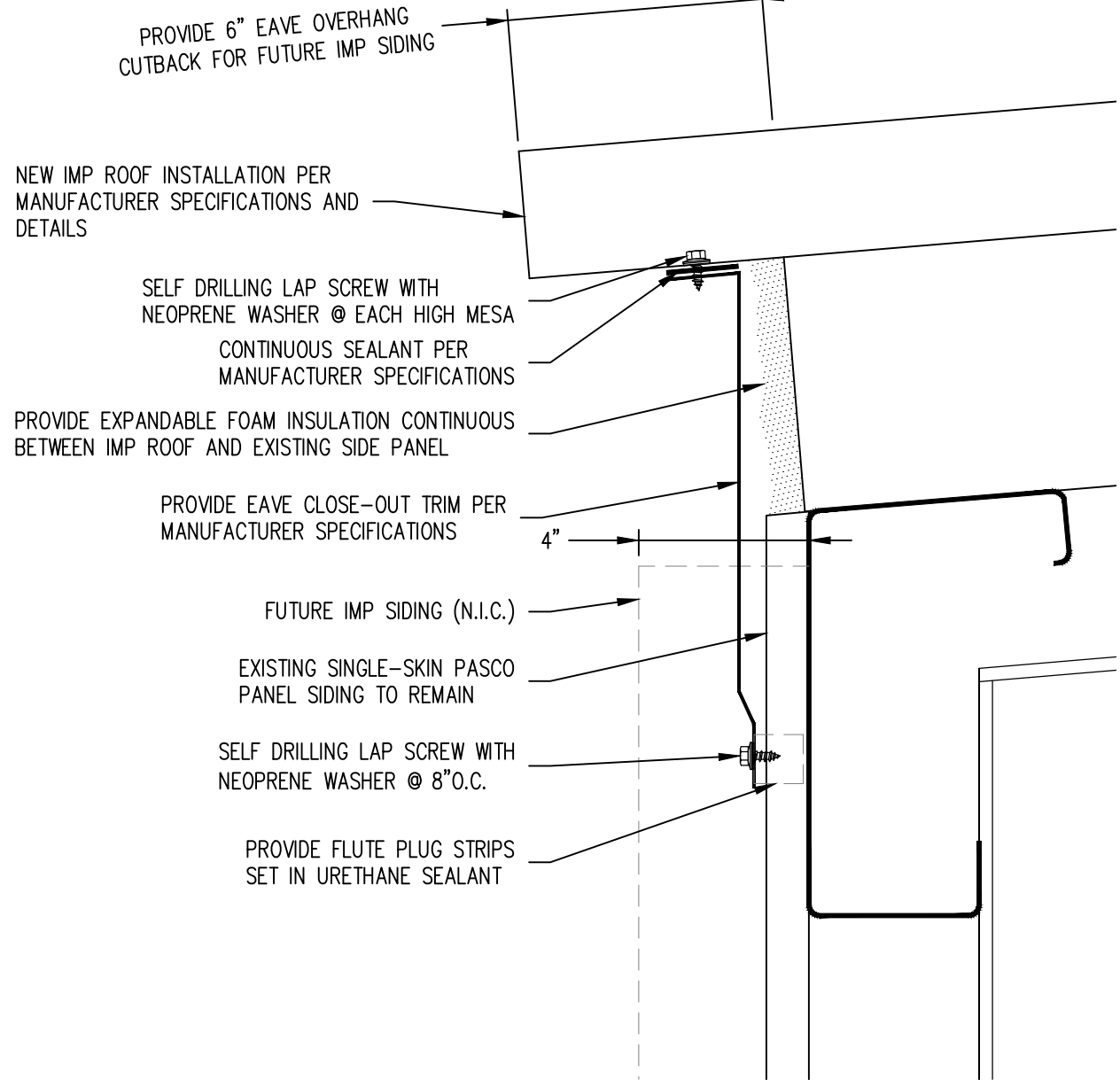
A REPLACEMENT ROOF PLAN
5 NO SCALE



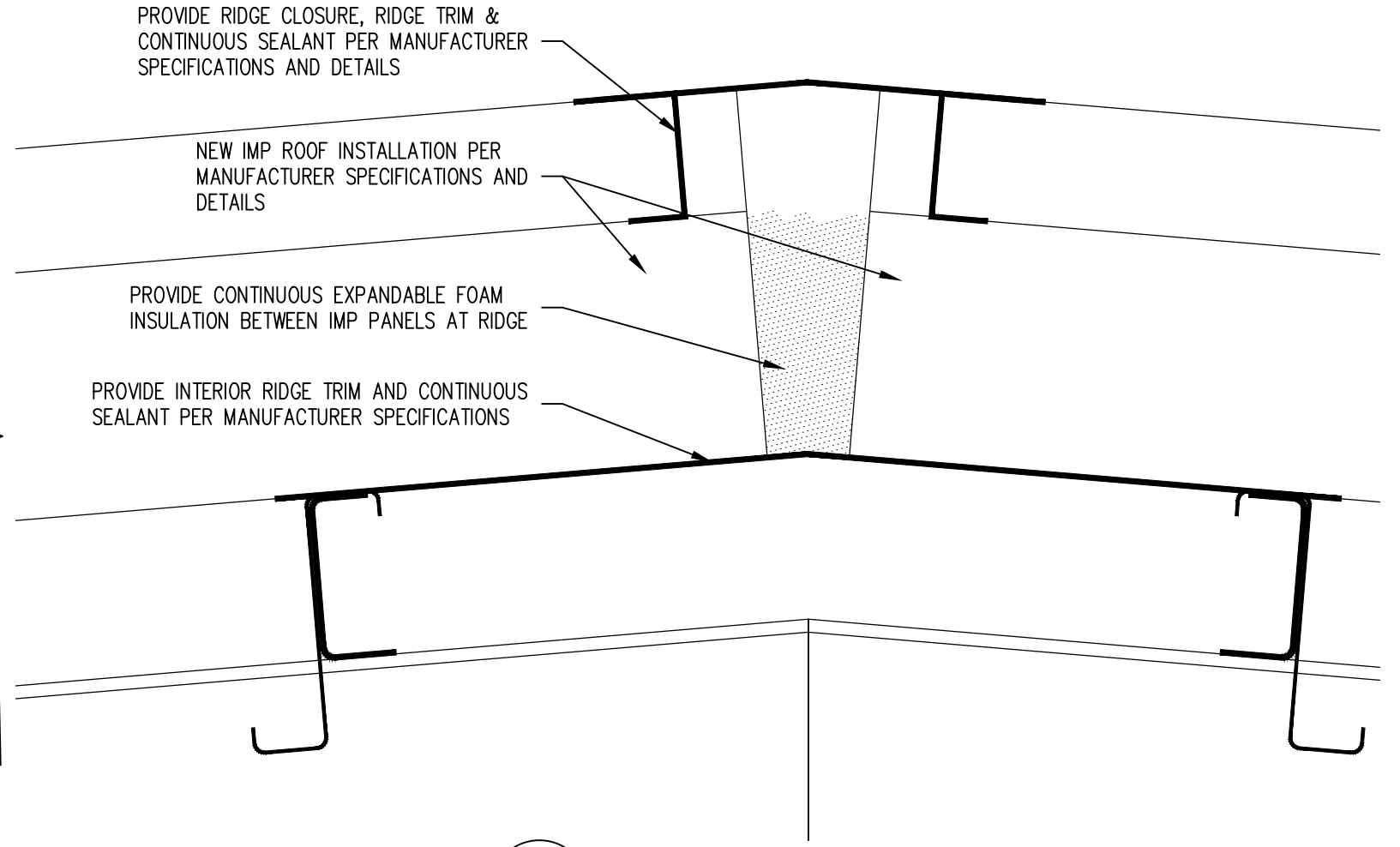
REV.	DATE	BY	REVISION

 ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500		
PROJECT : SEWARD ENGINE HOUSE ROOF REPLACEMENT		
TITLE: REPLACEMENT ROOF PLAN		
DESIGNED BY: ARRC	SCALE : AS NOTED	A/E NO.:
DRAWN BY: CDL	DATE : APRIL 2022	ACAD FILE:
CHECKED BY: ARRC		DWG NO. 5 OF 8
APPROVED BY: ARRC		

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A SECTION AT EAVE - REPLACEMENT DETAIL
6 NO SCALE

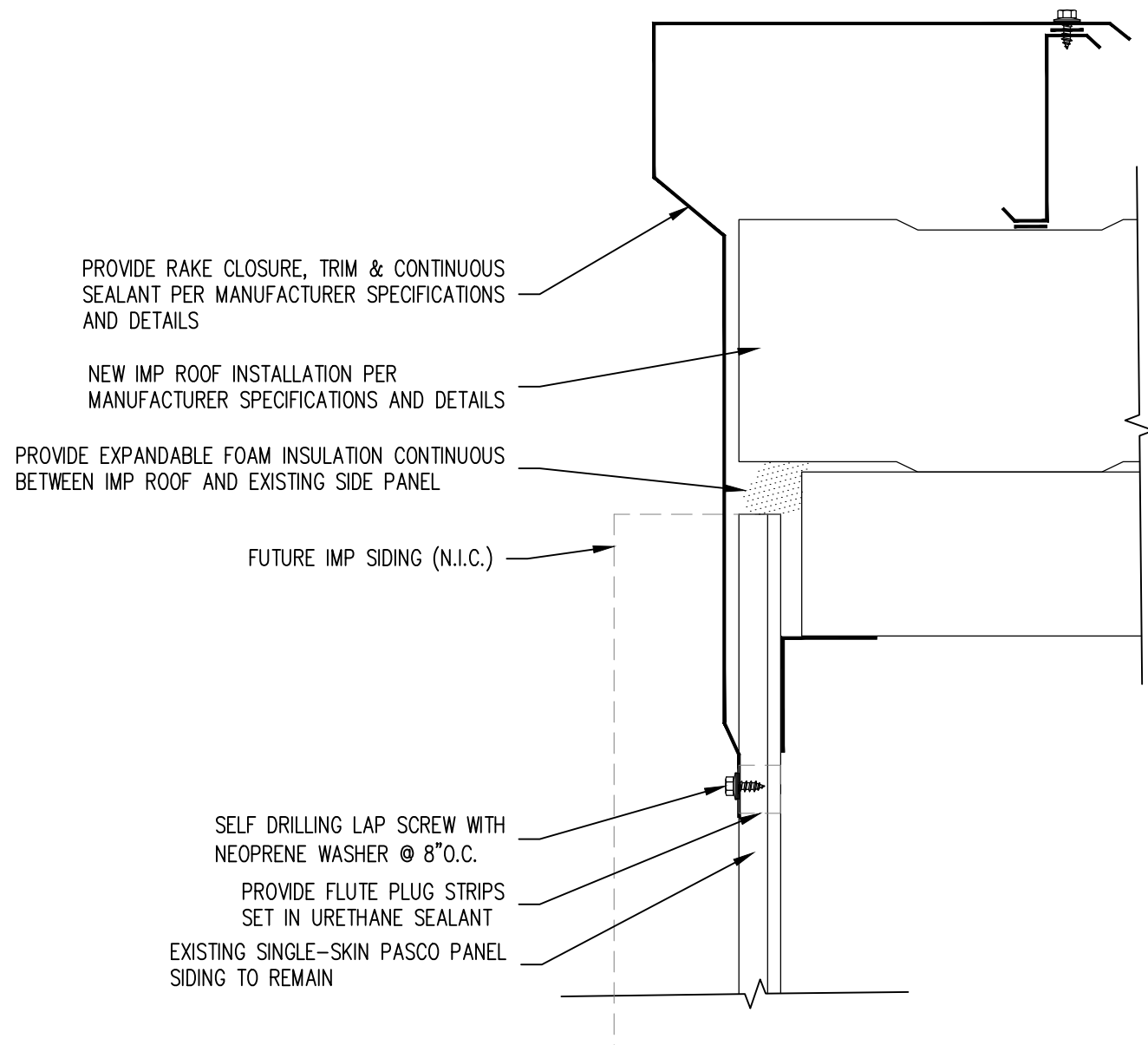


B SECTION AT RIDGE - REPLACEMENT DETAIL
6 NO SCALE

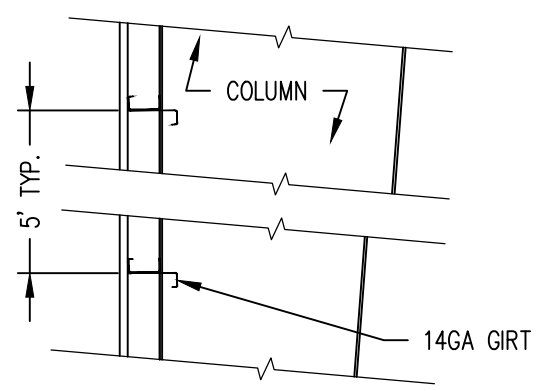
REV.	DATE	BY	REVISION

 ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500			
PROJECT : SEWARD ENGINE HOUSE ROOF REPLACEMENT			
TITLE: REPLACEMENT ROOF DETAILS			
DESIGNED BY: ARRC	SCALE : AS NOTED	AFE NO.:	
DRAWN BY: CDL	DATE : APRIL 2022	ACAD FILE:	
CHECKED BY: ARRC		DWG NO. 6 OF 8	
APPROVED BY: ARRC			

P:\Engineering\Buildings\MP 002 Seward\Bldg-31 Engine House - Round House\2022 Roofing\2022 Seward Engine House IMP Roof.dwg VPort: 07 DETAILS-REPLACE & NOTES Plot Style: 750C-Half.ctb



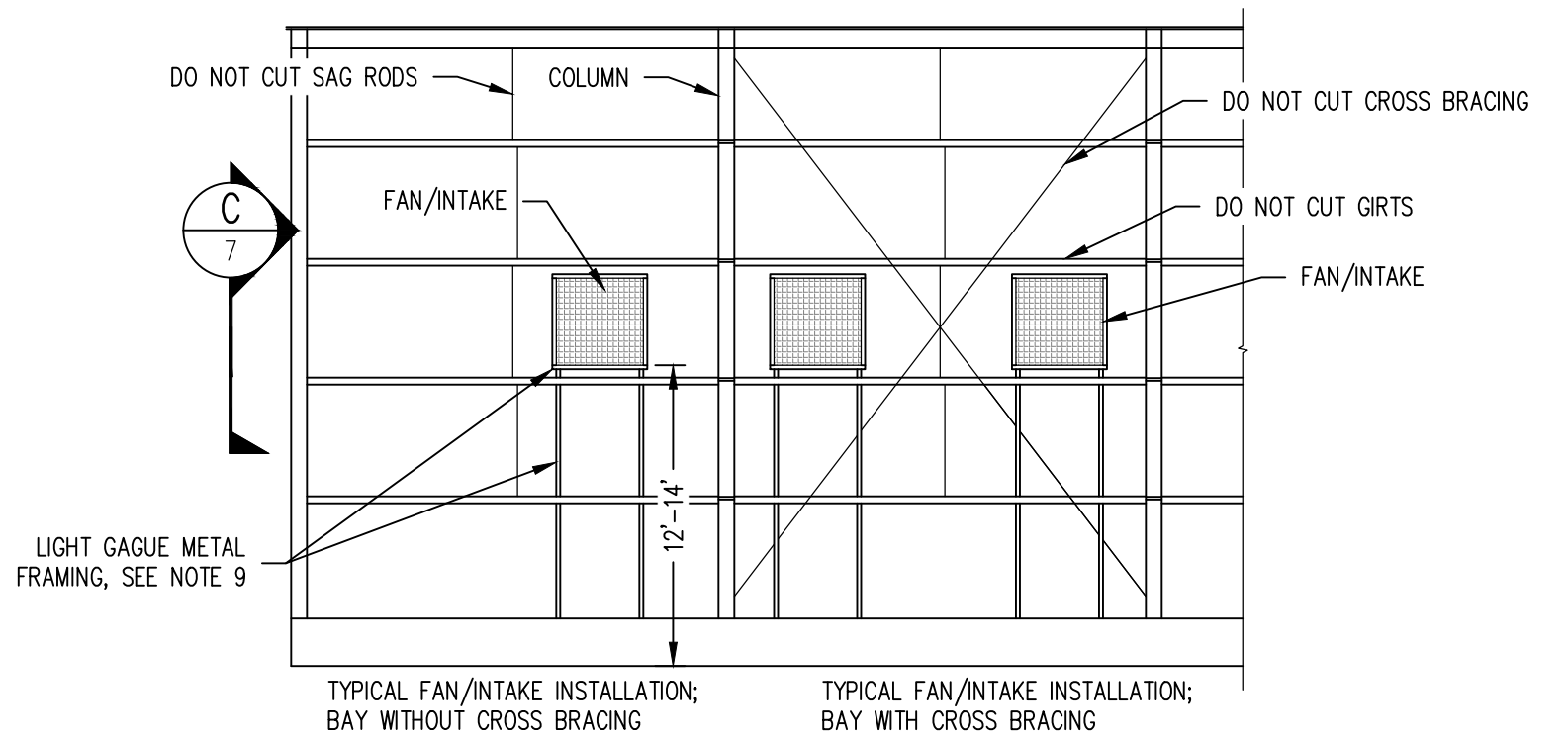
A
7 SECTION AT RAKE - REPLACEMENT DETAIL
NO SCALE



C
7 SECTION C
NO SCALE

NOTES:

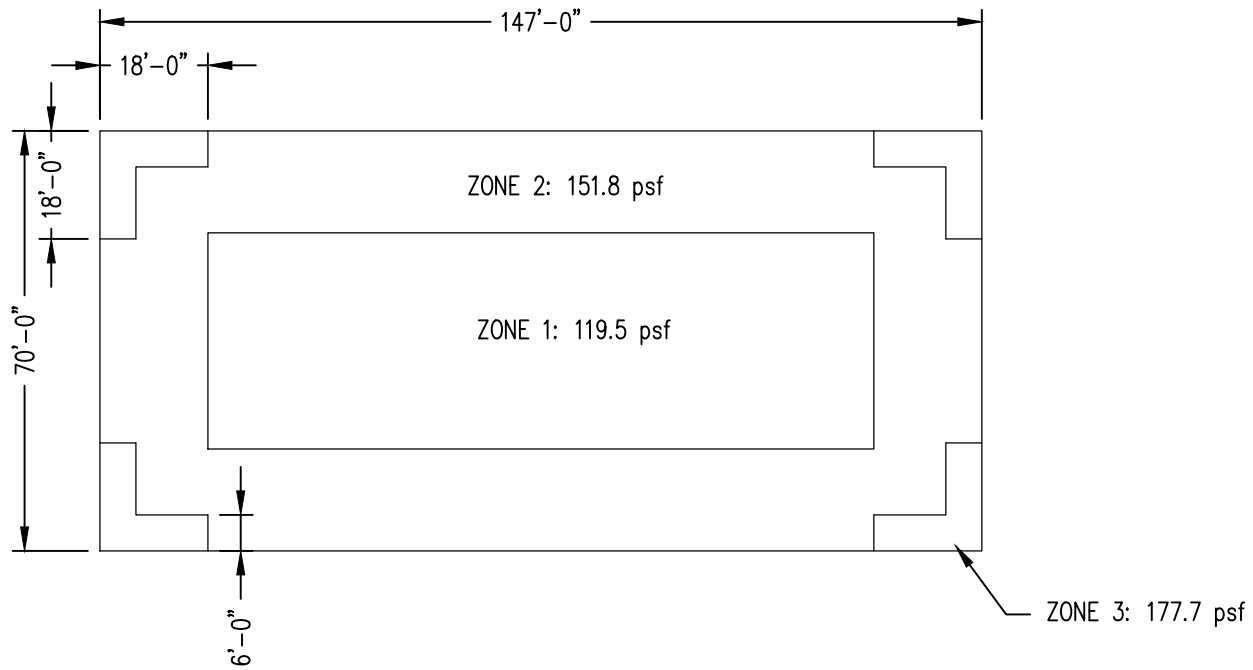
1. REMOVE AND REPLACE EXISTING SINGLE-SKIN METAL ROOF, RAKE/RIDGE TRIM & INSULATION WITH NEW STANDING SEAM INSULATED METAL PANELS AND TRIM.
2. FOLLOW ALL MANUFACTURER SPECIFICATIONS AND RECOMMENDATIONS FOR HANDLING AND STORING IMP'S.
3. INSTALL STANDING SEAM IMP ROOF ACCORDING TO MANUFACTURER SPECIFICATIONS AND DETAILS.
4. SHIM IMP CLIPS AT LOW PURLINS TO MAINTAIN ROOF PLANE FLATNESS OF 1/8" IN 5' & 1/4" IN 20'.
5. PROVIDE CONTINUOUS SEAL OF STRUCTURAL GAPS BY USING SHEET METAL TRIM TO BRIDGE GAPS IN BUILDING STRUCTURE.
6. SQUARE FIRST PANEL ON EACH SIDE OF ROOF TO BUILDING EAVE TO PROVIDE ≤ 1/4" SAWTOOTH BETWEEN ADJACENT PANELS.
7. PROVIDE IMP PANELS WITH R-VALUE OF 24± (3" PANEL).
8. BASIS OF DESIGN IS MBCI 42" WIDE, 3" CFR STANDING SEAM IMP ROOF.
9. PROVIDE LIGHT GAUGE METAL FRAMING TO SUPPORT FANS & BETWEEN GIRTS, 400S162-33 OR BETTER, TO CONCRETE STEM WALL. USE CONCRETE ANCHORS SET WITH ADHESIVE WHERE REQUIRED. EXPANSION ANCHORS IN CONCRETE ARE NOT ALLOWED.
10. PROVIDE ADD. ALT. ITEM COST TO REMOVE EXISTING EXHAUST FAN DUCTING & SUPPORTS IN ENTIRETY.



B
7 TYPICAL FAN/INTAKE PLACEMENT & SUPPORT
ELEVATION VIEW, NO SCALE

REV.	DATE	BY	REVISION

ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500			
PROJECT :			
SEWARD ENGINE HOUSE ROOF REPLACEMENT			
TITLE:			
REPLACEMENT ROOF DETAILS & NOTES			
DESIGNED BY: ARRC	SCALE : AS NOTED	AFE NO.:	
DRAWN BY: CDL	DATE : APRIL 2022	ACAD FILE:	
CHECKED BY: ARRC		DWG NO.	
APPROVED BY: ARRC		7 OF 8	




A SEWARD ENGINE HOUSE ROOF PRESSURE ZONES
8 PLAN VIEW, NTS

ULTIMATE WIND LOAD CALCULATIONS PER ASCE 7-16

WIND RISK CATEGORY II
WIND SPEED = 160 MPH
PARTIALLY ENCLOSED BUILDING
WIND EXPOSURE D

ROOF FIELD Z1 = 119.5 psf
ROOF PERIMETER Z2 = 151.8 psf
ROOF CORNERS Z3 = 177.7 psf

TRUSS SPACING: 18'
MAX PURLIN SPACING: 2.5'

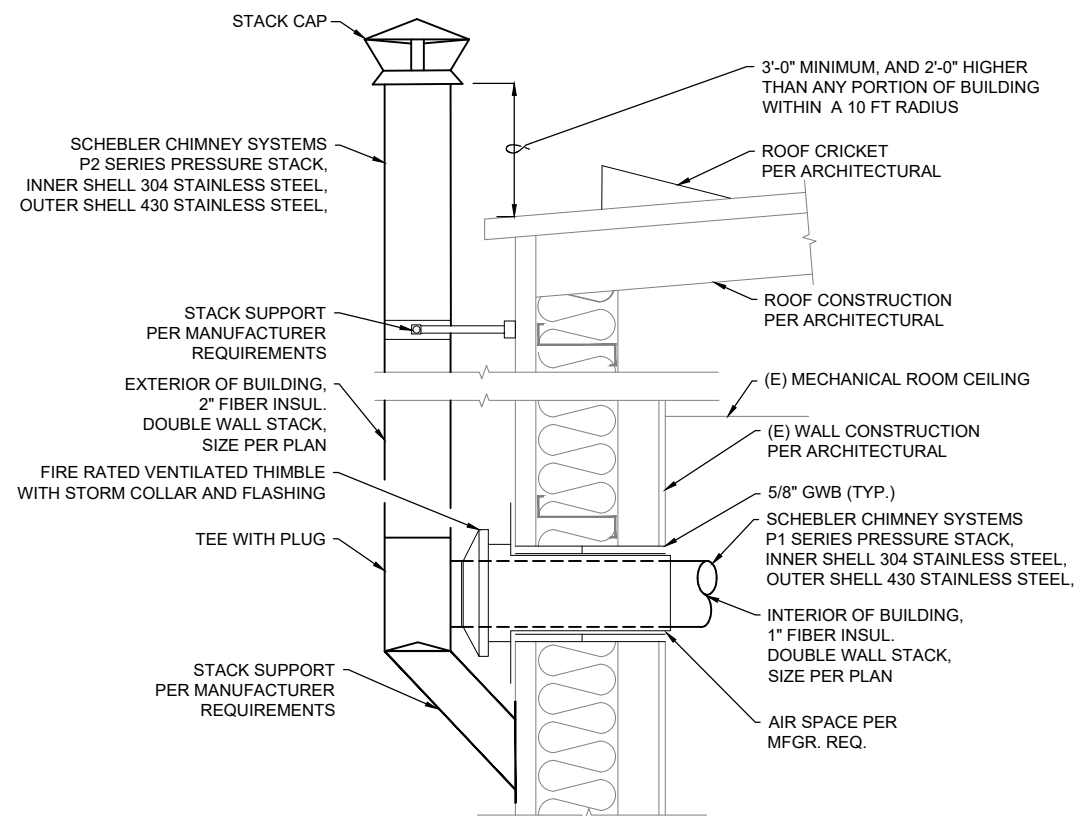
		ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500	
		PROJECT: SEWARD ENGINE HOUSE ROOF REPLACEMENT	
		TITLE: ULTIMATE WIND UPLIFT PRESSURES ZONES 1,2 & 3	
DESIGNED BY: CDL	SCALE: AS NOTED	AFE NO.:	
DRAWN BY: CDL	DATE: 3/18/22	ACAD FILE:	
CHECKED BY: ARRC		DWG NO.	
APPROVED BY: ARRC		8 OF 8	

LEGEND & ABBREVIATIONS		
ABBR.	EXPLANATION	SYMBOL
A	AIR - COMPRESSED	A
	AIR EXTRACTOR	
	AIR FLOW MEASURING DEVICE	
	AIR FOIL TURNING VANES	
AAV	AUTOMATIC AIR VENT	
AFF	ABOVE FINISHED FLOOR	
ADD	BACKDRAFT DAMPER	
BD	BALANCING DAMPER	
	BALANCING/ISOLATION VALVE	
	BALL VALVE	
CC	COOLING COIL	
CFM	CUBIC FEET/MINUTE	
CO	CLEANOUT	
CV	CHECK VALVE	
CW	COLD WATER	
DD	DUCT DETECTOR	
	DUCT IDENTIFICATION SYMBOL	
(E)	EXISTING	
E/A	EXHAUST AIR	
	EXPANSION COMPENSATOR	
F	FIRE	
FCO	FLOOR CLEANOUT	
FD	FIRE DAMPER	
FDC	FIRE DEPARTMENT CONNECTION	
FD	FLOOR DRAIN	
	FLEXIBLE CONNECTION	
	FLEXIBLE DUCT	
	FLOW CONTROL VALVE	
FOS	FUEL OIL SUPPLY	
FOR	FUEL OIL RETURN	
G	GAS	
	GLOBE VALVE	
GS	GLYCOL SUPPLY	
GR	GLYCOL RETURN	
HB	HOSE BIBB	
HC	HEATING COIL	
HW	HOT WATER	
HWC	HOT WATER CIRCULATION	
HWR	HEATING WATER RETURN	
HWS	HEATING WATER SUPPLY	
MOD	MOTOR OPERATED DAMPER	
MOV	2-WAY MOTOR OPERATED VALVE	
MOV	3-WAY MOTOR OPERATED VALVE	
NIC	NOT IN CONTRACT	
O/A	OUTSIDE AIR	
	PIPE ANCHOR	
	PIPE GUIDE	
POC	POINT OF CONNECTION	
	PRESSURE GAGE	
PRV	PRESSURE RELIEF VALVE	
PW	PUMPED WASTE	
R/A	RETURN AIR	
RD	ROOF DRAIN	
RL	RAIN LEADER	
RV	RELIEF VALVE	
	RETURN AIR SLOT	
	RETURN/EXHAUST AIR REG. OR GRILLE	
S	SANITARY SOIL	
S/A	SUPPLY AIR	
	SQUARE HEAD COCK	
	STRAINER WITH DRAIN VALVE	
SD	STORM DRAIN	
SL	ACOUSTICALLY LINED DUCT	
SP	SPRINKLER	
	STATIC PRESSURE SENSOR	
	SUPPLY AIR SLOT W/FLEX DUCT	
	SUPPLY AIR REG. GRILLE, OR DIFFUSER	
TW	TEMPERED WATER	
	THERMALLY INSULATED DUCT OR PIPE	
	THERMOMETER	
T'STAT	THERMOSTAT	
T'STAT	RETURN AIR THERMOSTAT	
	UNION	
V	VENT	
VTR	VENT THRU ROOF	
WCO	WALL CLEANOUT	
W	WASTE	

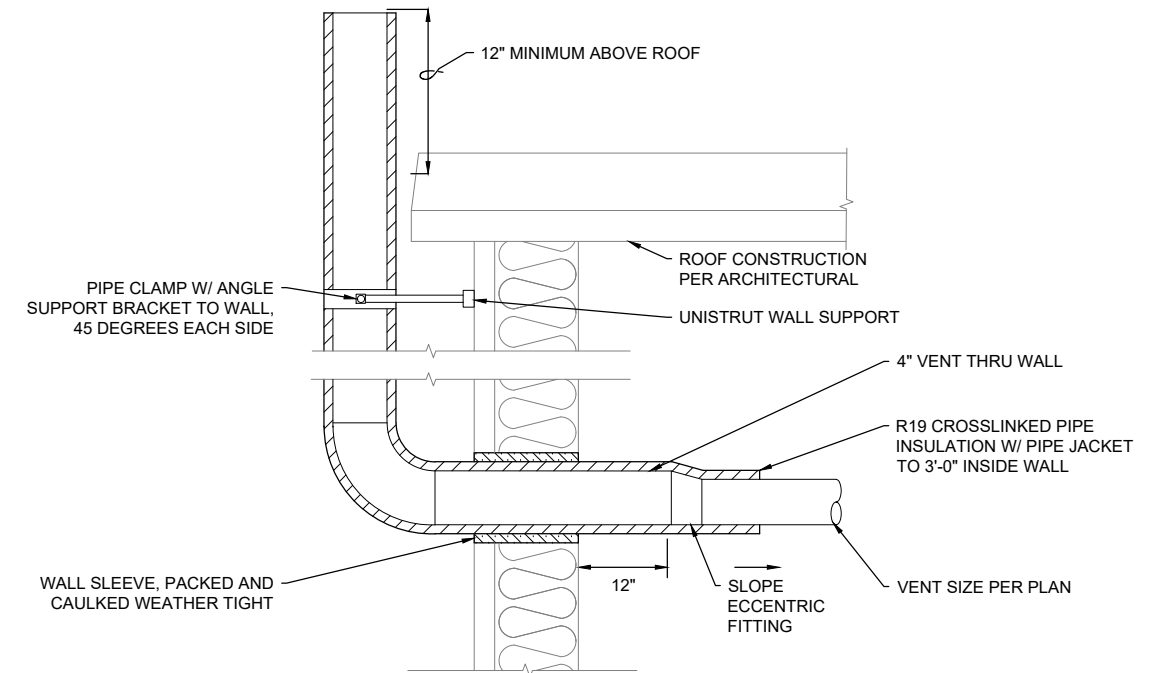
THIS IS A STANDARD LEGEND, SOME SYMBOLS SHOWN ON LEGEND ARE NOT NECESSARILY ON THE DRAWING.

FAN SCHEDULE											
SYMBOL	LOCATION	CFM	S.P.		RPM	O.V. FPM	TYPE		USE	MOTOR HP/VOLTS/PH	DESIGN BASIS PRODUCT
			TOT	EXT			FAN	WHL			
EF-1	SHOP AREA	505	--	0.35	1289	505	PROP	--	E/A	1/4 / 115 / 1	GREENHECK MODEL: SE1-12-432-VG, CONTROL DIAL FOR BALANCING, OSHA GUARD
EF-2	SHOP AREA	7065	--	0.35	919	1029	PROP	--	E/A	2 / 208 / 3	GREENHECK MODEL: AER-E30C-620-VG, CONTROL DIAL FOR BALANCING, OSHA GUARD

BOILER SCHEDULE								
SYMBOL	TYPE	FLUID (%)	FUEL	IBR BURNER CAPACITY	GROSS OUTPUT MBH	BURNER		DESIGN BASIS PRODUCT
						HP	VOLTS/PH	
(E) B-1.2	CAST IRON	30% P.G	FUEL OIL	5.5 GPH	634	1/4	120/1	WEIL-MCLAIN MODEL 680, CARLIN 301 CRD-W BURNER WITH TRIM PER IMC CH. 10



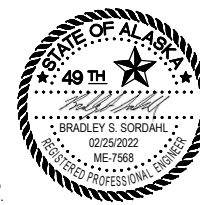
1 BOILER STACK DETAIL
M-1 SCALE: NONE



2 VENT THROUGH WALL DETAIL
M-1 SCALE: NONE

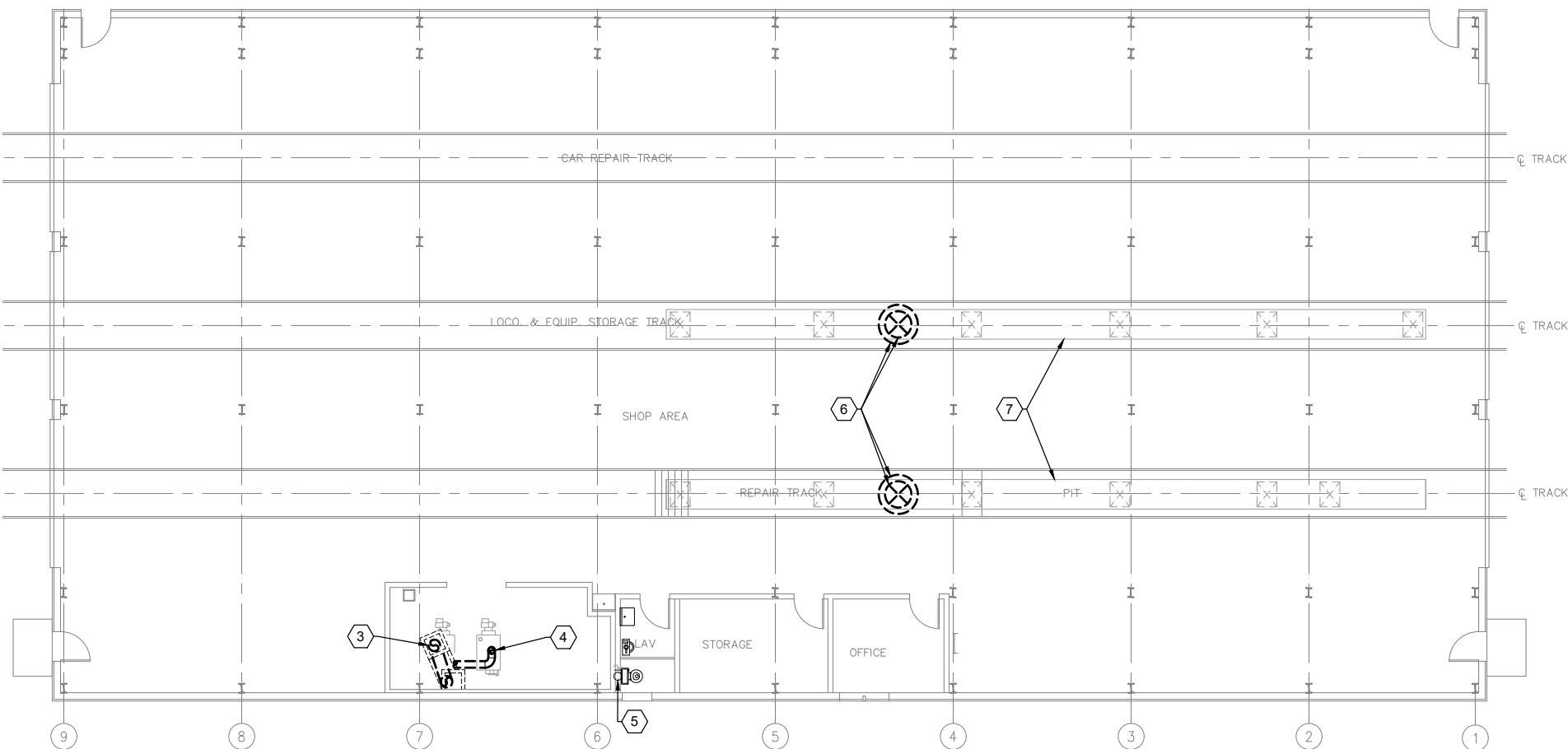
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REDUCE SCALE ACCORDINGLY

		ALASKA RAILROAD CORPORATION	
ENGINEERING SERVICES		P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500	
PROJECT: SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT			
TITLE: MECHANICAL LEGEND, SCHEDULES, DETAILS, & ELEVATIONS			
DESIGNED BY: KRR	SCALE: H: AS NOTED	M-1	AFE NO.:
DRAWN BY: KRR	V: AS NOTED		ACAD FILE:
CHECKED BY: BSS	DATE: 02/25/2022		DWG NO.:
APPROVED BY: BSS			01 OF 06



MBA
Consulting Engineers, Inc.

REV.	DATE	BY	REVISION



DEMOLITION NOTES:

1. CONTRACTOR SHALL PERFORM PRE-DEMOLITION WALK THROUGH WITH BUILDING USER REPRESENTATIVE TO FIELD VERIFY, CONFIRM AND MARK ALL MATERIALS, SYSTEMS, AND EQUIPMENT TO BE REMOVED PRIOR TO BEGINNING DEMOLITION WORK. ANY ITEMS DESIGNATED FOR SALVAGE SHALL BE DELIVERED TO THE ARRC.
2. SOME (E) EQUIPMENT AND MATERIALS NOT SHOWN FOR CLARITY. DO NOT DEMO UNLESS NOTED BELOW.
3. DEMOLISH (E) 14" COMBINED STACK THROUGH ROOF. SEE 2/M2.
4. DEMOLISH (E) 8" INDIVIDUAL BOILER STACKS, COLLARS, AND EXISTING BAROMETRIC DAMPERS. SEE 2/M2.
5. DEMOLISH (E) PLUMBING V.T.R. STOP DEMO 12" ABOVE MEZZANINE FLOOR. SEE 3/M2.
6. DEMOLISH (E) 1.5 HP 120V/1PH/60HZ ROOF MOUNTED EXHAUST FAN AND CONTROLS (TYP. 2). DEMO VERTICAL DUCT DOWN TO HORIZONTAL DUCT P.O.D. SEE 4/M2.
7. (E) HORIZONTAL DUCTS AND GRILLES TO BE ABANDONED IN PLACE. SEE 5/M2.

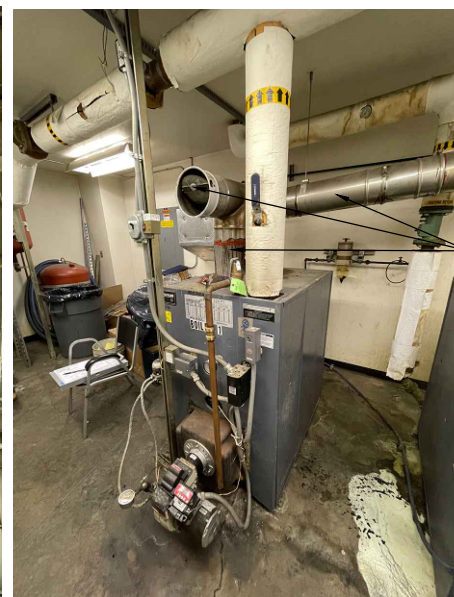
1 MECHANICAL DEMOLITION PLAN

M-2 SCALE: 1/8" = 1'-0" 22X34 SHEET



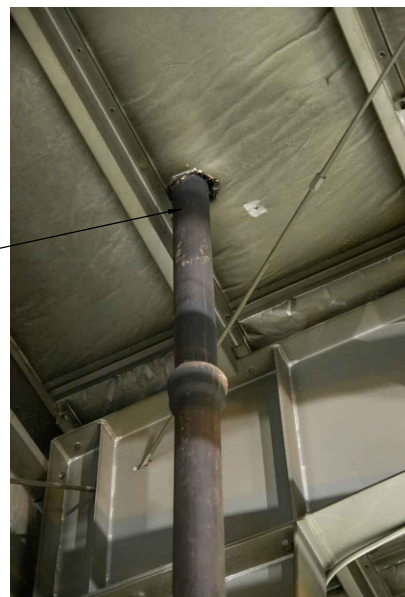
2 BOILER STACK TO BE REMOVED

M-2 SCALE: NONE



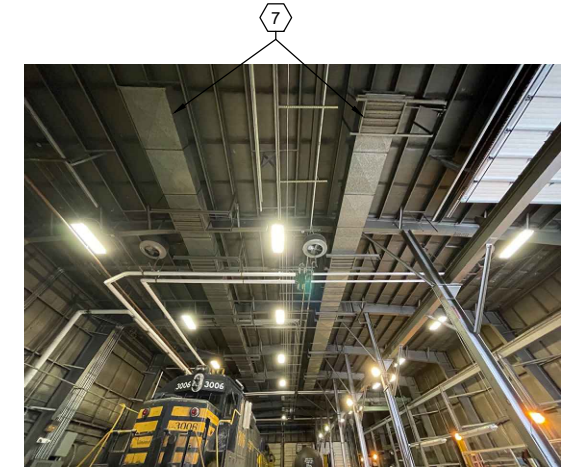
3 V.T.R. TO BE REMOVED

M-2 SCALE: NONE



4 EXHAUST FANS TO BE REMOVED


M-2 SCALE: NONE

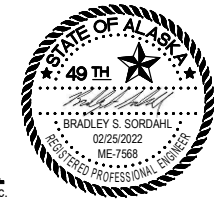


5 ABANDON DUCTS IN PLACE

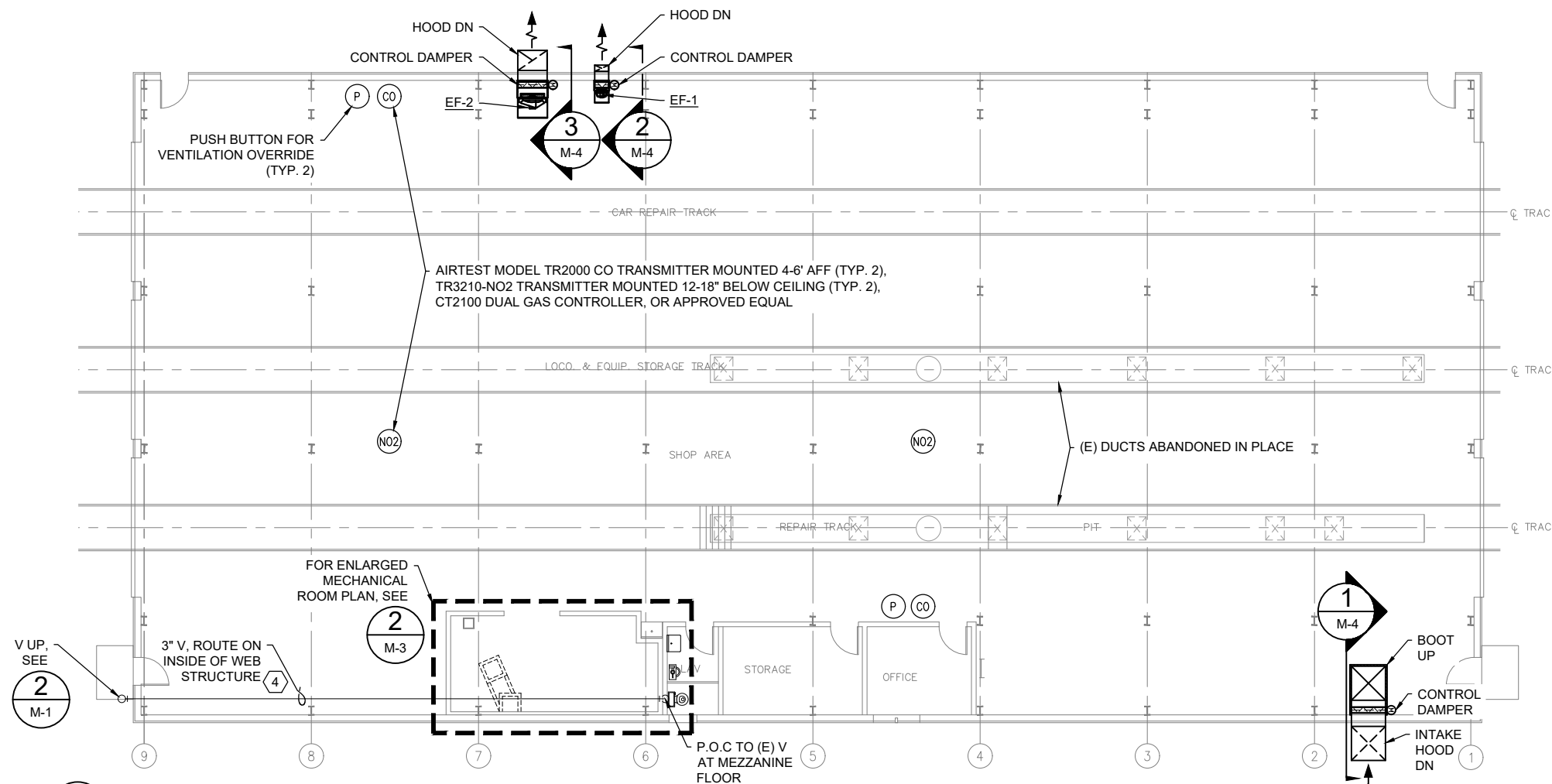
M-2 SCALE: NONE

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 ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500			
PROJECT: SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT			
TITLE: MECHANICAL DEMOLITION PLAN			
DESIGNED BY: KRR	SCALE: H: AS NOTED	M-2	AFE NO.:
DRAWN BY: KRR	V: AS NOTED		ACAD FILE:
CHECKED BY: BSS	DATE: 02/25/2022		DWG. NO.:
APPROVED BY: BSS			02 OF 06

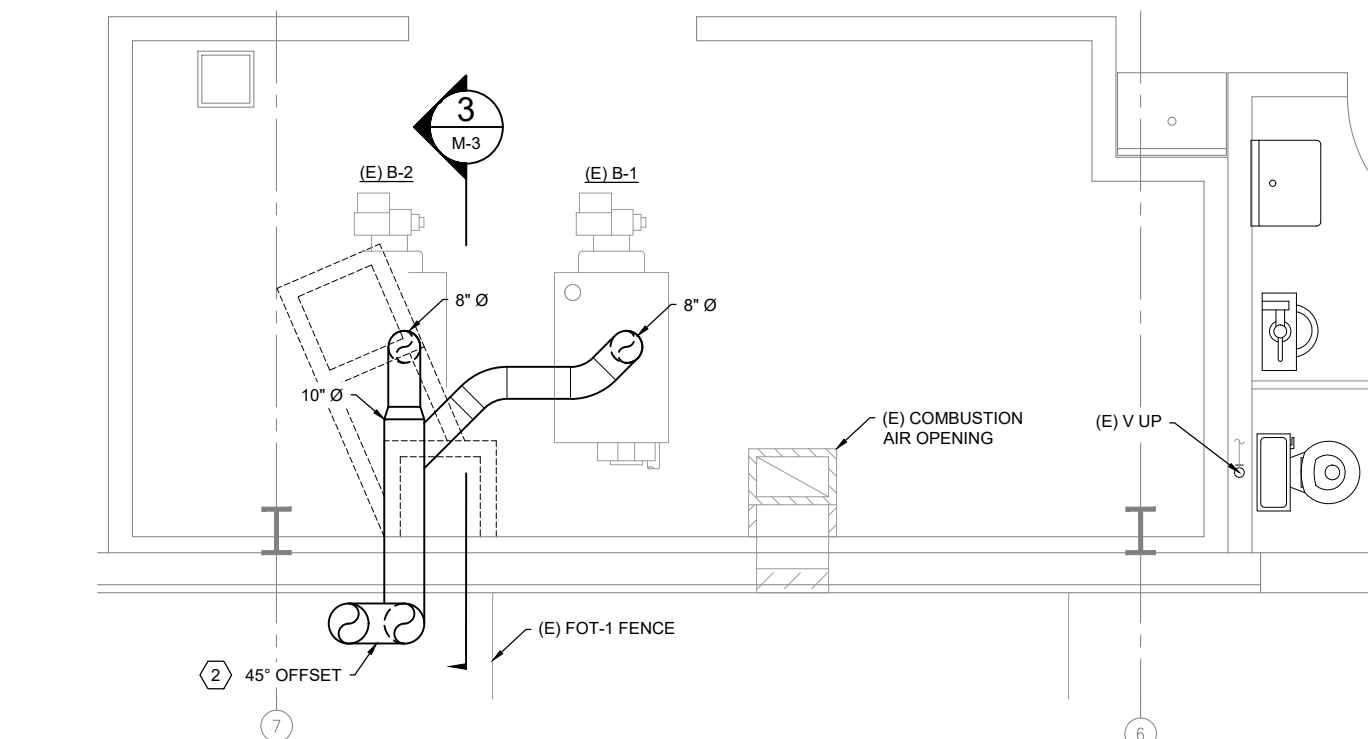


REV.	DATE	BY	REVISION



1 MECHANICAL PLAN

M-3 SCALE: 1/8" = 1'-0" 22X34 SHEET

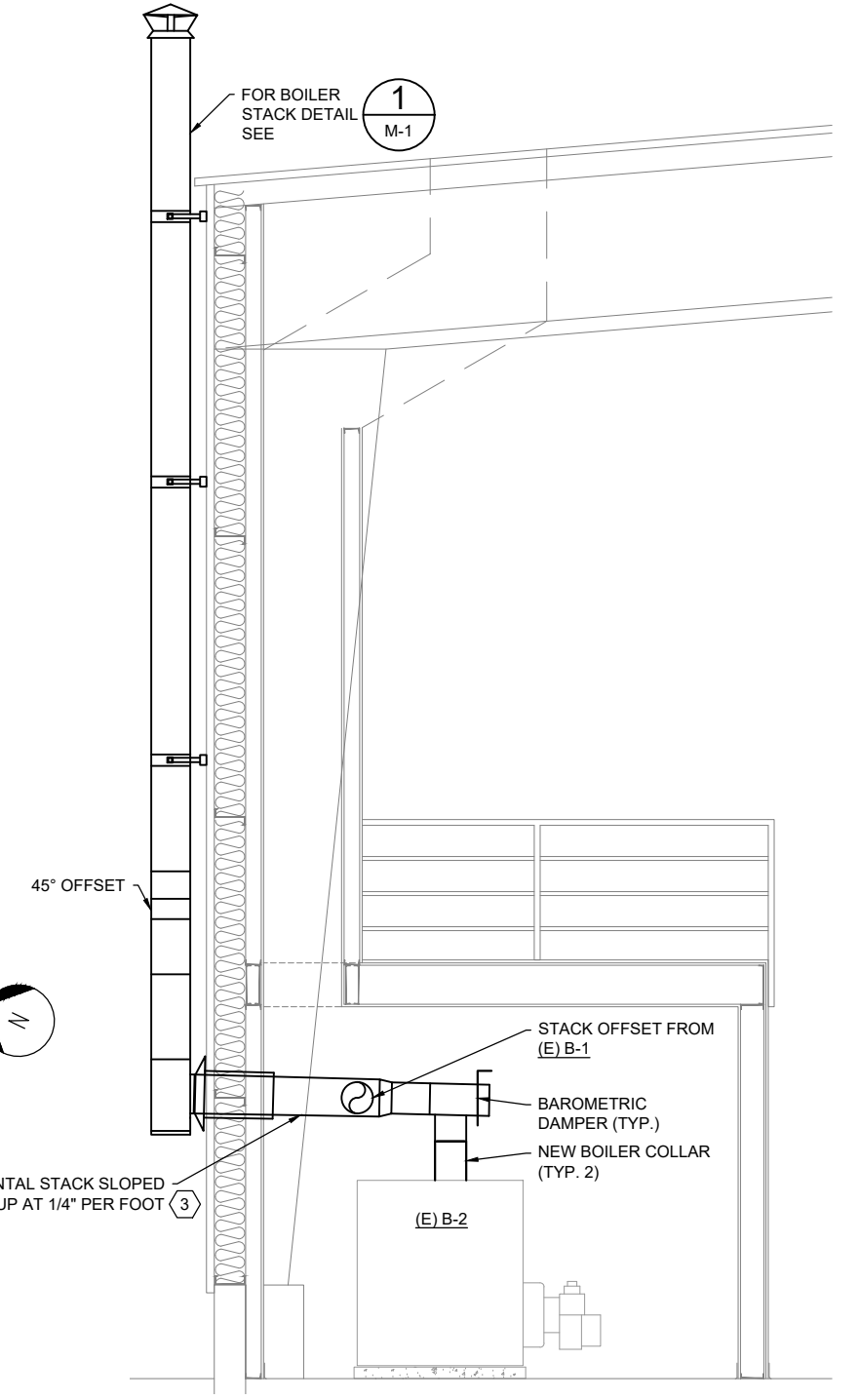


2 ENLARGED MECHANICAL ROOM PLAN

M-3 SCALE: 1/2" = 1'-0" 22X34 SHEET

SHEET NOTES:

1. SOME EXISTING EQUIPMENT AND MATERIALS NOT SHOWN FOR CLARITY.
2. UTILIZE EXISTING STACK SUPPORT. MODIFY SUPPORT TO FIT NEW STACK DIAMETER.
3. MAINTAIN CLEARANCE TO COMBUSTIBLES PER STACK MANUFACTURER RECOMMENDATIONS.
4. SLOPE UP AT 1/4" PER FOOT.

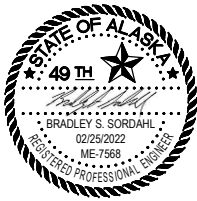


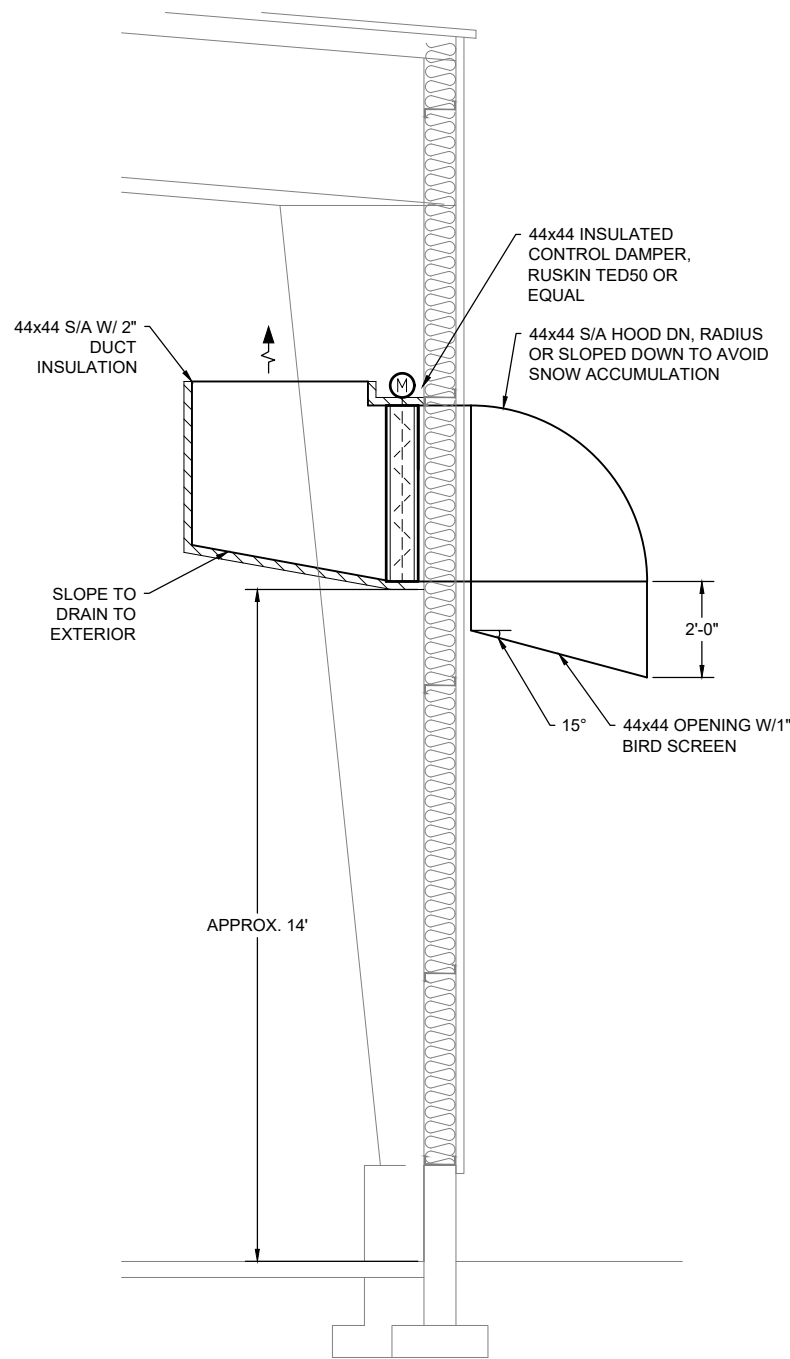
3 BOILER STACK SECTION

M-3 SCALE: 1/2" = 1'-0" 22X34 SHEET

IF SHEET IS LESS THAN 22"x34"
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REDUCE SCALE ACCORDINGLY

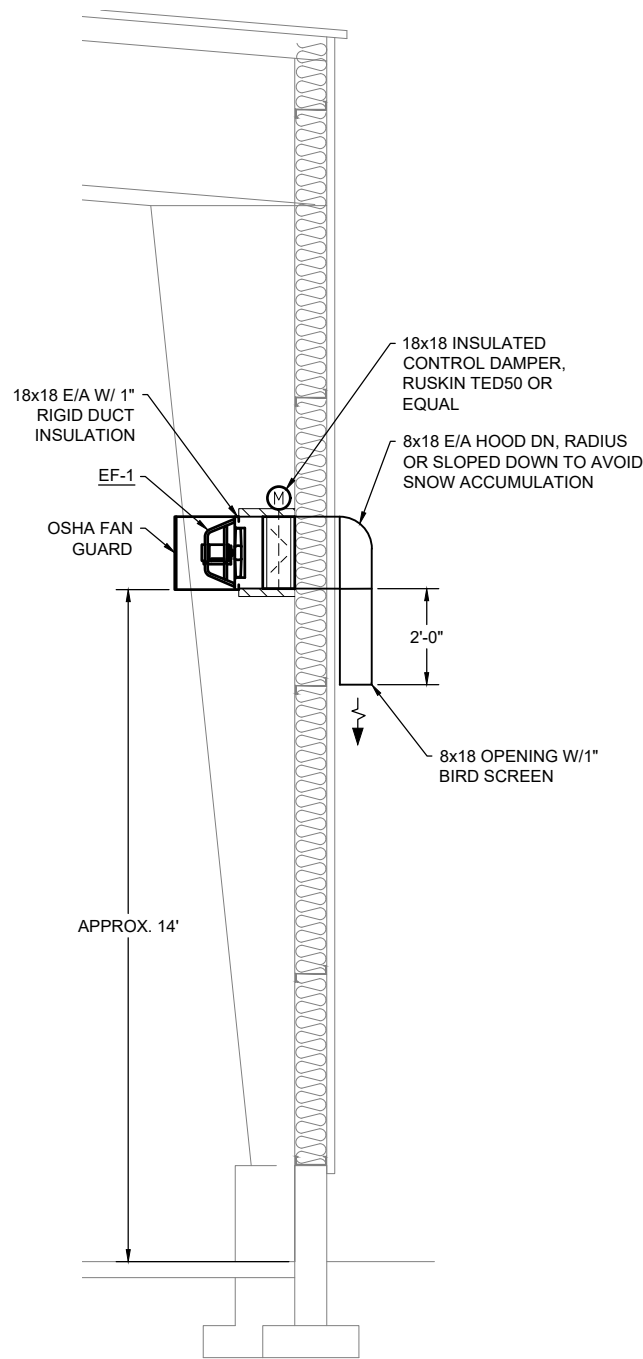
ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500																					
PROJECT: SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT																					
TITLE: MECHANICAL NEW PLANS AND SECTIONS																					
DESIGNED BY: KRR	SCALE: H: AS NOTED V: AS NOTED																				
DRAWN BY: KRR	DATE: 02/25/2022																				
CHECKED BY: BSS	M-3																				
APPROVED BY: BSS																					
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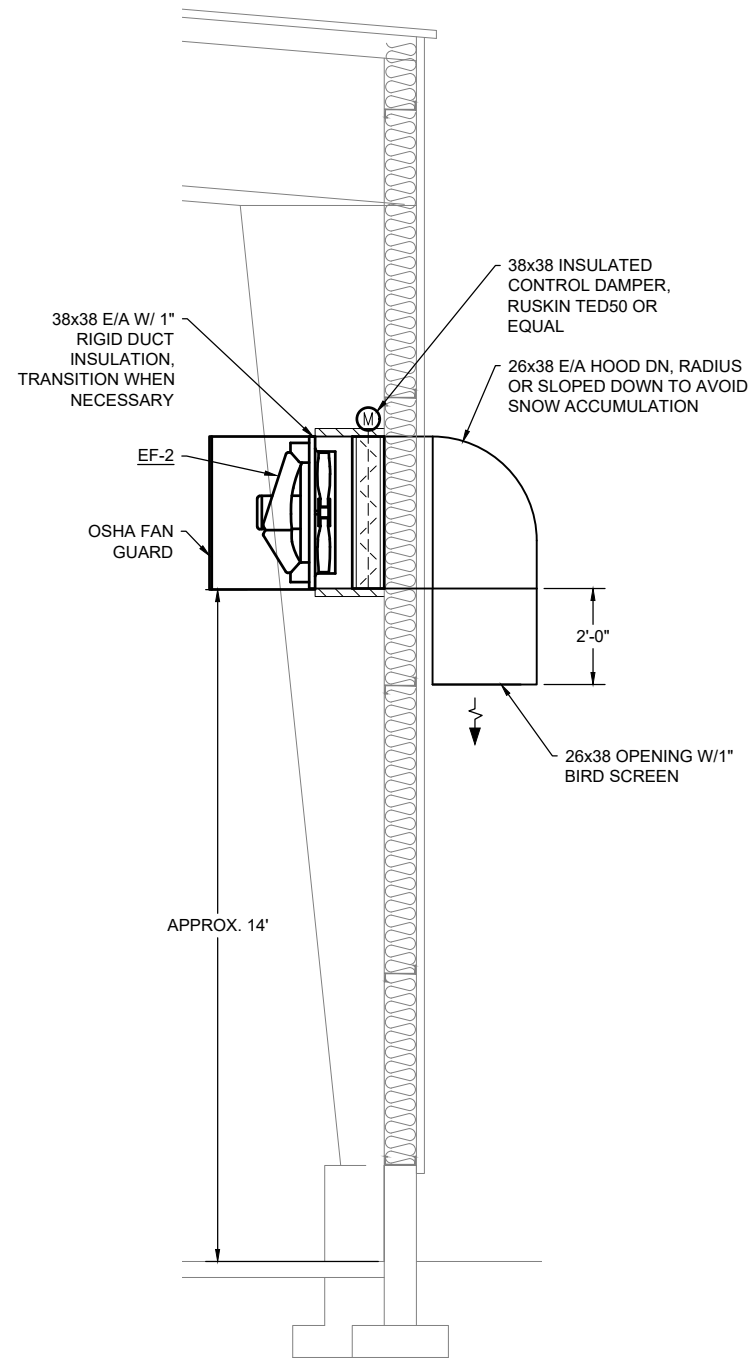
1 INTAKE ELEVATION

M-1 SCALE: 1/2" = 1'-0" 22X34 SHEET



2 EF-1 ELEVATION

M-1 SCALE: 1/2" = 1'-0" 22X34 SHEET




3 EF-2 ELEVATION

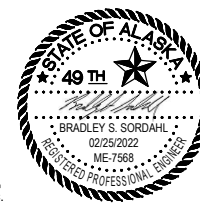
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PROJECT: SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT			
TITLE: MECHANICAL ELEVATIONS			
DESIGNED BY: KRR	SCALE: H: AS NOTED	M-4	AFE NO.:
DRAWN BY: KRR	V: AS NOTED		ACAD FILE:
CHECKED BY: BSS	DATE: 02/25/2022		DWG NO.:
APPROVED BY: BSS			04 OF 06

MBA
Consulting Engineers, Inc.



REV.	DATE	BY	REVISION

DIVISION 15 - MECHANICAL

PART 1 - GENERAL

1.1 WORK INCLUDED

A. WORK CONSISTS OF PROVIDING LABOR, PRODUCTS, AND IN PERFORMING ALL OPERATIONS REQUIRED FOR THE COMPLETE OPERATING INSTALLATION OF ALL MECHANICAL SYSTEMS AS SHOWN AND SPECIFIED, IN STRICT ACCORDANCE WITH SPECIFICATIONS, APPLICABLE DRAWINGS, TERMS, AND CONDITIONS OF THE CONTRACT AND ALL APPLICABLE CODES AND ORDINANCES GOVERNING INSTALLATION OF THE VARIOUS MECHANICAL SYSTEMS. CORRELATE ALL WORK FULLY WITH THE WORK OF OTHER CRAFTS. PROVIDE ALL SYSTEMS COMPLETE AND IN PROPER OPERATING ORDER.

1.2 REGULATORY REQUIREMENTS

A. COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND NATIONAL CODES, ORDINANCES AND REGULATIONS IN EXISTENCE AT BID DATE AFFECTING MATERIALS AND METHODS OF INSTALLATION OF THE MECHANICAL SYSTEMS. FOLLOW RECOMMENDED PRACTICES AS SET DOWN BY ASME, SMACNA, INTERNATIONAL BUILDING CODE, INTERNATIONAL MECHANICAL CODE, INTERNATIONAL FUEL GAS CODE, UNIFORM PLUMBING CODE, INTERNATIONAL FIRE CODE, NATIONAL ELECTRICAL CODE, AGA, AND OSHA AS THEY APPLY TO THIS PROJECT EXCEPT IN CASES WHERE STATUTES GOVERN.

1.3 MANUFACTURER'S WARRANTIES

A. IN THE EVENT OF EQUIPMENT OR COMPONENT FAILURE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO REPAIR OR REPLACE SUCH DEFECTIVE EQUIPMENT OR COMPONENTS AND BEAR ALL ASSOCIATED COSTS. THE CONTRACTOR SHALL PURSUE MANUFACTURER'S WRITTEN IMPLIED WARRANTIES TO THE EXTENT NECESSARY TO OBTAIN REPLACEMENT EQUIPMENT OR COMPONENTS PRIOR TO ANY OTHER ACTION BEING INITIATED.

1.4 ELECTRICAL WORK

A. ALL WIRING SHALL BE IN ACCORDANCE WITH NEC, STATE, AND LOCAL CODES.

1.5 TESTS AND INSPECTIONS

A. SCHEDULE, OBTAIN, AND PAY ALL FEES AND/OR SERVICES REQUIRED BY LOCAL AUTHORITIES AND BY THESE SPECIFICATIONS, TO TEST THE MECHANICAL SYSTEMS AS SPECIFIED.

B. DEFICIENCIES: IMMEDIATELY CORRECT ALL DEFICIENCIES, WHICH ARE EVIDENCED DURING THE TESTS AND REPEAT TESTS UNTIL SYSTEM IS APPROVED. DO NOT COVER OR CONCEAL PIPING, EQUIPMENT, OR OTHER PORTIONS OF THE MECHANICAL INSTALLATIONS UNTIL SATISFACTORY TESTS ARE MADE AND APPROVED.

C. COMPLETION: UPON COMPLETION OF THE MECHANICAL INSTALLATION, DEMONSTRATE TO THE CONTRACTING AGENCY'S SATISFACTION THAT THE SYSTEMS HAVE BEEN INSTALLED IN A SATISFACTORY MANNER IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, AND APPLICABLE CODES. DEMONSTRATE DYNAMIC OPERATION OF ALL SYSTEMS. SHOW THAT ALL CONTROLS ARE OPERABLE AND ARE PROPERLY ADJUSTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE FINAL SYSTEMS BALANCE, THAT ALL SYSTEMS ARE PROPERLY BALANCED, THAT ALL EQUIPMENT OPERATES PROPERLY, THAT FILTERS AND STRAINERS ARE CLEAN, AND THAT ALL COMPONENTS OF ALL SYSTEMS ARE INSTALLED AND ADJUSTED FOR PROPER OPERATION.

1.6 PROJECT/SITE CONDITIONS

A. INSTALL WORK IN LOCATIONS SHOWN ON DRAWINGS, UNLESS PREVENTED BY PROJECT CONDITIONS.

B. PROVIDE INFORMATION SHOWING PROPOSED REARRANGEMENT OF WORK TO MEET PROJECT CONDITIONS, INCLUDING CHANGES TO WORK SPECIFIED IN OTHER SECTIONS OR INTERFERENCE WITH SITE CONDITIONS NOT IN THE CONTRACT. OBTAIN PERMISSION OF OWNER BEFORE PROCEEDING.

1.7 SUBMITTALS

A. SUBMITTAL REVIEW IS FOR GENERAL DESIGN AND ARRANGEMENT ONLY AND DOES NOT RELIEVE THE CONTRACTOR FROM ANY REQUIREMENTS OF CONTRACT DOCUMENTS. PROVISION OF A COMPLETE AND SATISFACTORY WORKING INSTALLATION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

B. SUBMITTALS SHALL BE MADE IN ACCORDANCE WITH DIVISION 1 REQUIREMENTS.

1.8 OPERATION AND MAINTENANCE MANUALS

A. PROVIDE OPERATION AND MAINTENANCE (O&M) MANUALS FOR

TRAINING OF AND FUTURE REFERENCE BY, OWNER'S PERSONNEL IN OPERATION AND MAINTENANCE OF SYSTEMS AND RELATED EQUIPMENT. BIND EACH MANUAL IN A HARD-BACKED, LOOSE-LEAF, THREE-RING BINDER. USE 8-1/2" X 11" WHITE PAPER.

B. SUBMITTAL OF O&M MANUALS SHALL BE MADE IN ACCORDANCE WITH DIVISION 1 REQUIREMENTS.

1.9 SEISMIC RESTRAINT

A. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS AND STRUCTURALLY ENGINEERED SHOP DRAWINGS FOR SEISMIC RESTRAINT OF ALL NEW MECHANICAL COMPONENTS AND EQUIPMENT, INCLUDING DUCTWORK AND PIPING. FOR EQUIPMENT LOCATED OUTDOORS SUCH AS ROOFTOP MOUNTED EQUIPMENT, ALSO INCLUDE WIND RESTRAINT. CALCULATIONS TO BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 16 OF THE 2006 INTERNATIONAL BUILDING CODE AND DRAWINGS ARE TO BE STAMPED BY A REGISTERED PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF ALASKA.

B. SEISMIC RESTRAINT DESIGN TO BE BASED ON OCCUPANCY CATEGORY II, SEISMIC DESIGN CATEGORY D AND IMPORTANCE FACTOR 1.0 FOR MECHANICAL EQUIPMENT. REFER TO STRUCTURAL DRAWINGS AND/OR SPECIFICATIONS FOR ADDITIONAL SEISMIC CRITERIA.

C. WIND RESTRAINT DESIGN: REFER TO STRUCTURAL DRAWINGS FOR PERFORMANCE.

PART 2 - PRODUCTS

2.1 SUPPORTS AND ANCHORS

A. PIPE HANGERS AND SUPPORTS

- HANGERS FOR PIPE SIZES 1/2 TO 1-1/2 INCH: ADJUSTABLE SWIVEL, LOOP HANGER.
- HANGERS FOR PIPE SIZES 2 TO 4 INCHES: ADJUSTABLE, SWIVEL.
- MICHIGAN HANGER CO. MODEL NO. 100 FOR STEEL AND PLASTIC AND MODEL #101 FOR COPPER PIPE.
- PIPING SUPPORT SPACING PER UNIFORM PLUMBING CODE.
- 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 ADJUSTMENTS.

B. HANGER RODS

- STEEL HANGER RODS: THREADED BOTH ENDS, THREADED ONE END, OR CONTINUOUS THREADED.

C. SLEEVES

- SLEEVES FOR PIPING AND DUCTWORK THROUGH NON-FIRE RATED FLOORS, BEAMS, WALLS, FOOTINGS, AND POTENTIALLY WET FLOORS: FORM WITH STEEL PIPE OR 18 GAUGE GALVANIZED STEEL. EXTEND SLEEVES THROUGH FLOORS ONE INCH ABOVE FINISHED FLOOR LEVEL. CAULK SLEEVES FULL DEPTH AND PROVIDE FLOOR PLATE. WHERE PIPING OR DUCTWORK PENETRATES CEILING OR WALL, CLOSE OFF SPACE BETWEEN PIPE OR DUCT AND ADJACENT WORK WITH FIRE-STOPPING INSULATION AND CAULK SEAL AIRTIGHT. PROVIDE CLOSE FITTING METAL COLLAR OR ESCUTCHEON COVERS AT BOTH SIDES OF PENETRATION. FIRE STOPPING INSULATION: GLASS FIBER TYPE, NON-COMBUSTIBLE. CAULK: ACRYLIC SEALANT.
- SLEEVES FOR PIPES THROUGH FIRE RATED AND FIRE RESISTIVE FLOORS AND WALLS, AND FIREPROOFING: PREFABRICATED FIRE RATED SLEEVES INCLUDING SEALS, UL LISTED.
- SIZE SLEEVES LARGE ENOUGH TO ALLOW FOR MOVEMENT DUE TO EXPANSION AND CONTRACTION. PROVIDE FOR CONTINUOUS INSULATION WRAPPING.
- INSTALL CHROME-PLATED STEEL ESCUTCHEONS AT FINISHED SURFACES.

D. DUCTWORK HANGERS AND SUPPORTS

- DUCTS 24 INCHES AND LESS: PROVIDE WITH ONE INCH X 18 GAUGE STRAPS FASTENED TO DUCTWORK AND TO BUILDING CONSTRUCTION. SPACE NOT MORE THAN EIGHT FEET ON CENTER.
- DUCTS 25 INCHES THROUGH 42 INCHES: PROVIDE MILD STEEL RODS FASTENED TO ANGLE IRON STIFFENERS WITH NUTS AND TO BUILDING CONSTRUCTION WITH APPROPRIATE INSERTS, FLANGES, OR CLAMPS. SPACE NOT MORE THAN EIGHT FEET ON CENTER.
- DUCTS OVER 42 INCHES: FASTEN HANGER RODS TO ANGLE STIFFENERS NOT MORE THAN FOUR FEET ON CENTER.

4. RECOMMENDED METHODS OF FASTENING BRACING TO DUCTWORK, INCLUDE RIVETING, BOLTING, AND TACK WELDING.

E. EXTERIOR HANGERS AND SUPPORTS

1. HANGERS AND STRUT LOCATED OUTDOORS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALL HANGER HARDWARE SHALL BE HOT DIP GALVANIZED OR STAINLESS STEEL. ZINC PLATED HARDWARE IS NOT ACCEPTABLE FOR OUTDOOR OR CORROSIVE USE.

2.2 MECHANICAL IDENTIFICATION

A. EQUIPMENT

1. PLASTIC NAMEPLATES: LAMINATED THREE-LAYER PLASTIC WITH ENGRAVED WHITE LETTERS ON DARK CONTRASTING BACKGROUND COLOR.

2.3 MECHANICAL INSULATION

A. INSULATION

- ACCEPTABLE MANUFACTURERS: ARMSTRONG, CERTAINTEED, MANVILLE, KNAUF, PITTSBURGH CORNING.
- GLASS FIBER INSULATION: ASTM C547, "K" VALUE OF 0.24 AT 75 DEGREES F, NONCOMBUSTIBLE, MINIMUM SERVICE TEMPERATURE -20, MAXIMUM SERVICE TEMPERATURE 300 DEGREES F, MAXIMUM MOISTURE ABSORPTION 0.20 PERCENT BY VOLUME, VAPOR RETARDER JACKET COMPOSED OF WHITE KRAFT PAPER AND ALUMINUM FOIL LAMINATE. FLAME SPREAD/SMOKE DEVELOPED RATING OF 25/50 OR LESS IN ACCORDANCE WITH UL 723.

B. SPECIAL INSULATION REQUIREMENTS

1. PLUMBING VENTS: INSULATE PLUMBING VENTS FROM 3 FEET BELOW THE HEATED AREA OF THE CEILING TO THEIR TERMINATION ABOVE THE ROOF LINE. PROVIDE VAPOR BARRIER.

C. DUCT INSULATION REQUIREMENTS

- INSULATE OUTSIDE AIR DUCTWORK WITH 2 INCH OF RIGID GLASS FIBER INSULATION, K= .24 AT 75 DEGREES F, 450 DEGREES F SERVICE TEMPERATURE, 0.02 PERM VAPOR TRANSMISSION, 5 PERCENT WATER VAPOR SORPTION.
- INSULATE EXHAUST AIR DUCTWORK WITH 1 INCH RIGID FSK FACED GLASS FIBER INSULATION, K = .24 AT 75 DEGREES F, 450 DEGREES F SERVICE TEMPERATURE .02 PERM VAPOR TRANSMISSION, 5 PERCENT WATER VAPOR SORPTION.

2.4 PLUMBING AND HYDRONIC PIPING

A. MATERIALS

1. SANITARY SEWER, VENT PIPING.

- CAST IRON PIPE: CISPI 301, HUBLESS, SERVICE WEIGHT. FITTINGS: CAST IRON. JOINTS: NEOPRENE GASKETS AND TYPE 304 STAINLESS STEEL CLAMP-AND-SHIELD ASSEMBLIES; CISPI HSN COMPRESSION TYPE WITH ASTM C564 NEOPRENE GASKETS.
- VENTS 1-1/2 INCH AND SMALLER: DWV COPPER WITH CAST COPPER ALLOY OR WROUGHT COPPER FITTINGS.
- ABS PIPE: ASTM D2661 OR D2751. FITTINGS: ABS. JOINTS: ASTM D2235, SOLVENT WELD.

2.5 PIPING EXECUTION

A. INSTALLATION

- REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN END FERROUS PIPE.
- REMOVE SCALE AND DIRT, ON INSIDE AND OUTSIDE OF PIPE, BEFORE ASSEMBLY.
- PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES OR UNIONS.
- INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- ROUTE PIPING IN ORDERLY MANNER AND MAINTAIN GRADIENT.
- SLEEVE PIPE PASSING THROUGH PARTITIONS, WALLS, AND FLOORS.
- INSTALL PIPING TO CONSERVE BUILDING SPACE AND NOT INTERFERE WITH USE OF SPACE.
- GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.
- INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.
- PROTECT PIPING SYSTEMS FROM ENTRY OF FOREIGN

MATERIALS BY TEMPORARY COVERS, COMPLETING SECTIONS OF THE WORK, AND ISOLATING PARTS OF COMPLETED SYSTEM.

11. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.

12. WHERE PIPE SUPPORT MEMBERS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPER, BRUSH CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDING.


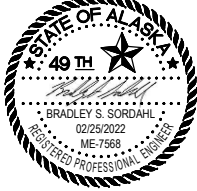
13. PREPARE UNFINISHED PIPE, FITTINGS, SUPPORTS, AND ACCESSORIES FOR FINISHED PAINTING.

B. TESTING

1. SANITARY SEWER, VENT, AND STORM WATER

- TEST ALL PIPING IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 OF THE UNIFORM PLUMBING CODE.
- TEST ALL SYSTEMS WITH WATER, EXCEPT IN CASES WHERE TO DO SO WOULD ADVERSELY SUBJECT THE PIPING TO DAMAGE FROM FREEZING. OBTAIN APPROVAL FROM CONTRACTING AGENCY IF AIR TEST IS TO BE SUBSTITUTED FOR WATER TEST.
- REPAIR LEAKS AND RETEST SYSTEM, REPEATING THIS PROCESS UNTIL PIPING SYSTEM IS FREE OF LEAKS.
- PROVIDE CERTIFICATION THAT TESTING HAS BEEN ACCOMPLISHED. TESTING CERTIFICATION TO BE INCLUDED IN OPERATION AND MAINTENANCE MANUALS.

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APPROVED BY:	BSS	DATE:	02/25/2022
		M-5	AFE NO.:
			ACAD FILE:
REV. DATE BY REVISION			DWG NO. 05 OF 06



DIVISION 15 - MECHANICAL

PART 1 - GENERAL CONTINUED

2.6 DUCTWORK

A. DEFINITIONS

1. DUCT SIZES: INSIDE CLEAR DIMENSIONS.

B. MATERIALS

1. GENERAL: NON-COMBUSTIBLE OR CONFORMING TO REQUIREMENTS FOR CLASS 1 AIR DUCT MATERIALS OR UL 181.
2. STEEL DUCTS: ASTM A525 GALVANIZED STEEL SHEET, LOCK FORMING QUALITY, HAVING ZINC COATING OF 1.25 OZ PER SQUARE FOOT FOR EACH SIDE IN CONFORMANCE WITH ASTM A90.
3. SEALANT: NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE, COMPATIBLE WITH MATING MATERIALS, LIQUID USED ALONE OR WITH TAPE, OR HEAVY MASTIC.

C. DUCTWORK INSTALLATION

1. FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS AND ASHRAE HANDBOOKS, EXCEPT AS INDICATED. PROVIDE DUCT MATERIAL, GAGES, REINFORCING, AND SEALING FOR OPERATING PRESSURE INDICATED.
2. INCREASE DUCT SIZES GRADUALLY, NOT EXCEEDING 15 DEGREES DIVERGENCE WHEREVER POSSIBLE. DIVERGENCE UPSTREAM OF EQUIPMENT SHALL NOT EXCEED 30 DEGREES, CONVERGENCE DOWNSTREAM SHALL NOT EXCEED 45 DEGREES.
3. USE DOUBLE NUTS AND LOCK WASHERS ON THREADED ROD SUPPORTS.

D. DUCTWORK APPLICATION SCHEDULE

AIR SYSTEM	MATERIAL
LOW PRESSURE SUPPLY	GALVANIZED STEEL
EXHAUST	GALVANIZED STEEL

2.7 TEMPERATURE CONTROLS

A. PROVIDE ELECTRIC/ELECTRONIC TEMPERATURE CONTROLS FOR ALL EQUIPMENT AND SYSTEMS SPECIFIED INCLUDING BUT NOT LIMITED TO THE FOLLOWING.

1. EXHAUST FANS

a. NORMAL OPERATION

- 1) 2 POSITION CONTROL DAMPER OPENS AND EXHAUST FAN EF-1 RUNS CONTINUOUSLY WITH MAKE-UP DAMPER 10% OPEN TO PROVIDE 0.05 CFM PER SQUARE FOOT VENTILATION.

b. FUME OPERATION

- 1) 2 POSITION CONTROL DAMPER OPENS AND EXHAUST FAN EF-1 & EF-2 RUN CONTINUOUSLY AND MAKE-UP AIR DAMPER IS FULL OPEN TO PROVIDE 0.75 CFM PER SQUARE FOOT VENTILATION UPON DETECTION OF CARBON MONOXIDE CONCENTRATION OF 20 PARTS PER MILLION OR HIGHER, NO2 CONCENTRATION OF 1 PART PER MILLION OR HIGHER, OR ACTIVATION OF MANUAL COUNTDOWN TIMER BUTTON IN ROOM.

c. WHEN ASSOCIATED FAN IS OFF, CONTROL DAMPER IS CLOSED.

B. PROVIDE NECESSARY WIRING, CONDUIT AND TERMINAL UNIT CONTROLS FOR A COMPLETE AND FUNCTIONAL CONTROL SYSTEM.

C. MANUFACTURER SHALL BE COMPANY SPECIALIZING IN MANUFACTURING PRODUCTS REQUIRED FOR SYSTEM CONTROL WITH MINIMUM FIVE YEARS' EXPERIENCE.

D. INSTALLER: COMPANY SPECIALIZING IN APPLYING THE WORK WITH MINIMUM FIVE YEARS' EXPERIENCE.

2.8 TESTING, ADJUSTING, AND BALANCING

A. EXAMINATION

2. BEFORE COMMENCING WORK, VERIFY THAT SYSTEMS ARE COMPLETE AND OPERABLE. ENSURE THE FOLLOWING:

- EQUIPMENT IS OPERABLE AND IN A SAFE AND NORMAL CONDITION.
- TEMPERATURE CONTROL SYSTEMS ARE INSTALLED COMPLETE AND OPERABLE.
- PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE FOR ELECTRICAL EQUIPMENT.
- DUCT SYSTEMS ARE CLEAN OF DEBRIS.

e. CORRECT FAN ROTATION.

f. DUCT SYSTEM LEAKAGE HAS BEEN MINIMIZED.

2. REPORT ANY DEFECTS OR DEFICIENCIES NOTED DURING PERFORMANCE OF SERVICES TO ARCHITECT/ENGINEER.

3. PROMPTLY REPORT ABNORMAL CONDITIONS IN MECHANICAL SYSTEMS OR CONDITIONS WHICH PREVENT SYSTEM BALANCE.

4. IF, FOR DESIGN REASONS, SYSTEM CANNOT BE PROPERLY BALANCED, REPORT AS SOON AS OBSERVED.

5. BEGINNING OF WORK MEANS ACCEPTANCE OF EXISTING CONDITIONS.

B. PREPARATION

1. PROVIDE INSTRUMENTS REQUIRED FOR TESTING, ADJUSTING, AND BALANCING OPERATIONS.

2. PROVIDE ADDITIONAL BALANCING DEVICES AS REQUIRED.

C. INSTALLATION TOLERANCES

1. ADJUST AIR HANDLING SYSTEMS TO PLUS OR MINUS 10 PERCENT FOR FROM FIGURES INDICATED.

D. ADJUSTING

1. RECORDED DATA SHALL REPRESENT ACTUALLY MEASURED, OR OBSERVED CONDITION.

2. AFTER ADJUSTMENT, TAKE MEASUREMENTS TO VERIFY BALANCE HAS NOT BEEN DISRUPTED OR THAT SUCH DISRUPTION HAS BEEN RECTIFIED.

3. LEAVE SYSTEMS IN PROPER WORKING ORDER, REPLACING BELT GUARDS, CLOSING ACCESS DOORS, CLOSING DOORS TO ELECTRICAL SWITCH BOXES, AND RESTORING THERMOSTATS TO SPECIFIED SETTINGS.

E. AIR SYSTEM PROCEDURE

1. ADJUST AIR HANDLING AND DISTRIBUTION SYSTEMS TO PROVIDE REQUIRED OR DESIGN SUPPLY, RETURN, AND EXHAUST AIR QUANTITIES.


2. MAKE AIR QUANTITY MEASUREMENTS IN DUCTS BY PITOT TUBE TRAVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.

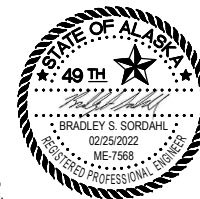
3. MEASURE AIR QUANTITIES AT AIR INLETS AND OUTLETS.

4. MEASURE STATIC AIR PRESSURE CONDITIONS ON AIR SUPPLY UNITS, INCLUDING FILTER AND COIL PRESSURE DROPS, AND TOTAL PRESSURE ACROSS THE FAN.

5. ADJUST OUTSIDE AIR AUTOMATIC DAMPERS, OUTSIDE AIR, RETURN AIR, AND EXHAUST DAMPERS FOR DESIGN CONDITIONS.

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POWER LEGEND

	ELECTRICAL POWER PANEL
	ELECTRICAL DISTRIBUTION PANEL
	ELECTRICAL LIGHTING PANEL
	PANELBOARD CABINET FLUSH MOUNT
	PANELBOARD CABINET SURFACE MOUNT
	SWITCHBOARD EXISTING
	SWITCHBOARD NEW
	METER
	CONTROLLER/DISCONNECT
	UNFUSED DISCONNECT
	FUSED DISCONNECT
	VARIABLE FREQUENCY DRIVE
	CONTROLLER
	CONTACTOR
	MOTOR SINGLE PHASE
	MOTOR SINGLE PHASE : X = HORSE POWER
	MOTOR 3PH
	MOTOR 3PH : X = HORSE POWER
	GENERATOR POWER
	TRANSFORMER
	THERMAL SWITCH

WIRING DEVICES LEGEND

	PUSH BUTTON
	JUNCTION BOX
	GFCI
	RECEPTACLE - DUPLEX CEILING MOUNT
	RECEPTACLE - SPLIT WIRE
	RECEPTACLE - DUPLEX
	RECEPTACLE - DUPLEX FLOOR MOUNT
	RECEPTACLE - DUPLEX ON EMERGENCY POWER
	RECEPTACLE - DUPLEX ISOLATED GROUND
	RECEPTACLE - QUAD
	RECEPTACLE - SINGLE
	RECEPTACLE - X-NEMA CALLOUT
	EQUIPMENT CONNECTION

WIRING CIRCUITS LEGEND

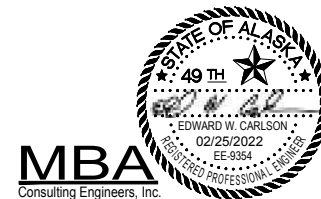
	CONDUIT
	CONNECTION POINT
	HOMERUN
	CONDUIT BREAK
	GROUND
	BREAKER
	STUB OUT
	2 HOT
	3 HOT
	4 HOT

PANEL: 2F		MOUNTING MAINS		OPTIONS				
PROJECT: ARRC SEWARD ENGINE HOUSE		<input checked="" type="checkbox"/> SURFACE	<input checked="" type="checkbox"/> LUGS	<input type="checkbox"/> FEEDTHRU	<input type="checkbox"/> SHUNT TRIP	<input type="checkbox"/> R/O GND BAR		
LOCATION: WEST WALL		<input checked="" type="checkbox"/> FLUSH	<input checked="" type="checkbox"/> CB	<input type="checkbox"/> SUBFEED LUG	<input type="checkbox"/> SUBFEED BRKR	<input checked="" type="checkbox"/> SOLID NEUTRAL		
VOLTAGE: 208Y/120 VOLT		3 PHASE	4 WIRE	150 A MLO		22k A/C		
CIRCUIT DESCRIPTION	KVA	AMP	P	CKT	CKT	KVA	CIRCUIT DESCRIPTION	
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				3	4		RV PEDESTALS QOB3100	
SPARE 15A		15	1	5	6			
HEAT TRACE CONTROL CKT		20	1	7	8		SPARE NEAR PANEL D	
HEAT TRACE GF150		50	2	9	10		SPARE NEAR PANEL D	
				11	12		SPARE NEAR PANEL D	
EF-1 (1/4HP)	0.7	15	1	13	14		SPARE NEAR PANEL D	
				15	16		SPARE QOB120	
EF-2 (2HP)	2.7	15	3	17	18		SPARE QO120	
				19	20			
SPACE				21	22	100	2	SHOWER SHACK SECTION/OFFICE QO2100
SPACE				23	24			SPARE QO120
SPACE				25	26			SPACE
SPACE				27	28			SPACE
SPACE				29	30			SPACE
SPACE				31	32			SPACE
SPACE				33	34			SPACE
SPACE				35	36			SPACE
SPACE				37	38			SPACE
SPACE				39	40			SPACE
SPACE				41	42			SPACE
CONNECTED LOAD:		3.4 KVA		9.4 A				REMARKS:
DEMAND LOAD:		4.1 KVA		11.3 A				
DATE:								
REV:								

LOAD SUMMARY

LOAD REMOVED		
2@1.5HP	-4.6 KVA	
LOAD ADDED		
2 HP	2.7 KVA	
1/4 HP	0.7 KVA	
TOTAL	-1.2 KVA	
OVERALL LOAD IS DECREASED.		

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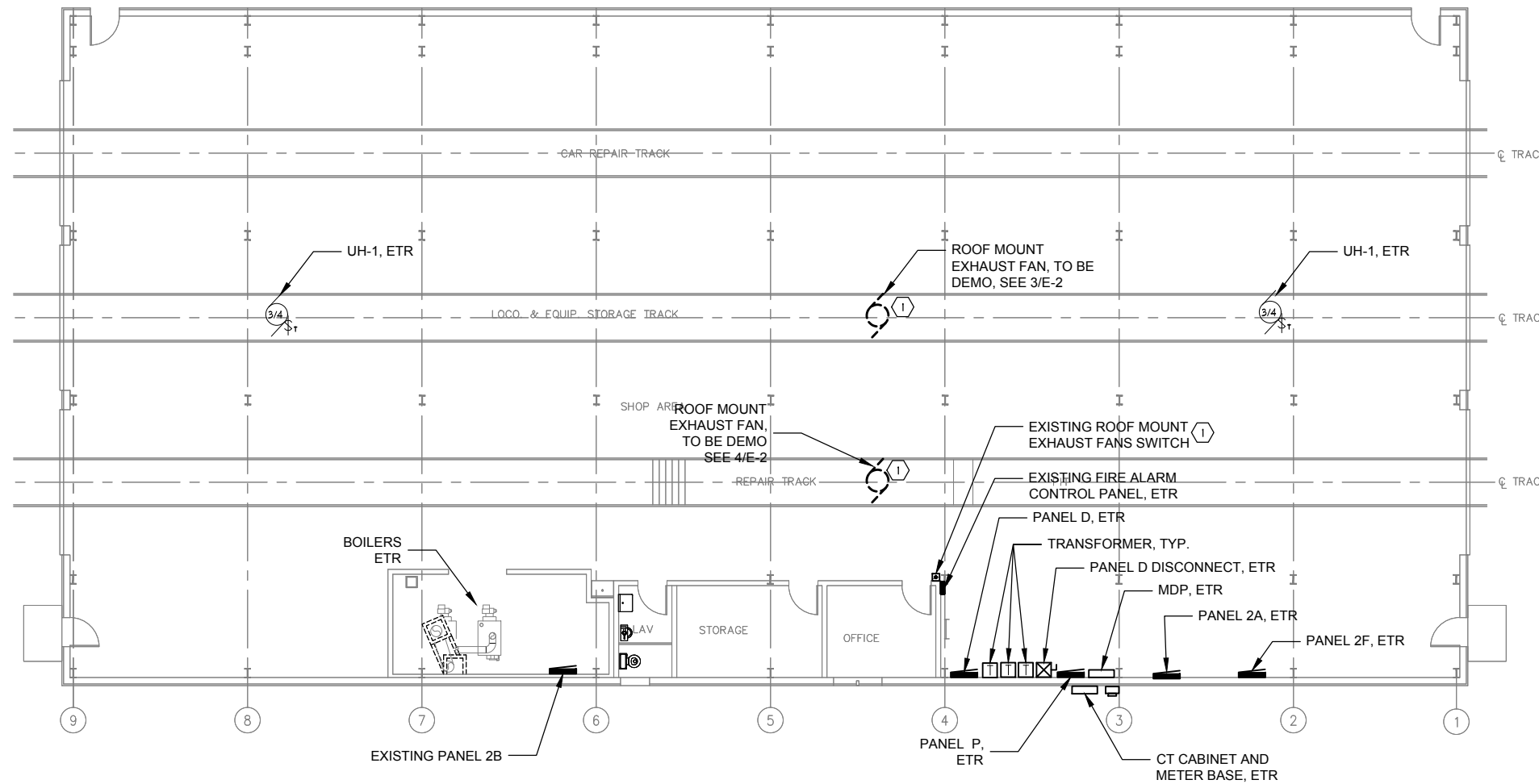
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REV.	DATE	BY	REVISION

		ALASKA RAILROAD CORPORATION	
ENGINEERING SERVICES		P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500	
PROJECT: SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT			
TITLE: ELECTRICAL LEGEND AND PANEL SCHEDULE			
DESIGNED BY: SNS	SCALE: H: AS NOTED	E-1	AFE NO.:
DRAWN BY: SNS	V: AS NOTED		ACAD FILE:
CHECKED BY: EWC	DATE: 02/25/2022		DWG NO.:
APPROVED BY: EWC			01 OF 04

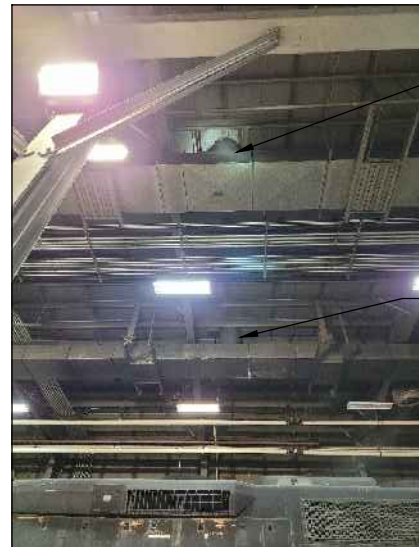
ELECTRICAL NOTES

① REMOVE EXISTING ROOF MOUNTED EXHAUST FANS. REMOVE ALL ASSOCIATED DEVICES, CONDUIT, AND CONDUCTORS BACK TO PANEL.



1 ELECTRICAL DEMOLITION PLAN

E-2 SCALE: 1/8" = 1'-0" 22X34 SHEET
0' 1' 2' 4'



EXISTING EF VENT PENETRATION

EXISTING EF VENT PENETRATION



3 ROOF MOUNT EXHAUST TO BE DEMO

E-2 SCALE: 1/8" = 1'-0" 22X34 SHEET



4 ROOF MOUNT EXHAUST TO BE DEMO

E-2 SCALE: 1/8" = 1'-0" 22X34 SHEET

2 ROOF MOUNT EXHAUST PENETRATIONS

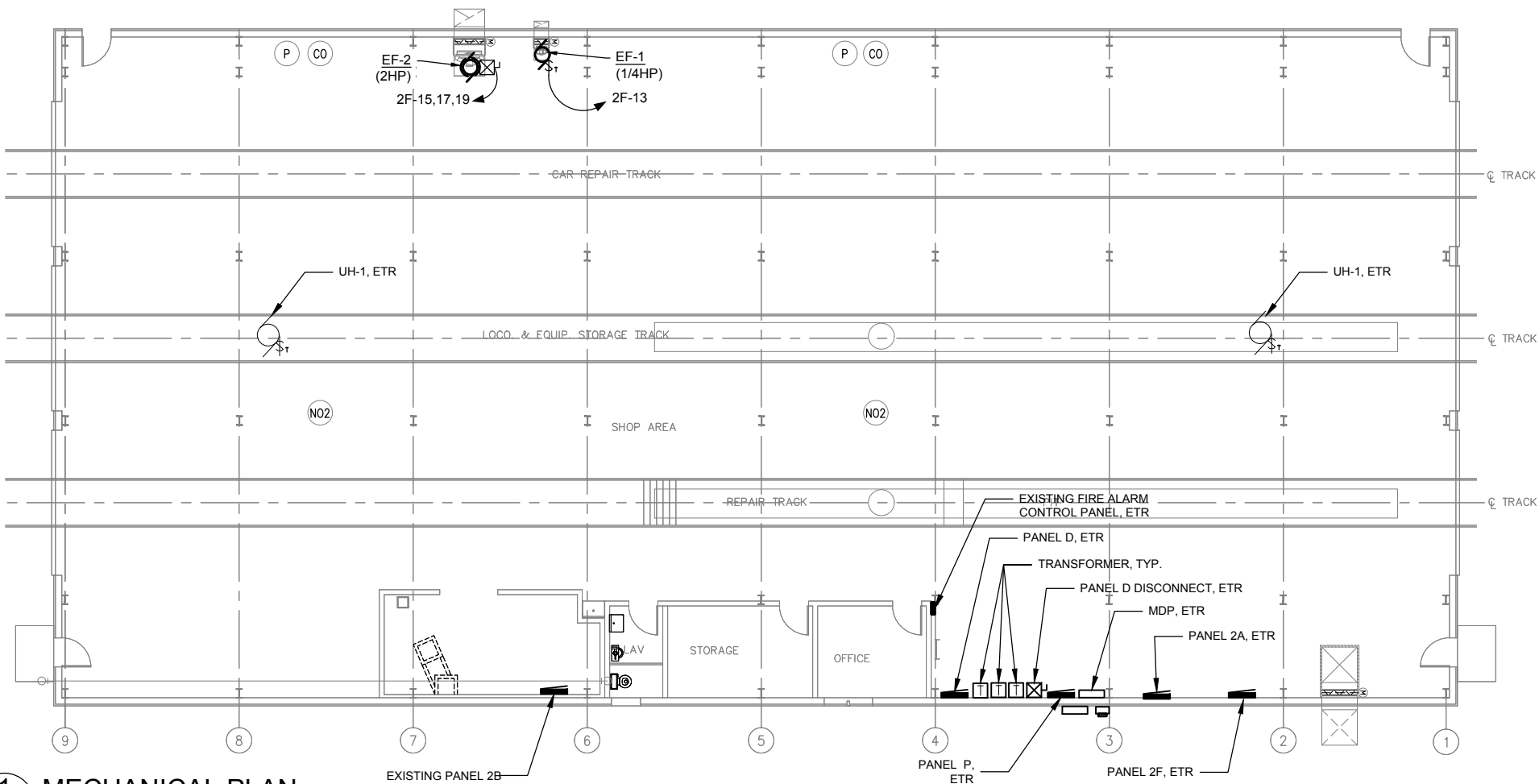
E-2 SCALE: 1/8" = 1'-0" 22X34 SHEET

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ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500	
PROJECT: SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT	
TITLE: ELECTRICAL DEMOLITION PLAN	
DESIGNED BY: SNS	SCALE: H: AS NOTED
DRAWN BY: SNS	V: AS NOTED
CHECKED BY: EWC	DATE: 02/25/2022
APPROVED BY: EWC	
E-2	
AFE NO.:	ACAD FILE:
02 OF 04	

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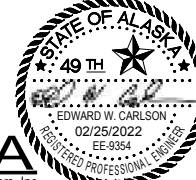


1 MECHANICAL PLAN
 M-3 SCALE: 1/8" = 1'-0" 22X34 SHEET
 0 1' 2' 4'



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 ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500	
PROJECT:	SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT
TITLE:	ELECTRICAL NEW PLAN
DESIGNED BY: SNS	SCALE: H: AS NOTED
DRAWN BY: SNS	V: AS NOTED
CHECKED BY: EWC	DATE: 02/25/2022
APPROVED BY: EWC	02/25/2022
AFE NO.:	
ACAD FILE:	
DWG NO.:	03 OF 04



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DIVISION 16 - ELECTRICAL

PART 1 - GENERAL

1.1 SCOPE

- A. PROVIDE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON DRAWINGS AND SPECIFIED. FURNISH ALL LABOR, EQUIPMENT, APPLIANCES, MATERIALS, AND PERFORM OPERATIONS REQUIRED FOR COMPLETE INSTALLATION IN ACCORDANCE WITH ALL SECTIONS OF SPECIFICATIONS, DRAWINGS, CODES, AND CONDITIONS OF CONTRACT.

1.2 CODES, STANDARDS, FEES, PERMITS

- A. COMPLY WITH LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, NATIONAL ELECTRICAL SAFETY CODE, LOCAL CODES, AMENDMENTS, ORDINANCES AND REQUIREMENTS OF UTILITY COMPANIES' FURNISHING SERVICES TO INSTALLATION. COMPLY WITH NEMA, UL, ANSI, ICEA AND OTHER INDUSTRY STANDARDS. COMPLY WITH REQUIREMENTS OF IBC, IMC, UPC, AND OTHER APPLICABLE CODES.
- B. SECURE AND PAY FOR ALL INSPECTIONS, FEES, PERMITS, ETC., REQUIRED BY LOCAL AND STATE AGENCIES.

1.3 DRAWINGS

- A. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND DO NOT SHOW ALL FEATURES OF WORK. INSTALL ELECTRICAL ITEMS TO PROVIDE SYMMETRICAL APPEARANCE. DO NOT SCALE DRAWINGS. REVIEW OTHER DRAWINGS AND ADJUST WORK TO CONFORM TO CONDITIONS SHOWN. VERIFY FIELD CONDITIONS. IMMEDIATELY CONTACT THE OWNER'S REPRESENTATIVE FOR CLARIFICATION OF QUESTIONABLE, OBSCURE ITEMS, OR APPARENT CONFLICTS. THE OWNER'S REPRESENTATIVE'S DECISION IS FINAL FOR ALL CLARIFICATIONS REQUESTED. EXTRA COST RESULTING FROM A CONDITION WHERE CLARIFICATION WAS NOT REQUESTED: MADE AT NO INCREASE IN CONTRACT AMOUNT UNLESS EXTRA COST IS APPROVED IN WRITING.

1.4 WORKMANSHIP

- A. CONSIDERED AS IMPORTANT AS ELECTRICAL AND MECHANICAL EFFICIENCY AND SUBJECT TO APPROVAL. EMPLOY WORKMEN SKILLED IN TRADE AND FAMILIAR WITH PARTICULAR TECHNIQUES APPLICABLE TO VARIOUS SECTIONS OF WORK. INSTALL IN ACCORDANCE WITH NECA "STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING."

1.5 COORDINATION

- A. COORDINATE WITH OTHER TRADES FOR PROPER INSTALLATION AND TIMELY EXECUTION. ANY CHANGES NECESSITATED BY FAILURE TO PROPERLY COORDINATE WORK: MADE AT NO INCREASE IN CONTRACT AMOUNT.
- B. VERIFY INFORMATION SHOWN ON PLANS WITH EQUIPMENT ITEMS ACTUALLY FURNISHED WHERE EQUIPMENT IS FURNISHED OR INSTALLED BY OTHERS. NOTIFY OWNER'S REPRESENTATIVE OF ANY CONFLICTS.

1.6 REMODEL WORK

- A. EXISTING CONDITIONS NOTED ON THE DRAWINGS WERE PREPARED FROM PREVIOUS CONSTRUCTION DRAWINGS. VISIT SITE, VERIFY EXISTING CONDITIONS AND ALLOW ADEQUATE MONIES TO COVER ADDITIONAL WORK REQUIRED AS A RESULT OF AS-BUILT CONDITIONS. ASSUME THAT THE AS-BUILT INFORMATION DOES NOT INDICATE EXACT CONDUIT ROUTING OR CIRCUITING. INCLUDE NECESSARY WORK TO PROVIDE CIRCUIT CONTINUITY TO EXISTING CIRCUITS THAT MAY BE AFFECTED BY NEW WORK. CUT BACK EXISTING WORK BEING REMOVED OR ABANDONED BEYOND FINISHED SURFACES TO ALLOW REPAIR AND REFINISHING. ASSUME CONDITION OF WIRING IS SUITABLE FOR RECONNECTING.
- B. NOTIFY OWNER'S REPRESENTATIVE OF ANY FIELD CONDITIONS WHERE CONTRACTOR CANNOT REUSE EXISTING MATERIAL OR EQUIPMENT BECAUSE OF DETERIORATED CONDITIONS. ALSO NOTIFY OWNER'S REPRESENTATIVE OF ANY EXISTING CONDITIONS WHICH MAY BE CONSIDERED UNSAFE OR IN NEED OF REPAIR.
- C. CERTAIN ITEMS SUCH AS PANEL 2F ARE NOTED ON DRAWINGS TO BE REUSED. THOROUGHLY CLEAN, PLACE IN LIKE NEW CONDITION.

1.7 SUBMITTALS

- A. SUBMITTAL REVIEW IS FOR GENERAL DESIGN AND ARRANGEMENT ONLY AND DOES NOT RELIEVE THE CONTRACTOR FROM ANY REQUIREMENTS OF CONTRACT DOCUMENTS. PROVISION OF A COMPLETE AND SATISFACTORY WORKING INSTALLATION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

1.8 SUBSTITUTIONS

- A. MAKE NO SUBSTITUTIONS OR REVISIONS WITHOUT WRITTEN APPROVAL. FOR EQUIPMENT SCHEDULED BY MANUFACTURER'S NAME AND CATALOG

DESIGNATIONS: MANUFACTURER'S PUBLISHED DATA AND/OR SPECIFICATION FOR THAT ITEM ARE CONSIDERED PART OF SPECIFICATION. ALL SIMILAR EQUIPMENT SAME MANUFACTURER THROUGHOUT.

1.9 PROJECT COMPLETION

- A. THOROUGHLY CLEAN INSIDE AND OUT ALL EQUIPMENT. CLEAN PREMISES OF CONSTRUCTION DEBRIS. CALL FOR FINAL CONSTRUCTION OBSERVATION. CONDUCT OPERATING TEST FOR APPROVAL. DEMONSTRATE INSTALLATION TO OPERATE SATISFACTORILY IN ACCORDANCE WITH REQUIREMENTS OF CONTRACT DOCUMENTS. PROVIDE PERSONNEL TO ASSIST ENGINEER IN REMOVAL AND REPLACEMENT OF EQUIPMENT FOR OBSERVATION PURPOSES.
- B. SHOULD ANY PORTION OF INSTALLATION FAIL, REPAIR OR REPLACE ITEMS UNTIL ITEMS CAN BE DEMONSTRATED TO COMPLY.
- C. FIRE ALARM AND EMERGENCY SYSTEMS MUST BE OPERATIONAL PRIOR TO OCCUPANCY.
- D. SUBMIT A LETTER CERTIFYING COMPLETION OF PROJECT IN ACCORDANCE WITH PLANS AND SPECIFICATIONS. TURN OVER RECORD DRAWINGS TO OWNER.
- E. SUBMIT OPERATING AND MAINTENANCE MANUALS TO OWNER, TRAIN OWNER'S PERSONNEL IN OPERATION AND MAINTENANCE OF ELECTRICAL SYSTEMS.

1.10 GUARANTEE

- A. GUARANTEE ALL MATERIAL TO BE NEW, ALL WORK TO BE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE ANY WORK OR MATERIAL DEEMED DEFECTIVE DURING THE GUARANTEE PERIOD AT NO COST TO THE OWNER.

PART 2 - PRODUCTS

2.1 RACEWAYS

- A. ELECTRICAL METALLIC TUBING: USE IN ALL OTHER AREAS UNLESS OTHERWISE INDICATED. PROVIDE RAIN/TIGHT/CONCRETE-TIGHT COMPRESSION FITTINGS.
- B. FLEXIBLE METALLIC CONDUIT: USE FOR FINAL CONNECTIONS TO FIXTURES AND EQUIPMENT TO ISOLATE VIBRATION OR ALLOW RELOCATION.
- C. NO CONDUIT ALLOWED EMBEDDED IN SPRAY-APPLIED FIREPROOFING OR BETWEEN STRUCTURAL STEEL MEMBERS AND GYPSUM WALL BOARD.
- D. UNLESS NOTED, INSTALL RACEWAYS CONCEALED EXCEPT AT SURFACE CABINETS, MOTOR AND EQUIPMENT CONNECTIONS, AND IN UTILITY ROOMS. LOCATE RACEWAYS TO NOT ENDANGER STRENGTH OF STRUCTURAL MEMBERS, AND SIX INCHES MINIMUM FROM PARALLEL RUNS OF HEAT PIPING. DO NOT INSTALL RACEWAYS IN OR THROUGH STRUCTURAL MEMBERS UNLESS SPECIFICALLY APPROVED. CROSS EXPANSION JOINTS WITH EXPANSION FITTINGS AND BONDING CONDUCTOR.
- E. PROVIDE PULL WIRE IN RACEWAYS INSTALLED BUT LEFT EMPTY.
- F. WATERPROOF ALL ROOF AND EXTERIOR WALL PENETRATIONS AS APPROVED.

2.2 WIRE AND CABLE

- A. INSTALL ALL CONDUCTORS IN APPROVED RACEWAY SYSTEMS. #12 AWG MINIMUM EXCEPT CONTROL WIRING MAY BE #14.
- B. MINIMUM INSULATION RATING: 75 DEGREES C, 600 VOLT.
- C. 120 VOLT BRANCH CIRCUIT LENGTHS FROM PANEL TO FIRST OUTLET EXCEEDING 75': NO. 10 AWG MINIMUM.
- D. INCREASE CONDUCTOR SIZES TO #10 AWG OR USE 90 DEGREES C-RATED INSULATION TO OFFSET DERATING FACTOR, WHEN MORE THAN THREE 20 AMP CONDUCTORS ARE INSTALLED IN SINGLE RACEWAY.
- E. COLOR CODE 120/208 VOLT SYSTEMS: BLACK, RED, BLUE AND WHITE. MATCH EXISTING COLOR CODE IN REMODEL AREAS IF DIFFERENT FROM ABOVE. IF NO COLOR CODE IS PRESENT, PROVIDE NEW WORK WITH SPECIFIED COLOR CODE
- F. INSTALL NO THERMOPLASTIC INSULATED CONDUCTORS WHEN TEMPERATURE IS BELOW 20 DEGREES F.
- G. CONNECTIONS:
 1. #6 AND LARGER: SOLDERLESS LUGS.
 2. #8 AND SMALLER: INSULATED WIRE NUT CONNECTOR, IDEAL "WINGNUT" HARD SHELL.

2.3 BOXES

- A. PROVIDE GALVANIZED OR CADMIUM PLATED, ONE PIECE PRESSED OR WELDED STEEL WITH DEVICE FINISH RING AND GANG COVER. FOUR INCH SQUARE OR OCTAGONAL, 1-1/2" DEEP MINIMUM SIZE.
- B. THROUGH WALL BOXES NOT PERMITTED. PROVIDE SIX INCH MINIMUM NIPPLE BETWEEN OUTLETS SHOWN BACK-TO-BACK ON COMMON WALLS. MINIMUM 24" SEPARATION IN FIRE-RATED WALLS AND PENETRATIONS. SET FLUSH WITH WALL OR CEILING FINISH. PROVIDE ISOLATION BARRIER BETWEEN DISSIMILAR VOLTAGES IN SAME OUTLET AND WHERE LINE-TO-LINE VOLTAGE EXCEEDS 300 VOLTS.
- C. PROVIDE ADDITIONAL PULL BOXES AS REQUIRED TO AVOID EXCESS PULLING TENSIONS AND TO FACILITATE WORK.

2.4 PANELBOARDS AND OVERCURRENT PROTECTION

- A. PROVIDE CIRCUIT BREAKERS OF THERMAL MAGNETIC TYPE, QUICK-MAKE, QUICK-BREAK WITH A MINIMUM OF 10,000 AIC RATING AT 120, 240 VOLT, MEET NEMA STANDARD AB1. PROVIDE HIGH INTERRUPTING CAPACITY AND NON-FUSE TYPE CURRENT LIMITING CIRCUIT BREAKERS WHERE SHOWN. PROVIDE MULTI-POLE BREAKERS WITH INTERNAL COMMON TRIP.
- B. PROVIDE CIRCUIT BREAKERS DESIGNATED "GFI" EQUIPPED WITH INTEGRAL CLASS A GROUND FAULT CIRCUIT INTERRUPTER SET TO TRIP ON GROUND FAULT OF SIX MILLIAMPS OR GREATER.

2.5 WIRING DEVICES

- A. DUPLEX RECEPTACLES: 20 AMP, 125 VOLT, NEMA TYPE 5-20R, MEET FEDERAL SPECIFICATION W-C-596F TESTS. COLOR AS DIRECTED BY ARCHITECT. PROVIDE OUTLETS DESIGNATED GFI WITH INTEGRAL CLASS A GROUND FAULT CIRCUIT INTERRUPTER UL 943-LISTED.
- B. SPECIAL OUTLETS: CAPACITY, VOLTAGE AND NEMA CONFIGURATION NOTED, SAME QUALITY AS DUPLEX RECEPTACLES.
- C. SWITCHES: 20 AMP, 120/277 VOLT, MEET FEDERAL SPECIFICATION W-S-896E, UL #20, SELF-GROUNDING. COLOR AS DIRECTED.
- D. DEVICE PLATES: UL LISTED, ONE PIECE FLUSH PLATES STAINLESS STEEL. USE GALVANIZED PLATES FOR EXPOSED WIRING, GASKETED SELF-CLOSING WEATHERPROOF PLATES OUTDOORS, U.L. LISTED FOR WET LOCATIONS WHILE IN USE.

2.6 MOTORS AND CONNECTIONS

- A. PROVIDE MOTORS DESIGNED FOR SPECIFIC APPLICATION AND DUTY WHERE APPLIED, DELIVER RATED HORSEPOWER WITHOUT EXCEEDING TEMPERATURE RATINGS WHEN OPERATED ON POWER SYSTEMS WITH COMBINED VARIATION IN VOLTAGE AND FREQUENCY NOT MORE THAN ±10%. 230/208 VOLT DUAL RATED MOTORS NOT CONSIDERED SUITABLE FOR USE ON 208 VOLT SYSTEMS. PROVIDE 208 VOLT OR 200 VOLT MOTORS.
- B. RATE FOR VOLTAGE AND PHASE STIPULATED IN THE VARIOUS SCHEDULES AND SUPPLY VOLTAGE SHOWN ON DRAWINGS. VERIFY FROM DRAWINGS AND SPECIFICATIONS AVAILABLE SUPPLY CHARACTERISTICS. FURNISH MOTORS THAT WILL PERFORM SATISFACTORILY UNDER CONDITIONS SPECIFIED. MOTORS, WHEN RUN AT FULL LOAD OR LESS, AND OPERATING AT SYSTEM VOLTAGE, NOT TO EXCEED 40 DEGREE C. RISE.

2.7 MOTOR STARTER AND DISCONNECTS

- A. PROVIDE EACH MOTOR WITH DISCONNECTING MEANS AND WITH SUITABLE CONTROLLER OR OTHER DEVICE AS REQUIRED, COMPLETE WITH MANUAL OR AUTOMATIC CONTROL OF STANDARD NEMA SIZES.
- B. PROVIDE ACROSS-THE-LINE COMBINATION STARTER-DISCONNECT MAGNETIC STARTERS WITH AMBIENT COMPENSATED THERMAL OVERLOAD PROTECTION SET AT 115% MEASURED FULL LOAD CURRENT IN EACH UNGROUNDED PHASE WITH MAINTENANCE-FREE, DOUBLE BREAK, SOLID SILVER ALLOY CONTACTS.
- C. PROVIDE CONTROL POWER TRANSFORMERS WHERE NECESSARY FOR OPERATION OF CONTACTOR SOLENOIDS AND CONTROL CIRCUIT DEVICES AT 120 VOLTS.
- D. ARRANGE CONTROL CIRCUITS FOR MANUAL, AUTO AND OTHER SIGNAL INPUTS FROM MECHANICAL CONTROL PANELS, AND ARRANGE CONTROL POWER TO DE-ENERGIZE CONTROL CIRCUITS WHENEVER OPERATING POWER SUPPLY TO PARTICULAR EQUIPMENT IS DISCONNECTED.
- E. PROVIDE HORSEPOWER RATED MANUAL MOTOR STARTING SWITCH WITH THERMAL OVERLOAD PROTECTION FOR EACH SINGLE PHASE MOTOR. SIZE HEATERS FOR 115% MEASURED FULL LOAD CURRENT.
- F. DISCONNECTS: HEAVY DUTY SAFETY SWITCHES, CIRCUIT BREAKERS OR MANUAL MOTOR STARTING SWITCHES.

2.8 GROUNDING

- A. GROUND ALL ELECTRICAL DEVICES, MOTORS, METALLIC PIPING, DUCTWORK, METAL FRAMING, ETC., IN ACCORDANCE WITH N.E.C. ARTICLE 250.
- B. UTILIZE THE METALLIC RACEWAY SYSTEM AS THE SYSTEM GROUNDING PATH FOR ALL DEVICES UNLESS OTHERWISE NOTED.
- C. PROVIDE SEPARATE GREEN GROUNDING CONDUCTOR FOR ALL CONDUIT.

PART 3 - EXECUTION

3.1 GENERAL

- A. INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, INSTRUCTIONS AND INSTALLATION DRAWINGS, UNLESS OTHERWISE INDICATED AND IN ACCORDANCE WITH NECA'S "STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONTRACTING".
- B. SEAL PENETRATIONS WITH UL-LISTED FIREPROOFING MATERIALS TO MAINTAIN FIREPROOFING INTEGRITY AND WATERTIGHTNESS.
- C. SEAL AIRTIGHT ALL PENETRATIONS THROUGH SMOKE PARTITIONING, FAN PLENUMS, DUCTWORK, AND VAPOR BARRIERS.
- D. REPLACE OR REPAIR ANY SPRAY-APPLIED FIREPROOFING OR INSULATION DAMAGED BY INSTALLATION OF ELECTRICAL EQUIPMENT.
- E. REPAIR ALL DAMAGE TO FINISHED SURFACES WHERE CAUSED BY INSTALLATION OF ELECTRICAL EQUIPMENT.
- F. PROVIDE PROPER IDENTIFICATION FOR PANELS, SWITCHES, OR ANY ITEM OF ELECTRICAL EQUIPMENT USED AS A CONTROL DEVICE OR DISCONNECTING MEANS FOR ANY EQUIPMENT. IDENTIFY BOXES CONTAINING EMERGENCY CIRCUITS PER N.E.C. ARTICLE 700-9.

3.2 SUPPORTS

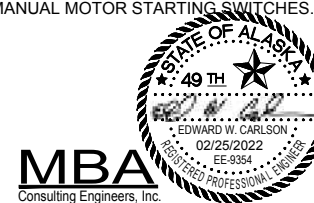
- A. SUPPORT RACEWAYS ON APPROVED TYPES OF WALL BRACKETS, CEILING TRAPEZE HANGERS OR MALLEABLE IRON STRAPS. PLUMBERS PERFORATED STRAP NOT PERMITTED AS MEANS OF SUPPORT.
- B. DO NOT SUSPEND RACEWAYS OR EQUIPMENT FROM CEILING TIE WIRE OR T-BAR, FROM STEAM, WATER OR OTHER PIPING OR DUCTWORK, BUT SUPPORT INDEPENDENTLY.
- C. ANCHOR EQUIPMENT TO THE BUILDING STRUCTURE TO RESIST SEISMIC DESIGN CATEGORY D EARTHQUAKE FORCES. PROVIDE ADEQUATE BACKING AT STRUCTURAL ATTACHMENT POINTS TO ACCEPT THE FORCES INVOLVED.
- D. SECURE BOXES, WALL BRACKETS, CABINETS AND HANGERS BY MEANS OF TOGGLE BOLTS IN HOLLOW MASONRY AND GYPBOARD; PRESET INSERTS OR EXPANSION BOLTS IN SOLID MASONRY AND CONCRETE; MACHINE SCREWS, BOLTS OR WELDING ON METAL SURFACES; AND WOOD SCREWS IN WOOD CONSTRUCTION.
- E. FOR FIXTURES WEIGHING 56 POUNDS OR MORE, SUPPORT LUMINAIRES FROM STRUCTURAL MEMBERS CAPABLE OF SUPPORTING TOTAL WEIGHT AND INDEPENDENTLY FROM WIRING SYSTEM.

3.3 AS-BUILT DRAWINGS

- A. KEEP CLEAN SET OF PRINTS AT JOB SITE AND RECORD ALL ELECTRICAL CHANGES THAT OCCURRED DURING CONSTRUCTION. FAILURE TO DO SO MAY DELAY PAYMENT.
- B. AT END OF CONSTRUCTION, PROVIDE ONE COMPLETE SET OF DRAWINGS INDICATING ALL FIELD CHANGES FOR RECORD PURPOSES TO THE OWNER'S REPRESENTATIVE.


END OF SECTION

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 ALASKA RAILROAD CORPORATION ENGINEERING SERVICES P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500			
PROJECT: SEWARD ENGINE HOUSE 2022 ROOF REPLACMENT			
TITLE: ELECTRICAL SPECIFICATIONS			
DESIGNED BY: SNS	SCALE:	E-4	AFE NO.:
DRAWN BY: SNS	H: AS NOTED		ACAD FILE:
CHECKED BY: EWC	V: AS NOTED		DWG NO.:
APPROVED BY: EWC	DATE: 02/25/2022		04 OF 04