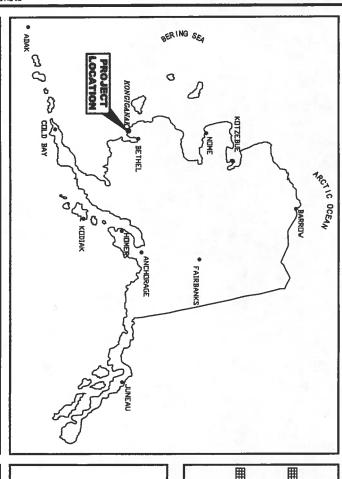
Kongiganak Traditional Council Sewer & Water Improvements

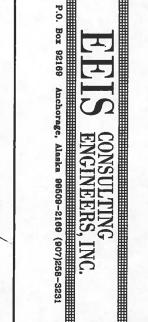
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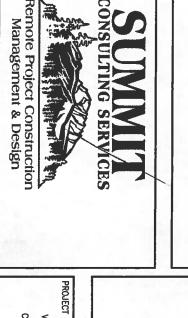
1.2 MG WATER STORAGE TANK

Department of Environmental Conservation In Cooperation with the State of Alaska

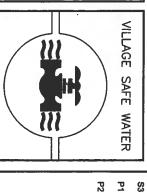
U.S. Department af Agriculture, Rural Development Village Safe Water Program and









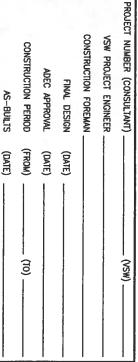


PIPING LEGEND (NOT IN THIS SCOPE)

MANIFOLD PIPING (NOT IN THIS SCOPE)

S2

FOUNDATION PLAN



Consultant

Location Map

Š No ដ ង 5 C14 C13 22 2 C10 င္ပ 8 C7 8 ပ္ပ Ω င္ယ R Ω 꼬 조 밇 22 9 72 \Box စ္ယ ō THERMISTOR DETAILS UTILITY SITE BOUNDARIES THERMISTOR PANEL DIAGRAM THERMOSYPHON PROFILES AND DETAILS LEGEND AND NOTES GENERAL NOTES GENERAL NOTES & TYPICAL DETAILS PIPING & INSTRUMENTATION DIAGRAM (NOT IN THIS SCOPE) TANK FOUNDATION AND GEOMEMBRANE LINER DETAILS TANK MEMBRANE DETAILS TANK VALVE HOUSING (NOT IN THIS SCOPE) TANK NOZZLE AND LADDER LOCATIONS THERMOSYPHON PROFILES THERMOSYPHON PLAN AND SPECIFICATIONS THERMISTOR SITE PLAN AND SPECIFICATIONS SURVEY CONTROL GEOTECHNICAL DATA DRILL HOLE TEST DETAILS GEOTECHNICAL INFORMATION PROJECT NARRATIVE, SCHEDULE & CALCULATIONS LEGEND AND NOTES SPECIFICATIONS GENERAL NOTES PIPING & INSTRUMENTATION DIAGRAM (NOT IN THIS SCOPE) TANK INSULATION DETAILS ALUMINUM FLASHING DETAILS TANK PLAN AND PROFILE THERMOSYPHON CROSS SECTIONS COVER SHEET SHEET INDEX

GENERAL PROJECT REQUIREMENTS

THE OWNER FOR THIS PROJECT IS THE KONGIGANAK TRADITIONAL COUNCIL (KTC), ALL WORK ITEMS REQUIRING DIRECTION OR APPROVAL FROM THE OWNER SHALL BE COORDINATED THROUGH THE VILLAGE ADMINISTRATOR.

LOCAL CONTACTS ARE AS FOLLOWS:

VILLAGE ADMINISTRATOR, KTC KONGIGANAK TRAD. COUNCIL (KTC)

WTP OPERATION
CALISTA REGIONAL CORPORATION
LOWER KUSKOKWIM SCHOOL DISTRICT
PUVURNAQ POWER COMPANY

557-5228 557-5224 557-5226 557-5637 279-5516 543-4810 557-5614

ROLAND ANDREW
BERTHA BLACK
NATHAN BLACK
NARY MARTINEZ
T BILL FERGUSON
BETTY PHILLIPS

PUBLIC LAND, SURFACE ESTATE AND RIGHTS OF WAY FOR THIS PROJECT, WITH THE EXCEPTIONS NOTED BELOW, ARE OWNED BY THE KONGIGANAK TRADITIONAL COUNCIL. SUBSURFACE ESTATE IS ADMINISTERED BY CALISTA REGIONAL CORPORATION. LANDS AND RIGHTS OF WAY (ROW): UNITED UTILITIES

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CONSTRUCTION STAGING AREAS:

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

EXISTING FACILITIES:

HAUL ROUTES FOR ALL CONSTRUCTION MATERIALS AND EQUIPMENT SHALL BE AS DIRECTED BY KTC.

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 IN THE SOLID WASTE SITE. UNCLAIMED OR UNUSABLE MATERIALS OR OBJECTS SHALL BE SALVAGED AND STORED AS DISCOURT BY THE WASTERIALS OR OBJECTS SHALL BE SALVAGED AND STORED AS DISCOURT BY THE WASTERIALS OR OBJECTS SHALL BE SALVAGED AND STORED AS DIRECTED BY KTC.

TREATED LUMBER SHALL NOT BE BURNED DUE TO POTENTIAL HAZARDOUS AIRBORNE BYPRODUCTS FROM COMBUSTION. SUCH MATERIAL SHALL BE DISPOSED IN THE SOLID WASTE SITE AND COVERED WITH FILL MATERIAL.

PERMITS AND AGENCY REQUIREMENTS:

PERMITS, PLANS & APPROVALS MAY BE REQUIRED FOR THIS PROJECT. COPIES OF THE REQUIRED FINAL PERMITS OR APPROVALS SHALL BE MAINTAINED AT THE PROJECT SITE. THE CONSTRUCTOR SHALL BE FAMILIAR WITH AND FOLLOW THE REQUIREMENTS AND CONDITIONS IDENTIFIED IN THESE PERMITS:

- U.S. ARMY CORPS OF ENGINEERS (COE) 404 PERMIT FOR DREDGE AND FILL
- STATE OF ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION (ADEC) CERTIFICATE OF REASONABLE ASSURANCE
- OFFICE OF PROJECT MANAGEMENT & PERMITTING, ALASKA DEPARTMENT OF NATURAL RESOURCES
- ADEC PLAN REVIEW AND APPROVAL TO CONSTRUCT
- ADEC STORM WATER POLLUTION PREVENTION PLAN

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. QUALIFICATIONS: SUBSEQUENT OPERATION OF THE FACILITIES WILL REQUIRE ADDITIONAL PERMITS.

ELECTRICAL WORK SHALL BE PERFORMED BY STATE OF ALASKA LICENSED JOURNEYMEN ELECTRICIANS 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.

SUBMITTALS ARE REQUIRED FOR THE FOLLOWING:

- WATER STORAGE TANK
 PIPING MATERIALS
 THERMISTORS
 GEOFOAM
 THERMOSYPHONS

RSPECTIONS:

THE ENGINEER SHALL CONDUCT PERIODIC INSPECTIONS OF THE WORK TO ENSURE GENERAL CONFORMANCE OF ALL WORK ELEMENTS TO THE PROJECT PLANS AND SPECIFICATIONS.

RECORD DRAWINGS:

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THE SUPERINTENDENT SHALL KEEP A DAILY RECORD THAT ACCURATELY SHOWS THE ACTUAL WORK COMPLETED AND DEVATIONS 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 REALTLY 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 MADE AVAILABLE TO THE ENGINEER DURING INSPECTIONS AND SHALL BE DELIVERED TO THE OWNER AT THE COMPLETION OF THE PROJECT. AFTER CORRECTIONS ARE MADE, FINAL RECORD DRAWINGS SHALL BE PRODUCED AND SENT TO THE APPROPRIATE AGENCIES.

SURVEY CONTROL:

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ij MONUMENTS:

THERE ARE SEVERAL PROPERTY CORNERS WHICH ARE LOCATED CLOSE TO THE CONSTRUCTION AREA. IT IS POSSIBLE THEY COULD BE DISTURBED OR DESTROYED BY THE CONSTRUCTION EFFORT

STATE LAW REQUIRES THAT MONUMENTS WHICH MAY BE DISTURBED OR DESTROYED BY CONSTRUCTION ACTIVITIES BE REFERENCED PRIOR TO THE BEGINNING OF CONSTRUCTION AND THAT THEY BE REPLACED IN THEIR ORIGINAL POSITION FOLLOWING CONSTRUCTION.

CONSISTENT. ALL TEST HOLES ACCOMPLISHED DURING THE PREPARATION OF THIS DESIGN AND OTHER AVAILABLE TEST HOLES ACCOMPLISHED PREVIOUSLY FOR OTHER PROJECTS ARE

IN GENERAL, UNDISTURBED SOILS ARE 6 - 12 INCHES OF ORGANIC MAT, 3 - 6 INCHES OF PEAT/SILT FOLLOWED BY SILT/FINE SANDY SILT TO AN UNKNOWN DEPTH. GROUND WATER IS NORMALLY NOT ENCOUNTERED AND FROZEN SILT/PERMAFROST IS FOUND FROM 3 - 9 FEET BELOW GRADE. THE PERMAFROST IS MUCH DEEPER IN SOUTHERN EXPOSED AREAS.

AND UNFROZEN SILT CAN BE EXPECTED. TO 3

Job No.:

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Checked By: Drawn By: Designed By:

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UNSUITABLE MATERIALS ARE ORGANIC MATERIALS, ICE RICH SILTS, PEATS, AND SATURATED MATERIALS, WHICH CANNOT BE READILY COMPACTED. THEY INCLUDE ANY MATERIAL THAT CONTAINS DELETERIOUS SUBSTANCES OR MATERIALS DESIGNATED AS

UNSUITABLE MATERIALS GENERATED ON THIS PROJECT SHALL BE USED TO THE EXTENT POSSIBLE AS TOP SOILS, NON-STRUCTURAL COVER, OR REPAR OF DAMAGED SURFACE AREAS OR AREAS DEVOID OF VEGETATION, UNSUITABLE MATERIALS, WHICH ARE NOT USED, SHALL BE DISPOSED OF IN THE SPOILS DISPOSAL AREA. THE SPOILS DISPOSAL AREA SHALL BE DISPOSED OF IN THE SPOILS DISPOSAL AREA. THE SPOILS DISPOSAL AREA SHALL BE DISPOSED OF IN THE START OF CONSTRUCTION AND SHALL BE

SEE APPLICABLE SPECIFICATIONS BELOW AND AS SHOWN ON THE PLANS.

THE ENGINEER SHALL ALSO MAKE A FINAL INSPECTION AND NOTED DEFICIENCIES SHALL BE CORRECTED.

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

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.

EMBANKMENT AND EXCAVATION

GENERAL:

DISTURBED AREAS, WHERE THE ORGANIC LAYER HAS BEEN DESTROYED OR REMOVED HAVE THE PEAT MIXED INTO THE SILT, FORMING A SOFT LIQUID SOIL. THIS CAN EXTEND DOWN TO FEET, BELOW 3 FEET, UNFROZEN SILT/FINE SANDY SILT EXTENDS DOWN TO AN UNKNOWN DEPTH. THE PERMAFROST IS MUCH DEEPER IN DISTURBED AREAS AND LAYERS OF FROZEN

UNSUITABLE MATERIALS:

SUITABLE MATERIALS:

SUITABLE MATERIALS SHALL BE IMPC RTED OR REMOVED FROM EXCAVATIONS ON THIS OR OTHER

SUITABLE MATERIALS SHALL CONTAIN OTHER CHARACTERISTICS OR PROPEI NO MUCK, PEAT, ICE, ROOTS, SOD, DELETERIOUS MATTER, OR RICHES WHICH WOULD CLASSIFY IT AS UNSUITABLE MATERIALS.

SUITABLE MATERIALS SHALL CONSIST OTHER IMPORTED SPECIFIED MATERIA OF CLEAN NATIVE SILT SOILS OR IMPORTED NFS MATERIALS OR ILS.

BORROW SITES:

THERE ARE SUITABLE BORROW AREAS ON BORROW SITES. AND OWNED OR LEASED BY KTC. KTC SHALL APPROVE ALL

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. ANY EXCESS UNSUITABLE MATERIAL WILL BE DISPOSED OF AT A LOCATION TO BE DETERMINED LATER.

WATER CONTROL:

AN APPROVED SWPPP SHALL BE DEVELOPED AND FOLLOWED FOR THIS PROJECT.

CONSTRUCTION AREA SHALL BE MAINTAINED IN A RELATIVELY DRY CONDITION THROUGHOUT THE CONSTRUCTION OPERATION. TRENCHES SHALL BE KEPT DEWATERED DURING PIPE INSTALLATION, DISCHARGE SHALL BE DIRECTED AWAY FROM THE SITE AND DISPOSED IN AN APPROVED MANNER.

APPROPRIATE MEASURES, SUCH AS SETTLI HIGHLY TURBID WATERS FROM ENTERING E SUCH EVENTS SHALL OCCUR ON THIS PROJ ING PITS OR SILT FENCES, SHALL BE USED TO PREVENT EXISTING WETLANDS OR WATERWAYS. IT IS NOT ANTICIPATED

COMPACTION REQUIREMENTS AND METHODS:

OPERATED VIBRATORY OR RECIPROCATING INCLUDING PLACEMENT AND COMPACTION O OF BEDDING - SURFACE DRAINAGE AND TRENCH DEWATERING PIPE . SHALL BE COMPACTED TO 92% OF MAXIMUM DENSITY BY HAND } PLATE COMPACTORS.

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.

AND COMPACTED. EACH LIFT SHALL BE COMPACTED UNIFORMLY THROUGHOUT THE LIFT. BE REDUCED IF THE REQUIRED COMPACTION IS NOT MET THROUGHOUT THE LIFT HEIGHT. FILL FOR THIS PROJECT SHALL BE SPREAD!
AND COMPACTED. EACH LIFT SHALL BE CON N HORIZONTAL LIFTS LESS THAN 12 INCHES (LOOSE) IN HEIGHT PACTED UNIFORMLY THROUGHOUT THE LIFT. LIFT HEIGHT SHALL

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.

FILL SHALL BE CONSTRUCTED USING UNFROZEN MATERIALS.



GENERAL NOTES









User: Doug Ramstad Date/Time: 4/17/2006 4:35 PM Drawing: S:\Engineering Projects\Kong Water Storage Tank\Acad\100% IFC\G2 Sheet: G2 Plotstyle: S\IMMIT.ctb

EROSION CONTROL AND RECLANATION:

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 PROVIECTION ACTIVITIES, SUCH AS SILT FENCING, 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:

30%

'NORCOAST BERING HARGRASS
(DESCHAMPSIA BERINGENSIS 'NORCOAST) (FESTUCA RUBRA 'ARCTARED')

50%

20%

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 WAY'S DISTURBED BY CONSTRUCTION ACTIVITIES.

SAFETY CONSIDERATIONS:

SIDE WALLS OF TRENCHES AND EXCAVATIONS SHALL BE SLOPED OR SUFFICIENTLY BRACED IN CONFORMANCE WITH THE APPROPRIATE STATE OF ALSKA DEPARTMENT OF LABOR STANDARDS AND THE LATEST FEDERAL OSHA EXCAVATION AND TRENCHING STANDARDS TO PROVIDE A SAFE WORKING ENVIRONMENT. ALL TRENCHES SHALL BE BACK FILLED OR COVERED BEFORE WORK IS STOPPED FOR THE DAY. IF IT BECOMES NECESSARY TO LEAVE A PORTION OF THE EXCAVATION OPEN AND UNATTENDED, THE OPEN SECTIONS SHALL BE ADEQUATELY SIGNED AND BARRICADED TO WARN RESIDENTS OF THE HAZARD. UTILITY LOCATIONS TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.

OTHER PROJECT MATERIALS

GEOTEXTILE:

GEOTEXTILE MATERIAL SHALL BE SUITABLE FOR USE IN EMBANKMENT, SEPARATION, AND REINFORCEMENT APPLICATIONS AND SHALL BE AMOCO 2006, 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 OVERLAP EDGES. OVERLAP JOINTS SHALL BE INSTALLED AS RECOMMENDED BY THE MANUFACTURER.

SEWN JOHNTS 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.

ALL-WEATHER WOOD:

ALL WOOD SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVER'S ASSOCIATION OF RECOMMENDED PRACTICE, STANDARD FOR PRESERVATIVE TREATMENT BY PRESSURE PROCESS - ALL TIMBER PRODUCTS. KILN-DRIED LUMBER SHALL BE TREATED WITH A WATERBORNE PRESERVATIVE AND SHALL HAVE A MAXIMUM MOISTURE CONTENT OF 15 PERCENT AFTER TREATMENT. PRESSERVATIVE SHALL CONFORM TO AMERICAN WOOD PRESERVES BUREAU STANDARD SPECIFICATIONS. CREOSOTE SHALL NOT BE USED. EACH PIECE OF TREATED LUMBER SHALL BEAR THE APPROVAL MARK OF AN APPROVED TESTING AGENCY.

ALL FIELD CUTS, NOTCHES, TAPS, OR DRILLED AREAS WHICH CREATE NEWLY EXPOSED AREAS SHALL BE TREATED WITH TWO HEAVY COATS OF THE SAME PRESERVATIVE USED IN THE ORIGINAL TREATMENT. MINIMUM PENETRATION OF FIELD-APPLIED PRESERVATIVES SHALL BE 1/4 INCH.

SILTCRETE:

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SITLCRETE SHALL CONSIST OF A MIXTURE OF NATIVE SILT AND PORTLAND CEMENT, WIT A RATIO OF 6-8% PORTLAND CEMENT, BY DRY WT PER 1 CUBIC FT OF NATIVE SILT. THE NATIVE SILT WILL BE DRAINED OF ANY FREE WAITER, PRIOR TO MIXING. AFTER MIXING, THE MATERIAL SHOULD BE COMPACTED AND SMOOTHED USING A SMALL PLATE COMPACTOR OR A SMALL, SMOOTH DRUM.

CONTAMINATED SOILS

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ACTIONS:

IF FUEL CONTAMINATED SOILS ARE ENCOUNTERED, ALL REMOVED SOILS SHALL BE PLACED ON A LINER AND COVERED WHILE A PLAN IS FORMULATED TO DISPOSE OF THE SOILS.

IF FUEL CONTAMINATED SOILS ENCOUNTERED ARE SATURATED AND FREE PRODUCT IS OBSERVED, THE CONSTRUCTION SHALL BE HALTED UNTIL THE FREE PRODUCT CAN BE KEPT OUT OF THE EXCAVATION.

NOTIFICATIONS:

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THE VSW AND SCS PROJECT ENGINEER SHALL BE NOTIFIED WITHIN 24 HOURS IF EITHER CONDITION OCCURS.

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PROJECT SCOPE

THIS PROJECT PRIMARILY CONSISTS OF THE PROCUREMENT AND INSTALLATION OF THE 1.2 MILLION GALLON WATER STORAGE TANK; ITS FOUNDATION AND PAD; THE 1.2 MILLION GALLON WATER STORAGE TANK; ITS FOUNDATION AND PAD; THE RISTALLATION OF A CONSTRUCTION ACCESS ROAD FROM EXISTING CONSTRUCTION MATTERIALS STORAGE PAD TO THE WATER TANK LOCATION; REROUTING OF THE EXISTING GRAVITY SEWER MAIN IN THE VICINITY OF THE NEW TANK LOCATION; AND THE INSTALLATION OF A BYPASS AROUND THE EXISTING SEWAGE TREATMENT FACILITY.

REFERENCE TO TANK INSULATION, RAW WATER PIPING, TREATED WATER PIPING, INSTRUMENTATION, ELECTRICAL, OR MECHANICAL WORK IS FOR INFORMATION

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WORK ON THE EXISTING WATER STORAGE TANK; AND THE WORK INSIDE THE WATER TREATMENT BUILDING WILL BE DESIGNED AND BUILT IN THE NEXT PHASE OF WORK.

KONGIGANAK 1.2 MG WATER STORAGE TANK

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GENERAL NOTES ISSUED FOR CONSTRUCTION









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SPECIFICATIONS: **GENERAL - WATER TANK APPLICATIONS:**

- WORK INCLUDED: THE ENGINEER'S SELECTION OF FACTORY-COATED BOLTED STEEL TANK CONSTRUCTION FOR THIS FACILITY HAS BEEN PREDICATED UPON THE DESIGN CRITERIA AND CONSTRUCTION METHODS SPECIFIED. DEVIATIONS FROM THE SPECIFIED DESIGN AND CONSTRUCTION DETAILS WILL NOT BE PERMITTED.
- DRAWINGS AND SPECIFICATIONS: CONSTRUCTION SHALL BE GOVERNED BY THE DRAWINGS AND SPECIFICATIONS SHOWING GENERAL DIMENSIONS AND CONSTRUCTION DETAILS. AFTER APPROVAL BY THE ENGINEER OF DETAILED ERECTION DRAWINGS PREPARED BY THE MANUFACTURER, THERE SHALL BE NO DEVIATION FROM THESE DRAWINGS AND SPECIFICATIONS EXCEPT UPON WRITTEN ORDER OR APPROVAL FROM THE ENGINEER.

THREE (3) COPIES OF THE SHOP DRAWINGS COVERING TANK, ANCHORS, ACCESSORIES, APPURTENANCES AND COATINGS PROVIDED SHALL BE SUBMITTED IN ACCORDANCE WITH THE "SUBMITTALS" AND "DRAWINGS AND SPECIFCIATIONS" SECTIONS.

QUALIFICATIONS OF TANK MANUFACTURER: THE TANK MANUFACTURE SHALL BE A SPECIALIST IN THE DESIGN, FABRICATION, AND ERECTION OF FACTORY-COATED BOLTED STEEL TANKS, THE MANUFACTURER SHALL BE QUALITY CERTIFIED, HAVING AN ACTIVE API-Q1 AND AN ISO 9001 REGISTRATION.

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Ö DESIGN CRITERIA:

MINIMUM CAPACITY:	TEMPERATURE OF PRODUCT:	PH OF PRODUCT:	SPECIFIC GRAVITY:	PRODUCT TO BE STORED:	JOB SITE LOCATION:	
1.200.000 GALLONS	45°F	7±0.5	1	UNTREATED DRINKING WATER	KONGIGANAK	

DECK LIVE LOAD: DESIGN PRESSURE/VAC: MINIMUM FREEBOARD: WIND SPEED: 6 ð

MAXIMUM DEPTH: DIAMETER:

23.5 2

NCHES 4 4

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8 MPH (WHEN COMPLETELY ERECTED)

REFERENCES: SEISMIC ZONE:

AWWA D103-97 - BOLTED STEEL TANK FABRICATION AND ERECTION

API 128 - PRINCIPLES OF STANDARD SPECIFICATION FOR BOLTED STEEL TANK

PRODUCTS - MATERIALS:

TANK STRUCTURE: THE MATERIALS, DESIGN, FABRICATION AND ERECTION OF THE BOLTED STEEL TANK SHALL CONFORM TO AWWA D103-97, TO THE PRINCIPLES OF STANDARD SPECIFICATION 128 OF THE AMERICAN PETROLEUM INSTITUTE, OR TO COLUMBIANS SPECIFICATIONS WHICH ARE DERIVED FROM ENGINEERING PRINCIPLES, INDUSTRY EXPERIENCES, AND THE AFOREMENTIONED

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FROM ENGINEERING PRINCIPLES, I STANDARDS AND SPECIFICATIONS.

P STEEL:

- STEEL SHEETS SHALL CONFORM TO OR SHALL BE AT LEAST EQUAL TO HOT-ROLLED QUALITY PER ASTM A570 GRADE 33 WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI. MINIMUM THICKNESS SHALL BE 12 GAUGE (0.0872* MINIMUM).
- STEEL PLATES SHALL CONFORM TO OR AT LEAST BE EQUAL TO THE REQUIREMENTS OF ASTM A36 WITH A MINIMUM YIELD STRENGTH OF 36,000 PSI.
- ROLLED STRUCTURAL SHAPES SHALL CONFORM TO ASTM A36

BOLTS:

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- ₽ GALVANIZED BOLTS, NUTS, AND WASHERS USED IN TANK JOINTS SHALL BE A MINIMUM 1/2 INCH BOLT DIAMETER AND SHALL MEET THE MINIMUM REQUIREMENTS OF API 12B, APPENDIX A, EXCEPT THAT BOLT HEADS AND NUTS MAY BE OTHER THAN SQUARE AT THE OPTION OF THE TANK MANUFACTURER.
- ဂ POLYCAPPED BOLT HEADS SHALL BE USED FOR ADDITIONAL CORROSION PROTECTION.
- OTHER BOLTS SHALL CONFORM TO OR AT LEAST BE EQUAL TO THE LATEST REVISION OF
- ADDITIONALLY, ANY STEEL NUTS THAT ARE IN CONTACT WITH THE LIQUID IN THE TANK SHALL BE FACTORY ENCAPSULATED SO THAT THE NUT FORMS ONE PIECE WITH THE CORROSION RESISTANT ENCAPSULATION MATERIAL.

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- GASKETS: ALL BOLTED CONNECTIONS SHALL INCORPORATE AN EPDM, NEOPRENE OR BUNA N'
 PREFABRICATED GASKET. MINIMUM WIDTH 1-3/4". A SINGLE PIECE DOUBLE-PUNCHED GASKET SHALL
 BE USED AT VERTICAL SEAMS WHICH REQUIRE TWO VERTICAL ROWS OF PUNCHING. FIELD CAULKING
 WILL BE ALLOWED WHEN JOINING A DISCONTINUOUS GASKET SECTION AND AT CERTAIN JOINT
 CONNECTIONS, NEOPRENE BACKED STEEL WASHERS SHALL BE PROVIDED AT ALL BOLTS IN CONTACT WITH THE STORED.
- MULTIPLE ROW PUNCHING: ALL SHEETS IN THE SHELL OF THE TANK THAT REQUIRE MULTIPLE VERTICAL ROW PUNCHING (DOUBLE OR TRIPLE) MUST BE IN A SINGLE STROKE TO INSURE PROPER ALIGNMENT.

NOTE: EPDM SHALL BE USED WHERE IT HAS BETTER RESISTANCE TO THE CHEMICALS PRESENT.

- COATING: ALL METAL PLATES, SUPPORTS, MEMBERS, AND MISCELLANEOUS PARTS, EXCEPT BOLTS, CERTAIN ACCESSORIES, AND APPURTENANCES, SHALL BE FACTORY COATED IN ACCORDANCE WITH THE PROVISIONS OF THESE SPECIFICATIONS. FIELD COATING, EXCEPT FOR TOUCH-UP WILL NOT BE
- INTERIOR: THERMALLY CURED EPOXY TRICO-BOND 478 BY COLUMBIAN STEEL TANK COMPANY OR EQUAL.
- EXTERIOR: AMINE EPOXY PRIMER WITH BAKED ACRYLIC FINISH COAT OR EQUAL
- ACCEPTED MANUFACTURERS: THE STEEL TANK AND ACCESSORIES FURNISHED UNDER THIS SECTION SHALL BE AS MANUFACTURED BY COLUMBIAN STEEL TANK COMPANY, KANSAS CITY, KANSAS.

EXECUTION: APPLICATION PROCEDURES FOR FACTORY COATING.

SURFACE PREPARATION:

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- TANK PARTS ARE THOROUGHLY WASHED AND RINSED TO REMOVE GREASE, OIL AND FOREIGN MATTER
- PARTS ARE THEN IMMEDIATELY OVEN-DRIED.
- PARTS ARE GRIT-BLASTED TO SSPC-SP10-63T (NEAR WHITE BLAST CLEANING) TO A 2-3 MILS PROFILE.
- ALL PARTS MUST BE COATED WITHIN 15 MINUTES AFTER BLASTING, AND NO FURTHER PROCESSING OTHER THAN COATING APPLICATION SHALL BE DONE.
- INTERIOR COATING: TICO-BOND 478 (INCLUDES UNDERNEATH SIDE OF STEEL BOTTOM)

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- FIRST COAT ELECTROSTATIC APPLICATION OF NSF APPROVED THERMOSET EPOXY. TECHNICAL COATINGS COMPANY EPICON 925 AS PRIMER, 2.5 MILS AVERAGE DRY FILM THICKNESS.
- SECOND COAT ELECTROSTATIC APPLICATION OF NSF APPROVED THERMOSET EPOXY, TECHNICAL COATINGS COMPANY EPICON 825 AS TOPCOAT, 2.5 MILS AVERAGE DRY FILM THICKNESS.
- COATING SYSTEM TO HAVE 5.0 MILS AVERAGE DRY FILM THICKNESS.
- EXTERIOR COATING: COLUMBIAN STANDARD TRICO-BOND 478 AND ACRYLIC ENAMEL FINISH

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- ONE COAT EPOXY PRIMER, TECHNICAL COATINGS COMPANY EPICON 925, 2 MILS AVERAGE DRY FILM THICKNESS, ELECTROSTATICALLY APPLIED.
- ONE COAT HIGH SOLIDS ACRYLIC BAKING ENAMEL, TECHIVAL COATINGS COMPANY #894-N-006 TAN, 1 MIL AVERAGE DRY FILM THICKNESS.
- COATING SYSTEM TO HAVE 3 MILS AVERAGE TOTAL DRY FILM THICKNESS
- **EXTERIOR COATING: Z BOND 493 OPTIONAL EXTERIOR COATING**

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- ONE COAT TECHNICAL COATINGS COMPANY ZINC RICH PRIMER, 2.5 MILS AVERAGE DRY FILM THICKNESS.
- ONE COAT ELECTROSTATIC APPLICATION OF THERMOSET EPOXY, TECHNICAL COATINGS COMPANY EPICON 925, 2.5 MILS AVERAGE DRY FILM THICKNESS.
- SECOND COAT ELECTROSTATIC APPLICATION OF THERMOSET EPOXY, TECHNICAL COATINGS COMPANY EPICON 925, 2.5 MILS AVERAGE DRY FILM THICKNESS.
- ONE TOPCOAT URETHANE, TECHNICAL COATINGS COMPANY ACROTHANE HF, 1.5 MILS AVERAGE DRY FILM THICKNESS.
- COATING SYSTEM TO HAVE 8.5 MILS AVERAGE TOTAL DRY FILM THICKNESS.

DRYING AND SHIPPING PARTS:

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CURING: BACKING OVENS TO BE USED AFTER EACH COAT, FINAL COAT IS TO BE CURED IN A BAKE OVEN FOR AT LEAST 15 MINUTES.

PREPARATION FOR TRANSPORT:

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- MATERIALS TO BE MARKED OR TAGGED WITH THE PART NUMBER AND ORDER NUMBER FOR FIELD ASSEMBLY REQUIREMENTS.
- TANK MATERIAL TO BE PLACED IN RACKS OR ON PALLETS TO FACILITATE TRANSPORTATION TO JOBSITE. THE RACKS WILL ALSO PREVENT SCRATCHING BY ERECTION CREWS.
- TOUCH-UP PAINT WITH INSTRUCTIONS FOR APPLICATION BY ERECTION PERSONNEL

ဂ **APPURTENANCES:**

- THE CONTRACTOR SHALL FURNISH AND INSTALL THE APPURTENANCES AS SHOWN ON THE CONTRACT DRAWINGS AND AS SPECIFIED BELOW.
- ILESS OTHERWISE NOTED, STANDARD APPURTENANCES SHALL BE
- HATCH: THE TANK ROOF HATCH SHALL HAVE A CURBED, UPWARD OPENING 24" SQLUARE. THE CURB SHALL EXTEND AT LEAST FOUR INCHES BOVE THE THE HATCH COVER LIP SHALL BE HINGED AND PROVISIONS MADE FOR LOCKING. THE HATCH COVER LIP SHOULD EXTEND FOR A DISTANCE OF TWO INCHES DOWN ON THE OUTSIDE OF CURB.
- NLET, OUTLET, AND OVERFLOW CONNECTIONS: INLET, JUTLET, AND OVERFLOW CONNECTIONS SHALL CONFORM TO THE SIZES AND LOCATIONS SPECIFIED ON THE PLAN SHEETS.
- VENT: A MUSHROOM-SCREENED VENT SHALL BE FURNISHED ABOVE THE MAXIMUM WATER LEVEL OF SUFFICIENT SIZE TO ACCOMMODATE NORMAL INLET AND OUTLET FLOW. THE OVERFILOW PIPE SHALL NOT BE CONSIDERED TO BE A TANK VENT. THE VENT SHALL BE SO DESIGNED AND CONSTRUCTED AS TO PREVENT THE ENTRANCE OF BIRDS AND ANIMALS.
- 24" x 46" FLUSH CLEANOUT DOOR (34" DIAMETER SHELL MANWAY): THE FLUSH CLEANOUT DOOR (SHELL MANWAY) SHALL CONFORM TO THE SIZES AND LOCATIONS SPECIFIED ON
- JTSIDE TANK LADDER: AN OUTSIDE OSHA LADDER SHALL BE IRNISHED AT THE LOCATION DESIGNATED.
- LIQUID LEVEL INDICATOR: A LIQUID LEVEL INDICATOR WITH FLOAT AND TARGET BOARD SHALL BE INSTALLED AS DETAILED ON THE PLANS AND TO THE TANK MANUFACTURER'S SPECIFICATIONS.
- SPECIFIED ON THE PLAN SHEETS. TERNAL OVERFLOW WEIR CONE: THE INTERNAL OVERFLOW EIR CONE SHALL CONFORM TO THE SIZE AND LOCATION
- GALVANIZED HANDRAIL AND TOEBOARD: HANDRAIL AND TOEBOARD AROUND THE DECK PERIMETER SHALL BE INSTALLED AS SPECIFIED ON THE PLAN SHEETS.

TANK FOUNDATION:

- ₽ THE TANK FOUNDATION SHALL BE DESIGNED TO SAFELY SUSTAIN THE LOADS FROM THE TANK
- è AWWA D BOTTOM TANKS: THE FOUNDATION SHALL BE INSTALLED PER D103-87, SECTION 11.4.
- THE FOUNDATION SHALL BE LEVEL WITH DIFFERENTIAL NOT EXCEEDING +1/4 NICH OR +0.02 FT WITHIN 30-FOOT CIRCUMFERENCE ON THE SILTORETE LEVEL

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- THE LAYER THAT FOAM RESTS UPON SHALL BE LEVEL WITH THE DIFFERENTIAL OF ±0.05 FT WITHIN ANY 30 FT CIRCUMFERENCE. THE LAY
- SHIPPING: ALL PLATES, SUPPORTS, MEMBERS, AND MISCELLANEOUS PARTS SHALL BE PACKAGED FOR SHIPMENT IN SUCH MANNER TO PREVENT ABRASION OR SCRATCHING OF THE FINISHED COATING.
- ERECTION: FIELD ERECTION OF FACTORY-COATED BOLTED STEEL TANKS SHALL BE IN STRICT ACCORDANCE WITH THE TANK MANUFACTURER'S RECOMMENDATIONS. PARTICULAR CARE SHALL BE EXCEPTION HANDLING AND BOLTING OF THE TANK PLATES, SUPPORTS, AND MEMBERS TO AVOID ABRASION OR SCRATCHING OF THE COATING. TOUCH-UP COATING SHALL BE DONE IN ACCORDANCE WITH TANK MANUFACTURER'S RECOMMENDATIONS WHERE AND
- TESTING: FOLLOWING COMPLETION OF ERECTION AND CLEANING OF THE TANK, THE TANK SHALL BE TESTED FOR LIQUID-TIGHTNESS BY FILLING THE TANK TO ITS OVERFLOW ELEVATION.

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- > ANY LEAKS DISCLOSED BY THIS TANK TEST SHALL BE CORRECTED BY THE CONTRACTOR IN ACCORDANCE WITH THE TANK MANUFACTURER'S RECOMMENDATIONS.
- CLEAN WATER REQUIRED FOR TESTING SHALL BE FURNISHED BY OWNER WITHOUT CHARGE AT THE TIME OF ERECTION COMPLETION. FILLING AND EMPTYING THE TANK ARE ALSO THE RESPONSIBILITY OF OWNER.

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WARRANTY: THE WARRANT THE WARRANT HE TANK MANUFACTURER SHALL WARRANT THE TANK AGAINST IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) HE DATE OF SHIPMENT. IN THE EVENT ANY DEFECT SHOULD WALL BE REPORTED IN WRITING TO THE MANUFACTURER DURING

> **KONGIGANAK** 1.2 MG WATER STORAGE TANK









SPECIFICATIONS

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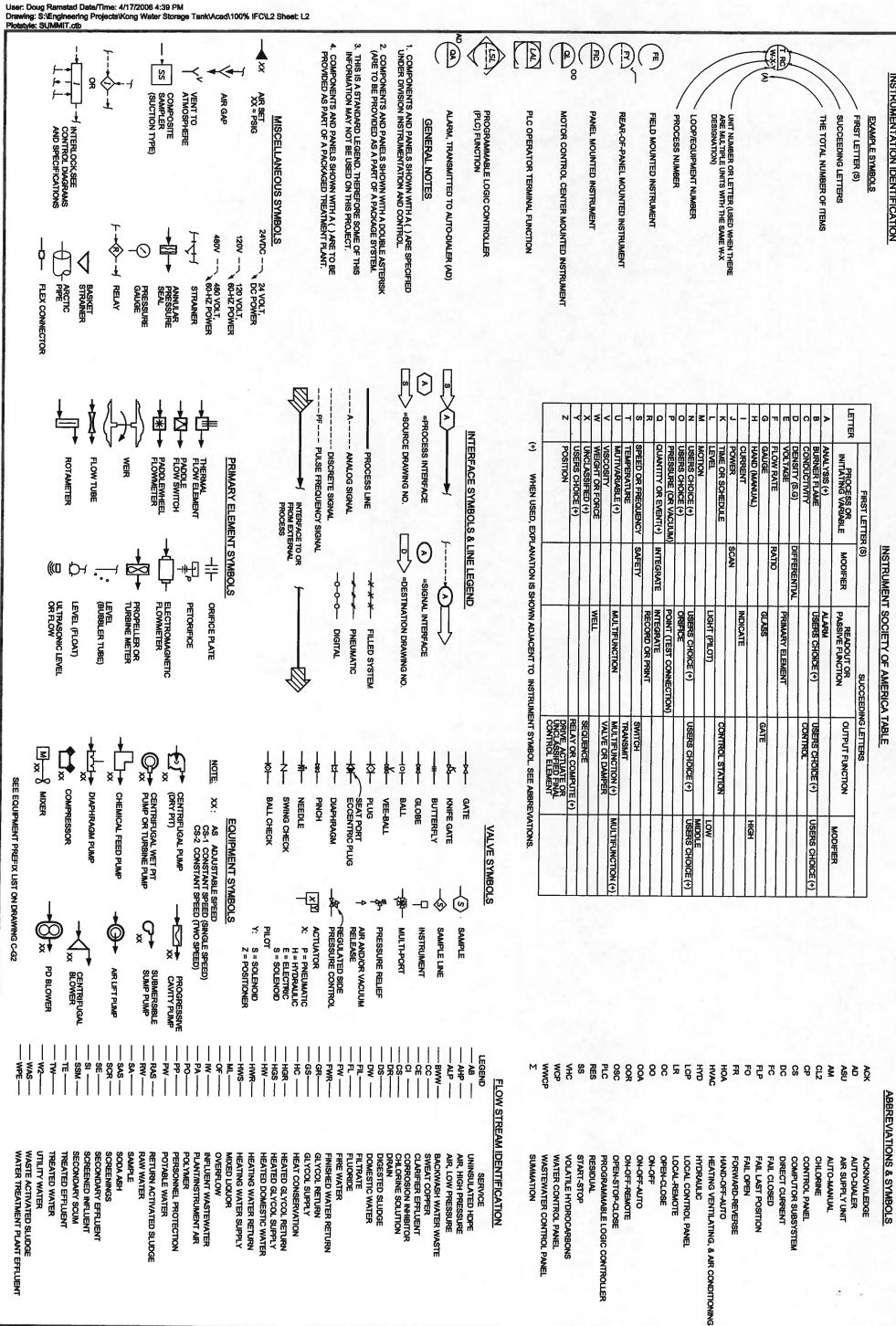
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KONGIGANAK

1.2 MG WATER STORAGE TANK

LEGEND AND NOTES

ISSUED FOR CONSTRUCTION



VILLAGE SAFE WATER

CONSULTING

ENGINEERS, INC.

INSTRUMENTATION IDENTIFICATION

CONSTRUCTION SEQUENCE

GENERAL: THE WATER STORAGE TANK AND FOUNDATION IS DESIGNED TO BE PLACED UPON VERY SILTY SQILS AND WARM PERMAFROST. IN ORDER FOR THE FOUNDATION TO SUPPORT THE WATER STORAGE TANK, AFTER IT IS FILLED, IT IS CRITICAL THAT FREEZE BACK OF THE SQILS UNDER THE TANK, BE ACHIEVED, THE TIME PERIOD BETWEEN EVENTS MAY REQUIRE EXTENSION, DEPENDING UPON THE WANTER WEATHER ENCOUNTERED AND OTHER CONDITIONS WHICH MAY AFFECT EDERETE BACK UNITER THE FOLINDATION. FREEZE BACK UNDER THE FOUNDATION.

FURTHER, ANY CHANGES TO THESE PLANS AND SPECIFICATIONS MUST HAVE PRIOR APPROVAL, IN WRITHAG, BY GEOTECHNICAL, STRUCTURAL DESIGN, AND PROJECT ENGINEER, PRIOR TO IMPLEMENTATION. ANY CHANGES, WHICH ARE NOT APPROVED IN WRITING, MAY ALTER THE DESIRED EFFECT OF THE DESIGN AND MAKE THE DESIGN NULL AND VOID.

THE FOLLOWING IS THE GENERAL SEQUENCE OF CONSTRUCTION:

1. THE SURFACE ORGANICS SHOULD BE REMOVED AND THE SITE GRADED TO THE NEAR LEVEL SURFACE THAT WILL SUPPORT THE GEOFCOAM BLOCKS, BUT THE BLOCKS WILL NOT BE INSTALLED. THE GRADING IS EXPECTED TO BE A CUT, UNDER THE TANK AREA. THIS WORK IS EXPECTED TO OCCUR IN THE LATE SUMMER OF 2005. CARE WILL BE TAKEN TO PREVENT THE EXPOSED SOIL FROM BECOMING SATURATED WITH RAIN WATER, AND NO PONDING WILL BE ALLOWED TO OCCUR.

2. IN THE LATE FALL, THE THERMOSYPHONS AND THERMISTOR STRINGS WILL BE INSTALLED, THIS WORK SHOULD OCCUR WHEN THE ART TEMPERATURE IS BELOW OR AT FREEZING. THE THERMOSYPHONS AND THERMISTOR STRINGS WILL BE INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE RADIATORS SHALL BE TEMPORARILY BRACED AND PROTECTED DURING CONSTRUCTION OF THE FOUNDATION AND THE TANK.

3. DURING THE WINTER OF 2005-2006, SNOW MUST BE KEPT OFF THE SURFACE OF THE TANK FOOTPRINT. THE PROJECT WILL RETAIN A LOCAL WORKER AND PROVIDE A SNOW BLOWER FOR THE REMOVAL OF SNOW. THE REMOVED SNOW MUST BE DEPOSITED OFF THE FOOTPRINT AND TO THE SOUTH, WHERE THE LOCATION WILL NOT PROMOTE SNOW DRIFTS ON THE FOOTPRINT. WEATHER CONDITIONS SHALL BE RECORDED ON A DAILY BASIS, USING THE RECORDING WEATHER STATION AT THE PROJECT OFFICE. REJONGS FROM THE THERMISTORS SHALL BE COLLECTED ON A WEEKLY BASIS AND TRANSMITTED TO THE GEOTECHNICAL ENGINEER AND PROJECT ENGINEER FOR REVIEW.

5. THE GEOFOAM AND INSULATION MUST BE PROTECTED BY THE INSTALLATION OF A HYDROCARBON RESISTANT MEMBRANE. THE MEMBRANE MUST TOTALLY ENCAPSULATE THE GEOFOAM. A MEMBRANE MUST BE INSTALLED OVER THE INSULATION PERIMETER AND SLOPE AWAY FROM THE TANK. THE MEMBRANE SHALL EXTEND TWO FEET BEYOND THE MISULATION AND WRAPPED UP OVER THE GRADE BAND. ANY LOCATIONS WHERE THE MEMBRANE IS CUT TO PROVIDE OPENINGS SUCH AS AT THE RADIATORS AND WHERE THE THERMISTOR CONDUITS COME ABOVE GRADE SHALL BE PROTECTED WITH A PARTCH OF BENTOMAT, A GEOSYNTHETIC CLAY LINER. THE PATCHES SHALL EXTEND 12 INCHES BEYOND THE CUT IN THE MEMBRANE AND SHALL EXTEND 4 INCHES UP THE CONDUIT OR THERMOSYPHONS. THE BENTOMAT SHALL BE THOROUGHLY WATERED BEFORE THE OVERLYING FILL IS PLACED. 4. DURING THE EARLY SPRING OF 2006, WHEN THE GROUND IS JUST STARTING TO THAW, AND THE DAILY AIR TEMPERATURES ARE JUST ABOVE FREEZING, THE SHALL BE CONSTRUCTED AND THE GEOFOAM INSTALLED INSIDE THE GRADE BAND, IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS, GREAT CARE MUST BE TAKEN TO PROTECT THE THERMOSYPHONS RADIATORS AND THE THERMISTOR

AFTER INSTALLATION OF THE GRADE BAND AND GEOFOAM, THE GEOFOAM SHALL BE COVERED WITH A 6-INCH THICK LAYER OF FILL (SAND, CRUSHED ROCK, OR CEMENT TREATED SILT) TO PROVIDE A WORKING SURFACE FOR THE CONSTRUCTION OF THE TANK.

8. THE CONSTRUCTION OF THE TANK WILL AFFECT THE WIND PATTERNS AND MAY EFFECT THE LOCATIONS OF SNOW DRIFTING, IF SNOW DRIFTING OCCURS THAT BLOCKS THE AFFLOW UNDER THE ADJACENT STRUCTURES AND PROPER AIRFLOW AROUND THE THERMOSYPHONS; THE SNOW SHOULD BE CLEARED OR THE THERMOSYPHON RADIATORS MAY NEED TO BE RETROFITTED TO PROMOTE PROPER WINTER COOLING, DURING THE PEROD WHEN THE FREEZE BACK IS OCCURRING, IN THE WINTER OF 2008/2007, THE RADIATORS MUST BE MONITORED TO ENSURE THEY ARE KEPT FREE FROM DRIFTING SNOW. THE DRIFT PATTERNS MUST BLASD BE MONITORED AND DOCUMENTED TO ALLOW RELOCATION OF THE BRANKTORS. 7. AFTER THE INSTALLATION OF THE FILL, THE CONSTRUCTION OF THE WATER STORAGE TANK CAN BEGIN, THE TANK SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. GREAT CARE SHALL BE TAKEN TO PREVENT ANY EQUIPMENT FROM STANDING OR RUNNING OVER THE GRADE BAND. GREAT CARE SHALL ALSO BE TAKEN TO PREVENT DAMAGE TO THE THERMOSYPHON

9. AFTER THE CONSTRUCTION OF THE TANK, THE READINGS OF THE THERMISTORS SHALL BE PROVIDED TO THE GEOTECHNICAL ENGINEER AND THE PROJECT ENGINEER MONTHLY. THE TANK MAY BE FILED IN THE SPRING OF 2007, IF THE GEOTECHNICAL ENGINEER IS SATISFIED THAT FREEZE BACK OF THE MATERIAL UNDER THE GEOFOAM HAS BEEN ACHIEVED.

PROJECT NARRATIVE AND SCHEDULE:

THIS PROJECT CONSISTS OF THE CONSTRUCTION OF A 1.2 MILLION-GALLON WATER STORAGE TANK. A BYPASS OF THE EXISTING WASTEWATER PRE-TREATMENT IS INCLUDED IN THIS

THE WORK WILL BE INITIATED IN THE SUMMER OF CY 2005. WORK WILL OCCUR IN CY 2006 AND BE COMPLETED IN 2007 末

THE WORK WILL CONSIST OF THE FOLLOWING

- CONSTRUCTION OF THE ACCESS ROAD.
- CONSTRUCTION SURVEY AND STAKING OF THE LOCATION OF THE TANK.

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- CLEARING AND GRUBBING OF THE WORK AREA OF THE TANK FOOT PRINT AND SURROUNDING AREA.
- PURCHASE AND DELIVERY OF THE WATER STORAGE TANK.
- INSTALLATION OF THE THERMOSTYPHONS

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- INSTALLATION OF THE PRE-TREATMENT BYPASS
- THE TANK FOOTPRINT WILL BE KEPT CLEAR OF SNOW, USING LOCAL LABOR, DURING THE WINTER OF CY
- INSTALLATION OF THE TANK FOUNDATION WILL OCCUR IN EARLY SPRING OF CY 2006.
- CONSTRUCTION OF THE TANK MAY BEGIN AS SOON AS THE FOUNDATION IS COMPLETED AND FINISHED.

10. THE TANK MUST NOT BE FILLED UNDER ANY CIRCUMSTANCE, INCLUDING: LEAK TESTING, BALLAST, OR ANY OTHER POSSIBLE REASON, UNTIL WRITTEN DOCUMENTATION IS RECEIVED FROM THE GEOTECHNICAL ENGINEER THAT REEZE BACK HAS OCCURRED.

REFERENCE TO TANK INSULATION, VALVE HOUSE, RAW WATER PIPING, TREATED WATER PIPING INSTRUMENTATION, ELECTRICAL OR MECHANICAL WORK IS FOR REFERENCE ONLY AND WILL BE ADDRESSED IN THE NEXT PHASE OF WORK.

WORK ON THE EXISTING WATER STORAGE TANK, AND CHANGES INSIDE OF THE EXISTING WATER TREATMENT PLANT SHALL BE DESIGN AND BUILT IN THE NEXT PHASE OF WORK.

KONGIGANAK WATER STORAGE CAI CULATIONS:

ALL CALCULATIONS ARE BASED UPON DATA FROM THE MASTER SANITATION PLAN AND UPDATE

TOTAL STORAGE (GAL)	EXISTING WST (GAL) EXISTING SCHOOL WST (GAL) EXISTING PROCESSED WST (GAL) NEW WST (GAL)
1,862,065	572,000 80,000 10,085 1,200,000

289 S 887

SSUME 2.5% ANNUAL GROWTH 2000 2010 2020	OTAL STORAGE (GAL) MONTHS (GALMO) D DAYS/MO (GALDAY) ALLONS AVAILABLE/DAY	EW WST (GAL)
359 590	1,862,085 286,009 8,867 8,867	1,200,000

55 2

PATA	SSUME: FLUSHES/PCD GAL/PCD TOT
	PCD @ 0.4 GALA
	THE WELL
	7

FIRST FILL OF YEAR OCCURS MID MAY LAST FILL OF YEAR OCCURS MID OCT MONTHS STORAGE REQUIRED (MO)

WATER REQUIRED

2000 2010 2020

WATER USE/DAY (GAL) 5385 6800 8850

WATER AVAILABLE (GAL/DAY) 8867 8867 8867

(GAL/DAY) UMMIT ULTING SERVICES







KONGIGANAK 1.2 MG WATER STORAGE TANK

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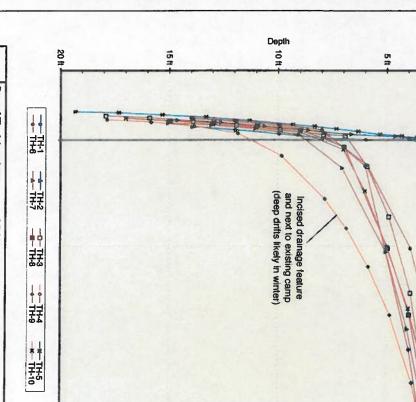
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Job No.:

User: Doug Ramstad Date/Time: 4/17/2006 4:41 PM Drawing: S:\Engineering Projects\Kong Water Storage Tank\Acad\100% iFC\D2 Sheet: D2 Plotstyle: SUMMIT.ctb

TEST HOLE SITE PLAN







Dume Miller & Asso Job No.: 4146.003 Date: July 2004 High ground near existing tank and center of site Neasured Temperatures on July 19, 2004; Kong WST GROUND TEMPERATURES Proposed Water Storage Tank Kongiganek, Alaska 40.0°F → Plate

GEOTECHNICAL INFORM TION:

THE SANITATION FACILITIES MASTER PLAN, PREPARED BY HDR ALASKA IN 1983 INDICATED THE KONGIGAWAK TOWNSITE AND IMMEDIATE AREAS ARE UNDERLAIN BY PERENNIALLY FROZEN SILTS AND FINE SANDS TO A MINIMUM DEPTH OF APPROXIMATELY 200 FEET, BASED UPON AVAILABLE INFORMATION. SURFACE AND NEAR SURFACE SOLIS ARE COMPOSED OF ORGANIC OVERBURDEN AND ORGANIC RICH SILTS WITH ICE INCLUSIONS. ISOLATED PERMAFROST-FREE SOIL POCKETS ARE OFTEN ENCOUNTERED DUE TO LOCALIZED THAW BULBS NEAR LARGE BODIES OF WATER, WITH POTENTIAL SALT INCLUSIONS.

LIMITED GEOTECHNICAL INVESTIGATIONS IN THE PAST, NAMELY BY QUANDRA ENGINEERING AND HDR ALASKA ENGINEERING INDICATE SOME SOILS TESTING HAS OCCURRED NEAR THE WATER STORAGE TANK AND THE WATER TREATMENT PLANT. THESE INVESTIGATIONS INDICATE THE FOLLOWING GENERAL SOIL PROFILE:

30.0°F

THE PERMAFROST LEVEL WAS NOT INDICATED.

CURRENT INVESTIGATIONS:

PEAT, WITH VISIBLE ICE
ORGANIC SILTS WITH VISIBLE ICE
SILT WITH SOME ORGANICS AND VISIBLE ICE
GRAY-GREEN SILT WITH SOME CLAY
BROWN SILT WITH SOME CLAY AND TRACES OF ORGANICS

0-4 4-8 8-12 12-20 BELOW 20

DEPTH (FT)

DESCRIPTION

LIMITED GEOTECHNICAL INVESTIGATIONS OF THE SOILS NEAR THE EXISTING AND PROPOSED LAGOON WERE PERFORMED. LACK OF SUITABLE EQUIPMENT AND THE TYPE OF SOILS LIMITED MOBILITY FOR LARGER EQUIPMENT AND A DRILL RIG WAS NOT AVAILABLE.

AN INITIAL SOILS INVESTIGATION FOR THE LAGOON DESIGN WAS CONDUCTED BY MR. CHRIS ALLARD, P.E. MONTGOMERY WATSON HARZA, OCTOBER 2001. THE METHOD USED WAS A 5-FOOT PROBE CONSTRUCTED OF 1/8-INCH STEEL PIPE WITH AN OUTSIDE DIAMETER OF 0.4 INCHES. THE RESISTANCE TO THE PROBE TO INSERTION INTO THE SOILS WAS USED AS AN INCHES. THE SOILS TYPE.

THE GENERAL SOILS PROFILE OBSERVED CONSISTED OF 18 INCHES OF ORGANICS COMPRISED OF ORGANICS ROOTS AND PEAT. THE UPPER 1 TO 3 INCHES WERE FROZEN. BELOW THE ORGANICS IN MOST LOCATIONS WAS GRAY SILT THAT BECAME SLIGHTLY STIFFER (OFFERING MORE RESISTANCE) WITH DEPTH.

VARIATIONS TO THIS GENERAL PROFILE WERE FOUND IN THE MOUNDS AT THE SOUTH END AND SOUTHWEST SIDE OF THE LAGOON, WHERE PERMARROST WAS FOUND AT OR NEAR 2-FEET DEPTH. ANOTHER VARIATION WAS VERY LITTLE RESISTANCE TO PROBING TO 5-FEET DIGGING, USING HAND IMPLEMENTS REVEALED A TRANSITION FROM ORGANICS TO A MIXTURE OF ORGANICS AND SILT, BECOMING MORE SILTY WITH DEPTH. THIS PROFILE WAS FOUND IN SCATTERED LOCATIONS ALONG THE WEST SIDE OF THE LAGOON.

IN JUNE, 2004 CHRIS WROBEL, ENVIRONMENTAL SCIENTIST WITH SUMMIT CONSULTING SERVICES, INSTALLED TEN THERMISTOR WELLS IN THE FOOTPRINT OF THE WATER STORAGE TANK FOUNDATION. THE TEST WELL LOCATIONS ARE SHOWN ON DETAIL D2 #1. THE WELLS WERE BETWEEN 15 AND 20 FEET DEEP. A SURFACE MAT OF OR GANIC MATERIAL EXTENDED BETWEEN ONE AND THREE FEET DEEP. THE UNDERLYING SOILS CONSISTED ENTIRELY OF TAN SILT. FROZEN SOILS WERE FIRST ENCOUNTERED FROM AS SHALLOW AS 1.5 FEET TO AS DEEP AS 13 FEET BELOW THE SURFACE. THE SOIL LOGS ARE INCLUDED ON SHEET D3. AFTER THE WELLS WERE ALLOWED TO STABILIZE FOR SEVERAL WEEKS, A CREW FROM DUANE MILLER AND ASSOCIATES MEASURED THE SOIL TEMPERATURE FROM THE THERMISTOR WELLS. THE MEASURED TEMPERATURES BELOW 22 DEGREES F WERE FOUND TO BE AS SHALLOW AS THREE FEET AND AS DEEP AS 11.25 FEET. THESE MEASUREMENTS ARE INCLUDED ON DETAIL D2, #2. IN JUNE 2002, ANOTHER LIMITED GEOTECHNICAL SOILS INVESTIGATION WAS CONDUCTED BY RON GODDEN, P.E., SUMMIT CONSULTING SERVICES, NEAR THE SOUTH END OF THE EXISTING LAGOON. WHILE MOBILITY OF THE EXCAVATOR AND BULLDOZER WAS LIMITED, A HOLE TO 9-FEET BELOW GRADE WAS ACCOMPLISHED. THE SOILS PROFILE OBSERVED CONSISTED OF APPROXIMATELY 1-FOOT OF ORGANICS AND PEAT, UNDERLAIN BY GRAY SILT TO 5-FEET. FROM 5-FEET TO APPROXIMATELY 9-FEET, GRAY BLACK SILT WAS OBSERVED. PERMAFROST WAS ALSO OBSERVED BEGINNING AT APPROXIMATELY 3-FEET TO THE BOTTOM OF THE HOLE.

KONGIGANAK 1.2 MG WATER STORAGE TANK

GEOTECHNICAL INFORMATION

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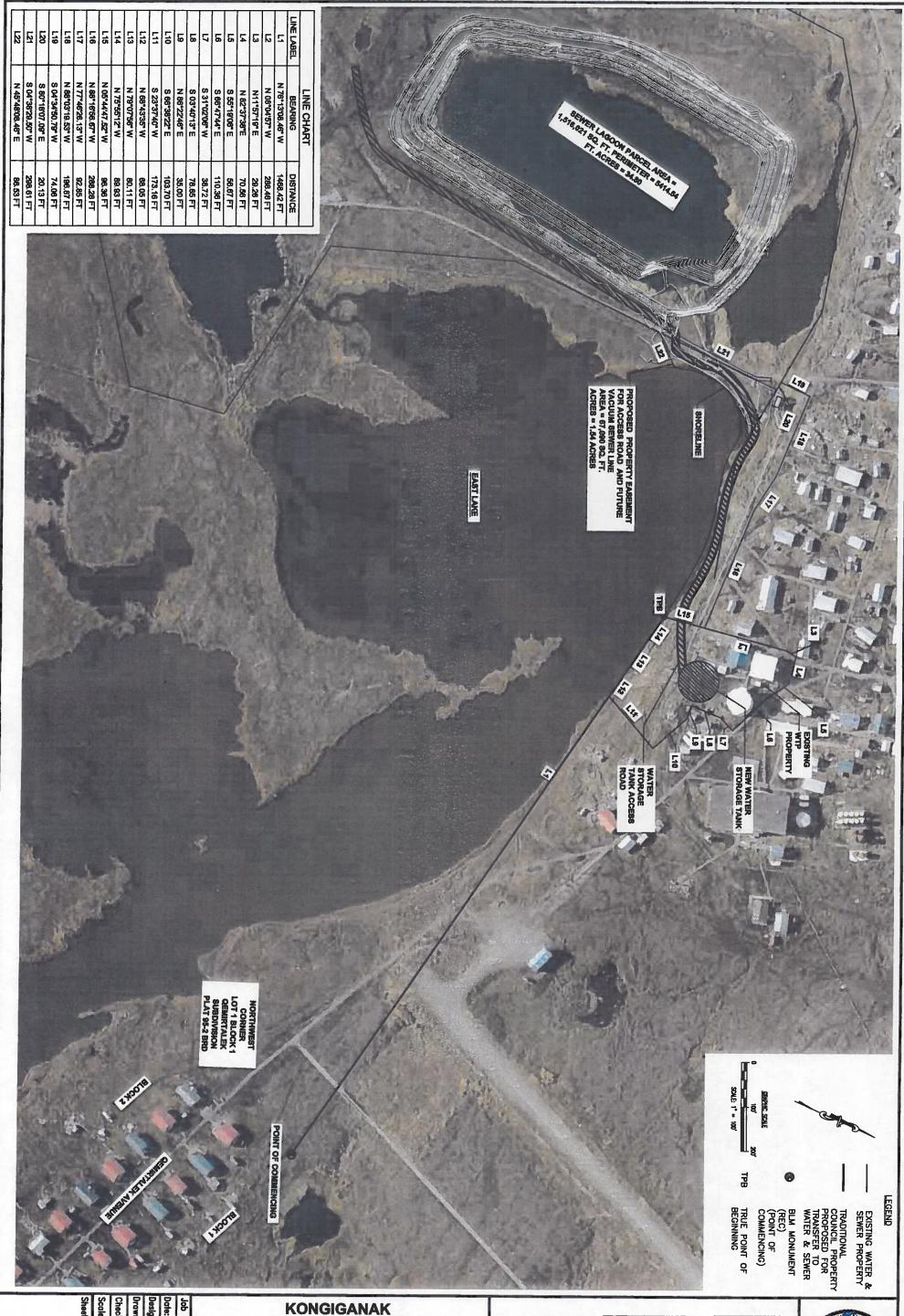
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THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT ARE INCORPORATED TO THIS DESIGN AND HAVE BEEN COORDINATED WITH THE GEOTECHNICAL ENGINEER.

A GEOTECHNICAL REPORT WAS PREPARED BY DUANE MILLER AND ASSOCIATES AUGUST 15, 2005. THIS REPORT WAS PROVIDED UNDER A SEPERATE SUBMITTAL.

GEOTECHNICAL REPORT:

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1.2 MG WATER STORAGE TANK

SURVEY CONTROL





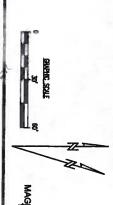




	S 31°02'06" W	ᅜ
	N 11°57'19" E	-
DISTANCE	BEARING	LINE LABEL
	LINE CHART	

C13	C12	C11	C10	8	&	63	8	S	2	ಜ	ន	C	CORNER LABEL	CORN
90°	27°	90°	35°	98°	110	42°	710	20°	68°	3°	10°	88°	DEGREE OF CHANGE	CORNER CHART





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KONGIGANAK 1.2 MG WATER STORAGE TANK

UTILITY SITE BOUNDARIES ISSUED FOR CONSTRUCTION









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1.2 MG WATER STORAGE TANK SITE PLAN









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KONGIGANAK 1.2 MG WATER STORAGE TANK

THERMISTOR SITE PLAN AND SPECIFICATIONS **ISSUED FOR CONSTRUCTION**

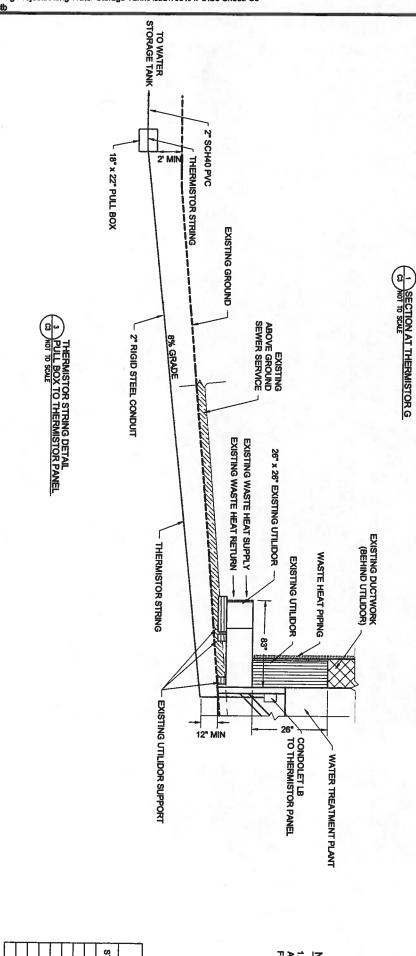


A1, A2 B1, B2 C-1, C2 D-1, D-2 E-1, E-2 E-1, F-2 G-1, G-2 H-1, H-2









⊕ ELEV 19.25

ELEV 19.25

THERMISTOR 1 BACK UP
THERMISTOR 1

ELEV 23.25

THERMISTOR 2

1/2" PVC SCH40

FILL WITH DRY SAND

THERMISTOR 2 BACK UP

⊕ ELEV 27.25

THERMISTOR 3 BACK UP

THERMISTOR 4 BACK UP

FILL WITH DRY SAND

ELEV 31.25

THERMISTOR STRING BACK UP THERMISTOR STRING

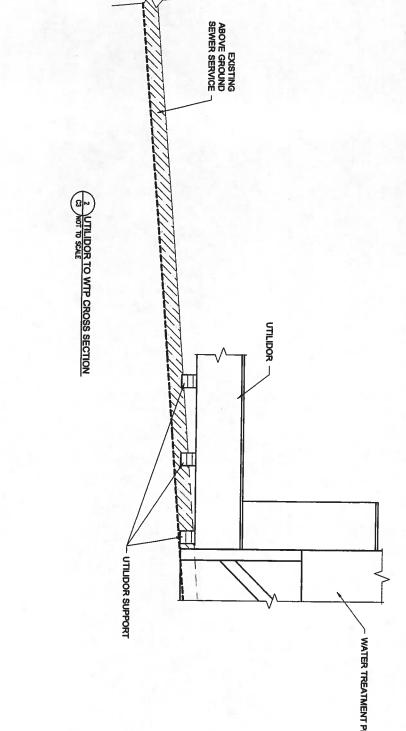
⊕ ELEV 30.75

LOCAL FILL LEVELING COURSE

EXISTING SURFACE

BOTTOM OF TANK ELEVATION 35.25

		FOR ALL ELEVATIONS PROVIDED IN THIS DESIGN.	1. THE TBM (TEMPORARY BENCH MARK) IS AT AN ELEVATION OF 40.65'. THIS IS THE REFERENCE	NOTES:	
C	8	Α	THERMISTOR #	THERMISTOR PVC RI	
			2"		



		(TWO STRINGS REQUIRED FOR EACH THERMISTOR)	(TWO STRINGS REQUIRED FOR EACH THERMISTOR)	ERMISTOR)	
STRING TAG	THERMISTOR 1	THERMISTOR 2	THERMISTOR 3	THERMISTOR 4	TOTAL STRING LENGTH
A-1,A-2	153.7	149.7	145.7	142.2"	163 7
B-1,B-2	173.1'	169.1'	165.1	161.6	183 1
0-1,0-2	191.5	167.5	183.5	180.00	304 5
D-1,D-2	215.3	211.3"	207.3	202 81	205.0
E-1.E-2	163 6	150 81	ARE DI	200.0	6.62
		100.0	0.00	152.1	173.6
7-1,1-2	211.6'	207.6'	203.6	200.1	221.6
G-1,G-2	156.6'	152.6'	148.6"	145.1	188 2
H-1,H-2	117.3'	113.3'	109.3'	105.8	127.3

2" SCH 40 PVC RACEWAY FROM PULL BOX TO END	I	6	П	т	D	c	8	A	THERMISTOR #	THERMISTOR PV
94.0'	6.0'	31.9"	50.2"	12.0'	30.0'	7.5'	22.9'	20.6'	2" SCH 40 PVC FROM RACEWAY TO THERMISTOR	THERMISTOR PVC REQUIREMENTS

Scale: AS	Checked By:	Drawn By:	Designed By:	Date: 10/	ייסט ואסיי
AS NOTED	WL	æ	REG	10/20/05	

C3

KONGIGANAK

1.2 MG WATER STORAGE TANK

THERMISTOR DETAILS

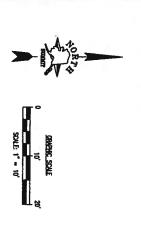








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NOTES:

- THERMO SYPHON AT 6' O.C.
- A-E INDICATES THERMISTOR STRING
- THE TBM (TEMPORARY BENCH MARK) IS AT AN ELEVATION OF 40.65. THIS IS THE REFERENCE FOR ALL ELEVATIONS PROVIDED IN THIS DESIGN.

(1) THERMOSYPHON PLAN

- PERIMETER LAYER OF RIGID INSULATION (SEE SHEET S2)

FOAM BOARD GRADE BAND TANK WALL THERMOSYPHON RADIATOR SEE NOTES 8 (8) (g). (F)

THERMOSYPHON MANUFACTURER REQUIREMENTS:

THE RADIATOR SECTION WILL CONSIST OF AT LEAST 70 SQUARE FEET OF AREA THE THERMOSYPHONS SHALL BE TWO-PHASE AND SHALL BE CONSTRUCTED OF 3-INCH DIAMETER

THERMOSYPHON SPECIFICATIONS THERMOSYPHON CONSTRUCTION:

STEEL PIPE

3HALL CONSIST OF HB FULLER IF-1074 FUSION BOND EPOXY NICE WITH AWS C2.2.

THE MANUFACTURER OF THE THERMOSYPHONS SHALL SUBMIT SHOP DRAWINGS UNDER THE SEAL OF A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF ALASKA, WHICH SHALL BE APPROVED BY THE GEOTECHNICAL AND PROJECT ENGINEER.

THE THERMOSYPHONS SHALL BE COATED TO PREVENT CORROSION. CORROSION PROTECTION S APPLIED OVER A MINIMUM OF 3 MILS OF FLAME OR ARC-SPRAYED ALUMINUM APPLIED IN ACCORD.

THE MANUFACTURER SHALL SPECIFY THE SHOP AND FIELD WELDING PROCEDURE SPECIFICATION (WPS) STANDARDS WHICH WILL BE USED DURING MANUFACTURE AND CONSTRUCTION OF THE THERMOSYPHONS.

THE MANUFACTURER PROCEDURE QUALIFICATION RECORDS SHALL ALSO BE PROVIDED.

THERMOSYPHON INSTALLATION:

THE VERTICAL SECTION OF THE THERMOSYPHONS SHALL EITHER BE FREE STANDING, OR BRACK BRACED AND PROTECTED DURING THE COMPLETION OF THE FILL PLACEMENT AND THE CONSTRU ETED TO THE TANK. THE RADIATORS SHALL BE TEMPORARILY CTION OF THE TANK.

THE RADIATORS MUST BE PROTECTED FROM DAMAGE DURING CONSTRUCTION. THE RADIATORS MUST BE INSPECTED AFTER CONSTRUCTION. IF ANY DAMAGE HAS OCCURRED, THE DAMAGE MUST BE EVALUATED BY THE GEOTECHNICAL AND PROJECT ENGINEERS TO DETERMINE IF REPLACEMENT IS REQUIRED. IF REQUIRED, DAMAGED RADIATORS MUST BE REPLACED. THE THERMOSYPHONS MUST BE INSTALLED ACROSS THE FULL WIDTH OF THAT TANK. THE RADIA

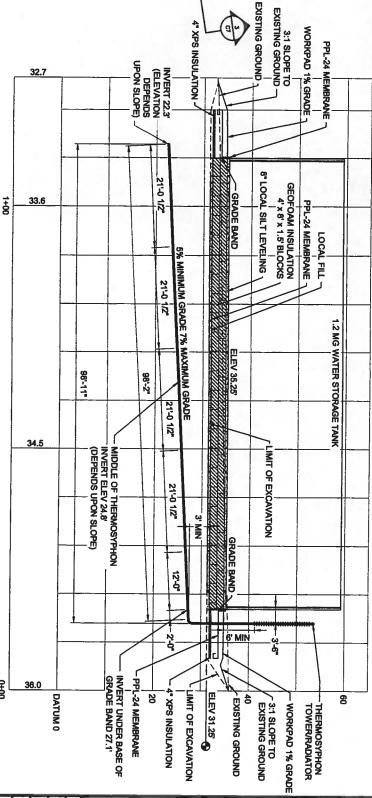
THAT PORTION OF THE THERMOSYPHONS UNDER THE TANK SHALL HAVE A MINIMUM SLOPE OF 5% SHALL BE 5 FEET BELOW THE BOTTOM OF THE GEOFOAM BLOCKS. THE MINIMUM DEPTH SHALL BE FORS MUST BE INSTALLED ON THE NORTHERLY SIDE OF THE TANK AND A MAXIMUM SLOPE OF 7%. THE AVERAGE BURIAL DEPTH 3 FEET BELOW THE GRADE BAND AT THE UPHILL SIDE AND A

MAXIMUM OF 8 FEET AT THE DOWNHILL SIDE.

THE THERMOSYPHONS SHALL BE INSTALLED IN A NARROW TRENCH. LOW OR HIGH SPOTS IN THE THERMOSYPHON PIPE ARE NOT ALLOWED.

AFTER THE THERMOSYPHONS ARE INSTALLED, THE TRENCH SHALL BE BACKFILLED WITH UNFROZEN LOCALLY AVAILABLE SILT, IN A MAXIMUM OF 12 INCH LIFTS. MATERIAL SHALL BE TAMPED FOR COMPACTION UNTIL NO FURTHER REDUCTION IN VOLUME CAN BE ACHIEVED. CARE MUST BE TAKEN WITH THE FIRST LIFT TO ENSURE THE THERMOSYPHONS ARE NOT DAMAGED BY THE COMPACTION EFFORT.

NOTE: ELEVATIONS AT MIDDLE AND END OF THERMOSYPHON ARE APPROXIMATE AND MAY VARY DUE TO SLOPE. THEY ARE PROVIDED TO FACILITATE CONSTRUCTION ONLY. ELEVATIONS AT THERMOSYPHON RADIATOR TOWER IS FIXED.



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Designed By: Job No.:

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Checked By: Drawn By:

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NOTED REG THERMOSYPHON PLAN









NOTE: OTHER THERMISTORS NOT SHOWN FOR CLARIT

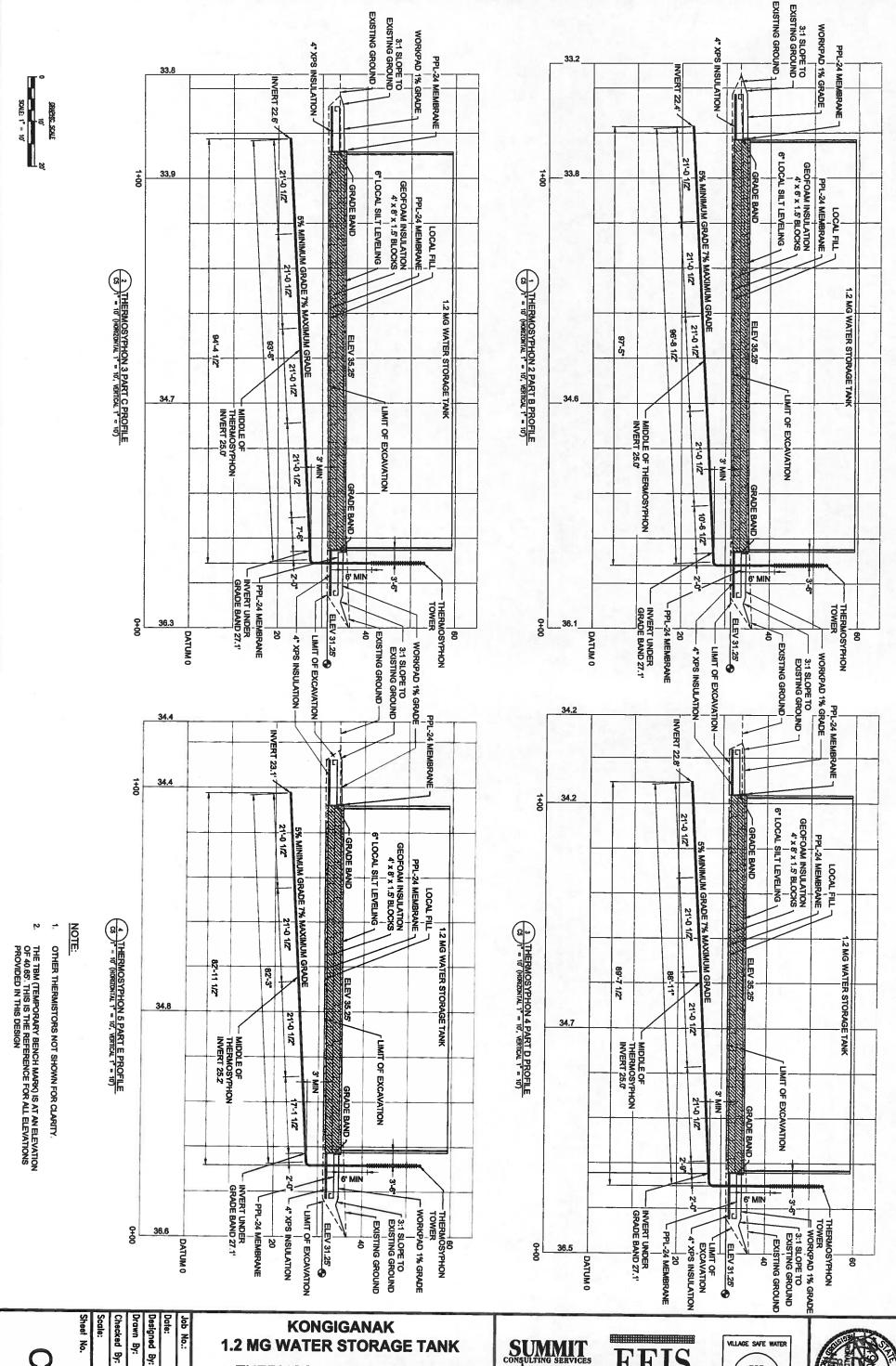
2 THERMOSYPHON 1 PART A PROFILE
C4 1" = 10' (HORIZONTAL 1" = 10'; VERTICAL 1" = 10')

KONGIGANAK 1.2 MG WATER STORAGE TANK

AND SPECIFICATIONS

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THERMOSYPHON PROFILES



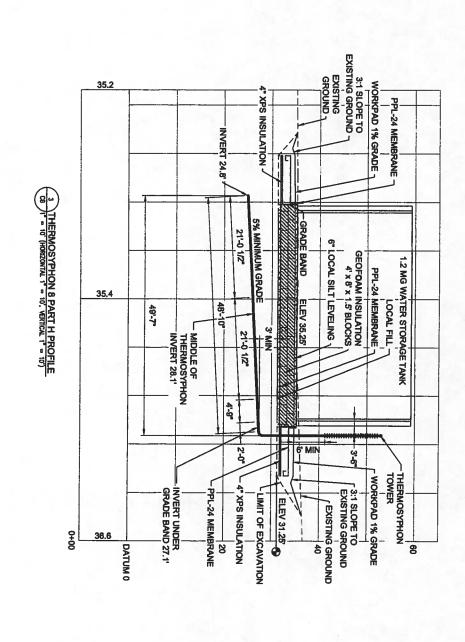


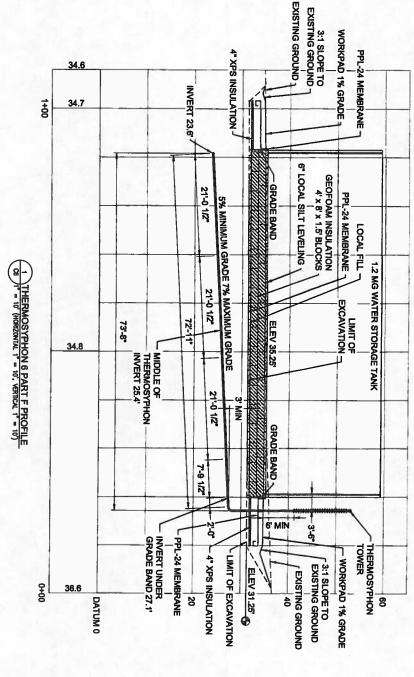


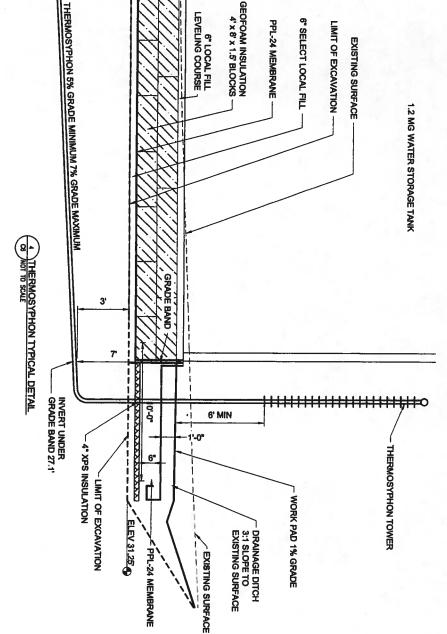


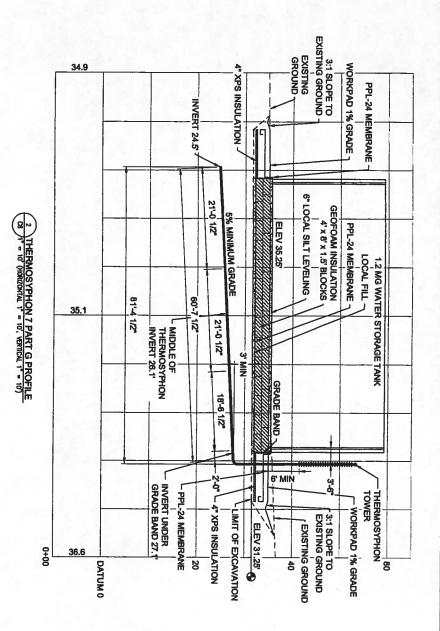
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C6

Sheet No.

OTHER THERMISTORS NOT SHOWN FOR CLARITY.

THE TBM (TEMPORARY BENCH MARK) IS AT AN ELEVATION OF 40.65°. THIS IS THE REFERENCE FOR ALL ELEVATIONS PROVIDED IN THIS DESIGN

Job No.:

Date: 10/20/05

Designed By: REG

Drawn By: RB

Checked By: REG

Scale: AS NOTED

KONGIGANAK 1.2 MG WATER STORAGE TANK

THERMOSYPHON PROFILES
AND DETAILS
ISSUED FOR CONSTRUCTION

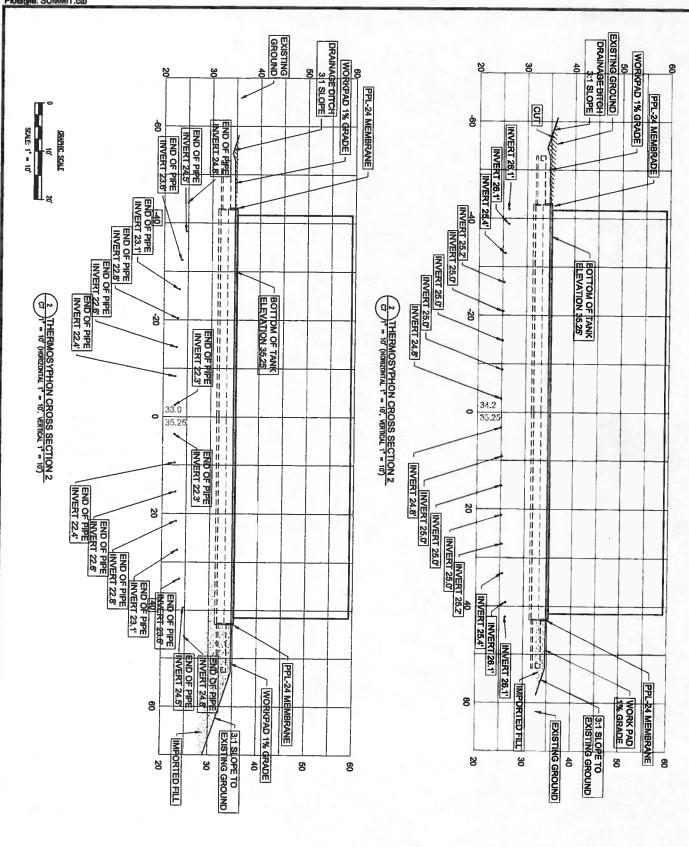


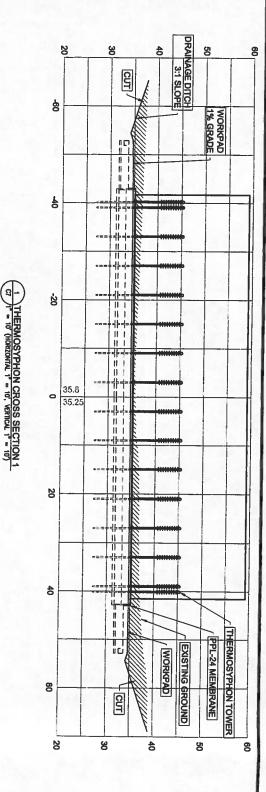






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NOTE:

THE TBM (TEMPORARY BENCH MARK) IS AT AN ELEVATION OF 40.65'. THIS IS THE REFERENCE FOR ALL ELEVATIONS PROVIDED IN THIS DESIGN

Checked Scale: Designed Sheet Drawn Date: Job No.: Š Ву: Ŗ ₩. REG AS NOTED 10/20/05 REG RB

KONGIGANAK 1.2 MG WATER STORAGE TANK THERMOSYPHON CROSS SECTIONS





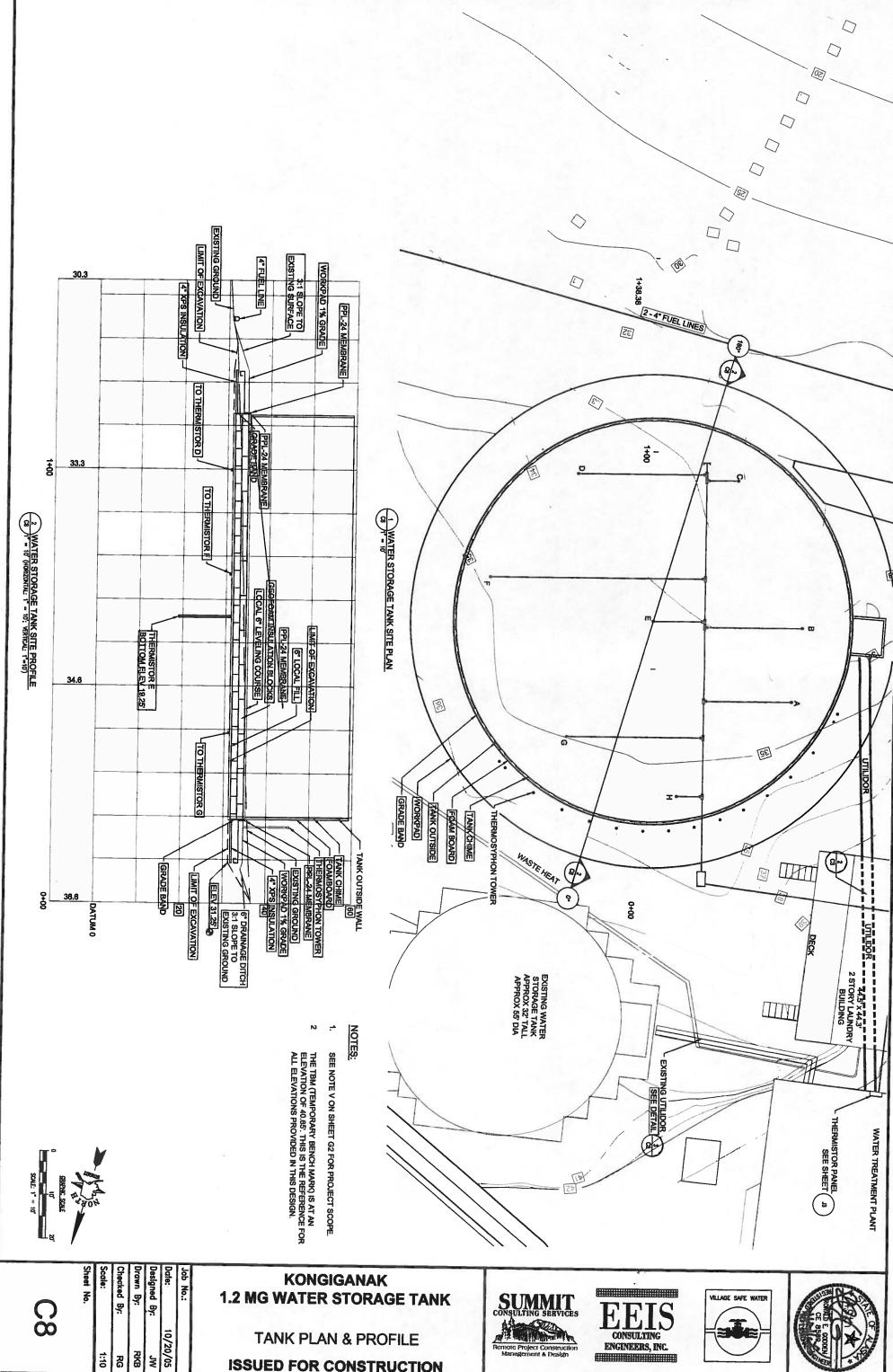


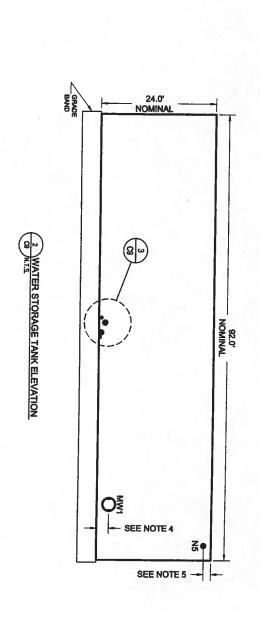


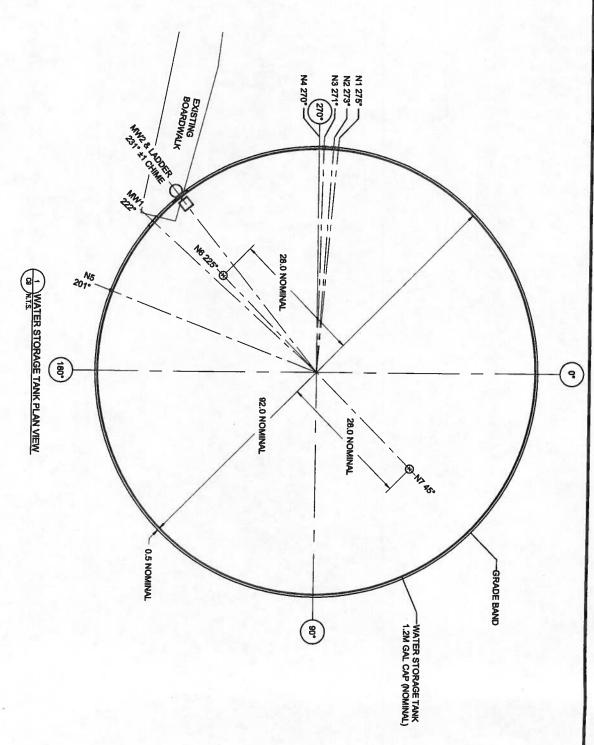
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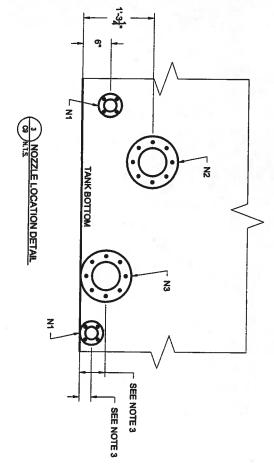
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ISSUED FOR CONSTRUCTION









Nozzie No.	Size	Description	Comment
N1	Ŋ	Tank Drain	Interior & Exterior flanges
153	6"	Fill line	Interior & Exterior flanges
చ	O _e	Draw line	Exterior flange and interior vortex breaker
¥	2"	LIT-1-2	exterior flange only
ớ	6"	Overflow	Interior pipe shall have vortex breaker
8	20"	Roof vent	Manway color with ventilator assembly
4	20"	Roof vent	Manway color with ventilator assembly
MW1	30"	Shell manway	
WW2	30°	Roof hatch	

NOTES:

- THE FOUNDATION SHALL BE LEVEL WITH DIFFERENTIAL NOT EXCEEDING ±1/4" OR ±0.02 FT WITHIN ANY 30 FT CIRCUMFERENCE ON THE SILTCRETE LEVEL
- AND PORTLAN
 OF NATT
 DRAINER
 AFTER A
 COMPAC
 PLATE C

THE LAYER THE FOAM REST UPON SHALL BE LEVEL WITH THE DIFFERENTIAL OF 9/16* OR ±0.05 FT WITHIN ANY 30 FT CIRCUMFERENCE.	OF NATIVE SILT. THE NATIVE SILT WILL BE DRAINED OF ANY FREE WATER, PRIOR TO MIXING AFTER MIXING, THE MATERIAL SHOULD BE COMPACTED AND SMOOTHED USING A SMALL PLATE COMPACTOR OR A SMALL, SMOOTH DRUM.
--	---

PLACEMENT TO BE AS CLOSE TO THE BOTTOM OF THE TANK AS POSSIBLE.

PLACEMENT TO BE PER MANUFACTURERS STANDARD HEIGHT.

YER THE FOAM REST UPON SHALL BE LEVEL HE DIFFERENTIAL OF 9/16" OR 40.05 FT	ICHE SHALL BE A MIXTURE OF NATIVE SILT ORTLAND CEMENT, WIT A RATIO OF 6.8% AND CEMENT, BY DRY WIT PER 1 CUBIC FT TIVE SILT. THE NATIVE SILT WILL BE ED OF ANY FREE WATER, PRIOR TO MIXING. MIXING, THE MATERIAL SHOULD BE NOTHER AND SMOOTHED USING A SMALL COMPACTOR OR A SMALL, SMOOTH DRUM.
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_	Z
MAGNETIC DEC. 14°22' E 2005	72-

	KONG	IGANAK	
1.2 MG	WATER	STORAGE	TANK



SEE SHEET D-1, NOTE 9

LADDER NOT SHOWN FOR CLARITY.

ALL SHELL NOZZLES ARE RADIAL.

PLACEMENT TO BE AS REQUIRED TO ACHEIVE A MINIMUM OF 6" BETWEEN THE TOP RIM OF THE OVERFLOW VORTEX BREAKER AND THE TOP OF THE SHELL TO ROOF CONNECTION.





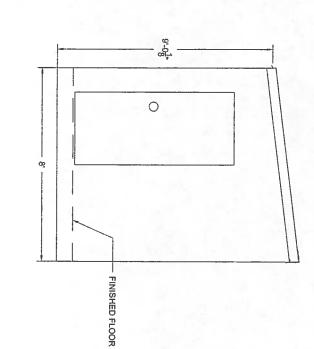


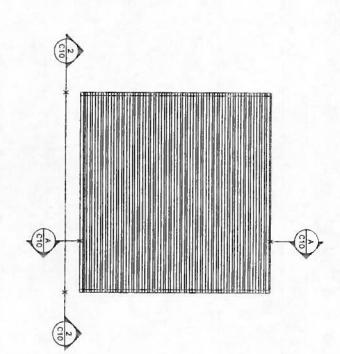
VALVE HOUSE ELEVATION

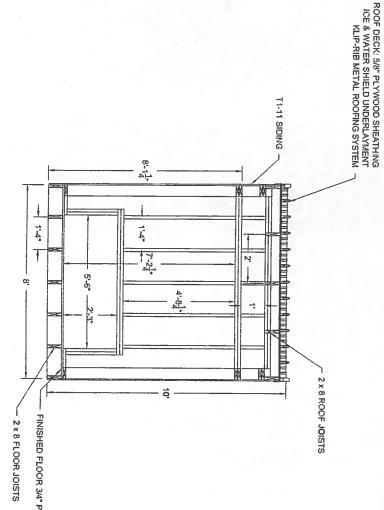
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CID SCALE: 1/2" - 1

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NOT PART OF THIS PROJECT FOR REFERENCE ONLY

VALVE HOUSE PLAN VIEW

NOTES:

- ALL STUD SPACES, ROOF JOIST SPACES & FLOOR JOIST SPACES TO BE INSULATED WITH FIBERGLASS BATT.
- INSTALL MINIMUM 6 MIL. VAPOR BARRIER TO INTERIOR STUDS & ROOF JOISTS.
- NTERIOR WALLS AND CEILING TO BE SHEATHED WITH 12" PLYWOOD OR OSB.

EE NOTE V ON SHEET G2 FOR PROJECT SCOPE.

LIP-RIB® ROOFING SYSTEM TO BE INSTALLED IAW MIFR'S ISTRUCTIONS.

OOF SPACE TO BE VENTILATED. INSTALL 2x6 BLOCKING V RAFTER SPACES ON TOP OF TOP PLATES. INSTALL IRD/BUG SCREENING BETWEEN TOP OF BLOCKING AND OOF SHEATHING.



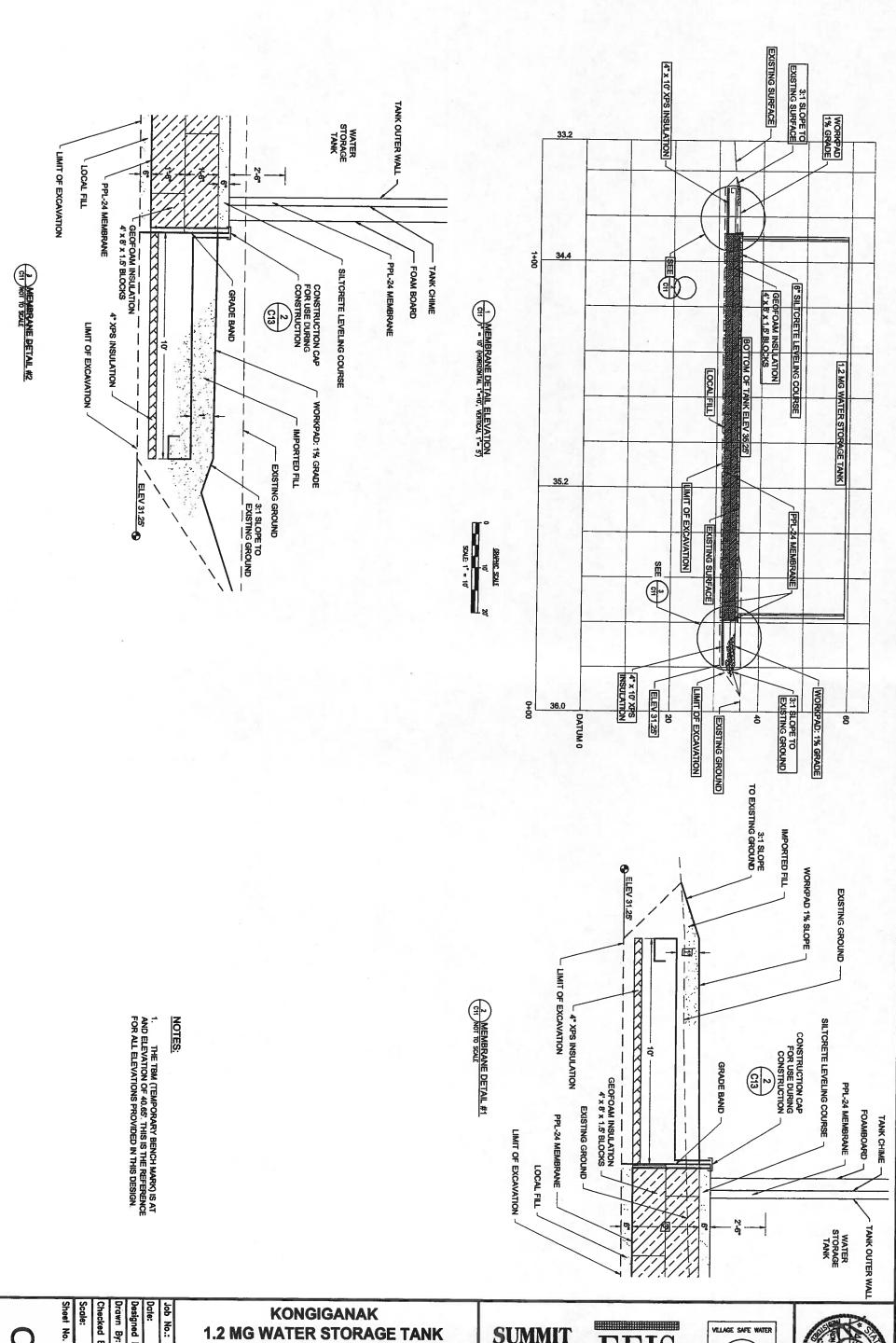




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0		1/2" = 1'	RG	RTK	RTK	10/20/05

KONGIGANAK 1.2 MG WATER STORAGE TANK

TANK VALVE HOUSING



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1.2 MG WATER STORAGE TANK

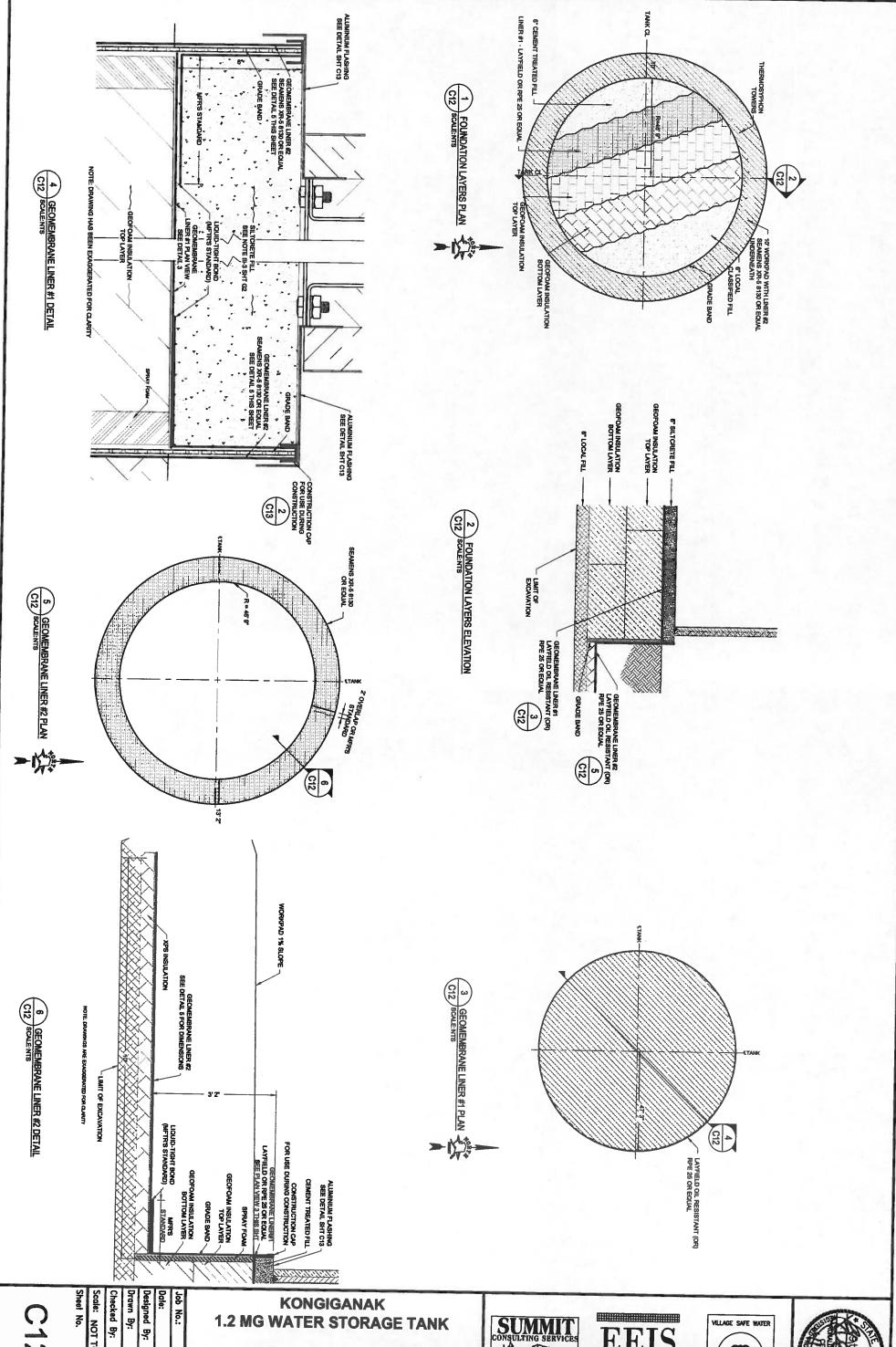
TANK MEMBRANE DETAILS ISSUED FOR CONSTRUCTION











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TANK FOUNDATION AND **GEOMEMBRANE LINER DETAILS** ISSUED FOR CONSTRUCTION

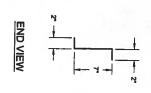


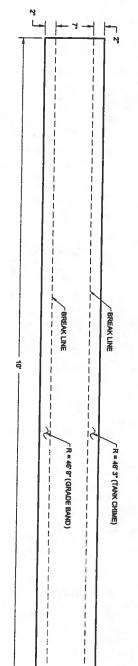




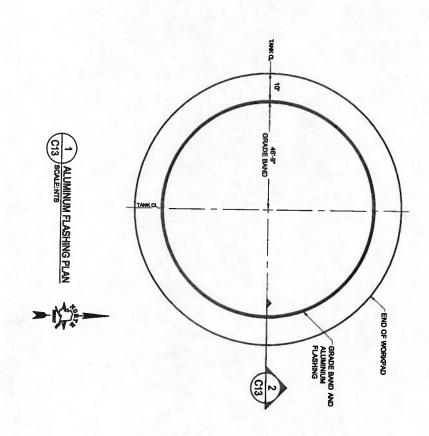


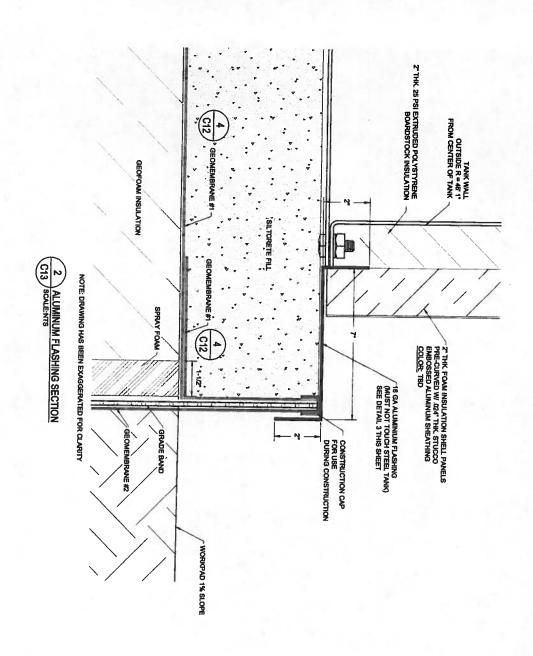
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Plotstyle: SUMMIT.ctb





3 ALUMINUM FLASHING PANEL (FLAT) C13 SCALE:NTS





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KONGIGANAK 1.2 MG WATER STORAGE TANK

ALUMINUM FLASHING DETAILS ISSUED FOR CONSTRUCTION

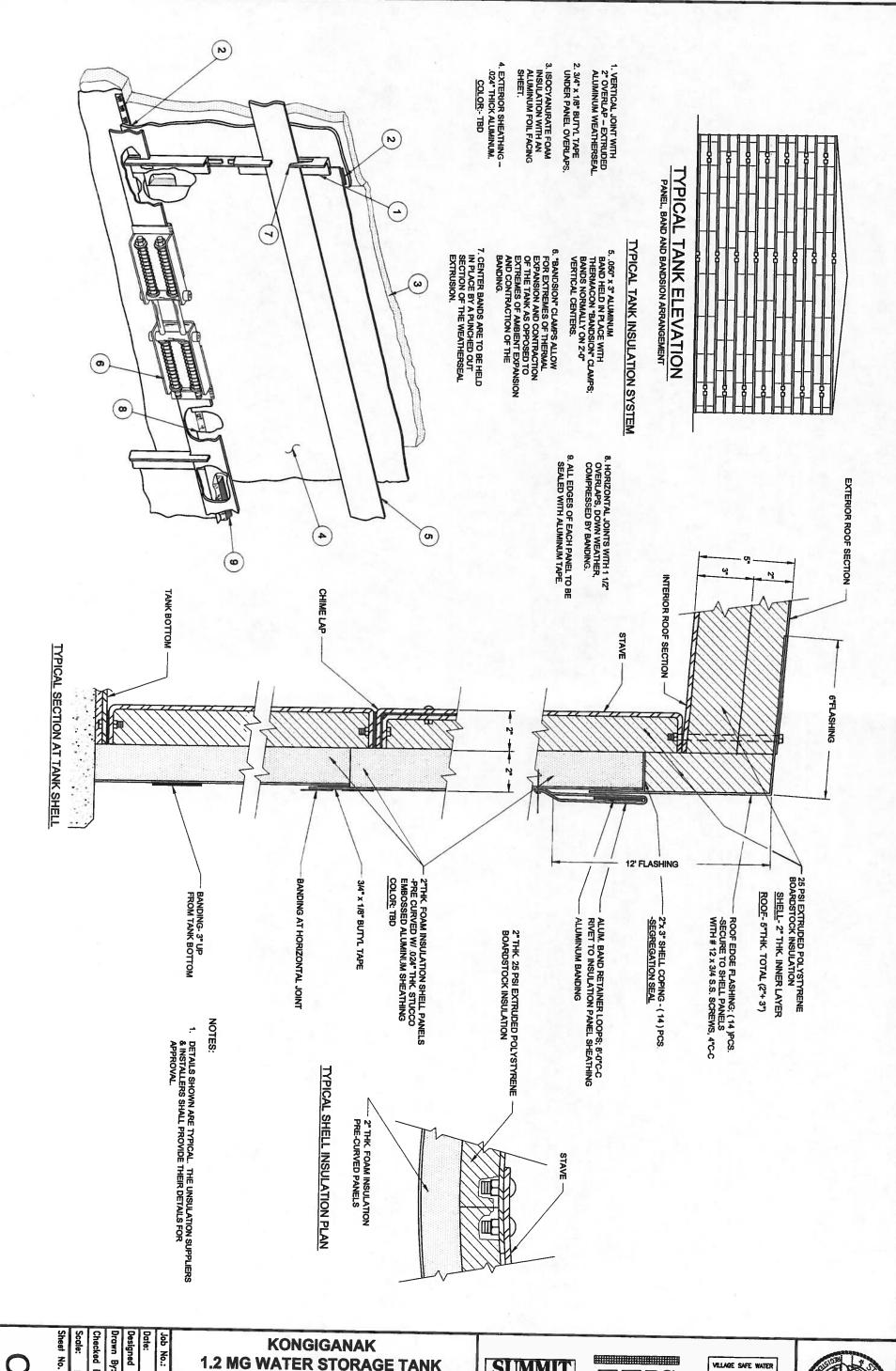








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Plotstyle: SUMMIT.ctb



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KONGIGANAK 1.2 MG WATER STORAGE TANK

TANK INSULATION DETAILS **ISSUED FOR CONSTRUCTION**









DIA: 92 FT
HEIGHT: 24 FT
HEIGHTTO
OVERFLOW: 24.5 FT
CAP: 1.2 MM GAL
INSUL: ROOF 5"
WALL 4"

DIA: 55 FT
HEIGHT: 32 FT
HEIGHT TO
OVERFLOW: 31.5 FT
CAP: .56 MM GAL
INSUL: 6"

DUTY:
DESIGN:
SHELL:
TUBE:
AREA:
INSULATION:
MATERIAL:
SHELL:
TUBE:

DOUBLE ISOLATION
XX
XX
XX
XX
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XX
XX

NEW RW STORAGE TANK

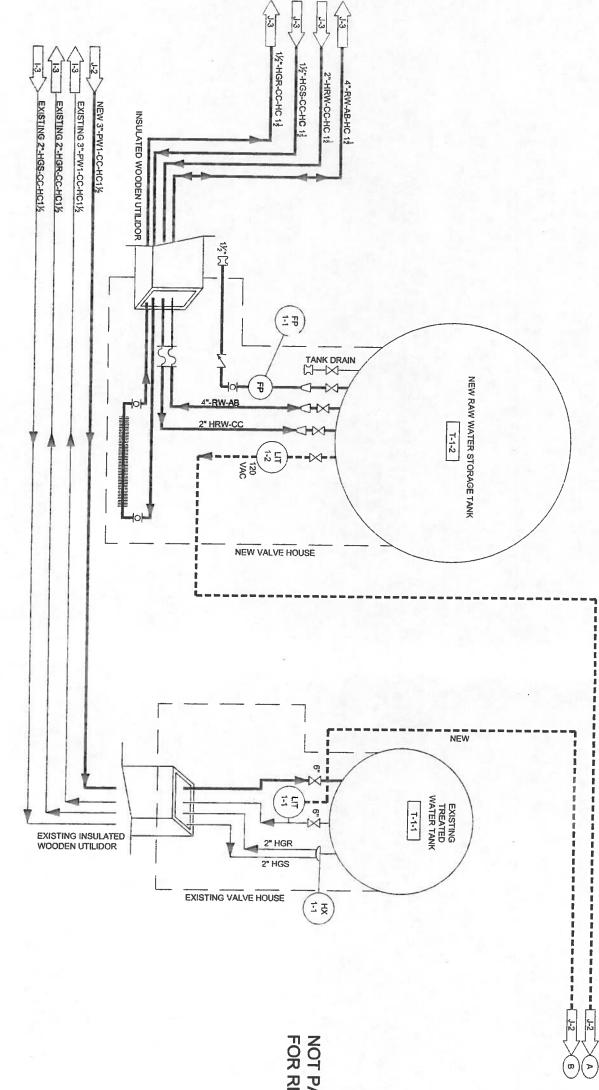
FIRE WATER PUMP
HP: XX

V.TS: XX

XX

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T-1-1
EXISTING STORAGE TANK



NOT PART OF THIS PROJECT FOR REFERENCE ONLY

SEE NOTE V ON SHEET G2 FOR PROJECT SCOPE.

NOTES:

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KONGIGANAK 1.2 MG WATER STORAGE TANK

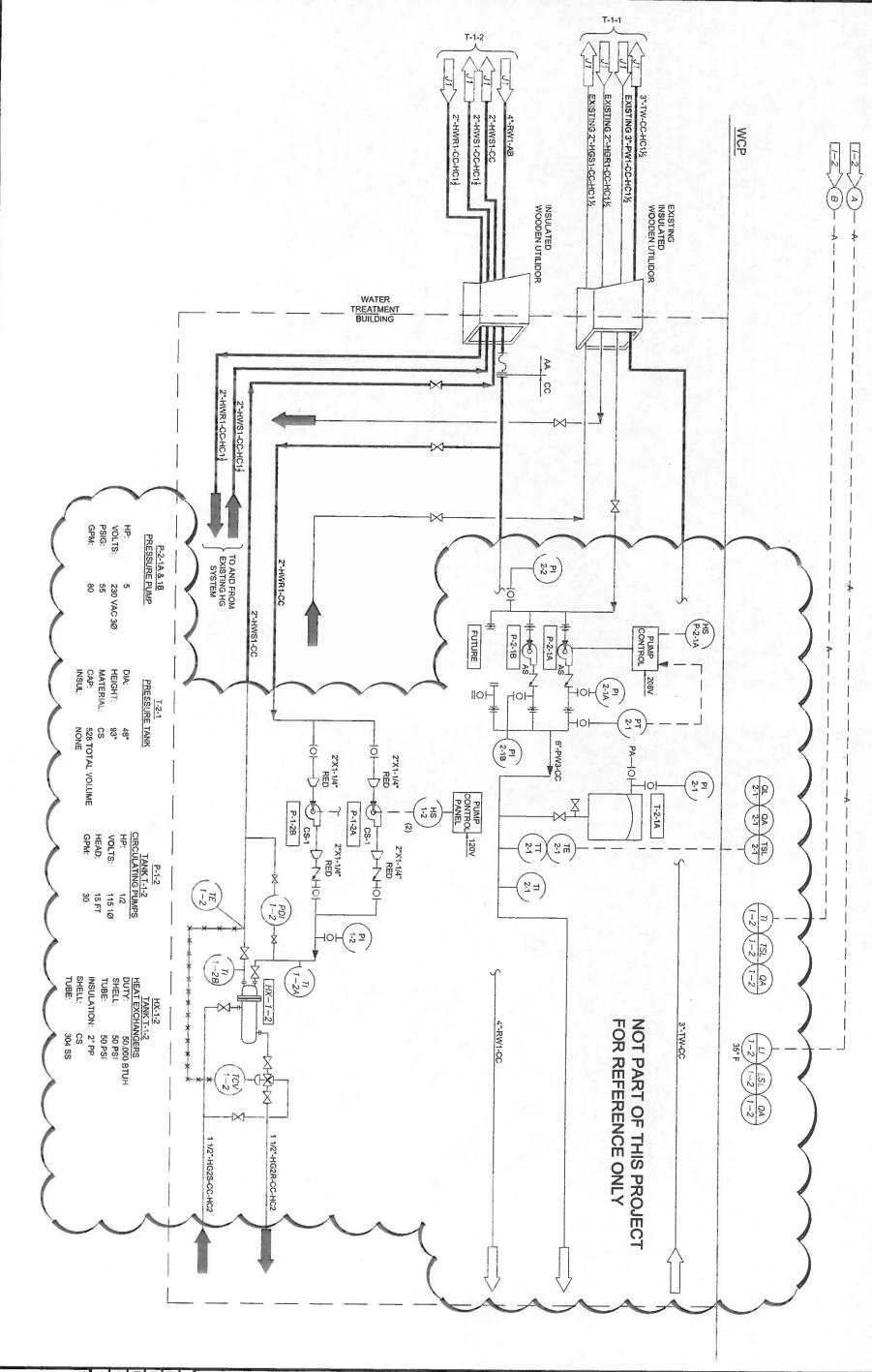
PIPING & INSTRUMENTATION DIAGRAM NOT ISSUED FOR CONSTRUCTION











SUMMIT
CONSULTING SERVICES
Remote Project Construction
Management & Design

EEIS
CONSULTING
ENGINEERS, INC.





NOTES:

SEE NOTE V ON SHEET G2 FOR PROJECT SCOPE.

J2

Date: 10/20/05
Designed By: JW
Drawn By: RTK
Checked By: REG
Scale: NOT TO SCALE
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KONGIGANAK
1.2 MG WATER STORAGE TANK

PIPING & INSTRUMENTATION DIAGRAM
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SECTION 13451 THERMISTOR TEMPERATURE DISPLAY PANEL

MANUFACTURER'S EXPERIENCE

DESCRIPTION OF WORK

TEMP DISPLAY 120 VAC INPUT

(2)

TEMPERATURE DISPLAY

A. PROVIDE AND INSTALL A PREWIRED DISPLAY PANEL AND ELECTRICAL COMPONENTS TO BE ABLE TO DIGITALLY DISPLAY THE GROUND TEMPERATURES OF MULTIPLE THERMISTOR STRINGS. THE PANEL WILL BE FIELD MOUNTED BY OTHERS.

SUBMITTALS

PART I: GENERAL

. THE DISPLAY PANEL SHALL BE USED TO MONITOR THE UBSURFACE (PERMAFROST) GROUND TEMPERATURES BELOW THE 2 MILLION GALLON WATER STORAGE TANK.

THE EIGHT THERMISTOR STRINGS SHALL BE DIVIDED INTO TWO ANKS; A AND B.

. BANK A SHALL BE COMPRISED OF THERMISTOR STRINGS A, B, C

. BANK B SHALL BE COMPRISED OF THERMISTOR STRINGS E, F, G ND H.

. A SELECTOR SWITCH SHALL BE USED TO SELECT THE DESIRED ANK.

BY INDEX THE ROTARY SWITCH EACH THERMISTOR BEAD IN ACH STRING CAN BE READ. THE DIGITAL DISPLAY WILL INDICATE HE TEMPERATURE IN DEGREES FAHRENHEIT. ONCE THE DESIRED BANK HAS BEEN SELECTED THE ORRESPONDING ROTARY INDEXING SWITCH WILL BE ACTIVATED.

DELIVERY, STORAGE AND HANDLING

. THE PANEL SHALL BE PACKAGED TO PROTECT IT FROM HYSICAL DAMAGE AND TO ENDURE AIR CARGO TRANSPORTATION O BUSH ALASKA.

10 WARRANTY

N. THE PANEL MANUFACTURER SHALL WARRANT THE PANEL MEANIST ANY DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE OF THE PANEL BY THE ENGINEER. IN THE EVENT A DEFECT SHOULD APPEAR, IT SHALL BE REPORTED IN WRITING TO THE MANUFACTURER DURING THE WARRANTY PERIOD.

ART II: PRODUCTS

GENERAL

. PROVIDE NEMA-1 ENCLOSURE PANEL WITH ALL INSTRUMENTS, WITCHES, INDICATING LIGHTS, TERMINAL BOARDS, AND WIRING TO ERFORM THE FOLLOWING FUNCTIONS. PANEL TO BE WALL IOUNTED.

PROVIDE A DIGITAL PROCESS DISPLAY.

PROVIDE TWO EACH 24 POSITION ROTARY SWITCHES

PROVIDE ONE EACH TOGGLE SWITCH FOR BANK SWITCHING.

PROVIDE ONE EACH LINEARIZING CIRCUIT DEVICE.

PART III: EXECUTION INSTALLATION

A. PANEL INSTALLATION OF IS BY OTHERS AND WILL BE INSTALLED AT THE LOCATION SHOWN ON THE DRAWINGS.

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Drawn By: Checked By:

Sheet No.

NOT TO SCALE

REG 쫉

END OF SECTION 13451

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Job No.:

KONGIGANAK

ISSUED FOR CONSTRUCTION







8. OPERATION AND MAINTENANCE MANUALS: SUBMIT O & M
ANUALS: MANUALS TO NICLUDE DESCRIPTION OF CONTROL
WITCHES, SYSTEM OPERATION, THEORY OF OPERATION, WARRANTY
NFORMATION, THE ABOVE DRAWINGS, AND MANUFACTURERS
"UBLISHED LITERATURE ON CONTROL COMPONENTS, HIGHLIGHT
"ART NUMBERS OF COMPONENTS USED ON THE DRAWINGS.
8 SYSTEM DESCRIPTION



1.2 MG WATER STORAGE TANK THERMOMISTOR PANEL DIAGRAM User: Doug Ramstad Date/Time: 4/17/2006 2:12 PM Drawing: S:\Engineering Projects\Kong Water Storage Tank\Acad\100% IFC\S1-SCS.dwg Sheet: S1 Plotstyle: SUMMIT.ctb

RIGID INSULATION RING

S1 //8"=1" SECTION S(96) G(C) P(H) D(EDS)

Scole B.

6'-0"

WATER TANK FOUNDATION

GEOFOAM EPS

S	0.189
S,	0.149
EXPOSURE	C
WIND BASE PRESSURE	43.11 PSF TRANSVERSE
(130 MPH 3 SECOND GUST)	43.11 PSF LONGITUDINAL
ALLOWABLE SAIL BEARING PRESSURE	2,600 PSF
ROOF L.L. (SNOW)	40 PSF
ROOF D.L.	15 PSF
FLOOR L.L. (TANK)	1,500 PSF
FLOOR D.L. (TANK)	32.0 PSF

BUILDING CATEGORY/SEISMIC USE GROUP	
SITE CLASS (ASSUMED)	0
Se	0.189
8,	0.149
EXPOSURE	C
WIND BASE PRESSURE	43 11 PSE TRANSVERSE
(130 MPH 3 SECOND GUST)	43.11 PSF LONGITUDINAL
ALLOWABLE SAIL BEARING PRESSURE	2,600 PSF
ROOF L.L. (SNOW)	40 PSF
ROOF D.L.	15 PSF
FLOOR L.L. (TANK)	1,500 PSF
FLOOR D.L. (TANK)	32.0 PSF

(2000 EDITION OF THE IBC)

- SOIL UNDER GEOFDAM EPS SHALL BE LEVEL TO A TOLERANCE OF $\pm \frac{4}{10}^{\circ}$ OR ± 0.05 FT FOR ANY CIRCUMFERENCE OF 30 FT.
- 3. SOIL ABOVE THE GEOFOAM EPS SHALL BE LEVEL TO A TOLERANCE OF ± 1 OR 0.02 FT FOR ANY CIRCUMFERENCE OF 30 FT.

- DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW AND APPROVAL OF THE ENGINEER, IF ANY ERRORS OR OMISSIONS APPEAR IN THE DRAWINGS, SPECIFICATIONS, OR OTHER DOCUMENTS, THE CONTRACTOR SHALL NOTHY THE OWNER OR ENGINEER IN WRITING OF SUCH OMISSION OR ERROR BEFORE PROCEEDING WITH THE WORK OR ACCEPT FULL RESPONSIBILITY FOR COSTS TO RECTIFY THE ERROR.

WELDING
ALL WELDING SHALL BE IN ACCORDANCE I
BY AN AWS CERTIFIED WELDER. ALL WELL
BEVEL WELDS SHALL BE 1/16" LESS THAN I
NOTED OTHERWISE.

WITH AISC AND AWS STANDARDS AND SHALL BE PERFORMED .DS SHALL BE 3/16" FILLET UNLESS NOTED OTHERWISE, ALL THE THICKNESS OF THE MATERIAL TO BE WELDED UNLESS

NOTES:

DESIGN CRITERIA

FOAM-IN-PLACE RIGID INSULATION
RIGID INSULATION SHALL BE MULTIPLE LAY
INSULATION. STAGGER PANELS AT EACH L
MANUFACTURER'S INSTRUCTIONS. A. USE TO FILL THE ANNULUS BETWEEN THE GRADE BAND AND THE INSTALLED FOAM BLOCK PIECES. SPRAY FOAM MATERIALS MUST CONFORM TO OTHER LIMITATIONS OF APPLICABLE ICBO /ERS OF 2" DOW STYROFOAM BRAND HIGH LOAD 40 AYER (OR ALTERNATELY, INSTALL AT 90'). INSTALL PER

B. PRODUCT:

REPORT.

- TWO COMPONENTS, SPRAY APPLIED, POLYURETHANE FOAM SYSTEM
- CLASSIFIED BY THE UBC AS CLASS 1 PER ASTM 84 (UL-723)
- PRODUCT CURES BY REACTION WITH ATMOSPHERIC WATER VAPOR AND DOES NOT REQUIRE RESTRAINT FOR DURABILITY

4. TECHNICAL REQUIEMENTS: A. DENSITY: B. K-FACTOR: C. R-FACTOR: D. COMPRESSIVE STREN (1) 10% PARALLEL: (2) 10% PERPENDIC E. WATER ABSORPTION:	INICAL REQUIEMENTS: DENSITY: K-FACTOR: R-FACTOR: COMPRESSIVE STRENGTH: (1) 10% PARALLEL: (2) 10% PERPENDICULAR: WATER ABSORPTION:	ASTM ME ASTM ME ASTM ME	ASTM METHOD D1622: ASTM METHOD C-177: ASTM METHOD C-177: ASTM METHOD D1621: ASTM D-2842:
	WATER ABSORPTION: CLOSED CELL CONTENT:	ASTM D-2842:	3.5% MAX
ACCEPTABLE M	ACCEPTABLE MANUFACTURERS: CONVENIENCE PRODUCT NUMBER 4004590200 OB ABBEDIAGO POLICE	CONVENIENCE PRODUC	CONVENIENCE PRODUCTS - TOUCH 'N SEAL® U2-200

1.2 MILLION GALLON WATER TANK BY OTHERS

ဂ္ INSTALLATION:

- STORAGE:
- TEMPERATURE: STORE MATERIALS ABOVE FREEZING TEMPERATURES.
- PRIOR TO INSTALLATION, STORE AT 70" F FOR 24 HOURS.
- FOLLOW THE MANUFACTURER'S RECOMMENDATION FOR PREPARATION, INSTALLATION, SAFETY REQUIREMENTS AND CLEANUP INSTRUCTIONS.
- INSTALLATION OF FOAM SHALL BE ACCOMPLISHED USING FOUR FOAM PACKAGES. THE INSTALLERS SHALL BE POSITIONED AT 00, 900, 1800, 2700 WITH EACH INSTALLER STANDING ON THE FOAM BLOCKS. THEY SHALL START THE FLOW OF FOAM SIMULTANEOUSLY AND WALK TO THEIR LEFT.
- THEY SHALL MOVE AT THE SAME PACE UNTIL THE SPRAY FOAM PACKAGE IS EMPTY OR THE LEVEL OF THE FOAM IS WITHIN 6" OF THE TOP OF THE FOAM BLOCK THIS MAY TAKE SEVERAL REVOLUTIONS AROUND THE GRADE BAND. ALLOW FOAM TO CURE FOR ONE HOUR AND ADD ADDITIONAL FOAM UNTIL THE SPRAY FOAM IS LEVEL WITH OR SLIGHTLY HIGHER THAN THE FOAM BLOCKS.

ONCE FOAM HAS THOROUGHLEXCESS FOAM THAT EXTENDS

Y CURED AND EXPANDED, REMOVE BY CUTTING ANY MORE ONE INCH ABOVE THE FOAM BLOCKS.

KONGIGANAK 1.2 MG WATER STORAGE TANK

AND TYPICAL DETAILS









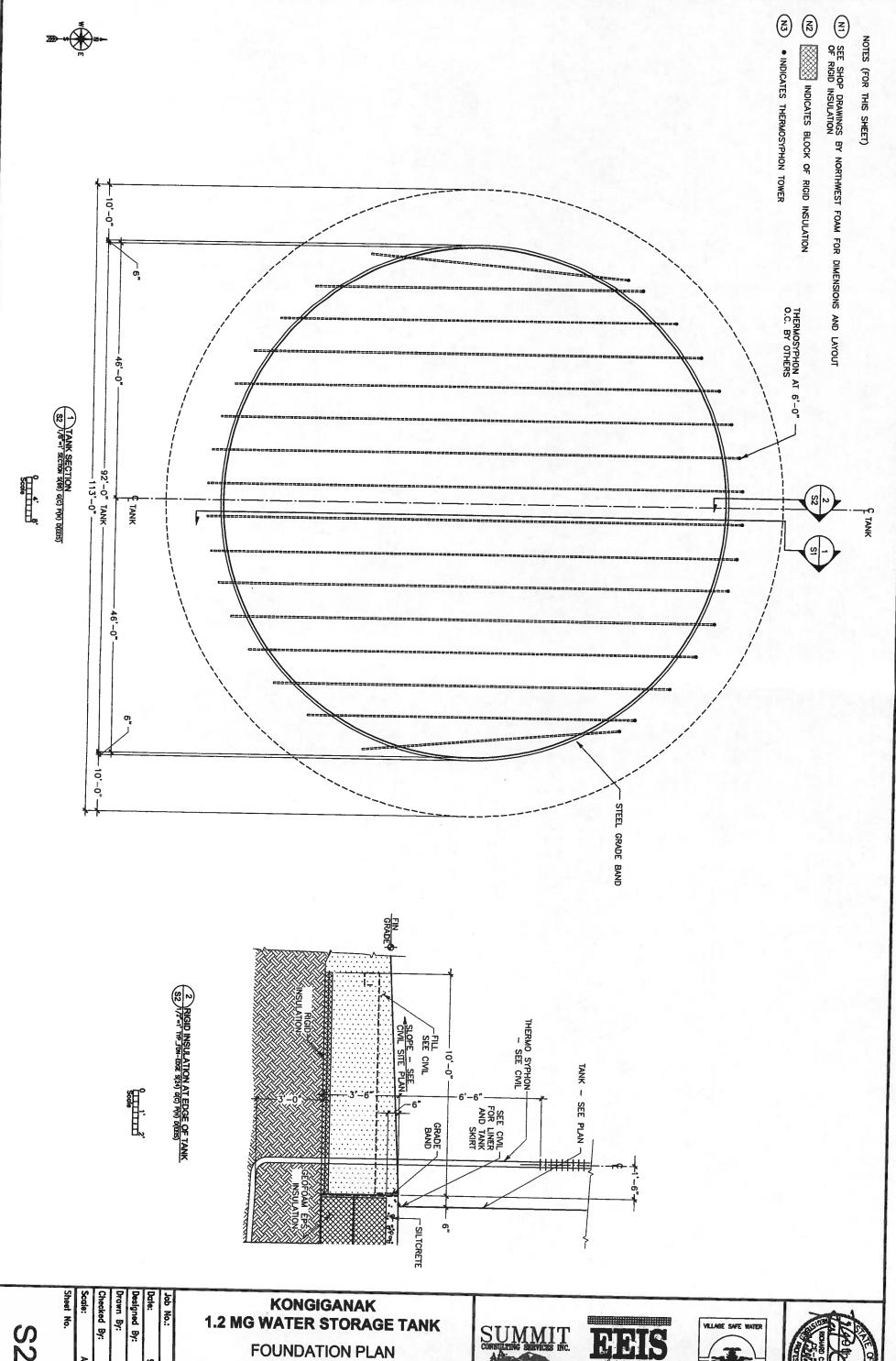
STRUCTURAL STEEL, INCLUDING PLATES, ANGLES, AND MISCELLANEOUS SHAPES SHALL CONFORM TO STRUCTURAL STEEL, INCLUDING PLATES, ANGLES, AND MISCELLANEOUS SHAPES SHALL CONFORM TO ASTM A-38, FY = 38 KSI. WOOD/WOOD OR WOOD/STEEL BOLTS OR THREADED ROD SHALL CONFORM TO ASTM A-397 UNLESS NOTED OTHERWISE. ALL LAG BOLTS, BOLTS, AND NUTS TO HAVE WASHERS. BOLTS USED IN STEELISTEEL CONNECTIONS SHALL BE A325N UNLESS NOTED OTHERWISE. ALL STEEL SHALL BE SHOP-COATED WITH RED OXIDE PRIMER. ALL STEEL CONNECTORS PLACED IN CONTACT WITH PRESSURE PRESERVATIVE TREATED WOOD SHALL BE GALVANIZED.

FOUNDATION - EXCAVATION
GEOTECHNICAL RECOMMENDATIONS ARE

BASED ON A SOILS REPORT AS ISSUED BY DUANE MILLER.

Sheet No. Checked By: Drawn By: Designed By: Job Mo.: ₽ 9-12-05 NOTED R.B. S.K. R.B

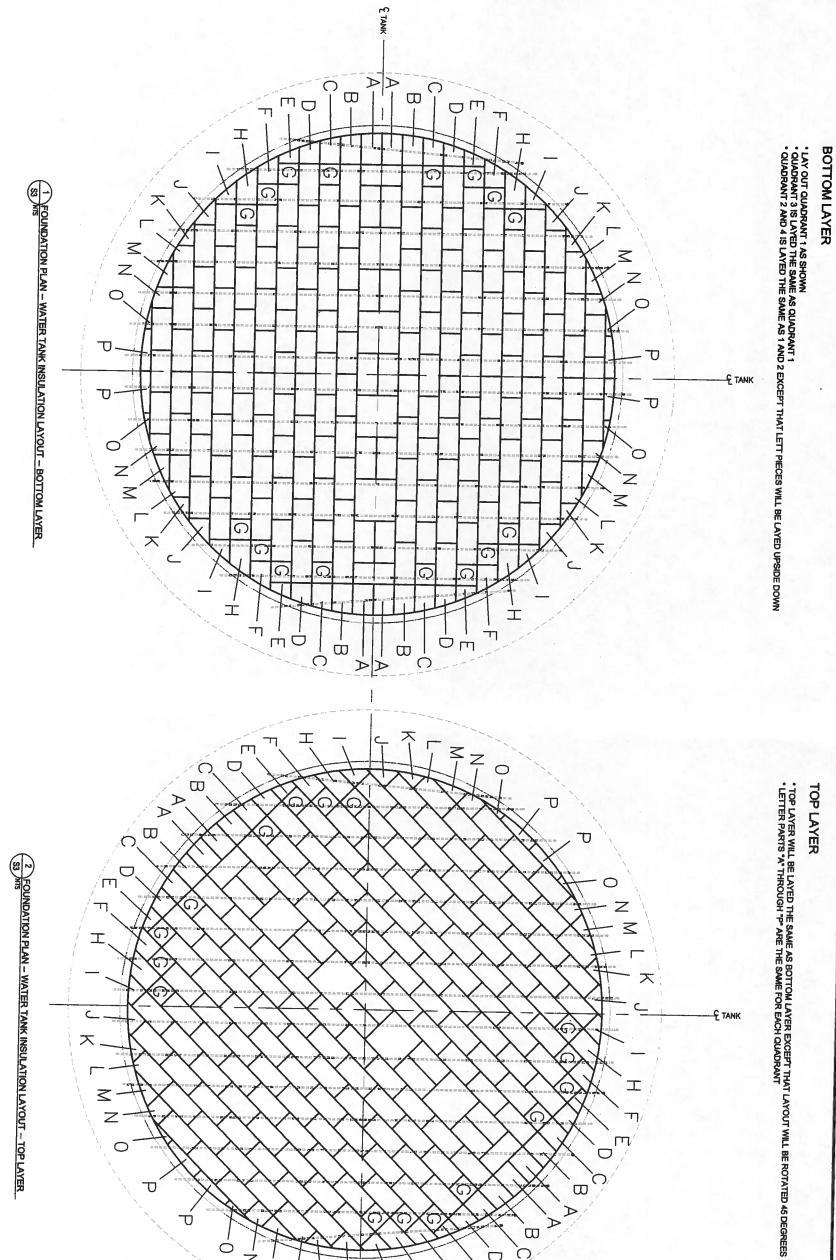
GENERAL NOTES



R.B. AS NOTED

9-12-05 R.B. S.K.





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KONGIGANAK

1.2 MG WATER STORAGE TANK

INSULATION PLAN

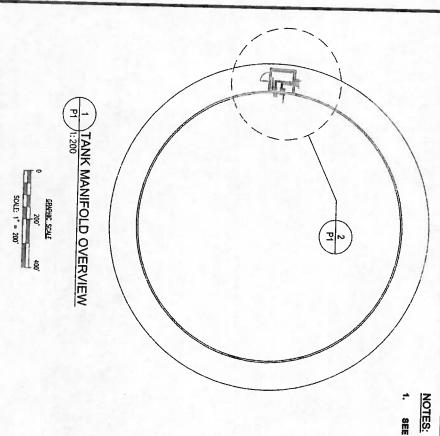








User: Doug Ramstad Date/Time: 4/19/2006 4:22 PM
Drawling: S:\Engineering Projects\Kong Water Storage Tank\Acad\100% iFC\P1 Sheet: Layout1
Plotstyle: SUMMIT.ctb



FOR REFERENCE ONLY NOT PART OF THIS PROJECT 記与 (a) $\overline{2}$ (a) O WTP $\langle \overline{\cdot} \rangle$ FILL LINE (3) (E) 0

Designed By: Drawn By: Checked By: 10/20/05

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77.5

WATER TANK MANIFOLD DETAIL

KONGIGANAK 1.2 MG WATER STORAGE TANK

MANIFOLD PIPING NOT ISSUED FOR CONSTRUCTION









GRADE BAND INSULATION TANK SHEL SEE NOTE V ON SHEET G2 FOR PROJECT SCOPE

X-40-X	X-30-X	X-20-X	×-6-×	X-5-X	×4-×	X-3-X	X-2-X	X-1-X	
WASTE HEAT	LAGOON/SEPTIC TANKS	OFFSITE	SOURCE WATER LAKE	VACUUM SKID	MISCELLANEOUS UTILITIES	HEATED GYLCOL - BOILER SYSTEM	WATER TREATEMENT AND DISTRIBUTION	WATER STORAGE TANK	

X-40-X	X-30-X	X-20-X	X-6-X	X-5-X	×4-×	X-3-X	X-2-X	X-1-X	NUMBER		*ALF	m Q		EQUIPI		
WASTE HEAT	LAGOON/SEPTIC TANKS	OFFSITE	SOURCE WATER LAKE	VACUUM SKID	MISCELLANEOUS UTILITIES	HEATED GYLCOL - BOILER SYSTEM	WATER TREATEMENT AND DISTRIBUTION	WATER STORAGE TANK	DESCRIPTION	TABLE 3	'ALPHA CHARACTERS ARE ADDED FOR REDUNDANT EQUIPMENT.	EQUIPMENT NUMBER	UNITNUMBER	EQUIPMENT DESIGNATOR	P - 1 - 1A*	EQUIPMENT LINE DESCRIPTIONS

HW	WDCP	WCP	4	SRV	N.S.	ZJ	PCV	ט	MXR	MCC	Z	LCV	X	ດ	FCV	ET	DV	C	BV	BLR	BEP	G. >2	NHO	דנ
WATER HEATER	WATER DISTRIBUTION CONTROL PANEL	WATER CONTROL PANEL	TANK	SAFETY RELIEF VALVE	STATIC MIXER	RESERVOIR	PRESSURE CONTROL VALVE	PUMP	MIXER	MCTOR CONTROL CENTER	MOTOR	LEVEL CONTROL VALVE	HEAT EXCHANGER	GENERATOR	FLOW CONTROL VALVE	EXPANSION TANK	DUMP VALVE, ELECTRIC ACTUATED	COMPRESSOR	BLOCK VALVE, ELECTRIC ACTUATED	BLOWER	BACKFLOW PREVENTER	BOILER	AIR HANDLING UNIT	EQUIPMENT PREFIX LIST

HDPE (UNINSULATED)
PVC
COPPER (SWEAT)
COPPER (TUBING)
STAINLESS STEEL (TUBING)
GALVANIZED STEEL (THREADED)

NO.		WH		HGX	ā		AV	FÖ	72	S	cs		0	AMP	STMBOL	מעונים	
NOTE: ADD "S" OR "R" FOR SUBBLY AND BETT ITS PROPERTY		HEATED POTABLE WATER		HEATED GLYCOL (COLLECTION SYSTEM)	DEALED GLYCOL		WASTE HT, GLYCOL FR POWER DI ANT	FUEL OIL	FLUORIDE	DRAIN	CHLORINE		CORROSION INHIBITOR	AIR, HIGH PRESSURE	COMMODITY		TABLE 1
7			HGA	_!	FM	-	7107	SS	SA	TRW	RW	VAL	700	PA	SYMBOL		_
			WASTE HEAT GLYCOL SYSTEM		FORCE MAIN	REALED WATER		SANITARY SEWER	SODA ASH	 HEATED RAW WATER	RAW WATER	TO ABLE WALER		PLANT/IIVSTRUMENT AIR	COMMODITY		
-				T		Т	T	YS		1		<	(5) H	>			<
1	TSS	SS	CT	S	AC	AB	\$	12		GT - GLY	ET-ELE	TWO ALF	EAT TRA	CC - HEA	PP - PER	HC - HE	TWO ALI
	STAINLESS STEEL CTURING	STAINLESS STEEL	COPPER (TUBING)	COPPER (SWEAT)	PVC	HDPE (UNINSULATED)	HDPE (INSULATED)	MATERIAL TYPE	TABLE 2	GT - GLYCOL HEAT TRACE	ET - ELECTRICAL HEAT TRACE	TWO ALPHA CHARACTERS:	5 HEAT TRACE REQUIREMENT	CC - HEAT CONSERVATION-COLD	PP - PERSONAL PROTECTION	HC - HEAT CONSERVATION-HOT	TWO ALPHA CHARACTERS:

5 HEAT TRACE REQUIREMENT	(3) MATERIAL SPECIFICATION	(2) COMMODITY SYMBOL & LINE DESIGNATOR	1 Line size	
				6" - PW . AA . HC3 . ET

LINE IDENTIFICATION SYMBOL

- LINE SIZE
 EXPRESSED IN PIPE TRADE SIZES
- COMMODITY SYMBOL & LINE DESIGNATOR

 UP TO 3 ALPHA CHARACTERS (SEE TABLE 1, BELOW)
- A) INSULATION REQUIREMENT AND THICKNESS
 TWO ALPHA CHARACTERS:
 HC HEAT CONSERVATION-HOT
 PP PERSONAL PROTECTION
 CC HEAT CONSERVATION-COLD

MATERIAL SPECIFICATION
TWO ALPHA CHARACTERS ARE INDICATIVE OF THE
MATERIALS OF CONSTRUCTION (SEE TABLE 2 BELOW)

NOT PART OF THIS PROJECT FOR REFERENCE ONLY

KONGIGANA	(
1.2 MG WATER STORA	GE TANK

PIPING LEGEND NOT ISSUED FOR CONSTRUCTION









Drawn By: Checked By:

JW RTK RG RG

Designed By: