

TOO'GHA INCORPORATED

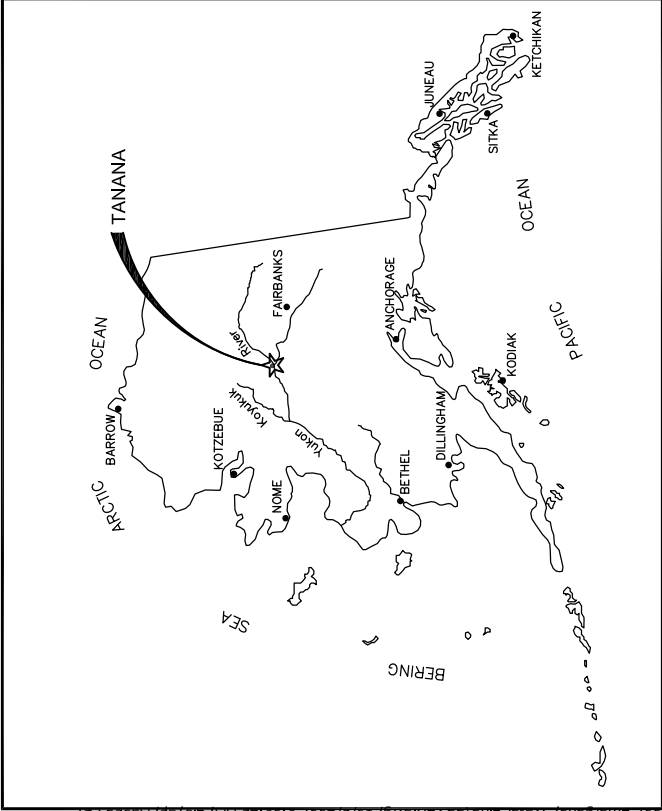
CITY OF TANANA, ALASKA

2007 SEASONAL RIVER WATER PUMP AND TRANSMISSION LINE

- PREPARE 200 LF OF 2" HDPE WATER TRANSMISSION MAIN AND 4X12 ARCTIC DUCT
- COMPLETE ELECTRICAL AND MECHANICAL UPGRADES AT THE EXISTING WELL HOUSE

In Cooperation with the State of Alaska
Department of Environmental Conservation
Village Safe Water Program

ISSUED FOR REVIEW 65%



LOCATION MAP



CE2
ENGINEERS, INC.
PO BOX 22246 ANCHORAGE, AK 99523 PH: 907-348-0110 FAX: 907-348-0115



Project Number (Consultant)	_____ (VSW)
VSW Project Manager	SUSAN RANDLETT
Construction Foreman	DAN TRUMBLE
Final Design (Date)	_____ AUGUST 2007
ADEC Approval (Date)	_____
Construction Period (From) _____ (To) _____	
As-Built (Date)	_____

RECORD DRAWING CERTIFICATE



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

NAME _____ DATE _____

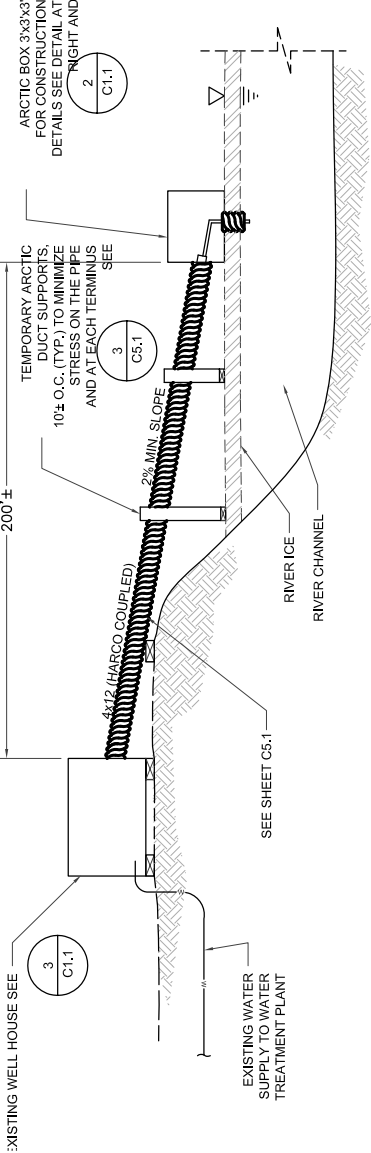
PROJECT OVERVIEW

THE EXISTING COMMUNITY WATER SUPPLY WELL IS LOCATED ON THE NORTH BANK OF THE YUKON RIVER ALONG THE FIRST AVENUE RIGHT-OF-WAY, APPROXIMATELY 100 FEET EAST OF GARDEN STREET. RAW WATER IS PUMPED FROM THIS SHALLOW WELL AND TRANSMITTED TO THE WATER TREATMENT PLANT THROUGH A RECIRCULATED RAW WATER LOOP. OCCASIONALLY, THIS WELL HAS NOT BEEN ABLE TO PRODUCE ENOUGH WATER TO MEET COMMUNITY DEMANDS DURING THE LATE WINTER/EARLY SPRING TIME PERIOD.

THIS PROJECT WILL COMPLETE IMPROVEMENTS TO THE EXISTING WELL HOUSE AND PROVIDE A 200 LF INSULATED WATER TRANSMISSION LINE AND WINTER RIVER WATER INTAKE STRUCTURE FOR USE OFF OF THE RIVER ICE. THIS WATER SUPPLY WILL REPLACE OR SUPPLEMENT THE EXISTING WELL AND WILL ONLY BE USED DURING EMERGENCY PERIODS TO MEET COMMUNITY WATER DEMANDS.

ALL ITEMS WILL BE STAGED TO ALLOW WATER TREATMENT OPERATORS TO QUICKLY LOCATE ALL OF THE REQUIRED COMPONENTS AND ASSEMBLE THEM DURING WINTERTIME CONDITIONS. DISASSEMBLY MUST BE COMPLETED PRIOR TO BREAKUP WHILE ICE CONDITIONS ARE SAFE.

SHEET INDEX	
No.	Title
G1.0	COVER SHEET
G2.0	GENERAL NOTES - LEGEND VICINITY MAP AND PROJECT AREA
C1.1	DETAILS
C5.1	PIPING AND SUPPORT DETAILS
C5.2	ARCTIC BOX DETAILS
C5.3	ARCTIC BOX DETAILS



NOTE: VERTICAL LONG SWEEP BENDS (22.5° OR 45°) MAY BE REQUIRED TO TRANSITION FROM THE WELL HOUSE PENETRATION DOWN THE BLUFF AND TO THE RIVER LEVEL.

1 RAW WATER INTAKE DETAILS

NTS

2 RAW WATER INTAKE DETAILS

NTS



EXISTING PIPING

3 WELL HOUSE IMPROVEMENTS

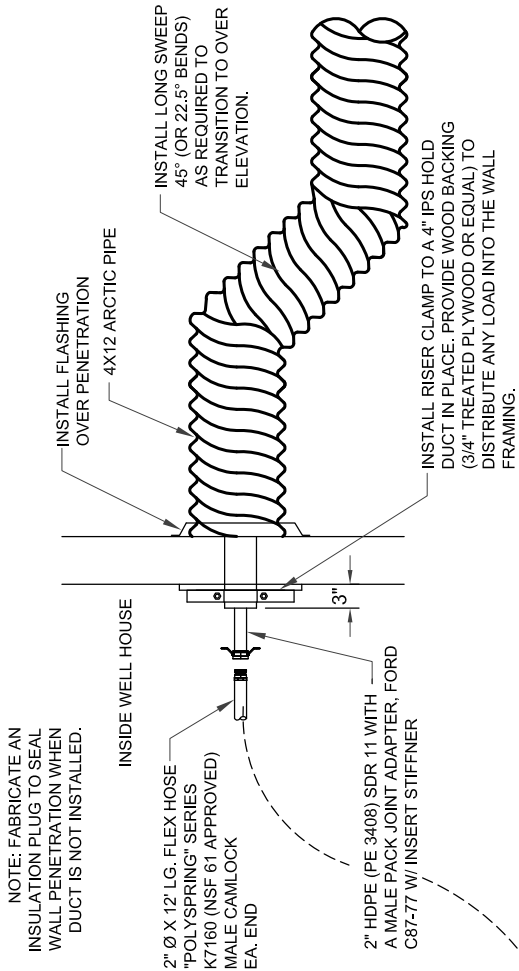
C1.1



PROPOSED PIPING

4 WELL HOUSE PENETRATION DETAIL

NTS



- NOTES:
1. THE PROPOSED WATER TRANSMISSION MAIN GLYCOL HEAT TRACE IS NOT SHOWN FOR CLARITY.
 2. MOUNT NEW WELL PUMP HAND/OFF SWITCH AND CONTROL BOX (PROVIDED BY PUMP SUPPLIER) NEAR NEW DUCT WALL PENETRATION.
 3. RECONFIGURE THE LOAD CENTER TO ABANDON THE POWER SUPPLY TO THE TWO UNUSED WELLS (WELL #1 AND WELL #2) AND RECONNECT TO THE NEW RIVER PUMP CONTROLS AND HEAT TRACE.
 4. ALL WORK SHALL BE COMPLETED BY A JOURNEYMAN ELECTRICIAN IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REQUIREMENTS.

GENERAL NOTES

A. GENERAL

1. THE PROJECT SUPERINTENDENT SHALL MAINTAIN A CLEAN SET OF "AS BUILT" RECORD DRAWINGS SHOWING THE LOCATIONS AND SWING TIES TO ALL APPURTENANCES. ALL ELEVATIONS SHALL BE MARKED ASB (AS-BUILT) WITH THE CORRECT VALUE INSERTED. DRAWINGS SHALL BE KEPT CURRENT IN RED PENCIL ON A DAILY BASIS IN A NEAT, LEGIBLE FASHION. COPIES OF THE AS-BUILT DRAWINGS SHALL BE SUBMITTED TO THE CITY OF MT. VILLAGE AND VSW UPON COMPLETION OF CONSTRUCTION.

2. EXISTING UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS TO THE BEST OF THE ENGINEER'S KNOWLEDGE. AT THE TIME OF DESIGN, RECORDS MAY NOT BE COMPLETELY ACCURATE. THE PROJECT SUPERINTENDENT SHALL VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES WITHIN EACH CONSTRUCTION REACH PRIOR TO BEGINNING WORK. WATERMAIN JOINTS SHALL BE NINE (9) FEET MINIMUM FROM ANY SEWER JOINT OR CROSSING WITH ANOTHER UTILITY.

B. ARCTIC PIPE

ALL WATERLINE MATERIALS SHALL COMPLY WITH NSF 61. ALL PIPING AND FITTINGS SHALL BE NSF-61 COMPLIANT WHERE SUCH PIPING AND FITTINGS ARE IN CONTACT WITH POTABLE WATER. ALL WATER TREATMENT OR DISTRIBUTION SYSTEMS SHALL BE DESIGNED TO BE COMPATIBLE WITH THE WATER TREATMENT PROCESS. ALL PIPING SHALL BE LEAD FREE. ALL SOLDERING SHALL BE DONE USING SOLDER JOINTS SHALL USE A SOLDER CERTIFIED TO NOT TO CONTAIN LEAD (BRIDGET OR EQUAL).

1. CARRIER PIPE:

SHALL MEET ANTHC-V/SW ARCTIC PIPE STANDARDS EXCEPT WHERE NOTED.
RAW WATER TRANSMISSION MAIN: 2" HDPE, SDR 11, GLYCOL TRACE PIPING: 1+1/2" HDPE, SDR 9. ALL HDPE PIPING SHALL BE LISTED BY THE PPI WITH A DESIGNATION OF PE3408 AND A CELL CLASSIFICATION OF 345434C OR BETTER AS PER ASTM D3350.

2. INSULATION:

ARCTIC PIPE INSULATION SHALL BE CLOSED CELL (ASTM D2341 CELL CLASSIFICATION 550674970034) URETHANE FOAM WITH A MAXIMUM K FACTOR OF 0.155 BTU-IN/HR-SF-DEG F. THE INSULATION CORE DENSITY SHALL BE BETWEEN 3.0 AND 4.0 LBS/CF. VOIDS GREATER THAN 0.05 CUBIC INCHES BEYOND 24 INCHES OF EITHER END OF THE PIPE SECTION WILL BE CAUSE FOR REJECTION OF THE PIPE. SEE TECHNICAL SPECIFICATION FOR FURTHER REQUIREMENTS.

3. OUTER JACKET MATERIAL:

THE OUTER JACKET MATERIAL FOR ALL ARCTIC PIPE AND FITTINGS SHALL BE 16 GAUGE HELICAL CORRUGATED ALUMINUM PIPE WITH SEAMS THAT WILL WITHSTAND A HYDROSTATIC PRESSURE OF 5 FEET OF WATER WITH NO LEAKAGE.

WORK SUMMARY

- CONFIRM WHAT PROJECT MATERIALS ARE ON-HAND IN TANANA TO COMPLETE THIS PROJECT. (CURRENTLY THE 4x12 ARCTIC DUCT, 200 LF OF 2" HDPE WATER TRANSMISSION MAIN AND HEAT TRACE ARE OWNED BY THE TANANA WATER AND SEWER PROJECT AND ARE AVAILABLE.) (PROCURE ANY OTHER REQUIRED ITEMS NOT AVAILABLE IN TANANA.)
- COMPLETE IMPROVEMENTS TO THE EXISTING WELL HOUSE.
- PREPARE THE ARCTIC DUCT, TRANSMISSION LINE, HEAT TRACE, PIPE STANDS AND APPURTENANCES.
- PREPARE THE INSULATED WATER INTAKE BOX AND WELL PUMP ASSEMBLY.
- CONSTRUCT A WEATHERPROOF CONTAINER TO PROVIDE ORGANIZED PERMANENT STORAGE OF ALL SMALLER COMPONENTS.
- COORDINATE WITH WATER TREATMENT PLANT OPERATORS TO SELECT AN APPROPRIATE SAFE AND SECURE STORAGE AREA FOR ALL NEW TRANSMISSION LINE COMPONENTS.
- PROVIDE AN OPERATIONS AND MAINTENANCE MANUAL AND ONSITE OPERATOR TRAINING TO INSURE THAT THE EMERGENCY RIVER WATER SUPPLY PIPING CAN BE SAFELY ASSEMBLED DURING HARSH WINTER CONDITIONS. THIS DOCUMENT MUST STRESS THAT ASSEMBLY AND DISASSEMBLY PROCESS MUST BE COMPLETED WHEN THE RIVER ICE IS SAFE FOR PERFORMING THIS ACTIVITY.

D. EARTHWORKS:

- SIDE WALLS OF EXCAVATIONS SHALL BE SLOPED OR SUFFICIENTLY BRACED IN CONFORMANCE WITH SECTION 05.160 OF THE STATE OF ALASKA DEPARTMENT OF LABOR STANDARDS AND THE LATEST FEDERAL OSHA EXCAVATION AND TRENCHING STANDARDS. IF IT IS NECESSARY TO LEAVE AN OPEN EXCAVATION UNATTENDED, THE OPEN EXCAVATION SHALL BE ADEQUATELY SIGNED AND BARRICADED TO WARN RESIDENTS OF THE HAZARD.
- COMPACTION SHALL TYPICALLY BE ACCOMPLISHED USING A MECHANICAL DEVICE SUCH AS A VIBRATORY PLATE OR VIBRATORY DRUM COMPACTOR. EMBANKMENT FILL SHALL BE COMPACTED IN MAXIMUM 12" LIFTS PRIOR TO SUBSEQUENT PLACEMENT OF FILL.
- WHERE EXCAVATIONS ENCOUNTER GROUNDWATER, DEWATERING SHALL BE IMPLEMENTED AND TEMPORARY SHORING MAY BE REQUIRED TO STABILIZE THE WALLS WHILE EXCESS WATER IS ALLOWED TO DRAIN OR PUMPED OUT OF THE EXCAVATION.

E. WATERMAIN TESTING:

- ALL TESTS SHALL BE WITNESSED BY A REPRESENTATIVE DESIGNATED BY THE OWNER (TODD H. INC.). UPON SUCCESSFUL COMPLETION OF ALL TESTS, THE RESULTS OF THE TEST SHALL BE SUBMITTED TO THE OWNER. THE TESTS SHALL BE WITNESSED BY THE OWNERS REPRESENTATIVE. THE RESULTS OF THE TESTS SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE. THE RESULTS OF THE TESTS SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE. THE RESULTS OF THE TESTS SHALL BE SUBMITTED TO THE OWNERS WITNESS.
- WATERMAIN TESTING - PERFORM HYDROSTATIC TESTING OF WATERMANS. HYDROSTATIC TESTS SHALL BE PERFORMED AFTER OPEN BORE FLUSHING AND BEFORE DISINFECTION (SEE ITEM 3 BELOW). FILL THE LINE WITH WATER AND REMOVE AIR PRIOR TO STARTING THE TEST. TEST TO 150 PSI FOR 1 HOUR. PRESSURE MUST BE MAINTAINED AT 150 PSI FOR THE ENTIRE DURATION OF THE TEST. IF THE PRESSURE DROPS, STOP THE TEST, RE-FLUSH THE LINE TO 120 PSI AND BEGIN A 1-HOUR TEST. FOR THE WATERLINE TO BE ACCEPTED THE MAKE-UP WATER REQUIRED TO RETURN THE PRESSURE TO 120 PSI AT THE END OF THE TEST PERIOD SHALL NOT BE GREATER THAN 0.4 GALLONS PER 100 FEET OF 6" WATERMAIN PLUS 0.1 GALLONS PER 80 FEET OF CIRCULATING WATER SERVICE LINE.
- DISINFECTION PROCEDURES:
WATER LINE DISINFECTING - ALL WATER DISTRIBUTION LINES SHALL BE DISINFECTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST EDITION OF AWWA C651-192. THE METHOD OF CHLORINATION SHALL BE WITH THE SLUG METHOD, AS DESCRIBED IN SECTION 5.3 OF THE STANDARD. AFTER DISINFECTION, THE WATER DISTRIBUTION LINES SHALL BE FLUSHED TO REMOVE THE CHLORINE. THE CHLORINE RESIDUE SHALL BE 0.5 MG/L (50 MG/100 GALLONS) OF CHLORINE. DISINFECTED WATER SHALL BE NITRIFIED WITH SODIUM BISULFITE OR SODIUM SULFITE AT A RATE TABULATED IN APPENDIX B OF THE STANDARD. THE SUPERINTENDENT IN CHARGE OF THE DISINFECTION AND FLUSHING OF THE LINES SHALL HAVE A COPY OF AWWA C651 ON SITE FOR READY REFERENCE.

REVEGETATION SPECIFICATION

THE ENTIRE AREA DISTURBED BY CONSTRUCTION SHALL BE REVEGETATED AS QUICKLY AS GOOD CONSTRUCTION PRACTICE ALLOWS. AREAS TO BE REVEGETATED SHALL FIRST BE COVERED WITH A MINIMUM 6-INCH LAYER OF FRAILABLE, LOOSELY PLACED TOPSOIL, FREE OF DEBRIS. THE FOLLOWING SEED MIXTURE AND FERTILIZER APPLICATION RATES SHALL BE APPLIED.

SEED	NAME/TYPE	RATE	METHOD
Red Fescue	Arctic Red	14 lbs/acre	Broadcast
Bering Hairgrass	Norcoast	16 lbs/acre	Broadcast
Alaska Clover	Aurora	2 lbs/acre	Broadcast
FERTILIZER	20-20-20	180 lbs/acre	Broadcast

LEGEND

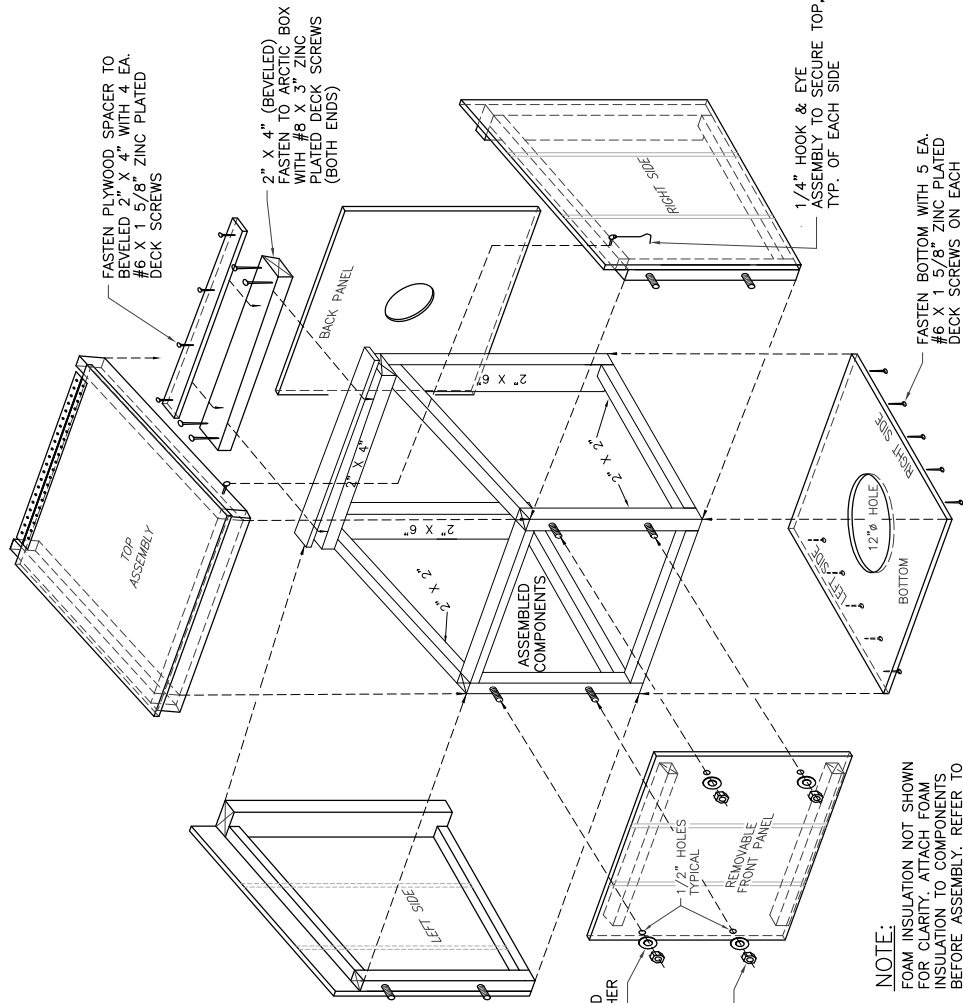
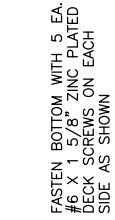
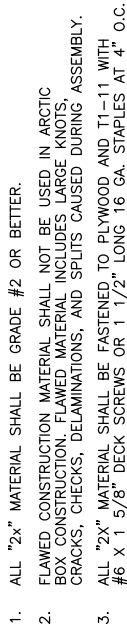
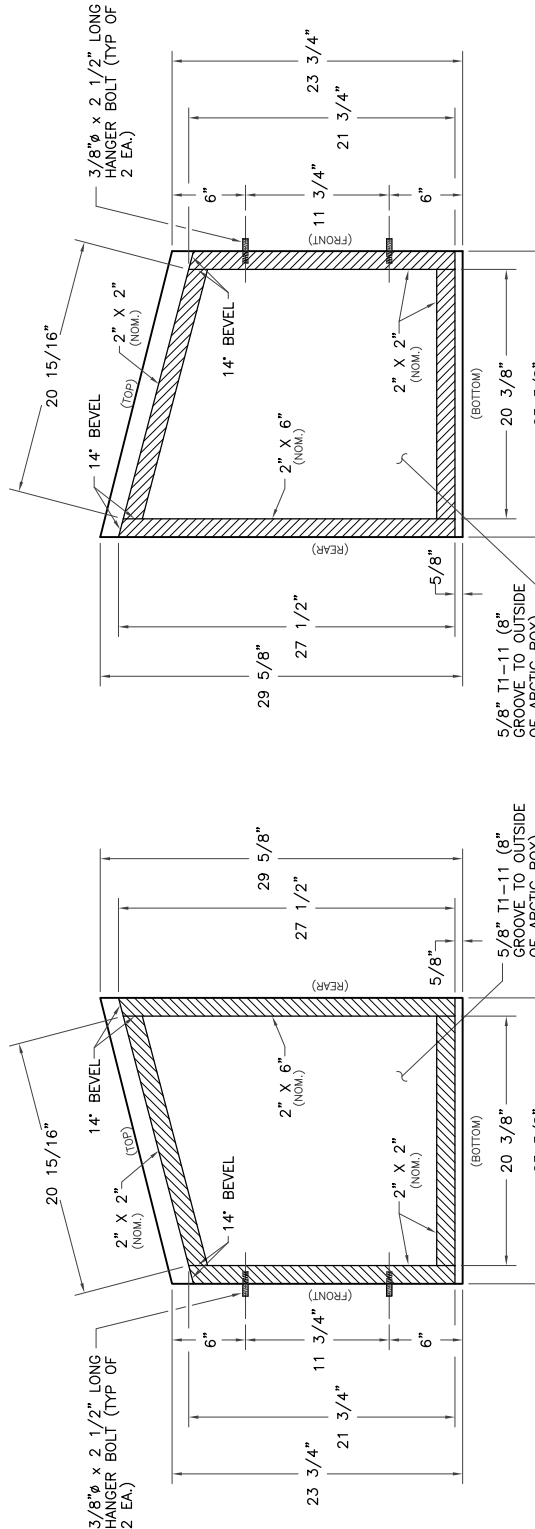
EXISTING		PROPOSED		DESCRIPTION
PLAN VIEW	PROFILE VIEW	PLAN VIEW	PROFILE VIEW	
				GROUND SURFACE
				DRAINAGE/WATER FEATURE
				SEWER FORCE MAIN LIFT STATION, REDUCER, AND DOUBLE WYE CLEANOUT
				(HYDRANT NOT SHOWN IN PROFILE VIEW)
				CULVERT
				BURIED ELECTRICAL LINE
				BURIED FUEL OIL LINE
				BURIED TELEPHONE LINE
				OVERHEAD ELECTRIC
				EASEMENT
				UTILITY POLE
				FENCE
				ROADS AND TRAVELED WAYS
				CONTOUR LINE
				R.O.W. (RIGHT-OF-WAY)
				SHORELINE
				TREES AND/OR BRUSH
				STRUCTURE
				GROUND PROFILE
				DIRECTION OF DRAINAGE
				PROPERTY LINE
				SECTION LINE
				BLM BRASS CAPPED MONUMENT
				BENCH MARK
				SPOT ELEVATION
				REBAR - ABILITY SURVEY POINT NO.
				SURVEY MONUMENT
				TRACT NUMBER
				LOT NUMBER
				HEAT TRACE POWER SUPPLY

SECTION AND DETAIL DESIGNATIONS

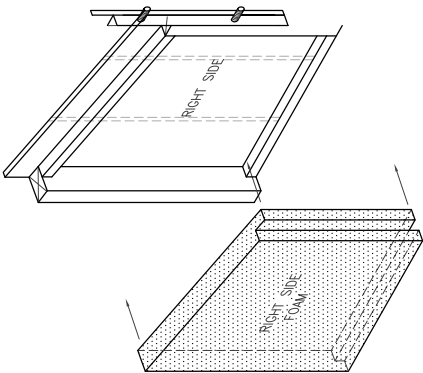
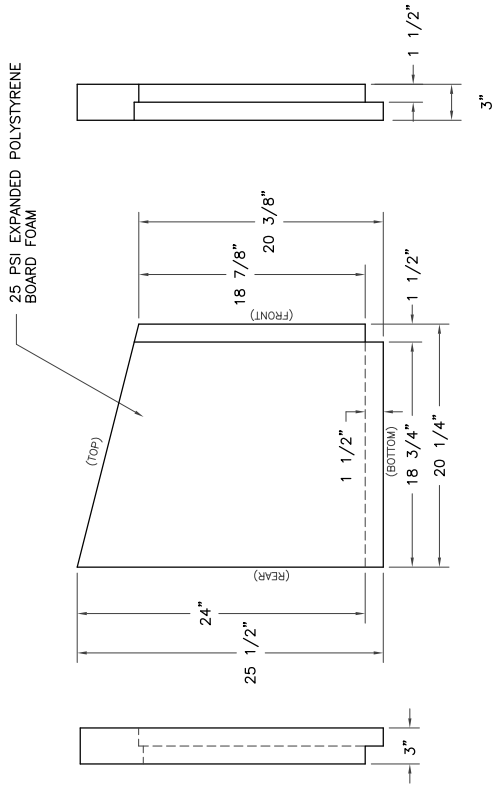
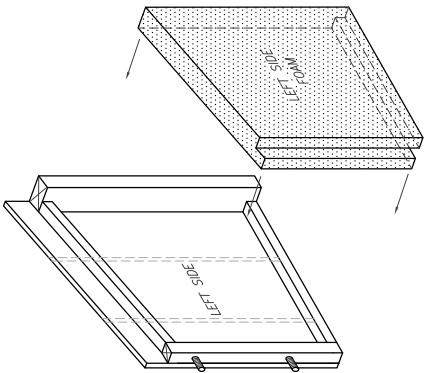
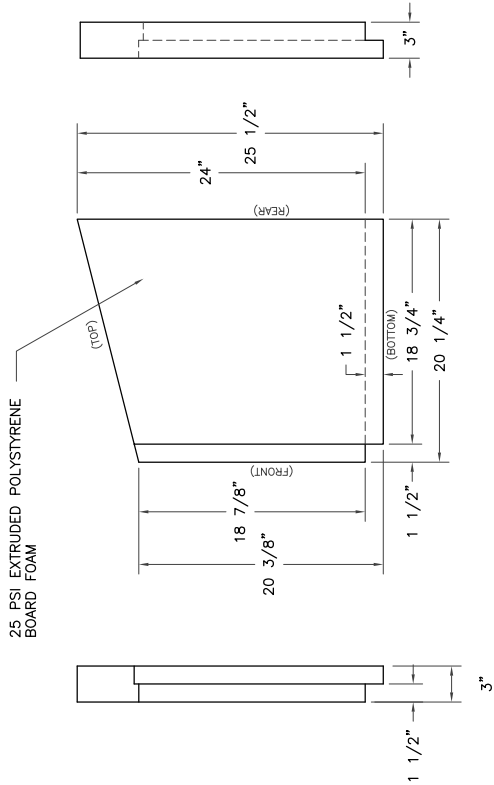


ABBREVIATIONS

A.P.	ANGLE POINT (HORIZONTAL)
CMP	CORRUGATED METAL PIPE
C.O.E.	CORPS OF ENGINEERS
CULV.	CULVERT
FF	FINISHED FLOOR ELEVATION
G.B.	GRADE BREAK (VERTICAL)
G.V.	GATE VALVE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HLS	HELICAL LOCK SEAM
INV.	INVERT
IPS	IRON PIPE SIZE (INDUSTRY STANDARD OUTSIDE PIPE DIAMETER)
LF	LINEAR FEET
MFR	MANUFACTURER
MH	MANHOLE
SDR	SIDE DIMENSION RATIO
SHT.	SHEET
SS	STAINLESS STEEL
STA	STATION
TQJ	TOP OF PIPE JACKET
V.B.	VALVE BOX
WS	WATER SURFACE



NOTE:
ALL FOAM INSULATION SHALL BE SECURELY GLUED TO THE
INSIDE FACE OF THE T1-T11 ARCTIC BOX WITH FOAM-PLYWOOD
ADHESIVE (LIQUID NAILS LN 605) TYPICAL.

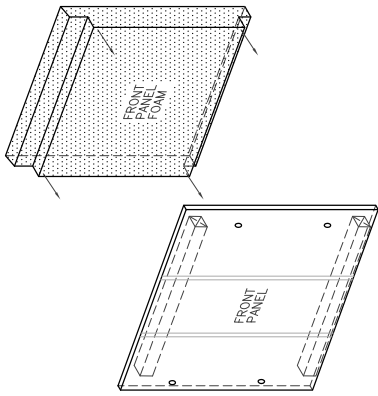
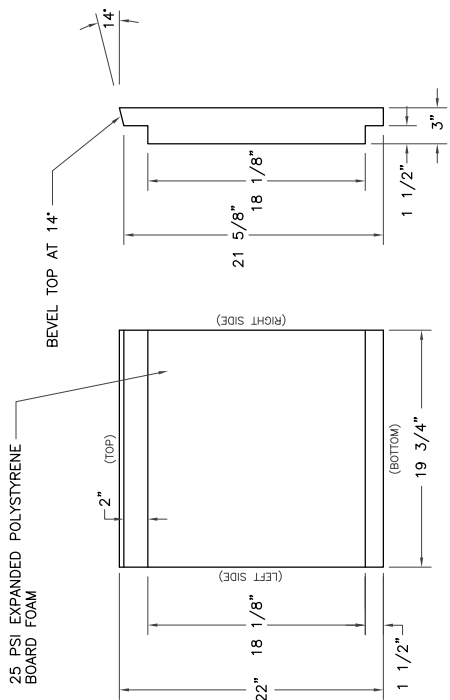


LEFT SIDE FOAM
(VIEW FROM INSIDE ARCTIC BOX)
SCALE: 1 1/2" = 1'

LEFT SIDE ASSEMBLY
NOT TO SCALE

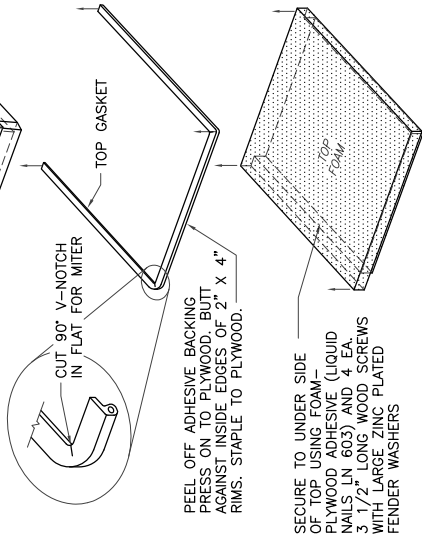
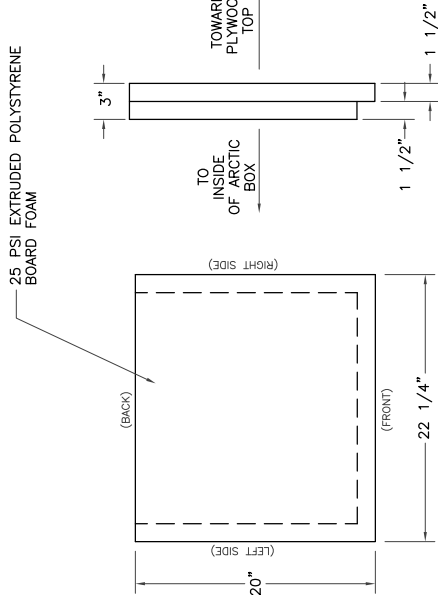
RIGHT SIDE FOAM
(VIEW FROM INSIDE ARCTIC BOX)
SCALE: 1 1/2" = 1'

RIGHT SIDE ASSEMBLY
NOT TO SCALE



FRONT PANEL FOAM
SCALE: 1 1/2" = 1'

FRONT PANEL ASSEMBLY
NOT TO SCALE



TOP FOAM
(VIEW FROM ABOVE)
SCALE: 1 1/2" = 1'

TOP ASSEMBLY
NOT TO SCALE

CE2 ENGINEERS, INC.
P.O. BOX 232946
ANCHORAGE, ALASKA 99523

TRANSMITTAL

(907) 349-1010
(907) 349-1015

To: **Susan Randlett**
Village Safe Water, 4th Floor
555 Cordova Street
Anchorage, AK 99501

Date: **August 30, 2007**
From: **Lloyd Persson**

Project Name: **River Water Intake-Tanana**

If enclosures are not as noted, please inform us immediately.

WE TRANSMIT:

☒ **Herewith** ☐ Under Separate Cover Via: _____
☐ In Accordance With Your Request _____

FOR YOUR:

☐ Approval ☐ Distribution to Parties ☐ Information
☒ **Review & Comment** ☐ Record ☐ Use
☐ Other _____

THE FOLLOWING:

☒ **Drawings** ☐ Shop Drawing Prints ☐ Samples
☐ Specifications ☐ Shop Drawing Reproducibles ☐ Product Literature
☐ Change Order ☐ Report _____

Copies	Date	Description
1	October 2007	Seasonal River Water Pump and Transmission Line, Tanana, Alaska 65% Design Review (Electronic PDF Submittal to VSW)

Remarks:

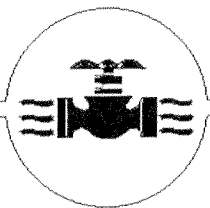
If you need additional copies, contact us.

If you have any questions or comments, please do not hesitate to contact us.

Copies To: (With Enclosures)

Too'gha Inc. (X)
CE2 Files ()
()
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By: Lloyd Persson, P.E.



Village Safe Water

Alaska Department of Environmental Conservation
Division of Water - Facility Construction & Operation
555 Cordova Street; Anchorage, AK 99501
(907) 269-7602 ph; (907) 269-7509 fax

LETTER OF TRANSMITTAL

Date: 10/5/2007

From: LLOYD PERSSON, CE2 ENGINEERS

Subject: Request for Review & Comment

Village Name: TANANNA

Submittal Description: 65% DESIGN REVIEW - RIVER WATER INTAKE

Submittal Date: OCTOBER 5, 2007

The following recipients are being provided copies of the referenced submittal for review and comment.

Recipients	Organization	No. of Copies		
		Half Size (11"x 17")	Full Size (24"x 36")	Plan or Study
<u>SUSAN RANDLETT</u>	<u>VSU</u>	<u>1 # EA</u>		

The Village Safe Water Engineer in this office assigned to this project is:

Name: SUSAN RANDLETT
Phone: (907) 269-7614
Fax: (907) 269-7509
email: SUSAN.RANDLETT@ALASKA.GOV

You are requested to provide written comments to the project engineer as noted above

Not Later Than OCT. 19, 2007.

The tentative date for the design review meeting is set for OCT 22, 2007.

If you have any questions in regards to the submittal or project schedule, please direct them to the project engineer.

Signed: [Signature]

LLOYD PERSSON
CE2 ENGINEERS INC.
P. 349-1010 F. 349-1015
EMAIL: LLOYD@CE2ENGINEERS.COM