Bristol
ENGINEERING
SERVICES CORPORATION

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907-563-0013 Phone
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August 23, 2012

Alaska Department of Environmental Conservation
Drinking Water Program
555 Cordova St.
Anchorage, Alaska 99501

Attn: William Tyrell

Subject: Water Source Waiver (Ekwok School), Ekwok Sewer Improvements

Dear Mr. Tyrell:

This letter revises the City of Ekwok's request for a water source waiver for the Ekwok Sanitary Sewer Improvements Project. The original waiver request was submitted to your office on May 7, 2012, and revised on May 30, 2012. During ongoing discussions with your department, you requested that sanitary sewer manhole SSMH16 be relocated outside of the Ekwok School's well protection radius (200') to further protect the well. The attached, revised drawings for the Ekwok Sanitary Sewer Project are enclosed. SSMH16 is now located outside of the 200' minimum horizontal separation distance from the Ekwok School's Class A water well.

A separation distance waiver is requested for Sanitary Sewer Manhole SSMH22 (Sheet C2.5). As previously discussed by phone conversation, SSMH22 will be less than the 200' separation distance from the school well. SSHW22 will be constructed approximately 185' from the school well. Sheet C2.6 shows the construction details for SSMH22. SSMH22 will be installed with a CLA MAX granulated clay liner (GCL) wrap at every manhole joint. The GCL wrap will be strapped into place, and insulation will be installed over the manhole and GCL wrap. The ring and lid assembly for SSMH22 will be watertight per Detail 1/Sheet C2.3.

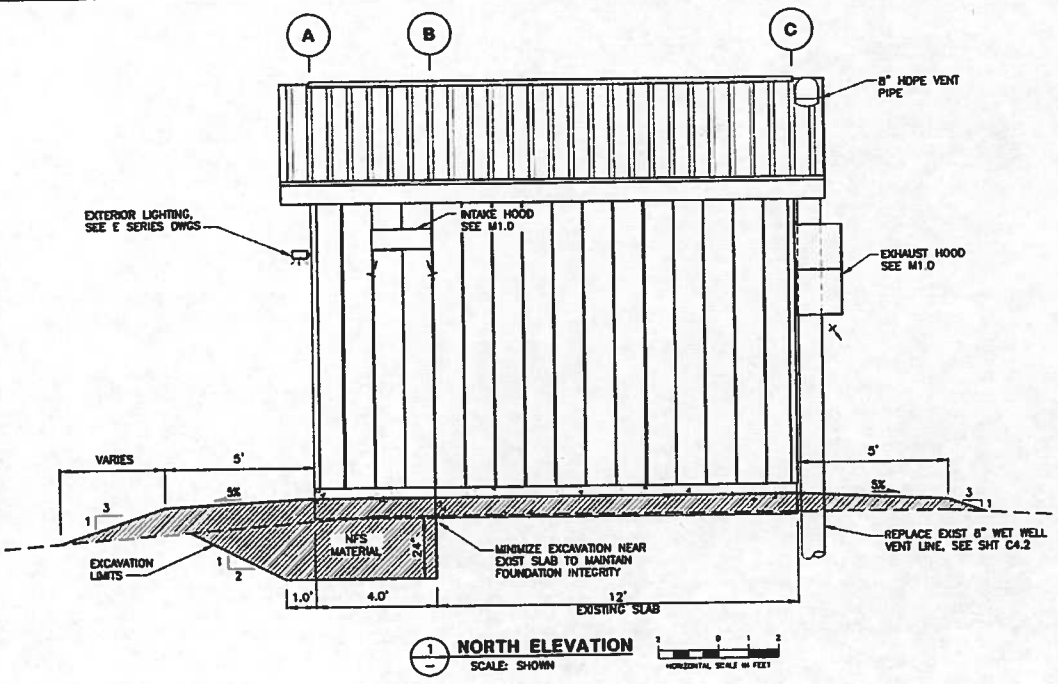
As shown on Sheet C2.5, SSMH22 cannot be constructed further away from the well without encroaching on nearby, native restricted lots (USS 4878, Tract A, Block 7, Lots 1 and 2). SSMH22 was positioned in this location to allow permanent and temporary easements of sufficient width to construct the sewer main between SSMH22 and SSMH18 (Station S4 102+52.31 to S4 105+11.71). All other sanitary sewer manholes installed under this project will be outside of the 200' separation distance from the school well.

Please contact me if you have any questions or comments regarding this plan submittal. My direct number is (907) 743-9349.

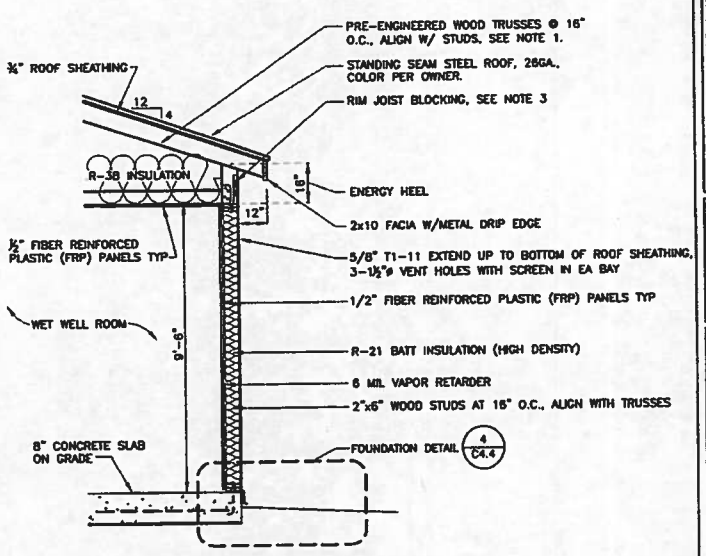
Kyle Petersen, P. E.
Bristol Engineering Services Corporation

Attachments: Revised Plan Set, Ekwok Sanitary Sewer Improvements 95% Plan Drawings

c.c. Susan Randlett, VSW
Bill Rieth, ADEC



1 — NORTH ELEVATION
SCALE: SHOWN



2 — BUILDING SECTION
SCALE: SHOWN

ALL FRAMING DETAILS NOT SHOWN OTHERWISE SHALL BE CONSTRUCTED TO THE MIN STANDARDS OF THE IBC.

FRAMING LUMBER GRADE	
STUDS, PLATES / MISC JOIST	HEM-FIR #2 HEM-FIR STANDARD OR BETTER

FRAMING FASTENING SCHEDULE		
CONNECTION	LOCATION	FASTENING
JOIST TO PLATE	TOENAIL BOTH SIDES	(2) 10D
RAFTER TO PLATE	TOENAIL BOTH SIDES	(2) 16D
DOUBLE STUDS	FACE NAIL	16D @ 24" OC
DOUBLE PLATES	TYPICAL FACE NAIL	16D @ 16" OC
BLOCKING BTWN JOISTS/ RAFTERS TO TOP PLATE	TOENAIL	(3) 10D
BOTTOM PLATE TO STUD	FACE NAIL	(2) 16D
DOUBLE PLATES-LOWER PLATE TO TOP OF STUD	TOENAIL	(2) 10D
*CEILING STRIPPING TO STUDS - 1" LEDGER	FACE NAIL	(2) 8D (1-SLANT)
*CEILING STRIPPING TO STUDS - 2" LEDGER	FACE NAIL	(2) 16D (1-SLANT)

*ENDS OF STRIPPING BOARDS WHERE CEILING IS ⅝" GYPSUM USE ANNULAR RING NAILS (NO SLANT)

PLYWOOD SHEATHING				
THICKNESS	GRADE	LOCATION	EXPOSURE	SPAN RATING (ROOF/FLOOR)
3/4"	CD	ROOF	EXPOSURE 1	40/20
5/8"	T1-11	WALL (EXT)	EXTERIOR	32/16
5/8"	CD	WALL (INT)	INTERIOR	40/20

PLYWOOD FASTENING SCHEDULE			
LOCATION	GRADE	FASTENING	
ROOF	APA	SQUARE EDGE	10D @ 4" OC SEAMS, 10D @ 12" OC FIELD
WALL (EXT)	APA	BLOCK EDGES	10D @ 6" OC SEAMS, 10D @ 12" OC FIELD
WALL (INT)	APA	AWWF	10D @ 6" OC SEAMS, 10D @ 12" OC FIELD

NOTES

1. DESIGN TRUSSES FOR SNOW LOAD = 50 PSF, AND DEAD LOAD = 15 PSF.
2. INSTALL SIMPSON H1 HURRICANE TIE AT EACH TRUSS, BOTH ENDS. INSTALL SIMPSON SP-2 TIE PLATE @ WALL STUD TO TOP PLATE ADJACENT TO EACH TRUSS.
3. INSTALL RIM JOIST BLOCKING EVERY OTHER BAY. HOLD DOWN 1" BELOW BOTTOM OF ROOF SHEATHING
4. APPLY GRACE ICE & WATER SHIELD SELF ADHERING ROOF UNDERLAYMENT TO ENTIRE ROOF.

NOTE: WALL BOARD JOINTS COVERED W/PAPER TAPE AND JOINT COMPOUND FASTENER HEADS COVERED W/JOINT COMPOUND.

3 — INTERIOR WALL PARTITION
SCALE: SHOWN

95% SUBMITTAL

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

VILLAGE SAFE WATER

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION IMPROVEMENTS
BUILDING SECTIONS

REVISION	BY	DATE

CAD FILE NAME: 20080_C4-6.DWG

Project No. 20080
Date 5/13/11
Designed KLP/SJW
Drawn SJW
Approved KLP

Sheet No.
C4.6
SHEET 27 OF 35

User: SWHEAT May 11, 2011 - 2:21pm
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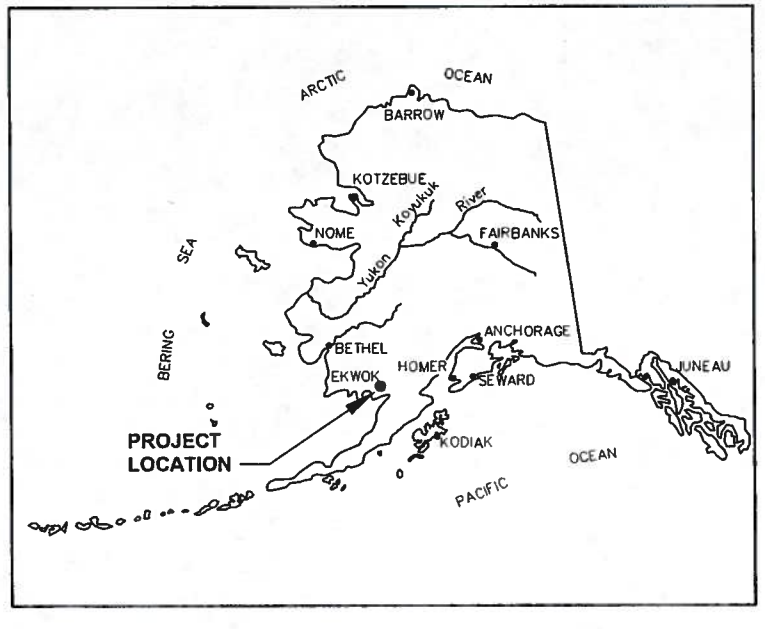
Xrefs: BORDER.DWG - Images: None

City of Ekwok
Sanitary Sewer Improvements

2012

ADEC REVIEW

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



Location Map

VILLAGE SAFE WATER

Bristol
ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

CIVIL

EDC, Inc.
215 W. FIREWEED LANE
ANCHORAGE, AK 99503
(907) 276-7535

MECHANICAL/ELECTRICAL

Consultant

Project Number (Consultant) 28060 (VSW) 08EK14

VSW Project Engineer SUSAN A. RANDLETT, P.E.

Construction Foreman _____

Final Design (Date) _____

ADEC Approval (Date) _____

Construction Period (From) _____ (To) _____

As-Builts (Date) _____

SHEET INDEX

Project Scope

- INSTALLATION OF 2,210 LF OF 8" ARCTIC PIPE GRAVITY SEWER MAIN, 11 SERVICES, AND 10 MANHOLES.
- REPLACE 726 LF OF EXISTING 8" AP GRAVITY SEWER MAIN
- MODIFICATIONS TO THREE EXISTING MANHOLES
- LIFT STATION MODIFICATIONS
  - EXISTING WET WELL TO REMAIN
  - EXISTING SLAB/FOUNDATION TO REMAIN
  - NEW BUILDING
  - NEW ELECTRICAL/CONTROL ROOM
  - NEW ACCESS HATCH, SAFETY GRATE, HOIST W/TROLLY, PUMPS, RAILS/GUIDES AND PIPING
  - NEW LIFT STATION VALVE SUMP
  - ENLARGED BUILDING SLAB

CAD FILE NAME: 28060_G1-0.DWG, PLOT DATE: 05/13/11

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Xrefs: BORDER.DWG - Images: None

ABBREVIATIONS

AGS	ABOVE GROUND SURFACE	MED	MEDIUM
AP	ARCTIC PIPE	MIPT	MALE IRON PIPE THREAD
APA	AMERICAN PLYWOOD ASSOCIATION	MPT	MALE PIPE THREAD
APPROX	APPROXIMATE	MNFR	MANUFACTURER
ARV	AIR RELEASE VALVE	MAX	MAXIMUM
AWW	ALL WEATHER WOOD	MD	MAXIMUM DENSITY
AWWF	ALL WEATHER WOOD FOUNDATION	MDL	MODEL
		mg/L	MILLIGRAMS PER LITER
BGS	BELOW GROUND SURFACE	MH	MANHOLE
BH	BORE HOLE	MIL	MILLIMETER
BLDG	BUILDING	MIN	MINIMUM
BM	BENCH MARK	MISC	MISCELLANEOUS
BTWN	BETWEEN	MW	MONITOR WELL
℄	CENTERLINE	N.I.C.	NOT IN CONTRACT
CC	CENTER TO CENTER	N	NORTH
CD	PLYWOOD GRADE	NA	NOT APPLICABLE
CF	CUBIC FEET	NOM	NOMINAL
CFS	CUBIC FEET PER SECOND	NTS	NOT TO SCALE
CMP	CORRUGATED METAL PIPE		
CO	CLEANOUT	OC	ON CENTER
CTRS	CENTERS	OD	OUTSIDE DIAMETER
CU	COPPER	OHE	OVERHEAD ELECTRIC
CW	CLOCKWISE		
CY	CUBIC YARD	PE	PLAIN END OR POLYETHYLENE
		PERF	PERFORATED
DET	DETAIL	℘	PLATE
DI OR DIP	DUCTILE IRON PIPE	PI	POINT OF INTERSECTION
DIA	DIAMETER	PNL	PANEL
DWG	DRAWING	PSF	POUND PER SQUARE FOOT
DWV	DRAIN WASTE VENT	PSI	POUND PER SQUARE INCH
EA	EACH	QTY	QUANTITY
ELEV OR EL	ELEVATION		
EXIST	EXISTING	R	RADIUS
EQ	EQUAL	REF	REFERENCE
EW	EACH WAY	REINF	REINFORCEMENT
EMT	ELECTRICAL METALLIC TUBING	REQD	REQUIRED
		RFCA	RESTRAINED FLANGED COUPLING ADAPTER
F	FUEL	RW	RESILIENT WEDGE
FDN	FOUNDATION		
FF	FINISH FLOOR	S	SLOPE
FIPT	FEMALE IRON PIPE THREAD	SCH	SCHEDULE
FPT	FEMALE PIPE THREAD	SDR	STANDARD DIAMETER RATIO
FL	FLANGE	SECT	SECTION
FM	FORCE MAIN	SHT	SHEET
FT	FOOT OR FEET	SIM	SIMILAR
FTG	FOOTING	SS	STAINLESS STEEL OR SANITARY SEWER
		SSCO	SANITARY SEWER CLEANOUT
GA	GAUGE	STA	STATION
GAL	GALLON	STD	STANDARD
GALV	GALVANIZED	STEG	SEPTIC TANK EFFLUENT GRADE
GCL	GRANULATED CLAY LINER		
GIP	GALVANIZED IRON PIPE	TCP	TEMPORARY CONSTRUCTION PERMIT
GL	GROUND LEVEL (EXIST)	T&G	TONGUE AND GROOVE
GND	GROUND	THD	THREAD
GPD	GALLONS PER DAY	THWN	THERMOPLASTIC HIGH WATER-RESISTANT NYLON COATED
		TYP	TYPICAL
HDPE	HIGH DENSITY POLYETHYLENE	TRANS	TRANSITION
HP	HORSE POWER		
IE	INVERT ELEVATION	USD	UNITED STATES DEPARTMENT
ID	INSIDE DIAMETER		
INV	INVERT	VERT	VERTICAL
		VPI	VERTICAL POINT OF INTERSECTION
LB	POUND	W/	WITH
LBS	POUNDS	W/O	WITHOUT
LF	LINEAR FEET	WS	WATER SURFACE
LR	LONG RADIUS	WT	WEIGHT
		WWF	WELDED WIRE FABRIC
		YD	YARD

LEGEND

EXISTING FEATURES

- RECOVERED BLM MONUMENT
- RECOVERED PRIMARY MONUMENT
- RECOVERED SECONDARY MONUMENT
- SET PRIMARY SURVEY CONTROL POINT
- SET SECONDARY SURVEY CONTROL POINT
- (123) SURVEY POINT NUMBER
- ANTENNA
- BASKETBALL HOOP
- ELECTRIC METER
- FLAG POST
- FUEL TANK
- GATE POST
- GUY WIRE
- JUNK CAR
- PHONE BOOTH
- SEWER ENTRANCE TO HOUSE
- SIGN
- SEPTIC RISER
- +12.3 SPOT ELEVATION
- 2008 DMA TEST PIT
- 1985 CORWIN & ASSOC. INC. TEST HOLE
- 1987 USD OF HEALTH & HUMAN SERVICES TEST HOLE
- TELEPHONE PEDESTAL
- TREE
- UTILITY POLE
- BUILDING SEPTIC VENT
- WATER ENTRANCE TO HOUSE
- WELL WATER WELL
- 120 CONTOUR MAJOR
- 122 CONTOUR MINOR
- EDGE OF GROUND SURVEY

- —x—x— FENCE
- TREELINE
- MW MONITORING WELL
- —OHE— OVERHEAD ELECTRIC
- —F— UNDERGROUND FUEL LINE
- —S— UNDERGROUND SANITARY SEWER
- —T— UNDERGROUND TELEPHONE
- —W— UNDERGROUND WATER LINE
- SS SANITARY SEWER MANHOLE
- EASEMENT
- EXISTING ACTIVE WATER WELL W/SEPARATION CLASS RADIUS
- EXISTING INACTIVE OR ABANDONED WATER WELL W/SEPARATION CLASS RADIUS
- AREA SUBJECT TO FLOODING
- 23 SINGLE STORY FRAME HOUSE — BUILDING NO.; SHADING REPRESENTS SERVICE TO BE INSTALLED THIS PROJECT

PROFILE

- •T TELEPHONE
- •P POWER
- •OHE OHE

NEW FEATURES

- SEWER MANHOLE
- SEWER CLEAN OUT
- ISOLATION VALVE
- END CAP
- —S— SANITARY SEWER MAIN
- ---SS--- SANITARY SEWER SERVICE
- EASEMENT

SECTION IDENTIFICATION — A / C1.2
DRAWING NUMBER WHERE SECTION IS SHOWN (A DASH IS USED IF TAKEN FROM SAME DRAWING OR MULTIPLE DRAWINGS)

SECTION IDENTIFICATION — A / C1.2 SECTION 1"=30'
DRAWING NUMBER WHERE SECTION IS TAKEN (A DASH IS USED IF TAKEN FROM SAME DRAWING OR MULTIPLE DRAWINGS)

DETAIL IDENTIFICATION — 1 / C1.2 DETAIL 1"=30'
DRAWING NUMBER WHERE DETAIL IS TAKEN (A DASH IS USED IF TAKEN FROM SAME DRAWING OR MULTIPLE DRAWINGS)

DETAIL IDENTIFICATION — 1 / C1.2
DRAWING NUMBER WHERE DETAIL IS SHOWN (A DASH IS USED IF TAKEN FROM SAME DRAWING OR MULTIPLE DRAWINGS)

95% SUBMITTAL

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

VILLAGE SAFE WATER

STATE OF ALASKA 49TH KYLE LINDEN PETERSEN No. CE-11250 5/13/11 REGISTERED PROFESSIONAL ENGINEER

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
GENERAL LEGEND AND ABBREVIATIONS

REVISION	BY	DATE

CAD FILE NAME 28060_G1-2.DWG

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

Sheet No. G1.2
SHEET 2 OF 35

User: SWHEAT May 11, 2011 - 2:36pm
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Xrefs: BORDER.DWG - Images: None

I GENERAL PROJECT REQUIREMENTS

1. GENERAL

THE OWNER FOR THIS PROJECT IS THE CITY OF EKWOK. ALL WORK ITEMS REQUIRING DIRECTION OR APPROVAL FROM THE OWNER SHALL BE COORDINATED THROUGH THE VILLAGE SAFE WATER ENGINEER.

LOCAL CONTACTS ARE AS FOLLOWS:

CITY OF EKWOK	ERNIE NELSON	464-3311
MAYOR	JULIE BRANDON	464-3311
VILLAGE COUNCIL	LUKI AKELKOK	464-3336
BBNC		278-3602
SCHOOL DISTRICT	RICK DALMEN	342-5287
EKWOK POWER PLANT	RICHARD STERMER	464-3333
BRISTOL BAY TELEPHONE COOP		246-3403
GCI CABLE		1-800-800-7754

2. LANDS AND RIGHTS OF WAY (ROW)

PUBLIC LAND, SURFACE ESTATE AND RIGHTS OF WAY FOR THIS PROJECT, WITH THE EXCEPTIONS NOTED ON SHEET G1.9, ARE OWNED BY THE CITY OF EKWOK.

PRIVATE LOTS WITHIN THE SURVEYED PORTION OF EKWOK SHALL NOT BE CONSTRUCTED UPON, OR ACCESSED, WITHOUT SIGNED EASEMENTS OR WRITTEN PERMISSION OF THE LAND OWNER AND/OR HIS AGENT. PROPERTY CORNERS SHALL BE RECOVERED OR REESTABLISHED BY A LAND SURVEYOR, REGISTERED IN THE STATE OF ALASKA, FOR ALL LOTS DIRECTLY OR INDIRECTLY AFFECTED BY THIS PROJECT, PRIOR TO COMMENCEMENT OF ANY WORK ON OR NEAR THOSE LOTS.

3. CONSTRUCTION STAGING AREAS

ALL CONSTRUCTION EQUIPMENT AND MATERIALS SHALL BE STORED, STOCKPILED, AND STAGED IN DESIGNATED AREAS AS IDENTIFIED OR APPROVED BY THE CITY OF EKWOK.

4. HAUL ROUTES

HAUL ROUTES FOR ALL CONSTRUCTION MATERIALS AND EQUIPMENT SHALL BE AS DIRECTED BY THE CITY OF EKWOK.

5. EXISTING FACILITIES

PRESERVE AND PROTECT EXISTING FACILITIES ON PRIVATE PROPERTY AND WITHIN THE ROW. THIS INCLUDES, BUT IS NOT LIMITED TO, ELECTRICAL DISTRIBUTION FACILITIES, COMMUNICATIONS FACILITIES, FUEL FACILITIES, PRIVATE DWELLINGS, AND OTHER PRIVATE STRUCTURES AND PROPERTY. MISCELLANEOUS DEBRIS AND UNUSABLE MATERIALS MAY BE DISPOSED OF IN THE SOLID WASTE SITE. UNCLAIMED OR UNIDENTIFIED MATERIALS OR OBJECTS SHALL BE SALVAGED AND STORED AS DIRECTED BY THE CITY OF EKWOK.

USED LUMBER, WHICH HAS BEEN TREATED, SHALL NOT BE BURNED FOR HEATING OR COOKING DUE TO POTENTIAL HAZARDOUS AIRBORNE BYPRODUCTS FROM COMBUSTION. SUCH MATERIAL SHALL BE DISPOSED OF IN THE SOLID WASTE SITE AND COVERED WITH FILL MATERIAL.

6. PERMITS AND AGENCY REQUIREMENTS

THE FOLLOWING PERMITS MAY BE REQUIRED FOR THIS PROJECT. COPIES OF THE REQUIRED FINAL PERMITS OR APPROVALS SHALL BE MAINTAINED AT THE PROJECT SITE. THE CONSTRUCTION SUPERINTENDENT SHALL BE FAMILIAR WITH AND FOLLOW THE REQUIREMENTS AND CONDITIONS IDENTIFIED IN THESE PERMITS.

ADEC PLAN REVIEW AND APPROVAL TO CONSTRUCT.
ADEC STORM WATER POLLUTION PREVENTION PLAN
ADNR TEMPORARY WATER USE AUTHORIZATION
ADFG FISH HABITAT PERMIT

7. QUALIFICATIONS

WORK UNDER THIS PROJECT SHALL BE CARRIED OUT BY PROPERLY TRAINED INDIVIDUALS WORKING UNDER QUALIFIED SUPERVISION. QUALIFIED SUPERVISION SHALL CONSIST OF COMPETENT FOREMEN AND SUPERINTENDENTS EXPERIENCED AND TRAINED IN THE WORK WHICH IS BEING SUPERVISED.

ELECTRICAL WORK SHALL BE PERFORMED BY STATE OF ALASKA LICENSED JOURNEYMEN ELECTRICIANS UNDER THE SUPERVISION OF AN ELECTRICAL ADMINISTRATOR AND SHALL BE IN ACCORDANCE WITH THE MOST RECENT VERSION OF NFPA 70 ADOPTED BY THE STATE OF ALASKA.

MECHANICAL WORK SHALL BE PERFORMED BY STATE OF ALASKA LICENSED JOURNEYMEN PLUMBERS AND SHALL BE IN ACCORDANCE WITH THE MOST RECENT VERSIONS OF THE UPC, AND UMC ADOPTED BY THE STATE OF ALASKA.

ALL OTHER SPECIALTY WORK SHALL BE UNDERTAKEN BY LICENSED AND QUALIFIED PERSONNEL FOR THAT PARTICULAR TRADE.

ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE STATE AND FEDERAL LAWS REGARDING LICENSING, QUALIFICATIONS, AND OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA) REQUIREMENTS.

8. SUBMITTALS

SUBMITTALS ARE REQUIRED FOR THE FOLLOWING:

- HDPE ARCTIC PIPE WASTEWATER MAINS & SERVICES - WITH HARCO COUPLINGS
- ELECTRIC HEAT TRACE, INCLUDING WIRING CONDUIT, RECEPTACLE BOXES, AND SWITCHES
- HEAT SHRINK
- CLA-MAX "DIAPER" MATERIAL
- PRECAST MANHOLES - INCLUDING Z-LOCK PIPE CONNECTIONS
- BOARD INSULATION
- CMP
- GRUNDFOS 15-42SF CIRC. PUMPS (OR APPROVED EQUAL)

SEE APPLICABLE SPECIFICATIONS BELOW AND PLANS.

9. INSPECTIONS

THE ENGINEER AND VSW INSPECTOR SHALL CONDUCT PERIODIC INSPECTIONS OF THE WORK TO ENSURE GENERAL CONFORMANCE OF ALL WORK ELEMENTS TO THE PROJECT PLANS AND SPECIFICATIONS. REFER TO SECTION VII FOR KEY INSPECTION REQUIREMENTS.

THE ENGINEER SHALL ALSO MAKE A FINAL INSPECTION AND NOTED DEFICIENCIES SHALL BE CORRECTED. AFTER CORRECTIONS ARE MADE, FINAL RECORD DRAWINGS SHALL BE PRODUCED AND SENT TO THE CITY, ADEC, AND VSW.

10. RECORD DRAWINGS

THE SUPERINTENDENT SHALL KEEP A DAILY RECORD THAT ACCURATELY SHOWS THE ACTUAL WORK COMPLETED AND ANY DEVIATIONS FROM THE PLANS AND SPECIFICATIONS. A FULL SIZE SET OF PLANS SHALL BE RESERVED AND USED FOR THIS PURPOSE. THIS SET OF "REDLINE" MARK UPS SHALL BE NEATLY DRAWN TO SCALE AND SHALL INCLUDE NOTES, AS REQUIRED, TO FULLY AND ACCURATELY DESCRIBE THE ACTUAL WORK COMPLETED. THE SET OF "REDLINE" RECORD DRAWINGS SHALL BE COMPLETED AT LEAST ON A WEEKLY BASIS AND SHALL BE MADE AVAILABLE TO THE ENGINEER AND OWNERS REP. DURING INSPECTIONS. THEY SHALL BE DELIVERED TO THE ENGINEER AT THE COMPLETION OF THE PROJECT FOR CAD FILE RECORD DRAWING PRODUCTION. THE ORIGINAL "REDLINES" AND ELECTRONIC RECORD DRAWINGS WILL BE DELIVERED TO THE OWNER AND VSW AT PROJECT COMPLETION.

11. SURVEY CONTROL

SURVEY CONTROL POINTS SHALL BE ESTABLISHED AS PART OF THIS PROJECT. PRIMARY SURVEY CONTROL, RECOVERING OR REESTABLISHING PROPERTY CORNERS, AND SETTING REFERENCE POINTS TO CONTROL THE WORK ON THIS PROJECT SHALL BE UNDERTAKEN BY A LAND SURVEYOR REGISTERED IN THE STATE OF ALASKA.

LINES AND GRADES INDICATED OR SHOWN ON THE DRAWINGS SHALL BE LAID OUT IN THE FIELD BY COMPETENT PERSONNEL USING THESE CONTROL POINTS. WORK CONSTRUCTED SHALL BE IN GENERAL CONFORMANCE TO THE LINES AND GRADES INDICATED OR SHOWN.

FEATURES SHOWN ON THE BASE MAPS ARE TAKEN FROM RECTIFIED AERIAL SURVEY. FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF FEATURES AS REQUIRED.

II EMBANKMENT AND EXCAVATION

1. GEOTECHNICAL INVESTIGATION

A SITE SPECIFIC GEOTECHNICAL INVESTIGATION WAS COMPLETED FOR THIS PROJECT IN JULY 2008. HISTORICAL INFORMATION INDICATES SOILS IN THE UPPER 10 FEET GENERALLY CONSIST OF 0.25 TO 1 FEET OF ORGANICS WITH LOWER LAYERS OF SILTS, SANDS, GRAVELS, AND PEAT. HIGH GROUNDWATER IS PREVALENT IN MANY AREAS. FROZEN SOILS WERE NOT IDENTIFIED IN THE PROJECT AREA.

2. MATERIALS

A. UNSUITABLE MATERIALS

UNSUITABLE MATERIALS ARE: ORGANIC MATERIAL; ICE RICH SILTS AND PEAT, SATURATED MATERIAL; MATERIAL WHICH CANNOT BE READILY COMPACTED; ANY MATERIAL CONTAINING DELETERIOUS SUBSTANCES; OR MATERIAL DESIGNATED UNSUITABLE BY THE ENGINEER.

UNSUITABLE MATERIAL GENERATED ON THIS PROJECT SHALL BE USED, TO THE EXTENT POSSIBLE, FOR: TOPSOIL; NON-STRUCTURAL COVER REQUIREMENTS; REPAIR OF DAMAGED SURFACE AREAS; OR APPLIED TO AREAS DEVOID OF VEGETATION.

B. SUITABLE MATERIALS

EXCAVATED OR IMPORTED SUITABLE MATERIALS ARE REQUIRED FOR PIPE BEDDING AND FOUNDATION MATERIAL.

SUITABLE MATERIAL SHALL BE IMPORTED OR REMOVED FROM EXCAVATIONS ON THIS PROJECT, OR FROM THE EXISTING CITY OWNED BORROW PIT, AND SHALL CONTAIN NO MUCK, PEAT, MASSIVE ICE ROOTS, SOD, DELETERIOUS MATTER, OR OTHER CHARACTERISTICS OR PROPERTIES WHICH WOULD CLASSIFY IT AS UNSUITABLE.

SUITABLE MATERIAL SHALL CONSIST OF 3" MINUS NATIVE GRANULAR, WELL GRADED SOILS OR IMPORTED NFS MATERIAL.

3. BORROW SITES

AVAILABLE BORROW SITE IS LOCATED WEST OF THE EXISTING AIRPORT.

4. DISTURBANCE OF UNAFFECTED AREAS

DISTURBANCE OF VEGETATION OUTSIDE THE LIMITS OF FILL OR EXCAVATION IS TO BE MINIMIZED AS FAR AS POSSIBLE. WHERE THIS CANNOT BE AVOIDED, RE-TOPSOIL WITH UNSUITABLE MATERIAL GENERATED ELSEWHERE ON THE PROJECT AND RESEED. IF THE AREA IS SLOPING, USE EROSION CONTROL MEASURES TO RECLAIM THE DAMAGED AREA.

5. WATER CONTROL

CONSTRUCTION AREA SHALL BE MAINTAINED IN A RELATIVELY DRY CONDITION THROUGHOUT THE CONSTRUCTION OPERATION. TRENCHES SHALL BE KEPT DEWATERED DURING PIPE INSTALLATION, INCLUDING PLACEMENT AND COMPACTION OF BEDDING - SURFACE DRAINAGE AND TRENCH DEWATERING DISCHARGE SHALL BE DIRECTED AWAY FROM THE SITE AND DISPOSED IN AN APPROVED MANNER. APPROPRIATE MEASURES, SUCH AS SETTLING PITS OR STRAW DIKES, SHALL BE USED TO PREVENT HIGHLY TURBID WATERS FROM ENTERING EXISTING WETLANDS OR WATERWAYS. A STORM WATER POLLUTION PREVENTION PLAN SHALL BE PREPARED FOR PROJECT WORK.

6. COMPACTION REQUIREMENTS AND METHODS

PIPE BEDDING AND TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO 85% OF MAXIMUM DENSITY BY HAND OPERATED VIBRATORY (JUMPING JACK) OR RECIPROCATING PLATE COMPACTORS. A SHEEPS FOOT ROLLER CAN BE USED FOR WIDER TRENCH OR ROADWAY APPLICATIONS.

COMPACTION OF TRAVELED WAY SURFACES SHALL BE PERFORMED BY DRIVING AVAILABLE WHEELED OR TRACKED VEHICLES, OR A STEEL DRUM ROLLER, OVER THE FILL AREAS UNTIL THE FILL IS COMPACTED TO A DENSE AND UNYIELDING SURFACE AND NO RUTTING OR PUMPING OCCURS UNDER VEHICULAR TRAFFIC. HORIZONTAL LIFT HEIGHTS MAY VARY BUT SHALL NOT EXCEED A DEPTH SUCH THAT THE COMPACTION EFFORT AND RESULTS ARE NOT UNIFORM THROUGHOUT THE ENTIRE LIFT HEIGHT AND WIDTH.

FILL FOR THIS PROJECT UNLESS OTHERWISE SPECIFIED SHALL BE SPREAD IN HORIZONTAL LIFTS LESS THAN 12 INCHES (LOOSE) IN HEIGHT AND COMPACTED. EACH LIFT SHALL BE COMPACTED UNIFORMLY THROUGHOUT THE LIFT. LIFT HEIGHT SHALL BE REDUCED IF THE REQUIRED COMPACTION IS NOT MET THROUGHOUT THE LIFT HEIGHT. BACKFILL PLACED WITHIN ROADWAYS SHALL BE IN LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS, COMPACTED TO A MIN OF 90% OF ITS MAX DENSITY.

ALL AREAS WITHIN 2 FEET OF AN EXISTING STRUCTURE OR PREVIOUSLY COMPLETED PORTION OF A FOUNDATION, OR OTHER INACCESSIBLE AREAS, SHALL BE COMPACTED BY HAND OPERATED VIBRATORY PLATE COMPACTORS OR RECIPROCAL ACTING PLATE COMPACTORS. REFER TO SHEET C4.4 FOR SPECIFICS OF COMPACTION AT LIFT STATION.

FILL SHALL BE CONSTRUCTED USING UNFROZEN MATERIALS. BACKFILL MATERIAL SHALL CONTAIN NO MORE THAN 12% PASSING THE #200 SIEVE.

7. EROSION CONTROL AND RECLAMATION

EROSION CONTROL AND RECLAMATION SHALL BE CONSTRUCTED IN ALL VEGETATED AREAS DISTURBED BY ACTIVITIES CONDUCTED AS PART OF THIS PROJECT. THE EROSION CONTROL AND RECLAMATION DESCRIBED IN THIS SECTION ONLY INCLUDES THOSE EFFORTS TO PROVIDE PERMANENT PROTECTION AND RECLAMATION. TEMPORARY EROSION PROTECTION ACTIVITIES, SUCH AS SILT FENCING, STRAW BALES, ADDITIONAL GRADING, ETC. SHALL BE DISCUSSED IN THE STORM WATER POLLUTION PREVENTION PLAN.

FERTILIZER SHALL BE 20-20-10 (N-P-K) AND SHALL CONFORM TO THE REQUIREMENTS OF ADOT STANDARD SPECIFICATIONS SECTION 725. FERTILIZER SHALL BE APPLIED AT A RATE OF 450 TO 500 LB PER ACRE (OR APPROXIMATELY 10 LB PER 1,000 SF). THE FERTILIZER SHALL BE RAKED INTO THE TOP SEVERAL INCHES OF SOIL AFTER APPLICATION.

SEED SHALL BE PROVIDED IN GENERAL CONFORMANCE WITH APPLICABLE REQUIREMENTS OF ADOT STANDARD SPECIFICATIONS SECTION 724. SEED SHALL CONSIST OF A MIX OF THE FOLLOWING:

'NORCOAST' BERING HAIRGRASS	60%
'ARCTARED' RED FESCUE	35%
(DESCHAMPSIA BERINGENSIS 'NORCOAST')	5%
ANNUAL RYE	

SEED SHALL BE BROADCAST SPREAD (AFTER APPLICATION OF FERTILIZER) USING A MECHANICAL SPREADER AND APPLIED AT A RATE OF 1 LB PER 1,000 SF. SEED SHALL NOT BE SPREAD AFTER AUGUST 15. EFFORTS SHOULD BE MADE TO RESEED DISTURBED AREAS THE SAME SUMMER THEY ARE DISTURBED. IF THIS CANNOT BE COMPLETED AS DESCRIBED ABOVE, AREAS SHOULD BE RESEEDED THE FOLLOWING SPRING AS SOON AS SNOW HAS MELTED FROM THE AREAS.

TOPSOIL SHALL CONSIST OF A MIXTURE OF NATIVE ORGANIC MATERIAL AND LOCALLY AVAILABLE SILTY MATERIAL. THE MATERIALS SHALL BE THOROUGHLY MIXED. TOPSOIL SHALL BE MOISTENED PRIOR TO APPLICATION. IT IS ANTICIPATED THAT MUCH OF THE UNUSABLE MATERIALS GENERATED AT EXCAVATIONS ON THIS PROJECT WILL BE USED TO PROVIDE TOPSOIL FOR EROSION PROTECTION AND RECLAMATION. TOPSOIL SHALL BE APPLIED AT ALL NON-TRAVELED WAYS DISTURBED BY CONSTRUCTION ACTIVITIES.

MULCH SHALL BE A STRAW MULCH MATERIAL AND SHALL BE APPLIED LIGHTLY TO FORM A 1 INCH THICK LAYER OVER THE ENTIRE AREA TO BE REVEGETATED. MULCH SHALL BE PLACED OVER APPLICABLE AREAS AFTER FERTILIZER AND SEED HAVE BEEN PLACED.

95% SUBMITTAL

RECORD DRAWING CERTIFICATE

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49TH KLYE LINDEN PETERSEN No. CE-11250 5/13/11 REGISTERED PROFESSIONAL ENGINEER

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

GENERAL NOTES

REVISION	BY	DATE

CAD FILE NAME 28060-G1-3.DWG

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

Sheet No. **G1.3**

SHEET 3 OF 35

III PIPING

1. MATERIALS

NEW SEWER MAINS AND SERVICE LINES ARE HIGH DENSITY POLYETHYLENE (HDPE) PIPE INSULATED WITH RIGID POLYURETHANE FOAM AND ENCASED IN A 16 GAUGE INTERNAL HELICAL LOCK-SEAM CORRUGATED ALUMINUM PIPE OUTER JACKET. PIPE CONFIGURATIONS ARE SHOWN ON SHEET G1.5. INSULATED SEWER MAINS SHALL BE SUPPLIED IN STRICT CONFORMANCE WITH THE CURRENT VSW SPECIFICATIONS TITLED "TECHNICAL SPECIFICATIONS FOR INSULATED GRAVITY SEWER PIPE AND FITTINGS."

2. PIPE JOINTS

SEWER MAINS AND SEWER SERVICE CARRIER PIPES SHALL BE JOINED BY "HARCO" PUSH-JOINT COUPLINGS.

PUSH JOINT COUPLINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE JOINT MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES.

ARCTIC PIPE JOINTS ARE COVERED BY PREFABRICATED INSULATION HALF SHELLS. FIELD TRIM INSULATION ON HALF SHELLS FOR CLOSE FIT AT JOINT. A 2 INCH THICK INSULATING WASHER IS PROVIDED ON PUSH-JOINT COUPLINGS. PLACE HEAT SHRINK WRAP AROUND INSULATION AND OVERLAP ALUMINUM OUTER JACKET 6 INCHES MIN AT BOTH ENDS. INSTALL STEEL COUPLING BAND AT EACH JOINT TO PROTECT HEAT SHRINK AND INSULATION HALF SHELLS AND WASHERS.

3. INSTALLATION

SURVEY EQUIPMENT SHALL BE USED BY QUALIFIED PERSONNEL TO TRANSFER GRADES AND HORIZONTAL LOCATIONS FROM CONTROL POINTS. SURVEY NOTES AND RECORD DRAWINGS SHALL BE MAINTAINED FOR ALL PORTIONS OF THE SEWER PIPELINES.

MINIMUM GRAVITY SEWER GRADE = 0.5%

THE ALIGNMENT OF THE INSTALLED PIPE SHALL APPEAR STRAIGHT AND TRUE BY LAMPING.

ALL PIPE SHALL BE INSTALLED IN A TRENCH AS SHOWN ON THE DRAWINGS. EACH SECTION OF PIPE SHALL BE FULLY SUPPORTED ALONG ITS ENTIRE LENGTH PROVIDING AN INVERT THAT IS TRUE TO ESTABLISHED LINE AND GRADE.

PIPE SHALL BE INSPECTED AND CLEANED PRIOR TO INSTALLATION. NO TRASH OR DEBRIS SHALL BE ALLOWED TO ENTER THE PIPE. ENDS SHALL REMAIN PLUGGED OR CAPPED AT ALL TIMES WHEN WORK IS NOT IN PROGRESS ON ANY GIVEN PIPE SEGMENT.

4. FLUSHING

ALL SEWER LINES SHALL BE FLUSHED PRIOR TO PLACING IN SERVICE. SUFFICIENT VOLUMES OF CLEAN WATER SHALL BE USED TO PRODUCE A MIN FLOW VELOCITY OF 3 FEET PER SECOND IN THE PIPELINE. FLUSHING SHALL CONTINUE UNTIL WATER EXITING THE PIPE IS CLEAR AND FREE FROM DIRT, SEDIMENT, AND FOREIGN OBJECTS OR DEBRIS.

5. SEWER LINE TESTING

SEWER LINE WILL BE HYDROSTATICALLY TESTED PRIOR TO PUTTING INTO SERVICE.

A LOW PRESSURE AIR TEST CAN BE PERFORMED AS A PRELIMINARY CHECK ON PIPE PRESSURE INTEGRITY. THE PRESSURE SHALL BE A MIN OF 4 PSI (DO NOT EXCEED 5 PSI), AND AIR TEST SHALL BE A MIN OF 30 MINUTES.

FOR HYDROSTATIC TESTING, PLUG ALL OPEN PIPE ENDS AND CONNECTIONS WITH RUBBER STOPPERS, OR TEMPORARY CAPS, FITTED TO THE PIPE WITH NO-HUB COUPLINGS. FILL SEWER LINE WITH WATER TO A POINT 5 FEET ABOVE THE HIGHEST END OF THE LINE. ALLOWABLE LEAKAGE IS IS COMPUTED BY:

$$E=0.000012\ L\ D\ H^{1/2}$$

E=ALLOWABLE LEAKAGE IN GPM
L=LENGTH OF LINE TESTED, FT.
D=INSIDE DIA. OF PIPE, IN.
H=DIFFERENCE IN ELEV BETWEEN WATER SURFACE IN TEST APPARATUS AND LOWEST POINT IN PIPING (OR HIGHEST GROUNDWATER ELEVATION).

ALL TEST RECORDS WILL BE FILED WITH DAILY REPORTS AND FILED ON SITE.

6. MANHOLE EXFILTRATION TESTING.

WATERTIGHTNESS OF MANHOLES MAY BE TESTED IN CONNECTION WITH HYDROSTATIC TESTS OF SANITARY SEWERS OR AT THE TIME THE MANHOLE IS COMPLETED AND BACKFILLED. ANY EVIDENCE OF LEAKAGE AS A RESULT OF TESTING SHALL BE REPAIRED. THE INLET AND OUTLET OF THE MANHOLE BEING TESTED SHALL BE SEALED WITH WATERTIGHT PLUGS OR BULKHEADS, AND THE MANHOLE SHALL BE FILLED WITH WATER UNTIL THE ELEVATION OF THE WATER IS ABOVE THE INTERFACE OF THE CONCRETE AND THE CASTING. THE TEST LEVEL SHALL BE CLEARLY MARKED IN THE MANHOLE. AFTER THE ONE-HOUR PERIOD HAS ELAPSED, THE MANHOLE SHALL BE REFILLED TO THE ORIGINAL DEPTH, AND THE DROP IN WATER SURFACE SHALL BE RECORDED AFTER A PERIOD OF FROM 15 MINUTES TO ONE HOUR HAS ELAPSED. THE MAXIMUM ALLOWABLE DROP IN THE WATER SURFACE SHALL BE ONE-HALF INCH FOR EACH 15 MINUTE PERIOD OF TESTING. IF A MANHOLE FAILS THE WATER EXFILTRATION TEST, THE MANHOLE SHALL BE REPAIRED WITH A NON-SHRINKABLE GROUT OR OTHER APPROVED MATERIAL. ALL OBSERVED LEAKS SHALL BE CORRECTED EVEN IF EXFILTRATION IS WITHIN THE ALLOWABLE LIMITS. ALL TEMPORARY PLUGS SHALL BE REMOVED AFTER EACH TEST.

IV OTHER PROJECT MATERIALS

1. GEOTEXTILE

GEOTEXTILE MATERIAL SHALL BE SUITABLE FOR USE IN EMBANKMENT, SEPARATION, AND REINFORCEMENT APPLICATIONS AND SHALL BE AMOCO 2002, MIRAFI 500X, OR APPROVED EQUAL.

GEOTEXTILE MAY ALSO BE PLACED, WHERE SHOWN ON THE PLANS, TO MITIGATE ADVERSE LOCAL CONDITIONS OR TO FACILITATE CONSTRUCTION OR SITE ACCESS. ADVERSE LOCAL CONDITIONS MAY INCLUDE, BUT ARE NOT LIMITED TO, WET, SOFT, AND UNSTABLE AREAS, OR OTHER CONDITIONS WHEREBY USE OF A GEOTEXTILE MATERIAL MAY HELP TO MINIMIZE FILL QUANTITIES.

GEOTEXTILES MAY BE INSTALLED WITH SEWN OR OVERLAPPED EDGES. OVERLAPPED JOINTS SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER.

SEWN JOINTS SHALL BE INSTALLED USING THREAD HAVING PHYSICAL, CHEMICAL, AND ULTRAVIOLET-RESISTANCE CHARACTERISTICS SIMILAR TO OR GREATER THAN THE GEOTEXTILE FABRIC. SEAMS, STITCHES AND STITCH SPACING SHALL BE AS RECOMMENDED BY THE GEOTEXTILE MANUFACTURER.

JOINTS AND EDGES MAY BE PINNED TO HOLD FABRIC IN PLACE DURING FILL OR BACKFILL OPERATIONS IF CONDITIONS, SUCH AS HIGH WINDS, WARRANT.

V CONTAMINATED SOILS

IF CONTAMINATED SOILS ARE ENCOUNTERED DURING EXCAVATION, ADEC CONTAMINATED SITES SECTION WILL BE CONTACTED FOR ADDITIONAL INFORMATION AND REQUIREMENTS. THE VSW PROJECT MANAGER WILL ALSO BE NOTIFIED.

VI SEPTIC TANK ABANDONMENT

EXISTING SEPTIC TANKS WILL BE PUMPED AND DRAINED BEFORE ABANDONMENT. THE SEPTIC TANKS WILL BE CRUSHED AND BACKFILLED WITH CLEAN FILL MATERIAL. CUT EXISTING VENT PIPES TO GRADE, BACKFILL, AND ABANDON IN PLACE.

VII CRITICAL INSPECTION POINTS

THE FOLLOWING WILL REQUIRE INSPECTION AND APPROVAL BY THE OWNER PRIOR TO THE CONTINUANCE OF WORK.

- MANHOLE SUBGRADE
- LIFT STATION SUBGRADE
- LIFT STATION CONCRETE REINFORCEMENT
- LIFT STATION SLAB POUR
- LIFT STATION FRAMING
- SEWER LINE TESTING

95% SUBMITTAL

RECORD DRAWING CERTIFICATE

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49TH KLYE LINDEN PETERSEN No. CE-11250 5/13/11 REGISTERED PROFESSIONAL ENGINEER

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
GENERAL NOTES

REVISION	BY	DATE

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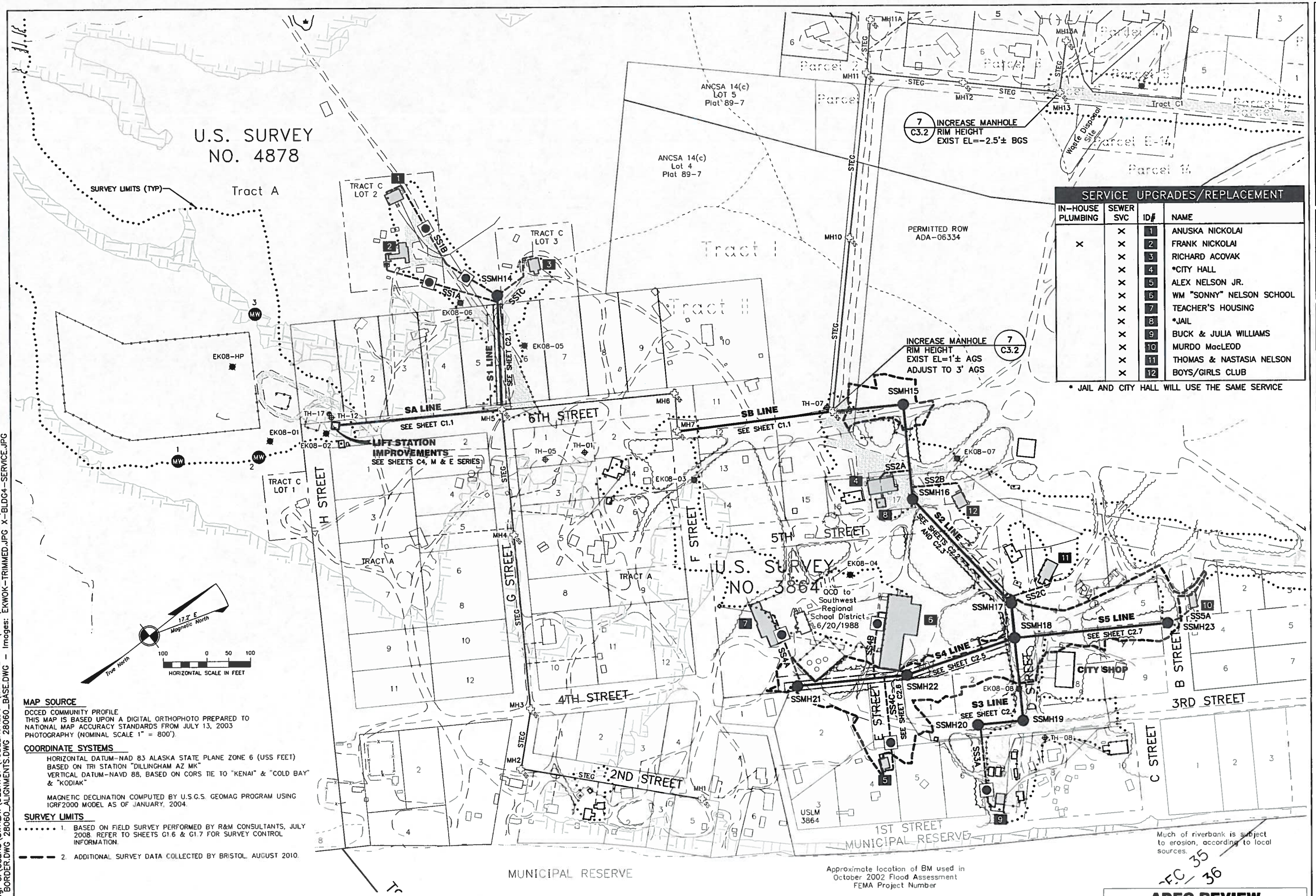
Designed KLP
Drawn SJW
Approved FJV

Sheet No. G1.4
SHEET 4 OF 35



SERVICE UPGRADES/REPLACEMENT

IN-HOUSE PLUMBING	SEWER SVC	ID#	NAME
	X	1	ANUSKA NICKOLAI
X	X	2	FRANK NICKOLAI
	X	3	RICHARD ACOVAK
	X	4	*CITY HALL
	X	5	ALEX NELSON JR.
	X	6	WM "SONNY" NELSON SCHOOL
	X	7	TEACHER'S HOUSING
	X	8	*JAIL
	X	9	BUCK & JULIA WILLIAMS
	X	10	MURDO MacLEOD
	X	11	THOMAS & NASTASIA NELSON
	X	12	BOYS/GIRLS CLUB

* JAIL AND CITY HALL WILL USE THE SAME SERVICE

MAP SOURCE

DCCED COMMUNITY PROFILE
THIS MAP IS BASED UPON A DIGITAL ORTHOPHOTO PREPARED TO NATIONAL MAP ACCURACY STANDARDS FROM JULY 13, 2003 PHOTOGRAPHY (NOMINAL SCALE 1" = 800').

COORDINATE SYSTEMS

HORIZONTAL DATUM-NAD 83 ALASKA STATE PLANE ZONE 6 (USS FEET) BASED ON TRI STATION "DILLINGHAM AZ MK"
VERTICAL DATUM-NAVD 88, BASED ON CORS TIE TO "KENAI" & "COLD BAY" & "KODIAK"

MAGNETIC DECLINATION COMPUTED BY U.S.G.S. GEOMAG PROGRAM USING IGRF2000 MODEL AS OF JANUARY, 2004.

SURVEY LIMITS

1. BASED ON FIELD SURVEY PERFORMED BY R&M CONSULTANTS, JULY 2008. REFER TO SHEETS G1.6 & G1.7 FOR SURVEY CONTROL INFORMATION.
2. ADDITIONAL SURVEY DATA COLLECTED BY BRISTOL, AUGUST 2010.

ADEC REVIEW

RECORD DRAWING CERTIFICATE
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NAME _____ DATE _____

VILLAGE SAFE WATER

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — CHARLES LINDEN PETERS — No. CE-11250 — 9/21/12

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION — Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
PROJECT MAP

REVISION	BY	DATE

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Project No.	28060
Date	5/13/11
Designed	KLP
Drawn	SJW
Approved	FJV

Sheet No. G1.5
SHEET 5 OF 35

User: SWHEAT Aug 22, 2012 - 9:40am
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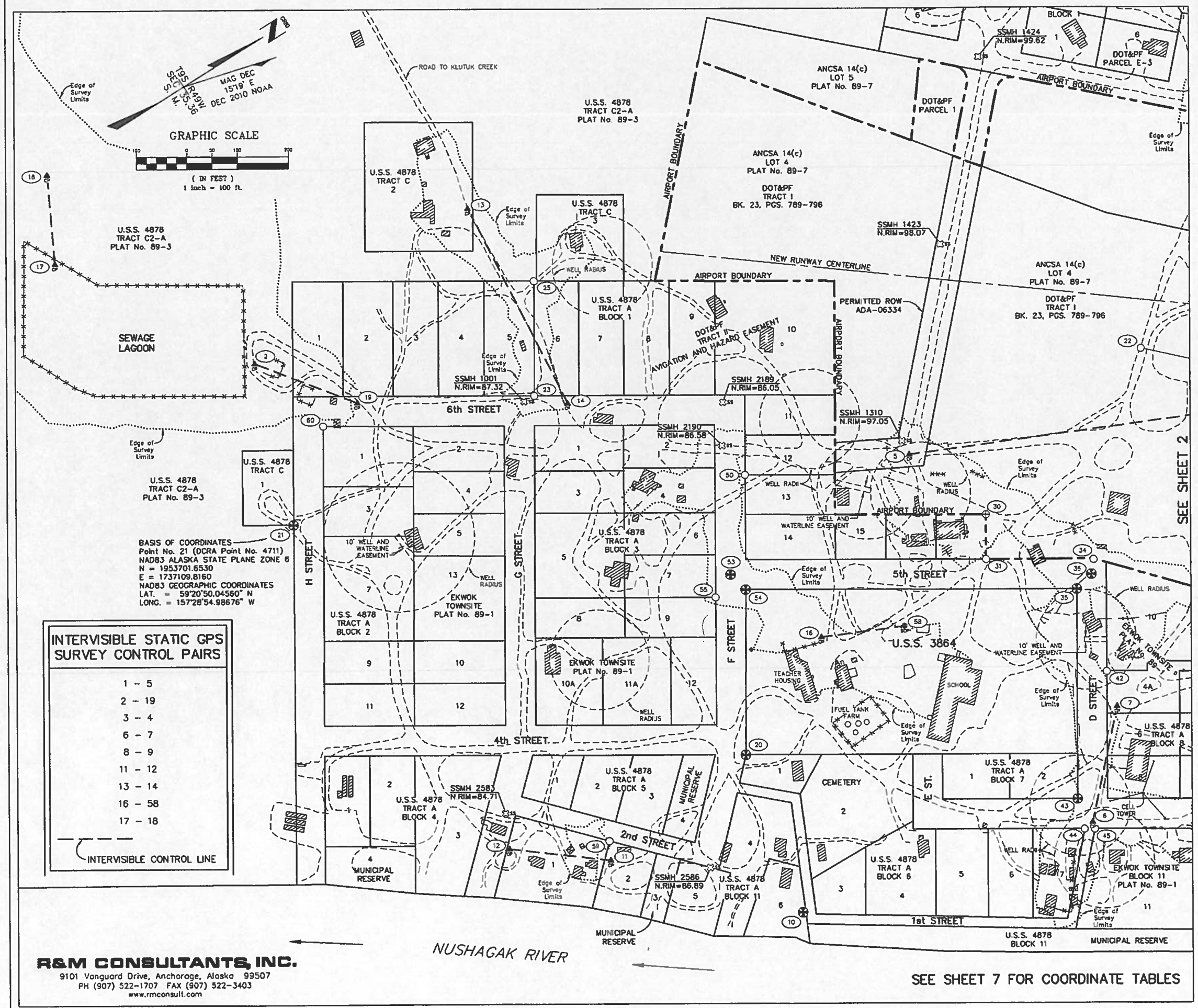

SURVEY NOTES

1. The information provided here is based on the field survey performed by R&M Consultants, July 2008.
2. Primary horizontal control was established using Static GPS techniques with Trimble dual frequency receivers. GPS vectors were adjusted using simultaneous least-squares methods.
3. Basis of Coordinates:
   Project coordinates are NAD83 Zone 6 U.S. Survey Feet based on 2003 Ekwok Community Mapping by the Department of Commerce, Community and Economic Development (DCED), Division of Community and Regional Affairs (DCRA). All project coordinates are based on GPS static ties to DCRA Point No. 4711, a BLM aluminum cap monument marking Corner 4, Lot 1, Tract C, U.S. Survey 4878. Project Point No. 21 = DCRA Point No. 4711. Project NAD83 Zone 6 coordinates for Point No. 21 (DCRA Point No. 4711) = N1953701.6530, E1737109.8160.
4. Basis of Bearing:
   Project bearings are NAD83 Zone 6 state plane grid bearings based on GPS adjusted measurements constrained only at Point No. 21 (DCRA Pt. 4711).
5. Basis of Elevations:
   Project elevations are approximate NAVD88 based on Project Point No. 21 (DCRA Pt. No. 4711). Project elevations equal DCRA 2003 Ekwok Community Mapping elevations. Project elevation for Point No. 21 (DCRA Pt. No. 4711) = 86.78. Differential levels were utilized to transfer elevations from Point No. 21 to all primary control except points 11, 12, 17, & 18. GPS measurements and Geoid06 were used to transfer elevations from Point No. 21 to points 11, 12, 17, & 18. Elevations for secondary control and topography were established using an optical instrument and trigonometric methods. Sewer manhole north rim elevations were established by differential levels.
6. Topographic and planimetric data provided by R&M is delineated by borders marked "Edge of Survey Limits". DCRA topography and planimetrics outside the "Survey Limits" has not been reviewed or edited by R&M. Some DCRA mapped property boundaries have been corrected to show plat 89-1 which was not included in the DCRA mapping.
7. Water easements and well radii are digitized from plats 89-1 and 89-2. The restrictive intent of the radii is not explained on the plats.
8. All property corners, either shown or not shown here, must be referenced and reset if they risk being disturbed during construction.
9. Vertical Control will be verified by the Contractor before construction.

MONUMENT LEGEND

- RECOVERED BLM MONUMENT
- RECOVERED PRIMARY MONUMENT
- RECOVERED SECONDARY MONUMENT
- SET PRIMARY SURVEY CONTROL POINT
- SET SECONDARY SURVEY CONTROL POINT
- (123) SURVEY POINT NUMBER

TOPOGRAPHY LEGEND

- SEWER MANHOLE
- GATE POST
- GUY WIRE
- EDGE OF GROUND SURVEY
- FENCE

HATCH LEGEND

- BUILDING/SHED/CONEX

95% SUBMITTAL

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VILLAGE SAFE WATER

STATE OF ALASKA 49TH Ronald H. Baker Registered Professional Engineer

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

SURVEY CONTROL SHEET

REVISION	BY	DATE

CAD FILE NAME EKWOK_SCS V2008.DWG

Project No. 28060	Date 5/11/11	Designed RHB	Drawn RHB	Approved

Sheet No. **G1.6**
SHEET 6 OF 35

R&M CONSULTANTS, INC.
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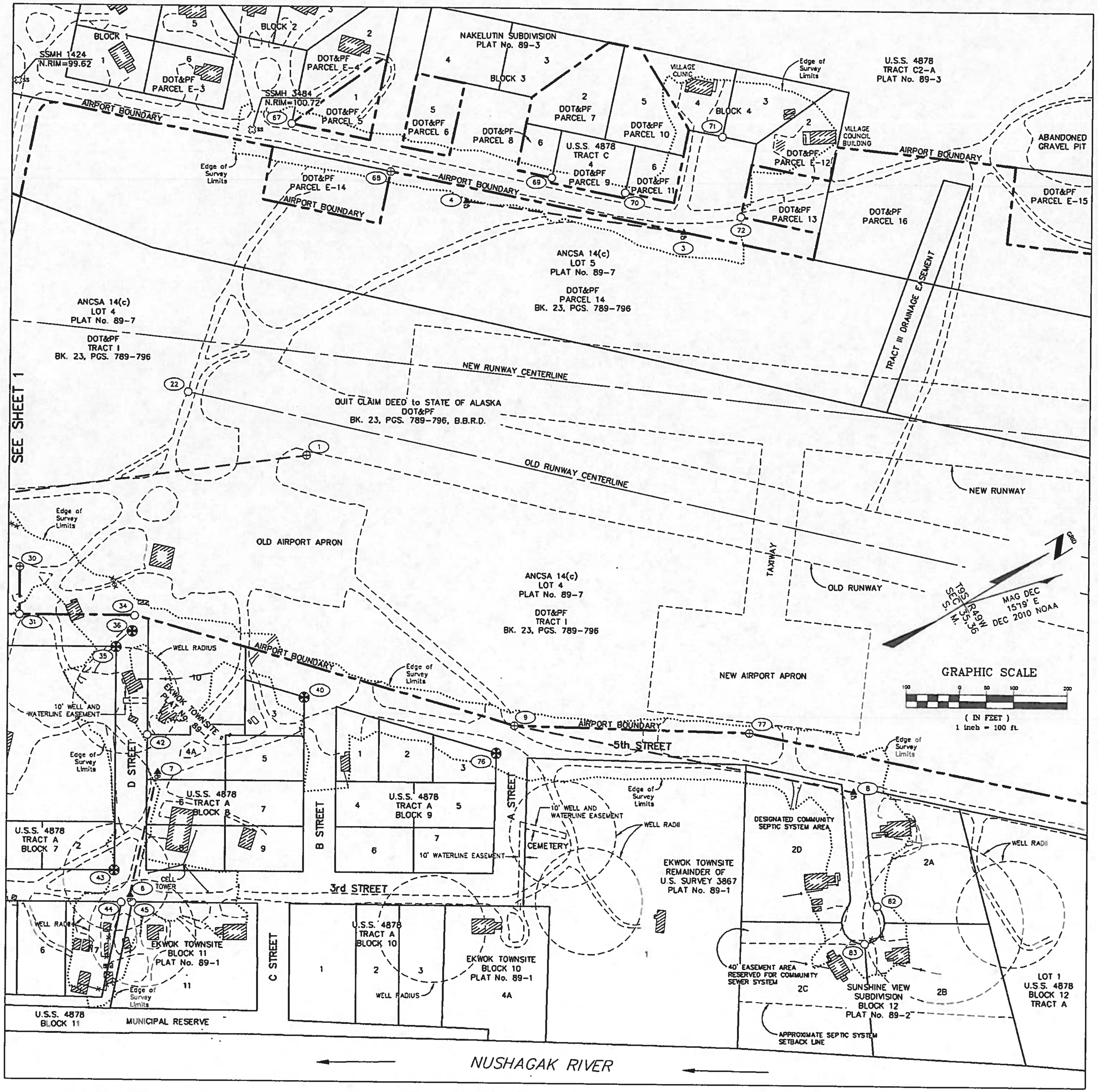


HORIZONTAL CONTROL

POINT	NAD83 AK S.P. ZONE 6 NORTHING	NAD83 AK S.P. ZONE 6 EASTING	DESCRIPTOR	DESCRIPTION
1	1955438.4472	1737935.0049	KEK A	Fnd. 3-1/4" BC, DOT/PF
2	1953810.8908	1736796.2867	CP2	Set 5/8"x30" Rebar w/2" AC, R&M
3	1956259.1015	1737949.4102	CP3	Set 5/8"x30" Rebar w/2" AC, R&M
4	1955943.2709	1737685.1973	CP4	Set 5/8"x30" Rebar w/2" AC, R&M
5	1954811.2659	1737648.9931	CP5	Set 5/8"x30" Rebar w/2" AC, R&M
6	1954723.3988	1738465.3024	CP6	Set 5/8"x30" Rebar w/2" AC, R&M
7	1954889.0702	1738297.1587	CP7	Set 5/8"x30" Rebar w/2" AC, R&M
8	1955974.2621	1739013.8049	CP8	Set 5/8"x30" Rebar w/2" AC, R&M
9	1955499.4367	1738572.4819	ALMON DOT	Fnd. 3-1/4" AC, DOT/PF
11	1953873.0734	1738014.0176	CP11	Set 5/8"x30" Rebar w/2" AC, R&M
12	1953714.0190	1737885.9213	CP12	Set 5/8"x30" Rebar w/2" AC, R&M
13	1954333.8103	1736761.6465	CP13	Set 5/8"x30" Rebar w/2" AC, R&M
14	1954293.1567	1737197.5079	CP14	Set 5/8"x30" Rebar w/2" AC, R&M
16	1954466.8614	1737864.2260	CP16	Set 5/8"x30" Rebar w/2" AC, R&M
17	1953585.0400	1736415.0056	CP17	Set 5/8"x30" Rebar w/2" AC, R&M
18	1953667.5507	1736256.7771	CP18	Set 8" Spike in Spruce Stump
19	1953940.3266	1736971.7308	CP19	Set 5/8"x30" Rebar w/2" AC, R&M
58	1954618.0927	1737933.6955	CP58	Set 8" Spike

VERTICAL CONTROL

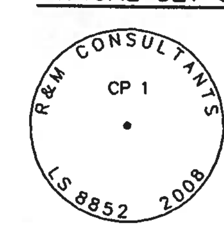
POINT	NAD83 AK S.P. ZONE 6 NORTHING	NAD83 AK S.P. ZONE 6 EASTING	NTH. RIM ELEVATION	DESCRIPTOR	DESCRIPTION
1001	1954221.	1737147.	87.32	SSMH	SEWER MANHOLE, NTH. RIM
1310	1954814.	1737618.	97.05	SSMH	SEWER MANHOLE, NTH. RIM
1423	1955090.	1737327.	98.07	SSMH	SEWER MANHOLE, NTH. RIM
1424	1955355.	1737053.	99.62	SSMH	SEWER MANHOLE, NTH. RIM
2189	1954554.	1737362.	86.05	SSMH	SEWER MANHOLE, NTH. RIM
2190	1954506.	1737434.	86.58	SSMH	SEWER MANHOLE, NTH. RIM
2583	1953746.	1737822.	84.71	SSMH	SEWER MANHOLE, NTH. RIM
2586	1954031.	1738132.	86.89	SSMH	SEWER MANHOLE, NTH. RIM
3484	1955674.	1737361.	100.72	SSMH	SEWER MANHOLE, NTH. RIM

RECOVERED PROPERTY CORNERS

POINT	NAD83 AK S.P. ZONE 6 NORTHING	NAD83 AK S.P. ZONE 6 EASTING	DESCRIPTOR	DESCRIPTION
9	1955499.4367	1738572.4819	ALMON DOT	Fnd. 3-1/4" AC, DOT/PF
10	1954139.7843	1738306.4865	BCMON BLM	Fnd. 3-1/4" BC, BLM
20	1954211.9284	1737980.8868	BCMON BLM	Fnd. 3-1/4" BC, BLM, Leaning
21	1953701.6530	1737109.8160	ALMON BLM	Fnd. 3-1/4" AC, BLM
22	1955315.6216	1737717.7809	ALCAP	Fnd. 2" AC, DOT
23	1954244.4641	1737148.3506	YPC	Fnd. 1-1/4" YPC
25	1954367.4610	1736954.3089	ALCAP	Fnd. 1-1/2" AC
30	1954875.3370	1737832.5879	ALMON DOT	Fnd. 3-1/4" AC, DOT/PF
31	1954827.1492	1737908.4375	IP	Fnd. 2-1/2" Iron Pipe
34	1955008.0733	1738023.7029	REBAR	Fnd. 1/2" Rebar
35	1954947.3660	1738055.5192	BCMON BLM	Fnd. 3-1/4" BC, BLM
36	1954988.7655	1738046.2089	BCMON BLM	Fnd. 3-1/4" BC, BLM
40	1955193.7827	1738320.4309	CWELD BLM	Fnd. 2" Copperweld, BLM
42	1954909.6232	1738226.9455	ALCAP	Fnd. 2" AC, LS 6934
43	1954722.6368	1738410.1898	CWELD BLM	Fnd. 2" Copperweld, BLM
44	1954702.2164	1738468.1162	REBAR BENT	Fnd. 1/2" Rebar-bent
45	1954719.5544	1738478.9457	ALCAP BENT	Fnd. 2" AC, Rebar-bent, LS 6934
50	1954513.1256	1737507.7356	ALCAP	Fnd. 2" AC, LS 6934
53	1954380.9410	1737660.7793	BCMON BLM	Fnd. 3-1/4" BC, BLM
54	1954390.1869	1737702.4129	BCMON BLM	Fnd. 3-1/4" BC, BLM
55	1954331.2995	1737683.1564	ALCAP	Fnd. 1-1/2" AC, BLM
59	1953891.5738	1737980.2391	ALCAP	Fnd. 2" AC, LS 7611
60	1953857.7930	1736974.3741	YPC	Fnd. 1-1/4" YPC, Coast Surveyors
67	1955743.0758	1737389.4528	ALCAP	Fnd. 2" AC, LS 6934
68	1955853.2652	1737563.5396	ALMON DOT	Fnd. 3-1/4" AC, DOT/PF
69	1956103.6787	1737732.5796	ALCAP	Fnd. 2" AC
70	1956205.1024	1737828.8807	ALCAP	Fnd. 2" AC, LS 6934
71	1956415.8478	1737835.8068	ALCAP	Fnd. 2" AC, LS 6934
72	1956366.1756	1737981.8740	ALCAP	Fnd. 2" AC, DOT/PF
76	1955441.9068	1738598.0147	CWELD BLM	Fnd. 2" Copperweld, BLM
77	1955866.8528	1738816.5524	ALMON DOT	Fnd. 2-1/2" AC, DOT/PF
82	1955898.1193	1739218.3902	ALCAP	Fnd. 2" AC, LS 6934
83	1955841.2307	1739265.5756	ALCAP	Fnd. 2" AC, LS 6934

See Field Notes for further details of set and found survey monuments..

TYPICAL SET CONTROL STATION



(1) SET 2" ALUMINUM CAP ON 5/8" X 30" REBAR

95% SUBMITTAL

RECORD DRAWING CERTIFICATE

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

NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49th Randel H. Brinker LS 8852 Registered Professional Land Surveyor

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
SURVEY CONTROL SHEET

REVISION	BY	DATE

CAD FILE NAME EKWOK_SCS V2008.DWG

Project No. 28060
Date 5/11/11
Designed RHB
Drawn RHB
Approved

Sheet No. G1.7

User: SWHEAT Mpy 11, 2011 – 2:43pm
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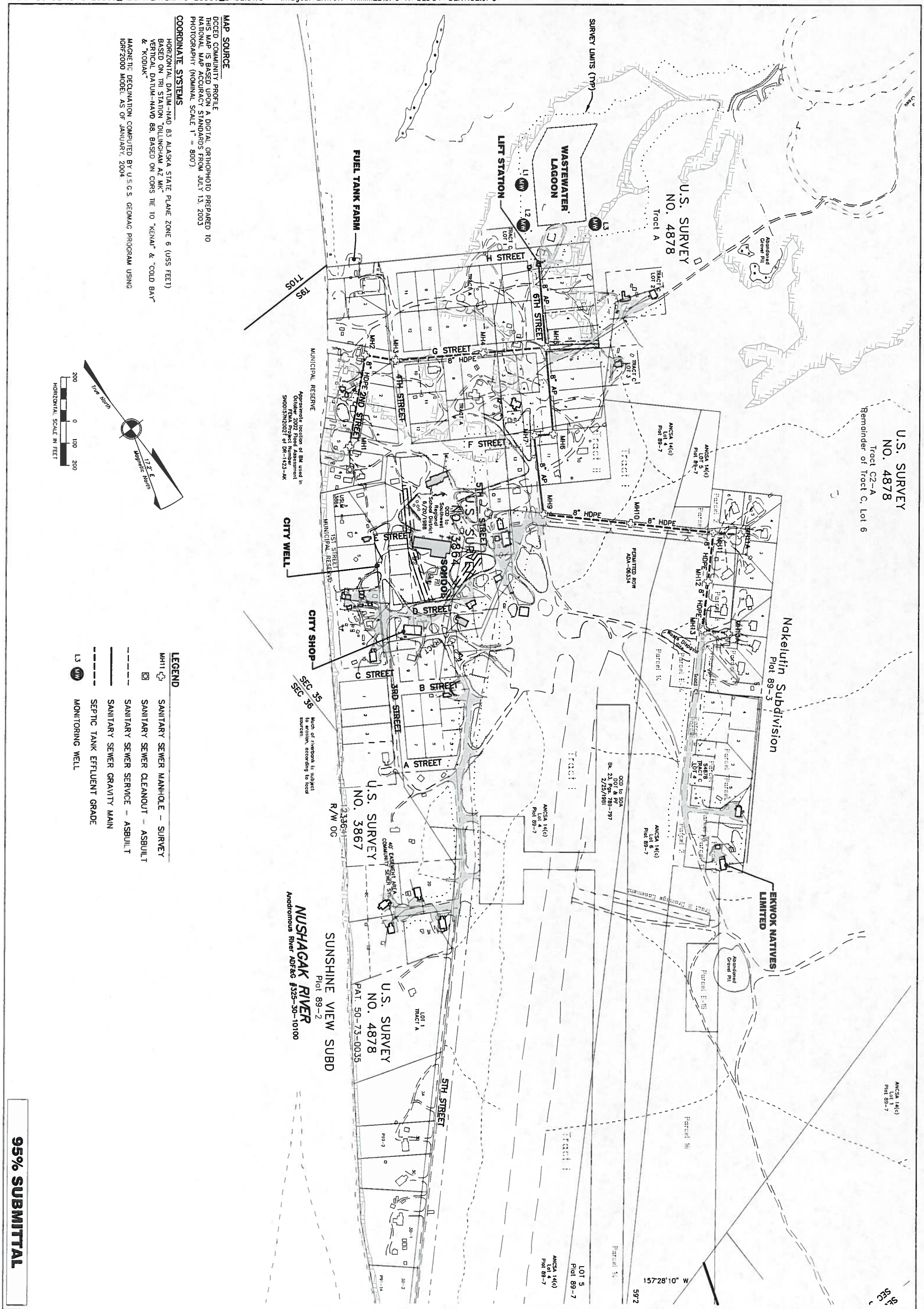

95% SUBMITTAL

Project No.	28060
Date	5/13/11
Designed	KLP
Drawn	SJW
Approved	FJV

REVISION	BY	DATE

CAD FILE NAME
28060_G1-8.DWG

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

EXISTING
SANITARY SEWER SYSTEM

Bristol
ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

STATE OF ALASKA
49TH
KLYE LINDEN PETERSEN
No. CE-11250
5/13/11
REGISTERED PROFESSIONAL ENGINEER

VILLAGE SAFE WATER

RECORD DRAWING CERTIFICATE
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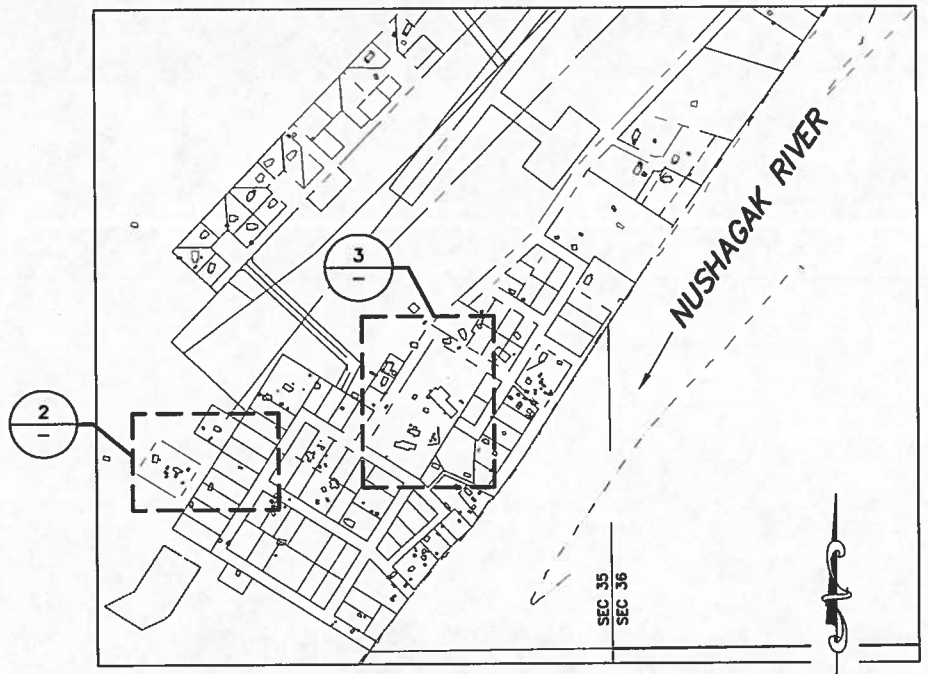
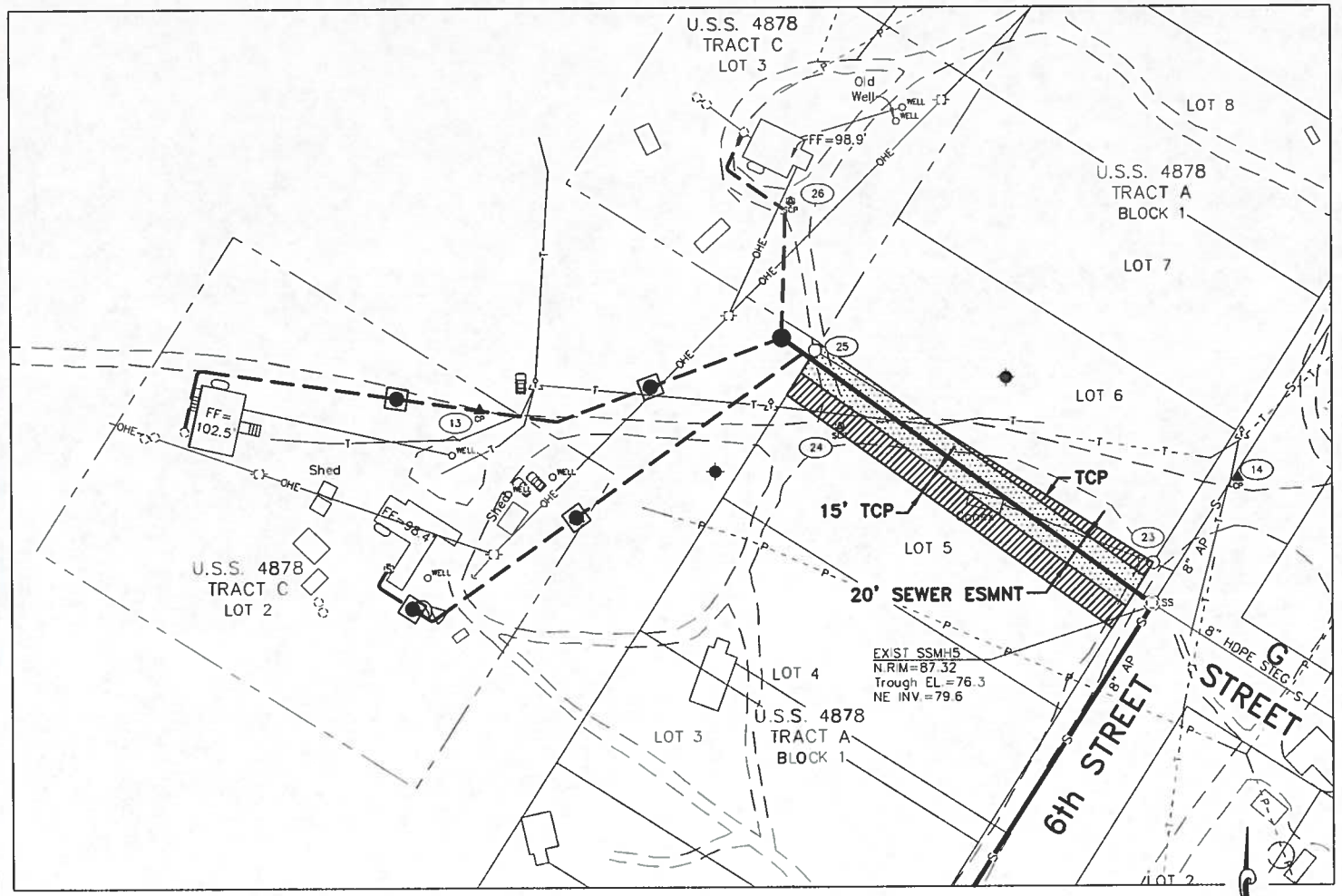
NAME DATE

Sheet No. G1.8
SHEET 8 OF 35

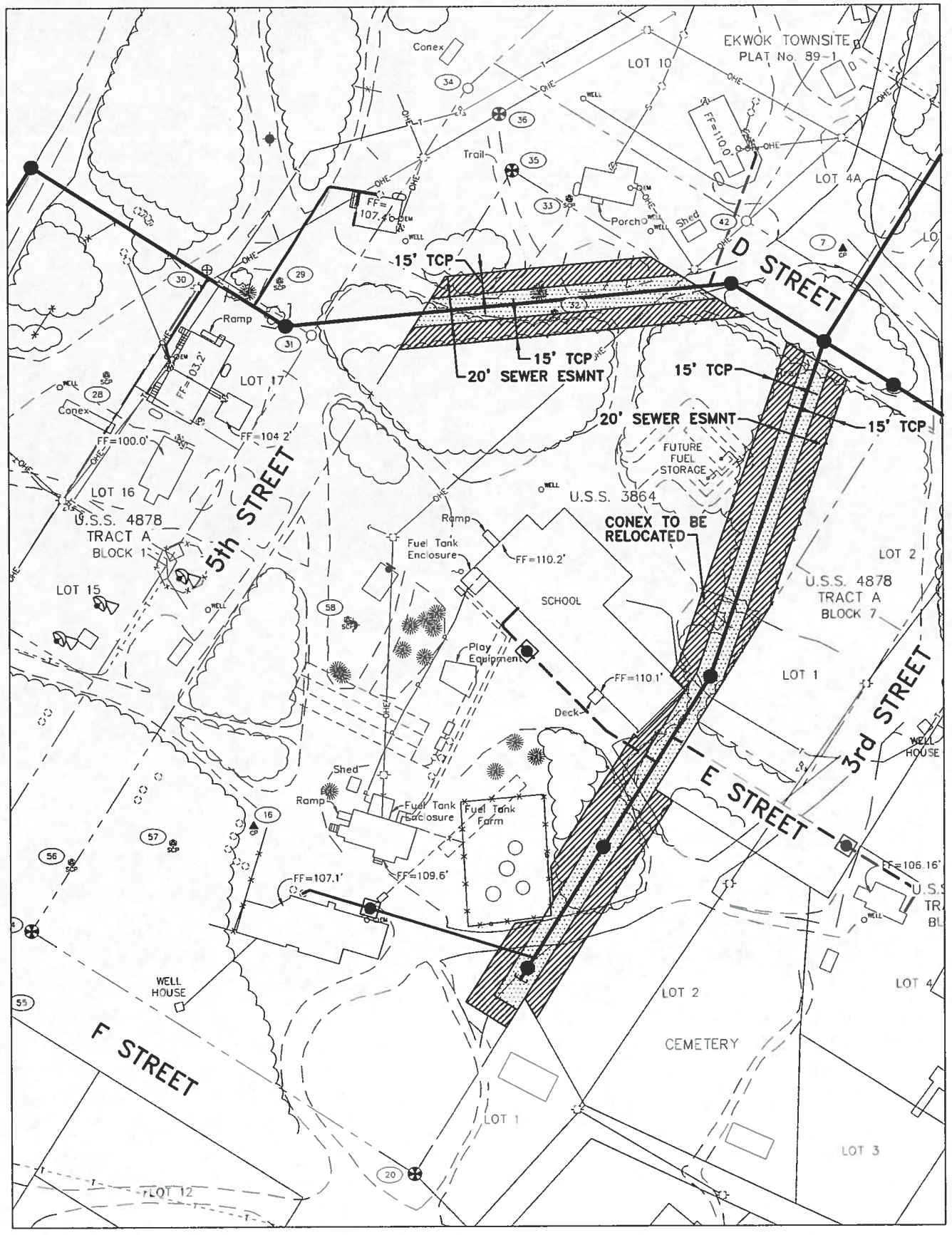


1 — **KEYMAP**
SCALE: NTS

500 0 250 500
HORIZONTAL SCALE IN FEET



2 — **S1 LINE EASEMENT**
SCALE: SHOWN



3 — **S2 LINE AND S4 LINE EASEMENTS**
SCALE: SHOWN

50 0 25 50
HORIZONTAL SCALE IN FEET

ADEC REVIEW

RECORD DRAWING CERTIFICATE.
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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — JULIE LYNN PETERSEN — No. CE-11250 — 8/21/12

Bristol Environmental & Engineering Services Corporation

Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
PROJECT EASEMENTS
PLAN

REVISION	BY	DATE

CAD FILE NAME
28060_G1-9.DWG

Project No.	28060
Date	5/13/11
Designed	KLP
Drawn	SJW
Approved	KLP

Sheet No.
G1.9
SHEET 9 OF 35

Date Plotted: Aug 22, 2012 - 9:50am
Drawing: C:\USERS\SWHEA\DESKTOP\TOBEBACKEDUP\28060_EKWOK\DWG\28060_G1-9.DWG — Layout: INDEX
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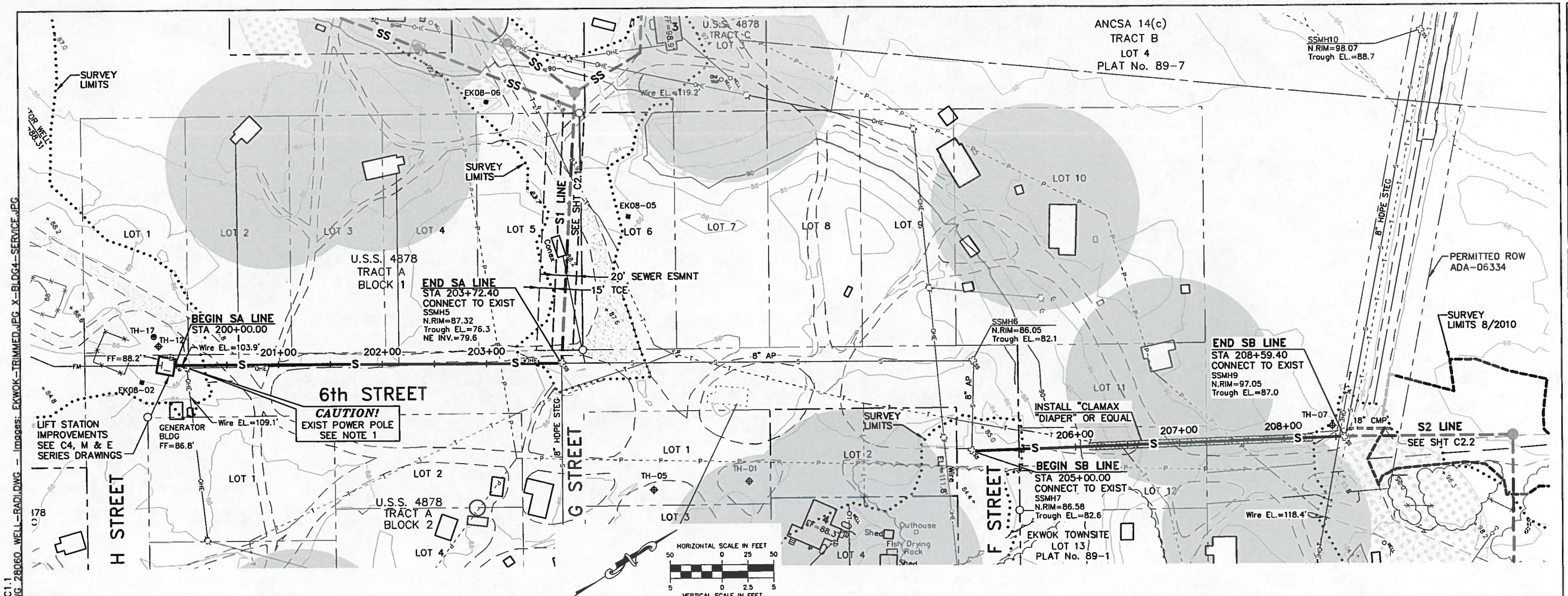

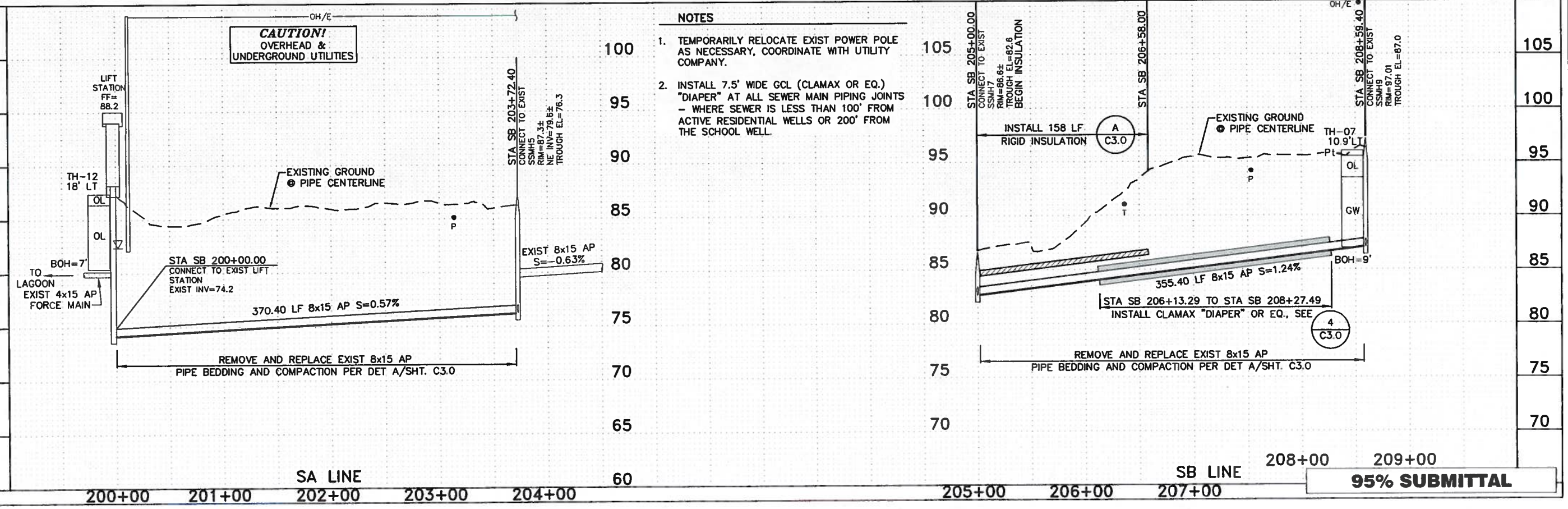

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NAME
DATE

VILLAGE SAFE WATER

STATE OF ALASKA — REGISTERED PROFESSIONAL ENGINEER — No. 05-11250 — 5/13/11

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
REPLACE EXISTING SEWER MAIN
SA AND SB PLAN & PROFILES

BY	DATE	REVISION

CAD FILE NAME 28060_C1-0.DWG

Project No. 28060 | Date 5/13/11 | Designed KLP | Drawn SJW | Approved FJV

Sheet No. C1.1
SHEET 10 OF 35

User: SWHEAT May 11, 2011 - 1:34pm
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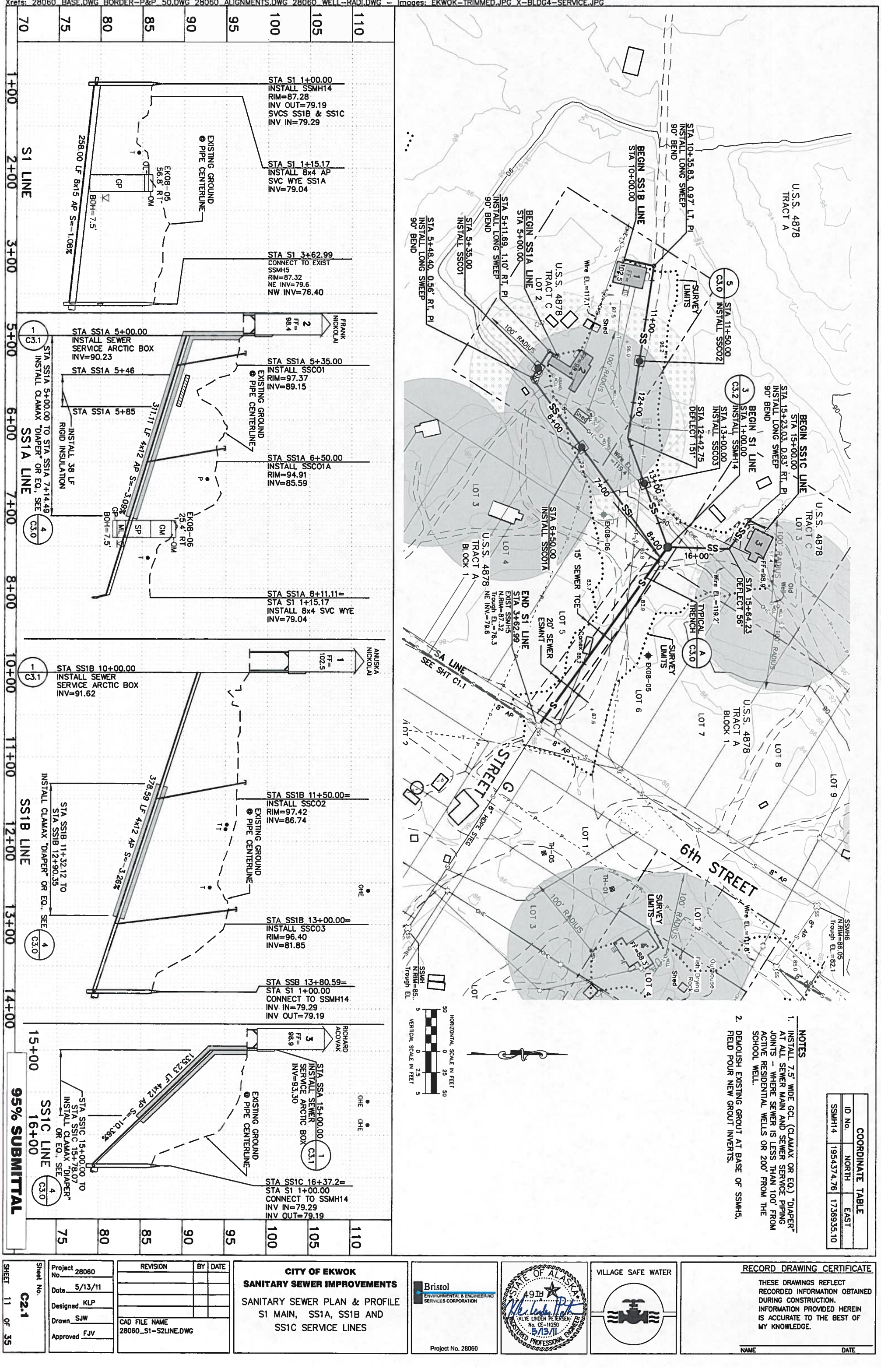
Xrefs: 28060_BASE.DWG BORDER-P&P_50.DWG 28060_ALIGNMENTS.DWG 28060_WELL-RADI.DWG - Images: EKWOK-TRIMMED.JPG X-BLDG4-SERVICE.JPG



NOTES

1. INSTALL 7.5' WIDE GCL (CLAMAX OR EQ.) "DIAPER" AT ALL SEWER MAIN AND SEWER SERVICE PIPING JOINTS - WHERE SEWER IS LESS THAN 100' FROM ACTIVE RESIDENTIAL WELLS OR 200' FROM THE SCHOOL WELL.
2. DEMOLISH EXISTING GROUT AT BASE OF SSMH5, FIELD POUR NEW GROUT INVERTS.

COORDINATE TABLE		
ID No.	NORTH	EAST
SSMH14	1954374.76	1736935.10

Project No. 28060	REVISION	BY	DATE
Date 5/13/11			
Designed KLP			
Drawn SJW			
Approved FJV	CAD FILE NAME 28060_S1-S2LINE.DWG		

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

SANITARY SEWER PLAN & PROFILE
S1 MAIN, SS1A, SS1B AND
SS1C SERVICE LINES

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

STATE OF ALASKA 49TH
KLYE LINDEN PETERSEN
No. CE-11250
REGISTERED PROFESSIONAL ENGINEER
5/13/11

VILLAGE SAFE WATER

RECORD DRAWING CERTIFICATE

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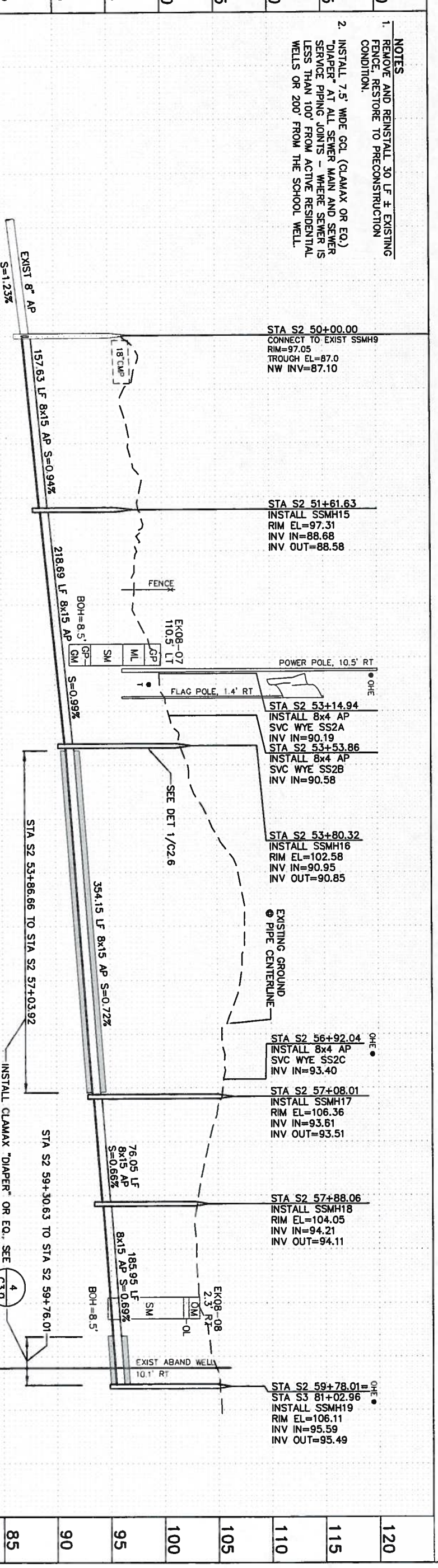
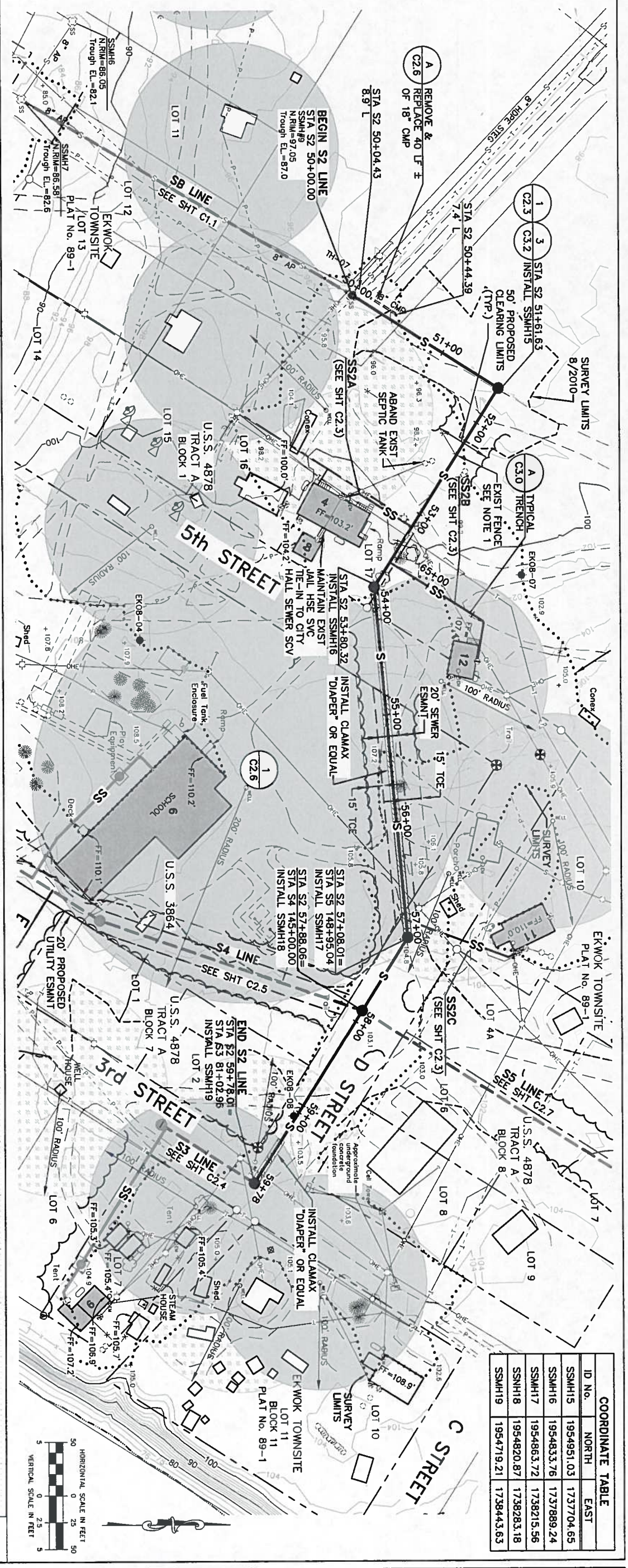
NAME DATE

Sheet No. C2.1
SHEET 11 OF 35

NOTES

1. REMOVE AND REINSTALL 30 LF ± EXISTING FENCE, RESTORE TO PRECONSTRUCTION CONDITION.
2. INSTALL 7.5' WIDE GCL (CLAMAX OR EQ.) "DIAPER" AT ALL SEWER MAIN AND SEWER SERVICE PIPING JOINTS - WHERE SEWER IS LESS THAN 100' FROM ACTIVE RESIDENTIAL WELLS OR 200' FROM THE SCHOOL WELL.





COORDINATE TABLE		
ID No.	NORTH	EAST
SSMH15	1954951.03	1737704.65
SSMH16	1954833.76	1737889.24
SSMH17	1954863.72	1738215.56
SSMH18	1954820.87	1738283.18
SSMH19	1954719.21	1738443.63

Project No.	28060
Date	5/13/11
Designed	KLP
Drawn	SJW
Approved	FJV
Sheet No.	C2.2
SHEET	12 OF 35

REVISION	BY	DATE

CAD FILE NAME
28060_S1-S2LINE.DWG

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
SANITARY SEWER PLAN & PROFILE
S2 MAIN

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

STATE OF ALASKA 49TH
KLYE LINDEN PETERSEN
No. CE-11250
8/21/12
REGISTERED PROFESSIONAL ENGINEER

VILLAGE SAFE WATER

RECORD DRAWING CERTIFICATE
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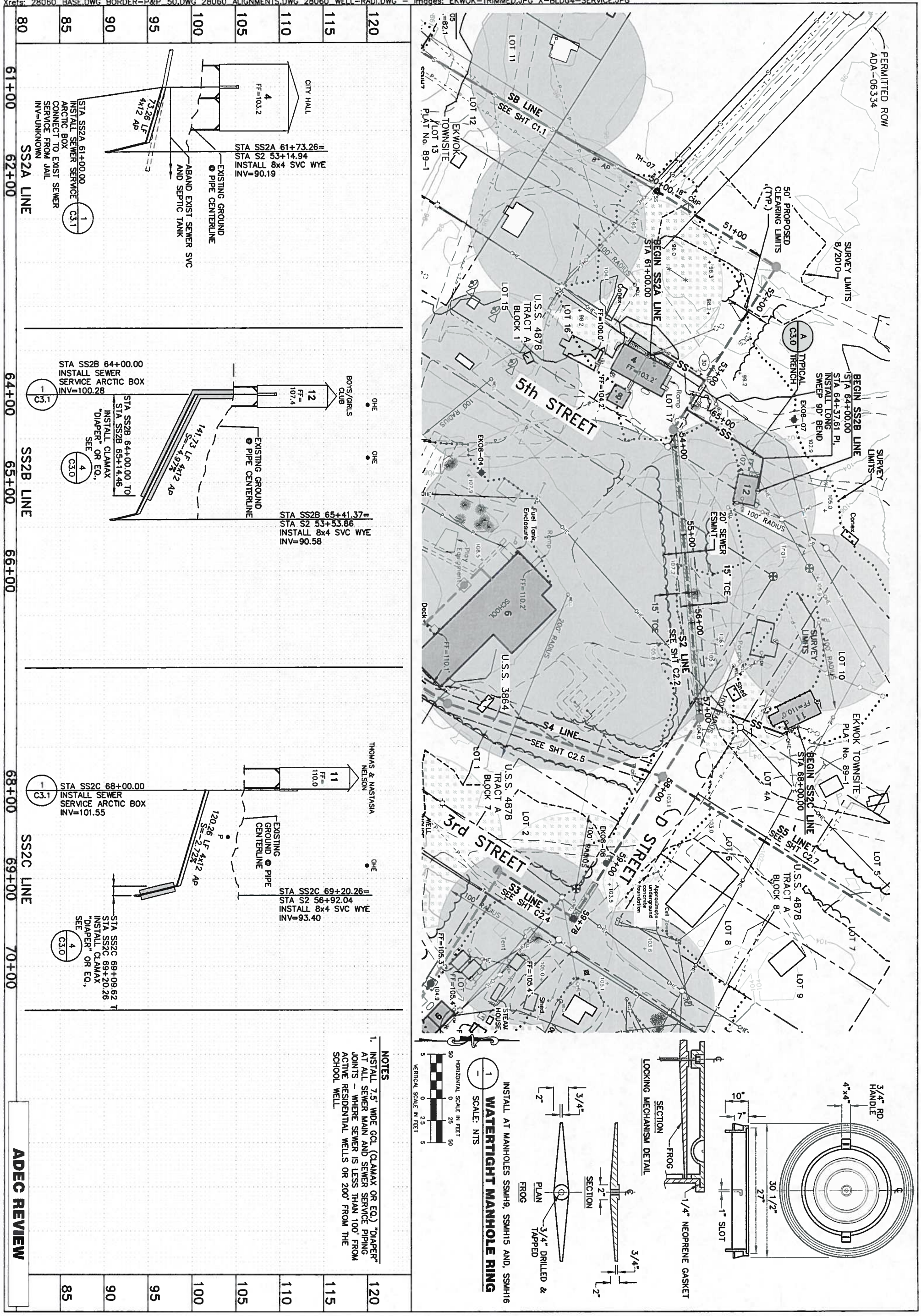
NAME DATE



1 / C3.1 **WATERTIGHT MANHOLE RING**
SCALE: NTS

HORIZONTAL SCALE IN FEET 50 0 25 50
VERTICAL SCALE IN FEET 5 0 2.5 5

NOTES

1. INSTALL 7.5' WIDE GCL (CLAMAX OR EQ.) "DIAPER" AT ALL SEWER MAIN AND SEWER SERVICE PIPING JOINTS - WHERE SEWER IS LESS THAN 100' FROM ACTIVE RESIDENTIAL WELLS OR 200' FROM THE SCHOOL WELL.

ADEC REVIEW

Project No.	28060
Date	5/13/11
Designed	KLP
Drawn	SJW
Approved	FJV
Sheet No.	C2.3
SHEET	13 OF 35

REVISION	BY	DATE

CAD FILE NAME
28060_S1-S2LINE.DWG

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
SANITARY SEWER PLAN & PROFILE
SS2A, SS2B, AND SS2C
SERVICE LINES

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

STATE OF ALASKA 49TH
KLYE LINDEN PETERSEN
No. CE-11250
REGISTERED PROFESSIONAL ENGINEER
8/21/12

VILLAGE SAFE WATER

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NAME DATE

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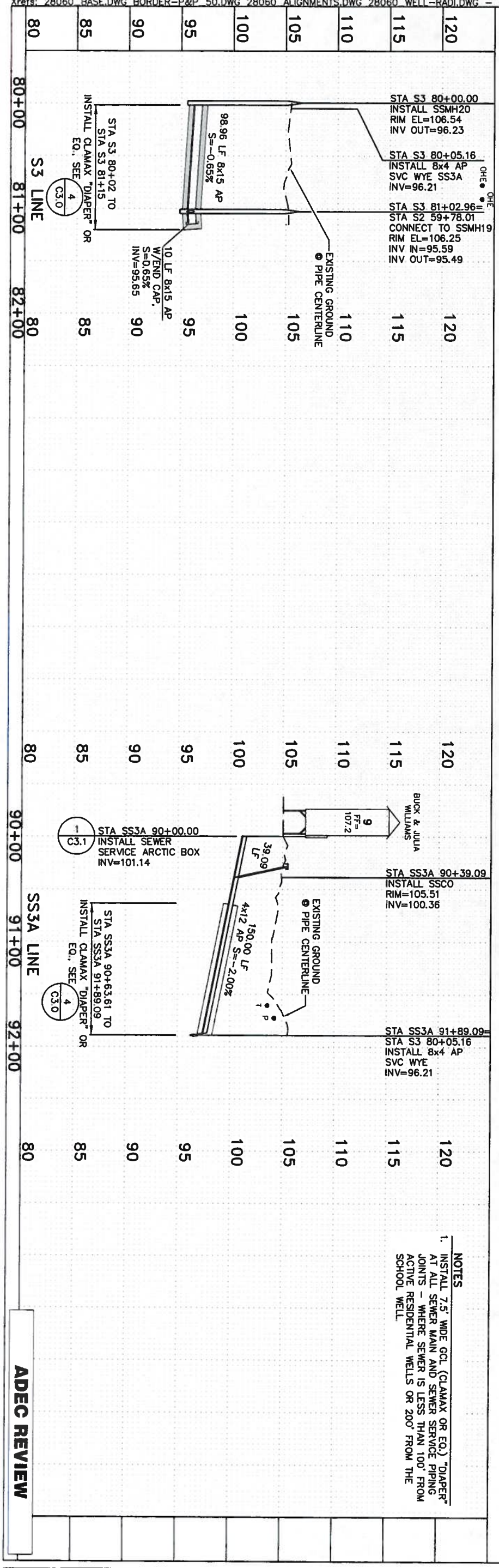

COORDINATE TABLE		
ID No.	NORTH	EAST
SSMH20	1954632.26	1738388.49

NOTES

1. INSTALL 7.5' WIDE GCL (CLAMAX OR EQ.) "DIAPER" AT ALL SEWER MAIN AND SEWER SERVICE PIPING JOINTS - WHERE SEWER IS LESS THAN 100' FROM ACTIVE RESIDENTIAL WELLS OR 200' FROM THE SCHOOL WELL.

ADEC REVIEW

REVISION	BY	DATE
CAD FILE NAME 28060_S3LINE.DWG		

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

Sheet No. C2.4
SHEET 14 OF 35

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

SANITARY SEWER PLAN & PROFILE
S3 MAIN, SS3A, AND
SS3B SERVICE LINES

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

STATE OF ALASKA 49TH
KLYE LINDEN PETERSEN
No. CE-11250
REGISTERED PROFESSIONAL ENGINEER
8/21/12

VILLAGE SAFE WATER

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NAME DATE

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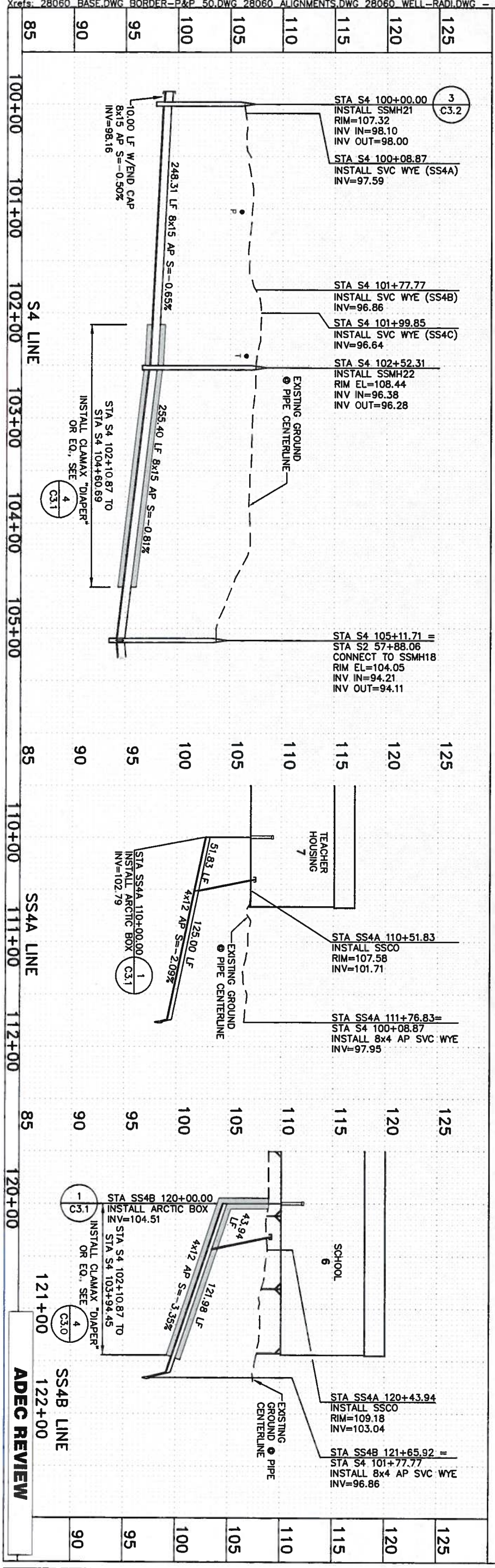

COORDINATE TABLE			
ID No.	NORTH	EAST
SSMH21	1954362.27	1738064.12
SSMH22	1954575.53	1738198.97

ADEC REVIEW

REVISION	BY	DATE

CAD FILE NAME
28060_S4LINE.DWG

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

SANITARY SEWER PLAN & PROFILE
S4 MAIN, SS4A AND
SS4B SERVICE LINES

Bristol
ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

STATE OF ALASKA
49TH
KLYE LINDEN PETERSEN
No. CE-11250
9/21/12
REGISTERED PROFESSIONAL ENGINEER

VILLAGE SAFE WATER

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NAME DATE

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

Sheet No. C2.5
SHEET 15 OF 35

User: SWHEAT Aug 22, 2012 – 9:28am
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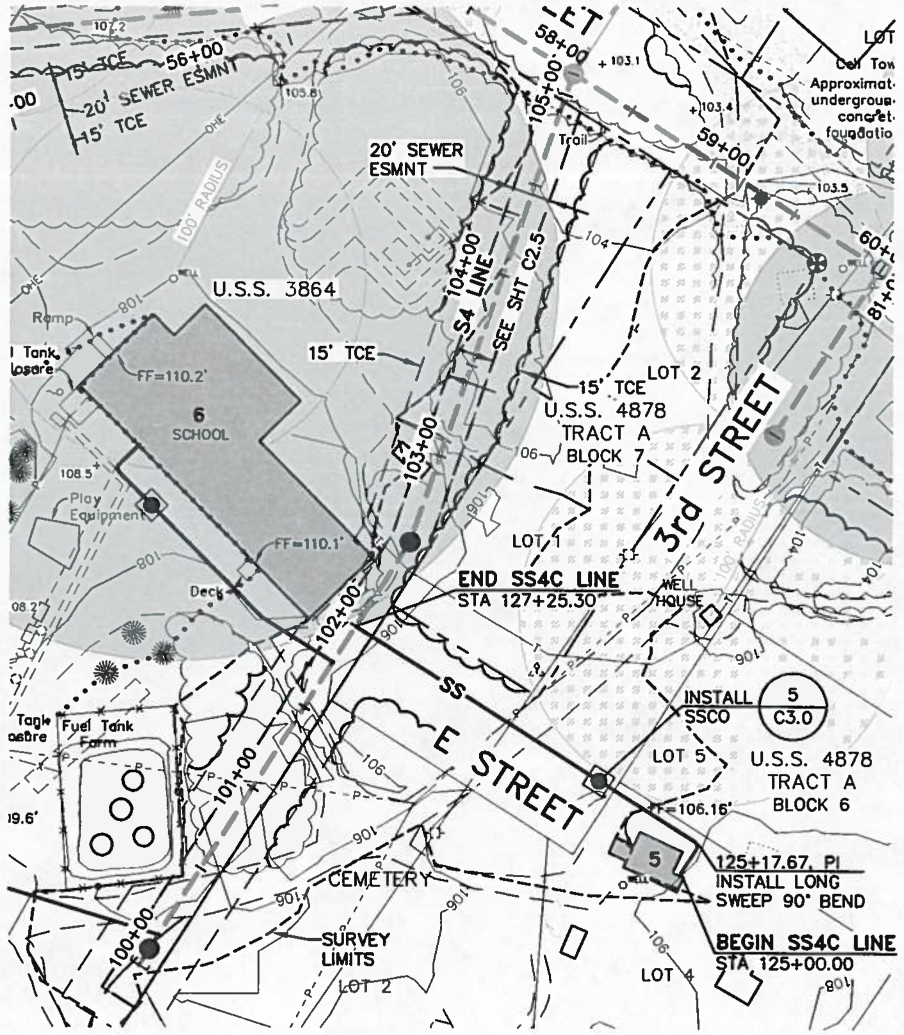
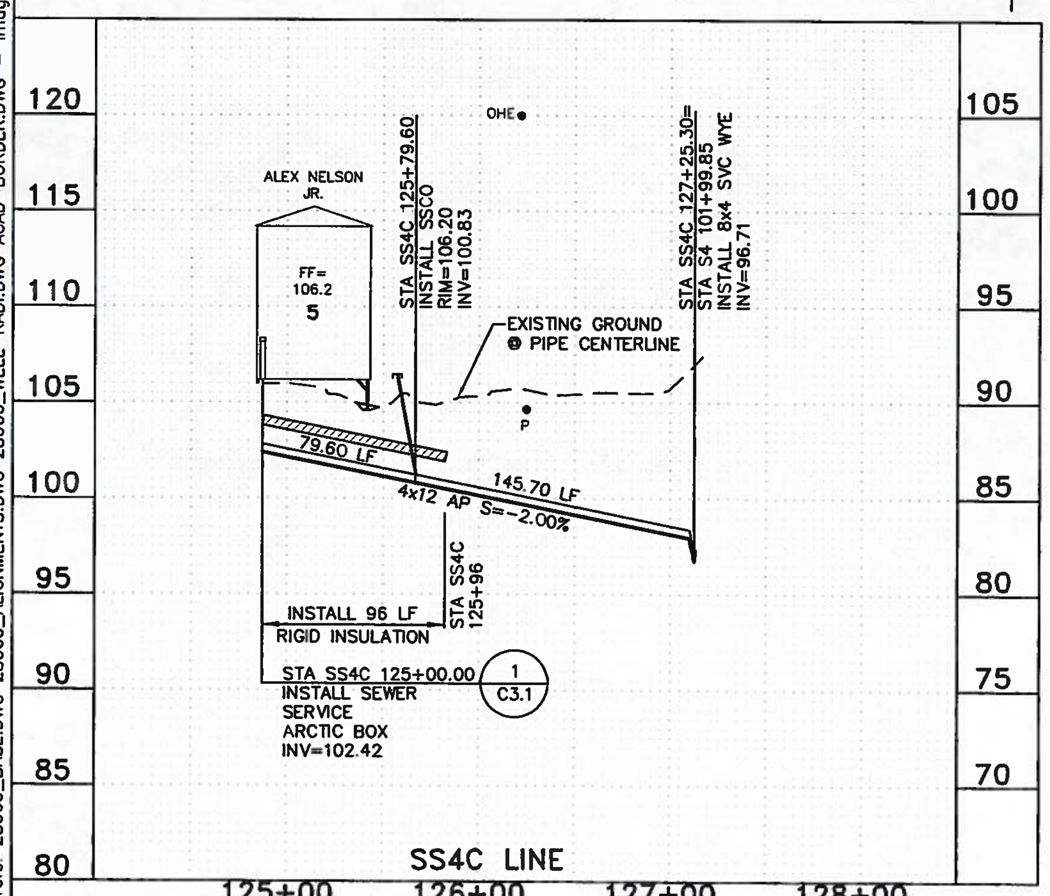
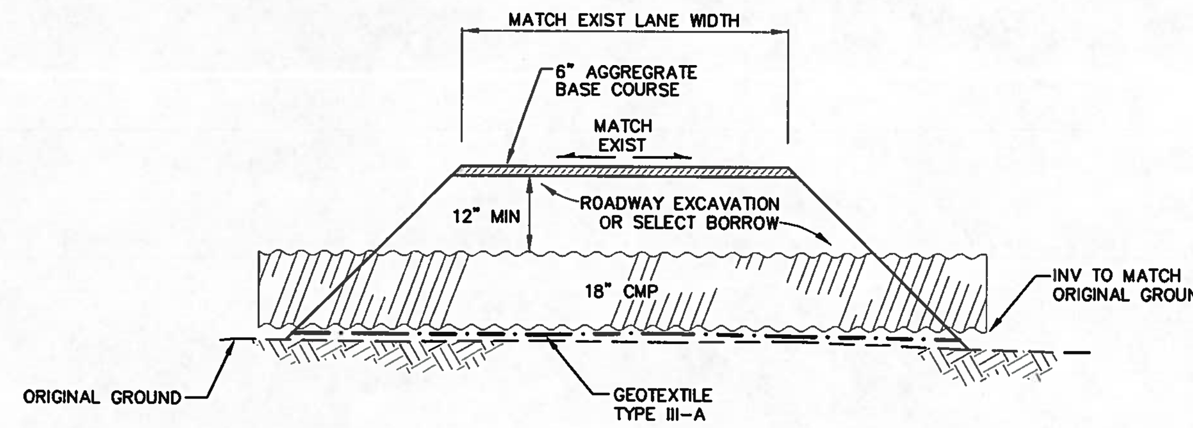
Xrefs: 28060_BASE.DWG 28060_ALIGNMENTS.DWG 28060_WELL-RADI.DWG ACAD-BORDER.DWG – Images: EKWOK-TRIMMED.JPG X-BLDG4-SERVICE.JPG



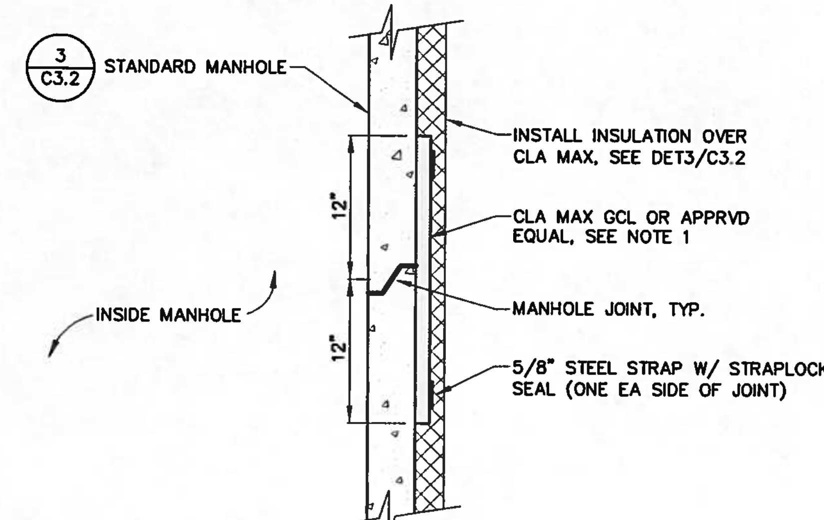


HORIZONTAL SCALE IN FEET
50 0 25 50
5 0 2.5 5
VERTICAL SCALE IN FEET



EXISTING ROADWAY RECONSTRUCTION SHALL MEET OR EXCEED ORIGINAL CONDITION.

A / – CULVERT REPLACEMENT SECTION
SCALE: NTS



NOTES:

1. INSTALL CLA MAX GCL WRAP ON EVERY JOINT. PROVIDE 4" OF OVERLAP FOR VERTICAL SEAMS.
2. DETAIL APPLIES TO SSMH19, SSMH20, AND SSMH22

1 / – MANHOLE GCL WRAP DETAIL
SCALE: NTS

ADEC REVIEW

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49TH KYLE LINDEN PETERSEN No. CE-11250 8/21/12 REGISTERED PROFESSIONAL ENGINEER

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
SS4C SERVICE LINE AND CULVERT REPLACEMENT SECTION

REVISION	BY	DATE

CAD FILE NAME 28060_C2-6.DWG

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

Sheet No. C2.6
SHEET 16 OF 35

User: SWHEAT Aug 22, 2012 - 9:27am
Drawing: C:\USERS\SWHEAT\DESKTOP\TOBEBACKEDUP\28060 EKWOK\DWG\28060_S5LINE.DWG - Layout: S5LINE
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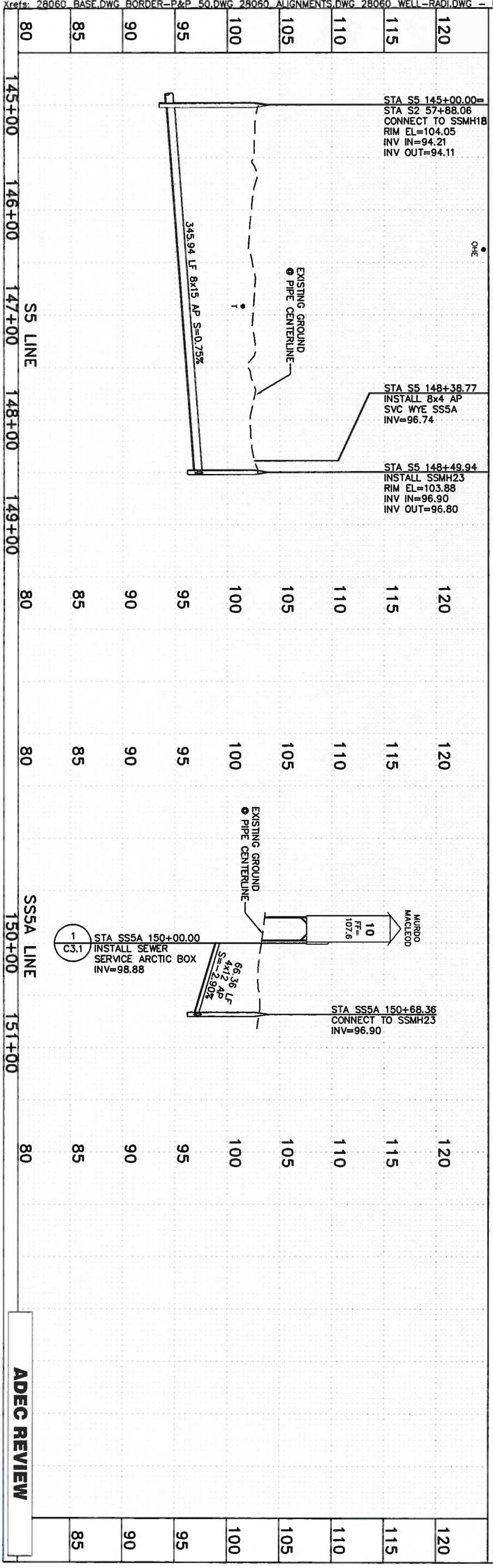

ADEC REVIEW

Sheet No.	C2.7
SHEET	17 OF 35
Project No.	28060
Date	5/13/11
Designed	KLP
Drawn	SJW
Approved	FJV

REVISION	BY	DATE

CAD FILE NAME
28060_S5LINE.DWG

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

SANITARY SEWER PLAN & PROFILE
S5 MAIN AND
SS5A SERVICE LINE

Bristol
ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

STATE OF ALASKA
49TH
KLYE LINDEN PETERSON
No. CE-11250
9/21/12
REGISTERED PROFESSIONAL ENGINEER

VILLAGE SAFE WATER

RECORD DRAWING CERTIFICATE

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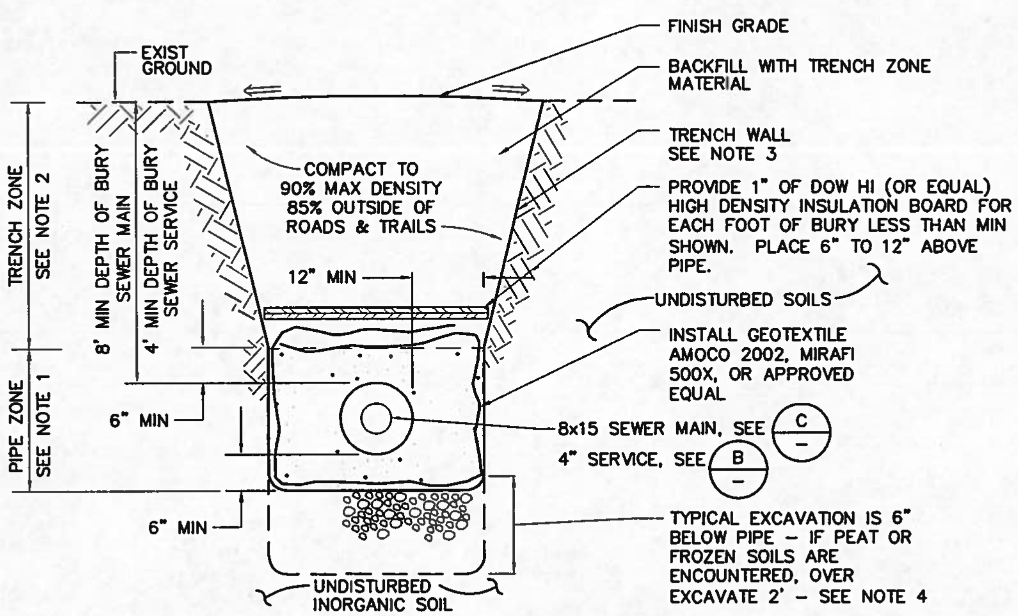
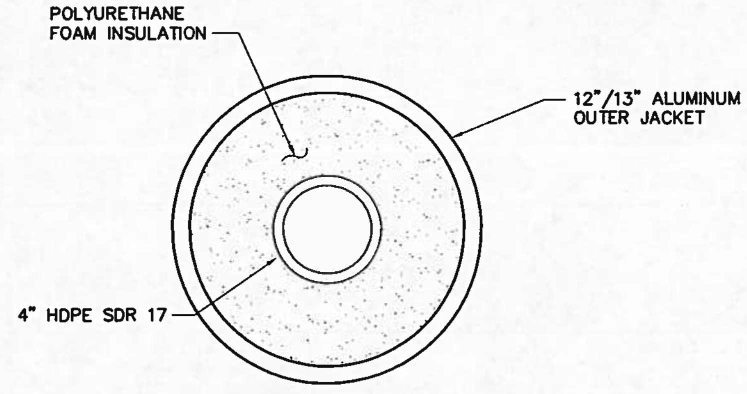
NAME DATE



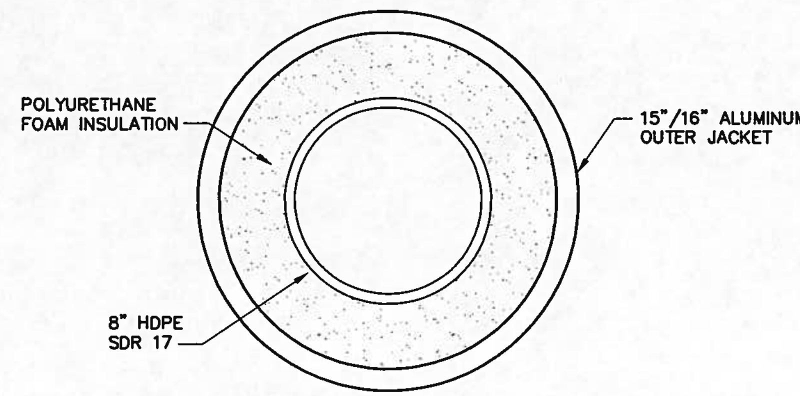
NOTES:

1. PIPE ZONE MATERIAL SHALL BE GRANULAR, WELL GRADED BACKFILL, COMPACT TO 90% MAX DENSITY WITHIN TRAILS & ROADWAYS. 85% OUTSIDE OF ROADWAYS.
2. TRENCH ZONE MATERIAL SHALL CONTAIN NO MORE THAN 12% PASSING THE #200 SIEVE.
3. TRENCH WALL SHALL BE SLOPED OR SHORED IN CONFORMANCE WITH ALL APPLICABLE SAFETY STANDARDS.
4. OVER EXCAVATE AND FILL W/ GRANULAR WELL GRADED BACKFILL IN AREAS OF FROZEN SOILS OR PEAT, COMPACT TO 90% MAX DENSITY.

A — TYPICAL SEWER TRENCH SECTION
SCALE: NTS

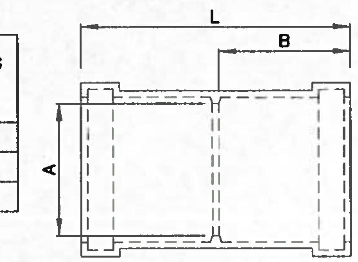


B — 4" SEWER SERVICE LINE (HOUSES)
SCALE: NTS



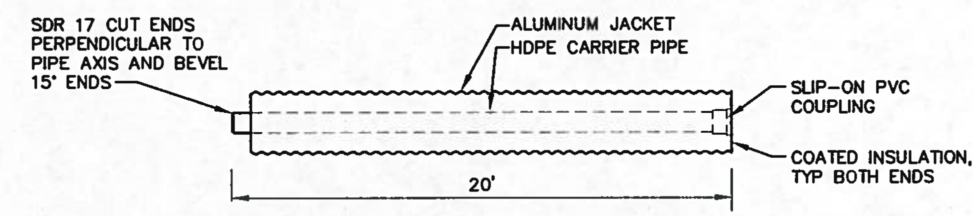
C — 8" SEWER MAIN
SCALE: NTS

A HDPE NOM. DIA (IFS)	D JACKET NOM. ID (IFS)	B COUPLING DEPTH (IFS)	L COUPLING DEPTH (IFS)
4"	12"	4"	8⅜"
6"	12"	4⅝"	9⅜"
8"	15"	4⅜"	11"

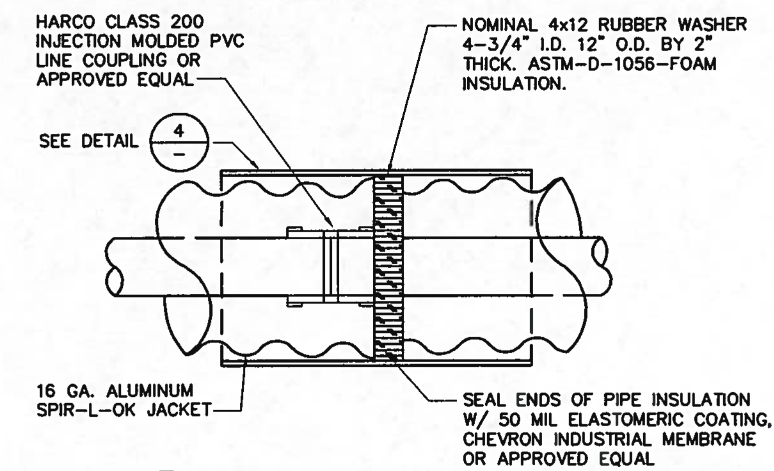


ONE PIECE INJECTION MOLDED PVC PUSH-ON COUPLING, CLASS 200, DR21 WITH ELASTOMERIC GASKET, NON-CIRCULAR IN CROSS SECTION.

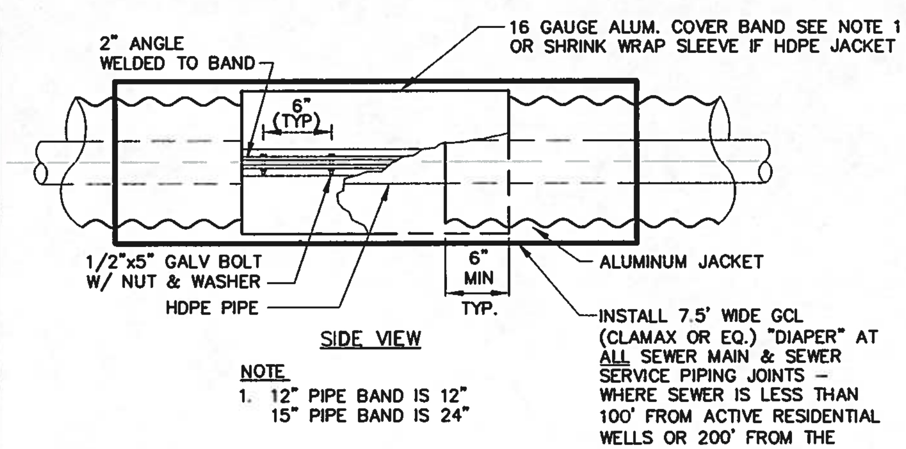
1 — GRAVITY SEWER COUPLING
SCALE: NTS



2 — ARCTIC PIPE DETAIL
SCALE: NTS



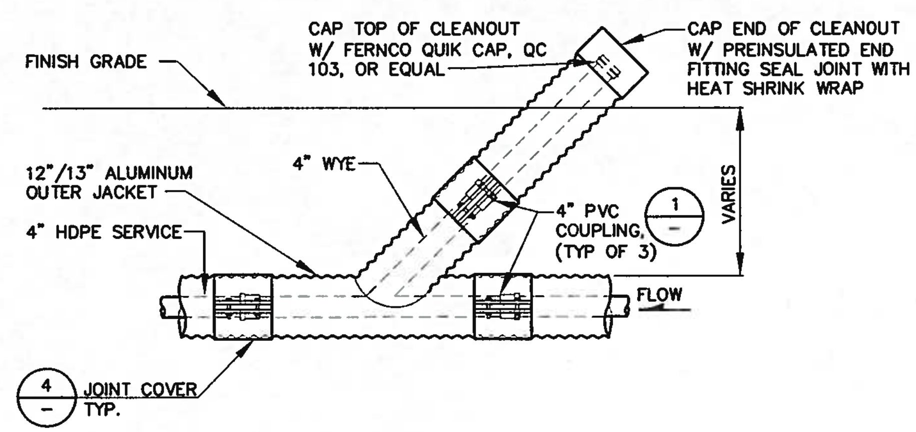
3 — TYPICAL PUSH JOINT COUPLING DETAIL
SCALE: NTS



SIDE VIEW

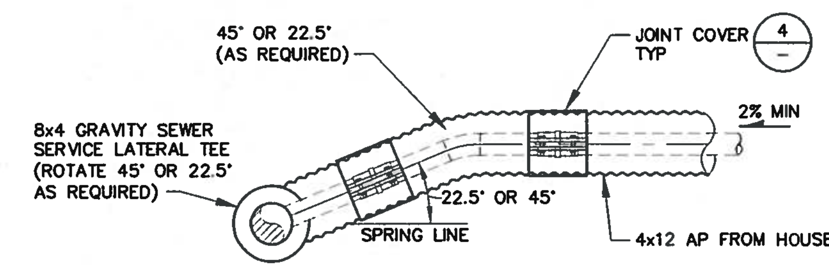
NOTE
1. 12" PIPE BAND IS 12"
15" PIPE BAND IS 24"

4 — TYPICAL JOINT COVER KIT DETAIL
SCALE: NTS



SIDE VIEW

5 — CLEANOUT DETAIL
SCALE: NTS



SIDE VIEW

6 — SEWER MAIN SERVICE CONNECTION
SCALE: NTS

95% SUBMITTAL

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NAME | DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49TH — KLYE LINDEN PETERSEN No. CE-11250 5/13/11 REGISTERED PROFESSIONAL ENGINEER

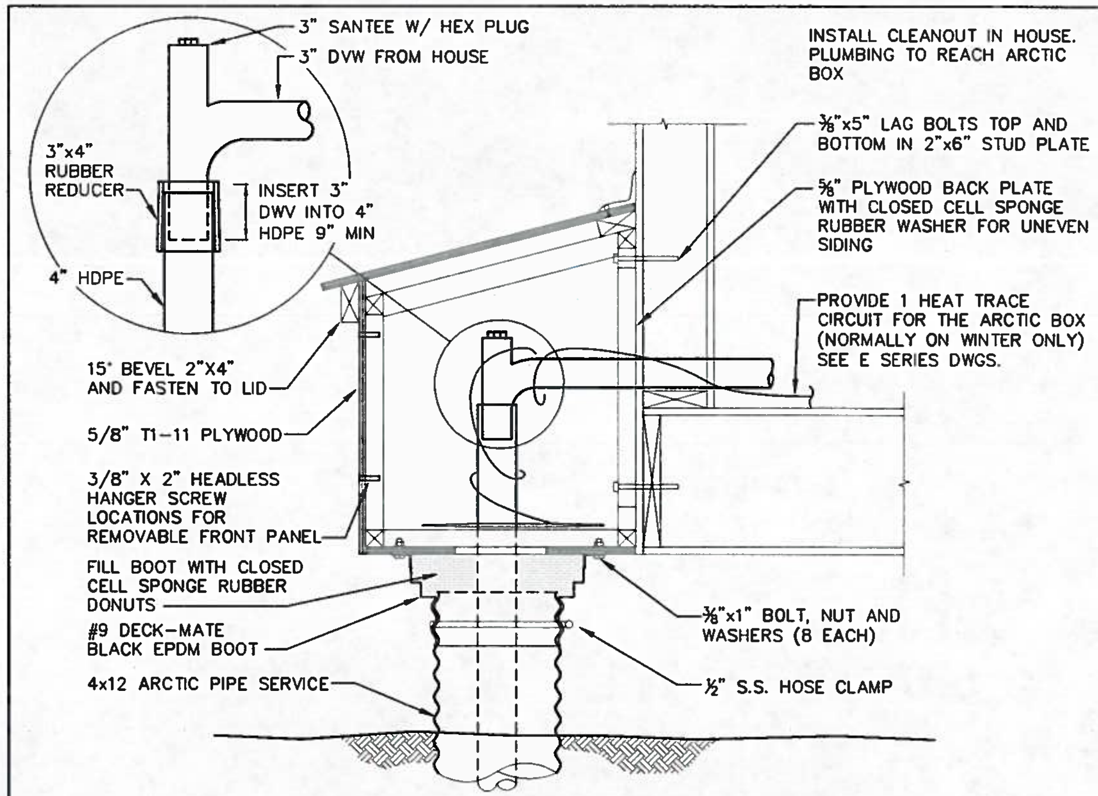
Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
SANITARY SEWER DETAILS

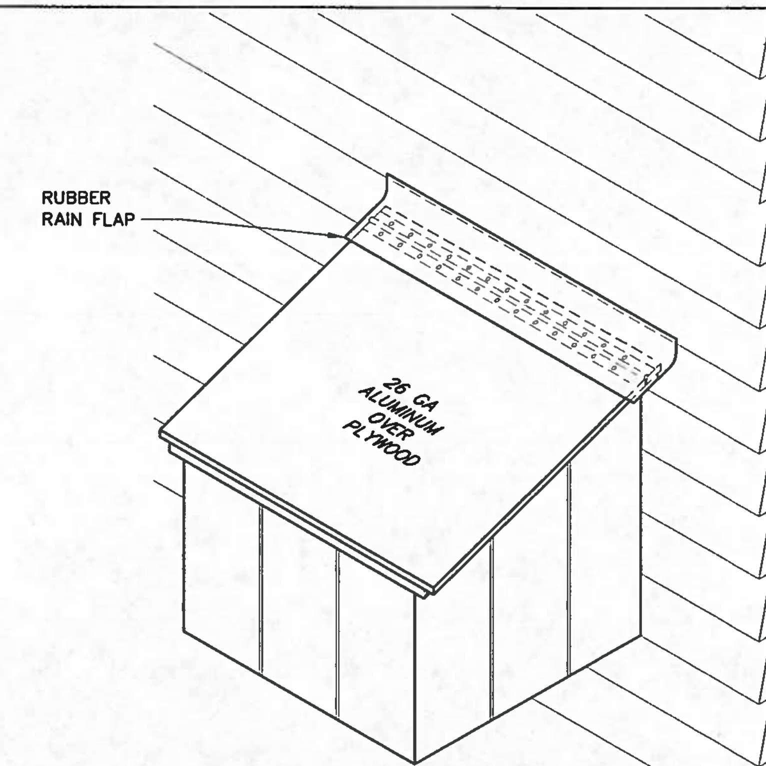
REVISION	BY	DATE
CAD FILE NAME 28060_C3-0.DWG		

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

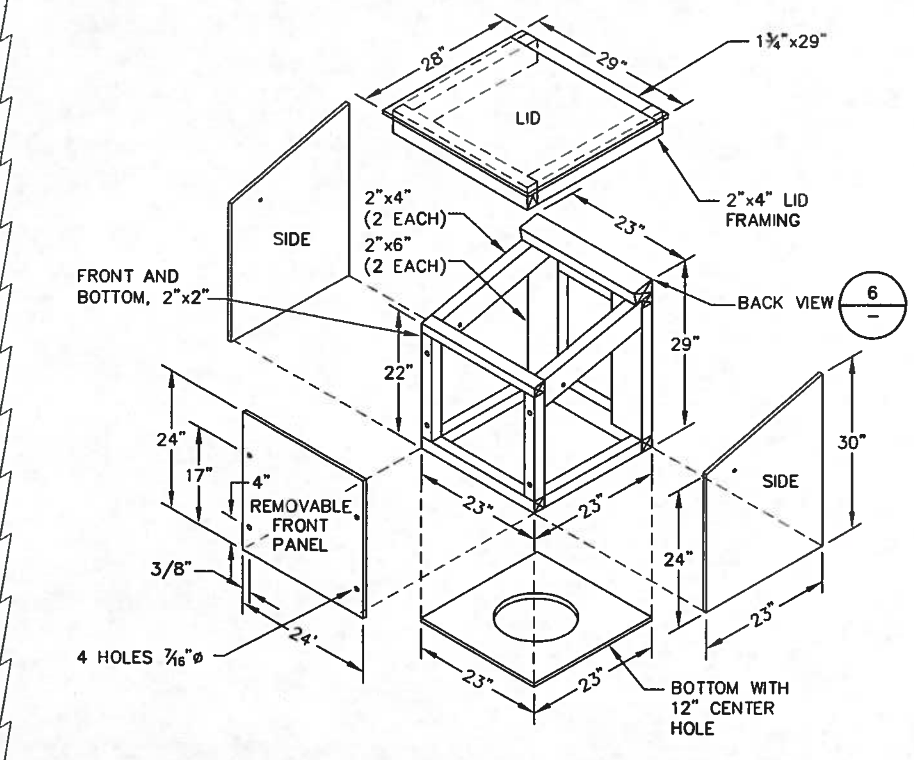
Sheet No. C3.0
SHEET 18 OF 35



1 TYPICAL HOUSE SEWER CONNECTION
SCALE: NTS



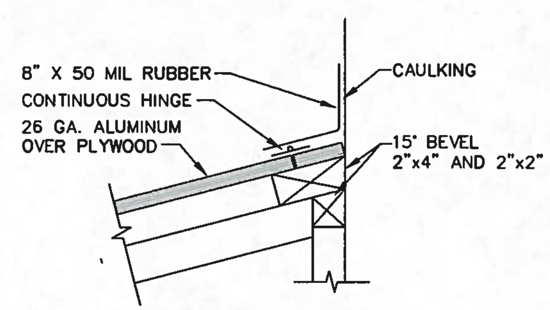
2 TYPICAL ARCTIC BOX FOR SEWER HOUSE CONNECTION
SCALE: NTS



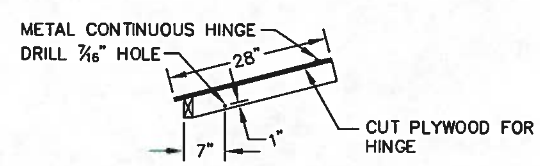
3 ARCTIC BOX CONSTRUCTION - EXPLODED VIEW
SCALE: NTS

NOTES:

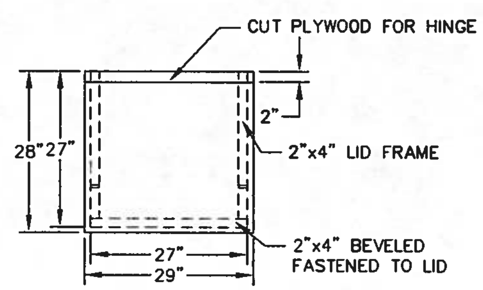
1. BOX IS FASTENED TOGETHER WITH CONSTRUCTION ADHESIVE AND 1/4"x2" WOOD SCREWS AT 6" O.C.
2. UPON COMPLETION OF ARCTIC BOX, FILL VOID SPACE IN BOX WITH FIBERGLASS BATT INSULATION SEALED IN PLASTIC BAGS.
3. 3" THICK BOX BOTTOM INSULATION SHALL BE FIELD CUT FOR PIPE PENETRATION.
4. PROVIDE EXTERIOR AND INTERIOR PRIMER COAT OF TRANSPARENT WATER SEAL. FINAL COAT OF EXTERIOR SEMI-TRANSPARENT PIGMENTED STAIN TO BE FIELD APPLIED.
5. SEAL ALL GAPS AND CRACKS IN FOAM BOARD INSULATION WITH SPRAY FOAM INSULATION.



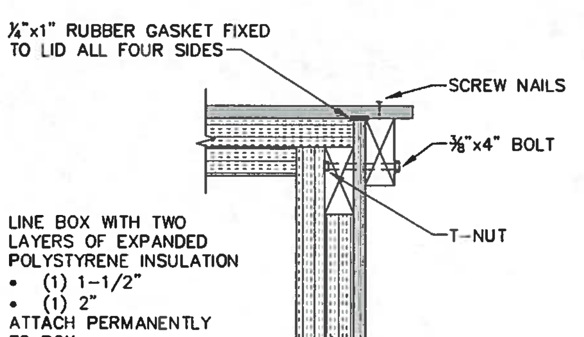
4 HINGE DETAIL
SCALE: NTS



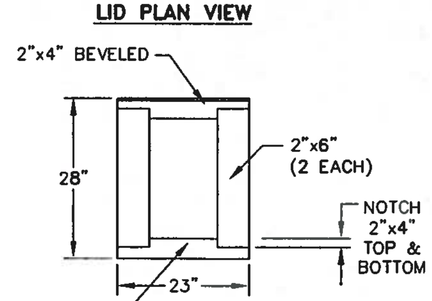
LID SIDE VIEW



LID PLAN VIEW



5 LID/BOX FASTENING DETAIL
SCALE: NTS



BOX BACK VIEW

6 ARCTIC BOX DETAILS
SCALE: NTS

95% SUBMITTAL

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49TH KLYE LINDEN PETERSEN No. CE-11250 5/13/11 REGISTERED PROFESSIONAL ENGINEER

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
SANITARY SEWER DETAILS

REVISION	BY	DATE

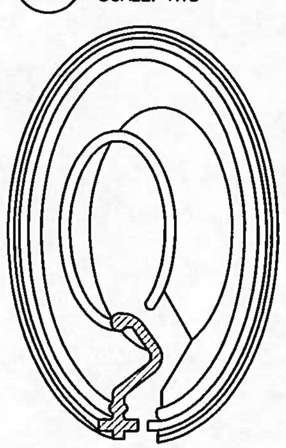
CAD FILE NAME 28060_C3-1.DWG

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

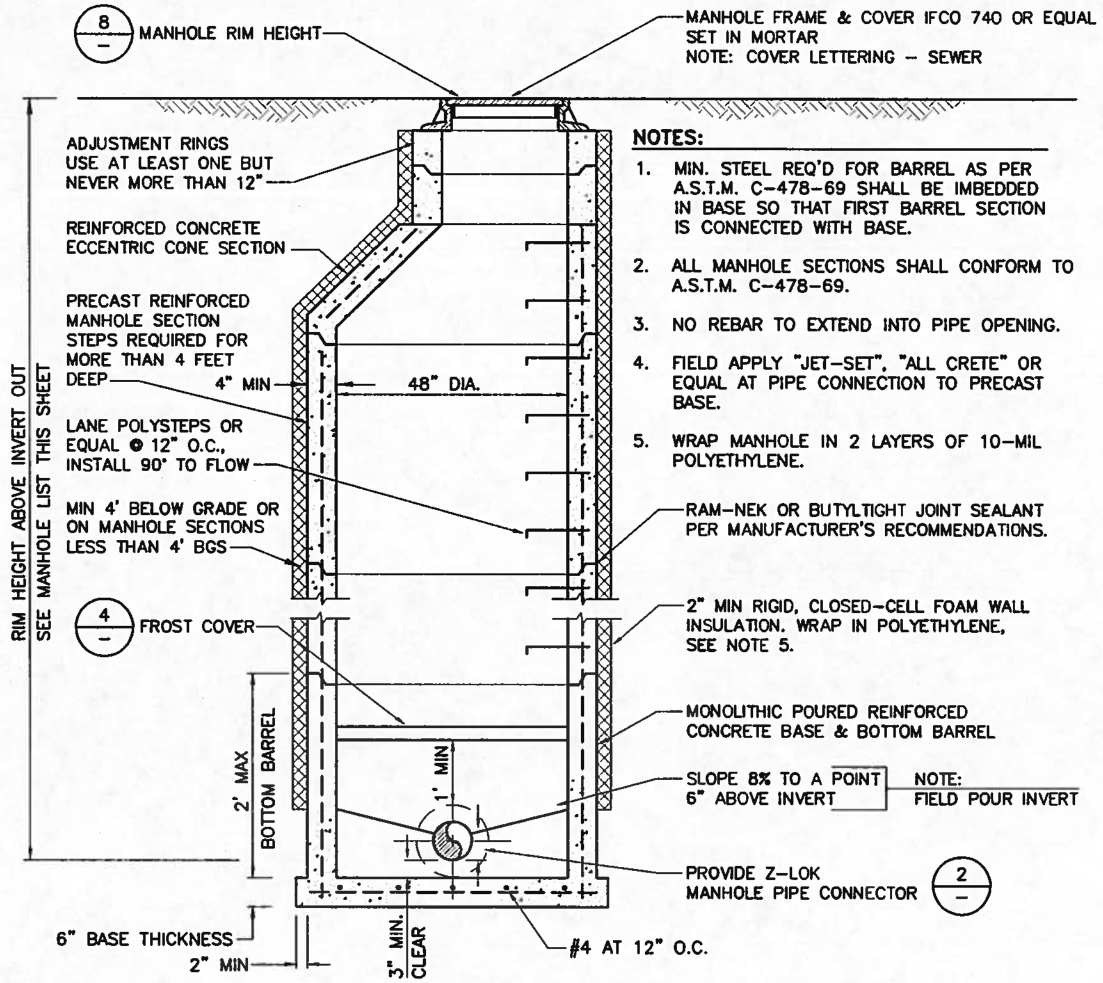
Sheet No. C3.1
SHEET 19 OF 35

MANHOLE NUMBER	RIM HEIGHT ABOVE INVERT OUT	INVERT IN (1.2 INCHES ABOVE INVERT OUT)	ANGLE (CW FROM INVERT OUT)	INVERT OUT ELEVATION
SSMH14	8.09'	1	124° 236°	79.19
SSMH15	8.73'	1	270°	88.58
SSMH16	11.73'	1	130°	90.85
SSMH17	12.03'	1	230°	93.51
SSMH18	9.83'	1	90° 180° 257°	94.11
SSMH19	10.76'	1	270°	95.49
SSMH20	10.31'	N/A	N/A	96.23
SSMH21	9.32'	1	180°	98.00
SSMH22	12.16'	1	193°	96.28
SSMH23	7.08'	N/A	N/A	96.80

1 SEWER MANHOLE SCHEDULE
SCALE: NTS

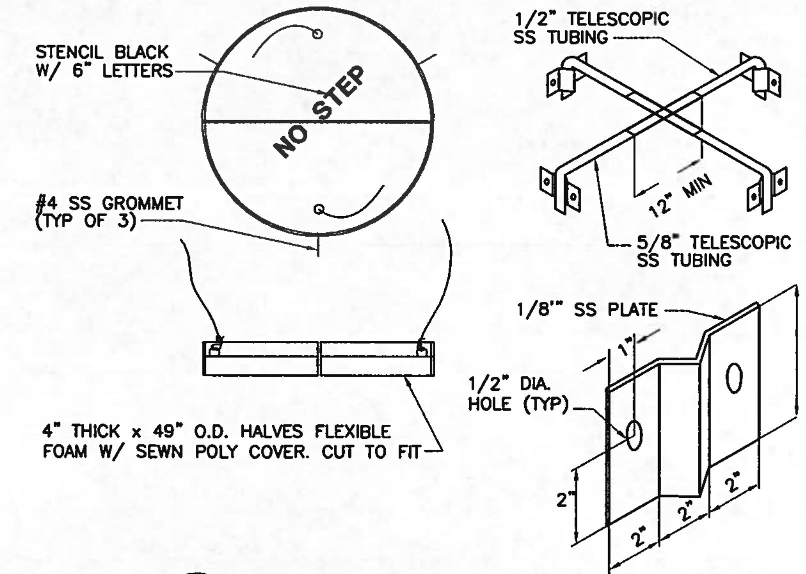


2 Z-LOK RING DETAIL
SCALE: NTS

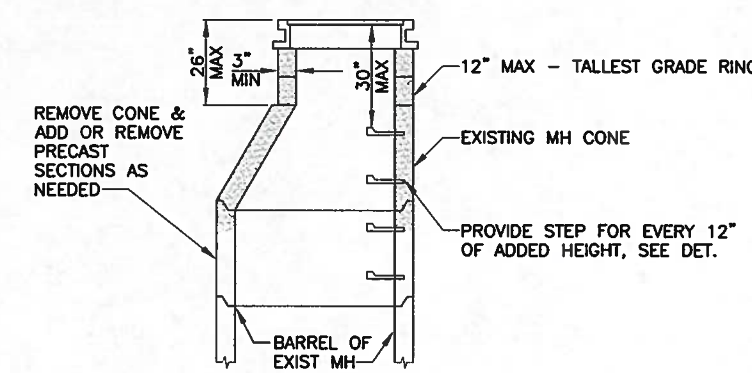


NOTES:
1. MIN. STEEL REQ'D FOR BARREL AS PER A.S.T.M. C-478-69 SHALL BE IMBEDDED IN BASE SO THAT FIRST BARREL SECTION IS CONNECTED WITH BASE.
2. ALL MANHOLE SECTIONS SHALL CONFORM TO A.S.T.M. C-478-69.
3. NO REBAR TO EXTEND INTO PIPE OPENING.
4. FIELD APPLY "JET-SET", "ALL CRETE" OR EQUAL AT PIPE CONNECTION TO PRECAST BASE.
5. WRAP MANHOLE IN 2 LAYERS OF 10-MIL POLYETHYLENE.

3 SANITARY SEWER - STANDARD MANHOLE
SCALE: NTS

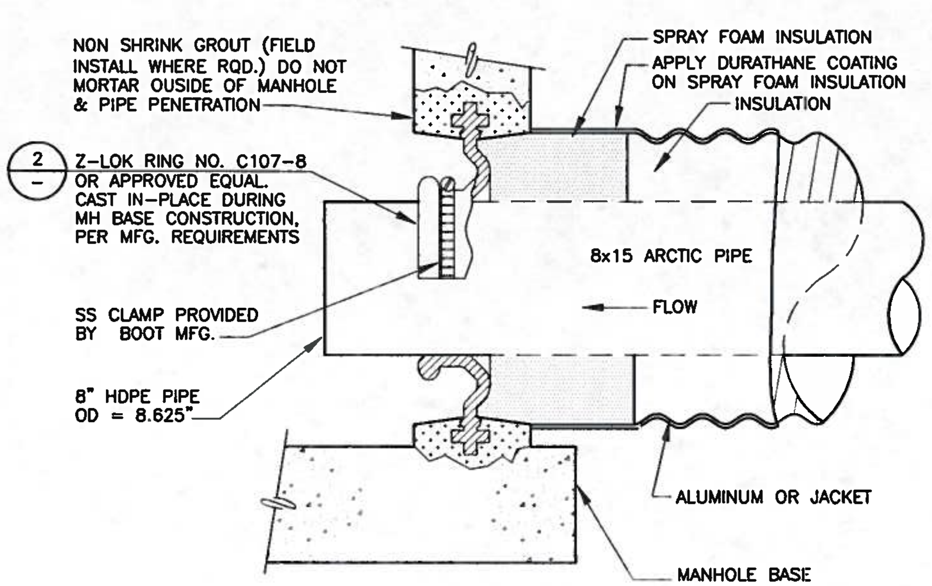


4 FROST COVER DETAIL
SCALE: NTS



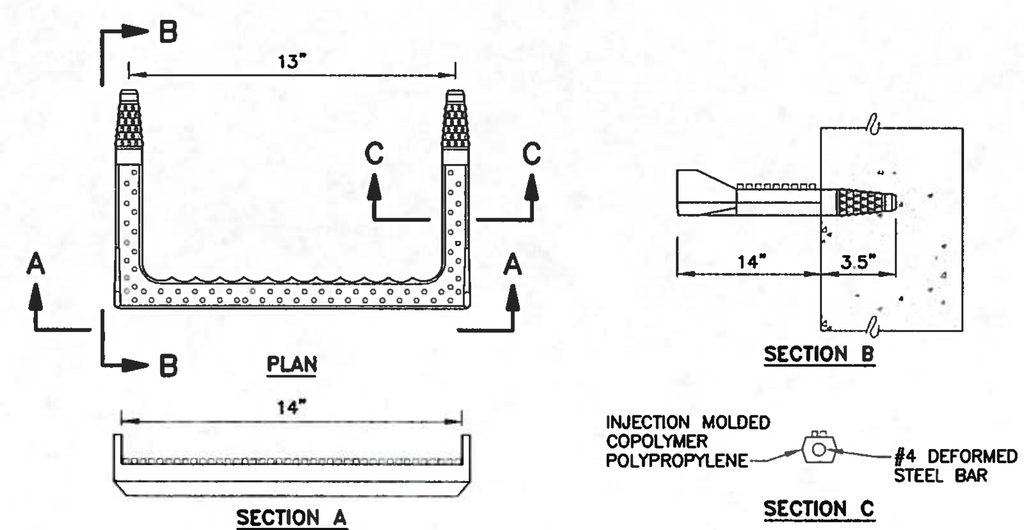
NOTES
1. WHEN AN ADJUSTMENT OF GREATER THAN 18" IN GRADE RINGS IS REQUIRED, ADJUST CONE RATHER THAN GRADE RINGS.
2. RESET CONCRETE GRADE RING IN FULL BED OF MORTAR.
3. REFER TO ASTM DESIGNATION C-478 FOR DESIGN AND STRENGTH REQUIREMENTS.
4. RESET CONE IN RAM-NEK OR EQUAL.
5. ADJUST FRAME TO ELEVATION SHOWN IN PLANS.

7 MANHOLE CONE/RING ADJUSTMENT
SCALE: NTS



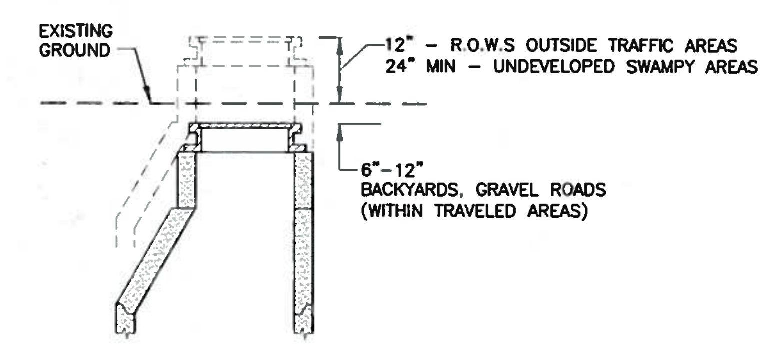
NOTE:
MANHOLE PIPE CONNECTION TO PROVIDE A MIN PIPE DEFLECTION OF 25 DEGREES IN ANY DIRECTION & 3/4" OF VERTICAL OR HORIZONTAL MOVEMENT WITHOUT A LOSS OF SEAL.

5 MANHOLE PIPE CONNECTION
SCALE: NTS



NOTES
1. DRIVE RUNG INTO PREFORMED OR DRILLED HOLES WITH A 6 TO 10 LB. SLEDGE HAMMER, AFTER CONCRETE IS CURED TO 3000 PSI MIN.
2. THE INSTALLED STEP SHALL RESIST A PULLOUT FORCE OF 1500 LBS.

6 MANHOLE STEP DETAIL
SCALE: NTS



8 MANHOLE RIM HEIGHT
SCALE: NTS

ADEC REVIEW

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49TH KLYE LINDEN PETERSEN No. CE-11250 8/21/12 REGISTERED PROFESSIONAL ENGINEER

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
SANITARY SEWER DETAILS

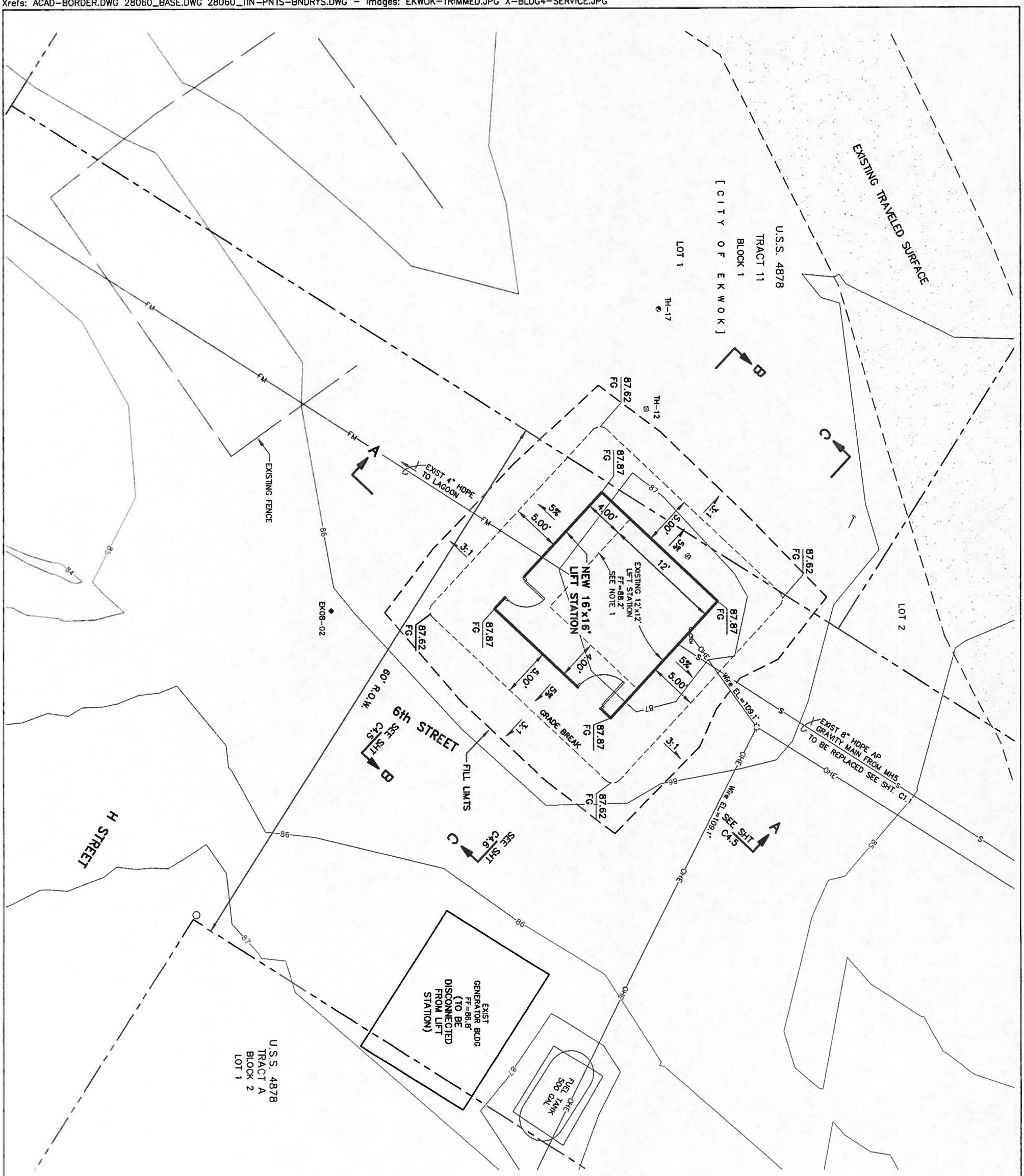
REVISION	BY	DATE

CAD FILE NAME 28060_C3-2.DWG

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

Sheet No. C3.2
SHEET 20 OF 35

User: SWHEAT May 11, 2011 - 1:59pm
Drawing: C:\DOCUMENTS AND SETTINGS\SWHEAT\DESKTOP\EKWOK\DWG\28060_C4-0.DWG - Layout: C1.0
Xrefs: ACAD-BORDER.DWG 28060_BASE.DWG 28060_TIN-PNTS-BNDRYS.DWG - Images: EKWOK-TRIMMED.JPG X-BLDG4-SERVICE.JPG



NOTES

1. EXISTING 12'x12' LIFT STATION BUILDING TO BE DEMOLISHED. EXISTING SLAB AND 6' ID WET WELL TO REMAIN.
2. CONTRACTOR SHALL COORDINATE REMOVAL/DISPOSAL OR SALVAGE OF EXISTING BUILDING COMPONENTS WITH CITY OF EKWOK.
3. CONTRACTOR SHALL PROTECT EXISTING SLAB AND WET WELL DURING SEWER GRAVITY MAIN REPLACEMENT, AND NEW TIE-IN TO EXISTING FORCE MAIN.

HORIZONTAL SCALE IN FEET
5 0 2.5 5

95% SUBMITTAL

Sheet No. **C4.0**
SHEET 21 OF 35

Project No. 28060
Date 5/13/11
Designed KLP
Drawn SJW
Approved FJV

REVISION	BY	DATE

CAD FILE NAME
28060_C1-0.DWG

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION IMPROVEMENTS
SITE GRADING PLAN

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

STATE OF ALASKA
KLYE LINDEN PETERSEN
No. CE-11250
5/13/11
REGISTERED PROFESSIONAL ENGINEER

VILLAGE SAFE WATER

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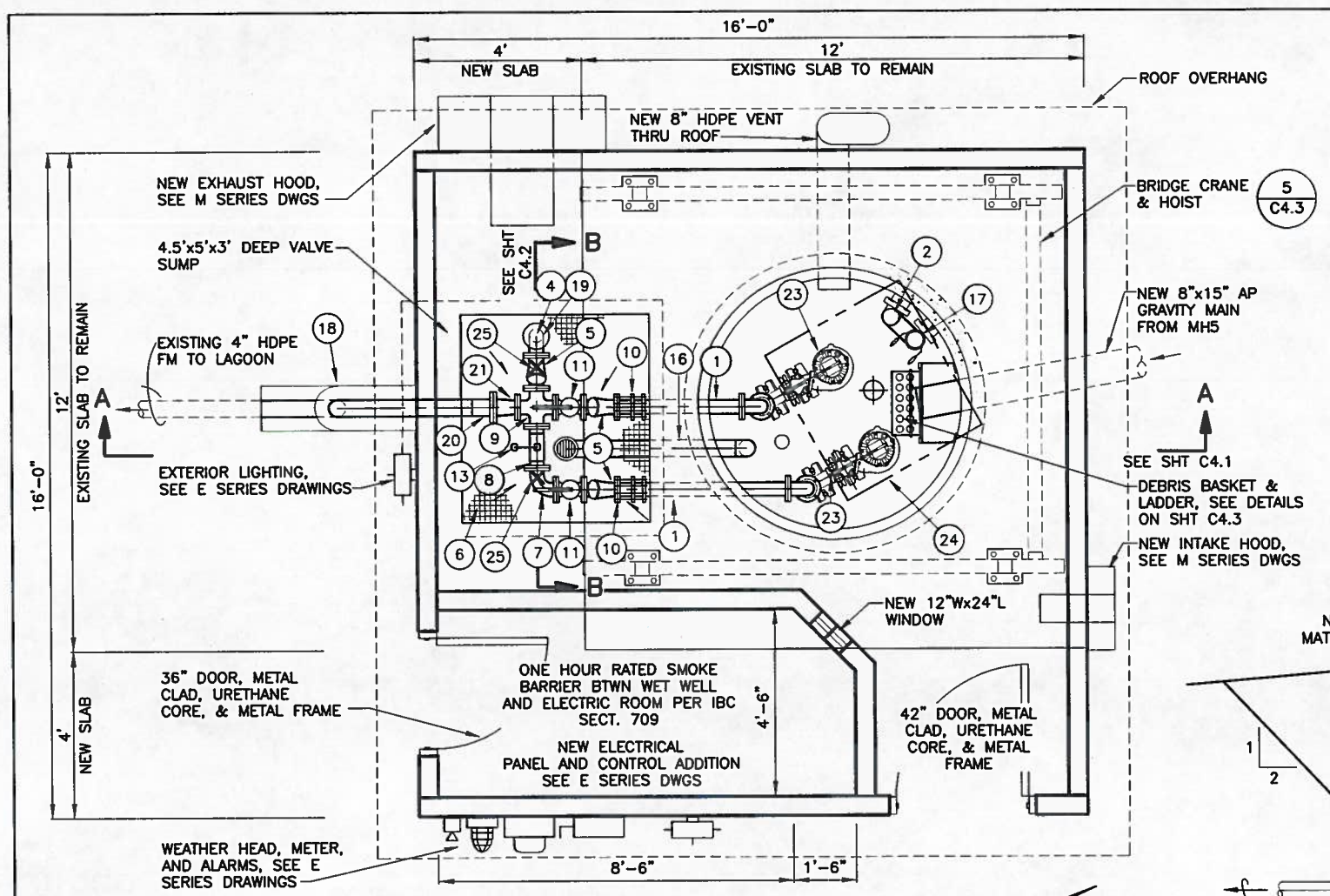
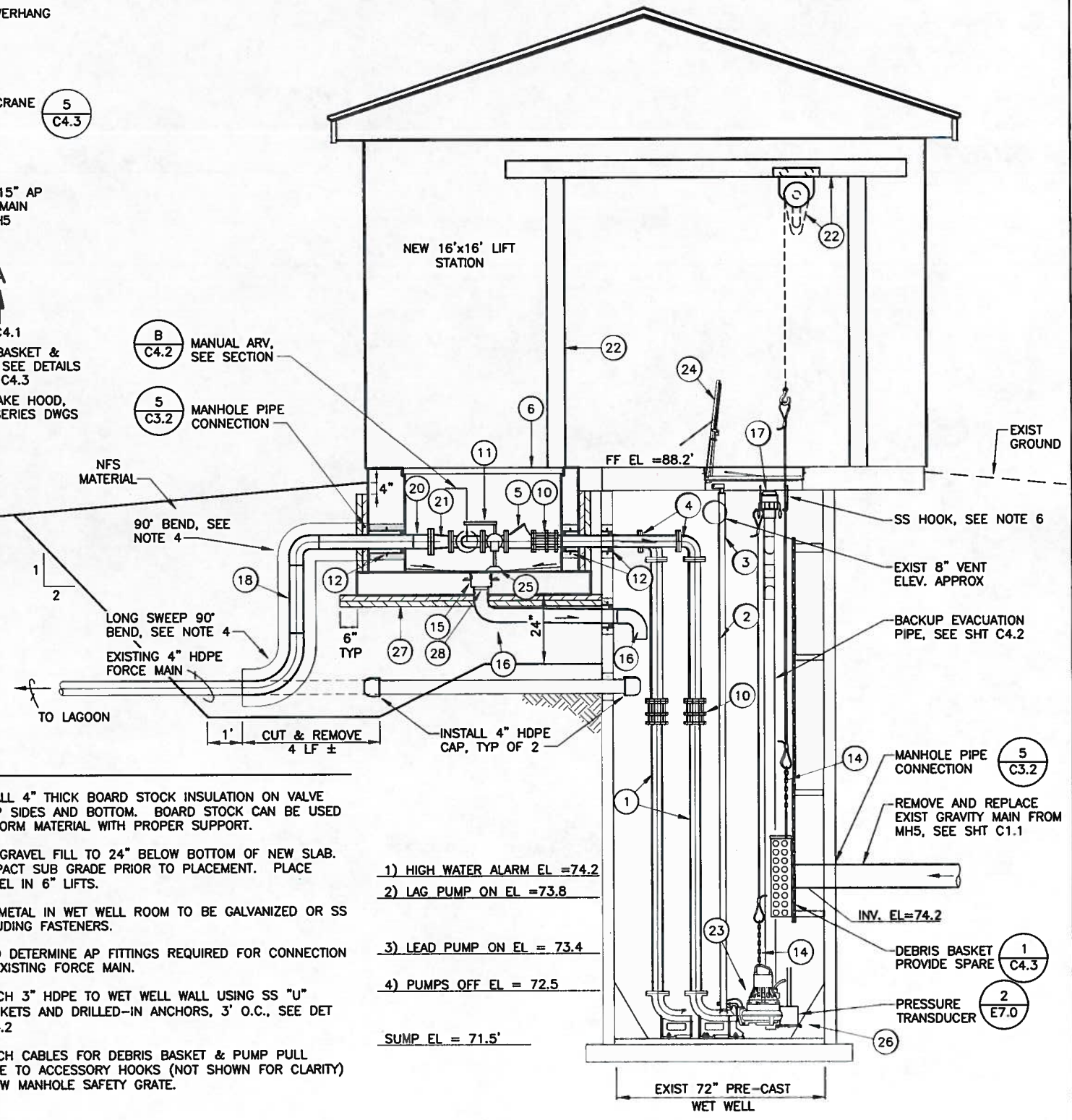
NAME DATE



1/— **PIPING PLAN**
SCALE: SHOWN

HORIZONTAL SCALE IN FEET 2 0 1 2



A/— **SECTION A-A**
SCALE: SHOWN

2 1 0 0.5 1 2
SCALE 1/2" = 1'-0"

KEY

1. 3" DIP, FLxPLAIN END
2. 3" HDPE, SDR 17–SEE NOTE 5
3. STAINLESS STEEL GUIDE RAILS PER PUMP MNFR.
4. 3" DIP 90° BEND, FL
5. 3" BALL CHECK VALVE, FL
6. 1 1/2" FIBERGLASS GRATING, NON-SKID SURFACE, 4.5'x5'
7. 3" DIP, LR, 90° BEND, FL
8. 3" DIP SPOOL, FLxFL, 1-0' LONG
9. 3" DIP CROSS, FLxFL
10. 3" RFCA-3.96, ROMAC OR EQ.
11. 3" BALL VALVE, FL
12. LINK-SEAL WALL SLEEVE MODEL
13. MANUAL WASTEWATER ARV, SEE SEC. B-B SHT C4.2
14. 316L SS LIFTING CHAIN PER MNFR, AND NYLON ROPE
15. FLOOR DRAIN, JR SMITH, EXT. ADPTR, 8½"ø, MED. DUTY, OR EQ.
16. 4" DWV PIPE
17. 3" CAMLOCK/HDPE FEMALE TRANS, S.S., W/ CAP & CHAIN, POLY-CAM SERIES 643 OR EQ. LOCATE FOR ACCESS FROM LIFT STATION FINISH FLOOR
18. 4x12 ARCTIC PIPE
19. 3" S.S. FL ADAPTER W/CAM-LOCK FEMALE ADAPTER W/CAP & CHAIN.
20. 4" FL ADAPTER, W/SS BACKER RING
21. 4x3 DIP REDUCER, FLxFL
22. BRIDGE CRANE & HOIST – SEE DETS/SHT C4.3
23. DUPLEX WASTEWATER PUMPS, 3 PHASE, FLYGT MODEL NP3085.190, ABS MODEL XFP 80C VX, OR APPVD EQ., SEE SHT C4.2
24. RETRO ACCESS DOOR, 41"x48", HALLIDAY PRODUCTS OR EQ, STAINLESS STEEL HARDWARE. AND RETRO SAFETY GRATE.
25. PIPE SUPPORT, SEE DET 2/C4.2
26. GROUT EXIST SURFACE TO PROVIDE POSITIVE DRAINAGE TO PUMP(S) INLET(S)
27. 4" THICK HIGH DENSITY INSULATION BOARD, EXTEND 6" BEYOND BASE OF VALVE SUMP
28. INLINE 4" FLOOR DRAIN TRAP SEALER, SURE SEAL MODEL SS4009 W/ GASKET, OR EQ.

NOTES

1. INSTALL 4" THICK BOARD STOCK INSULATION ON VALVE SUMP SIDES AND BOTTOM. BOARD STOCK CAN BE USED AS FORM MATERIAL WITH PROPER SUPPORT.
2. NFS GRAVEL FILL TO 24" BELOW BOTTOM OF NEW SLAB. COMPACT SUB GRADE PRIOR TO PLACEMENT. PLACE GRAVEL IN 6" LIFTS.
3. ALL METAL IN WET WELL ROOM TO BE GALVANIZED OR SS INCLUDING FASTENERS.
4. FIELD DETERMINE AP FITTINGS REQUIRED FOR CONNECTION TO EXISTING FORCE MAIN.
5. ATTACH 3" HDPE TO WET WELL WALL USING SS "U" BRACKETS AND DRILLED-IN ANCHORS, 3' O.C., SEE DET 1/C4.2
6. ATTACH CABLES FOR DEBRIS BASKET & PUMP PULL CABLE TO ACCESSORY HOOKS (NOT SHOWN FOR CLARITY) BELOW MANHOLE SAFETY GRATE.

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA — REGISTERED PROFESSIONAL ENGINEER — JULIE LINDEN PETERSEN — No. EC-11250 — 5/13/11

Bristol Environmental & Engineering Services Corporation

Project No. 28060

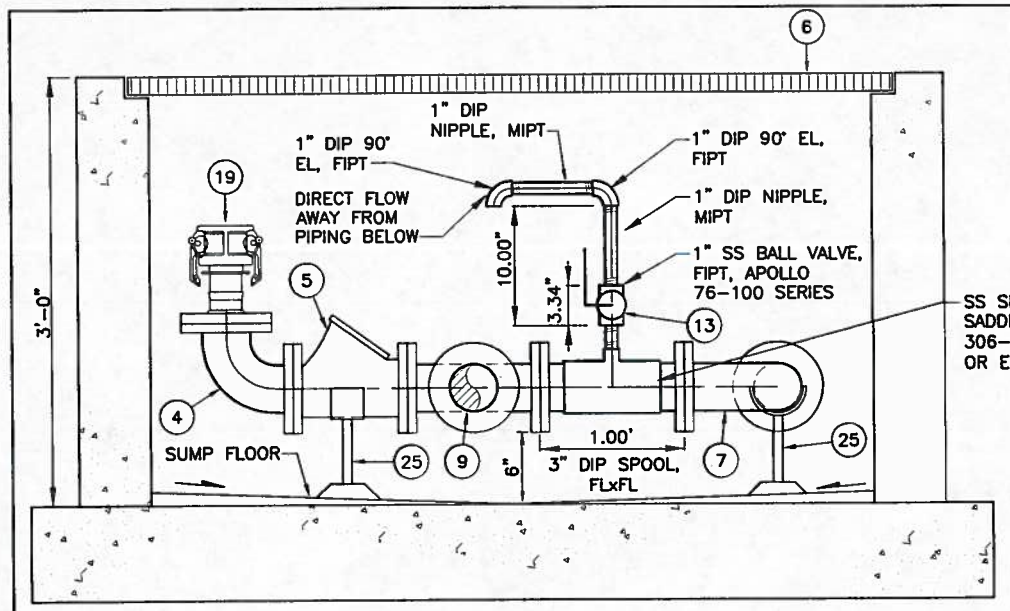
CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION IMPROVEMENTS
PIPING PLAN, SECTION, KEY AND NOTES

REVISION	BY	DATE

CAD FILE NAME 28060_C4-1.DWG

Project No. 28060 | Date 5/13/11 | Designed KLP/SJW | Drawn SJW | Approved KLP

Sheet No. C4.1
SHEET 22 OF 35



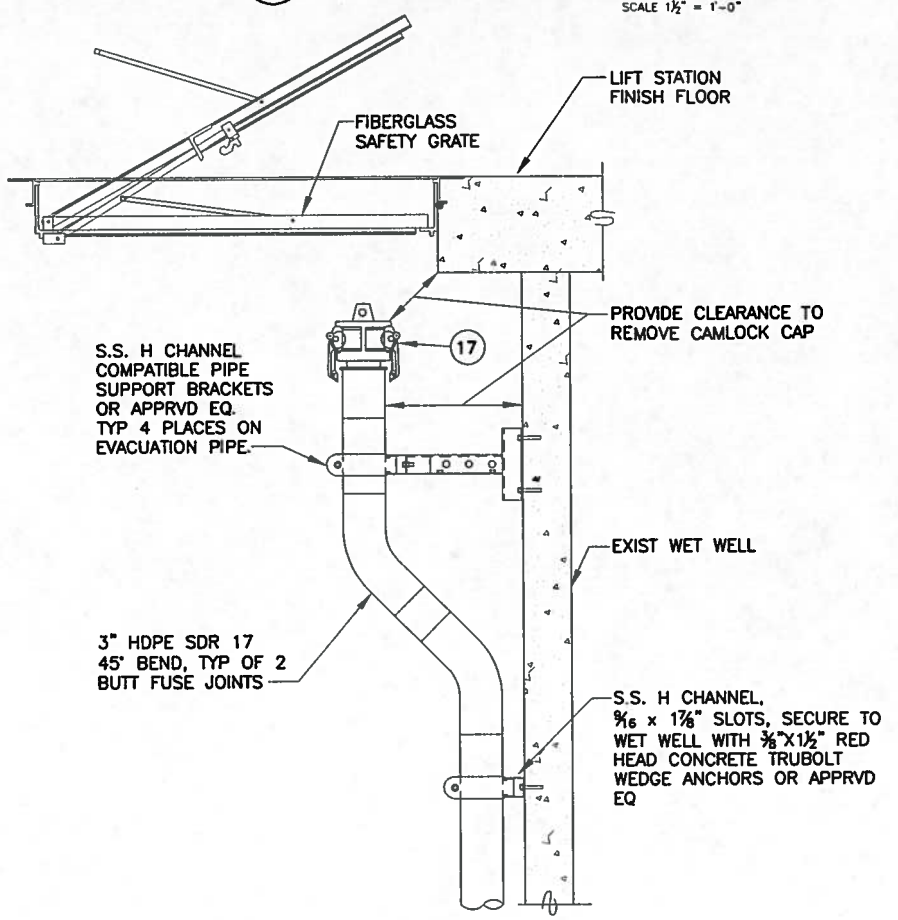
NOTES

1. REFER TO SHT C4.1 FOR PIPING KEY.
2. SEE A/C4.4 FOR STRUCTURAL DETAILS.

(B/—) SECTION B-B

SCALE: NTS

SCALE 1½" = 1'-0"



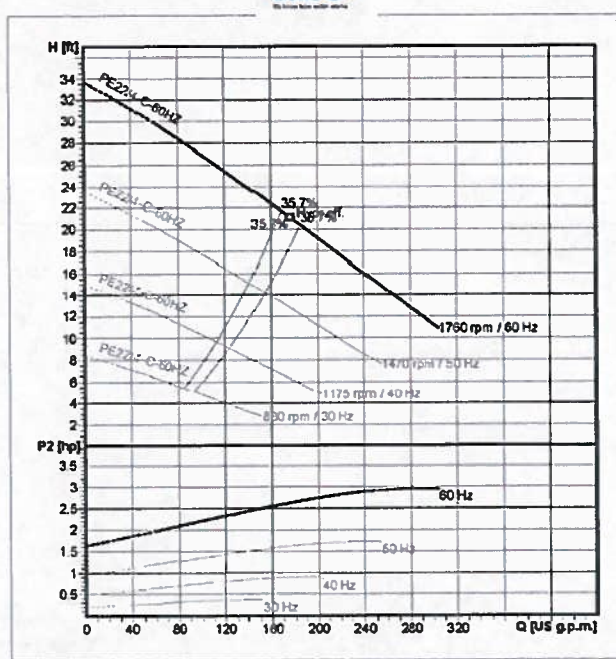
BACKUP EVACUATION NARRATIVE

ALL ELECTRIC POWER TO THE PERMANENT PUMPS WILL BE SHUT OFF AT THE CONTROL PANEL. THE BALL VALVES, (SEE ITEM (11) ON FLOOR PLAN, SHT. C4.1) TO BOTH PERMANENT PUMPS WILL BE CLOSED, THE HATCH TO THE WET WELL WILL BE OPENED AND THE SUCTION SIDE OF THE TEMPORARY PUMP WILL BE CONNECTED TO THE CAM-LOCK FITTIING (SEE ITEM (17) ON FLOOR PLAN, SHT. C4.1) IN THE WET WELL. THE PUMP DISCHARGE WILL BE CONNECTED TO THE CAM-LOCK (SEE ITEM (19) ON FLOOR PLAN, SHT. C4.1) IN THE VALVE VAULT. THE PUMP WILL BE CONNECTED TO AN ELECTRICAL OUTLET, AND TURNED ON.

(1/—) EVACUATION PIPE DETAIL

SCALE: NTS

XFP 80C VX 60HZ



Operating data specification			
Flow	184 US g.p.m.	Head	20.5 ft
Efficiency	35.7 %	Shaft power	2.87 hp
Fluid	Water	Temperature	39 F
Nature of system	Single head pump	No. of pumps	1
Pump data			
Type	XFP 80C VX 60HZ	Make	ABS
Series	XFP PE1-PE3	Impeller	Vortex Impeller
N° of vanes	6	Impeller size	6.34 inch
Free passage	3"	Suction port	DN80
Discharge port	DN80		
Motor data			
Rated voltage	230 V	Frequency	60 Hz
Rated power P2	2.95 hp	Nominal speed	1760 rpm
Number of poles	4	Efficiency	89.7 %
Power factor	0.977	Rated current	9.1 A
Starting current	43.9 A	Rated torque	8.6 lbf ft
Starting torque	24.3 lbf ft	Degree of protection	IP68
Insulation class	H		

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ABSEL PRO I 7.2 / 2007-02-07

PERFORMANCE CURVE

PRODUCT	NP3085.190	TYPE	MT
DATE	2010-12-09	PROJECT	Ekwok Lift Station Revamp
CURVE NO	63-462-00-5306	ISSUE	1

	1/1-LOAD	3/4-LOAD	1/2-LOAD
POWER FACTOR	0.85	0.80	0.70
EFFICIENCY	77.0 %	79.0 %	78.0 %
MOTOR DATA	---	---	---

RATED POWER 3 hp; STARTING CURRENT ... 50 A; RATED CURRENT ... 9.9 A; RATED SPEED 1690 rpm; TOT.MOM.OF INERTIA 0.020 kgm2; NO OF BLADES 2

IMP. THROUGHLET ---

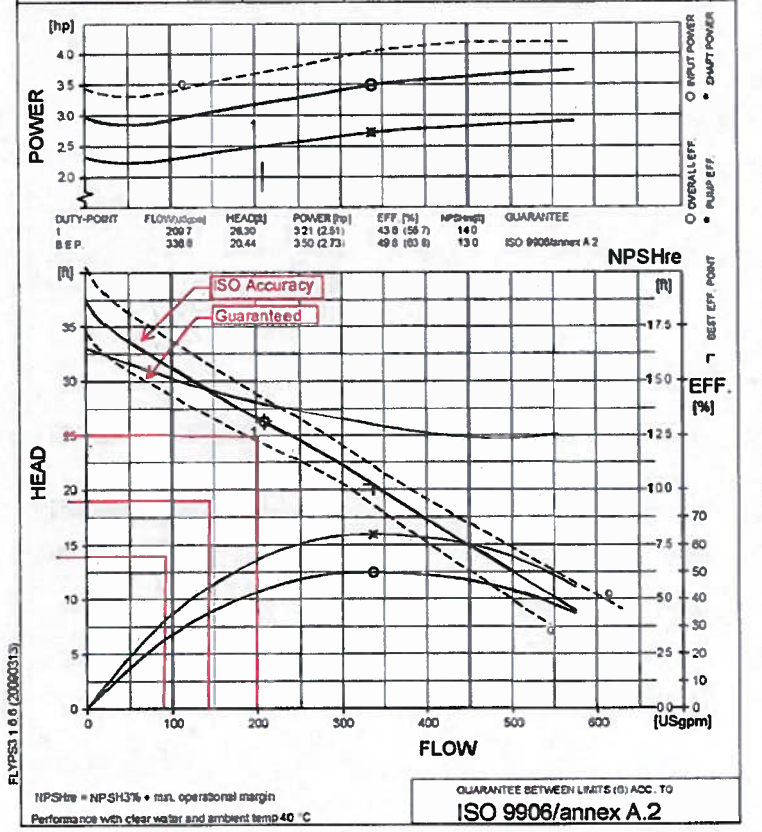
IMPELLER DIAMETER 152 mm

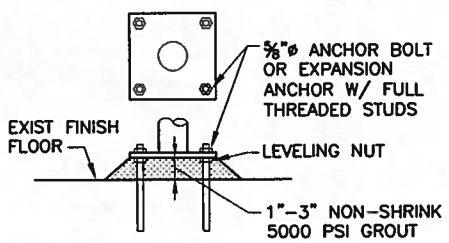
MOTOR # 15-10-4AL; STATOR 68Y; REV 10; FREQ 60 Hz; PHASES 3; VOLTAGE 200 V; POLES 4

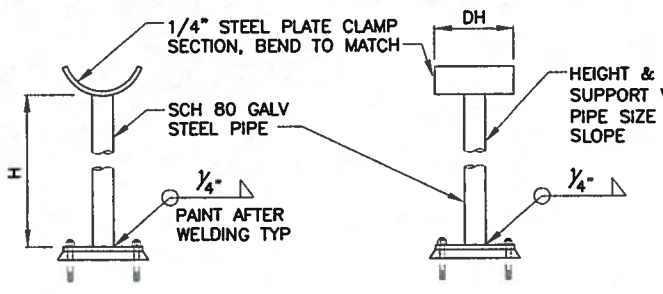
COMMENTS: Variable Speed Controlled

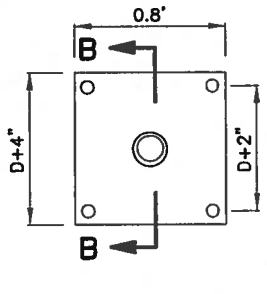
INLET/OUTLET -/- / 3.0 inch

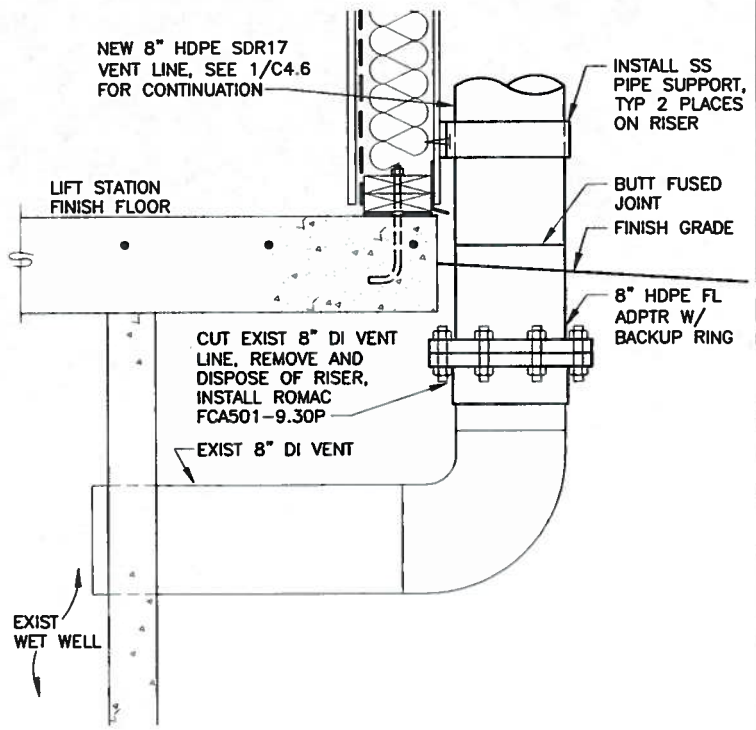
GEAR TYPE ---; RATIO ---











(3/—) WET WELL VENT DETAIL

SCALE: NTS

(2/—) PIPE SUPPORT DETAIL

SCALE: NTS

95% SUBMITTAL

RECORD DRAWING CERTIFICATE

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NAME: DATE:

VILLAGE SAFE WATER

STATE OF ALASKA — 49TH — REGISTERED PROFESSIONAL ENGINEER — No. EC-11250 — JULIE LYNN PETERSEN — 5/13/11

Bristol Environmental & Engineering Services Corporation

Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION IMPROVEMENTS
SECTION, DETAILS, PUMP CURVES, AND BACKUP EVACUATION NARRATIVE

REVISION	BY	DATE

CAD FILE NAME: 28060_C4-0.DWG

Project No.	28060
Date	5/13/11
Designed	KLP/SJW
Drawn	SJW
Approved	KLP

Sheet No. **C4.2**

SHEET 23 OF 35

User: SWHEAT May 11, 2011 - 2:12pm
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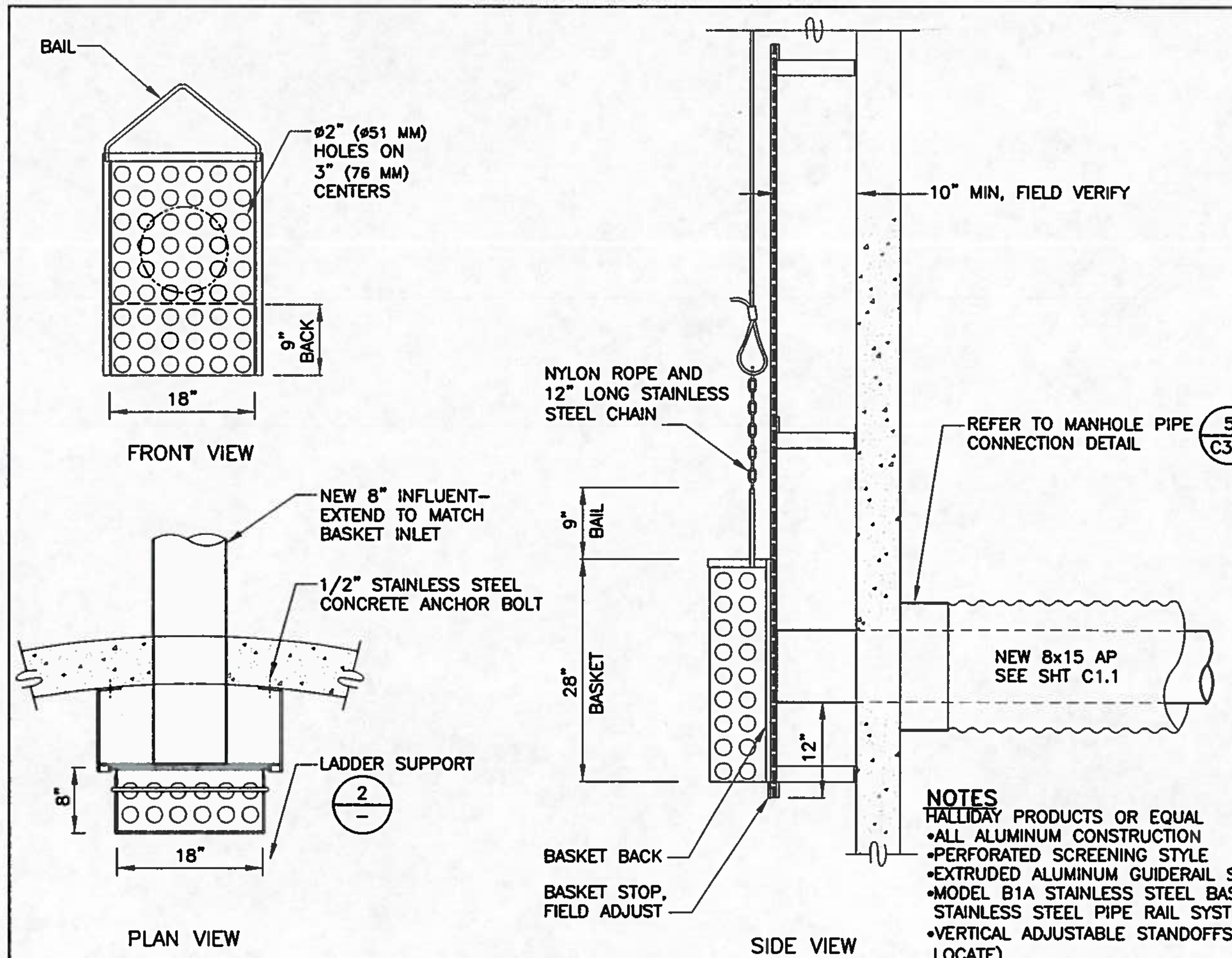
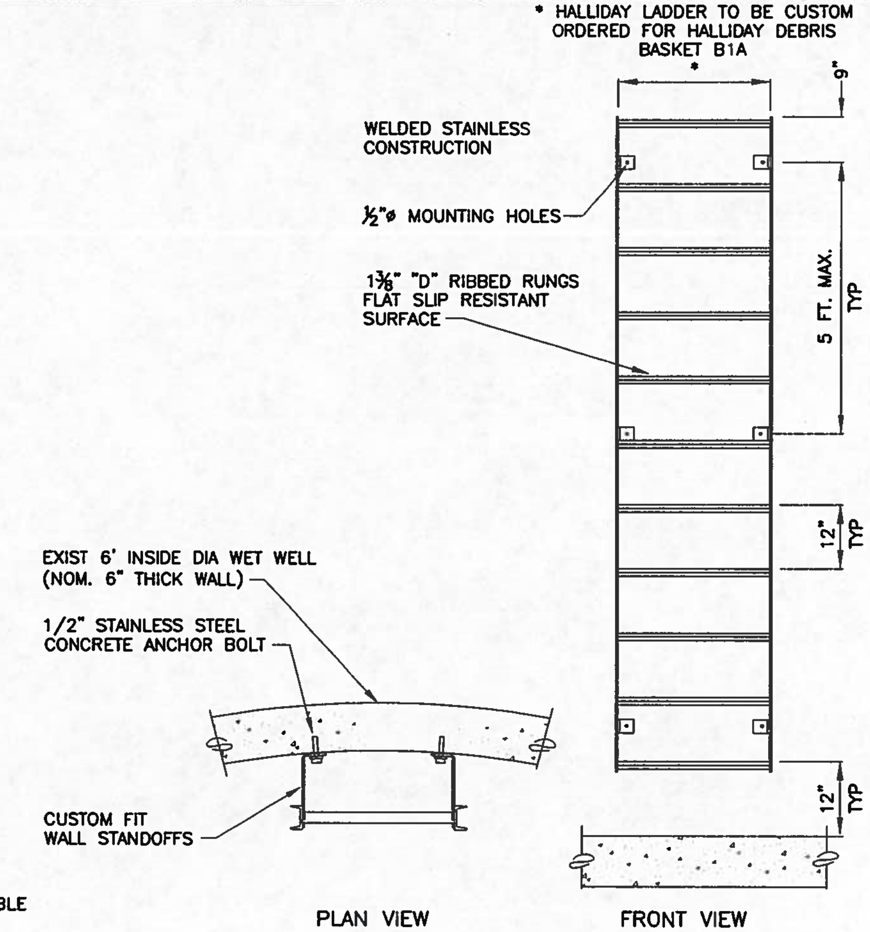
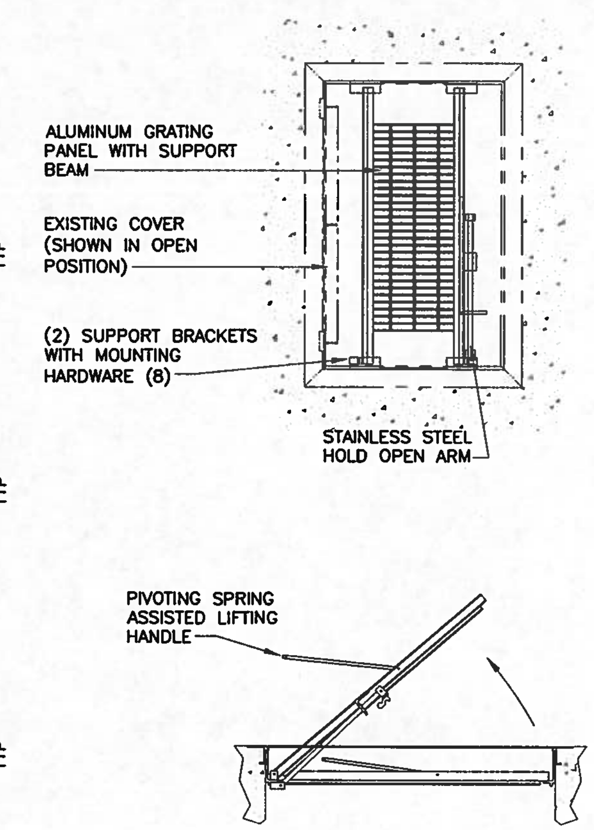


NOTES
HALLIDAY PRODUCTS OR EQUAL
- ALL ALUMINUM CONSTRUCTION
- PERFORATED SCREENING STYLE
- EXTRUDED ALUMINUM GUIDERAIL SYSTEM
- MODEL B1A STAINLESS STEEL BASKET STAINLESS STEEL PIPE RAIL SYSTEM AVAILABLE
- VERTICAL ADJUSTABLE STANDOFFS (FIELD LOCATE)
- PROVIDE LADDER PER DETAIL 2

1 DEBRIS BASKET DETAIL
SCALE: NTS

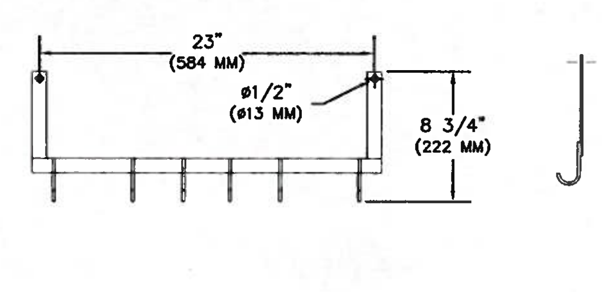


2 LADDER SUPPORT DETAIL
SCALE: NTS

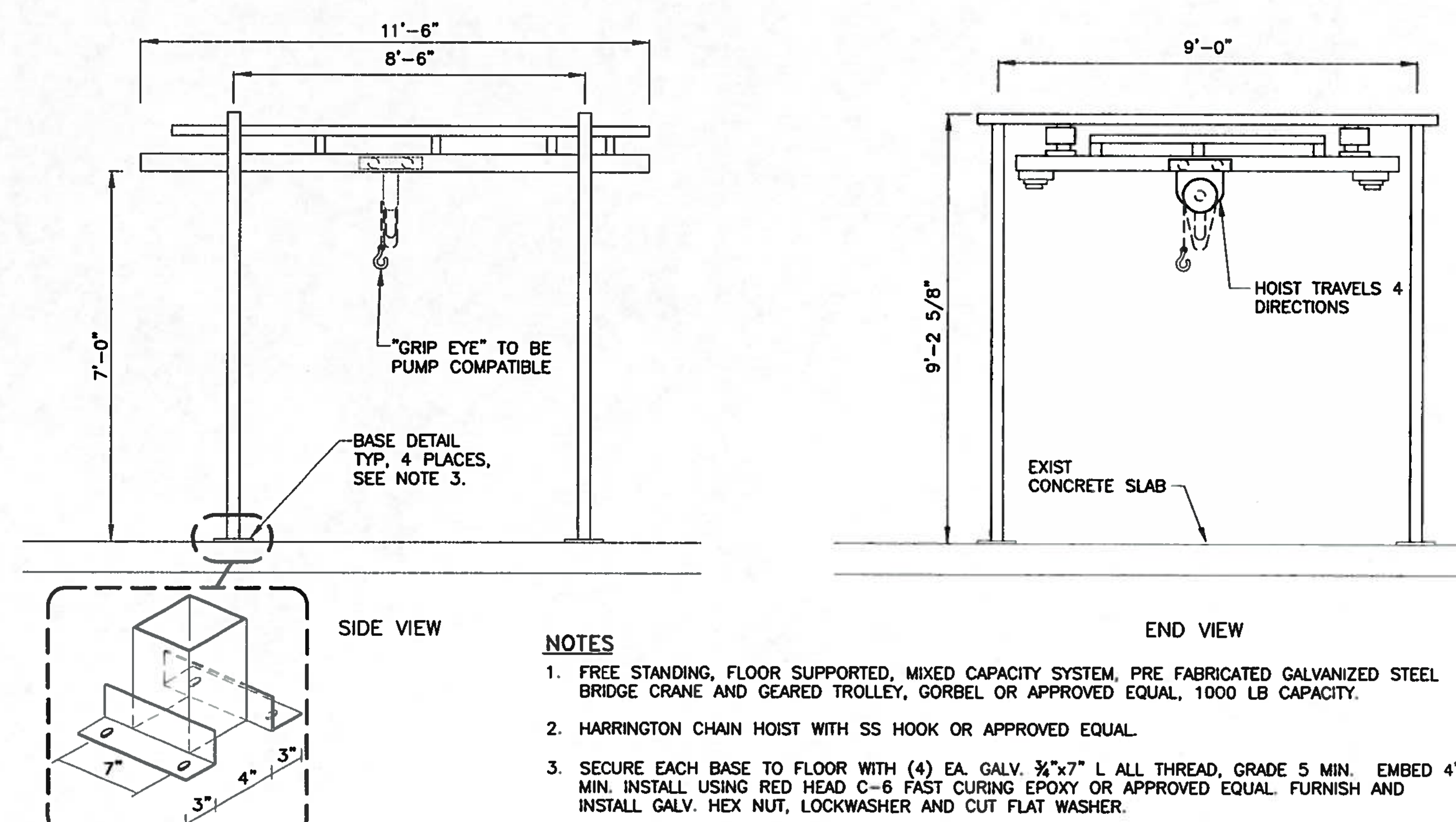


3 RETO-SAFETY GRATE
SCALE: NTS

HALLIDAY SERIES J4A CABLE HOLDER OR EQUAL
STANDARD FEATURES:
- TYPE-316 STAINLESS STEEL CONSTRUCTION
- 6 HOOKS STANDARD - FOR FLOAT SWITCHES



4 CABLE HOLDER DETAIL
SCALE: NTS



NOTES
1. FREE STANDING, FLOOR SUPPORTED, MIXED CAPACITY SYSTEM, PRE FABRICATED GALVANIZED STEEL BRIDGE CRANE AND GEARED TROLLEY, GORBEL OR APPROVED EQUAL, 1000 LB CAPACITY.
2. HARRINGTON CHAIN HOIST WITH SS HOOK OR APPROVED EQUAL.
3. SECURE EACH BASE TO FLOOR WITH (4) EA. GALV. ¾"x7" L ALL THREAD, GRADE 5 MIN. EMBED 4" MIN. INSTALL USING RED HEAD C-6 FAST CURING EPOXY OR APPROVED EQUAL. FURNISH AND INSTALL GALV. HEX NUT, LOCKWASHER AND CUT FLAT WASHER.

5 BRIDGE CRANE & HOIST DETAIL
SCALE: NTS

95% SUBMITTAL

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA 49TH KLYE LINDEN PETERSEN No. CE-11250 5/13/11 REGISTERED PROFESSIONAL ENGINEER

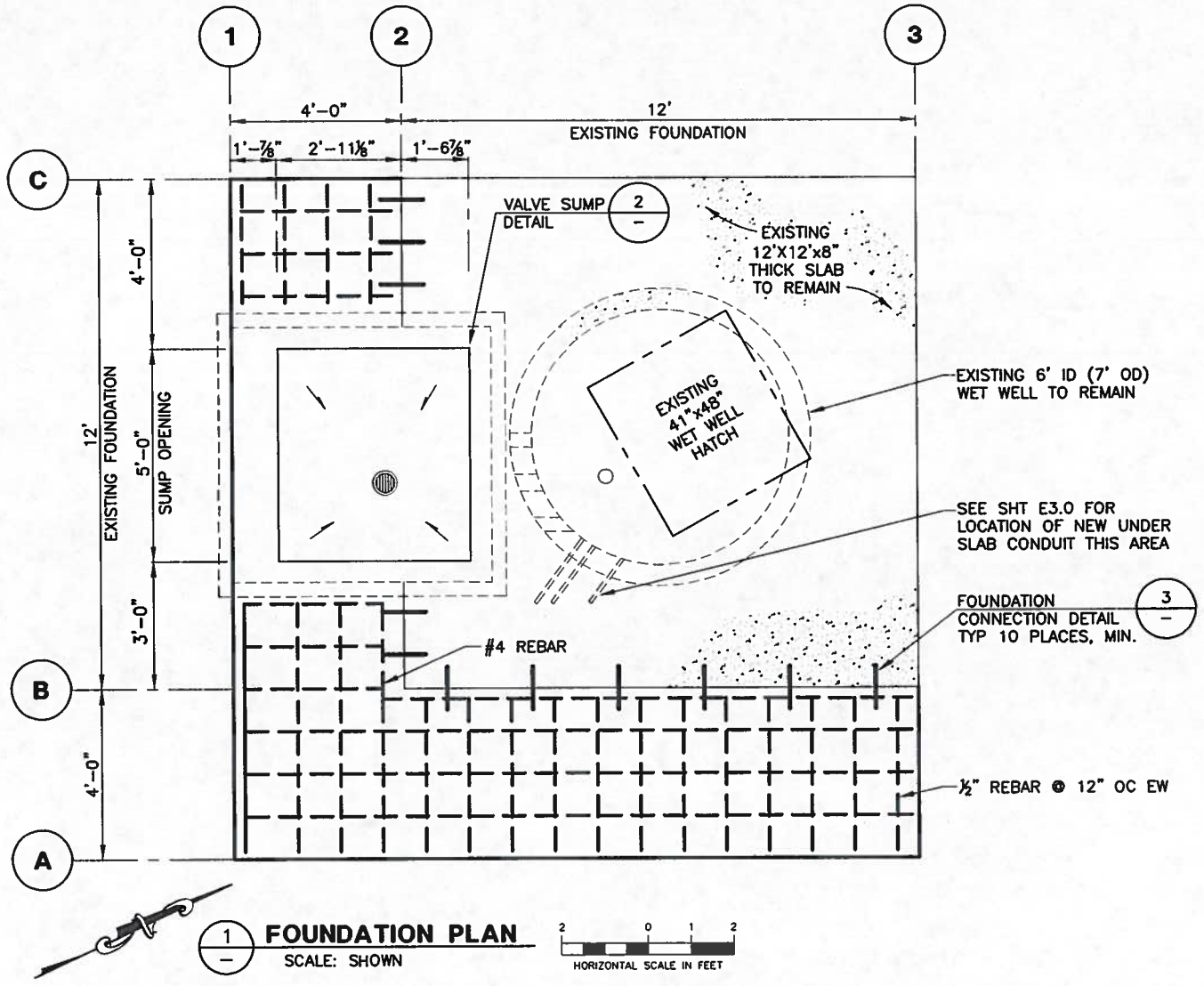
Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION
Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION IMPROVEMENTS
DETAILS AND NOTES

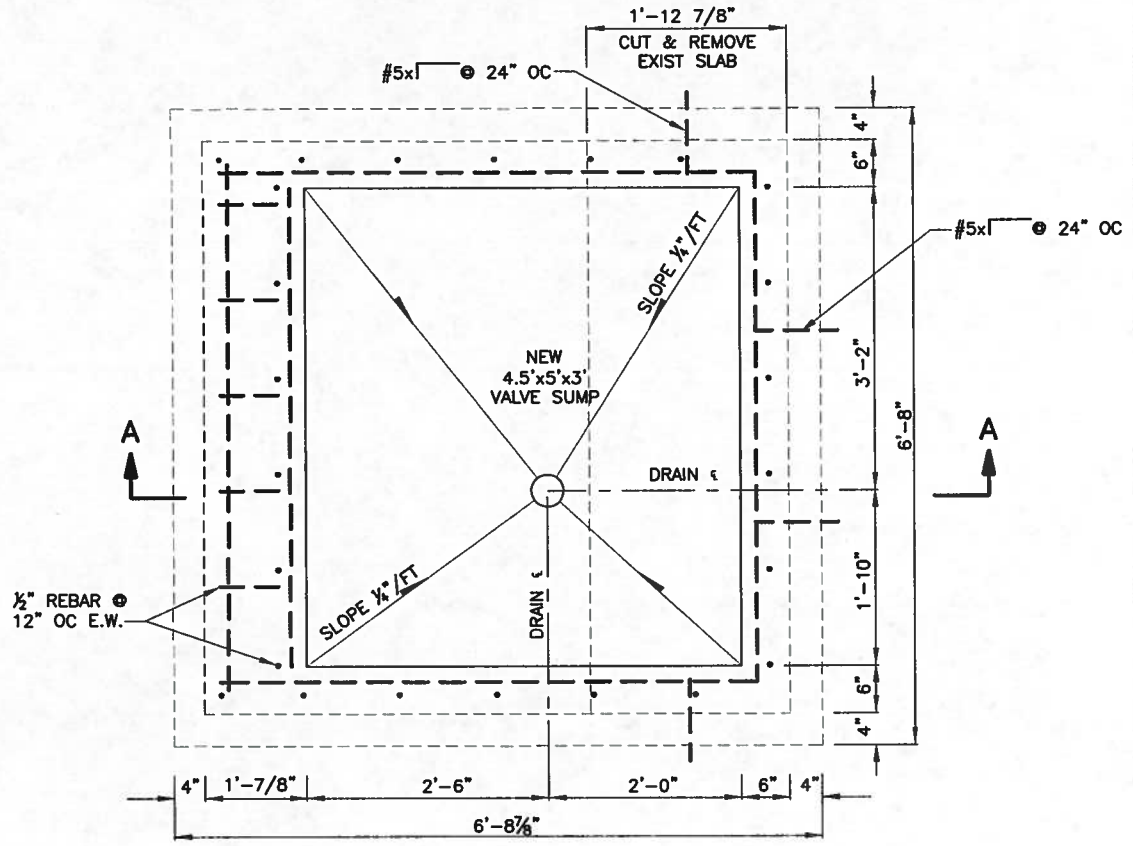
REVISION	BY	DATE

CAD FILE NAME 28060_C4-3.DWG

Project No. 28060
Date 05/13/11
Designed KLP/SJW
Drawn SJW
Approved KLP



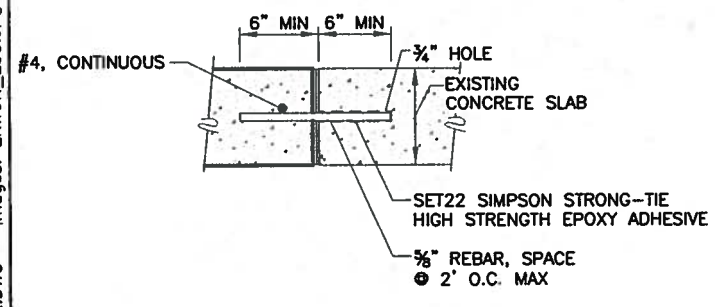
1 / — **FOUNDATION PLAN**
SCALE: SHOWN
HORIZONTAL SCALE IN FEET



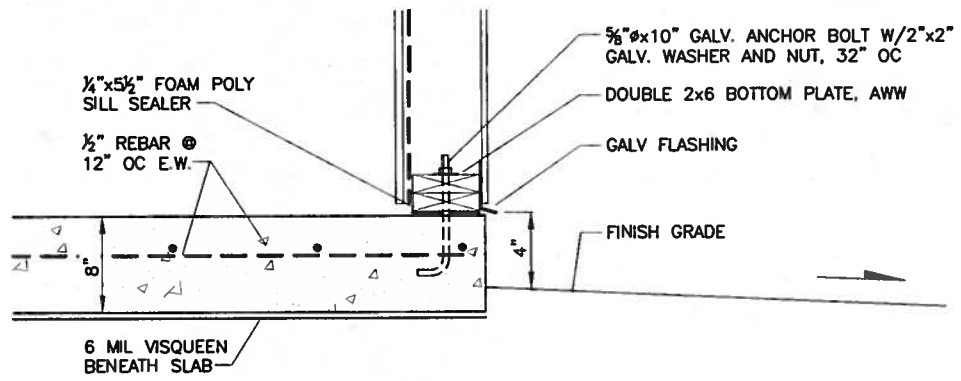
2 / — **VALVE SUMP PLAN**
SCALE: SHOWN
HORIZONTAL SCALE IN FEET

NOTES

1. SUBGRADE SHALL BE LEVELED AND GRADED TO REQUIRED ELEVATIONS, ALL FILL SHALL BE GRANULAR, NFS MATERIAL PLACED IN MAXIMUM 8" LIFTS, AND COMPACTED TO MIN 92% MAXIMUM DENSITY.
2. NFS GRAVEL FILL TO 24" BELOW BOTTOM OF SLAB. COMPACT SUB GRADE PRIOR TO PLACEMENT. PLACE GRAVEL IN 6" LIFTS.
3. CAST-IN-PLACE CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS. EACH YARD OF CONCRETE MUST CONTAIN NOT LESS THAN 5 ½ SACKS OF CEMENT AND NOT MORE THAN 5.5 GALLONS OF WATER PER SACK OF CEMENT.
4. DEFORMED REINFORCING MUST CONFORM TO ASTM SPECIFICATION A615 AND HAVE A MINIMUM YIELD STRENGTH OF 60,000 PSI. LAP BARS MUST BE A MINIMUM OF 30 DIAMETERS. REINFORCING STEEL LAYOUT AND PLACING WILL CONFORM TO THE STANDARD BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-83).
5. WELDED WIRE FABRIC FOR ENTRY SLAB WILL CONFORM TO ASTM A18. LAPS TO BE ON CROSSWISE SPACING PLUS 1½".
6. CONCRETE COVER FOR REINFORCING STEEL MUST BE 3 INCHES FOR THE FOOTINGS AND 2 INCHES FOR WALLS AND SLAB.



3 / — **FOUNDATION CONNECTION DETAIL**
SCALE: SHOWN
SCALE 1½" = 1'-0"



4 / — **FOUNDATION DETAIL**
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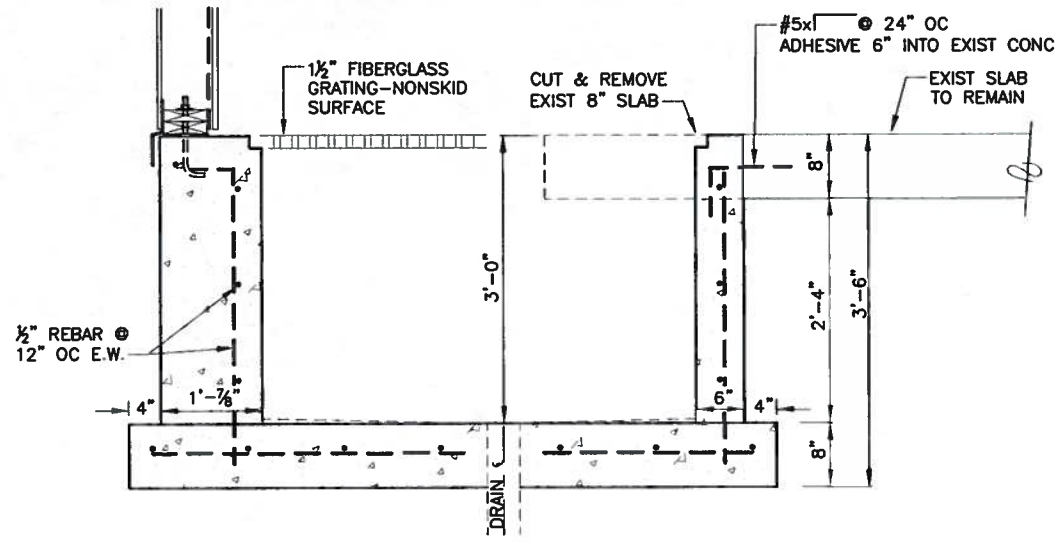
SCALE 1½" = 1'-0"



A / — **VALVE SUMP SECTION**
SCALE: SHOWN
HORIZONTAL SCALE IN FEET

95% SUBMITTAL

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VILLAGE SAFE WATER

STATE OF ALASKA — ALEX UNGEN PETERSEN — REGISTERED PROFESSIONAL ENGINEER — No. CE-11250 — 5/13/11

Bristol Environmental & Engineering Services Corporation

Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION IMPROVEMENTS
FOUNDATION PLAN, DETAILS, VALVE SUMP DETAIL, SECTION AND NOTES

REVISION	BY	DATE

CAD FILE NAME 28060_C4-0.DWG

Project No.	28060
Date	5/13/11
Designed	KLP/SJW
Drawn	SJW
Approved	KLP

Sheet No. **C4.4**
SHEET 25 OF 35

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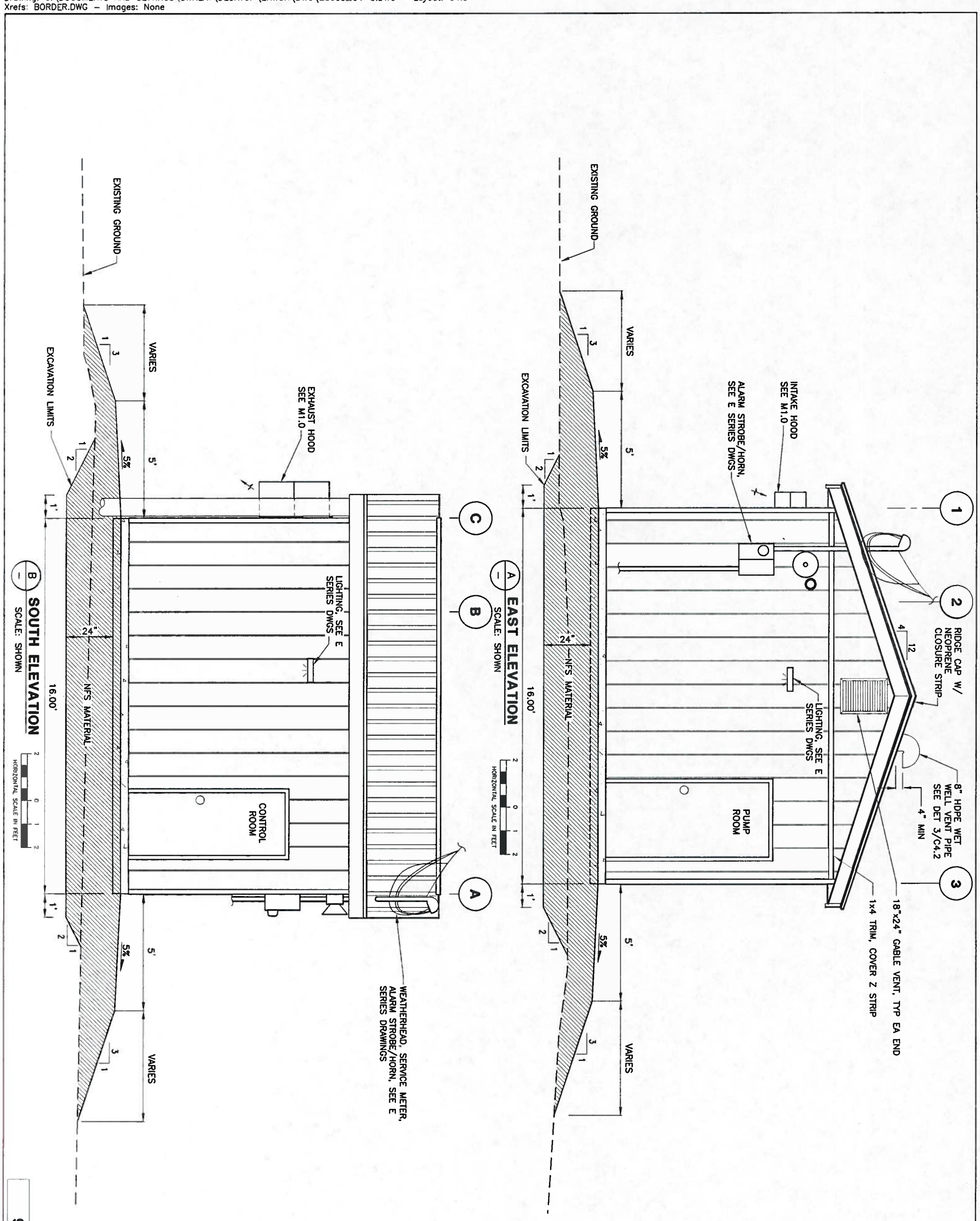

95% SUBMITTAL

Sheet No.	Project No	Date	Designed	Drawn	Approved
C4.5 SHEET 26 OF 35	28060	5/13/11	KLP/SJW	SJW	KLP

REVISION	BY	DATE

CAD FILE NAME
28060_C4-5.DWG

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

LIFT STATION IMPROVEMENTS
BUILDING ELEVATIONS

Bristol
ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

STATE OF ALASKA
49TH
KLYE LINDEN PETERSEN
No. CE-11250
REGISTERED PROFESSIONAL ENGINEER
5/13/11

VILLAGE SAFE WATER

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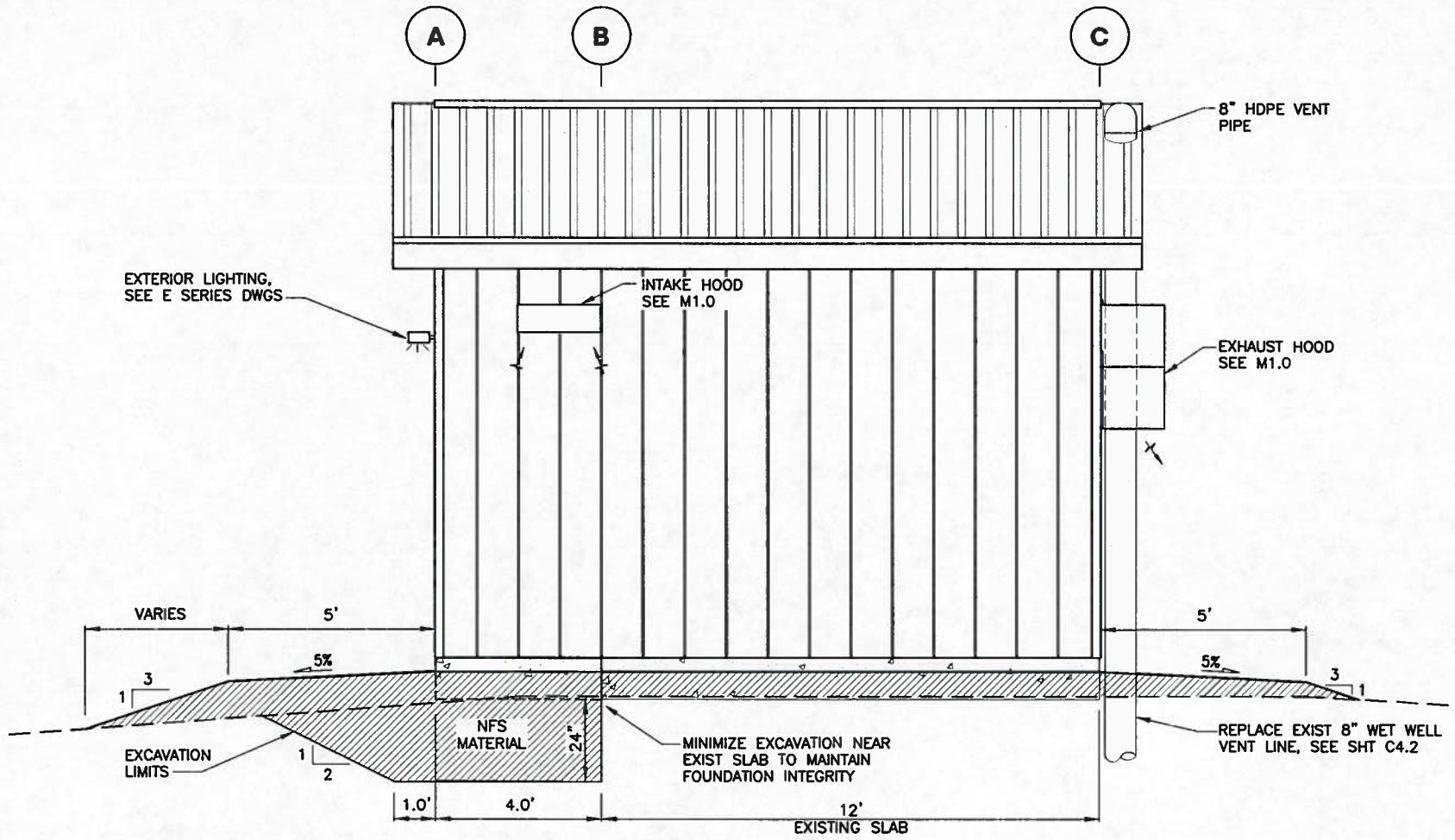
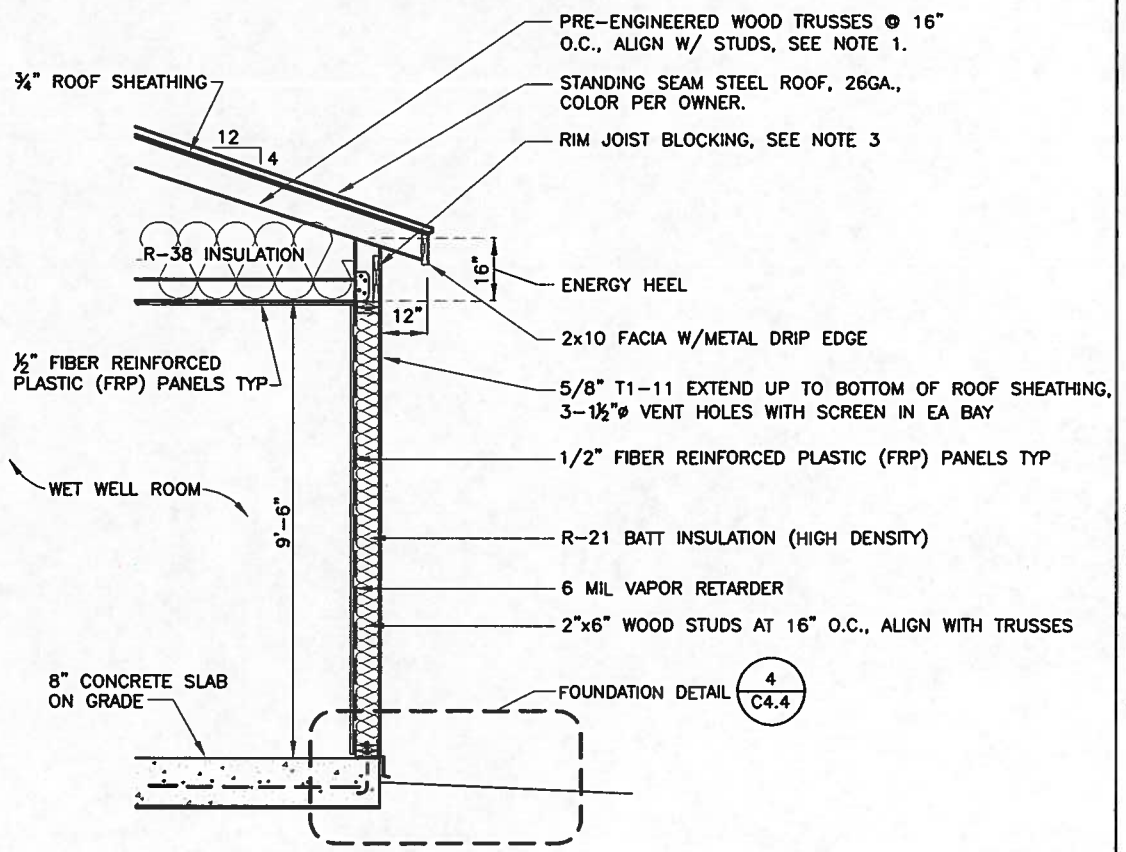


1 — **NORTH ELEVATION**
SCALE: SHOWN

2 0 1 2
HORIZONTAL SCALE IN FEET



2 — **BUILDING SECTION**
SCALE: SHOWN

2 0 1 2
HORIZONTAL SCALE IN FEET

ALL FRAMING DETAILS NOT SHOWN OTHERWISE SHALL BE CONSTRUCTED TO THE MIN STANDARDS OF THE IBC.

FRAMING LUMBER GRADE	
STUDS, PLATES / MISC	HEM-FIR #2
JOIST	HEM-FIR STANDARD OR BETTER

FRAMING FASTENING SCHEDULE		
CONNECTION	LOCATION	FASTENING
JOIST TO PLATE	TOENAIL BOTH SIDES	(2) 10D
RAFTER TO PLATE	TOENAIL BOTH SIDES	(2) 16D
DOUBLE STUDS	FACE NAIL	16D @ 24" OC
DOUBLE PLATES	TYPICAL FACE NAIL	16D @ 16" OC
BLOCKING BTWN JOISTS/ RAFTERS TO TOP PLATE	TOENAIL	(3) 10D
BOTTOM PLATE TO STUD	FACE NAIL	(2) 16D
DOUBLE PLATES-LOWER PLATE TO TOP OF STUD	TOENAIL	(2) 10D
*CEILING STRIPPING TO STUDS - 1" LEDGER	FACE NAIL	(2) 8D (1-SLANT)
*CEILING STRIPPING TO STUDS - 2" LEDGER	FACE NAIL	(2) 16D (1-SLANT)

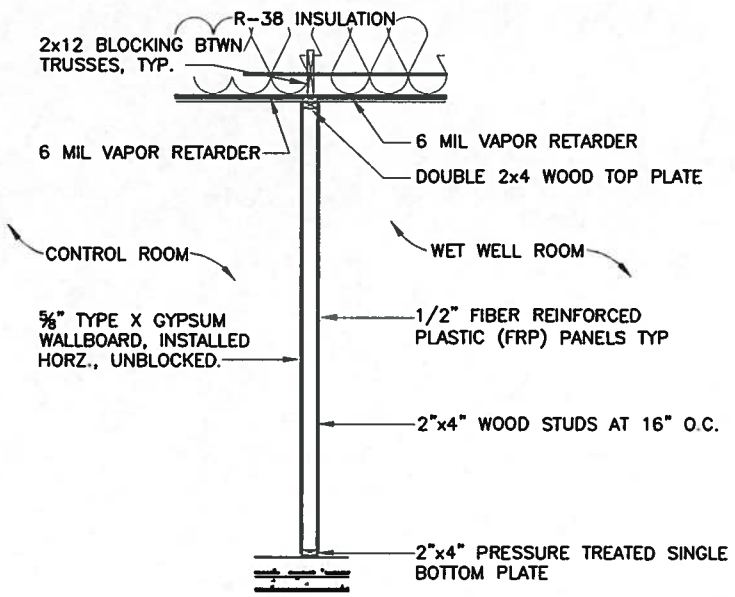
*ENDS OF STRIPPING BOARDS WHERE CEILING IS 5/8" GYPSUM USE ANNULAR RING NAILS (NO SLANT)

PLYWOOD SHEATHING				
THICKNESS	GRADE	LOCATION	EXPOSURE	SPAN RATING (ROOF/FLOOR)
3/4"	CD	ROOF	EXPOSURE 1	40/20
5/8"	T1-11	WALL (EXT)	EXTERIOR	32/16
5/8"	CD	WALL (INT)	INTERIOR	40/20

PLYWOOD FASTENING SCHEDULE			
LOCATION	GRADE	FASTENING	
ROOF	APA	SQUARE EDGE	10D @ 4" OC SEAMS, 10D @ 12" OC FIELD
WALL (EXT)	APA	BLOCK EDGES	10D @ 6" OC SEAMS, 10D @ 12" OC FIELD
WALL (INT)	APA	AWWF	10D @ 6" OC SEAMS, 10D @ 12" OC FIELD

NOTES

1. DESIGN TRUSSES FOR SNOW LOAD = 50 PSF, AND DEAD LOAD = 15 PSF.
2. INSTALL SIMPSON H1 HURRICANE TIE AT EACH TRUSS, BOTH ENDS. INSTALL SIMPSON SP-2 TIE PLATE @ WALL STUD TO TOP PLATE ADJACENT TO EACH TRUSS.
3. INSTALL RIM JOIST BLOCKING EVERY OTHER BAY. HOLD DOWN 1" BELOW BOTTOM OF ROOF SHEATHING
4. APPLY GRACE ICE & WATER SHIELD SELF ADHERING ROOF UNDERLAYMENT TO ENTIRE ROOF.



NOTE: WALL BOARD JOINTS COVERED W/PAPER TAPE AND JOINT COMPOUND. FASTENER HEADS COVERED W/JOINT COMPOUND.

3 — **INTERIOR WALL PARTITION**
SCALE: SHOWN

2 0 1 2
HORIZONTAL SCALE IN FEET

95% SUBMITTAL

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NAME
DATE

VILLAGE SAFE WATER

Bristol ENVIRONMENTAL & ENGINEERING SERVICES CORPORATION

Project No. 28060

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION IMPROVEMENTS
BUILDING SECTIONS

REVISION	BY	DATE

CAD FILE NAME 28060_C4-6.DWG

Project No. 28060	Date 5/13/11	Designed KLP/SJW	Drawn SJW	Approved KLP

Sheet No. C4.6
SHEET 27 OF 35

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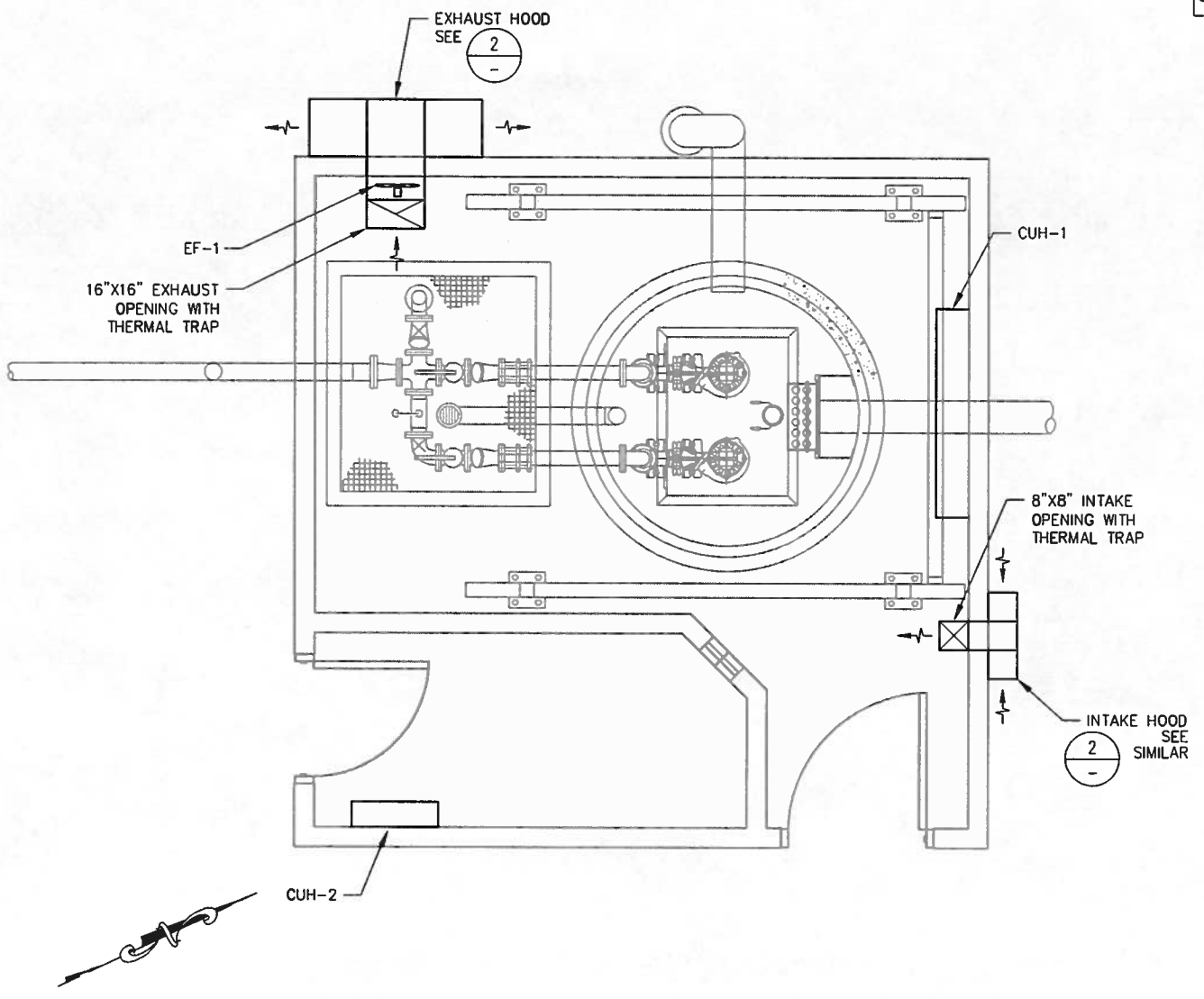
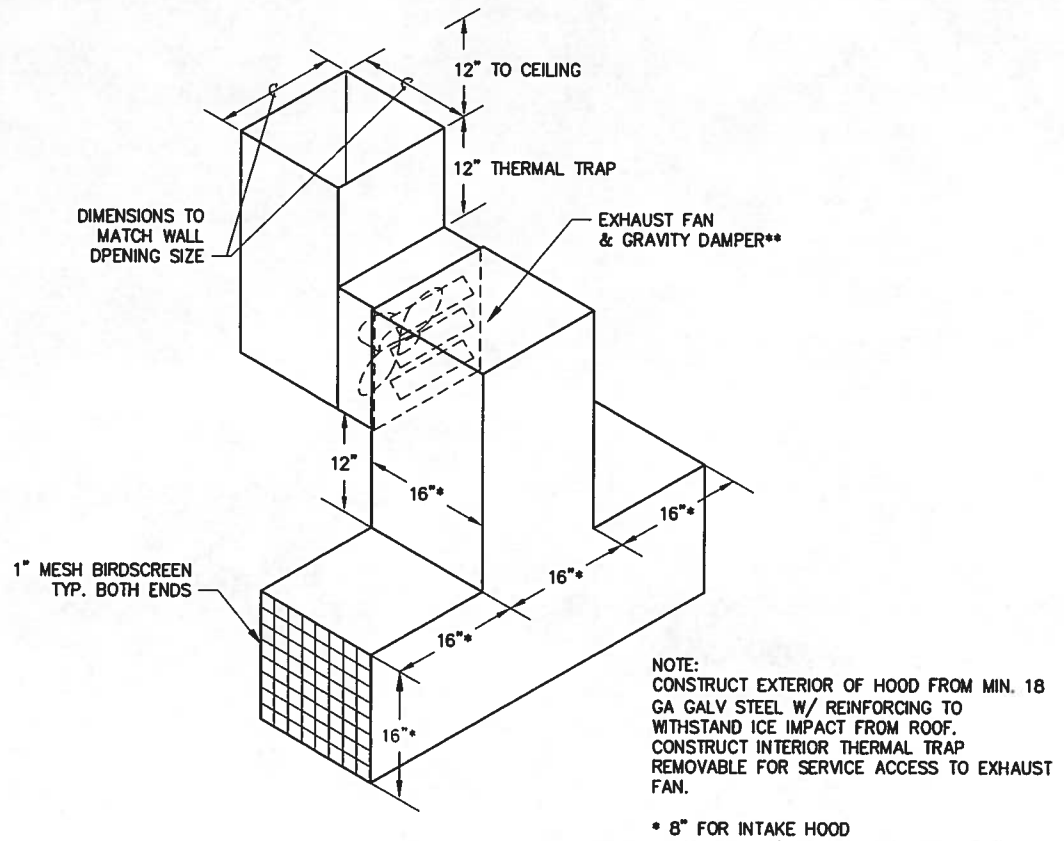
Xrefs: BORDER.DWG - Images: None

FANS						
TAG NO.	MANUFACTURER/MODEL	CAPACITY (CFM)	STATIC PRESSURE (IN. H2O)	MOTOR (HP)	VOLTAGE & PHASE	NOTES
EF-1	PENN / BX12Q	175	3/8	1/6 HP	120V, 1 PH	EXPLOSION PROOF MOTOR, INSTALL STOP ON DAMPER TO LIMIT FAN DISCHARGE VOLUME TO 175 CFM. NON-SPARKING CONSTRUCTION.

UNIT HEATERS				
TAG NO.	MANUFACTURER/MODEL	CAPACITY (KW)	VOLTAGE AND PHASE	NOTES
CUH-1	CHROMALOX MODEL CVEP-76-21-00-00	7.6	240V, 1 PH	EXPLOSION-PROOF, WITH THERMOSTAT
CUH-2	CHROMALOX MODEL HCH-101	1	120V, 1 PH	MOUNT WITH 12" VERTICAL CLEARANCE WITH THERMOSTAT.



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



NOTE:
CONSTRUCT EXTERIOR OF HOOD FROM MIN. 18 GA GALV STEEL W/ REINFORCING TO WITHSTAND ICE IMPACT FROM ROOF. CONSTRUCT INTERIOR THERMAL TRAP REMOVABLE FOR SERVICE ACCESS TO EXHAUST FAN.

* 8" FOR INTAKE HOOD
** NO FAN & DAMPER FOR INTAKE HODD

2/- SNOW HOOD
SCALE: NONE

FOR AGENCY REVIEW - NOT FOR CONSTRUCTION

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NAME _____ DATE _____

VILLAGE SAFE WATER

STATE OF ALASKA * 49TH * REGISTERED PROFESSIONAL ENGINEER Kevin L. Hansen Reg. No. AK-13641 5/10/11

EDC, INC.
213 W. FIREWEED LANE
ANCHORAGE, AK 99503
(907) 276-7833

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
MECHANICAL PLAN

REVISION	BY	DATE

CAD FILE NAME M1.DWG

Project No. 28060
Date 5/10/11
Designed KLH
Drawn ZBB
Approved KLH

Sheet No.
M1.0
SHEET 28 OF 35

Date: Aug 20, 2010 - 9:32am
Drawing: P:\PROJECTS\BRISTOL ENVIRON\EKWOK\DWGS\XREF\XEKWOK-BOARDER.DWG - Layout: MODEL
Xrefs: None - Images: None

ELECTRICAL LEGEND

- LIGHT FIXTURES
- EXPOSED CONDUIT, GRC UNLESS OTHERWISE SHOWN
- CONDUIT RUN UNDERGROUND OR IN CONCRETE
- CONDUIT RUN – CHANGE IN ELEVATION
- FLEXIBLE CORD/CABLE
- (HP) MOTOR, 3 PHASE
- (HP) MOTOR, SINGLE PHASE
- (J) JUNCTION BOX OR FITTING
- SEAL-OFF FITTING
- $ 120V, 20A, SINGLE POLE SWITCH, UON.
- $XP 120V, 20A, EXPLOSION-PROOF SINGLE POLE SWITCH, UON.
- 12DV GROUND FAULT INTERRUPTING (GFI) DUPLEX RECEPTACLE, NEMA CONFIGURATION 5-20R. UP 18" AFF UON
- SPECIAL RECEPTACLE
- METERBASE
- (M) KILOWATT-HOUR METER
- MOLDED CASE CIRCUIT BREAKER, X = AMPERE RATING, Y = NO. OF POLES
- MOTOR OVERLOAD
- LEVEL FLOAT
- TRANSDUCER
- GROUND ROD
- DISCONNECT SWITCH
- PANELBOARD

CIRCUIT AND DEVICE LEGEND

A-1,a GROUP OR EQUIPMENT IDENTIFICATION.
"A" DENOTES PANEL NAME
"1" DENOTES CIRCUIT NUMBER
"a" DENOTES SWITCH LEG AS INDICATED.

$a SWITCH IDENTIFICATION.
"a" DENOTES SWITCH LEG AS INDICATED.

ABBREVIATIONS

ø	ELECTRICAL PHASE
A	AMPERE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISHED GRADE
AWG	AMERICAN WIRE GAUGE
BCU	BARE COPPER
C	CONDUIT
CP	CONTROL PANEL
CU	COPPER
DWG	DRAWING
(E)	EXISTING
EXP	EXPLOSION-PROOF
G	GROUND CONDUCTOR
GFI	GRDUND FAULT INTERRUPTING
GRC	GALVANIZED RIGID (STEEL) CONDUIT
H	HOT CONDUCTOR
HOA	HAND OFF AUTO
HL	HIGH LEVEL
HP	HORSEPOWER
HPS	HIGH PRESSURE SODIUM
IMC	INTERMEDIATE METALLIC CONDUIT
KVA	KILO-VOLT-AMPERES
LTF	LIQUID TIGHT FLEXIBLE CONDUIT (METALLIC)
LS	LIFT STATION
MCB	MAIN CIRCUIT BREAKER
MLO	MAIN LUGS ONLY
N	NEUTRAL CONDUCTOR
NEC	NATIONAL ELECTRICAL CODE
SIG	SIGNAL CONDUCTOR
SS	STAINLESS STEEL
TEMP	TEMPORARY
TWSH	TWISTED WIRE SHIELDED CONDUCTOR
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
V	VOLTS
W	WATTS
WP	WEATHERPROOF
XFMR	TRANSFORMER
XP	EXPLOSION-PROOF, CLASS 1, DIVISION 1

FIXTURE SCHEDULE

TYPE	LAMP SIZE	MOUNTING	DESCRIPTION
I1	200W INCAND.	CEILING/WALL MOUNTED	INCANDESCENT EXPLOSION-PROOF LIGHT. CROUSE-HINDS #EVCX210.
F1	54W FLUOR.	CEILING MOUNTED	DAMP LOCATION INDUSTRIAL FLUORESCENT FIXTURE. LITHONIA #DM-2-54-ARDP-120-GEB10RS.
S1	70 HPS	WALL MOUNT @ 10'	70W, HIGH PRESSURE SODIUM, WALL PACK W/ PHOTOCELL. LITHONIA #TWH-70S-120-PE.

SPECIFICATIONS

PART 1- GENERAL

1.1 SYSTEM DESCRIPTION:
- A. SCOPE OF WORK: FURNISH, INSTALL, TEST AND PLACE INTO SATISFACTORY AND SUCCESSFUL OPERATION ALL MATERIALS, EQUIPMENT, DEVICES AND NECESSARY APPURTENANCES TO PROVIDE COMPLETE LIFT STATION POWER, LIGHTING AND CONTROLS AS INDICATED ON THE DRAWINGS AND SPECIFICATIONS.
- B. ALL COMPONENTS FOR THE PROJECT SHALL BE LISTED OR LABELED BY UL (UNDERWRITERS LABORATORIES), FM (FACTORY MUTUAL) OR ANOTHER AGENCY RECOGNIZED BY INDUSTRY STANDARDS. WORK SHALL COMPLY WITH ALL LISTED AND APPLICABLE INDUSTRY STANDARDS, CODES, LOCAL ORDINANCES AND MANUFACTURER'S INSTRUCTIONS.
- C. SYSTEM SHALL BE COMPLETE AND SHALL INCLUDE ALL TERMINATIONS AND SPLICES TO PROVIDE A FUNCTIONAL SYSTEM.
- D. PROJECT CONDITIONS: CONTRACTOR SHALL VERIFY IN THE FIELD THAT DIMENSIONS, ROUTING AND CONNECTION LOCATIONS SHOWN ON THE DRAWINGS ARE REASONABLY ACCURATE.

1.2 STANDARDS AND CODES:
- A. NFPA 70 – NATIONAL ELECTRIC CODE, LATEST PUBLISHED ADDITION.
- B. IBC – INTERNATIONAL BUILDING CODE, LATEST PUBLISHED ADDITION.
- C. IFC – INTERNATIONAL FIRE CODE, LATEST PUBLISHED ADDITION.
- D. LOCAL CODES AND AMENDMENTS.

1.3 SUBMITTALS:
- A. GENERAL: PROVIDE SUBMITTALS OF ALL MATERIAL AND EQUIPMENT. INCLUDE CATALOG NUMBERS, PERFORMANCE DATA, WIRING DIAGRAMS, AND ROUGH-IN DIMENSIONS.
- B. MANUFACTURER'S INSTALLATION INSTRUCTIONS: INCLUDE INSTRUCTIONS FOR STORAGE, HANDLING, PROTECTION, EXAMINATION, PREPARATION AND INSTALLATION OF PRODUCTS.

1.4 OPERATION AND MAINTENANCE DATA:
- A. PROVIDE ALL MANUFACTURER'S RELEVANT MAINTENANCE AND OPERATING INSTRUCTIONS INCLUDING PROCEDURES NECESSARY FOR SYSTEM START-UP, OPERATION, EMERGENCY OPERATION AND SHUTDOWN.
- B. MANUAL SHALL BE INDEXED, LABELED AND SHALL INCLUDE MAINTENANCE INSTRUCTIONS, PRODUCT DATA, SHOP DRAWINGS AND STEP BY STEP PROCEDURES FOR INSPECTION, REPAIR, CLEANING AND CALIBRATION.

PART 2 – PRODUCTS

2.1 IDENTIFICATION:
- A. PROVIDE ENGRAVED LAMINATED PLASTIC NAMEPLATES WITH BLACK LETTERS ON A WHITE BACKGROUND TO IDENTIFY ALL ELECTRICAL DISTRIBUTION AND CONTROL EQUIPMENT, AND LOADS SERVED AS NOTED ON THE DRAWINGS.
- B. LETTER HEIGHTS SHALL BE 1/8 INCH FOR INDIVIDUAL SWITCHES, MOTOR STARTERS AND 1/2 INCH ON PANELBOARDS AND CONTROL PANELS. SECURE NAMEPLATES TO EQUIPMENT FRONTS USING SCREWS OR RIVETS.
- C. PROVIDE WIRE MARKERS FOR ALL POWER AND CONTROL CIRCUITS IDENTIFYING BRANCH OR FEEDER CIRCUIT AND WIRE TERMINAL NUMBER INDICATED ON CONTROL SYSTEM SHOP DRAWINGS.

2.2 CONDUCTORS:
- A. ALL WIRING SHALL BE COPPER WITH TYPE XHHW-2 INSULATION UNLESS OTHERWISE NOTED. TYPE SIS OR MTW INSULATION SHALL BE ACCEPTABLE FOR CONTROL PANEL WIRING ONLY.
- B. MINIMUM BRANCH CIRCUIT CONDUCTOR SIZE SHALL BE #12 AWG. MINIMUM CONTROL CIRCUIT SIZE SHALL BE #18 AWG. MULTI-PAIR CONTROL CABLES SHALL BE RATED FOR DIRECT BURIAL.
- C. COLOR CODING SHALL BE AS FOLLOWS AND CONSISTENT THROUGHOUT THE ENTIRE INSTALLATION.
  120/240 V, 1PH, 3W:
  1. PHASE A – BLACK, PHASE B – RED, NEUTRAL – WHITE
  120/208 V, 3PH, 4W:
  2. PHASE A – BLACK, PHASE B – RED, PHASE C – BLUE, NEUTRAL – WHITE
- D. USE PROPERLY SIZED INSULATED WIRE CONNECTORS WITH PLASTIC CAPS FOR ALL CONDUCTORS #8 AWG AND SMALLER. TERMINATE #6 AND LARGER WITH CRIMP OR COMPRESSION TYPE CONNECTORS INSTALLED PER THE MANUFACTURERS RECOMMENDATIONS AND INSULATE WITH PROPERLY SIZED 600 VOLT RATED HEAT SHRINK TUBING AND ELECTRICAL TAPE.

2.3 CONDUIT:
- A. ALL WIRING SHALL BE INSTALLED IN GALVANIZED RIGID METALLIC CONDUIT (GRC) OR INTERMEDIATE METALLIC CONDUIT (IMC) UNLESS OTHERWISE NOTED. ALL FITTINGS, CONNECTORS, BOXES, ETC. SHALL BE APPROVED FOR USE AS GROUNDING MEANS.
- B. UTILIZE SHORT EXTENSIONS (36 INCH MINIMUM) OF FLEXIBLE, LOW TEMPERATURE LIQUIDTIGHT CONDUIT FOR CONNECTIONS OF ALL MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION IN NON-HAZARDOUS AREAS. USE EXPLOSION-PROOF FLEXIBLE COUPLINGS FOR CONNECTION IN HAZARDOUS AREAS AND AS SHOWN.
- C. COMPLETELY AND THOROUGHLY CLEAN AND SWAB RACEWAY SYSTEM BEFORE INSTALLING CONDUCTORS.
- D. ALL UNDERGROUND CONDUIT SHALL BE BURIED A MINIMUM OF 18 INCHES AND IN ACCORDANCE WITH NEC.

2.4 JUNCTION BOXES:
- A. NON-HAZARDOUS LOCATIONS: PROVIDE CAST STEEL BOXES WITH THREADED HUBS AND GASKETED COVERS.
- B. HAZARDOUS LOCATIONS: PROVIDE BOXES RATED FOR THE LOCATION AND USE.

2.5 WIRING DEVICES:
- A. SWITCHES: NEMA WD 1, HEAVY DUTY, SPEC GRADE, 20A, 120VAC GENERAL-USE.
- B. RECEPTACLES: NEMA WD 1, HEAVY DUTY, SPEC GRADE, 20A, 120VAC DUPLEX.
- C. EXTERIOR RECEPTACLES: METALLIC, WEATHERPROOF WHILE-IN-USE COVERS.

2.6 DISCONNECT/MANUAL TRANSFER SWITCHES:
- A. MANUFACTURER
  1. SQUARE D OR APPROVED EQUAL
- B. DISCONNECT: NEMA KS 1, INTERIOR: NEMA TYPE 1(NON-HAZARDOUS), EXTERIOR: NEMA TYPE 3R (NON-HAZARDOUS).
- C. MANUAL TRANSFER: (DOUBLE THROW SAFETY SWITCH): NON-FUSED, NEMA 3R.

2.7 VARIABLE FREQUENCY DRIVE (VFD):
- A. MANUFACTURER
  1. ALLEN-BRADLEY POWERFLEX OR APPROVED EQUAL.

2.8 PANELBOARDS AND CIRCUIT BREAKERS:
- A. MANUFACTURER
  1. SQUARE D OR APPROVED EQUAL
- B. NEMA KS1, PB1; PANELBOARD SHALL BE ENCLOSED, DEAD-FRONT CONSTRUCTION WITH COPPER BUSSES, NEMA TYPE 1 ENCLOSURE.
- C. DISTRIBUTION CIRCUIT BREAKERS: NEMA AB1, MOLDED CASE, INTEGRAL THERMAL AND ADJUSTABLE INSTANTANEOUS MAGNETIC TRIP FOR EACH POLE.
- D. BRANCH CIRCUIT BREAKERS: NEMA AB1, MOLDED CASE, BOLT-ON THERMAL MAGNETIC TRIP WITH COMMON TRIP HANDLE FOR ALL POLES.

2.9 LIGHTING:
- A. PROVIDE ALL LIGHTING EQUIPMENT OR APPROVED EQUAL AS SHOWN ON THE DRAWINGS AND DESCRIBED IN THE FIXTURE SCHEDULE.
- B. PROVIDE LIGHTING EQUIPMENT COMPLETE, WIRED, ASSEMBLED WITH PROPER FLANGES, MOUNTING SUPPORTS, HARDWARE, ETC.
- C. PROVIDE HIGH POWER FACTOR, REGULATING OR CONSTANT WATTAGE TYPE BALLASTS FOR HID FIXTURES.

2.10 GROUNDING AND BONDING:
- A. ALL GROUNDING AND BONDING SHALL COMPLY WITH NEC, STANDARDS AND CODES LISTED IN PART 1, MANUFACTURER'S RECOMMENDATIONS AND LOCAL CODES.
- B. PROVIDE EQUIPMENT GROUNDING CONDUCTOR TO ALL MOTORS.

2.11 EQUIPMENT CONNECTIONS:
- A. PROVIDE WIRING AND CONNECTION TO EQUIPMENT REQUIRING ELECTRICAL POWER BUT SPECIFIED UNDER OTHER DIVISIONS OF THE SPECIFICATIONS. REVIEW SUBMITTALS PRIOR TO INSTALLATION AND ROUGH-IN. VERIFY SIZE, AND TYPE OF CONNECTIONS.
- B. INTRINSICALLY SAFE WIRING: WIRING SHALL NOT BE INSTALLED IN RACEWAY WITH CONDUCTORS OF NON-INTRINSICALLY SAFE CIRCUITS PER NEC 504.
- C. RACEWAYS WITH INTRINSICALLY SAFE WIRING SHALL BE IDENTIFIED AS SUCH PER NEC 504.

2.12 PENETRATIONS:
- A. ALL ELECTRICAL PENETRATIONS THROUGH FIRE RATED BARRIERS SHALL BE SEALED IN ACCORDANCE WITH NEC AND THE MANUFACTURER'S INSTRUCTIONS. MATERIALS SHALL BE SUITABLE FOR THE FIRE STOPPING OF PENETRATIONS AND CAPABLE OF MAINTAINING AN EFFECTIVE BARRIER AGAINST FLAME, SMOKE AND GASES IN COMPLIANCE WITH THE REQUIREMENTS OF ASTM, UL AND OTHER INDUSTRY STANDARDS.
- B. THE RATING OF THE FIRE STOPS SHALL BE THE SAME AS THE RATED FLOOR, WALL OR CEILING ASSEMBLY.

2.13 HAZARDOUS LOCATIONS:
- A. ALL EQUIPMENT AND WIRING IN CLASS 1, DIV 1 AND 2 HAZARDOUS LOCATIONS SHALL BE INSTALLED AND RATED ACCORDINGLY OR SHALL BE INTRINSICALLY SAFE. ALL WIRING METHODS IN HAZARDOUS LOCATIONS SHALL MEET THE REQUIREMENTS OF NEC ARTICLE 501.

2.14 HEAT TRACE:
- A. SELF REGULATING, CROSS-LINKED CONDUCTIVE POLYMER CORE, TIN-PLATED 16-GAUGE COPPER BUS WIRES.
- B. THERMOSTAT: MAX. BULB TEMP. 160°F (71°C), SPDT, STAINLESS STEEL CAPILLARY
- C. ALL EQUIPMENT INSTALLED IN LIFTSTATION WET WELL AREA SHALL BE CLASS 1, DIV 1 RATED.
- D. RESIDENTIAL HEAT TRACE SHALL NOT BE HAZARDOUS LOCATION RATED.

PART 3 – EXECUTION

3.1 GENERAL:
- A. INSTALLATION OF ALL WORK SHALL BE MADE SO THAT ALL COMPONENT PARTS ARE INSTALLED AND FUNCTION AS A COMPLETE, WORKABLE SYSTEM.
- B. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE(NEC), NECA 1, AND THE STANDARDS AND CODES LISTED IN PART 1. WHERE QUESTIONS ARISE REGARDING WHICH REQUIREMENTS AND STANDARDS APPLY, THE MORE STRINGENT SHALL PREVAIL.
- C. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS AND RECOMMENDATIONS OF THE PRODUCT MANUFACTURER.
- D. REPLACE AND/OR REPAIR TO ORIGINAL (OR BETTER) CONDITION ANY EXISTING STRUCTURES, MATERIALS, EQUIPMENT, ETC. INADVERTENTLY DAMAGED OR DEMOLISHED DURING THE COURSE OF CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

3.2 TESTING
- A. TEST ALL SERVICE FEEDERS AND POWER CONDUCTORS PRIOR TO TERMINATION WITH A MEGOHM METER PER THE MANUFACTURER'S RECOMMENDATIONS. REPLACE ALL CONDUCTORS EXHIBITING LESS THAN 10 MEGOHM IMPEDANCE. REPEAT TESTING AS REQUIRED TO VERIFY COMPLIANCE.

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NAME DATE

VILLAGE SAFE WATER

STATE OF ALASKA – 49TH – REGISTERED PROFESSIONAL ENGINEER – John A. Popa – No. E11387 – 5/10/11

EDC, INC.
213 W. FIREWEED LANE
ANCHORAGE, AK 99503
(907) 276-7933

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
ABBREVIATIONS, LEGEND, AND SPECIFICATIONS

REVISION	BY	DATE

CAD FILE NAME E1.0.DWG

Project No. 28060
Date 5/10/11
Designed JP
Drawn PC
Approved JP

Sheet No. E1.0
SHEET 29 OF 35

Date: Aug 20, 2010, -, 9:32am
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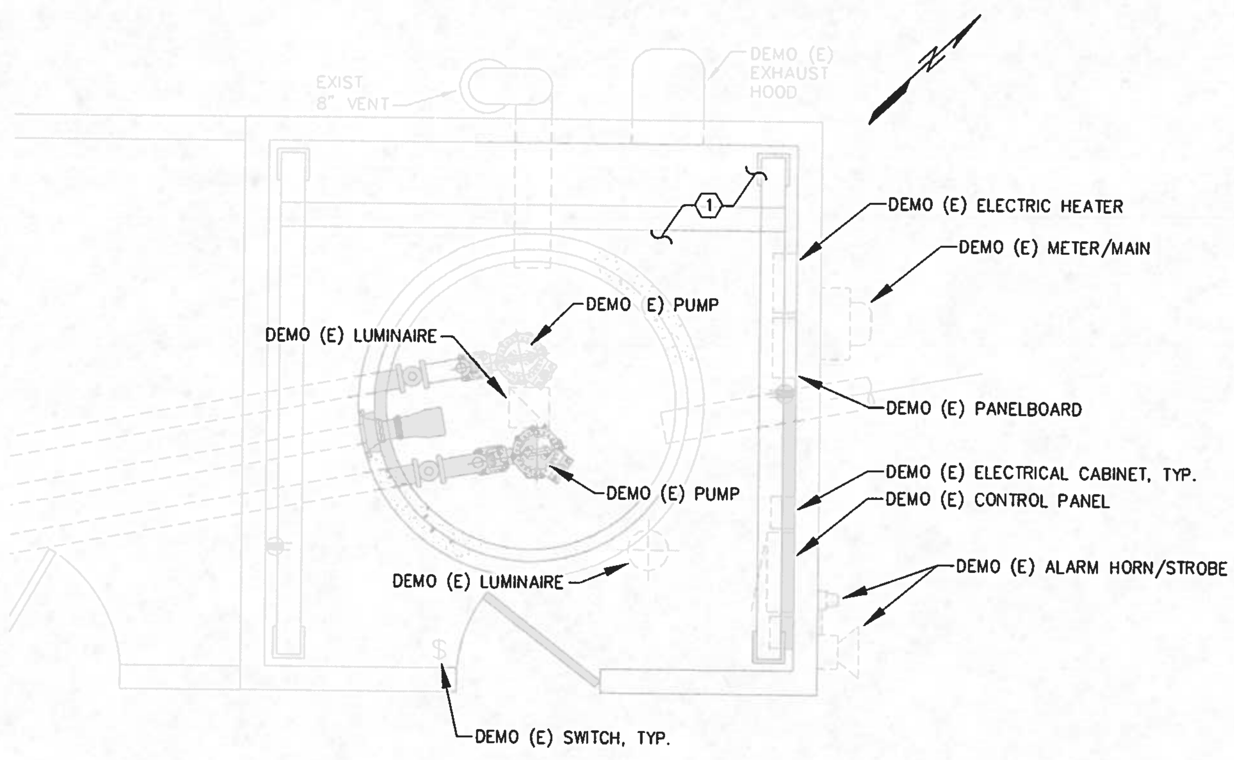
Xrefs: None - Images: None



1 – LIFT STATION DEMO PLAN
SCALE: 1"=2'-0"

2 – SITE PLAN
SCALE: 1"=10'-0"

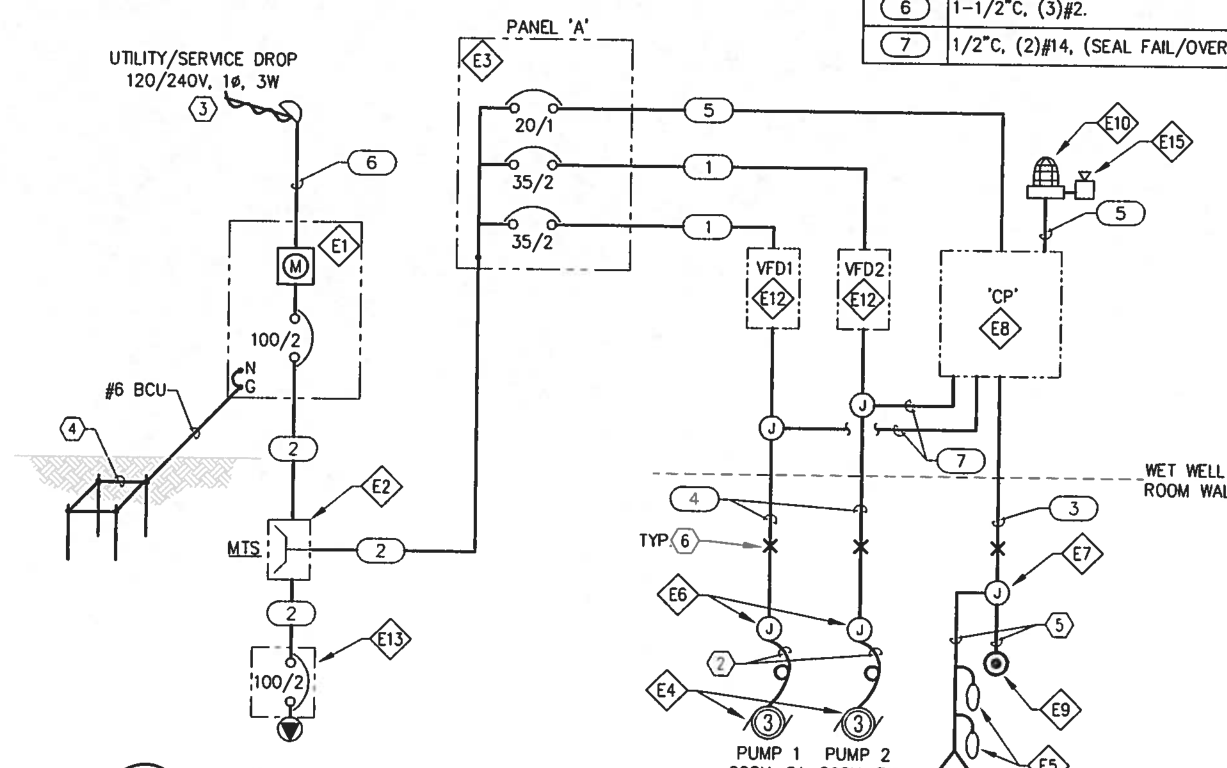
SHEET NOTES:

1. DEMO ALL EXISTING ELECTRICAL CONDUIT AND EQUIPMENT.
2. HEAVY DUTY USAGE CABLE, SUPPLIED WITH PUMP.
3. PROVIDE 18" MIN PIGTAIL OF 3#2 SERVICE ENTRANCE CONDUCTORS FOR CONNECTION TO SERVICE DROP BY UTILITY.
4. GROUNDING ELECTRODE SYSTEM (GES). SEE E3.0 FOR DETAILS.
5. INSTRUMENT CABLES SUPPLIED WITH EQUIPMENT.
6. SEAL-OFF FITTING WITH CORD GRIP.

EX COMPONENT ITEM X, SEE E3.0 FOR DESCRIPTION

FEEDER SCHEDULE

TAG	DESCRIPTION
1	1/2"C, (2)#1D, (1)#10 GND.
2	1-1/2"C, (3)#2, (1)#8 GND.
3	1/2"C, (4)#14 (FLOAT SIGNAL), (3)#18 TWSH (LEVEL TRANSDUCER). LABEL CONDUIT "INTRINSICALLY SAFE".
4	1/2"C, (4)#12 (MOTOR, GND), AND 2#14 (SEAL FAIL/OVERTEMP).
5	1/2"C, (2)#12, (1)#12 GND.
6	1-1/2"C, (3)#2.
7	1/2"C, (2)#14, (SEAL FAIL/OVERTEMP).



3 – POWER ONE-LINE
SCALE: NONE

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VILLAGE SAFE WATER

STATE OF ALASKA 49TH John A. Pape No. EE11387 REGISTERED PROFESSIONAL ENGINEER 5/10/11

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CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

DEMO PLAN, SITE PLAN, AND ONE-LINE DIAGRAM

REVISION	BY	DATE

CAD FILE NAME: E2.0.DWG

Project No. 28060
Date 5/10/11
Designed JP
Drawn PC
Approved JP

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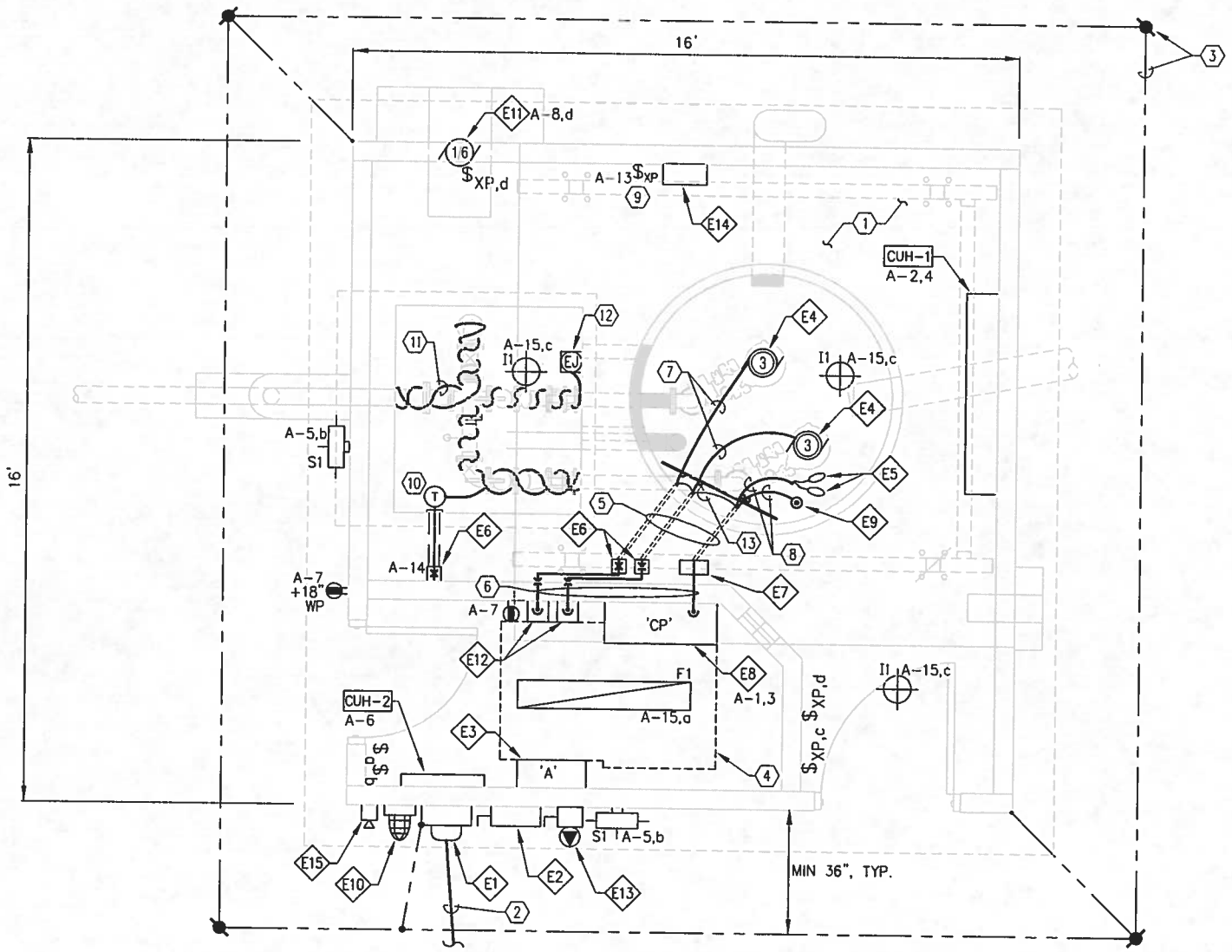
SHEET 30 OF 35



1 — LIFT STATION ELECTRICAL PLAN
SCALE: 1"=2'-0"
0 2' 4'

SHEET NOTES

1. A CLASS 1, DIVISION 1 HAZARDOUS LOCATION EXISTS WITHIN THE ENTIRE WET WELL ROOM AND WITHIN 3' IN ANY DIRECTION OF THE VENT AND DOOR OPENINGS. ALL WIRING AND EQUIPMENT IN THESE AREAS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 501.
2. UTILITY SERVICE CONNECTION, 120/240V, 1-PHASE, 3-WIRE.
3. GROUNDING ELECTRODE SYSTEM (GES). 4 EA, 3/4"X10' CU CLAD GROUND RODS, LOCATED AROUND BUILDING PERIMETER AND CONNECTED BY #2/0 BCU (BURIED NOT LESS THAN 30"). CONNECT TO BUILDING FOUNDATION STEEL AND TO MAIN DISCONNECT WITH #6 BCU.
4. MAINTAIN A MINIMUM OF 36" DEEP OF CLEAR SPACE IN FRONT OF PANELS PER NEC.
5. (3) 2" GRC CHASES UNDER SLAB. PROVIDE GROUND BUSHING AT BOTH ENDS. EXTEND TO 6" BEHIND HATCH OPENING IN WETWELL. SLOPE TO DRAIN TOWARD WET WELL. SEE DETAIL 4, SHEET E7.0.
6. SEAL AROUND CONDUIT TO MAINTAIN VAPORTIGHT BARRIER BETWEEN HAZARDOUS AND NON-HAZARDOUS LOCATIONS.
7. HEAVY DUTY USAGE CABLE, SUPPLIED WITH PUMPS.
8. INSTRUMENT CABLES, SUPPLIED WITH EQUIPMENT.
9. PROVIDE WALL MOUNTED (+48") ON/OFF XP FACTORY SEALED SNAP SWITCH MOUNTED ADJACENT TO UTILITY LIGHT HANGER/HOOK. SEE DETAIL ON E7.0.
10. AMBIENT TEMPERATURE THERMOSTAT, CLASS 1, DIV 1 RATED. SET AT 35°F FOR CONTROL OF HEAT TRACE. NELSON #TA7140.
11. HEAT TRACE. CLASS 1, DIV 1 RATED, 3W/FT, 120V. NELSON #LT3-J-D1. WRAP A MINIMUM OF 100' AROUND PIPING IN VALVE PIT.
12. CLASS 1, DIV RATED, END CONNECTION KIT FOR HEAT TRACE. NELSON TYPE HASK-E.
13. BOND CABLE SUPPORT RACK, CONDUITS, HATCH AND LADDER WITHIN THE WET WELL USING #6 BCU. CONNECT TO MAIN GROUNDING ELECTRODE SYSTEM (GES).

COMPONENT SCHEDULE

ITEM NO.	DESCRIPTION	MANUFACTURER
E1	100A, 120/240V, 1ϕ, 3-WIRE METER/MAIN COMBINATION SERVICE ENTRANCE, NEMA 3R.	COOPER B-LINE CAT# 1M1R.
E2	MANUAL TRANSFER SWITCH. 100A, 240V, 1ϕ, DOUBLE THROW SAFETY SWITCH, NON-FUSED, NEMA 3R.	SQUARE D CAT# DTU223RB.
E3	PANELBOARD 'A'. 100A, 120/240V, 1ϕ, 3-WIRE, 18 SPACE, NEMA 1.	SQUARE D CAT# NQ18L1C, MH26.
E4	SUBMERSIBLE PUMP, 3 HP, 208V, 3ϕ. (SEE CIVIL FOR DETAILS)	
E5	HIGH AND LOW LEVEL ALARM FLOATS WITH 65' CABLE.	FLYGT OR ABS
E6	CLASS 1, DIV 1 RATED CAST JUNCTION BOX.	CROUSE-HINDS GUA TYPE
E7	NEMA 4X ENCLOSURE. SEE E7.0 FOR DETAILS.	HOFFMAN
E8	CONTROL PANEL 'CP'.	SEE CONTROL PANEL SHEETS FOR DETAILS
E9	LEVEL TRANSDUCER, 4-20mA, 15 PSI.	SIEMENS TYPE A1000 W/60' OF CABLE & ASSEMBLY KIT. NO SUBSTITUTES.
E10	ALARM STROBE. 120VAC RED, WEATHERPROOF, SURFACE MOUNT AT +84" AFG.	FEDERAL SIGNAL 141ST-12DR
E11	EXHAUST FAN. 1/6 HP, 120V, 1ϕ.	SEE MECHANICAL
E12	VARIABLE FREQUENCY DRIVE (VFD). 3HP, NEMA 1 RATED WITH 1ϕ INPUT AND 3ϕ OUTPUT. PROVIDE W/ 5% INPUT LINE REACTORS.	ALLEN-BRADLEY POWERFLEX 40 CAT# 22B-A012N104
E13	GENERATOR RECEPTACLE WITH ENCLOSED CIRCUIT BREAKER. 100A, 240V, 1ϕ, 3-POLE, HEAVY DUTY NEMA 3R RECEPTACLE WITH MATING PLUG.	CROUSE-HINDS ARKTITE CAT# NBR51731 WT100, APJ STYLE PLUG.
E14	CLASS 1, DIV. 1 UTILITY WORK LIGHT WITH 5D FT SO CORD. WALL MTD STORAGE HANGER/HOOK SHALL BE STAINLESS STEEL. SEE SHEET E7.0 FOR DETAIL.	KILLARK XHL-10D OR EQUAL
E15	ALARM HORN. 120VAC, WEATHERPROOF, NEMA 4X, SURFACE MOUNT AT +84" AFG.	FEDERAL SIGNAL 350WB-120

PANEL SCHEDULE

PANEL NAME: A			240/120V				1Ø, 3 Wire	125A MAINS	
LOCATION: LIFT STATION ELECTRICAL ROOM			MLO				NEMA 1	10,000 AIC	
POLE	AMP TRIP	LOAD DESCRIPTION	POLE kVA	A Ø	B Ø	POLE kVA	LOAD DESCRIPTION	AMP TRIP	POLE
1	20/2	CONTROL PANEL 'CP'	0.1	3.9		3.8	CABINET UNIT HEATER (CUH-1)	40/2	2
3			0.1		3.9	3.8			4
5	20/1	EXTERIOR LIGHTING	0.2	1.2		1.0	CABINET UNIT HEATER (CUH-2)	20/1	6
7	20/1	RECEPTACLES	0.5		1.0	0.5	EXHAUST FAN	20/1	8
9	35/2	PUMP 1	2.1	4.1		2.1	PUMP 2	35/2	10
11			2.1		4.1	2.1			12
13	20/1	UTILITY LIGHT	0.1	0.4		0.3	HEAT TRACE	20/1	14
15	20/1	INTERIOR LIGHTING	0.8		0.8		SPARE	20/1	16
17				0.0					18
				9.5	9.8				

TOTAL kVA = 19.3
AMPS = 80.3

EQUIPMENT CONNECTION SCHEDULE

TAG ID	LOAD					CIRCUIT SIZE	NOTES
	KVA	HP	FLA	V	PH		
CUH-1	7.6		31.7	240	1	(2)#8, (1)#10 GND, 1/2"C	
CUH-2	1.0		8.3	120	1	(2)#12, (1)#12 GND, 1/2"C	

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NAME _____ DATE _____

VILLAGE SAFE WATER

STATE OF ALASKA — 49TH — John K. Popa No. CE1357 — REGISTERED PROFESSIONAL ENGINEER — 5/10/11

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CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS

LIFT STATION ELECTRICAL PLAN

REVISION	BY	DATE

CAD FILE NAME E3.0.DWG

Project No. 28060 | Date 5/10/11 | Designed JP | Drawn PC | Approved JP

Sheet No. E3.0
SHEET 31 OF 35

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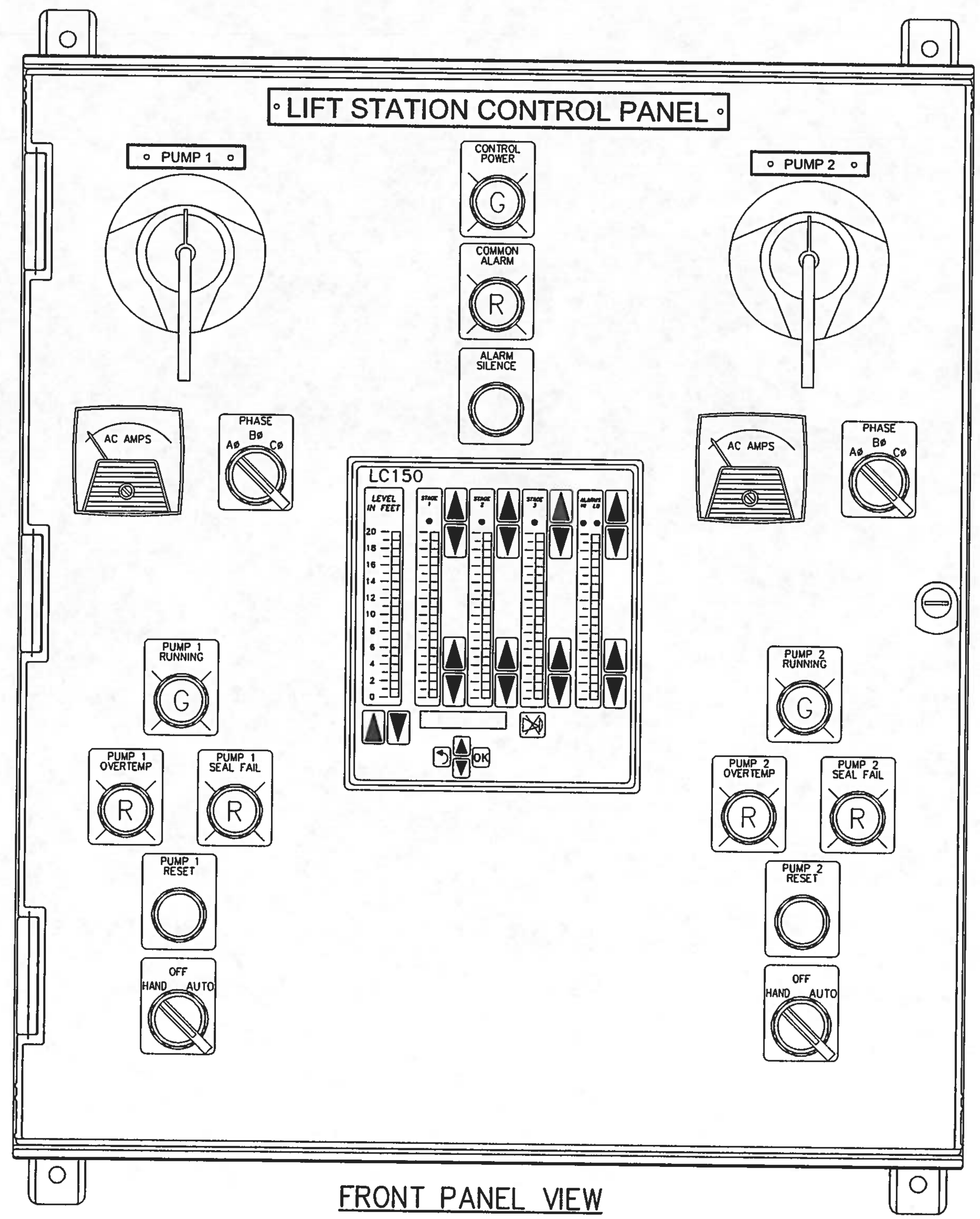

FRONT PANEL VIEW

CONTROL PANEL FUNCTIONAL DESCRIPTION

CONTROL PANEL FEATURES:

THE PANEL IS A DUPLEX SUBMERSIBLE PUMP CONTROL PANEL CONTROLLING 3ø SUBMERSIBLE PUMPS. THE CONTROLS INCLUDE 'COMMON ALARM' AND 'CONTROL POWER' PILOT LIGHTS, AND AN 'ALARM SILENCE' PUSHBUTTON. EACH PUMP HAS A HOA SWITCH; 'RUNNING', 'SEAL FAIL' AND 'OVERTEMP' PILOT LIGHTS, AMMETER WITH PHASE SELECTOR SWITCH AND A 'PUMP RESET' PUSHBUTTON. THE HEART OF THE CONTROLS IS A PUMP CONTROLLER WITH THE FOLLOWING FEATURES:

1. 'VIEW-AT-A-GLANCE' DISPLAY OF WET WELL LEVEL, LEAD AND LAG PUMP SETPOINTS, AND HIGH AND LOW LEVEL ALARM SETPOINTS.
2. LED LIGHTS TO INDICATE 'CALL FOR LEAD PUMP', 'CALL FOR LAG PUMP', 'HIGH LEVEL ALARM' AND 'LOW LEVEL ALARM'.
3. SIMPLE PUSHBUTTON ADJUSTMENT OF PUMP ON/OFF AND LEVEL ALARM SETPOINTS.
4. SIMPLE PUSHBUTTON LEVEL SIMULATION ADJUSTMENT FOR TESTING AND TROUBLESHOOTING.
5. AUTO-ALTERNATION OR LEAD PUMP SELECT OPTIONS.
6. RUN-TIME METER AND CYCLE COUNTER.

THE PANEL HAS A VOLTAGE MONITOR WHICH WILL DISABLE THE OPERATION OF BOTH PUMPS IN ALL MODES OF OPERATION DURING A HIGH/LOW VOLTAGE, PHASE LOSS OR PHASE IMBALANCE CONDITION. IF THIS OCCURS, THE 'CONTROL POWER' PILOT LIGHT WILL NO LONGER BE ENERGIZED. IN ADDITION TO THE VOLTAGE MONITOR, EACH PUMP HAS A VARIABLE FREQUENCY DRIVE (VFD) WITH SOLID STATE OVERLOAD, AND PHASE LOSS. IF ANY OF THESE CONDITIONS OCCURS THE PUMP WILL BE DISABLED. THE FAULT MUST BE MANUALLY CLEARED BY PRESSING THE 'PUMP RESET' PUSHBUTTON.

OPERATING MODES:

- HAND – IN HAND MODE THE PUMP WILL RUN CONTINUOUSLY UNLESS AN OVERLOAD OR VOLTAGE MONITOR FAULT OCCURS. A PUMP OVERTEMPERATURE CONDITION WILL CREATE AN ALARM, BUT THE PUMP WILL REMAIN RUNNING.

- OFF – IN THE OFF MODE THE PUMP WILL BE DISABLED.

- AUTO – IN THE AUTO MODE THE NORMAL PUMPING OPERATION WILL BE IN A LEAD/LAG CONFIGURATION WITH BOTH PUMP SELECTOR SWITCHES IN 'AUTO' AND THE CONTROL SET TO AUTO-ALTERNATE SO THAT THE LEAD AND LAG PUMPS ALTERNATE AUTOMATICALLY ON EACH PUMPING CYCLE. WHEN A PUMP IS CALLED TO RUN IT WILL RUN UNLESS AN OVERLOAD, OVERTEMPERATURE OR VOLTAGE MONITOR FAULT OCCURS. A SEAL FAIL CONDITION WILL CREATE AN ALARM, BUT WILL NOT SHUT DOWN THE PUMP.

  THE LEAD PUMP IS ENERGIZED WHEN WASTEWATER IN THE WET WELL RISES TO AN ELEVATION ABOVE THE 'CALL FOR LEAD PUMP' LEVEL (SEE CIVIL SHEETS FOR SETPOINT ELEVATIONS).

  IF THE LEAD PUMP DOES NOT ENERGIZE OR IF THE WASTEWATER RISES IN THE WET WELL FASTER THAN THE LEAD PUMP CAN REMOVE IT, THE LAG PUMP IS ENERGIZED WHEN THE WASTEWATER RISES ABOVE THE ELEVATION OF THE 'CALL FOR LAG PUMP' SETPOINT.

  IF NEITHER THE LEAD PUMP NOR THE LAG PUMP IS ENERGIZED OR IF THE WASTEWATER RISES IN THE PUMP STATION FASTER THAN THE LEAD AND LAG PUMPS CAN REMOVE IT, THE 'HIGH LEVEL' ALARM IS ACTIVATED AND THE EXTERNAL AUDIBLE/VISUAL ALARMS ARE ENERGIZED WHEN THE INFLUENT REACHES A LEVEL ABOVE THE 'HIGH LEVEL' SETPOINT. THE EXTERNAL AUDIBLE AND VISIBLE (STROBE) ALARMS CAN BE DE-ENERGIZED BY PRESSING THE SILENCE BUTTON. THE INTERNAL (PANEL MOUNTED) ALARM LIGHTS WILL REMAIN ON AS LONG AS THE ALARM CONDITION EXISTS. ONCE SILENCED, THE EXTERNAL ALARMS WILL RESPOND TO SUBSEQUENT ALARMS EVEN IF EXISTING ALARMS ARE STILL ACTIVE.

  BOTH PUMPS ARE DE-ENERGIZED WHEN WASTEWATER IN THE WET WELL FALLS BELOW THE ELEVATION OF THE 'PUMPS OFF' SETPOINT. IF THE LEVEL IN THE WET WELL CONTINUES TO FALL BELOW THE ELEVATION OF THE 'LOW LEVEL' SETPOINT, THE 'LOW LEVEL' ALARM IS ACTIVATED AND THE AUDIBLE/VISUAL ALARMS ARE ENERGIZED.

CONTROL PANEL I/O:

THE PANEL HAS THE FOLLOWING INPUTS:

240VAC, SINGLE-PHASE, SUPPLY POWER
4-20mA WET WELL LEVEL TRANSDUCER SIGNAL
1 N.C. CONTACT, WET WELL REDUNDANT HIGH LEVEL FLOAT SWITCH
1 N.O. CONTACT, WET WELL REDUNDANT LOW LEVEL FLOAT SWITCH
(2 EA.) SEAL FAIL AND HIGH TEMPERATURE SENSORS

THE PANEL HAS THE FOLLOWING OUTPUTS:

120 VAC, ALARM HORN AND STROBE

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RECORD DRAWING CERTIFICATE

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NAME ____ DATE ____

VILLAGE SAFE WATER

STATE OF ALASKA, 49TH, John A. Pape, No. EE11387, REGISTERED PROFESSIONAL ENGINEER, 5/10/11

EDC, INC.
213 W. FIREWEED LANE
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(907) 276-7933

CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION CONTROL PANEL LAYOUT AND FUNCTIONAL NARRATIVE

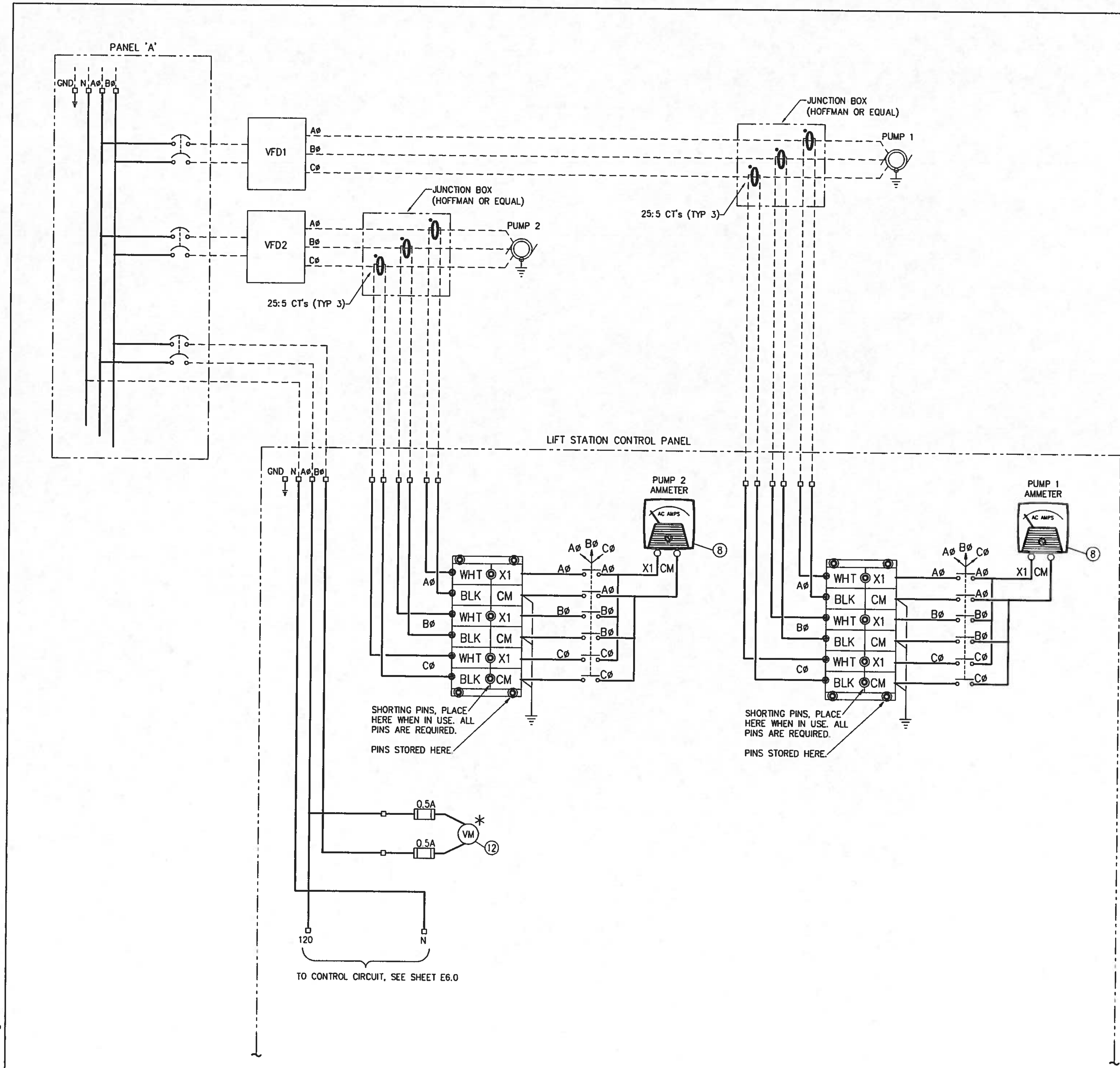
REVISION	BY	DATE

CAD FILE NAME: E4.0.DWG

Project No. 28060
Date 5/10/11
Designed JP
Drawn PC
Approved JP

Sheet No. E4.0
SHEET 32 OF 35

Date: Aug 20, 2010 - 9:32am
Drawing: P:\PROJECTS\BRISTOL ENVIRON\EKWOK\DWGS\XREF\XZKWOK-BOARDER.DWG - Layout: MODEL
Xrefs: None - Images: None



CONTROL PANEL COMPONENT SCHEDULE

	ITEM
1	RELAY, 3PDT, 11-PIN OCTAL SOCKET MOUNT SQUARE D CLASS 8501, TYPE KP
2	PILOT LIGHT, PUSH TO TEST, 120V, LENS TINT AS SHOWN SQUARE D TYPE K 9001 KT1(R=R31, G=G31)
3	PUMP MONITOR RELAY
4	N.O. PUSHBUTTON SQUARE D, TYPE SK 9001 - CONTACT BLOCKS AS REQUIRED
5	VFD START/STOP FUNCTION RELAY.
6	DUPLEX PUMP CONTROLLER 'VIEW-AT-A-GLANCE'. PUMP DOWN TYPE, SIEMENS MODEL LC150. NO SUBSTITUTES.
7	CONTROL PANEL FLUORESCENT FIXTURE WITH CONVENIENCE RECEPTACLE AND DOOR SWITCH.
8	AC AMMETER, 0-15A RANGE, 72mm, W/INTEGRAL SELECTOR SWITCH & POLYCARBONATE SHATTERPROOF WINDOW. CROMPTON INSTRUMENTS #E243-02E-G-LS-**-C7-AMP3; **= APPLICABLE CT PRIMARY VALUE.
9	3-POSITION SELECTOR SWITCH SQUARE D TYPE SK 9001 SKS42BH2 W/ CONTACT BLOCKS AS REQUIRED.
10	INTRINSICALLY SAFE BARRIER, DUAL CHANNEL SWITCH INPUT W/ TWO SPDT RELAY OUTPUTS, STAHL MODEL 9251/02-10.
11	UL489 MINIATURE CIRCUIT BREAKER, VOLTAGE/AMPERE RATING AND NUMBER OF POLES AS SHOWN. DIN RAIL MOUNTED W/BOX LUGS. SQUARE D MULTI 9 C60N CLASS 860 SERIES.
12	VOLTAGE MONITOR, 1-PHASE, 190-48DV, SYMCOM MODEL 46D. DETECTS HIGH/LOW VOLTAGE, VOLTAGE IMBALANCE AND PHASE LOSS.
13	INTRINSICALLY SAFE BARRIER, 3-WIRE, 4-20mA INPUT AND OUTPUT, US FILTER MODEL IS1-3.

COMPONENTS MAY BE SUBSITUTED IF APPROVED BY THE ENGINEER UNLESS OTHERWISE NOTED.

LEGEND

- PANEL WIRING
- FIELD WIRING OR WIRING INTERNAL TO LC150 CONTROLLER
- TERMINAL ON LC150 CONTROLLER (COMPONENT SCHEDULE ITEM 6) XX = TERMINAL NUMBER
- TERMINAL ON VFD, XX=TERMINAL NUMBER
- CONTROL PANEL TERMINAL FOR FIELD WIRING
- FIELD MOUNTED DEVICE
- CONTROL PANEL MOUNTED DEVICE
- COMPONENT ITEM #, SEE THIS SHEET FOR DESCRIPTION

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VILLAGE SAFE WATER

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CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION CONTROL PANEL SCHEMATIC

REVISION	BY	DATE

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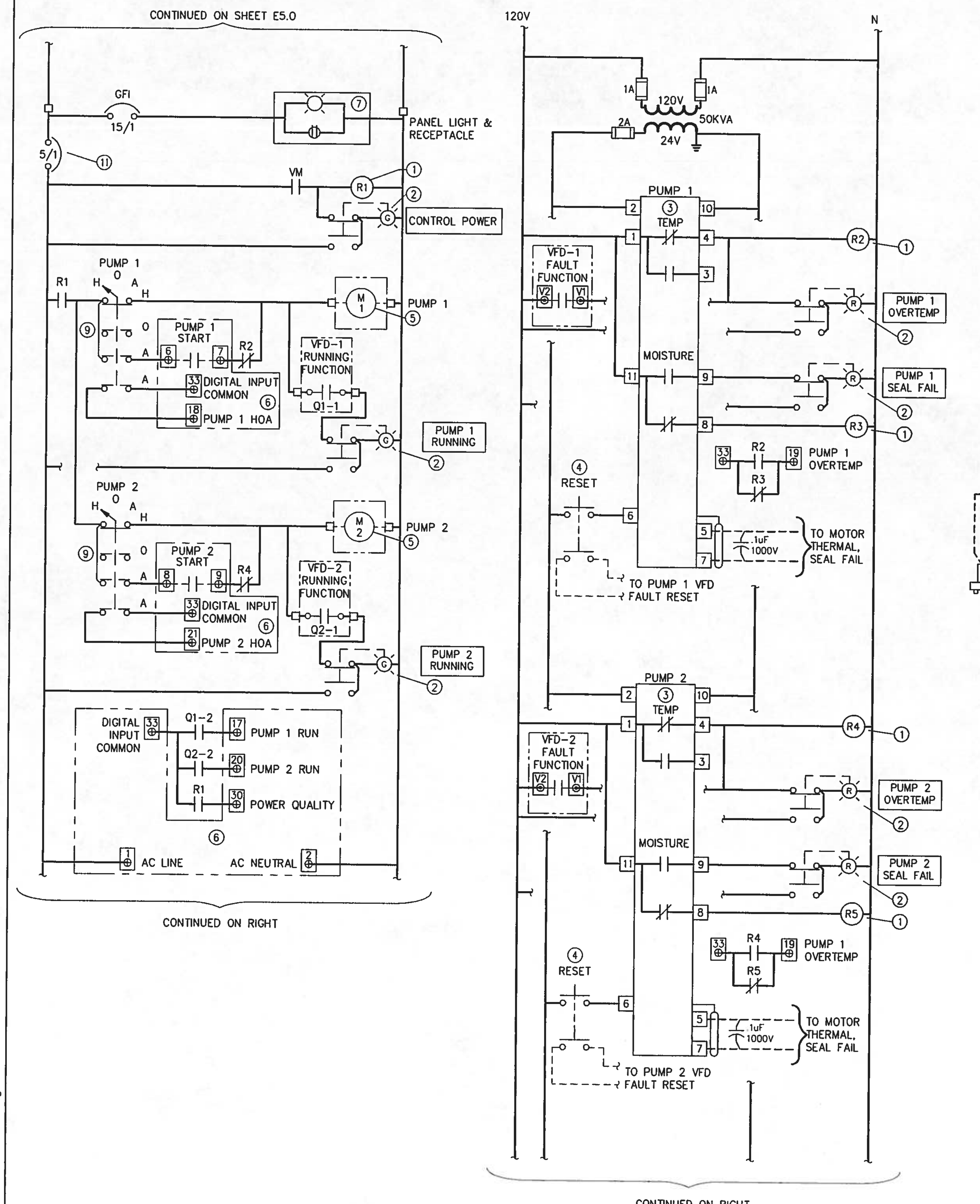
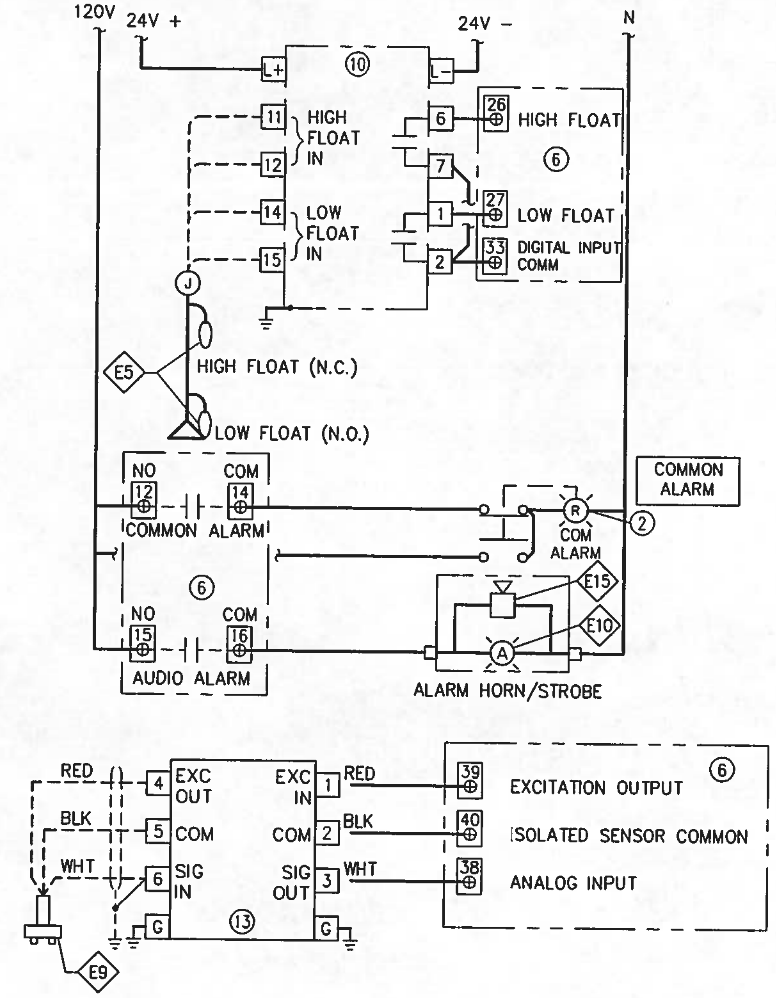
Approved JP

Sheet No. E5.0
SHEET 33 OF 35



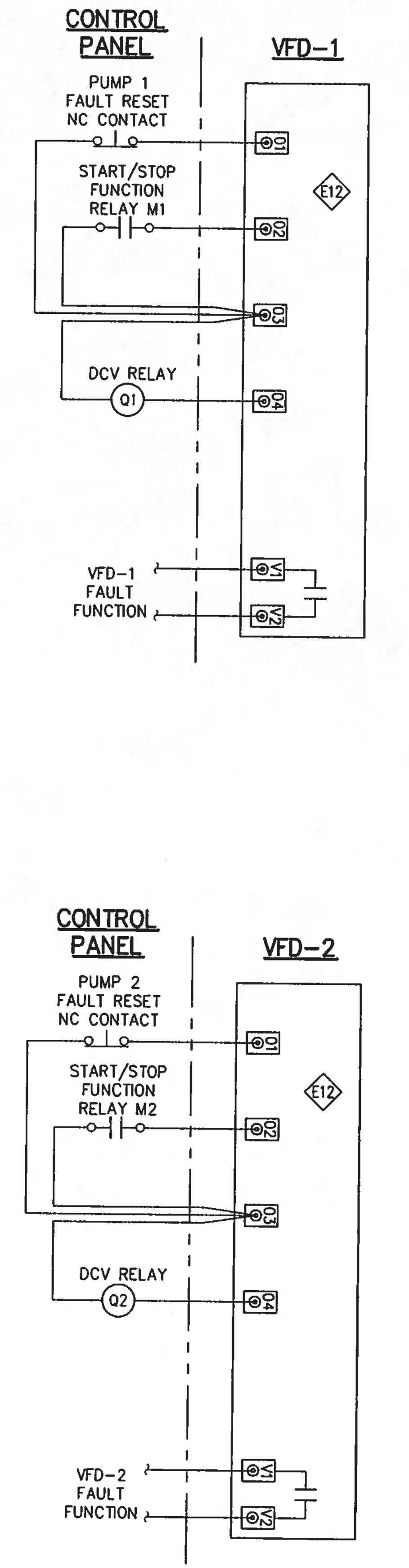


LC150 CONTROLLER TERMINAL ASSIGNMENTS

LC150 (6)

Terminal	Assignment
1	AC LINE
2	AC NEUTRAL
3	BATTERY/DC+
4	BATTERY/DC-
5	AUXILIARY POWER
6	PUMP 1 B
7	PUMP 1 A
8	PUMP 2 B
9	PUMP 2 A
10	PUMP 3 B
11	PUMP 3 A
12	COM ALARM NO
13	COM ALARM NC
14	COM ALARM COM
15	AUDIO ALARM NO
16	AUDIO ALARM COM
17	PUMP 1 RUN
18	PUMP 1 HOA
19	PUMP 1 TEMP
20	PUMP 2 RUN
21	PUMP 2 HOA
22	PUMP 2 TEMP
23	PUMP 3 RUN
24	PUMP 3 HOA
25	PUMP 3 TEMP
26	HIGH FLOAT
27	LOW FLOAT
28	ALARM SILENCE
29	PUMP INHIBIT
30	PWR QUALITY
31	DOOR SWITCH
32	DOOR ACK
33	DIGITAL INPUT COMMON
34	ANALOG OUTPUT
35	COMMON
36	HIGH ALARM
37	LOW ALARM
38	ANALOG INPUT
39	EXCITATION OUTPUT
40	ISOLATED SENSOR COMMON

MOTOR VFD SETTINGS



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VILLAGE SAFE WATER

STATE OF ALASKA — 49th — John A. Pepe — No. EE11387 — REGISTERED PROFESSIONAL ENGINEER — 5/10/11

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CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
LIFT STATION CONTROL PANEL SCHEMATIC

REVISION	BY	DATE

CAD FILE NAME: E6.0 LIFT STATION CONTROL PANEL SCHEMATIC.DWG

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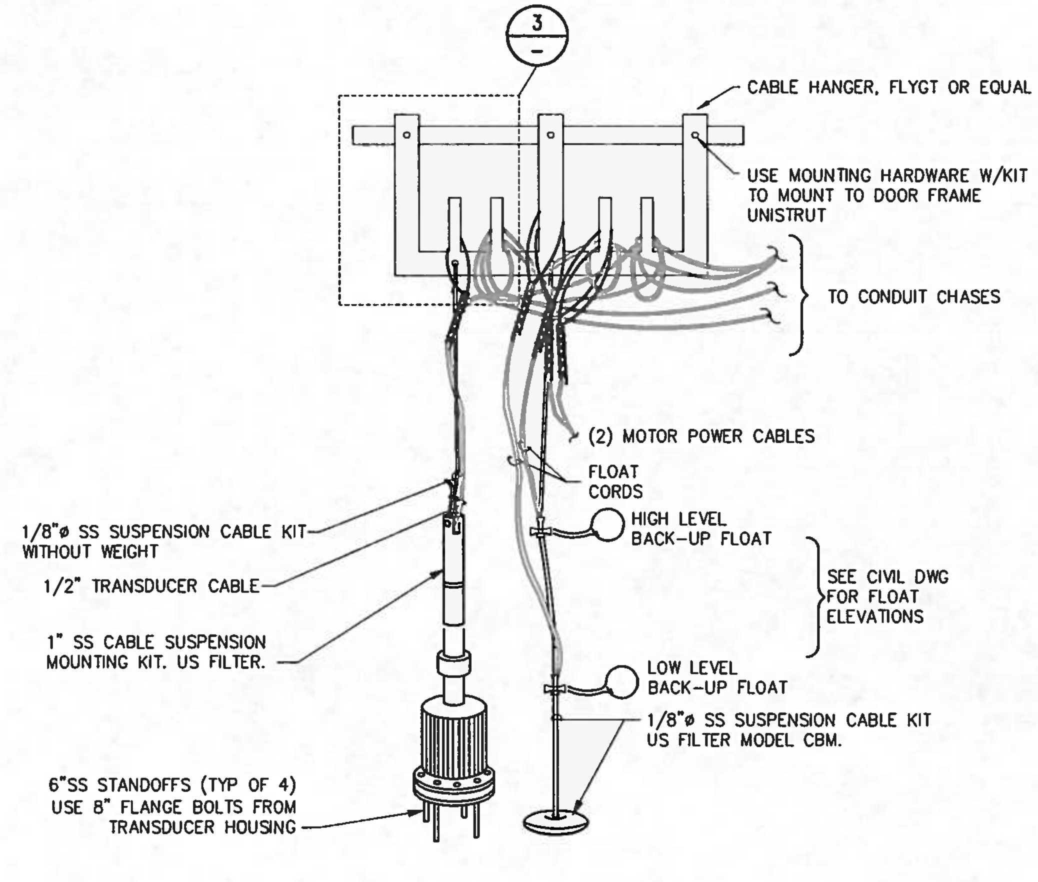
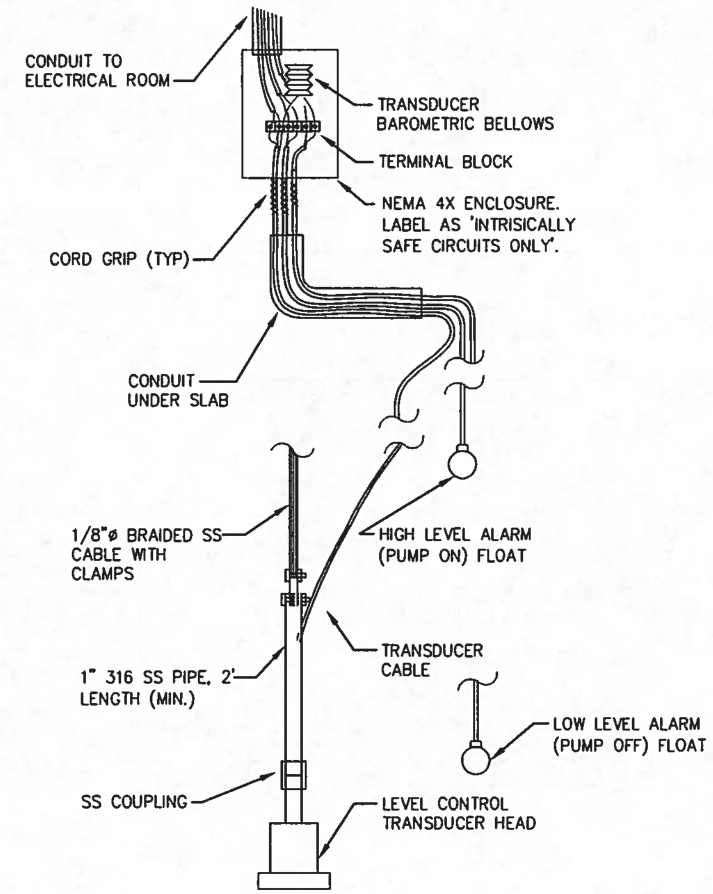
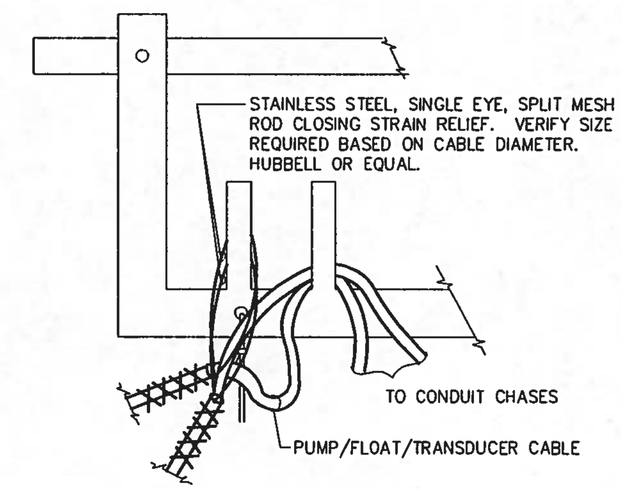
Approved JP



1 CABLE SUPPORT DETAIL
NO SCALE



2 TRANSDUCER/FLOAT DETAIL
NO SCALE



3 CABLE SUPPORT DETAIL
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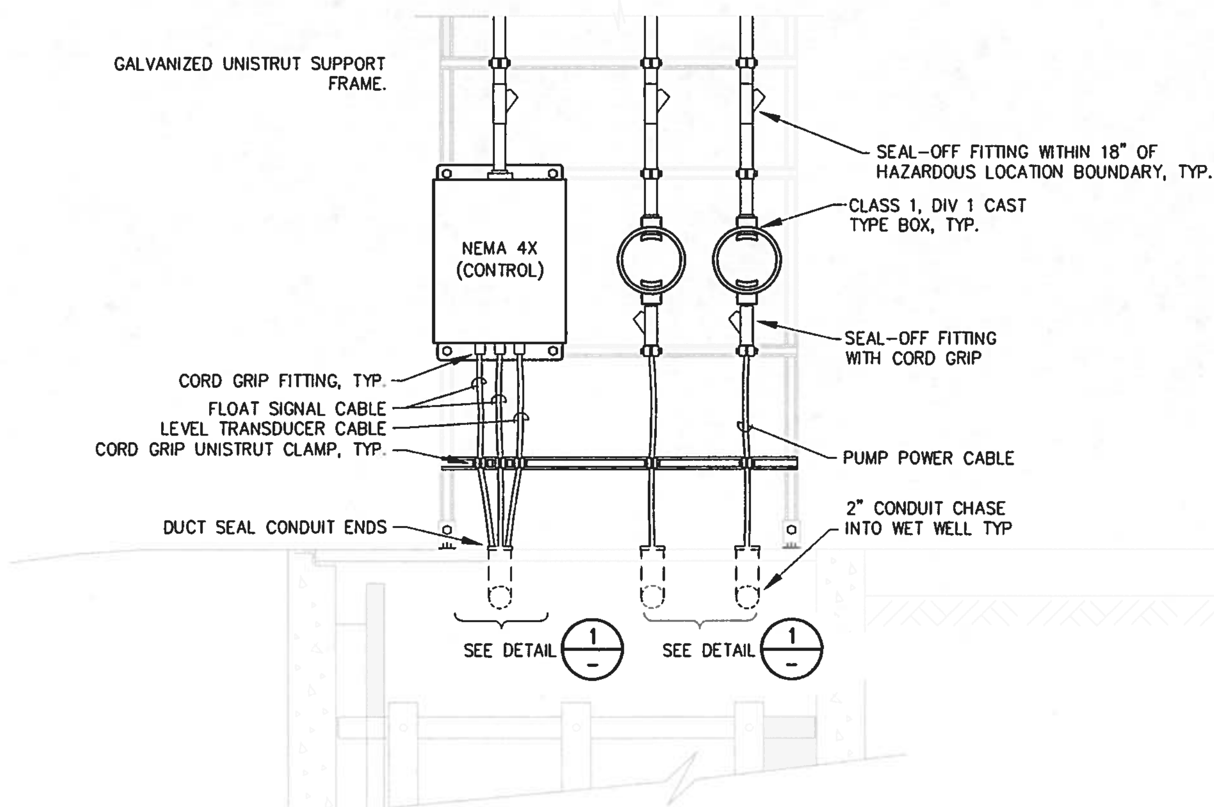
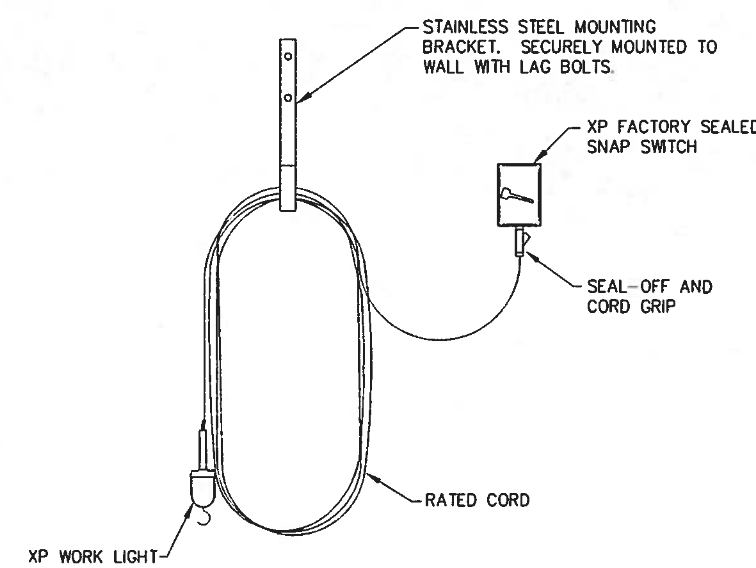


4 WETWELL CONDUIT CHASE DETAIL
NO SCALE



5 UTILITY WORK LIGHT DETAIL
NO SCALE

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VILLAGE SAFE WATER

STATE OF ALASKA 49TH John A. Pope No. EE11387 REGISTERED PROFESSIONAL ENGINEER 5/10/11

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CITY OF EKWOK
SANITARY SEWER IMPROVEMENTS
ELECTRICAL DETAILS

REVISION	BY	DATE

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SHEET 35 OF 35