

CITY OF CHEFORNAK, ALASKA

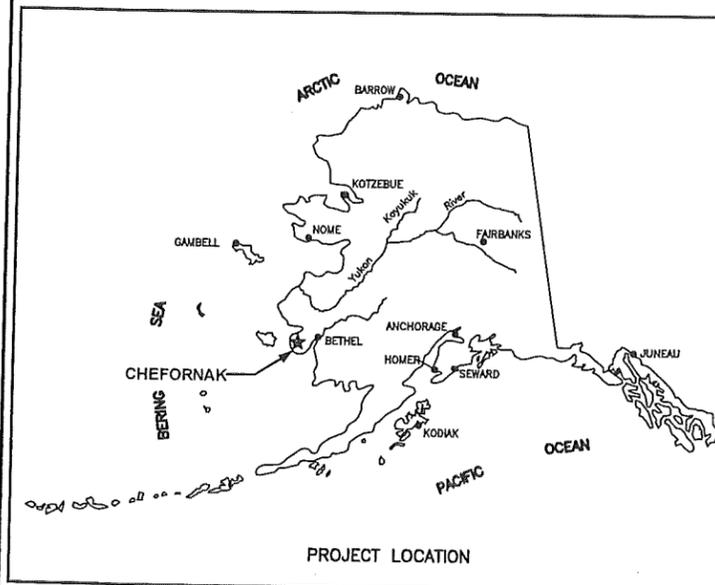
PUMP HOUSE 1 IMPROVEMENTS

IN COOPERATION WITH STATE OF ALASKA
VILLAGE SAFE WATER AND THE CITY OF
CHEFORNAK, ALASKA

65% REVIEW - APRIL 2015

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Location Map



PO BOX 232946 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015



Consultant

RECORD DRAWING CERTIFICATE

THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION. INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.

NAME _____ DATE _____

Construction Foreman _____

FINAL DESIGN (Date) _____

ADEC APPROVAL (Date) _____

Construction Period (From) _____ (To) _____

As-Built (Date) _____

DESIGN CRITERIA

COMMUNITY

POPULATION (2012) 434
 DESIGN POPULATION (2034) 458
 WATER CONSUMPTION (2034) 8,000 GPD (5.6 GPM AVERAGE FLOW)

CONSISTING OF:

WATERING POINTS 1,000 GPD
 CLINIC 1,000 GPD
 SCHOOL 3,000 GPD
 WASHETERIA 3,000 GPD

PLANNED WATER SUPPLY AT PUMP HOUSE 1 5,300 GPD (3.7 GPM)
 PLANNED WATER SUPPLY AT PUMP HOUSE 2 2,700 GPD (1.9 GPM)
 WATER STORAGE, PUMP HOUSE 1 5,000 GAL
 WATER STORAGE, PROPOSED PUMP HOUSE 2 2,500 GAL
 WATER STORAGE, PROPOSED WASHETERIA 20,000 GAL

CITY WELL (BY PUMP HOUSE 1)

WATER SOURCE: 118 FT DEEP WELL, 4 IN DIA.
 CONTINUOUS PUMPING RATE 5.6 GPM AT DESIGN
 WATER TREATMENT: 2 CARTRIDGE FILTERS IN SERIES
 10 MICRON 1ST STAGE (PRELIMINARY)
 5 MICRON 2ND STAGE (PRELIMINARY)
 170 SF PLEAT AREA EACH

WATER PRESSURIZATION

2 EA 15 GPM MULTISTAGE PRESSURE PUMPS LEAD/LAG, MAX 30 GPM, CONTROLLED BY VFD/PRESSURE SENSOR, SET POINT ADJUSTABLE BETWEEN 40 AND 50 PSIG
 1 EA HYDROPNEUMATIC BUFFER TANK, 3 GAL ACCEPTANCE FACTOR

WATER DISTRIBUTION

CIRCULATION: 20 TO 35 GPM @40 TO 59' TDH
 2 EACH 20 TO 40 GPM 1725 RPM VERTICAL MULTISTAGE PUMPS, PRIMARY/BACKUP

ENVIRONMENTAL

DESIGN MINIMUM OUTDOOR TEMPERATURE: -50°F
 DESIGN ANNUAL HEATING DEGREE DAYS AT 65°F 13,200° F*DAY/YR
 DESIGN ANNUAL HEATING DEGREE DAYS AT 50°F 7,900° F*DAY/YR

ELECTRICAL POWER

120/240 VOLTS, CENTER TAPPED NEUTRAL, SINGLE PHASE

RECORD DRAWING CERTIFICATE	THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION. INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.
SCALE: AS SHOWN	DATE: _____ NAME: _____
CONSTRUCTION RECORD	FIELD BOOK _____ STAKING _____ FOREMAN _____ AS-BUILT _____ INSPECTOR _____
	
PUMP HOUSE 1 IMPROVEMENTS	DESIGN CRITERIA CHEFORNAK, ALASKA
	PO BOX 23264 ANCHORAGE, AK 99523 PH: 807-348-0110 FAX: 807-348-1015
REVISION	BY DATE
Project No.	OCT. 2014
Date	PCW
Designed	CM
Drawn	ECW
Approved	ECW
Sheet No.	G3.1
SHEET	OF

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GENERAL NOTES

- ALL CONSTRUCTION SHALL BE DONE IN A SAFE WORKMANLIKE MANNER TO INDUSTRY STANDARDS AND IN CONFORMANCE WITH APPLICABLE LOCAL STATE AND FEDERAL CODES AND REGULATIONS. HIGH STANDARDS OF WORKMANSHIP SHOWING A SENSE OF PRIDE BY WORKMEN SHALL BE MAINTAINED. WORKERS SHALL BE PREPARED TO SIGN THEIR INDIVIDUAL WORK AS IF IT WAS THEIR OWN ARTWORK.
- ALL MATERIALS SHALL MEET OR EXCEED THE MINIMUM QUALITY STANDARDS SPECIFIED IN THE DRAWINGS. ANY MATERIAL IN CONTACT WITH THE WELL WATER OR POTABLE WATER SHALL BE NSF 61 APPROVED. SOLDER CONTAINING LEAD SHALL NOT BE ALLOWED.
- THE BASIS OF VERTICAL CONTROL IS THE 3" BLM BRASS CAP OF USS 4412, TR-A, CORNER 11, BLOCK 6, AS SHOWN ON SURVEY CONTROL SHEET C1.0 AS POINT IDENTIFIER 616. THE ELEVATION OF THE TOP OF CAP IS 77.68 FT.
- THE BASIS OF HORIZONTAL CONTROL IS THE BEARING BETWEEN POINT IDENTIFIER 600 AND POINT IDENTIFIER 616 AS SHOWN ON SURVEY CONTROL SHEET C1.0. THE BEARING IS NORTH 7° 14' 42" E WITH A LENGTH OF 2988.5 FEET.
- EXISTING UTILITIES ARE SHOWN IN APPROXIMATE LOCATION TO THE BEST KNOWLEDGE OF THE ENGINEER AT THE TIME OF DESIGN. UTILITY RECORDS MAY NOT BE COMPLETELY ACCURATE. THE PROJECT SUPERINTENDENT SHALL VERIFY HORIZONTAL AND VERTICAL LOCATION OF UTILITIES WITHIN EACH CONSTRUCTION REACH PRIOR TO CONSTRUCTION. ALL UTILITIES ARE ABOVE GROUND UNLESS OTHERWISE NOTED.

WATER AND SEWER - CHEFORNAK WATER AND SEWER UTILITY (907) 867-8301
 ELECTRIC - NATERKAQ LIGHT PLANT (907) 867-8213
 TELEPHONE - UNITED UTILITIES, INC. (800) 478-2020

- THE PROJECT SUPERINTENDENT SHALL BE RESPONSIBLE FOR MAINTAINING A CLEAN SET OF AS-BUILT "RED LINE" RECORD DRAWINGS SHOWING LOCATION AND SWING TIES TO ALL BURIED SYSTEM COMPONENTS. ALL ELEVATIONS SHALL BE MARKED ASB (AS-BUILT) OR F.C. (FIELD CHANGED) WITH THE CORRECT VALUE INSERTED. DRAWINGS SHALL BE KEPT CURRENT IN RED PENCIL AND UPDATED DAILY IN A NEAT AND LEGIBLE FASHION. A COPY OF THE AS-BUILT DRAWINGS SHALL BE SUBMITTED TO THE CITY OF CHEFORNAK AND THE VILLAGE SAFE WATER PROJECT ENGINEER.
- GENERAL RESTORATION - THE AREAS IMPACTED BY CONSTRUCTION SHALL BE RETURNED TO PRECONSTRUCTION CONDITION OR BETTER. CONSTRUCTION DEBRIS SHALL BE REMOVED FROM THE AREA AND DISPOSED OF IN A PROPER MANNER. DUE CARE AND CAUTION SHALL BE TAKEN TO AVOID DISTURBING PERSONAL PROPERTY.
- CONSTRUCTION IN SENSITIVE AREAS - ANY DAMAGE CAUSED BY CONSTRUCTION ACTIVITIES SHALL BE REPAIRED OR RESEDED AS NECESSARY TO RETURN THE AREAS AFFECTED BY CONSTRUCTION TO ITS PRECONSTRUCTION STATE.
- THE CONSTRUCTION SITE SHALL BE ADEQUATELY PROTECTED, RESTRICTED AND BARRICADED IN THE BEST PUBLIC INTERESTS OF HEALTH, SAFETY AND WELFARE, WITH VISIBLE AND STABLE BARRIERS, UNDERSTANDABLE, LARGE-PRINT WARNING SIGNS, AND OTHER PRECAUTIONARY EQUIPMENT AND MEASURES AS REQUIRED. ALL SAFETY MEASURES SHALL BE IN CONFORMANCE WITH APPLICABLE STATE OF ALASKA DOT AND OSHA SAFETY REQUIREMENTS.
- EXISTING BOARDWALK SHALL BE REMOVED ONLY WHERE INDICATED ON THE PLANS AND IN ALL AREAS WHERE THE EXISTING BOARDWALK CONFLICTS WITH THE PROPOSED BOARDWALK ALIGNMENT. REMOVED BOARDWALK MATERIAL WITH ANY SALVAGE VALUE SHALL BE CLEANED OF FASTENERS (NAILS, SCREWS, PLATES, ETC.) AND NEATLY STACKED AT A LOCATION DESIGNATED BY THE CITY. PROVIDE STICKERS BETWEEN EVERY THIRD ROW IN THE STACK. EXISTING BOARDWALK MATERIAL WITH NO SALVAGE VALUE SHALL BE DISPOSED OF AT THE LANDFILL.

GENERAL DESIGN CRITERIA:

SEE SHEET G3.1

WATERLINES / WATER TANK:

TESTING - ALL TESTING SHALL BE IN CONFORMANCE WITH THE FOLLOWING REQUIREMENTS.

- PLUMBING TESTING - PERFORM A TEST OF WATERLINES. ALL POTABLE WATER PIPING MUST BE PRESSURIZED TO 90 PSI WITH WATER AND LEFT FOR 1 HOUR. AFTER THE INITIAL STABILIZATION PERIOD WITH NO LOSS IN PRESSURE.
- ALL TESTS SHALL BE WITNESSED BY A REPRESENTATIVE DESIGNATED BY THE OWNER (CITY OF CHEFORNAK). UPON SUCCESSFUL COMPLETION OF A TEST THE RESULTS OF THE TEST SHALL BE DOCUMENTED ON A TEST FORM AND ACKNOWLEDGED BY SIGNATURE OF THE OWNER'S REPRESENTATIVE WITNESSING THE TEST AND BY THE PROJECT SUPERINTENDENT. THE SUPERINTENDENT'S RED LINED AS-BUILT DRAWINGS SHALL ALSO NOTE, FOR EACH SEGMENT OF THE SYSTEM TESTED, THE TIME AND DATE OF THE TEST AND THE NAME OF THE OWNER'S WITNESS. COPIES OF THIS TEST SHALL BE SENT TO VSWENGINEER.
- THE CONSTRUCTION MANAGER WILL SUBMIT A QA/QC MANUAL OF ALL TESTING FOR REVIEW.

WATER PIPING SHALL BE BUTT FUSED, HDPE SDR 11 (PE 3408), ROUTED THROUGH AN INSULATED ARCTIC PIPE DUCT. THE DUCT SHALL HAVE A 4" Ø HDPE, SDR 17 CORE PIPE, 3" MINIMUM OF 3-4 LB/CF POLYURETHANE FOAM AND AN 12" Ø X 16 GAUGE CORRUGATED ALUMINUM JACKET.

DISINFECTION - ALL WATERLINES AND WATER TANKS TO BE DISINFECTED AND TESTED FOR COLIFORM IN ACCORDANCE WITH AWWA C651/3.

BOARDWALK:

ALL BOARDWALK MATERIALS SHALL BE AS SPECIFIED IN THE DRAWINGS AND MEET THE FOLLOWING REQUIREMENTS:

- LUMBER: HEMLOCK AND DOUGLAS FIR (HEM-FIR) GRADE #2 OR BETTER. ALL SIZES ARE GIVEN IN NOMINAL DIMENSIONS (I.E., 4X12 WILL MEASURE 3 1/2" THICK BY 11 1/2" WIDE).
- WOOD TREATMENT: ALL WOOD MATERIALS USED SHALL BE TREATED WITH THE WOOD PRESERVATIVE CROMATED COPPER ARSENATE (CCA) AT THE FOLLOWING CONCENTRATIONS: "SOIL CONTACT" (INCLUDES ALL SLEEPERS) - 0.6 POUNDS PER CUBIC FOOT ABOVE GROUND (>6" ABOVE GROUND) - 0.4 POUNDS PER CUBIC FOOT

GENERAL STRUCTURAL NOTES:

SEE STRUCTURAL GENERAL NOTES, SHEET S0.1

BUILDING FOUNDATION:

A FOUNDATION INVESTIGATION WAS PREPARED BY GOLDER AND ASSOCIATES. SOILS IN THE AREA GENERALLY CONSIST OF A VESICULAR BASALT BOLDER MATRIX WITH A THIN ORGANIC MAT OVERLAYING SILT. MARGINAL TEMPERATURE PERMAFROST AS WELL AS THAWED SOIL CONDITIONS EXIST IN THE PROJECT AREA. BEDROCK IS FOUND AT DEPTHS BETWEEN 20' AND 30'.

PIPING (GENERAL):

- ALL PIPING AND FITTINGS SHALL BE NSF-61 COMPLIANT WHERE SUCH PIPING AND FITTINGS ARE IN CONTACT WITH RAW OR POTABLE WATER IN THE WATER TREATMENT OR DISTRIBUTION PROCESS.
- ALL PIPING SHALL BE LEAD FREE.
- ALL PLUMBING USING SOLDERED JOINTS SHALL USE A SOLDER CERTIFIED TO NOT TO CONTAIN LEAD (BRIDGET OR EQUAL)

COPPER TUBING AND FITTINGS:

- ALL COPPER TUBING SHALL BE ASTM B75 DRAWN TEMPER, ANSI/NSF-61 CERTIFIED, TYPE L THICKNESS.
- COPPER SOLDER FITTINGS SHALL BE PRODUCED IN ACCORDANCE WITH ASME/ANSI B16.22, AND SHALL BE ANSI/NSF-61 CERTIFIED.

SERVICE LINES:

1. HDPE MATERIAL:

- LISTED BY THE PPI WITH DESIGNATION OF PE-4710
- CELL CLASSIFICATION OF PE-445574C OR BETTER IN ACCORDANCE WITH ASTM D3350
- MUST EXCEED 1000 HOURS WHEN TESTED IN ACCORDANCE WITH ASTM F1248 RING ENVIRONMENTAL STRESS CRACK RESISTANCE TEST) WITH FEWER THAN 50 PERCENT FAILURES.
- APPROVED BY THE NATIONAL SANITATION FOUNDATION (NSF) FOR POTABLE WATER SERVICE.
- SHALL CONTAIN TWO PERCENT (2%) CARBON BLACK FOR ULTRAVIOLET (UV) PROTECTION AND SHALL BE HOMOGENEOUS THROUGHOUT.

MECHANICAL: FOR MECHANICAL NOTES SEE SHEET M1.1

HYDRONIC PIPING:

- HYDRONIC HEAT TRACE:
HYDRONIC HEAT TRACE (WHERE SPECIFIED) SHALL BE A MINIMUM OF 3/4" DIA. HEAT PEX.

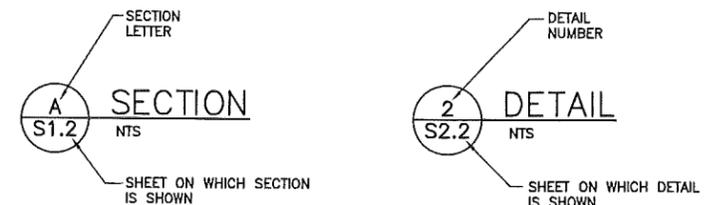
PIPELINE TESTING:

- GENERAL:
ALL TESTING SHALL BE IN CONFORMANCE WITH THE FOLLOWING REQUIREMENTS:
ALL TESTS SHALL BE WITNESSED BY A REPRESENTATIVE DESIGNATED BY THE COMMUNITY. UPON SUCCESSFUL COMPLETION OF A TEST THE RESULTS OF THE TEST SHALL BE DOCUMENTED ON A TEST FORM AND ACKNOWLEDGED BY SIGNATURE OF THE COMMUNITY'S REPRESENTATIVE WITNESSING THE TEST AND BY THE PROJECT SUPERINTENDENT. THE SUPERINTENDENT'S RED LINED AS-BUILT DRAWINGS SHALL ALSO NOTE THE TIME AND DATE OF THE TEST, AS WELL AS THE NAME OF THE COMMUNITY'S WITNESS, FOR EACH PIPE SEGMENT TESTED.
- GLYCOL HEAT TRACE TESTING - PERFORM HYDROSTATIC TESTING OF GLYCOL HEAT TRACE. HYDROSTATIC TESTS SHALL BE PERFORMED AFTER INSTALLATION. FILL THE LINE WITH WATER AND REMOVE AIR PRIOR TO STARTING THE TEST. PRESSURIZE TO 1.5 X OPERATING PRESSURE (80 PSI) = 120 PSI AND LEAVE FOR A MINIMUM OF 1-HOUR. AFTER THIS INITIAL PERIOD, ADD WATER TO BRING THE PRESSURE UP TO 120 PSI AND BEGIN A 4-HOUR TEST. FOR THE GLYCOL LOOP TO BE ACCEPTED THERE SHOULD BE NO LOSS IN PRESSURE. NO VISIBLE LEAKS SHOULD BE NOTED UPON A VISUAL INSPECTION OF EACH JOINT UNDER PRESSURE.

LEGEND

EXISTING		PROPOSED		DESCRIPTION
PLAN VIEW	PROFILE VIEW	PLAN VIEW	PROFILE VIEW	
				PROPOSED BOARD ROAD (WIDTH AS NOTED)
				EXISTING BOARD ROAD TO REMAIN EXISTING BOARD ROAD TO BE REMOVED
				GROUND PROFILE
				WATERMAIN
				FUTURE WATERMAIN
				FUTURE WASTEWATER FORCEMAIN
				OVERHEAD ELECTRIC
				PETROLEUM/OIL/LUBRICANTS
				UTILITY POLE AND GUY WIRE ANCHOR
				FENCE
				CONTOUR LINE
				SHORELINE
				EXISTING GROUND STRUCTURE
				EARTHWORK SLOPE
				NATURAL GROUND OR COMPACTED SOIL
				DIRECTION OF DRAINAGE
				PROPERTY LINE OR SECTION LINE
				MATCHLINE
				PERMANENT EASEMENT
				ALL WEATHER WOOD CORRUGATED METAL PIPE
				EXISTING GRADE ELEV.
				TOP OF BOARD ROAD ELEV.
				BRASS CAP MONUMENT AS NOTED
				TEST HOLE
				SPOT ELEVATION
				BLOCK NUMBER
				LOT NUMBER
				IRON PIPE SIZE (INDUSTRY STANDARD OUTSIDE PIPE DIAMETER)
				6" WELL
				MECHANICAL BOLT
				GALVANIZED RIGID CONDUIT
				ELEVATION

SECTION AND DETAIL DESIGNATIONS



RECORD DRAWING CERTIFICATE
 THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION. INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.

SCALE: AS SHOWN
 BASIS OF VERTICAL CONTROL: SURVEY CONTROL SHEET C1.0 AS POINT IDENTIFIER 616
 BASIS OF HORIZONTAL CONTROL: SURVEY CONTROL SHEET C1.0 AS POINT IDENTIFIER 616

CONSTRUCTION RECORD
 FIELD BOOK
 STAKING
 FOREMAN
 AS-BUILT
 INSPECTOR

STATE OF ALASKA
 49th
 PROFESSIONAL ENGINEER
 PH: 807-546-0100
 CE-10278

PUMP HOUSE 1 IMPROVEMENTS
 GENERAL NOTES AND LEGEND
 CHEFORNAK, ALASKA

GES ENGINEERS, INC.
 PO BOX 23296 ANCHORAGE, AK 99523 PH: 807-546-0100 FAX: 807-938-0105

REVISION	DATE

Project No. _____ Date OCT. 2014
 Designed _____ Drawn _____ Approved _____
 Sheet No. G4.0
 SHEET OF

6.0 RECOMMENDATIONS

6.1 Pumphouse Foundations

Based on the observed and inferred geologic and thermal conditions at the proposed pumphouse sites the use of a conventional shallow or mat foundation system could result in unacceptable differential settlement. Therefore, the recommended option for the proposed pumphouse foundations is drilled micro-piles seated on basalt with anchors advanced inside the micro-piles and grouted into the underlying basalt rock. Grouted micro-pile foundation systems have been successfully installed in areas of Alaska where challenging soil conditions overly relatively shallow bedrock. Site improvement such as buried utilities and facility access that will be constructed at shallower depths should consider the potential for differential settlement.

While the pile axial loads have not been finalized, CE2 has indicated they are to be in the range of 7-kips to 14-kips (per pile) for geotechnical design purposes. For frost uplift, we have used design stress of 40-pounds per square inch (psi) along the pile perimeter though the expected active layer. At these design loads, the frost uplift will exceed the axial compressive design loads.

The following recommendations include Golder's interpretation of the site geology and ground thermal conditions based on the geotechnical exploration data, prior experience in Chefornak and engineering judgment of permafrost conditions at this site, with consideration of preliminary structure geometry and proposed facility location on the site for the analysis.

6.1.1 Grouted Micro-Pile Foundation Design

The permafrost at Pumphouse #1 is considered "warm" and possibly degraded. Continued warming and thawing of the permafrost will result in unacceptable differential settlement if end bearing conditions are not developed or extensive passive subgrade cooling systems are not used. To accommodate the site conditions the building should be supported on micro-piles installed to an end bearing condition into the underlying bedrock. The micro-pile founded on bedrock will transfer the structural axial loads to the bedrock. End bearing on suitable rock will also accommodate additional down-drag forces on the piles as the surrounding permafrost warms or thaws. Anchoring the micro-pile with a rock anchor grouted into the underlying bedrock will resist the anticipated seasonal frost uplift forces. This type of foundation system has distinct advantages over other deep foundations in that it can be installed in areas with variable thermal and groundwater conditions and in areas where float rock and boulders may be encountered.

The recommended micro-pile foundation would consist of a minimum 6-inch diameter pipe pile seated on firm, competent bed rock. Schedule 40 or greater pipe piles are recommended with pile wall thickness determined by the structural engineer. Piles may be installed driven with or without predrilling vertically to end bearing in bedrock at the site. If seated on competent bedrock, axial capacities approaching the structural limits of the steel may be possible. It is assumed that the axial capacities and structural limits of the steel piles will be in excess of the actual design loads with a factor of safety of at least three. Golder

should review the design teams structural capacity needs for the foundation member for confirmation of bedrock support prior to issuing final design documents.

Drive shoes can be used with the piles, however the drive shoes must be of suitable dimension to allow for installed grouted anchors through pile annular space.

To resist the anticipated frost uplift forces the recommended foundation system would include all-thread rods grouted into the basalt rock through the tip of the seated micro-piles. The grouted anchor rods should be 0.75-inch diameter or as recommended by the structural engineer. The design is based on the grouted rods developing at least 80 pounds per square inch (psi) allowable strength along the grout / rock interface. The grouted anchor rods should be installed and grouted at least six (6) feet into competent basalt rock.

6.1.2 Lateral Loading of Grouted Micro-Piles

For preliminary design considerations, Ensoft's software LPILE version 2012.6.37 was used to estimate lateral capacity for a range of pile head deflections. The lateral capacity of the piles should be further analyzed as the project develops with coordination from the structural and civil engineers. The pile capacity response to applied lateral loads will be affected by pile stickup height from the ground surface. Structural framing and bracing will further define the pile head conditions as free head, fixed head, or partially fixed head.

Table 1 shows the estimated deflection with applied lateral load for a vertically installed 6-inch diameter, schedule 40 pipe pile with 3-foot stickup through unfrozen silt. For example, a free head pile installed at the site with pile stickup height of three feet would develop a 1-inch deflection at the pile cap with an estimated applied lateral load of 1.4 kips. These preliminary calculations are presented for planning that will require confirmation as the lateral loads and pile geometry are determined. Pile stresses under these lateral loads should be reviewed by the structural engineer.

Table 1: Estimated Lateral Deflection with Applied Lateral Load: 6-inch diameter Grouted Pipe Pile

Pile Stickup	Pile Head Condition	0.25 inch Deflection	0.5 inch Deflection	1 inch Deflection
3 feet	Free Head	0.5 kips	0.85 kips	1.4 kips

6.1.3 Seismic Design Criteria

Based on site conditions observed, the proposed building locations should meet seismic site class "D" criteria as defined in the International Building Code Seismic site class "D" is defined as, "Stiff soil with an average Standard Penetration Test (SPT) "N" value between 15 and 50 in the upper 100 feet". It is important to note that relative densities based on SPT "N" values were not determined in this area under our scope of services. However, soils with SPT "N" values between 15 and 50 can be reasonably expected at these sites, particularly with depth. It is also reasonable to expect permafrost or basalt rock to be encountered within 100 feet below of the surface in areas around Chefornak.

The criteria are based on mapped spectral response acceleration for short periods (S_s) of 0.2g and mapped spectral response accelerations for a 1 second period (S₁) of 0.13g.

Site coefficient factors F_a and F_v of 1.6 and 2.2, respectively, are considered appropriate to determine seismic characteristics for Site Class "D". Based on these values, the design spectral response acceleration for short period and 1-second period for Site Class "D" can be determined using the following equations:

SD_s = 2/3 F_aS_s and SD₁ = 2/3 F_vS₁

SD_s = 0.21g and SD₁ = 0.19g

Liquefaction of saturated finer-grained soil, in particular fine to medium grained sands, may occur during seismic events. However, based on our site findings and our general knowledge of the area geology, the risk of liquefaction is considered low unless saturated fine grained sand soils are present. If the project warrants a more refined liquefaction analysis, site-specific geotechnical test borings will be necessary as part of the liquefaction assessment.

6.1.4 Grouted Micro-Pile Installation

While bedrock was not observed during this investigation previous explorations have noted discontinuous volcanic flow consisting of vesicular basalt below the silt at variable depths, but generally between 20 and 30 feet below ground surface. However, 40 foot depths, possibly deeper, to suitable end bearing basalt is possible in the area. Due to the lack of a site specific geotechnical drilling program the soil bedrock contact elevation should be expected to vary by up to 10 feet for planning purposes. Additional micro-pile length will be needed if greater variability in depth to bedrock is present. We do not advise reliance on skin friction or adfreeze bond shear strength for long-term pile axial capacity unless a site specific deeper geotechnical site investigation is conducted.

We have assumed the micro-pile can be advanced to a firm, non-yielding state on competent bedrock through the overlying silt and potential float rock with and air-track or similar drill. The annulus would then be cleaned of soil and rock fragments to the bedrock seating surface. After the pile interior annulus is properly cleaned we recommend minimum 0.75-inch diameter 75-ksi all-thread anchor rods be installed below the pile tip. The anchor rods would be installed through a nominal 3-inch diameter, or larger, bore hole advanced inside the pile through the underlying rock.

The anchor will require tremmie-placed grout from the bottom of the anchor upwards with a fast setting Portland cement or Fondue cement grout. If desired by the contractor, fine grained silica sand may be added to the grout mixture at no more than 1 sand : 3 grout by mass ratio. We recommend continuous grouting through the rock section without pre-tensioning. We have assumed that the anchor rods set at least 6 feet into competent hard basalt would be installed through each pile. The basalt through the grouted anchor section may be fractured or have significant voids thus grout loss may occur.

Grout sequencing of the anchors and piles warrants consideration. The anchors should be grouted their full rock embedment lengths with the grout extending no more than one (1) foot above the pile tip if the tension testing uses the pile as the reaction base. If the tension testing reaction base is independent of the pile, a thicker grout section inside the pile annular space is permitted.

After the rock section grout has cured, the anchor rods should be tensioned tested. We have assumed tensions will be conducted against the top plate. We recommend tensioning each rock section grouted anchor to 50-kips then backing down the lock off load of 15-kips. The Post Tensioning Institute's recommended practices for proof testing grouted anchors are recommended. Deflection and load measurements should be collected during anchor tensioning as part of the construction installation records.

We have assumed winter construction (frozen ground) for installing the grouted micro-pile foundation. We have based our recommendation on winter construction due to the challenging site conditions and to reduce adverse impacts on the existing tundra surface. If summer construction is under consideration, we recommend using temporary construction mats or an insulated permanent fill pad to protect the tundra surface. We should be notified as soon as possible if construction during thawed surface soil conditions is under consideration.

6.2 Boardwalk Foundations

Based on conversations with CE2 we understand that the preferred foundation for the boardwalk connecting Pumphouse #2 to the existing wells will be helical anchors. Helical anchors need to be

sufficiently embedded to resist axial compression, frost heave forces, and lateral forces. Axial compression loads consist of the boardwalk's self-weight and traffic loads. The design axial compression helical anchor loads, used for analysis in this report, are 2.7 kips allowable load per helical anchor. The frost heave force is assumed to be 40 pounds per square inch (psi) uplift force acting over the riser's embedment within the active layer. For a minimum recommended riser diameter of 3.5 inches and an active layer of 4 feet (conservative estimate for the project area), the design frost force is 21 kips. We have assumed a 1,000 pound lateral load applied three feet above the ground surface for the purposes of this analysis.

G:\ACAD\CHIEFORNAK\2014 Pumphouse Improvements\Pump House 1\G5.0 GEOTECHNICAL.dwg, 3/20/2015 2:09:34 PM, cmerz, \\Ce2main\LANIER MP C2050\LD520C PCL 6

Chefornak Pumphouses



Chefornak Pumphouses



Chefornak Pumphouses



sufficiently embedded to resist axial compression, frost heave forces, and lateral forces. Axial compression loads consist of the boardwalk's self-weight and traffic loads. The design axial compression helical anchor loads, used for analysis in this report, are 2.7 kips allowable load per helical anchor. The frost heave force is assumed to be 40 pounds per square inch (psi) uplift force acting over the riser's embedment within the active layer. For a minimum recommended riser diameter of 3.5 inches and an active layer of 4 feet (conservative estimate for the project area), the design frost force is 21 kips. We have assumed a 1,000 pound lateral load applied three feet above the ground surface for the purposes of this analysis.

RECORD DRAWING CERTIFICATE
THESE DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION. INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.

SCALE: AS SHOWN
DATE: OCT. 2014

CONSTRUCTION RECORD
FIELD BOOK
STAKING
FOREMAN
AS-BUILT
INSPECTOR



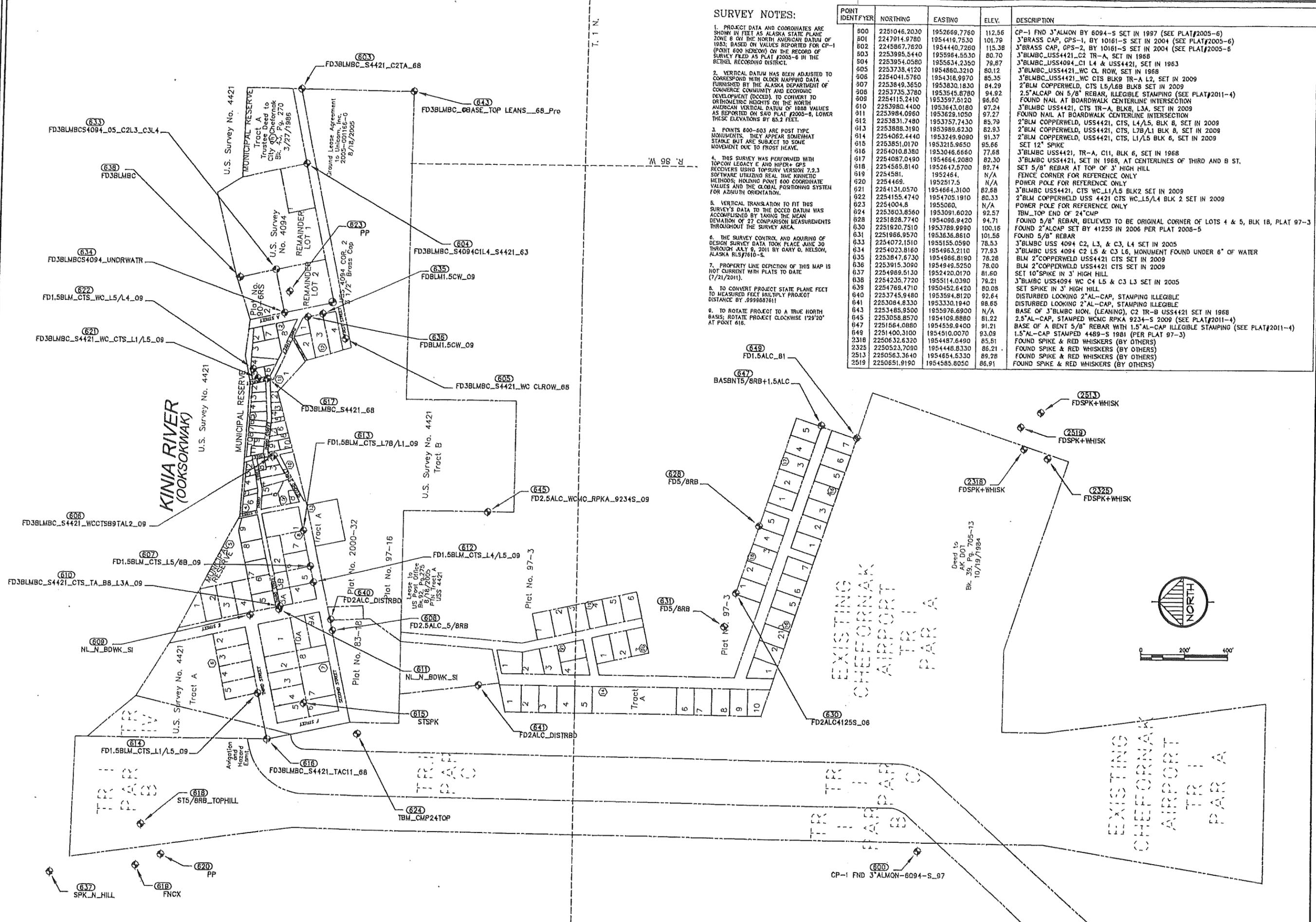
PUMP HOUSE 1 IMPROVEMENTS
GEOTECHNICAL INFORMATION
CHEFORNAK, ALASKA



Table with 2 columns: REVISION, BY DATE

Project No. _____ Date OCT. 2014
Designed _____ Drawn _____ Approved _____

G:\ACAD\CHIEF\MAX\2014 Pumphouse Improvements\Pump House 1\C1.0 SURVEY CONTROL.dwg, 3/30/2015 2:08:28 PM, cmerz, \\C2zmain\LANIER, MP C2050\LD520C PCL 6



SURVEY NOTES:

- PROJECT DATA AND COORDINATES ARE SHOWN IN FEET AS ALASKA STATE PLANE ZONE 8 ON THE NORTH AMERICAN DATUM OF 1983, BASED ON VALUES REPORTED FOR CP-1 (POINT 600 HEREIN) ON THE RECORD OF SURVEY FILED AS PLAT #2005-6 IN THE BETHEL RECORDING DISTRICT.
- VERTICAL DATUM HAS BEEN ADJUSTED TO CORRESPOND WITH OLDER MAPPING DATA FURNISHED BY THE ALASKA DEPARTMENT OF COMMERCE COMMUNITY AND ECONOMIC DEVELOPMENT (DCCED), TO CONVERT TO ORTHOMETRIC HEIGHTS ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 VALUES AS REPORTED ON SAID PLAT #2005-6, LOWER THESE ELEVATIONS BY 85.2 FEET.
- POINTS 600-603 ARE POST TYPE MONUMENTS. THEY APPEAR SOMEWHAT STABLE BUT ARE SUBJECT TO SOME MOVEMENT DUE TO FROST HEAVE.
- THIS SURVEY WAS PERFORMED WITH TOPCON LEICA E AND HIPER+ GPS RECEIVERS USING TOPSURV VERSION 7.2.3 SOFTWARE UTILIZING REAL TIME KINETIC METHODS, HOLDING POINT 600 COORDINATE VALUES AND THE GLOBAL POSITIONING SYSTEM FOR AZIMUTH ORIENTATION.
- VERTICAL TRANSLATION TO FIT THIS SURVEY'S DATA TO THE DCCED DATUM WAS ACCOMPLISHED BY TAKING THE MEAN DEVIATION OF 27 COMPARISON MEASUREMENTS THROUGHOUT THE SURVEY AREA.
- THE SURVEY CONTROL AND ACQUIRING OF DESIGN SURVEY DATA TOOK PLACE JUNE 30 THROUGH JULY 9, 2011 BY GARY D. NELSON, ALASKA RL57610-S.
- PROPERTY LINE DEPICTION OF THIS MAP IS NOT CURRENT WITH PLATS TO DATE (7/21/2011).
- TO CONVERT PROJECT STATE PLANE FEET TO MEASURED FEET MULTIPLY PROJECT DISTANCE BY .999887611
- TO ROTATE PROJECT TO A TRUE NORTH 645IS; ROTATE PROJECT CLOCKWISE 1'29"20" AT POINT 616.

POINT IDENTIFYER	NORTHING	EASTING	ELEV.	DESCRIPTION
600	2251046.2030	1952669.7760	112.56	CP-1 FND 3"ALMON BY 6094-S SET IN 1997 (SEE PLAT#2005-6)
601	2247914.9780	1954419.7530	101.79	3"BRASS CAP, GPS-1, BY 10161-S SET IN 2004 (SEE PLAT#2005-6)
602	2245867.7620	1954440.7260	115.38	3"BRASS CAP, GPS-2, BY 10161-S SET IN 2004 (SEE PLAT#2005-6)
603	2253985.5440	1955964.5530	80.70	3"BLMBC_USS4421_C2 TR-A, SET IN 1968
604	2253954.0580	1955634.2360	79.87	3"BLMBC_USS4094_C1 L4 & USS4421, SET IN 1963
605	2253738.4120	1954860.3210	80.12	3"BLMBC_USS4421_WC CL ROW, SET IN 1968
606	2254041.5760	1954318.9970	85.35	3"BLMBC_USS4421_WC CTS BLK9 TR-A L2, SET IN 2009
607	2253849.3650	1953830.1830	84.29	2"BLM COPPERWELD, CTS L5/L6B BLK8 SET IN 2009
608	2253735.3780	1953545.8780	94.92	2.5"ALCAP ON 5/8" REBAR, ILLEGIBLE STAMPING (SEE PLAT#2011-4)
609	2254115.2410	1953597.5120	96.60	FOUND NAIL AT BOARDWALK CENTERLINE INTERSECTION
610	2253980.4460	1953629.1050	97.27	3"BLMBC USS4421, CTS TR-A, BLK8, L3A, SET IN 2009
611	2253984.0980	1953757.7430	85.79	FOUND NAIL AT BOARDWALK CENTERLINE INTERSECTION
612	2253831.7480	1953989.6230	82.63	2"BLM COPPERWELD, USS4421, CTS, L7B/L1 BLK 8, SET IN 2009
613	2253888.3190	1953989.6230	91.37	2"BLM COPPERWELD, USS4421, CTS, L1/L5 BLK 6, SET IN 2009
614	2254062.4440	1953249.9090	95.66	SET 12" SPIKE
615	2253851.0170	1953215.9650	77.68	3"BLMBC USS4421, TR-A, C11, BLK 6, SET IN 1968
616	2254010.8380	1953046.6660	82.30	3"BLMBC USS4421, SET IN 1968, AT CENTERLINES OF THIRD AND B ST.
617	2254087.0490	1954664.2080	82.74	SET 5/8" REBAR AT TOP OF 3' HIGH HILL
618	2254565.8140	1952647.5700	N/A	FENCE CORNER FOR REFERENCE ONLY
619	2254581.	1952464.	N/A	POWER POLE FOR REFERENCE ONLY
620	2254469.	1952517.5	N/A	POWER POLE FOR REFERENCE ONLY
621	2254131.0570	1954664.3100	82.68	3"BLMBC USS4421, CTS WC_L1/L5 BLK2 SET IN 2009
622	2254155.4740	1954705.1910	80.33	2"BLM COPPERWELD USS 4421 CTS WC_L5/L4 BLK 2 SET IN 2009
623	2254004.8	1955060.	N/A	POWER POLE FOR REFERENCE ONLY
624	2253603.8560	1953091.6020	92.57	TBM TOP END OF 24" CMP
625	2251828.7740	1954098.9420	94.71	FOUND 5/8" REBAR, BELIEVED TO BE ORIGINAL CORNER OF LOTS 4 & 5, BLK 1B, PLAT 97-3
626	2251920.7510	1953789.9990	101.16	FOUND 2"ALCAP SET BY 4125S IN 2006 PER PLAT 2008-5
627	2251966.9570	1953836.8610	101.56	FOUND 5/8" REBAR
628	2254072.1510	1955155.0590	78.53	3"BLMBC USS 4094 C2, L3, & C3, L4 SET IN 2005
629	2254023.8160	1954963.2110	77.93	3"BLMBC USS 4094 C2 L5 & C3 L6, MONUMENT FOUND UNDER 6" OF WATER
630	2253847.6730	1954966.8190	78.28	BLM 2" COPPERWELD USS4421 CTS SET IN 2009
631	2253915.3090	1954949.5250	78.00	BLM 2" COPPERWELD USS4421 CTS SET IN 2009
632	2254069.5130	1952420.0170	81.60	SET 10" SPIKE IN 3' HIGH HILL
633	2254235.7720	1955114.0390	79.21	3"BLMBC USS4094 WC C4 L5 & C3 L3 SET IN 2005
634	2254769.4710	1950452.6420	80.08	SET SPIKE IN 3' HIGH HILL
635	2253745.9480	1953594.8120	92.64	DISTURBED LOOKING 2"AL-CAP, STAMPING ILLEGIBLE
636	2253084.8330	1953330.1940	98.85	DISTURBED LOOKING 2"AL-CAP, STAMPING ILLEGIBLE
637	2253485.9500	1955976.6900	N/A	BASE OF 3"BLMBC MON. (LEANING), C2 TR-B USS4421 SET IN 1968
638	2253058.8570	1954109.8880	81.22	2.5"AL-CAP, STAMPED WCMC RPKA 9234-S 2009 (SEE PLAT#2011-4)
639	2251564.0880	1954559.9400	91.21	BASE OF A BENT 5/8" REBAR WITH 1.5"AL-CAP ILLEGIBLE STAMPING (SEE PLAT#2011-4)
640	2251400.3100	1954510.0070	93.09	1.5"AL-CAP STAMPED 4489-S 1981 (PER PLAT 97-3)
641	2250632.6320	1954487.6490	85.81	FOUND SPIKE & RED WHISKERS (BY OTHERS)
642	2250523.7090	1954448.8330	86.21	FOUND SPIKE & RED WHISKERS (BY OTHERS)
643	2250563.3640	1954654.5330	89.28	FOUND SPIKE & RED WHISKERS (BY OTHERS)
644	2250651.9190	1954585.8050	86.91	FOUND SPIKE & RED WHISKERS (BY OTHERS)

RECORD DRAWINGS REFLECT RECORDED INFORMATION OBTAINED DURING CONSTRUCTION. INFORMATION PROVIDED HEREIN IS ACCURATE TO THE BEST OF MY KNOWLEDGE.

SCALE: AS SHOWN

CONSTRUCTION RECORD

FIELD BOOK

STAKING

FORSMAN

AS-BUILT

INSPECTOR

STATE OF ALASKA

48TH

Survey Control

CHEIFORNAK, ALASKA

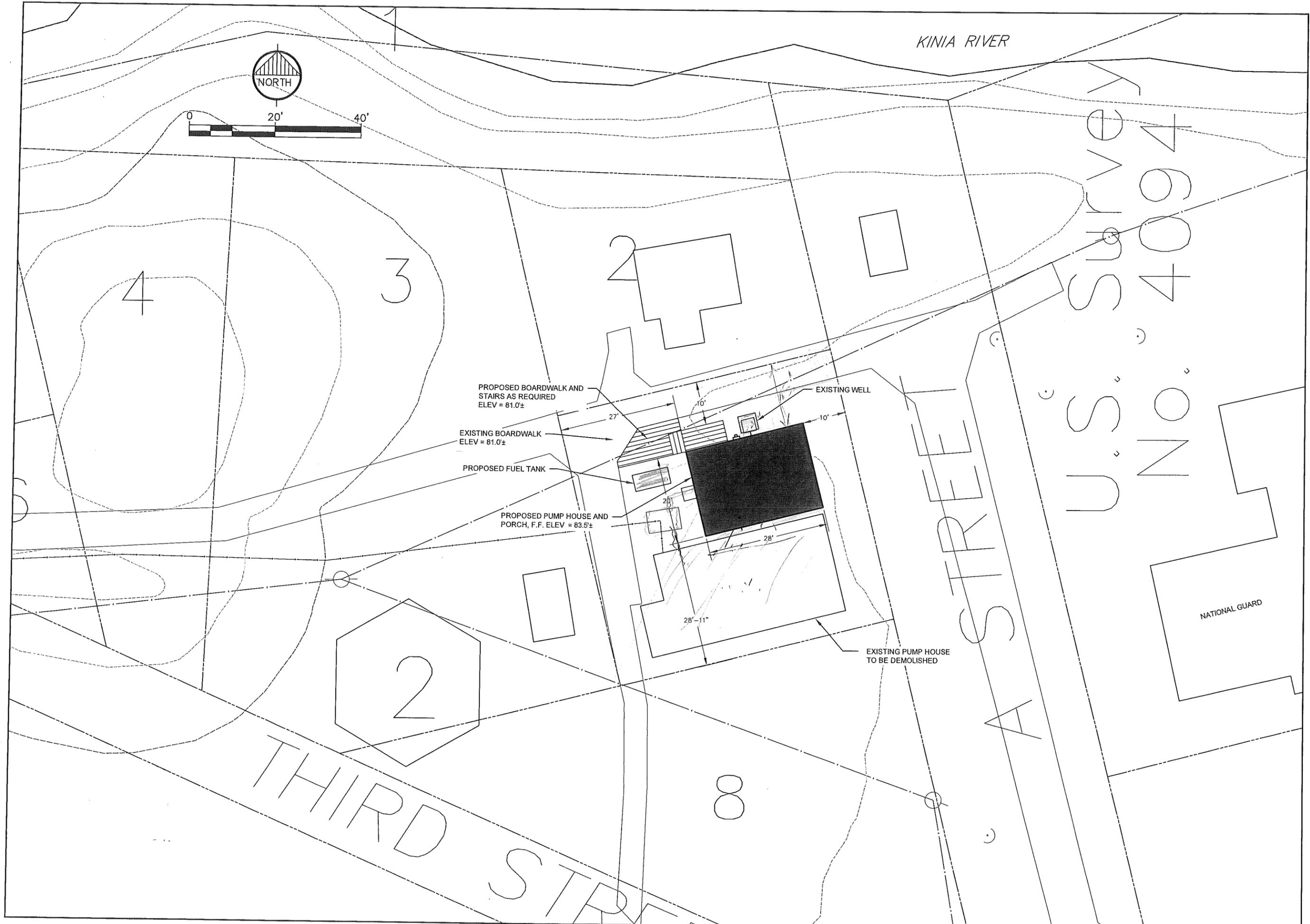
CER ENGINEERS, INC.

PO BOX 22046 ANCHORAGE, AK 99521 PH: 907-566-1011 FAX: 907-566-0115

REVISION	BY	DATE

Project No. _____ Date _____ Designed _____ CML _____ GN _____

Sheet No. **C1.0**



RECORD DRAWING CERTIFICATE
 THESE DRAWINGS REFLECT RECORDED
 INFORMATION OBTAINED DURING
 CONSTRUCTION. INFORMATION PROVIDED
 HEREIN IS ACCURATE TO THE BEST OF MY
 KNOWLEDGE.
 NAME _____ DATE _____

SCALE:
 AS SHOWN
 BAR IS ONE INCH OR
 ORIGINAL DRAWING
 IF NOT ONE INCH OR
 ORIGINAL DRAWING
 SCALE IS 1/8" = 1'-0"
 SCALE IS 1/4" = 1'-0"

CONSTRUCTION RECORD	
FIELD BOOK	_____
STAKING	_____
FOREMAN	_____
AS-BUILT	_____
INSPECTOR	_____



PUMP HOUSE 1
 IMPROVEMENTS
 SITE PLAN
 CHEFORNAK, ALASKA



REVISION	BY	DATE

Project No. _____ Date OCT. 2014
 Designed by PCW
 Drawn by CW
 Approved by PCW

Sheet No. C4.0
 SHEET OF

CODE ANALYSIS

PROJECT: CHEFORNAK PUMP HOUSE I
APPLICABLE CODES: INTERNATIONAL BUILDING CODE 2009 EDITION
 INTERNATIONAL MECHANICAL CODE 2009 EDITION
 NATIONAL ELECTRICAL CODE 2009 EDITION
 UNIFORM PLUMBING CODE 2007 EDITION
 INTERNATIONAL FIRE CODE 2009 EDITION
 INTERNATIONAL REL. GAS CODE 2009 EDITION
 ADA - ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES 2009 EDITION

CONSTRUCTION TYPE: V-B
BUILDING OCCUPANCY: U (UTILITY - WATER PUMP HOUSE)

GROSS BUILDING AREA: 672 SF.

BASIC ALLOWABLE HEIGHT AND AREA PER TABLE 503

ALLOWABLE AREA: 5,000 SF. (U) 1 STORY = 672 < 5,000 = OK

OCCUPANCY SEPARATION PER 508.3.2 NON-SEPARATED OCCUPANCIES

NO SEPARATION REQUIRED.

INCIDENTAL USE AREA SEPARATION (PER 508.2.5 & TABLE 508.2.5)

BOILER ROOM EQUIPMENT ROOM < 15 PSI AND 10 HP

FURNACE < 400,000 BTU = NO RATED WALLS REQUIRED

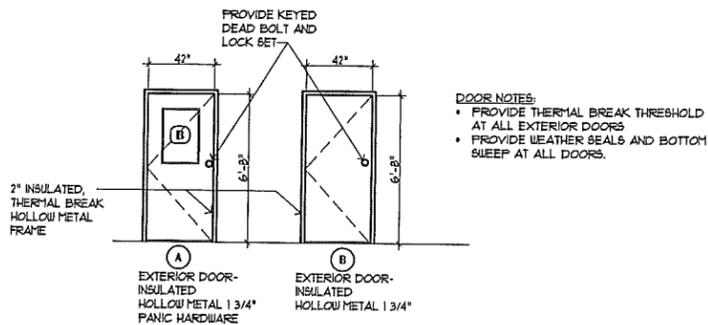
FIRE-RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE

SEPARATION DISTANCE 10' ≤ X < 30' = 0 RATING REQUIRED FOR GROUP U/ TYPE VB

LEGEND

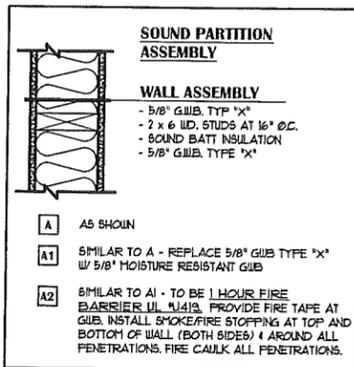
APPLIES TO SHEET AU # A12

- WALL ASSEMBLY - SEE WALL TYPES.
- DOOR - SEE SCHEDULE
- KEYED SHEET NOTE - SEE SHEET AU
- WALL TYPE INDICATOR - SEE SHEET AU
- DOOR TYPE INDICATOR - SEE SHEET AU
- WINDOW TYPE INDICATOR - SEE SHEET AU
- 1 HOUR WALL - FULL HT.
- FIRE EXTINGUISHER WITH WALL BRACKET
NFFA 10 LB, DRY CHEMICAL (4A-60B-C)
- FENCE BELOW



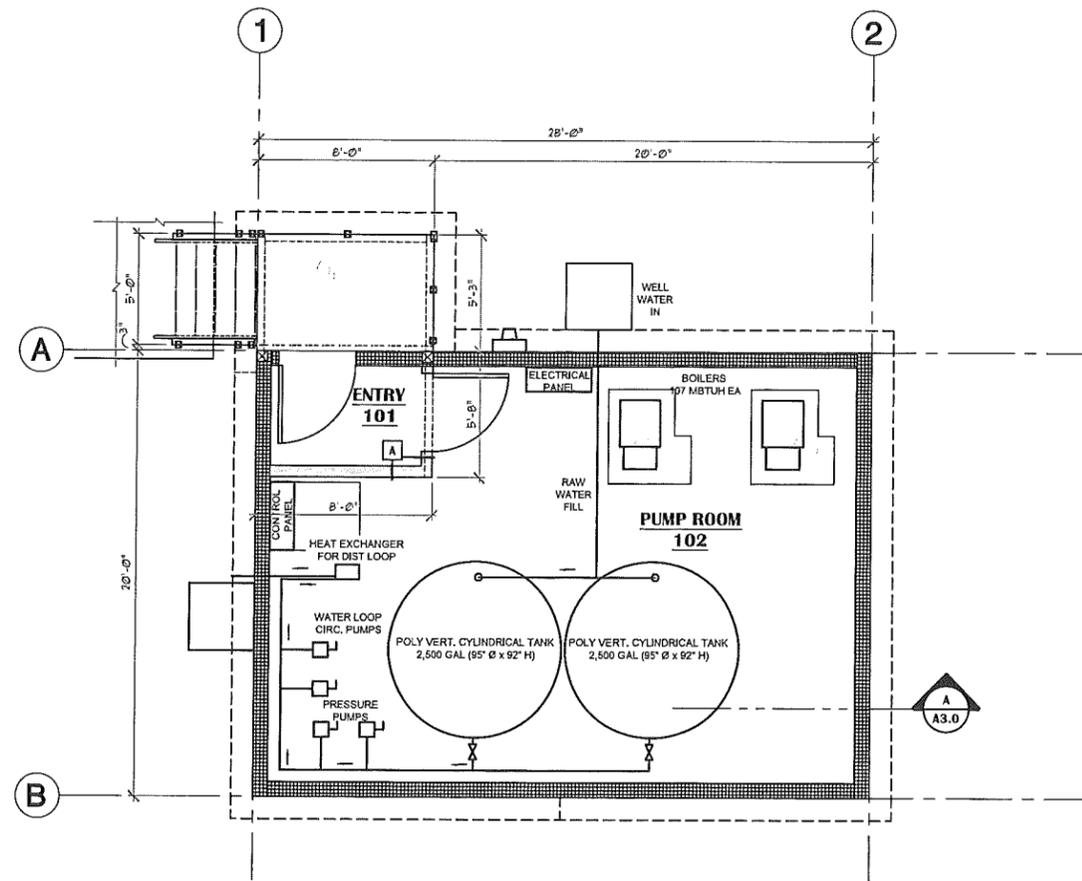
3 DOOR SCHEDULE

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



2 WALL TYPES

SCALE: 1/2"=1'-0"



- WALL TYPES-GENERAL NOTES:**
1. IET SIDE OF WALL REFERS TO TOILET/SHOWER ROOMS AND LAUNDRY ROOMS
 2. ALL GIBB TO BE TYPE "X"
 3. CONTRACTOR TO PROVIDE BACKING AS REQUIRED FOR ALL WALL MOUNTED FIXTURES AND EQUIPMENT. BACKING NOT IDENTIFIED IN WALL TYPES, COORDINATE W/ MECHANICAL DUGS AND MANUFACTURER CUT SHEETS.
 4. REFER TO BUILDING SECTIONS FOR EXTERIOR WALL ASSEMBLY
 5. INSTALL 1/2" PLYWOOD UP TO 8' IN AREAS WITH WALL MOUNTED PUMPS. PAINT WHITE.



SCALE: AS SHOWN
 1" = 10'-0" (VERTICAL)
 1" = 10'-0" (HORIZONTAL)
 IF NOT ONE INCH ON THIS SHEET, INDICATE SCALE APPROPRIATELY

CONSTRUCTION RECORD	FIELD BOOK	STAKING	FOREMAN	AS-BUILT	INSPECTOR

PUMP HOUSE #1 IMPROVEMENTS
 FLOOR PLAN
 CHEFORNAK, ALASKA



REVISION	BY	DATE

Project No.	INVAR 1447
Date	April 21, 2015
Designed	BT
Drawn	JH
Approved	ECW

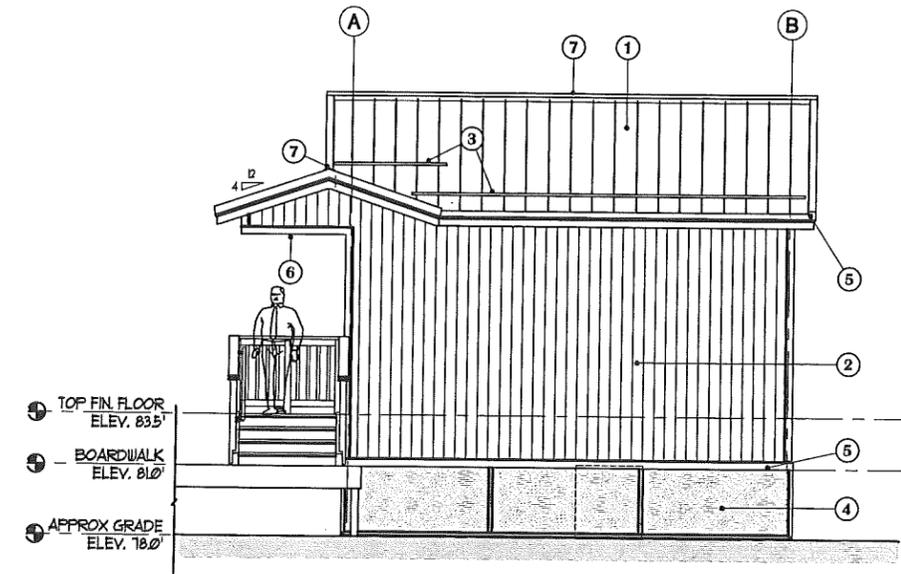
Sheet No. **A1.0**
 SHEET OF

GENERAL SHEET NOTES

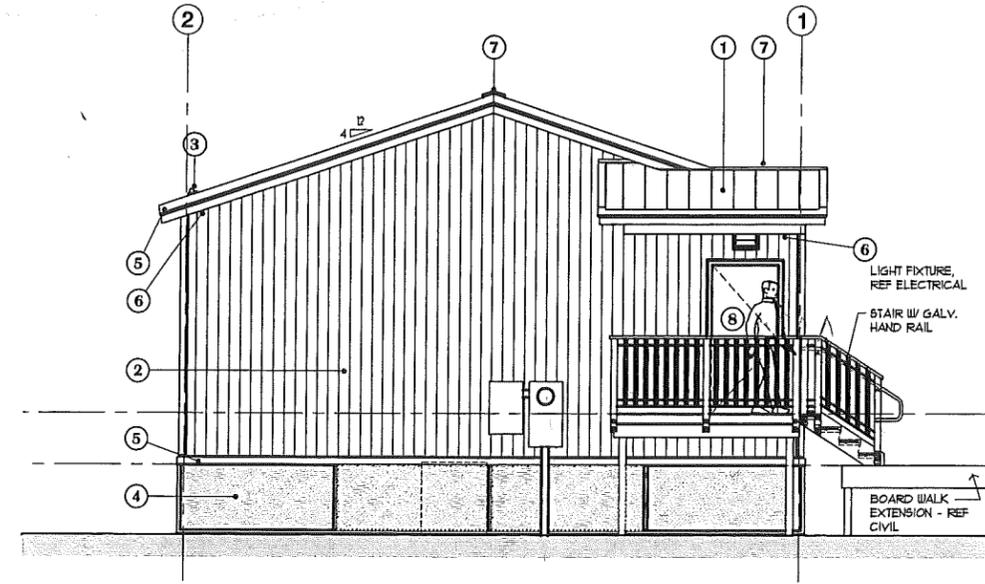
1 REFER TO CIVIL DRAWINGS FOR ALL FINAL SITE ELEVATIONS.

MATERIAL LEGEND

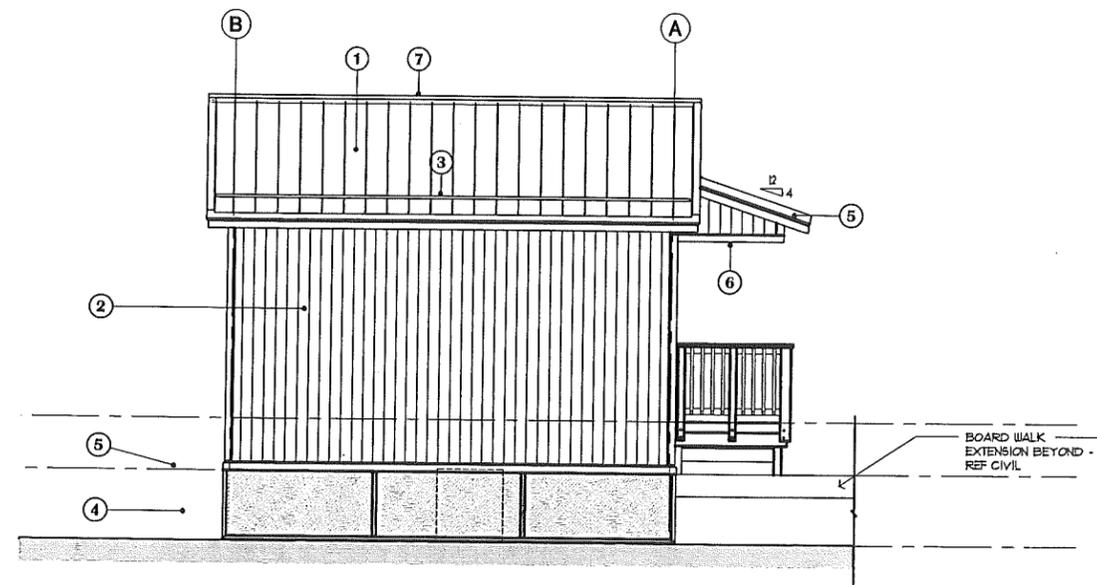
- 1 'KLIP-RIB' METAL ROOF
- 2 METAL SIDING
- 3 SNOW CLEATS
- 4 CHAIN LINK SKIRT W/ TOP & BOTTOM RAIL
- 5 METAL FLASHINGS - REF BUILDING SECTIONS
- 6 PERFORATED METAL SOFFIT AT EAVE & CANOPY
- 7 CONT. VENTED METAL RIDGE CAP. PROVIDE NON-VENTED AT ENTRY COVER
- 8 H/1 DOOR - REF. SHEET A11



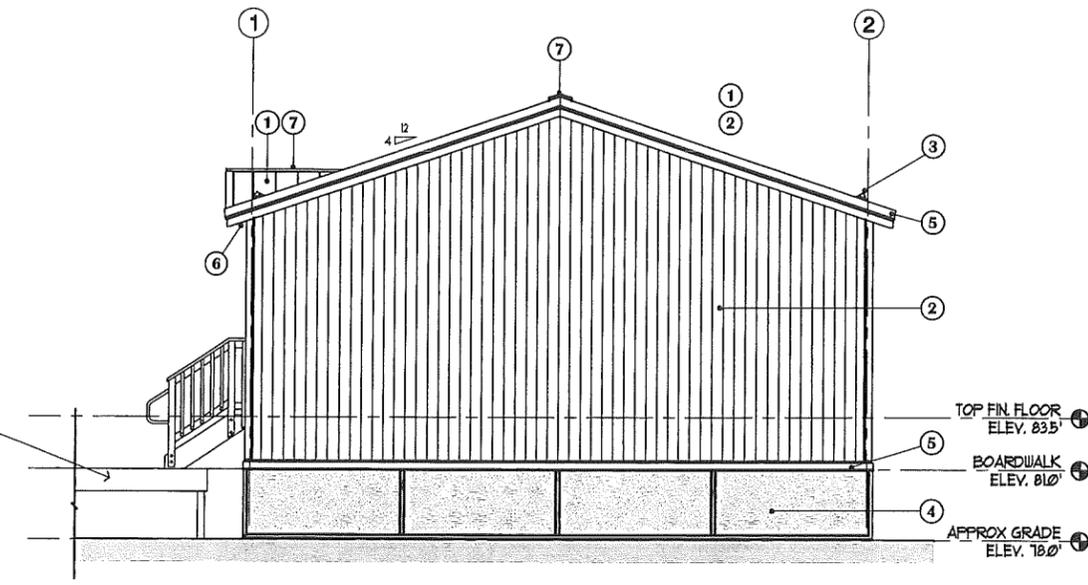
4 WEST ELEVATION
SCALE: 1/4"=1'-0"



3 NORTH ELEVATION
SCALE: 1/4"=1'-0"



2 EAST ELEVATION
SCALE: 1/4"=1'-0"



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



SCALE: AS SHOWN
1" = 10'-0"
IF NOT ONE INCH ON THIS SHEET, ADJUST COULD ACCORDINGLY

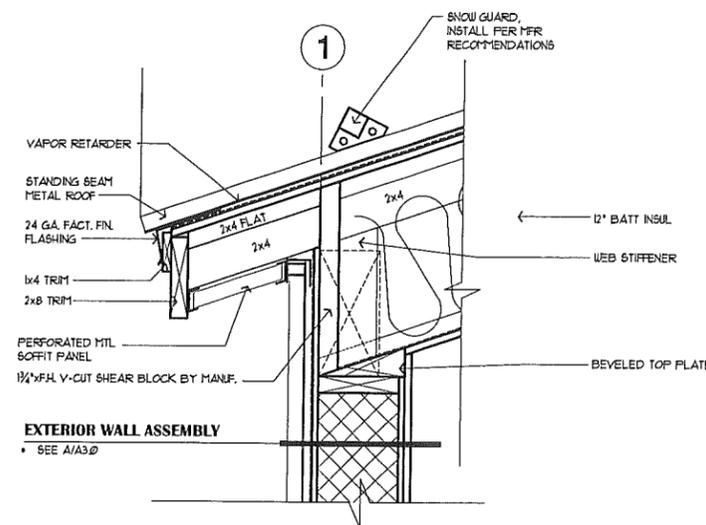
CONSTRUCTION RECORD	
FIELD BOOK	
STAKING	
FOREMAN	
AS-BUILT	
INSPECTOR	

PUMP HOUSE #1 IMPROVEMENTS
EXTERIOR ELEVATIONS
CHEFORNAK, ALASKA

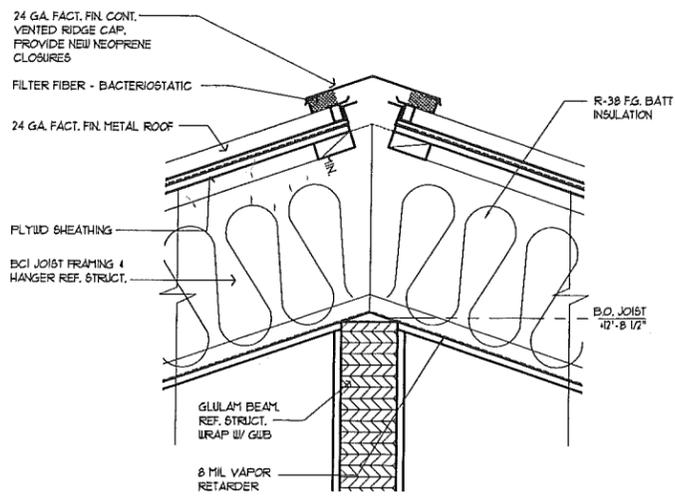


REVISION	BY	DATE

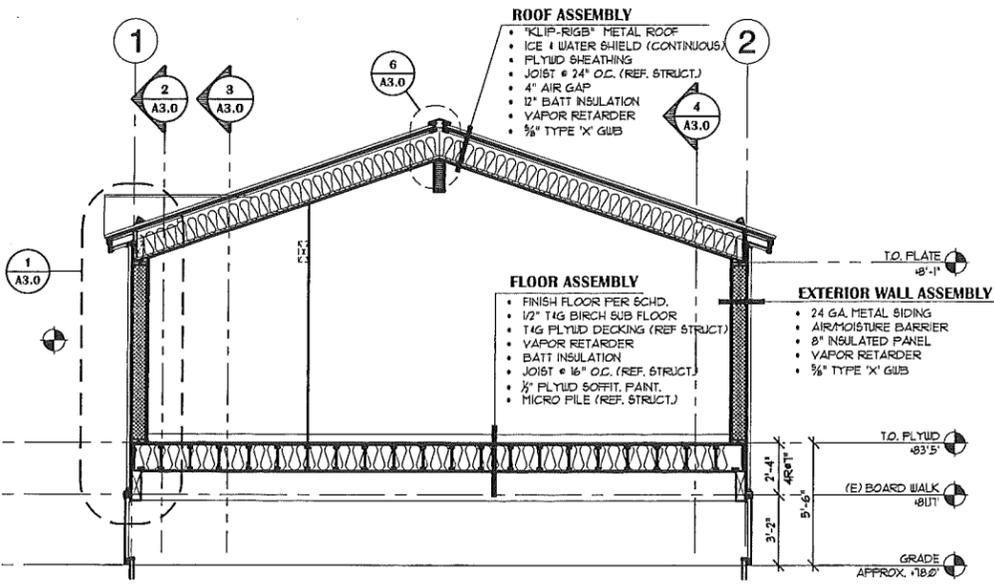
Project No. NVA# 1447	Date April 21, 2015	Designed BT	Drawn JH	Approved PCW
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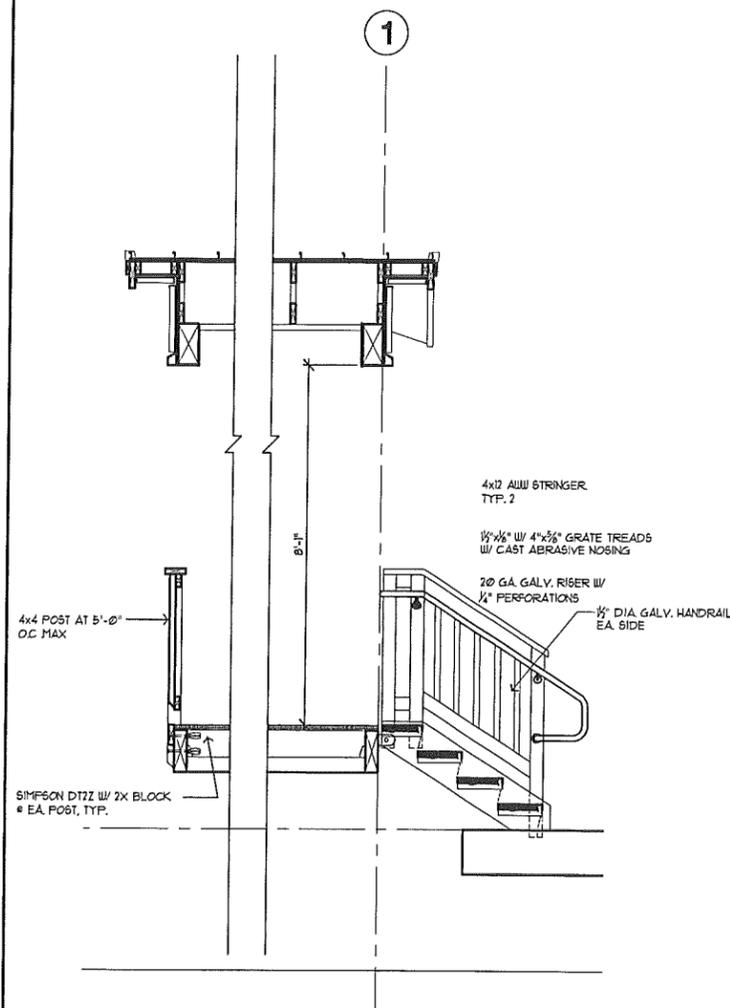
7 EAVE DETAIL
SCALE: 1/4"=1'-0"



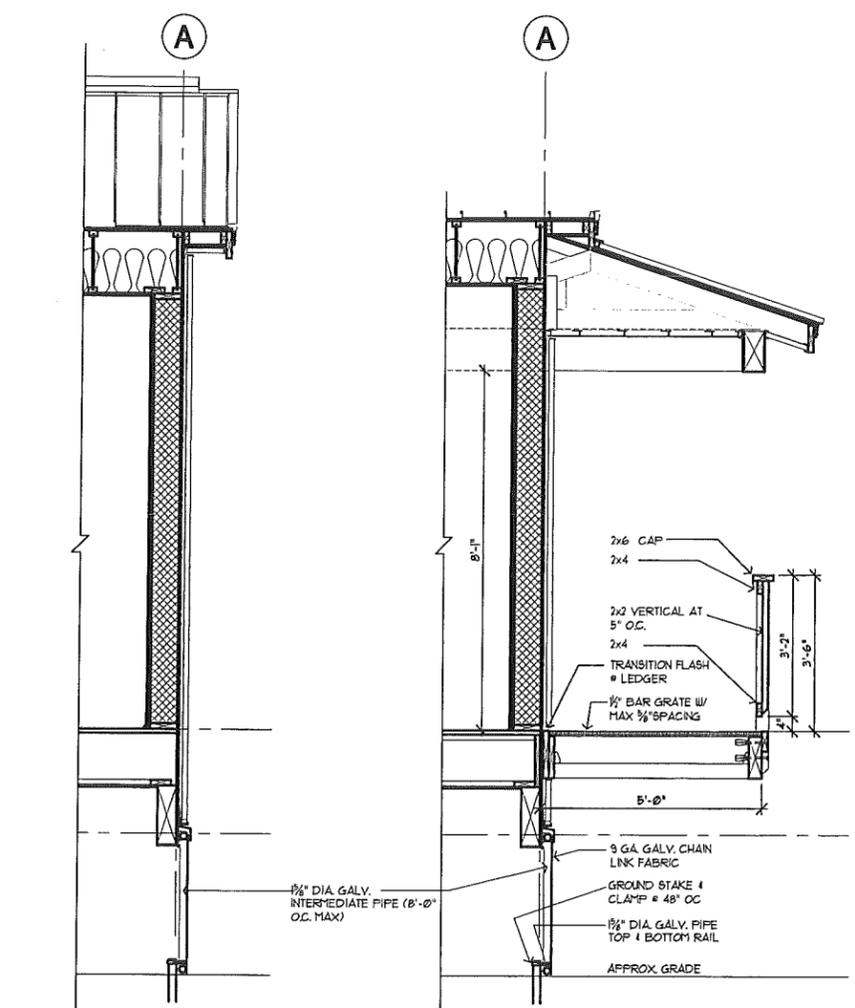
6 RIDGE VENT DETAIL
SCALE: 1/4"=1'-0"



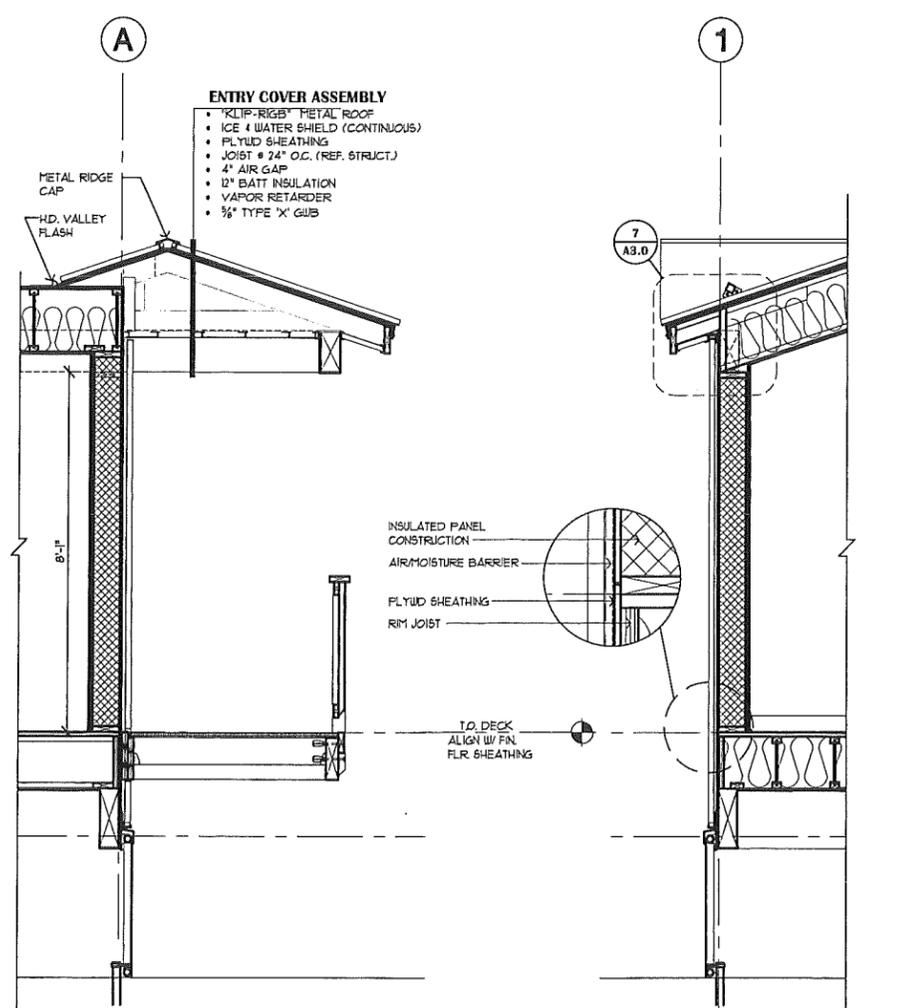
A BUILDING SECTION
SCALE: 1/4"=1'-0"



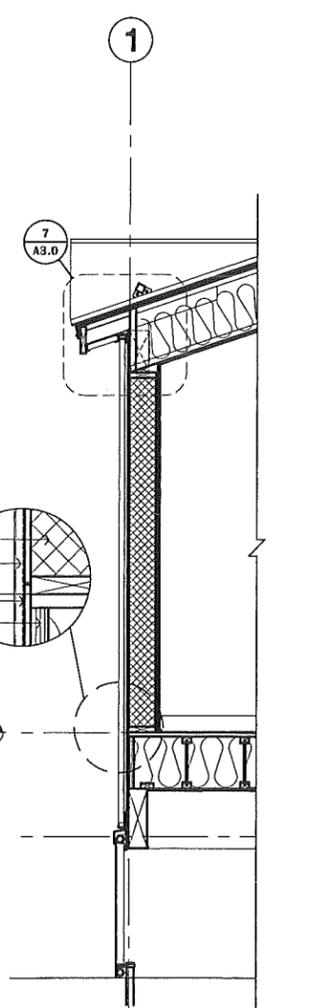
5 WALL SECTION
SCALE: 1/2"=1'-0"



4 WALL SECTION
SCALE: 1/2"=1'-0"



2 WALL SECTION
SCALE: 1/2"=1'-0"



1 WALL SECTION
SCALE: 1/2"=1'-0"

VISION ARCHITECTURE
1231 Gambel St. 400
Anchorage, Alaska 99501
907-349-1425

SCALE: AS SHOWN

CONSTRUCTION RECORD

FIELD BOOK	STAKING	FOREMAN	AS-BUILT	INSPECTOR
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PUMP HOUSE #1 IMPROVEMENTS
BUILDING SECTION
CHEFORKNAK, ALASKA

CEI ENGINEERS, INC.
PO BOX 222616 ANCHORAGE, AK 99523 PH: 907-349-1010 FAX: 907-349-1015

BY	DATE
REVISION	

Project No.	NVA# 1447
Date	April 21, 2015
Designed	BT
Drawn	JH
Approved	PCW

Sheet No. **A3.0**
SHEET OF

STRUCTURAL NOTES

THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS AMONG THE DRAWINGS BEFORE STARTING ANY WORK OR FABRICATION. ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, SITE CONDITIONS, SPECIFICATIONS AND THESE NOTES SHALL BE REPORTED TO THE ARCHITECT/ENGINEER AT ONCE.

ALL CONSTRUCTION SHALL COMPLY WITH THE 2009 INTERNATIONAL BUILDING CODE (IBC) AS AMENDED BY THE LOCAL BUILDING OFFICIAL.

SAFETY - THE CONTRACTOR IS RESPONSIBLE FOR MEETING ALL OSHA SAFETY STANDARDS. THE CONTRACTOR IS IN CHARGE OF ALL SAFETY MATTERS ON AND AROUND THE JOB SITE. PROVIDE TEMPORARY ERECTION BRACING AND SHORING AS REQUIRED FOR STABILITY OF THE STRUCTURE DURING ALL PHASES OF CONSTRUCTION.

CODE
2009 INTERNATIONAL BUILDING CODE (IBC)

DESIGN LIVE LOADS

FLOOR LOADS - SEE DESIGN LOAD SCHEDULE SHEET S-11
MINIMUM ROOF LIVE LOAD = 20 PSF

SNOW

GROUND SNOW LOAD = 50 PSF
ROOF SNOW LOAD = 40 PSF
SNOW EXPOSURE FACTOR, $C_e = 0.90$
SNOW LOAD IMPORTANCE FACTOR = 1.0
THERMAL FACTOR, $C_t = 1.0$

WIND DESIGN DATA

VELOCITY = 130 MPH HOUR 3 SECOND GUST
IMPORTANCE FACTOR, $I_w = 1.0$
EXPOSURE C
INTERNAL PRESSURE COEFFICIENT, $G_{Cp1} = \pm 0.18$
COMPONENTS AND CLADDING PRESSURES,
ROOF
ZONE 3 - WITHIN 8' OF CORNERS = 92.3 PSF
ZONE 2 - WITHIN 8' OF EAVE AND PEAK = 62.4 PSF
ZONE 1 - EVERYWHERE ELSE = 36.0 PSF
WALLS
ZONE 5 - WITHIN 8' OF VERTICAL CORNERS = 52.5 PSF
ZONE 4 - EVERYWHERE ELSE = 42.6 PSF

SEISMIC DESIGN DATA

$I_s = 1.0$
 $S_s = 1.00g$, $S_1 = 0.06g$, $S_D5 = .116$, $S_D1 = 0.09$
SITE CLASS D
SEISMIC DESIGN CATEGORY D
SEISMIC RESISTING SYSTEM = BEARING WALL,
PLYWOOD SHEARWALLS, $R = 6.5$
SEISMIC BASE SHEAR = $V_s = 34.3$ KIPS $C_s = 0.11$
EQUIVALENT LATERAL FORCE PROCEDURE

OCCUPANCY CATEGORY II

FOUNDATION DESIGN

FOUNDATION DESIGN IS BASED HELICAL PILING FOR A MAXIMUM 30 KIP TOTAL VERTICAL LOAD

WOOD PRODUCTS

ALL LUMBER SHALL BE A MINIMUM OF HF2 FOR ALL BRIDGING, BLOCKING AND FRAMING REQUIRED. MINIMUM FASTENING TO BE PER IBC TABLE 2304.9J UNLESS SPECIFICALLY NOTED IN THESE DRAWINGS. PROVIDE POSITIVE CONNECTION UTILIZING SIMPSON HANGERS OR FRAMED BEAM POCKETS TO RESIST VERTICAL AND LATERAL LOADING AT ALL POST CAPS AND BASES, BEARING WALLS.

WOOD I- JOISTS - PROVIDE WOOD I JOISTS AS MANUFACTURED BY BOISE CASCADE, TRUSS JOIST, ROSEBURG OR EQUAL. PROVIDE FULL DEPTH SOLID BLOCKING AT ALL SUPPORTS. COORDINATE ALL HANGERS WITH ACTUAL JOIST SIZE. SUBMIT CONTRACTOR CHECKED ENGINEER SHOP DRAWINGS STAMPED BY AN ALASKAN LICENSED PROFESSIONAL ENGINEER PRIOR TO FABRICATION AND INSTALLATION.

FLOOR SHEATHING - USE APA RATED SHEATHING, TONGUE AND GROOVE, USE 1 1/8" T&G

GLU LAM BEAMS SHALL BE 24F DFMF WITH $F_b = 2,400$ psi. USE V4 FOR SIMPLE SPANS AND V8 FOR CANTILEVERS OR BEAMS CONTINUOUS OVER SUPPORTS.

ROOF SHEATHING: USE APA RATED SHEATHING. UPPER ROOF SHEATHING WITH SUPPORTS @ 24" O.C. USE MINIMUM 3/4" SHEATHING WITH A 24/16 SPAN RATING.

WALL SHEATHING: USE APA RATED SHEATHING. PROTECT SHEATHING FROM THE WEATHER UNLESS IT IS RATED FOR EXTERIOR EXPOSURE. PROVIDE FRAMING OR BLOCKING BEHIND ALL PANEL EDGES. PROVIDE MINIMUM 1/2" FROM EDGE TO CENTER OF NAIL. DRIVE NAILS FLUSH, DO NOT OVERDRIVE FASTENERS. PROVIDE FASTENERS PER SHEARWALL SCHEDULE.

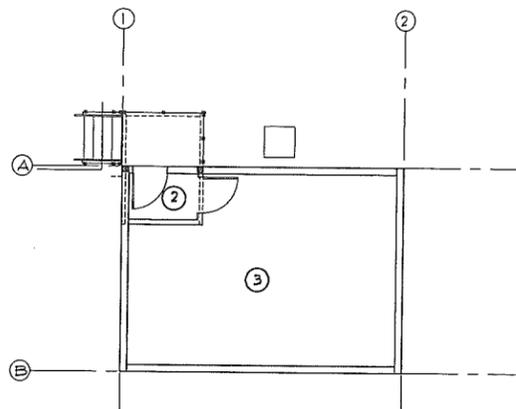
ALL WOOD IN CONTACT WITH CONCRETE OR EXPOSED TO THE WEATHER SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVATIVE ASSOCIATION. PROVIDE PRESSURE TREATED FOUNDATION GILL PLATES, PROVIDE 3X3X228" MIN. PLATE WASHERS FOR FOUNDATION ANCHOR BOLTS.

ABBREVIATIONS

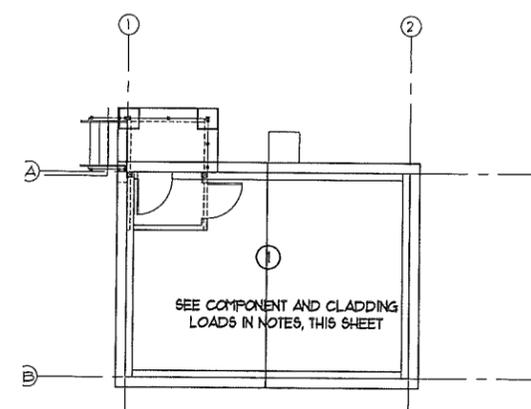
E.W. - EACH WAY
IBC - INTERNATIONAL BUILDING CODE
I.S. - INSIDE
O.S. - OUTSIDE
F.O.S. - FACE OF STUD
HDG - HOT DIP GALVANIZED
MFG - MANUFACTURER
FFA - POST FROM ABOVE
SIM - SIMILAR TO
SIP - STRUCTURAL INSULATED PANELS
TYP. - TYPICAL
UNO - UNLESS NOTED OTHERWISE
W.T.E. - WITH THE EXCEPTION
W.W.M. - WELDED WIRE MESH

DESIGN LOAD SCHEDULE

DESCRIPTION	SUPERIMPOSED DEAD LOAD (PSF)	LIVE LOAD (PSF)
① ROOF BALANCED SNOW LOAD	15	40
② FLOOR LOAD OFFICE	10	50
③ FLOOR LOAD MECHANICAL	10	100



① Floor Design Load
Scale: 1/8" = 1'-0"



② Roof Design Load
Scale: 1/8" = 1'-0"

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1422 Ligon Drive
Eagle River, AK 99571
Phone: (907) 441-0077
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www.olenassoc.com

SCALE: AS SHOWN
MAX IS ONE RICH ON ORIGINAL DRAWING
IF PHOTO COPYED OR REPRODUCED FROM THIS DRAWING, ALL DIMENSIONS SHALL ACCORD TO THIS SCALE

CONSTRUCTION RECORD
FIELD BOOK
STANDARD
FOREMAN
AS-BUILT
INSPECTOR



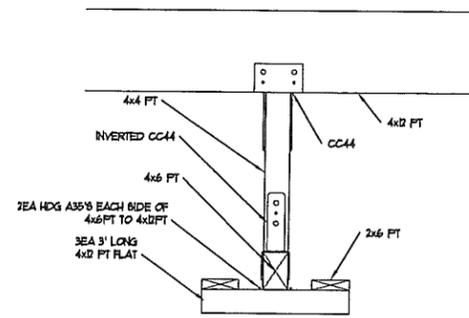
WASHETERIA, WATER TANK AND PUMP HOUSE PILING
STRUCTURAL NOTES
CHEFORNIAK, ALASKA

CEI ENGINEERS, INC.
FOR BIDDING PURPOSES, AK REG. PE: 03-548-0107 FAX: 907-548-5115

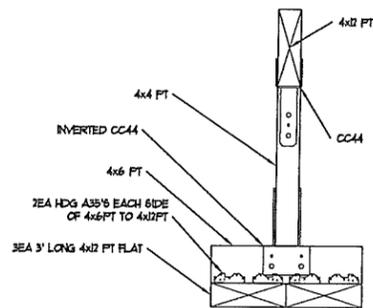
REVISION	BY	DATE

Project No. 42754
Date 4/8/15
Designed B.C.O.
Drawn R.E.L.
Approved O.A.L.

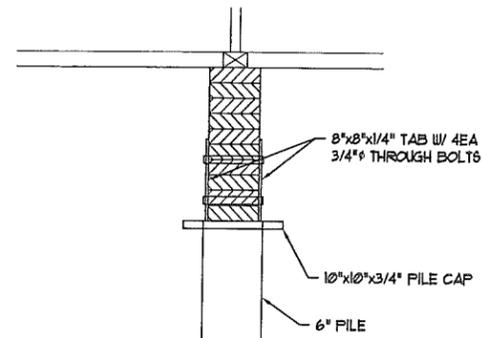
Sheet No. **S0.1**
SHEET OF



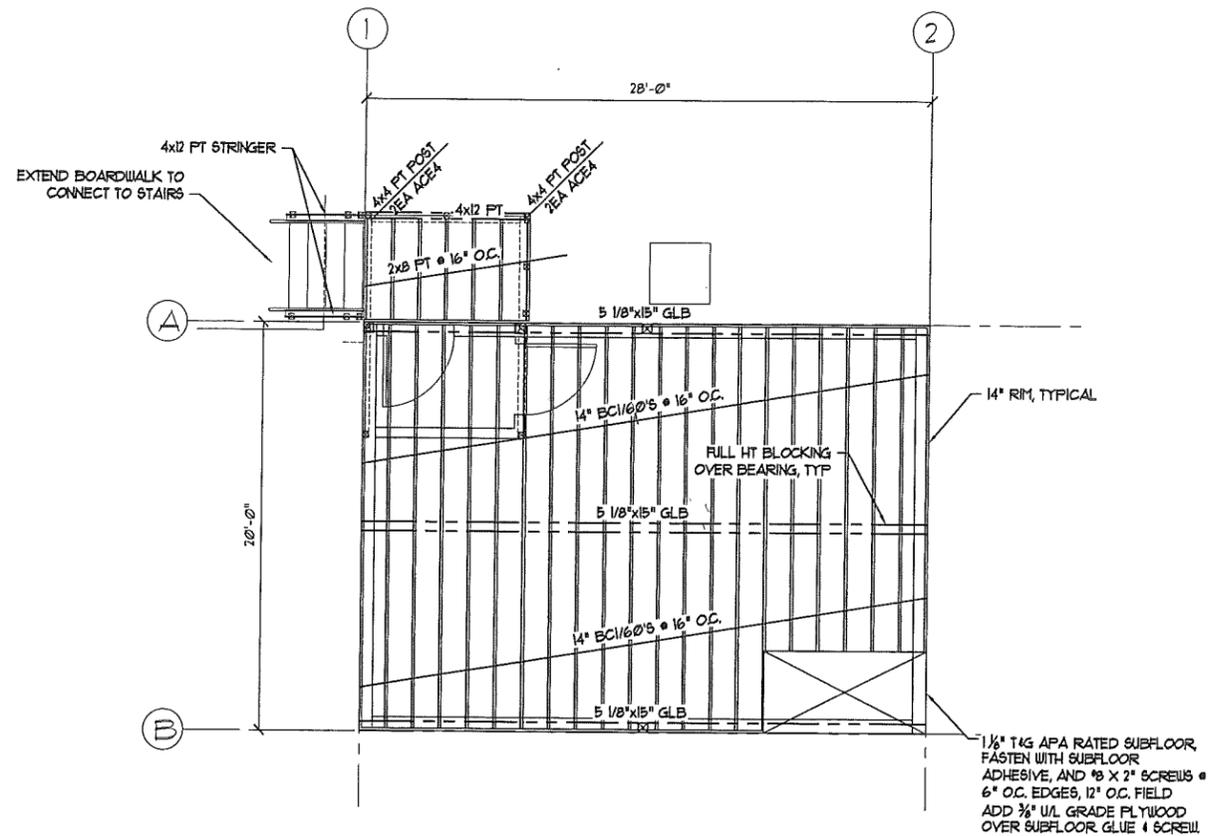
6 PT Pad Detail
Scale: 1" = 1'-0"



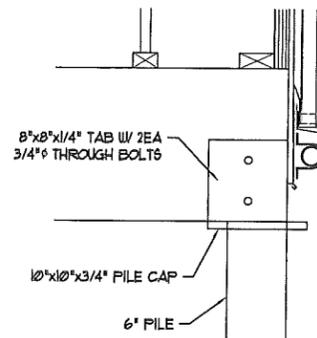
7 PT Pad Detail
Scale: 1" = 1'-0"



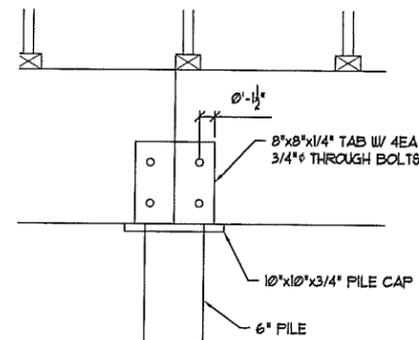
4 Pile Cap Detail
Scale: 1/2" = 1'-0"



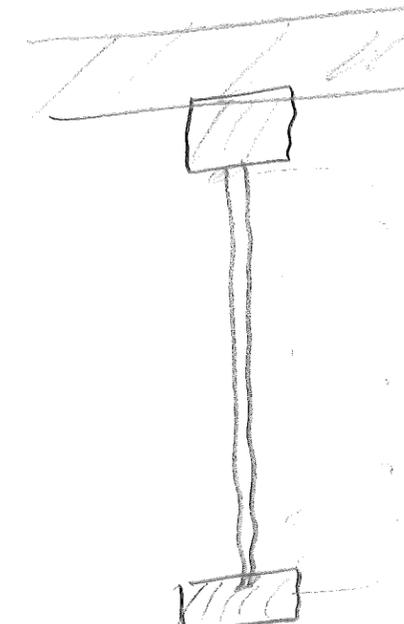
1 Pump House 1 - Floor Framing Plan
Scale: 1/2" = 1'-0"



3 Pile Cap Detail - End Pile
Scale: 1/2" = 1'-0"



2 Pile Cap Detail - Interior Pile
Scale: 1/2" = 1'-0"



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Email: bob@oien.com

SCALE:	AS SHOWN
CONSTRUCTION RECORD:	FIELD BOOK
STAMPING:	FOREMAN
AS-BUILT:	INSPECTOR



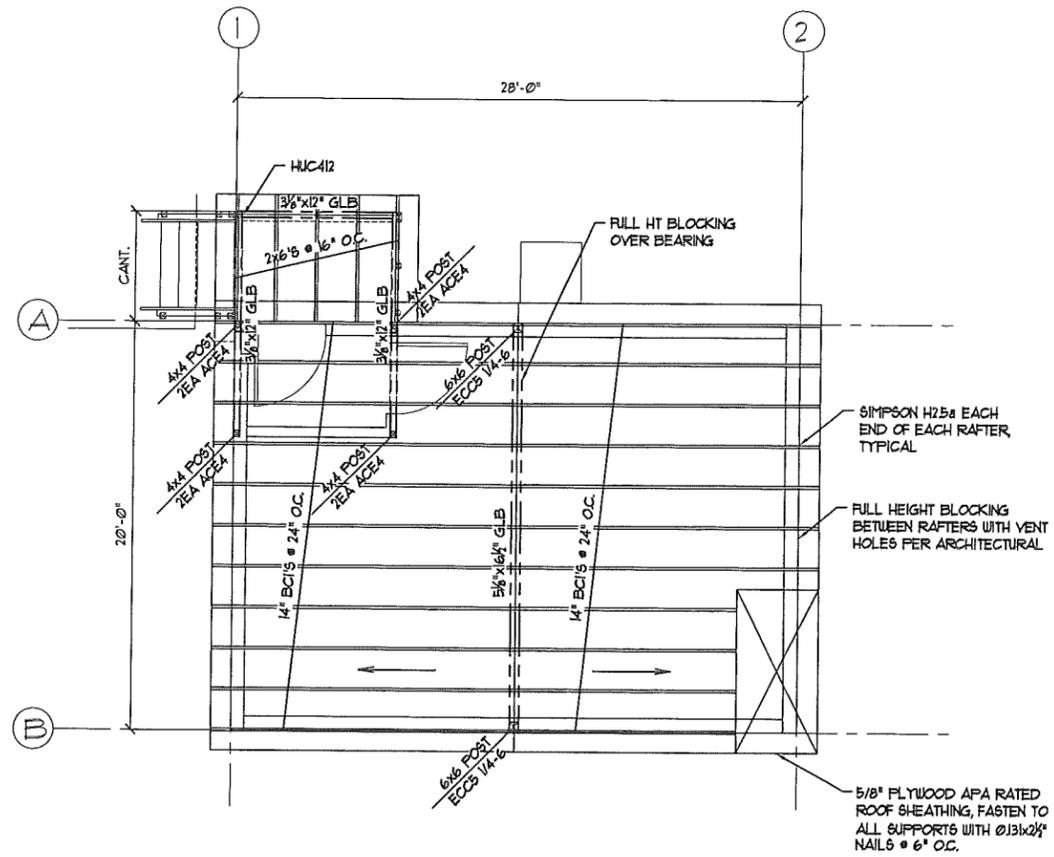
WASHETERIA, WATER TANK
AND PUMP HOUSE PILING
PUMP HOUSE 1
FLOOR FRAMING PLAN
CHEFORNIAK, ALASKA

CEI
ENGINEERS, INC.
PO BOX 2286 ANCHORAGE, AK 99513 TEL: 907-584-5100 FAX: 907-584-5115

REVISION	BY	DATE

Project No.	42754	Designed	BCC
Date	4/6/15	Drawn	BRL
		Approved	ODL

Sheet No. S2.1
SHEET OF



1 Pump House 1 - Roof Framing Plan
Scale: 1/4" = 1'-0"

Oien Associates, Inc.
Construction Management Engineering Inspection
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1422 Union Drive
Eagle River, AK 99577
Email: bob@oien.com

SCALE:
AS SHOWN
DATE IS ONE INCH ON ORIGINAL BOARD
IF ANY DIMENSIONS DO NOT MATCH THIS DRAWING, THE DIMENSIONS ON THE ORIGINAL BOARD SHALL ACCURATELY

CONSTRUCTION RECORD	
FIELD BOOK	
STARTING	
FOREMAN	
AS-BUILT	
INSPECTOR	



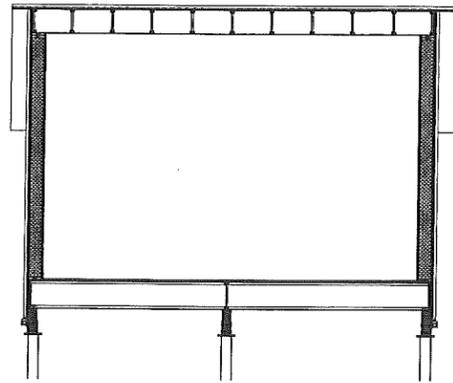
WASHETERIA WATER TANK AND PUMP HOUSE PILING
PUMP HOUSE 1
ROOF FRAMING PLAN
CHEFORINAK, ALASKA



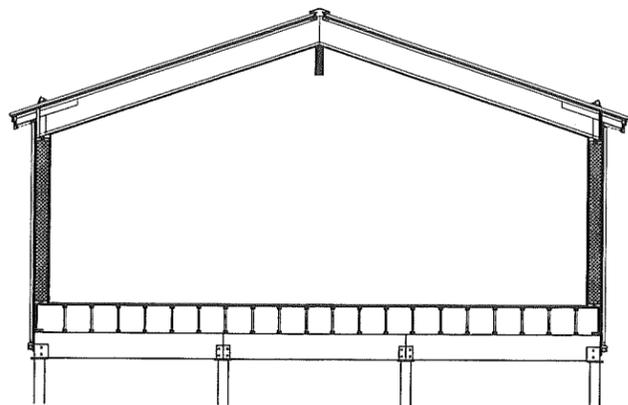
REVISION	BY	DATE

Project No. 42764	Date 4/6/15	Designed	RECO	Drawn	RRLL	Approved	OAL
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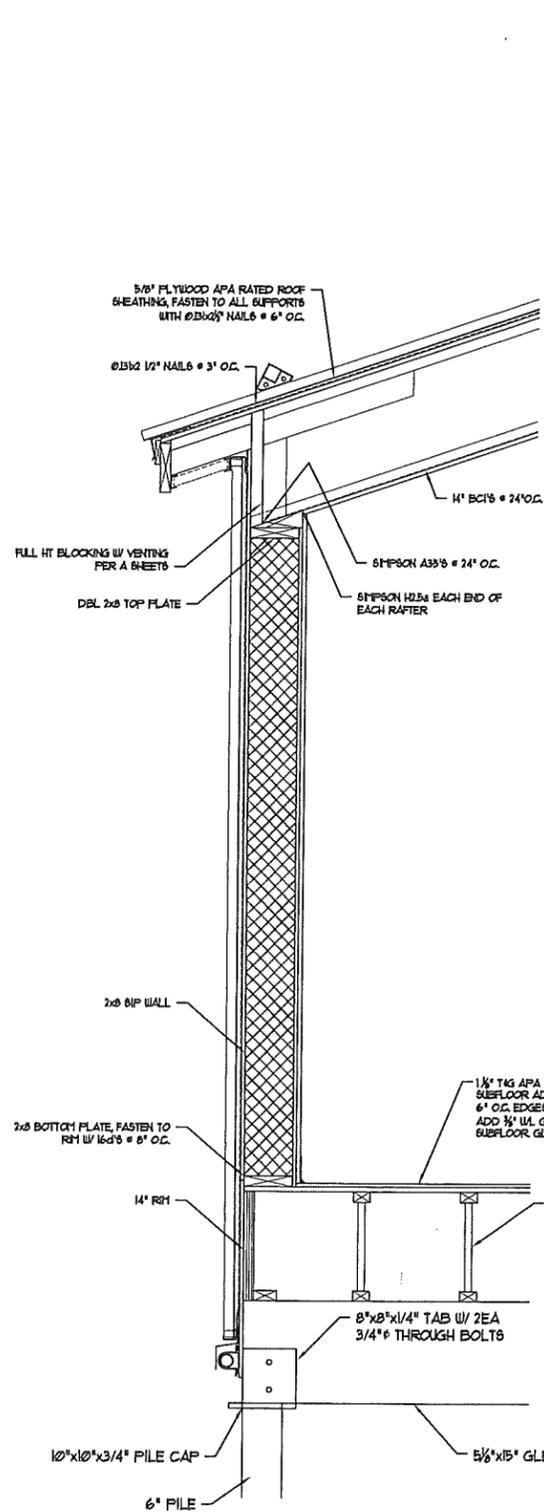
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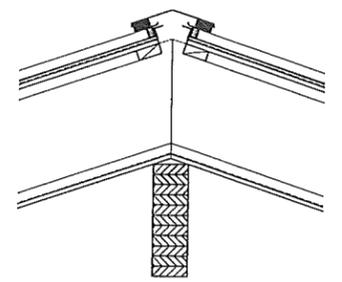
2 Pump House 1 - Building Section
Scale: 1/4" = 1'-0"



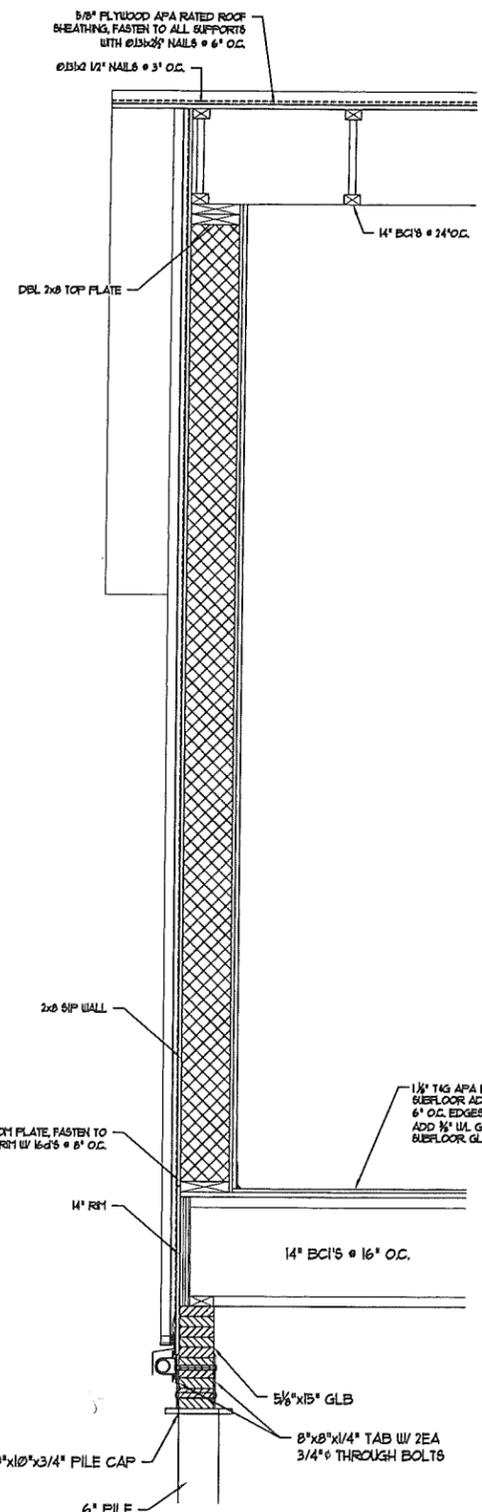
1 Pump House 1 - Building Section
Scale: 1/4" = 1'-0"



3 Wall Section
Scale: 1" = 1'-0"



4 Beam Detail
Scale: 1" = 1'-0"



5 Wall Section
Scale: 1" = 1'-0"

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e-mail: bob@oien.com

SCALE: AS SHOWN
DATE: 4/6/15
PROJECT: PUMP HOUSE 1 AND PUMP HOUSE PILING

CONSTRUCTION RECORD
FIELD BOOK
STARTING
FOREMAN
AS-BUILT
INSPECTOR



WASHETERIA, WATER TANK, AND PUMP HOUSE PILING
PUMP HOUSE 1 BUILDING SECTIONS
WALL SECTIONS
CHEFORNIAK, ALASKA

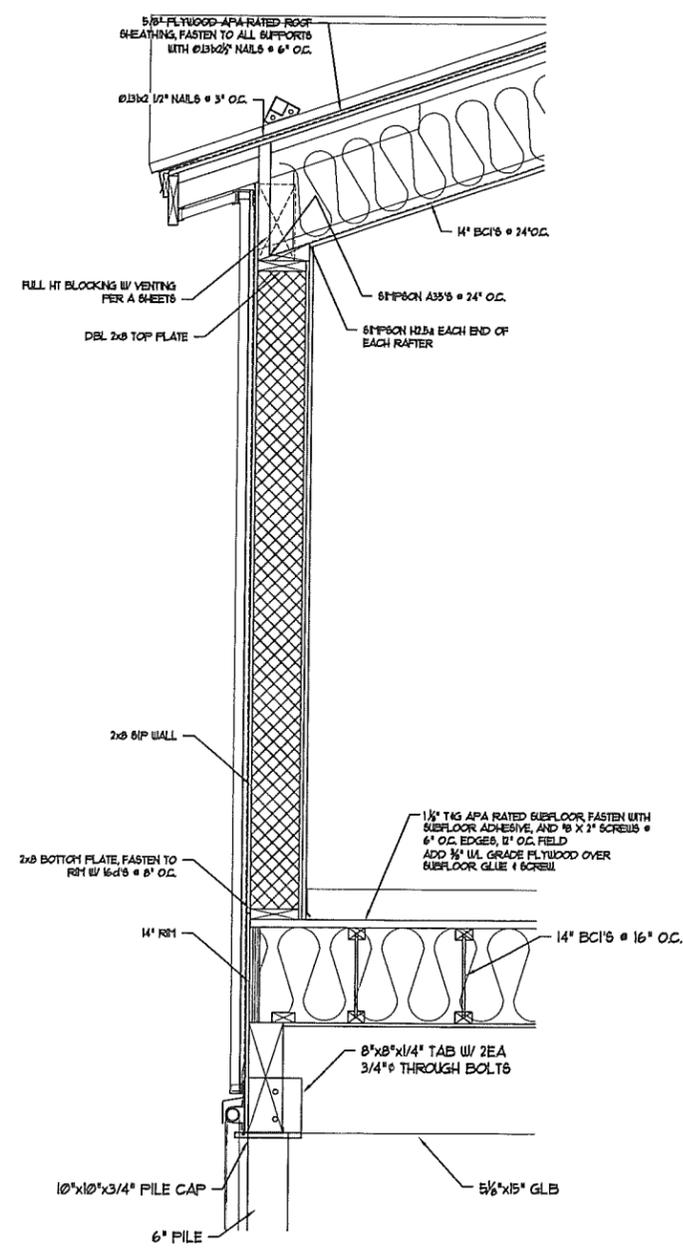


REVISION	BY	DATE

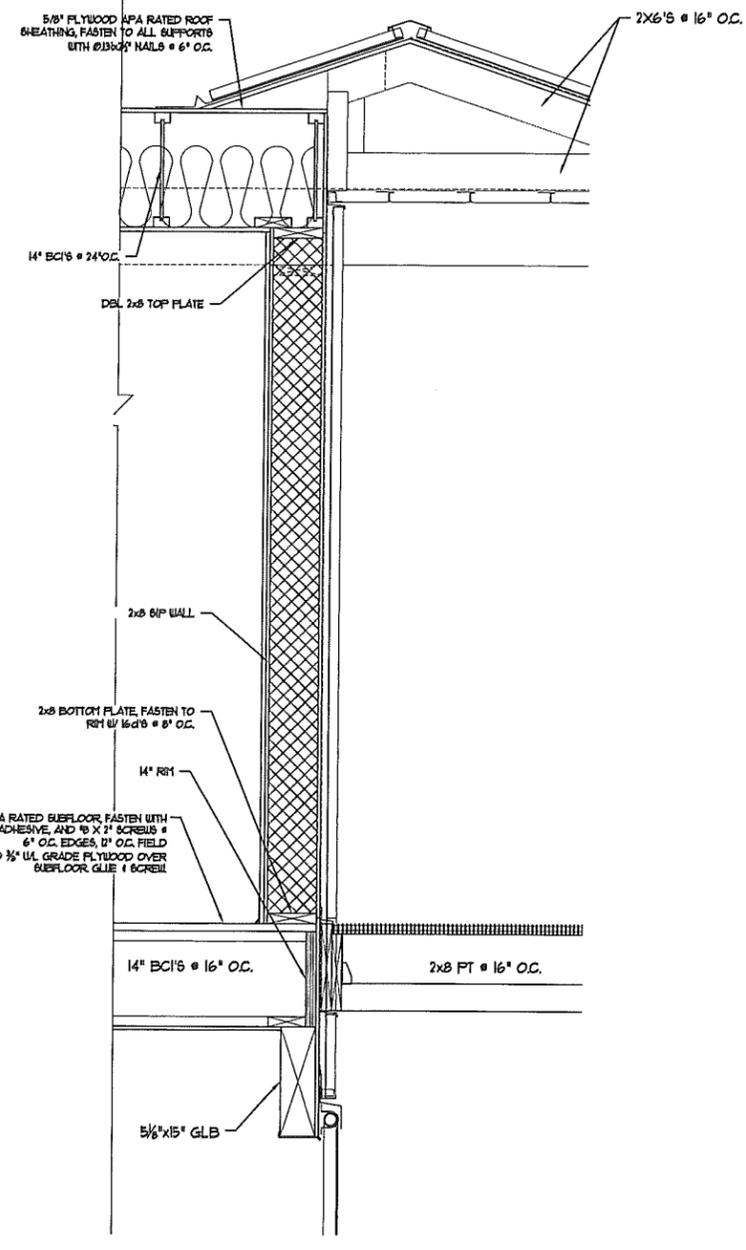
Project No. 47754	Designed B.C.O.
Date 4/6/15	Drawn R.R.L.
	Approved O.A.L.

Sheet No. S4.1
SHEET OF

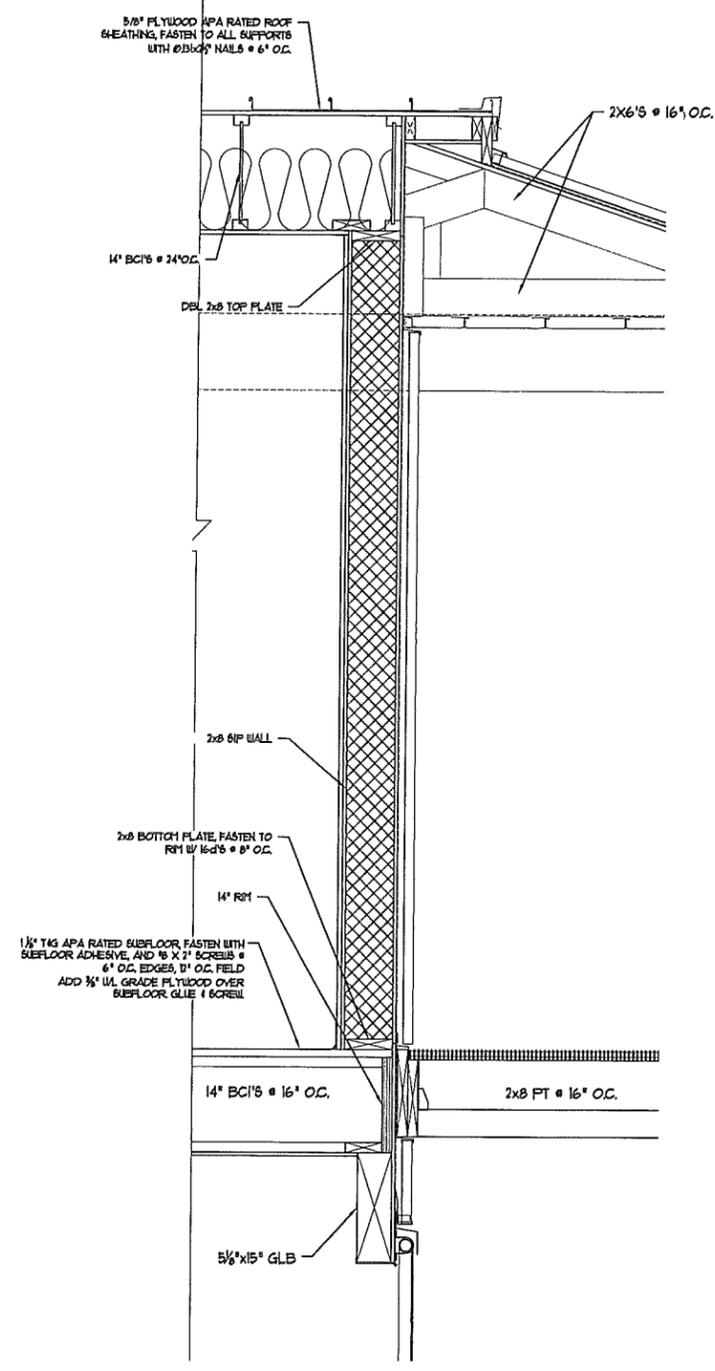
13



1 Wall Section
Scale: 1" = 1'-0"



2 Wall Section
Scale: 1" = 1'-0"



3 Wall Section
Scale: 1" = 1'-0"

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SCALE: AS SHOWN
DATE: 04/15/15
DRAWN: JLD
CHECKED: JLD
APPROVED: JLD

CONSTRUCTION RECORD
FIELD BOOK
STAGING
FOREMAN
AS-BUILT
INSPECTOR



WASHETERIA, WATER TANK
AND PUMP HOUSE PILING
PUMP HOUSE 1
BUILDING SECTIONS
WALL SECTIONS
CHEFORKNAK, ALASKA



REVISION	DATE

Project No. 42754	BCO
Date 4/6/15	RRL
Designed	Approved
Drawn	CALL

Sheet No. S4.2
SHEET OF

MECHANICAL / HVAC SYSTEMS OVERVIEW

MECHANICAL SYSTEMS FOR THE PUMP HOUSE ARE DESIGNED TO UTILIZE HEAT FROM THE BOILERS TO HEAT THE STRUCTURE, HEAT THE WELL HEAD AREA, AND TO PROVIDE ADD HEAT FOR THE VILLAGE DOMESTIC WATER LOOP. MECHANICAL SYSTEMS ARE DESIGNED FOR MAINTENANCE BY LOCAL ON SITE PERSONNEL. THE OUTSIDE AIR VENTILATION SYSTEM IS DESIGNED FOR OPERATION ONLY WHEN THE FACILITY IS OCCUPIED OR WHEN THE INSIDE AIR TEMPERATURE CAN CAUSE ELECTRICAL EQUIPMENT PROBLEMS.

GENERAL NOTES:

PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR COMPLETE SAFE WORKABLE SYSTEMS AS INDICATED ON THE DRAWINGS AND AS SPECIFIED. TEST ALL SYSTEMS TO ASSURE PROPER OPERATION. USE NEW EQUIPMENT OF THE LATEST DESIGN.

CONTRACTOR SHALL COMPLY WITH THE APPLICABLE LOCAL, STATE, AND NATIONAL CODES, ORDINANCES, AND REGULATIONS AFFECTING MATERIALS AND METHODS USED AND RECOMMENDED PRACTICES AS SET FORTH BY NFPA, UMC, UPC, NFC, UBC, UL, NEC EXCEPT IN CASES WHERE STATUTES GOVERN.

DURING FINAL INSPECTION, DEMONSTRATE THAT THE ENTIRE INSTALLATION OPERATES SATISFACTORILY IN ACCORDANCE WITH DRAWINGS. PROVIDE FLUID AND AIR BALANCE OF MECHANICAL SYSTEMS AND BALANCE REPORT INSTRUCT OWNERS PERSONNEL FOR OPERATION AND MAINTENANCE PROCEDURES. INSTALL ALL EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS. INSTALL EQUIPMENT TO PROVIDE EASE OF ACCESS FOR MAINTENANCE.

PROVIDE ACCESS DOORS FOR CONCEALED EQUIPMENT, VALVES, DAMPERS, AND OTHER MECHANICAL DEVICES REQUIRING SERVICING OR ADJUSTMENT.

DO NOT SPRING OR BEND PIPE TO FIT CONDITIONS OR MAKE-UP JOINTS. PROVIDE VALVES FOR BRANCH LINES AS REQUIRED OR SHOWN. MAINTAIN CURRENT "AS-BUILTS" AS THE PROJECT PROGRESSES AND TURN THEM OVER TO THE OWNER AT THE TIME OF FINAL INSPECTION.

MECHANICAL DRAWING LIST

- M-1.0 LEGEND DRAWING LIST GENERAL NOTES MECHANICAL/PLUMBING OVERVIEW
- M-1.1 PIPING AND MATERIALS LIST
- M-1.2 EQUIPMENT SCHEDULES
- M-1.3 CONTROLS
- M-1.4 CONTROLS
- M-1.5 CONTROLS
- M-2.0 MECHANICAL PLAN
- M-2.1 MECHANICAL SECTIONS
- M-2.2 MECHANICAL DETAILS
- M-2.3 MECHANICAL DETAILS
- M-3.0 HEATING SYSTEM DIAGRAM

LEGEND		
SYMBOL	ABBREV.	DESCRIPTION
		FLOW ARROW
	GHS	GLYCOL HEATING SUPPLY
	GHR	GLYCOL HEATING RETURN
	CW	DOM. COLD WATER SUPPLY
	CWC	DOM. COLD WATER CIRC.
	HW	DOM. HOT WATER
	WHSW	WELL HEAT SUPPLY WATER
	WHRW	WELL HEAT RETURN WATER
	W	WASTE OR SEWER
	V	VENT
	WW	WASHER WASTE WATER
	WV	WASHER VENT
	VTR	VENT THROUGH ROOF
		BALL VALVE
		PRESS. RELIEF VALVE
		CHECK VALVE
	C.O.	CLEAN OUT
	FOS	FUEL OIL SUPPLY
	FOR	FUEL OIL RETURN
	PMP-	PUMP
	ET	EXPANSION TANK
		PRESSURE GAGE'
		THERMOMETER
	TS	THERMOSTAT
	NC	VALVE NORMALLY CLOSED
	NO	VALVE NORMALLY OPEN
	SC	SPEED CONTROL
	SW	SWITCH
	AAV	AUTO AIR VENT
	MAV	MANUAL AIR VENT
		CIRCUIT SETTER /BALANCING VALVE
		DUCT WIDTH X HEIGHT
	RG-1 300 CFM	GRILL NUMBER AIRFLOW AND DIRECTION
	TE	TEMPERATURE ELEMENT

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MECHANICAL ENGINEERS
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 EAGLE RIVER, ALASKA 99577
 TELEPHONE 907 414-1456
 EMAIL: Pbelz@cbn.net



LEGEND DRAWING LIST NOTES MECH/PLC OVERVIEW
CHEFORNAK PUMPHOUSE #1
CHEFORNAK, ALASKA

DATE: APRIL 17, 2015
 DRAWN: F.H. BELZ
 CHKD:
 SCALE: AS NOTED
 REVISED:
 JOB NO. C 407

SHEET NO. 1 OF 11
 M-1.0

G:\ACAD\CHEFORNAK\2014 Pumphouse Improvements\From Others\Beltz Mechanical\Pump House 1\C407 M-1.1 CHEFORNAK PUMPHOUSE #1 PIPING AND GENERAL MATERIALS.dwg, 5/5/2015 5:23:18 PM, cmezt, \\Ce2main\LANIER MP C2050\LD520C PCL 6

GLYCOL PIPING MATERIAL

GLYCOL PIPING SHALL BE TYPE L HARD DRAWN COPPER WITH WROUGHT COPPER FITTINGS, PEX TUBING, HDPE, BLACK STEEL, GALVANIZED STEEL, BRASS, OR CAST IRON USE SILVER BEARING SOLDER FOR COPPER PIPING JOINTS

VALVES: VALVES SHALL BE BRASS FULL PORT BALL-TYPE USE SWEAT OR NPT CONNECTIONS
MFG: HAMMOND OR EQUAL RATED 400 PSI WOG

CHECK VALVES: BRONZE SWING CHECK
MFG: HAMMOND OR EQUAL

GLYCOL PIPING ACCESSORIES

FLOW CONTROL VALVES/CIRCUIT SETTERS: TACO ACUF SERIES OR EQUAL
PRESSURE GAGES: BOURDON TUBE TYPE 2" DIAL
THERMOMETERS: STRAP ON TYPE- DIAL INDICATOR

AS-1 AIR SCOOP 2 INCH SIZE MFG: TACO 434 OR EQUAL
AS-2 AIR SCOOP 1 INCH SIZE MFG: TACO 432 OR EQUAL
MAV MANUAL AIR VENT: SCREWDRIVER VENT MFG: TACO 417 OR EQUAL
AAV AUTO AIR VENT: VENT WITH 3/4" ISOLATION VALVE MFG: TACO 418 OR EQUAL

GLYCOL PIPING INSULATION

ALL GLYCOL PIPING SHALL BE INSULATED, VALVES ARE NOT INSULATED:
INSULATION: GHS-GHR(180 F PIPING), HW PIPING: 1 INCH FIBERGLASS WITH SEALING JACKET AND FITTING COVERS

GLYCOL

GLYCOL 50-50 MIX PROPYLENE GLYCOL

GLYCOL OR FUEL OIL PIPING HANGERS

PROVIDE ROD AND CLEVIS OR TRAPEZE HANGERS FOR HANGING PIPING
PROVIDE RIGID INSULATION AND INSULATION SHIELDS AT HANGERS
PROVIDE WALL HANGERS AS REQUIRED
HANGER SPACING AND SWAY BRACING PER NFPA 13
PROVIDE UNISTRUT CUSH A CLAMPS FOR PUMP PIPING AREAS TO ALLOW FOR PIPE EXPANSION AND TO REDUCE PIPE STRAIN.

FUEL OIL SUPPLY PIPING MATERIAL

FUEL OIL PIPING SHALL BE LOW TEMP SCH 80 BLACK STEEL A333 BLACK STEEL WITH SOCKET WELD FITTINGS

VALVES SHALL BE BRASS FULL PORT BALL-TYPE WITH NPT CONNECTIONS
MFG: HAMMOND OR EQUAL RATED 400 PSI WOG

FUEL OIL PIPING ACCESSORIES

TL TIGER LOOP AIR ELIMINATOR (1 PER BOILER)
MFG: WESTWOOD PRODUCTS INC TIGERLOOP ULTRA OR EQUAL
FUSIBLE VALVES: FIROMATIC OR EQUAL
CHECK VALVES: FIROMATIC OR EQUAL
FF-1 FUEL FILTER: GENERAL FILTERS 1A-25B OR EQUAL (1 PER BOILER)

GLYCOL/FUEL OIL PIPING GENERAL NOTES

PROVIDE UNIONS OR FLANGES FOR SERVICE AND REPLACEMENT OF EQUIPMENT
CLEAN AND DRY ALL PIPING BEFORE PUTTING INTO SERVICE
MATERIALS AND ACCESSORIES SHALL BE AS SHOWN OR EQUAL,

BOILER INSTALLATION ACCESSORIES

PROVIDE 16 GA GALVANIZED SHEET METAL DRIP PANS UNDER OIL BURNERS, OIL FILTERS, VALVES AND TIGER LOOPS

BOILER STACKS: SELKIRK METALBESTOS TYPE "PS"
STACK WITH TYPE 304 STAINLESS STEEL INNER AND OUTER PIPES. VERIFY SIZES. PROVIDE DRAFT REGULATORS: FIELD OR EQUAL

BOILER BASES: PROVIDE 28"WIDE X 48" DEEP X 3 1/2" THICK CONCRETE BASES FOR 2 BOILERS LAG BASES TO FLOOR AND PROVIDE CORNER ANGLES FOR SEISMIC RESTRAINT. SEE DETAILS

COMBUSTION AIR: PROVIDE DUCTED COMBUSTION AIR FROM HOODS TO BURNERS PER DETAIL
PROVIDE BACKDRAFT DAMPERS FOR PLUGGED DUCT OR HOOD OPERATION.

SEISMIC RESTRAINTS

PROVIDE CODE APPROVED WALL STRAPS FOR WATER TANKS AND HYDROPNEUMATIC TANKS
SWAY BRACE HANGING PIPING PER NFPA 13
PROVIDE GALVANIZED STEEL BASES LAGGED TO FLOOR AND BOLTED TO PUMPS FOR BASE MOUNTED PUMPS. BASES MAY BE FORMED OR WELDED CONSTRUCTION

HVAC DUCT WORK

ALL MATERIAL, SEALING, AND HANGERS TO BE PER IMC AND SMACNA STANDARDS

FLEX JOINTS AT INLINE FANS FOR VIBRATION REDUCTION

SEE DETAILS

CAPSTONE ENGINEERING LLC
MECHANICAL ENGINEERS
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EAGLE RIVER, ALASKA 99577
TELEPHONE 907-414-1456
EMAIL: fbelz@tas.net



APRIL 15, 2015

PIPING AND GENERAL MATERIALS
CHEFORNAK PUMPHOUSE #1
CHEFORNAK, ALASKA

DATE: APRIL 17, 2015
DRAWN: F.H. BELZ
CHKD:
SCALE: AS NOTED
REVISED:
JOB NO. C 407

SHEET NO. M-1.1 2 OF 11

G:\ACAD\CHEFORNAK\2014 Pumphouse Improvements\From Others\Beltz Mechanical\Pump House 1\C407 M-1.2 CHEFORNAK PUMPHOUSE #1 EQUIPMENT LIST.dwg, 5/9/2015 5:23:05 PM, cmez, \\cemein\LANIER HP C2050\LD520C PCL 6

BOILER SCHEDULE					
NUMBER	TYPE	INPUT	OUTPUT	MFG MODEL	NOTES
B-1	HOT WATER OIL FIRED CAST IRON	140 MBH 1.0 GPH	123 MBH DOE	WEIL MCLAIN UO-3E	BASE BOILER, NO CIRCULATOR, ALASKA DOUBLE HIGH LIMITS, LOW WATER CUT OFF, RIELLO 40 F3 BURNER DUCTED COMBUSTION AIR KIT FOR TO BURNER 5 AMPS / 115 V / 1 PH 6 INCH FLUE. PROVIDE WEIL MCLAIN AFM MODULE FOR DUAL BOILER CONTROL

PUMP SCHEDULE					
NUMBER	TYPE	FLUID PUMPED	GPM	FLUID-TDH FLUID TEMP	PUMP SELECTION
PMP-1A PMP-1B	INLINE CIRCULATOR WET ROTOR	PROP GLYCOL 50/50	25 GPM MAXIMUM 7 GPM MINIMUM	20 FT TDH 180 F	GRUNDFOS MAGNA3 32-100 F 60 HZ 98126824 OR EQUAL 1.61 AMPS / 120 V / 1 PH
PMP-2	INLINE CIRCULATOR WET ROTOR	WATER	4 GPM	10 FT TDH 80 F IN	GRUNDFOS UP 15-42F OR EQUAL 1/25 HP / 115 V / 1 PH

FUEL TANK SCHEDULE/FUEL OIL SERVICE				
NUMBER	TYPE	CAPACITY	PAINT	NOTES
FT-1	ABOVE GROUND DOUBLE WALL STEEL CONSTRUCTION SECONDARY CONTAINMENT INTEGRAL SKID MOUNTED	500 GALLON	MARINE GRADE EPOXY	UL 142 TANK STI F921 CONSTRUCTION: 50"OD X 72"LONG ASSEMBLY COMPLETE WITH REGULAR AND EMERGENCY VENTING PROVIDE FOR MINIMUM OF 2 EA FOS AND 2 EA FOR CONNECTIONS PROVIDE 2 EA 3/4" DIP TUBES AND 2 EA 3/4"ANTI SIPHON VALVES PROVIDE VISUAL TANK GAGE, STICK GAGE, ANTI SPILL FUNNEL FOR MANUAL FILL, END LADDER TO FILL PORT MFG: ANCHORAGE TANK, GREER TANK, OR APPROVED EQUAL

HEAT EXCHANGER SCHEDULE							
NUMBER	TYPE	HOT SIDE	HOT SIDE FLOW	COLD SIDE	COLD SIDE FLOW	CAPACITY	MFG: MODEL NUMBER
HE-1	PLATE & FRAME DOUBLE WALL	170 F EGT 150 F LGT 3 PSI PD MAX	16.5 GPM 50/50 PROP GLYCOL	40 F EWT 45 F LWT 3 PSI PD MAX	40 GPM WATER	150 MBH	DOUBLE WALL AMERIDEX X-15-17-DW 2"NPT PORTS
HE-2	HOT WATER MAKER	180 F EGT 3 PSI PD MAX	3 GPM 50/50 PROP GLYCOL	75 EWT 85F LWT 3 PSI PD MAX	4 GPM WATER	4 MBH	AMTROL CH-41ZDW DOUBLE WALL SUPERSTOR 45 GALLON DOUBLE WALL OR EQUAL. PROVIDE PT RELIEF VALVE

UNIT HEATER SCHEDULE						
NUMBER	TYPE	OUTPUT	FLUID	EGT/LGT FLOW	MFG MODEL	NOTES
UH-1	HOT WATER PROPELLOR TYPE	25 MBH	50/50 PROP GLYCOL	180 F EGT 160 F LGT 3.0 GPM	MODINE HC-63	1/12 HP / 115 V / 1 PH TE MOTOR 1.2 AMPS
UH-2	HOT WATER PROPELLOR TYPE	10 MBH	50/50 PROP GLYCOL	180 F EGT 160 F LGT 2 GPM	MODINE HC 18	1/60 HP / 115 V / 1 PH TE MOTOR 0.8 AMPS

FAN SCHEDULE					
NUMBER	TYPE	CFM	EXT STATIC	MFG MODEL	NOTES
VF-1	INLINE FAN	75 CFM	0.5 IN WC	FANTEC FG-5	20 WATTS / 115 V / 1 PH W/SPEED CONTROL STEEL HOUSING/ 5 INCH FLANGES
CF-1	CEILING FAN			LEADING EDGE 36201	75 WATTS / 115 V / 1 PH W/SPEED CONTROL LEADING EDGE 12003 SPEED CONTROL

EXPANSION AND PRESSURE TANK SCHEDULE					
NUMBER	TYPE	ACCEPT-ANCE	FLUID TEMP	MFG MODEL	NOTES
ET-1	BLADDER EXPANSION	2.5 GAL	P GLYCOL 180 F	AMTROL EX-30	180 F GLYCOL SYSTEM EXPANSION TANK
ET-2	BLADDER EXPANSION	2.5 GAL	WATER 90 F	AMTROL EX 30	; WATER HEAT SYSTEM FOR WELL HEAD

DAMPER SCHEDULE-MOTORIZED - CONTROL- BACKDRAFT				
NUMBER	TYPE	SIZE	CONTROL	MFG MODEL
BDD-1	INLINE BACKDRAFT DAMPER	8"WIDE X 8"HIGH		RUSKIN BD2/A2 OR EQUAL
CBD-1 CBD-2	INLINE BACKDRAFT DAMPER	6"WIDE X 6"HIGH	COUNTER BALANCED	RUSKIN CBD2 OR EQUAL RETURN ACTUATOR 24 VAC 7 VA-35 IN LB
MD-1	INLINE MOTORIZED DAMPER	8"WIDE X 8"HIGH	DAMPER MOTOR	RUSKIN CD-50 WITH BELIMO LF24 SPRING RETURN ACTUATOR 24 VAC 7 VA-35 IN LB

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EQUIPMENT LIST
CHEFORNAK PUMPHOUSE #1
CHEFORNAK, ALASKA

DATE: APRIL 17, 2015
 DRAWN: F.H. BELZ
 CHKD:
 SCALE: AS NOTED
 REVISED:
 JOB NO. C 407

SHEET NO. 3 OF 11
 M-1.2

G:\ACAD\CHEFORNAK\2014 Pumphouse Improvements\From Others\Beltz Mechanical\Pump House 1\C407 M-1.3 CHEFORNAK PUMPHOUSE #1 CONTROLS AND SEQUENCE OF OPERATION.dwg, 5/15/2015 5:22:51 PM, cmerz, \\Ca2main\LANIER MP C2050\LD520C PCL 6

CONTROL VALVES

CV-1, CONTROL VALVE: 1/4 TURN MOTOR OPERATED VALVE 1 1/2 INCH NPT BRASS BODY
SS BALL, SPRING RETURN 24 VAC ACTUATOR (FAIL OPEN) MFG: HONEYWELL VB2F 1350 OR EQUAL
CV-2 CONTROL VALVE: 1/4 TURN MOTOR OPERATED VALVE 3/4 INCH NPT BRASS BODY
SS BALL, SPRING RETURN 24 VAC ACTUATOR (FAIL OPEN) MFG: HONEYWELL VB2F 1350 OR EQUAL

OCCUPANCY SENSOR

OS-1 OCCUPANCY SENSOR: SENSOR DETECTS MOVEMENT AND CONTACTS CLOSE. NO MOVEMENT FOR 5 MINUTES OPENS CONTACTS
SENSOR HAS CONTACTS RATED FOR 24 VAC AND OPERATES ON 24 VAC MFG:WATTSTOPER OR EQUAL

BALANCE VALVES

VALVES ARE BRASS BODY WITH BALANCE MECHANISM AND MEMORY STOP
BV-1, BV-2, BV-3: 3/4 INCH WITH SWEAT FITTINGS. MFG: TACO ACCU FLOW OR EQUAL
BV-4: 1 1/2 INCH WITH SWEAT FITTINGS. MFG: TACO ACCU FLOW OR EQUAL
BV-5: 1 INCH WITH SWEAT FITTINGS. MFG: TACO ACCU FLOW OR EQUAL

MOTORIZED DAMPERS-SEE DAMPER SCHEDULE M-1.2 FOR DETAILS

THERMOSTATS

TH-1, TH-2, WALL THERMOSTATS-LINE VOLTAGE STAT MFG: HONEYWELL T4051A W/LOCKING COVER,
TH-3, TH-4, TH-5 THERMOSTAT: LOW VOLTAGE WALL STAT-REMOTE BULB WITH ADJUSTIBLE DIFFERENTIAL
0-100 F SET POINT, 3-10 F ADJUSTIBLE DIFFERENTIAL MFG: HONEYWELL T675A1045 OR EQUAL

MULTIPLE BOILER CONTROLLER

WEIL MCLAIN ADVANCED FEATURES MODULE (AFM) OR EQUAL IF BOILERS PROVIDED DIFFER FROM
BOILERS SPECIFIED.

SEQUENCE OF OPERATION B-1, B-2 BOILERS

BOILER CONTROLLER CONTROLS FIRING OF B-1 AND B-2 ON CALL FROM BOILER SUPPLY SENSOR SET POINT 180 F
BOILER CONTROLLER LOWERS SET POINT ON RESET FROM OUTSIDE AIR SENSOR.

SEQUENCE OF OPERATION PMP-1A, PMP-1B HEATING CIRCULATOR PUMPS.

EITHER PMP-1 OR PMP-2 OPERATES WITH THE OTHER PUMP ON MANUAL STANDBY. OPERATION IS CONTINUOUS
PUMP SPEED IS CONTROLLED BY A PRESSURE SENSOR ACCROSS THE PUMP. SEPARATE CONTROLS ARE PROVIDED FOR EACH PUMP

SEQUENCE OF OPERATION: UH-1 AND UH-2 UNIT HEATERS:

COIL FLOW IS CONTINUOUS. WALL THERMOSTAT CYCLES THE FAN. SET POINT 60 F

SEQUENCE OF OPERATION: UH-1 AND UH-2 UNIT HEATERS:

COIL FLOW IS CONTINUOUS. WALL THERMOSTAT CYCLES THE FAN. SET POINT 60 F

SEQUENCE OF OPERATION: HE-2 HEAT EXCHANGER AND PMP-2

SYSTEM PROVIDES HEATING FOR WELL ENCLOSURE AND WELL CASING.
TH-3 SENSES TEMPERATURE IN WELL ENCLOSURE
SIGNAL FROM TH-3 THERMOSTAT STARTS PMP-2 AND OPENS CV-2

SEQUENCE OF OPERATION: HE-1 HEAT EXCHANGER

SYSTEM PROVIDES HEATING FOR VILLAGE WATER SUPPLY LOOP
TH-4 SENSES TEMPERATURE IN RETURN LINE TO HE-1
SIGNAL FROM TH-4 OPENS CV-1

SEQUENCE OF OPERATION: VF-1 VENT FAN

SYSTEM PROVIDES VENTILATION AND BREATHING AIR FOR PUMP HOUSE
TH-5 SENSES TEMPERATURE IN ROOM CLOSES TO START VF-1 AND OPENS MD-1
WHEN TEMPERATURE DROPS BELOW DIFFERENTIAL SETPOINT THE THERMOSTAT OPENS AND VF-1 STOPS AND MD-1 CLOSES

SIGNAL FROM OS-1 (OCCUPANCY SENSOR) STARTS VF-1 AND OPENS MD-1
WHEN OS-1 TIMES OUT VF-1 STOPS AND MD-1 CLOSES

CONTROLS(CONTINUED)

T-1, T-2, T-3 TRANSFORMER 115 VAC TO 24 VAC 50 VA FOOT MOUNTED
MFG: HONEYWELL AT87-1106 OR EQUAL.

CR-1 CONTROL RELAY: DPDT RELAY, 12 AMP@ 120 VAC POWER DUTY RATED CONTACTS
WITH MAX 25 VA PILOT DUTY @ 24 VAC MFG: HONEYWELL R8222D1029 OR EQUAL

CR-2 CONTROL RELAY: SPDT RELAY, 16.0 AMPS@ 120 VAC POWER DUTY
24 VAC COIL, BOX OR WALL MOUNTED, TOTALLY ENCLOSED. MFG: WHITE RODGERS 8A0-1 OR EQUAL

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CONTROLS AND SEQUENCE OF OPERATION

CHEFORNAK PUMPHOUSE # 1

CHEFORNAK, ALASKA

DATE: APRIL 17, 2015
DRAWN: F.H. BELZ
CHKD:
SCALE: AS NOTED
REVISED:
JOB NO. C407

SHEET NO. 4 OF 11
M-1.3

DRAWING IN PROGRESS

DATE: APRIL 17, 2015
DRAWN: F.H. BELZ
CHKD:
SCALE: AS NOTED
REVISED:
JOB NO: C407

SHEET NO
M-1.4 5 OF 11

PMP-1A, PMP-1B, PMP-2 CONTROL DIAGRAM
CHEFORNAK PUMPHOUSE #1
CHEFORNAK, ALASKA



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DRAWING IN PROGRESS

DATE: APRIL 17, 2015
DRAWN: F.H. BELZ
CHKD:
SCALE: AS NOTED
REVISED:
JOB NO. C407

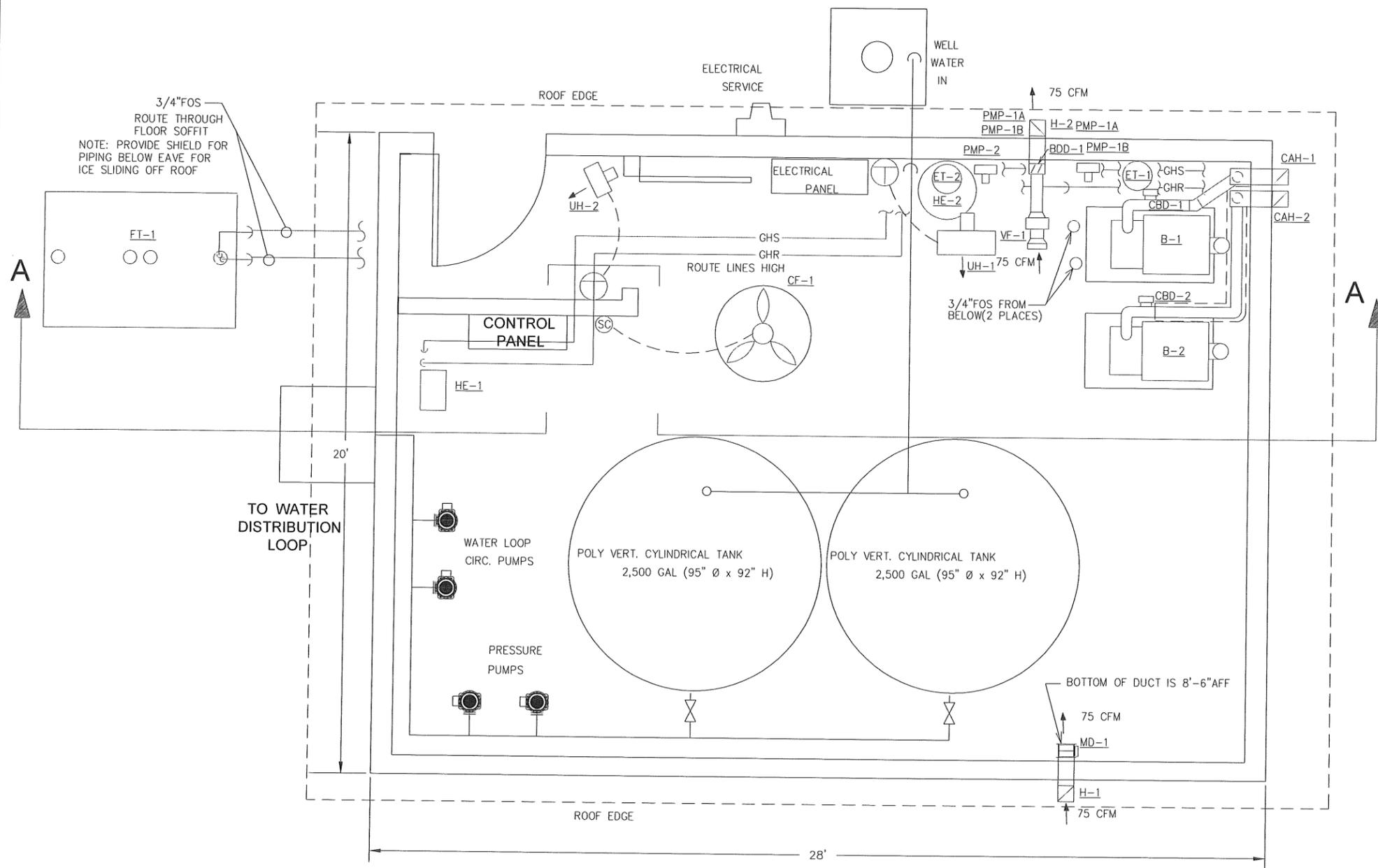
SHEET NO.
M-1.5 6 OF 11

UH-1, UH-2 VF-1 CONTROL DIAGRAM
CHEFORNAK PUMPHOUSE #1
CHEFORNAK, ALASKA



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CHEFORNAK PUMPHOUSE #1

1/4" = 1'-0"

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 EAGLE RIVER, ALASKA 99577
 TELEPHONE: 907-414-1456
 EMAIL: ForEst@cedr.net

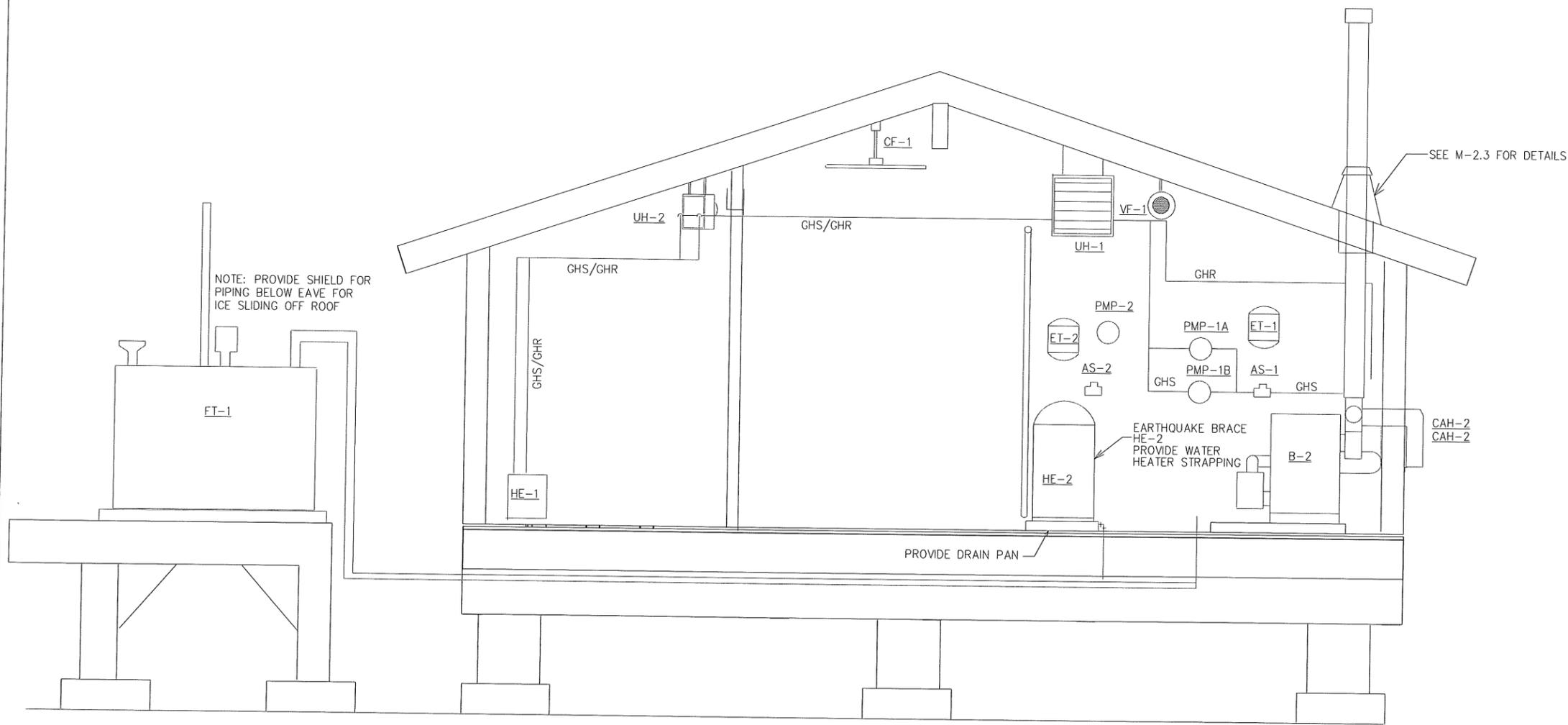


MECHANICAL PLAN - SECTIONS
CHEFORNAK PUMPHOUSE #1
CHEFORNAK, ALASKA

DATE: APRIL 17, 2015
 DRAWN: F.H. BELZ
 CHKD:
 SCALE: AS NOTED
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 JOB NO. C407

SHEET NO. 7 OF 11
 M-2.0

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SECTION A-A-DWG M-2.0

1/4"=1'-0"

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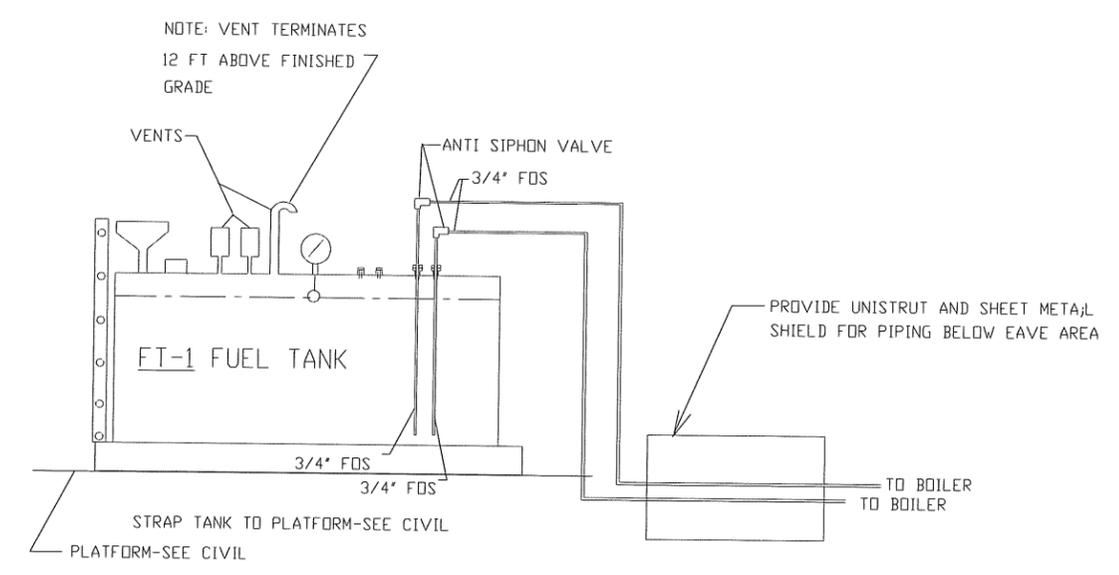
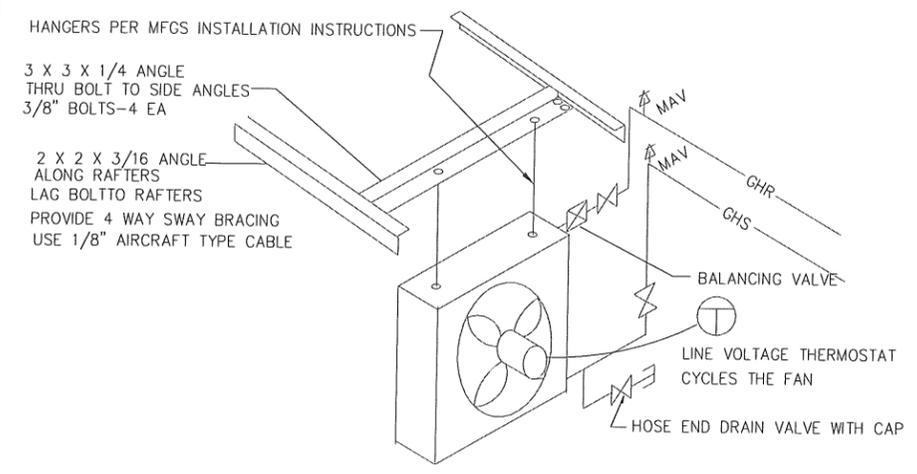
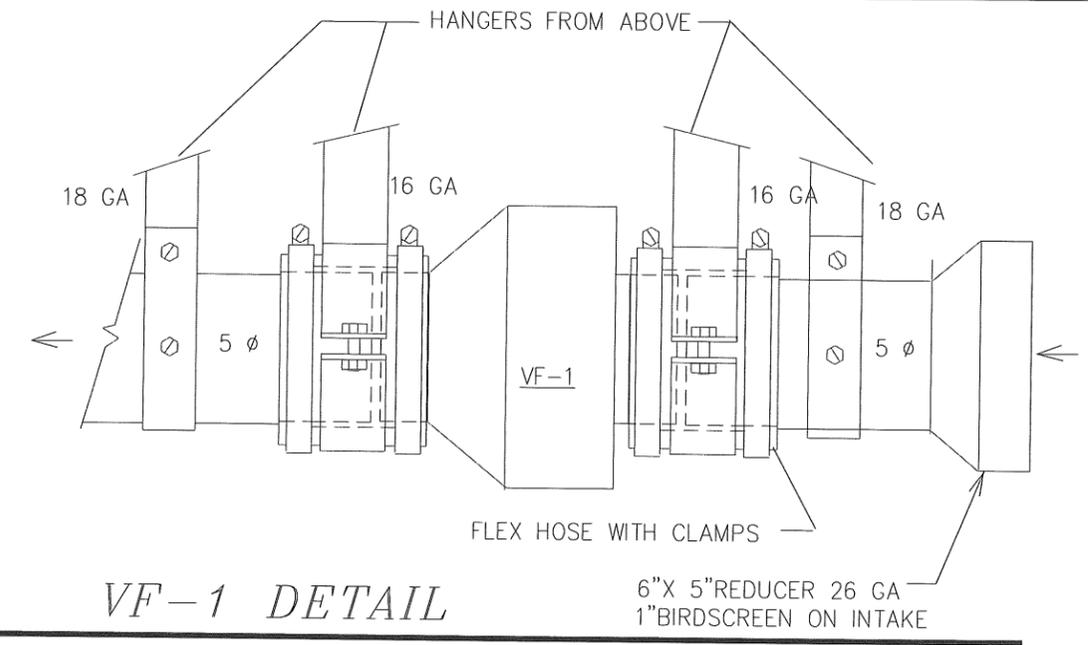
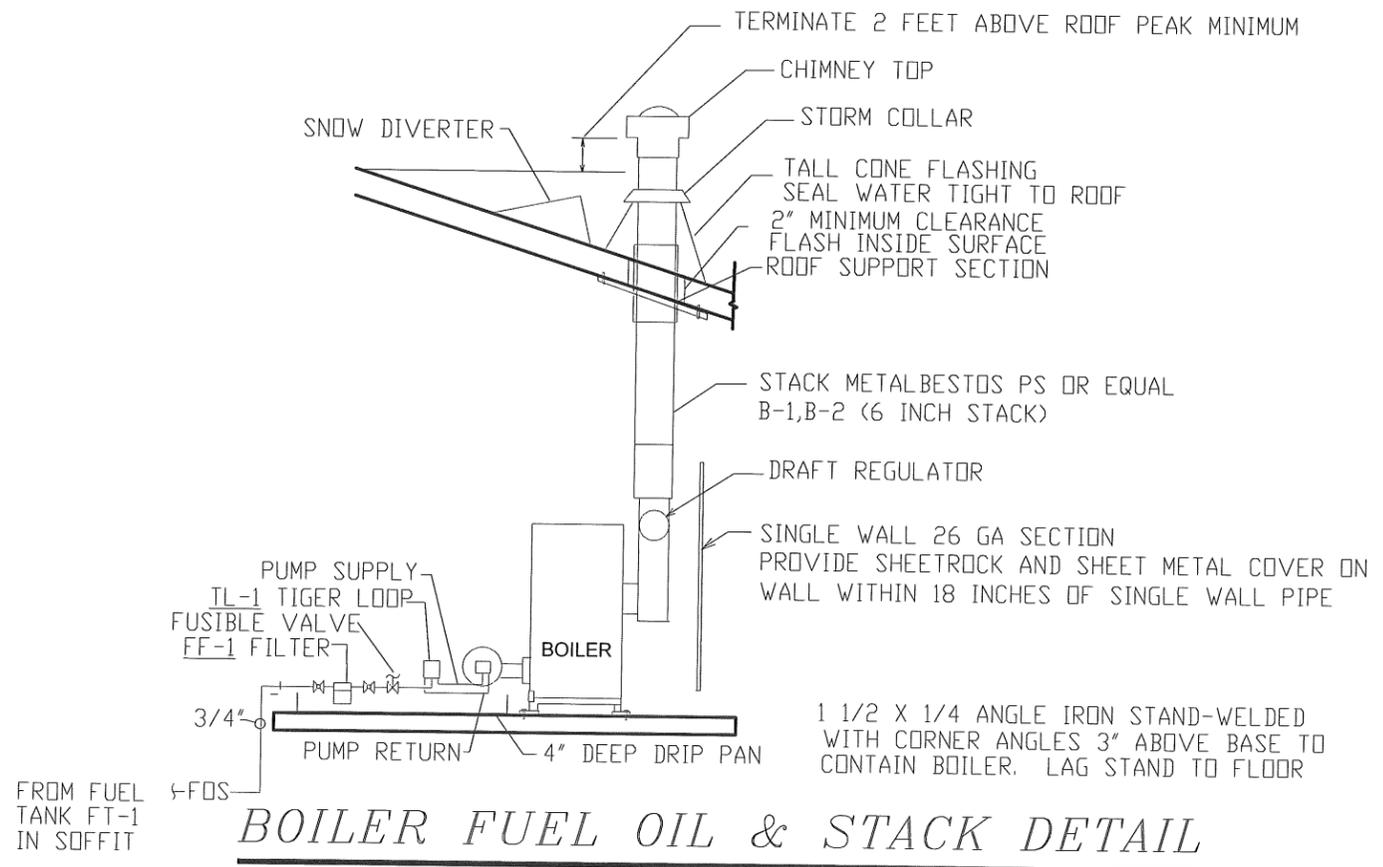


MECHANICAL PLAN - SECTIONS
CHEFORNAK PUMPHOUSE #1
CHEFORNAK, ALASKA

DATE: APRIL 17, 2015
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M-2.1

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HVAC AND HEATING DETAILS
CHEFORNAK WASHETERIA
CHEFORNAK, ALASKA

DATE:	APRIL 17, 2015
DRAWN:	F.H. BELZ
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SHEET NO.	9 OF 11
M-2.2	

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DATE:	APRIL 7, 2015
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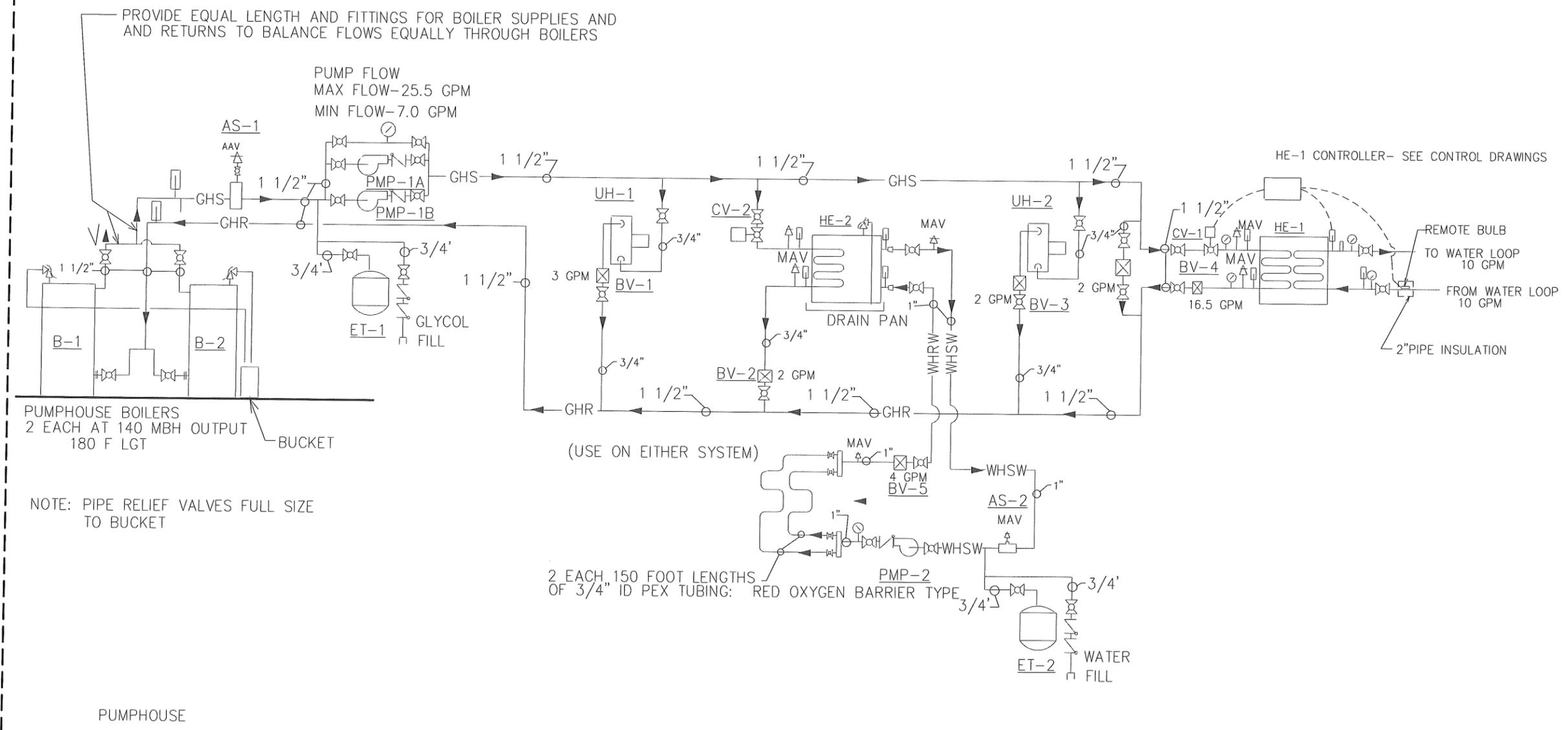
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HVAC AND HEATING DETAILS
 CHEFORNAK PUMPHOUSE # 1
 CHEFORNAK, ALASKA



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CHEFORNAK PUMPHOUSE # 1 HEATING SUPPLY DIAGRAM

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email: belz@ce2.com



HEATING AND WATER SUPPLY DIAGRAM
CHEFORNAK PUMPHOUSE # 1
CHEFORNAK, ALASKA

DATE: APRIL 17, 2015
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SCALE: AS NOTED
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JOB NO: C407

SHEET NO. 11 OF 11
M-3.0

ELECTRICAL LEGEND

(NOTE: THIS IS A STANDARD LEGEND AND NOT ALL SYMBOLS ARE NECESSARILY USED.)

- EXTERIOR LIGHT FIXTURE, POLE MOUNTED, HEADS AS SHOWN
- HAND HOLE
- ELECTRIC VAULT
- PHOTOCCELL CONTROL
- LUMINAIRE - TYPE AS NOTED ON PLAN
- LUMINAIRE - WALL MOUNTED: TYPE AS NOTED ON PLAN
- LUMINAIRE - EMERGENCY LIGHT
- TRACK LIGHTING - TRACK LENGTH AS SCALED: TYPE AS NOTED ON PLAN
- EMERGENCY LIGHTING UNIT (WALL; CEILING; REMOTE HEAD): TYPE "E", UON
- EMERGENCY BATTERY TO POWER REMOTE HEAD(S); TYPE "ERB", UON
- EXIT SIGN (CEILING; WALL); SHADE DENOTES FACE; ARROWS AS INDICATED; TYPE "X", UON
- SWITCH - SINGLE POLE, SINGLE THROW, UON
- SWITCH - THREE WAY
- SWITCH - FOUR WAY
- SWITCH CONTROL FOR FIXTURES DENOTED WITH "O" APPENDED TO CIRCUIT NUMBER
- SWITCH - LOW VOLTAGE
- SWITCH - ELECTRONIC DIMMER SWITCH COMPATIBLE WITH LIGHT FIXTURE
- SWITCH - KEYED
- SWITCH - PILOT LIGHT
- SWITCH - INTEGRAL MOTOR OVERLOAD
- SWITCH - VARIABLE SPEED CONTROL
- LIGHT CONTROL OCCUPANCY SENSOR - WALL SWITCH BOX MOUNTED
- LIGHT CONTROL OCCUPANCY SENSOR - CEILING MOUNTED
- POWER DISTRIBUTION PANELBOARD
- METERING DEVICE
- CURRENT TRANSFORMER ENCLOSURE
- POWER PANELBOARD (NEW - SURFACE; RECESSED), (EXISTING - SURFACE; RECESSED)
- TRANSFORMER: APPROX. PHYSICAL SIZE AS SCALED; ACTUAL RATING AS NOTED ON ONE-LINE DIAGRAMS
- MOTOR CONNECTION
- COMBINATION BATHROOM FAN/LIGHT: TYPE AS NOTED ON PLAN
- NON-FUSED SAFETY SWITCH
- FUSED SAFETY SWITCH
- ENCLOSED CIRCUIT BREAKER SWITCH
- MOTOR STARTER
- COMBINATION MOTOR STARTER SAFETY SWITCH
- PUSH BUTTON CONTROL STATION
- JUNCTION BOX OR EQUIPMENT CONNECTION - FLEX OR RECEPTACLE AS REQUIRED (CEILING; WALL; FLOOR)
- POWER CONNECTION TO FSD CONTROLLED BY FIRE ALARM SYSTEM
- SIMPLEX RECEPTACLE
- DUPLEX RECEPTACLE
- DOUBLE DUPLEX RECEPTACLE
- DUPLEX RECEPTACLE - SPLIT WIRED FOR SWITCH CONTROL OF LOWER OUTLET
- DUPLEX RECEPTACLE - GFCI PROTECTED
- DUPLEX RECEPTACLE - GFCI PROTECTED MOUNTED 48" AFF
- DUPLEX RECEPTACLE - GFCI PROTECTED MOUNTED ABOVE COUNTERTOP
- DUPLEX RECEPTACLE - MOUNTED ABOVE COUNTERTOP
- DUPLEX RECEPTACLE - FLOOR MOUNTED FIRE RATED POKE THROUGH, UON
- DOUBLE DUPLEX RECEPTACLE - FLOOR MOUNTED FIRE RATED POKE THROUGH, UON
- RECEPTACLE - PENDANT MOUNTED FROM CEILING
- RECEPTACLE - FLUSH MOUNTED IN CEILING
- DRYER RECEPTACLE - 30A, 3 POLE, 4 WIRE NEMA 14-30R
- ELECTRIC RANGE RECEPTACLE - 50A, 3 POLE, 4 WIRE, NEMA 14-50R
- SPECIAL PURPOSE RECEPTACLE - NEMA CONFIGURATION AS NOTED (SURFACE, WALL)
- GROUND CONNECTION POINT
- DUAL CHANNEL SURFACE MOUNTED RACEWAY - LENGTH AS SCALED
- SINGLE CHANNEL SURFACE MOUNTED RACEWAY - LENGTH AS SCALED
- TELECOMMUNICATION OUTLET (WALL; FLOOR)
- TELEPHONE OUTLET
- TELEVISION OUTLET (WALL; CEILING)
- DUAL CHANNEL SERVICE POLE
- TELECOMMUNICATION FLOOR STANDING RACK
- TELECOMMUNICATION WALL MOUNTED RACK
- TELECOMMUNICATION MAIN GROUNDING BUS
- TELECOMMUNICATION GROUNDING BUS
- CONTROL PANEL - TYPE AS NOTED (SURFACE; RECESSED)

- FIRE ALARM CONTROLLED MAGNETIC DOOR HOLDER / RELEASE
- ABORT STATION
- CARBON MONOXIDE DETECTOR
- HEAT DETECTOR - RATE OF RISE
- HEAT DETECTOR - FIXED TEMPERATURE AS NOTED
- SMOKE DETECTOR - PHOTOELECTRIC TYPE
- SMOKE DETECTOR - MULTI-SENSOR TECHNOLOGY TYPE
- SMOKE DETECTOR - DUCT MOUNTED
- SMOKE DETECTOR - BEAM RECEIVER
- SMOKE DETECTOR - BEAM TRANSMITTER
- FLAME DETECTOR
- LINE TYPE HEAT SENSITIVE CABLE DETECTOR
- FIRE ALARM HORN
- FIRE ALARM STROBE
- FIRE ALARM COMBINATION HORN/STROBE
- FIRE ALARM PULL STATION
- FIRE ALARM CONTROL PANEL
- FIRE SYSTEM ANNUNCIATOR PANEL
- HALON CONTROL PANEL
- FIRE ALARM SPEAKER STROBE
- WATER FLOW BELL - 120V CONTROLLED BY FLOW SWITCH
- FIRE ALARM FLOW SWITCH
- FIRE ALARM TAMPER SWITCH
- MICROPHONE INPUT JACK
- MICROPHONE INPUT JACK - FLOOR MOUNTED
- INTERCOM CALL BUTTON
- INTERCOM ADMINISTRATION PHONE
- SPEAKER (WALL; CEILING)
- CLOCK SPEAKER COMBINATION WALL MOUNT UNIT
- CLOCK - WALL MOUNTED
- SECURITY ACCESS CARD READER
- DOOR CONTROL SOLENOID
- DOOR MAGNETIC CONTACT
- SECURITY SYSTEM - GLASS BREAK SENSOR
- SECURITY SYSTEM - MOTION SENSOR
- SECURITY SYSTEM - DOOR POSITION SENSOR
- SECURITY SYSTEM - REQUEST TO EXIT MOTION DETECTOR
- SECURITY SYSTEM - ACCESS KEY PAD
- SECURITY SYSTEM - MOTION SENSOR - NARROW PATTERN
- SECURITY SYSTEM - CAMERA
- ACCESS PANEL
- LINETYPE DENOTING CABLE TRAY
- LINETYPE/LINEWEIGHT DENOTING FUTURE WORK
- LINETYPE/LINEWEIGHT DENOTING EXISTING WORK TO REMAIN
- LINETYPE/LINEWEIGHT DENOTING NEW WORK
- LINETYPE/LINEWEIGHT DENOTING DEMO WORK
- DENOTES AVAILABLE FAULT CURRENT

- ### EQUIPMENT TAG LEGEND
- LUMINAIRES**
 - LUMINAIRE TYPE (UNDERLINED)
 - THE NUMBER IN BRACKETS INDICATES HOW MANY TYPICAL LUMINAIRES OF THIS TYPE ARE IN THIS AREA
 - CIRCUIT AND SWITCHLEG
 - PANEL
 - TYPICAL LUMINAIRE
 - CONTROL SWITCHES**
 - LOWER CASE LETTER DENOTES SWITCH LEG FOR CORRESPONDING LUMINAIRE CONTROL
 - UPPERCASE LETTER OR NUMBER DENOTES SWITCH CONFIGURATION
 - EQUIPMENT CONNECTIONS**
 - EQUIPMENT ID (UNDERLINED) REFER TO EQUIPMENT CONNECTION SCHEDULE FOR REQUIREMENTS
 - TYPICAL EQUIPMENT (MOTOR STARTER SHOWN)
 - CIRCUIT NUMBER(S)
 - PANEL
 - RECEPTACLES**
 - MOUNTING HEIGHT AFF PANEL
 - CIRCUIT NUMBER(S)
 - NEMA CONFIGURATION FOR SPECIAL RECEPTACLES (UNDERLINED)

ABBREVIATIONS

(E)	EXISTING
A	AMPERES
AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPS INTERRUPTING CAPACITY
C	CONDUIT OR CELCIUS
CAT	CATEGORY
CB	CIRCUIT BREAKER
CO	CONDUIT ONLY
CT	CURRENT TRANSFORMER
(D)	DEMOLISH
DISC	DISCONNECT
EGC	EQUIPMENT GROUNDING CONDUCTOR
F	FAHRENHEIT
FAA	FIRE ALARM ANNUNCIATOR
FACP	FIRE ALARM CONTROL PANEL
FHP	FRACTIONAL HORSEPOWER
FLA	FULL LOAD AMPS
FSD	FIRE SMOKE DAMPER
FT	FEET
FU	FUSE
G	GROUND FAULT CIRCUIT INTERRUPTER
GEC	GROUNDING ELECTRODE CONDUCTOR
HP	HORSEPOWER
ID	IDENTIFICATION
IN	INCHES
KVA	KILOVOLT-AMPERE
KW	KILOWATT
LRA	LOCKED ROTOR AMPS
LTC	LIGHTING
MCA	MINIMUM CIRCUIT AMPACITY
MDP	MAIN DISTRIBUTION PANEL
MDS	MAIN DISTRIBUTION SWITCHBOARD
MFS	MAXIMUM FUSE SIZE
(N)	NEW
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
P	POLES
PC	PHOTO CELL
PH, #	PHASE
PNL	PANEL
PRI	PRIMARY
REC	RECEPTACLE
(R)	RELOCATED
RB	RELAY IN A BOX (MOTOR RATED)
SCCR	SHORT CIRCUIT CURRENT RATING
SE	SERVICE ENTRANCE RATED
SEC	SECONDARY
SSEBJ	SUPPLY SIDE EQUIPMENT BONDING JUMPER
SVC	SERVICE
TELECOM	TELECOMMUNICATION
TGB	TELECOMMUNICATION GROUNDING BUSBAR
TMGB	TELECOMMUNICATION MAIN GROUNDING BUSBAR
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLT-AMPERES
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS OR WIRE
WG	WIRE GUARD
WP	WEATHERPROOF (NEMA 4 RATED)
XFMR	TRANSFORMER

MOUNTING HEIGHT SCHEDULE

PANELBOARDS (TOP)	+70"
SPECIAL SYSTEM PANELS (TOP)	+66"
POWER METER BASE (CENTER LINE OF SOCKET)	+66"
CONTACTORS, MOTOR STARTERS, DISCONNECT SWITCHES (TOP)	+66"
RECEPTACLES IN OFFICE AREAS	+18"
RECEPTACLES IN NON-FINISHED AND MECHANICAL SPACES	+46"
ABOVE COUNTER DEVICES (DENOTED "AC" OR BY SYMBOL)	SEE NOTES
WALL MOUNTED SWITCHES	+46"
TELECOMMUNICATION OUTLETS	+18"
WALL MOUNTED TELEPHONE OUTLET (DENOTED "W")	+54"
CLOCK OUTLETS	+80" TO BOTTOM
HORNS/STROBES/HORN STROBES/DOORBELL RINGER	+80" TO BOTTOM
PULL STATIONS, PUSH BUTTONS, DOORBELL PUSHBUTTON	+46"

NOTES:

- COORDINATE AND INSTALL ALL EQUIPMENT AND DEVICES WITH THE ARCHITECTURAL PLANS AND ANY SPECIFICALLY DENOTED REQUIREMENTS.
- MOUNTED HEIGHTS SHALL PREVAIL UNLESS OTHERWISE NOTED OR FIELD CONDITIONS REQUIRE DEVIATION.
- MOUNTING HEIGHTS ARE FROM FINISHED FLOOR TO THE CENTERLINE OF THE DEVICE UNLESS OTHERWISE NOTED.
- COORDINATE MOUNTING HEIGHTS AND LOCATIONS OF OUTLETS DENOTED AS ABOVE COUNTER TO BE INSTALLED 6" ABOVE COUNTERS OR BACKSPASHES, WHICHEVER IS HIGHER.

GENERAL REQUIREMENTS

- ALL ELECTRICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE 2011 EDITION OF THE NATIONAL ELECTRIC CODE, STATE, MUNICIPAL, AND FEDERAL LAWS, AMENDMENTS AND/OR ORDINANCES GOVERNING THE PROJECT. IF IN ANY INSTANCE THE PLANS AND SPECIFICATIONS ARE IN DIRECT CONFLICT WITH SUCH CODES, LAWS, AND/OR ORDINANCES, THE CODE, LAWS, AND/OR ORDINANCES SHALL HAVE JURISDICTION AND THE WORK IN QUESTION SHALL BE INSTALLED ACCORDING TO THE CODES, LAWS, AND/OR ORDINANCES. ALL WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A CERTIFIED ELECTRICIAN.
- THE CONTRACTOR SHALL OBTAIN ALL REQUIRED CONSTRUCTION PERMITS AND PAY ALL ASSOCIATED FEES.
- MATERIALS AND EQUIPMENT SHALL BE COMMERCIAL GRADE AND ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED. ALL ELECTRICAL EQUIPMENT SHALL INCLUDE THE SEAL OF A NATIONALLY RECOGNIZED TESTING LABORATORY FOR THE PURPOSE FOR WHICH IT IS INSTALLED. WHENEVER POSSIBLE, SIMILAR ITEMS SHALL BE SUPPLIED BY THE SAME MANUFACTURER THROUGHOUT THE PROJECT.
- COORDINATE AND PROVIDE THE EQUIPMENT WITH THE SHORT CIRCUIT CURRENT RATING (SCCR) FOR THE AVAILABLE FAULT CURRENT AT THE POINT OF THE SYSTEM WHERE INSTALLED. SERIES RATING OF EQUIPMENT IS ACCEPTABLE. PROVIDE ARC FAULT WARNING LABELS ON ALL PANELBOARDS, MCC UNITS AND SIMILAR EQUIPMENT PER NEC REQUIREMENTS.
- THE FOLLOWING WIRING METHODS SHALL BE ACCEPTABLE FOR INSTALLATION OF ELECTRICAL CIRCUITS: TYPE MC CABLE, INTERMEDIATE METAL CONDUIT, RIGID METAL CONDUIT, RIGID NONMETALLIC CONDUIT (FOR UNDERGROUND USE ONLY), ELECTRICAL METALLIC TUBING, FLEXIBLE METALLIC TUBING, FLEXIBLE METAL CONDUIT, AND LIQUID TIGHT FLEXIBLE CONDUIT. ALL WIRING METHODS SHALL INCLUDE AN EQUIPMENT GROUNDING CONDUCTOR TO BE INSTALLED THEREIN AND SIZED FOR THE CIRCUITS SERVED. ALL CLASSIFIED AREAS SHALL USE RIGID CONDUIT, AND WIRING METHODS AND MATERIALS RATED FOR EXPLOSION PROOF PER NEC AND THE CLASSIFICATIONS NOTED ON THE PLANS.
- ALL CONDUCTORS SHALL BE COPPER. ALL CONDUCTORS IN UNHEATED SPACES OF THE BUILDING OR LOCATED OUTSIDE OF THE BUILDING ARE REQUIRED TO HAVE TYPE XHHW 90 DEGREE C INSULATION. ALL CONDUCTORS LOCATED IN HEATED SPACES CAN BE XHHW OR THHN 90 DEGREE C INSULATION UNLESS NOTED OTHERWISE. CONDUCTOR AMPACITY SHALL BE BASED ON TABLE 310-16 OF THE NEC. USE 60-DEGREE C RATING FOR CIRCUITS TERMINATING ON DEVICES RATED BELOW 100A. USE 75-DEGREE C RATING FOR CIRCUITS TERMINATING ON DEVICES AND IN ENCLOSURES RATED 100A AND OVER. DERATE CONDUCTORS PER NEC REQUIREMENTS.
- CONCEAL ALL ELECTRICAL RACEWAYS, BOXES, CABLING, CONDUCTORS AND THE LIKE IN WALLS, BELOW FLOORS, SLABS OR ABOVE FINISHED CEILING SPACES. ELECTRICAL EQUIPMENT AND WIRING CAN BE EXPOSED IN MECHANICAL ROOMS, TELECOMMUNICATION ROOMS OR WHERE SPECIFICALLY NOTED.
- DO NOT ROUTE RACEWAYS ON THE EXTERIOR SURFACE OF THE BUILDING, ROOF, OR FLOOR UNLESS SPECIFICALLY NOTED OTHERWISE.
- PROVIDE ALL WIRING AND EQUIPMENT IN WET AND EXTERIOR LOCATIONS USING EQUIPMENT AND WIRING METHODS RATED FOR WET ENVIRONMENTS.
- PROVIDE ACCESS PANELS FOR ALL LOCATION NECESSARY TO ACCESS ELECTRICAL EQUIPMENT AND JUNCTION BOXES. ACCESS PANELS SHALL BE FIRE RATED EQUAL TO OR EXCEEDING THE ADJACENT WALL OR CEILING CONSTRUCTION AND PAINTED TO MATCH.
- CONNECT ALL EMERGENCY LIGHTING UNITS AND MODULES TO THE LOCAL AREA LIGHTING CIRCUITS AHEAD OF ANY SWITCHES OR RELAYS. LOCATE REMOTE TEST SWITCHES AND INDICATOR LIGHTS AS NECESSARY FOR TEST SWITCHES ON EMERGENCY MODULES.
- SEAL ALL PENETRATIONS. SEAL PENETRATIONS AT ALL FIRE WALLS WITH APPROVED FIRE STOPPING COMPOUND.
- OUTLET BOXES LOCATED BACK TO BACK IN FIRE RATED WALLS SHALL BE SPACED A MINIMUM OF 2 FEET HORIZONTALLY OR PROVIDE AN APPROVED FIRE PROTECTIVE MATERIAL PLACED ON OR AROUND THEM LISTED FOR THE FIRE RATING OF THE WALL.
- CONTRACTOR SHALL SUBMIT REQUEST FOR SUBSTITUTION IN WRITING TO THE ENGINEER.
- PROVIDE SEISMIC SUPPORT AND DESIGN PER IBC REQUIREMENTS.
- THE ELECTRICAL CONTRACTOR SHALL CONTACT SERVING UTILITY CO. AND VERIFY EXACT SERVICE REQUIREMENTS FOR POWER. THE CONTRACTOR SHALL COORDINATE AND PROVIDE ALL REQUIREMENTS OF SERVING UTILITY AND ALL EQUIPMENT SHALL CONFORM TO THE SERVING UTILITY STANDARDS AND REQUIREMENTS.

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CONSTRUCTION RECORD	FIELD BOOK	STAKING	FOREMAN	AS-BUILT	INSPECTOR

FOR PRELIMINARY CONSTRUCTION NOT TO BE USED FOR PERMITS

CHEFORKNAK PUMP HOUSE

ELECTRICAL LEGEND AND GENERAL REQUIREMENTS

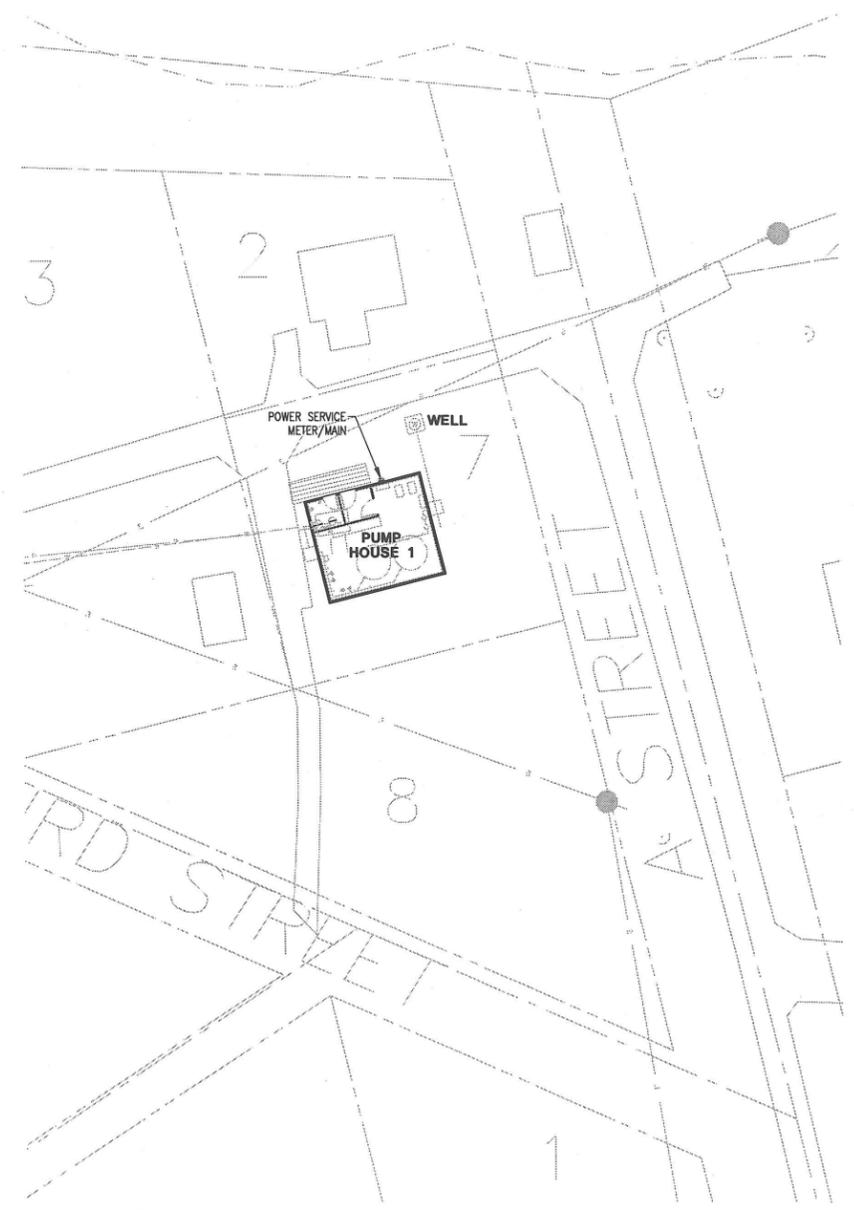
CHEFORKNAK, ALASKA

BY	DATE

REVISION	DATE	BY	DESCRIPTION

Project No. _____	Date _____	Designed _____	Drawn _____	Approved _____

Sheet No. **E1.1**



1 PUMP HOUSE 1 ELECTRICAL SITE PLAN
 E2.1 SCALE: 1" = 20'-0"



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EIC JOB #E14-2149

Project No.	Date	Designed	Drawn	Approved
	SEPT 2014	BLS	BLS	EDC

Sheet No.
E2.1

REVISION	BY	DATE

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CHEFORNAK PUMP HOUSE
 ELECTRICAL
 SITE PLAN
 CHEFORNAK, ALASKA



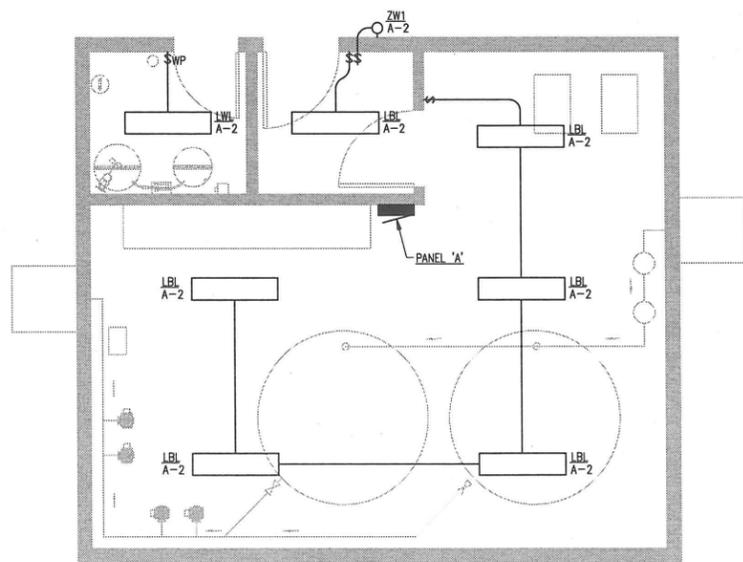
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INSPECTOR	

SCALE:
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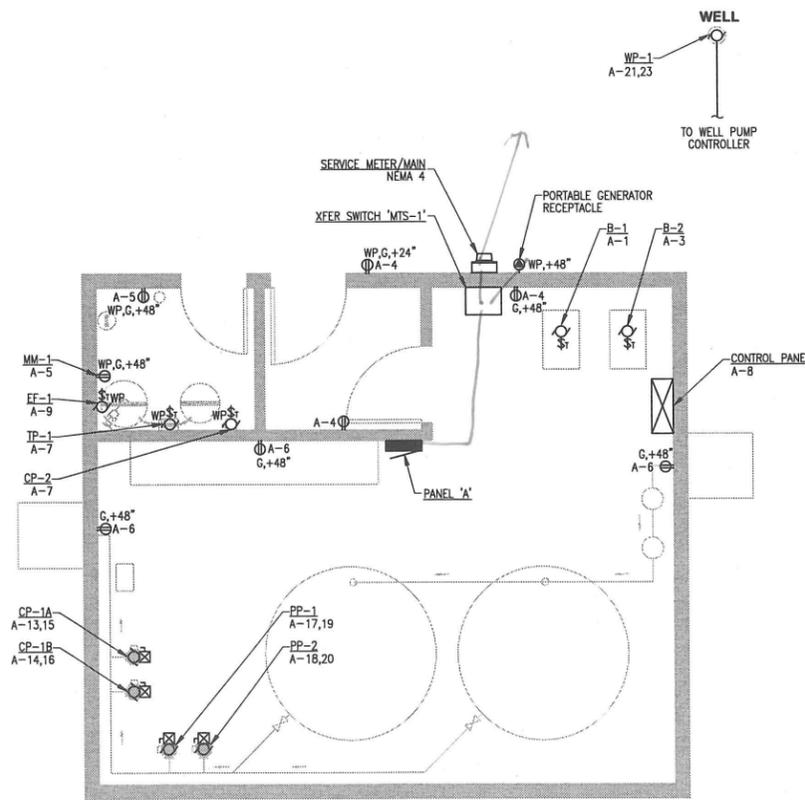
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 NAME _____ DATE _____

LUMINAIRE SCHEDULE					
TYPE	DESCRIPTION	LAMPS	MOUNTING	MANUFACTURER/MODEL	NOTES
LB4	4FT LED WRAP W/ PRISMATIC LENS	LED	CEILING SURFACE	LITHONIA #LBL4-LP835	
LW4	4FT ENCLOSED & GASKETED LED W/ WET LABEL	LED	CEILING SURFACE	LITHONIA #FEM4-LED-IMAFI	
ZW1	LED AREA LIGHT W/ CUTOFF OPTICS & INTEGRAL PHOTOCELL	LED	EXTERIOR WALL	LITHONIA #OLW14	
STANDARD NOTES					
A) CATALOG NUMBERS ARE FOR GENERAL REFERENCE AND ARE NOT INCLUSIVE OF ALL OPTIONS OR REQUIREMENTS DENOTED ON PLANS AND SPECIFICATIONS.					
B) REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND PROVIDE MOUNTING HARDWARE/FLANGES ETC FOR ALL LUMINAIRES FOR CEILING TYPES SHOWN.					
C) LUMINAIRES NOTED ON THE FLOOR PLANS AS 'NL' (NIGHTLIGHT) SHALL BE CONNECTED TO UNSWITCHED POWER CIRCUIT NOTED ON DRAWINGS.					
REFERENCED NOTES					
1) NOT USED					

MECHANICAL EQUIPMENT CONNECTION SCHEDULE										
UNIT ID	LOCATION OR FUNCTION	LOAD RATINGS							CONDUCTORS & CONDUIT	NOTES
		KVA	HP	FLA	MCA	MFS	V	PH		
B-1	BOILER			5			120	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
B-2	BOILER			5			120	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
CP-1A	WATER LOOP CIRCULATION PUMP	3/4					240	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
CP-1B	WATER LOOP CIRCULATION PUMP	3/4					240	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
EF-1	EXHAUST FAN		FHP				120	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
MM-1	MIXING TANK		FHP				120	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	1
PP-1	PRESSURE PUMP	1.5					240	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
PP-2	PRESSURE PUMP	1.5					240	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
WP-1	WELL PUMP	1					240	1	(2)10 AWG, (1)10 AWG EGC, 3/4" C.	
TP-1	TRANSFER PUMP		FHP				120	1	(2)12 AWG, (1)12 AWG EGC, 1/2" C.	
STANDARD NOTES										
A) REFER TO FLOOR PLAN DRAWINGS FOR EQUIPMENT TYPE REQUIREMENTS, LOCATIONS AND QUANTITIES.										
B) COORDINATE ALL CONNECTION REQUIREMENTS WITH MECHANICAL AND ACTUAL EQUIPMENT SUPPLIED PRIOR TO ROUGH-IN.										
REFERENCED NOTES										
1) CORD AND PLUG CONNECTION.										
2) PROVIDE HP RATED RELAY-IN-A-BOX (RIB) AS NECESSARY FOR CONTROL. COORDINATE ALL CONTROL REQUIREMENTS WITH MECHANICAL.										



1 PUMP HOUSE 1 - LIGHTING PLAN
E3.1 SCALE: 1/4" = 1'-0"



2 PUMP HOUSE 1 - POWER PLAN
E3.1 SCALE: 1/4" = 1'-0"



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CONSTRUCTION RECORD

FIELD BOOK

STARTING

FOREMAN

AS-BUILT

INSPECTOR



CHEFORNAK PUMP HOUSE
PUMP HOUSE 1
ELECTRICAL PLANS
CHEFORNAK, ALASKA

CE2
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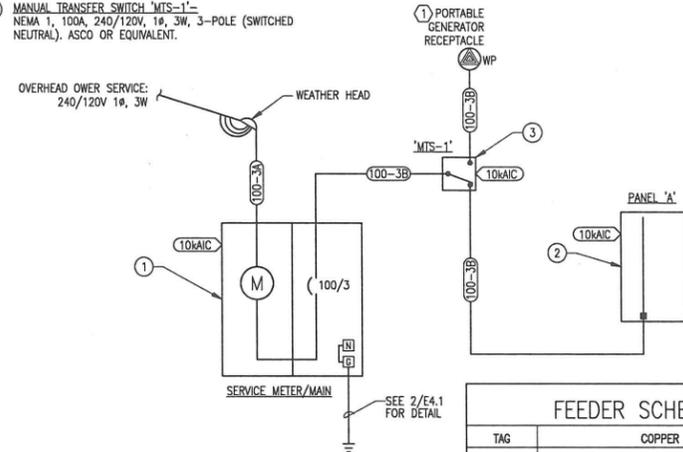
REVISION	BY	DATE

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DETAIL EQUIPMENT

- 1 SERVICE METER/MAIN-
SE RATED, NEMA 4, 100A MAIN CB, 240/120V,
1Ø, 3W, CIRCLE AW OR EQUIVALENT.
- 2 PANEL 'A'-
NEMA 1, 100A, 240/120V, 1Ø, 3W, 100A MAIN CB, 42
SPACE, SQUARE D TYPE NQDD OR EQUIVALENT.
- 3 MANUAL TRANSFER SWITCH 'MTS-1'-
NEMA 1, 100A, 240/120V, 1Ø, 3W, 3-POLE (SWITCHED
NEUTRAL), ASCO OR EQUIVALENT.



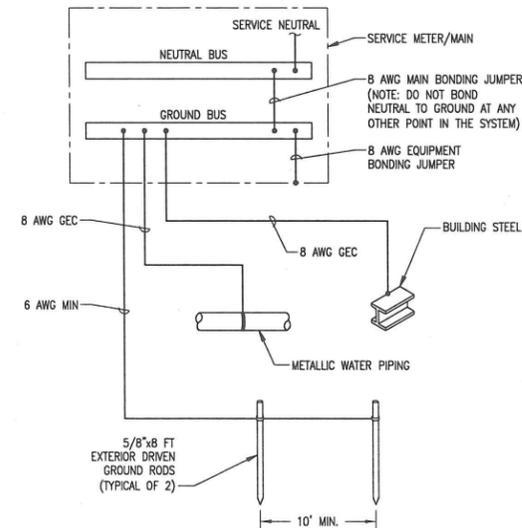
DETAIL NOTES

- 1) CONTRACTOR TO FIELD VERIFY PORTABLE GENERATOR RECEPTACLE CONFIGURATION WITH OWNER.

FEEDER SCHEDULE		
TAG	COPPER	NOTES
100-3A	1.25"Ø, (3) 2 AWG, (1) 8 AWG GEC	
100-3B	1.25"Ø, (3) 2 AWG, (1) 8 AWG EGC	
STANDARD NOTES		
A) ALL WIRE SIZES NOTED ARE COPPER.		
REFERENCED NOTES		
1) NOT USED.		

1 PUMP HOUSE 1 - POWER ONE-LINE DIAGRAM

E4.1 SCALE: NONE



DETAIL NOTES

- 1. BOND ALL PIPING AND BUILDING DISCONTINUITIES TO PROVIDE ELECTRICALLY CONTINUOUS SYSTEM. PROVIDE BOND JUMPER EQUAL TO GROUNDING ELECTRODE CONDUCTOR FOR THAT SYSTEM.
- 2. PROVIDE RACEWAY FOR ALL CONDUCTORS. RACEWAY TO BE METALLIC IN PLENUM AIR SPACES. WHERE METALLIC RACEWAY IS USED BOND EACH END TO CONDUCTOR.
- 3. ALL CONDUCTOR SIZES SHOWN ARE COPPER.

2 PUMP HOUSE 1 - GROUNDING SYSTEM DIAGRAM

E4.1 SCALE: NONE

VOLTAGE: 240/120V, 1PH, 3W
BUS: 100
MAIN LUGS ONLY -- FED BY 100A OPD

PANEL "A" SCHEDULE

MIN. A.I.C. RATING: SEE TLINE
ENCLOSURE: NEMA 1
MOUNTING SURFACE

LOAD DESCRIPTION	NOTE	KVA	LOAD	AMP	PKT	A	B	EXT	AMP	P	LOAD DESCRIPTION	NOTE	KVA	LOAD
B-1		0.60	M	20	11	1	2	20	11	11	LIG - PUMP HOUSE EXTERIOR		0.40	L
B-2		0.60	M	20	11	3	4	20	11	11	REC - PUMP HOUSE EXTERIOR		0.54	R
REC - PUMPHOUSE MM-1		0.37	N	20	11	5	6	20	11	11	REC - PUMP HOUSE		0.54	R
CP-2, TP-1		0.38	M	20	11	7	8	20	11	11	CONTROL PANEL		0.25	C
FE-1		0.19	M	20	11	9	10	20	11	11	SPARE			S
SPARE			S	20	11	11	12	20	11	11	SPARE			S
CP-1A		1.66	M	20	2	13	14	20	2	2	CP-1B		1.66	M
PP-1		2.40	LM	20	2	17	18	20	2	2	PP-2		2.40	M
WP-1		1.92	M	20	2	21	22				11 - SPACE			
						23	24				11 - SPACE			
						25	26				11 - SPACE			
						27	28				11 - SPACE			
						29	30				11 - SPACE			
						31	32				11 - SPACE			
						33	34				11 - SPACE			
						35	36				11 - SPACE			
						37	38				11 - SPACE			
						39	40				11 - SPACE			
						41	42				11 - SPACE			

SUMMARY BY LOAD TYPE	CONNECTED KVA			TOTAL KVA	NEC %	NEC TOTAL	NOTES
	PH A	PH B	FEED				
G GENERAL LOADS				N/A			
A APPLIANCE				0.75			
E ELECTRIC RANGE				1.00			
L LIGHTING	0.4			0.4	1.25	0.5	
R RECEPTACLES	0.5	0.5		1.1	100+50%	1.1	
M MOTORS	4.6	4.8		9.4	1.00	9.4	
LM LARGEST MOTOR	1.2	1.2		2.4	1.25	3.0	
C CONTINUOUS		0.3		0.3	1.25	0.3	
N NON-CONTINUOUS	0.4			0.4	1.00	0.4	
S SPARE						1.00	
X NON-COINCIDENT						0.00	
K KITCHEN						1.00	
D OTHER						1.00	
O OTHER						1.00	
ETR EXIST'G TO REMAIN						1.25	
FEEDER							
TOTAL KVA (PHASE)	7.1	6.8		13.9		14.7	
TOTAL AMPERES	59.3	56.6		58.0		61.1	
PHASE BALANCE, ABC	A-B						
PERCENT	4.7%						

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NAME: _____ DATE: _____

CONSTRUCTION RECORD

FIELD BOOK

STARTING

FOREMAN

AS-BUILT

INSPECTOR



CHEFORNAK PUMP HOUSE

PUMP HOUSE 1 ELECTRICAL DIAGRAMS & DETAILS

CHEFORNAK, ALASKA



REVISION	BY	DATE

Project No. _____

Date: SEPT 2014

Designed: BLS

Drawn: BLS

Approved: EDC

Sheet No. E4.1

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