CONCEPT DESIGN REPORT – UPDATED DRAFT

Alakanuk Native Corporation - Bulk Fuel Upgrades

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EXECUTIVE SUMMARY

This report has been prepared for the Alakanuk Native Corporation (ANC) and the Alaska Village Electric Cooperative (AVEC) to provide information for the development of a new bulk fuel storage tank farm in the community of Alakanuk, Alaska. A conceptual design report (CDR) was prepared by URS Corporation for the Alakanuk community in 2001. Much of the information in that report is now outdated. This updated CDR includes current information for the ANC fuel facilities only. Discussion of other entities in Alakanuk that store and/or sell fuel, including but not limited to AVEC, the City of Alakanuk (City), the Lower Yukon School District, and the Alstrom Store, is omitted from this report. Upgrades to these entities are not applicable to this document for the following reasons:

- AVEC is planning construction of (1) an intertie between Alakanuk and the neighboring community of Emmonak and (2) an upgraded tank farm and power plant in Emmonak that will serve both communities. The existing AVEC power plant in Alakanuk is scheduled to remain in its current state until these projects are completed. Upon completion of these projects, AVEC is planning to revise the existing power plant in Alakanuk to become a stand-by power plant.

- The Lower Yukon School District is planning to maintain the existing school facilities until construction of the new Alakanuk airport is completed. At that time, the school is tentatively planning to build a new school and a new tank farm facility on the existing Alakanuk airport apron. The project cannot be completed until the new airport is operational and the Alaska Depart of Transportation and Public Facilities (ADOT&PF) transfers ownership of the existing airport property to the community. This project will be on a schedule outside the confines of the ANC BFU project.

- The City of Alakanuk (City) stores bulk fuel for city operations and for use in heating the water treatment plant building. Fuel for city operations is obtained primarily from ANC, and fuel for the water treatment facility is purchased separately (approximately 37,000 gallons.) The City of Alakanuk reported that the City's existing tank farm is in good condition and is currently compliant with Coast Guard regulations. Most of the City fuel usage is included in ANC's fuel storage requirements.

- The Alstrom Store ceased fuel sales in Alakanuk in 2000.

As part of the development of this report, AVEC and ANC performed site investigations on April 28, 2010; May 18-19, 2010; and June 7, 2010. During these investigations, AVEC met with ANC and the community, examined the condition of the existing tank farm, and identified potential locations for the new ANC tank farm and dispensing facility.

ANC, with the support of AVEC, initially identified two possible sites for the proposed tank farm. However, one site was considered to be at a higher risk for flood damage and was not preferred by the ANC Board of Directors. The selected tank farm site was chosen based on reduced potential for flooding, availability of the property, easy access, and preference of the ANC Board of Directors. The proposed site is located approximately 0.22 miles west of ANC's existing tank farm.

The design for the new tank farm includes seven (7) 50,000 gallon vertical tanks constructed in "bath-tub" style steel containment, associated tank farm piping, a new dual product marine header, gasoline and diesel fill lines, and retail dispensing facilities. The tank farm will be constructed above the 100-year flood elevation and will be supported by driven piles. There is little or no permafrost at the tank farm site and stability will come from piles driven deeply into the sandy silts underlying the area. The existing tanks at the ANC tank farm will be decommissioned. The proposed tank farm gross design capacity was determined to be 350,000 gallons of which 200,000 gallons is gasoline and 150,000 is diesel. Containment will be constructed with capacity for an additional vertical 50,000 gallon diesel tank to be installed in the future to meet increased demand. The capacity meets a projected 10-year demand with a 15% reserve. The estimated cost for this tank farm is approximately $5.8 million.

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I. INTRODUCTION

This report has been prepared for the Alakanuk Native Corporation (ANC) and the Alaska Village Electric Cooperative (AVEC) to provide information for the development of a new bulk fuel storage tank farm in the community of Alakanuk, Alaska. A conceptual design report (CDR) for the Alakanuk community was prepared by URS Corporation in 2001. AVEC initiated and coordinated preparation of the original CDR. Much of the information in that report is now outdated, and ANC has requested preparation of this CDR addendum. For this addendum, AVEC is acting as an agent to ANC.

ANC primarily sells fuel in Alakanuk for home heating and individual vehicle use. ANC also sells fuel to the City of Alakanuk for city operations. This updated CDR includes current information for the ANC fuel facilities only. Discussion of other entities in Alakanuk that store and/or sell fuel, including but not limited to AVEC, the City of Alakanuk, the Lower Yukon School District, and the Alstrom Store, is omitted from this report. Upgrades to these entities are not applicable to this document for the following reasons:

- AVEC is planning construction of (1) an intertie between Alakanuk and the neighboring community of Emmonak and (2) upgraded tank farm and power plant facilities in Emmonak that will serve both communities. The proposed power plant and power transmission main will serve as the primary power line for both Alakanuk and Emmonak. The power plant in Alakanuk is scheduled to remain in its current state until completion of both the Emmonak power plant and tank farm upgrades project and completion of the Alakanuk-Emmonak intertie project. Upon completion of these projects, AVEC is planning to revise the existing power plant in Alakanuk to become a stand-by power plant.

- The Lower Yukon School District is planning to maintain the existing school facilities until construction of the new Alakanuk airport is completed. At that time, the school is tentatively planning to build a new school and a new tank farm facility on the existing Alakanuk airport apron. The project cannot be completed until the new airport is operational and the Alaska Depart of Transportation and Public Facilities (ADOT&PF) transfers ownership of the existing airport property to the community. This project will seek independent funding and will be on a schedule outside the confines of the ANC BFU project.

- The City of Alakanuk (City) stores bulk fuel for city operations and for use in heating the water treatment plant building. Fuel for city operations is obtained primarily from ANC, and fuel for the water treatment facility is purchased separately (approximately 37,000 gallons). The City of Alakanuk reported that the City's existing tank farm is in good condition and is currently compliant with Coast Guard regulations.

- ❖ The Alstrom Store in Alakanuk ceased fuel sale operations in Alakanuk in 2000. Therefore, upgrades to the Alstrom Store fuel facilities is not needed.

This report includes a review of the ANC existing bulk fuel systems, an analysis of existing and future fuel needs, a conceptual design for the replacement of ANC's existing facilities to meet future fuel needs, a site selection study, a proposed project schedule, and a budget cost estimate for the project.

A. CONTACTS

The following individuals contributed valuable information for this report:

Martin Harry	ANC President
Matt Metcalf	AVEC Project Manager
Chuck Katasse	ANC Representative

B. APPLICABLE REGULATIONS AND CODES

The design/operation of fuel systems is controlled by the following State and Federal regulations:

- State of Alaska Fire and Life Safety Regulations (13 AAC 50);
- 2006 International Fire Code as adopted by 13 AAC 50;
- 2006 International Building Code as adopted by 13 AAC 50;
- State of Alaska Oil and Hazardous Substances Pollution Control Regulations (18 AAC 75);
- EPA Oil Pollution Prevention Regulations (40 CFR Part 112);
- US Coast Guard Facilities Transferring Oil or Hazardous Material in Bulk Regulations (33 CFR Part 154).

The current State of Alaska Fire and Life Safety Regulations adopted the 2006 editions of the International Fire Code (IFC) and the International Building Code (IBC). The provisions of the IFC establish the primary design requirements for new facilities.

The State of Alaska Oil and Hazardous Substances Pollution Control regulations (C-Plan) apply to fuel systems that have a storage capacity of more than 420,000 gallons per Owner or Operator.

The US Environmental Protection Agency (EPA) regulations include two plans for fuel facilities from which a discharge could impact navigable water or adjoining shorelines: 1) Spill Prevention Control and Countermeasures (SPCC) Plans and 2) Facility Response Plans (FRPs). The SPCC Plan identifies requirements for facilities which have a minimum aggregate storage capacity of 1,320 gallons. The SPCC Plan must address every container 55 gallons and larger, and must be certified by a Professional Engineer. The FRP is a spill response plan required

for facilities which are filled by marine vessels and which have a storage capacity of more than 42,000 gallons.

The US Coast Guard Facilities Transferring Oil or Hazardous Material in Bulk Regulations apply to fuel facilities that are capable of transferring fuel, in bulk, to or from a vessel with a capacity of 10,500 gallons or more. This regulation includes two separate plans: 1) Facility Response Plan and 2) Operations Manual. The Facility Response Plan is similar to the EPA FRP and outlines spill planning requirements for the Coast Guard regulated portion of the facility. The Operations Manual is a plan that addresses the procedures and equipment required for receiving fuel at the facility. The Coast Guard requires these two plans, as well as a Letter of Intent to Operate, be submitted to the Captain of the Port for approval prior to delivery of fuel.

C. VILLAGE DESCRIPTION

Alakanuk is located at the east entrance of Alakanuk Pass, the major southern channel of the Yukon River, 15 miles from the Bering Sea. It is part of the Yukon Delta National Wildlife Refuge. It lies 8 miles southwest of Emmonak, approximately 162 air miles northwest of Bethel. Alakanuk is situated at approximately 62.6888° North Latitude and -164.6152° West Longitude (Sec. 14, T030N, R082W, Seward Meridian). It is the longest village on the lower Yukon – the development stretches over a 3 mile area along the pass. The population of Alakanuk is 670 (2008 DCCED Certified Population). The climate is subarctic. Temperatures range from -25 to 79°F. Heavy winds are frequent during the fall and winter.

The community is accessible by barge, riverboat, and via a 2,200 ft long airstrip. Barge services generally run from early June to late August. The Yukon is used as an ice road during freeze-up, from November through May. Water is derived from the Alakanuk Slough and is treated. Water and sewer serves about 90% of homes in the community.

II. EXISTING FUEL SYSTEMS

A. GENERAL OVERVIEW

AVEC traveled to Alakanuk on three occasions (April 28, 2010; May 18-19, 2010; and June 7, 2010) to meet with the community, examine the existing tank farm, and identify potential locations for the new ANC tank farm. The existing tank farm facility is in poor condition and does not meet Coast Guard requirements. In recent years, ANC has been working with the Coast Guard to correct deficiencies in the existing tank farm where practical to meet the intent of the regulations. Installation of a new bulk fuel storage facility that meets federal regulations is the preferred solution by the ANC Board of Directors.

B. EXISTING FACILITIES LAYOUT

The original 2001 Alakanuk CDR provided the following description of the existing ANC bulk fuel storage facilities:

"Bulk Fuel Storage at the existing ANC Tank Farm consists of two (2) horizontal, double-wall tanks and nine (9) vertical, single-walled tanks used for gasoline and fuel oil dispensing. The ANC Store operates a dual product vehicle dispenser as well as a gasoline marine dispenser. The vertical tanks have normal vents, but no emergency venting. All vertical tanks have visible surface corrosion and are supported by 2-inch by 12-inch planking on built up wood cribbing. The horizontal tanks are double-walled, welded-steel tanks with normal and emergency venting; each supported by four 12-inch by 12-inch treated timbers. The ANC tank farm piping is a mixture of rubber hose and Victaulic and threaded piping. Piping to dispensaries consists of 2-inch threaded fuel oil and 2 ½ -inch gasoline piping. Existing valves at the tank farm consist of bronze gate valves except for those on the horizontal tanks, which are flanged, steel ball valves. Secondary containment, security fencing and warning signs appeared to be lacking at the tank farm."

Since 2001, the existing tank farm has continued to deteriorate, and there have been no major improvements to the facility.

C. EXISTING TANK STORAGE CAPACITY SUMMARY

The existing ANC tank farm provides bulk storage for approximately 76,000 gallons each of gasoline and diesel fuel.

Table 1 lists the gross and net capacity for the existing ANC tank farm (URS 2001). The net fuel capacity is based on 90% of the gross tank capacity.

Table 1: Existing ANC Fuel Storage Capacity

Gasoline Storage		Diesel Storage	
Gross Capacity	Net Capacity	Gross Capacity	Net Capacity
76,000	68,400	76,000	68,400

D. CURRENT FUEL USE

ANC fuel consumption has increased since 2001. The 2001 CDR identified estimated ANC fuel consumption at that time based on community and barge service records for a five year average. Updated fuel consumption information from 2006 to 2009 was provided by ANC and AVEC. Fuel consumption data is summarized in Table 2 below.

Table 2: Historical Fuel Consumption Data

Operating Year	2001*	2006	2007	2008	2009
Gas	113,000	65,000	99,000	165,000	67,588
Diesel	73,000	92,500	80,000	135,000	83,358
Total:	**186,000**	**157,500**	**179,000**	**300,000**	**150,946**

*Data from CDR by URS Corporation, 2001.

The fuel consumption data shows a significant increase in fuel use from 2007 to 2008. ANC board members have reported that ANC had a surplus of older fuel from previous years that was sold in 2008 to nearby Emmonak residents at a lesser price than fuel was available in Emmonak. It is not known why there was a surplus of older fuel or how long this fuel had been stored in Alakanuk. It is also not known what portion of the 2008 fuel consumption was due to the reported surplus of older fuel.

ANC's variable fuel use may be partially attributed to the fact that Alakanuk is a regular fueling point for travel along the Yukon River. In the winter, travelers from Emmonak and other river communities frequently stop in Alakanuk to purchase fuel for snow machines or other hunting needs. In the summer, subsistence and commercial fishermen frequently stop at Alakanuk to fuel their boats.

Previously, the Alstrom family sold fuel in Alakanuk. The Alstrom family ceased fuel sales in the fall of 2000, and ANC has been providing fuel to the previous Alstrom customers. Average annual Alstrom fuel use was identified in the 2001 CDR to be approximately 15,000 gallons of gasoline and 4,500 gallons of diesel. Updated Alstrom fuel use was not available. Some of the older fuel discussed above may have been acquired by ANC at the time that the Alstrom store went out of business.

To estimate ANC's actual current annual fuel usage, it was assumed that 25% of the fuel sold in 2008 was due to the sale of surplus fuel to Emmonak residents, and the 2008 actual fuel use was decreased by this amount. Using the adjusted 2008 fuel consumptions, the current annual fuel use was computed as the average of the available usage data plus ten percent. The current usage is estimated to be approximately 103,000 gallons of gasoline and 94,600 gallons of diesel fuel.

This information does not reflect fuel sold between entities to cover surpluses and shortages in the community. Because there are several entities that sell fuel in Alakanuk, occasionally, one fuel-selling facility may purchase fuel from another when they run out. Therefore, the facility which sells the fuel may show higher use than actually required, while others may not adequately identify the amount

of fuel used. It is not known how much inter-fuel sales have occurred in Alakanuk.

Fuel is generally delivered once or twice a year by barge along the Yukon River. Actual delivery times vary each year with changing demand and seasonal weather conditions.

E. PROJECTED FUTURE FUEL USE

It is anticipated that community of Alakanuk will experience a slow increase in diesel and gasoline consumption over the next 10 years due to general community growth. In addition, there are several projects which may impact future fuel use. These projects include (1) construction of several miles of new road; (2) two new triplexes planned for construction in 2011; (3) a new school planned for construction in 2012; and (4) a future intertie planned for Alakanuk and Emmonak. Also, construction of a new airport began in 2008 and is estimated to be complete in 2012.

The projected future fuel use is based on a 10 year anticipated capacity with an additional 15% reserve. The systems will be designed for a 30-year life span.

Because the fuel usage data is limited and somewhat inconsistent due to variations in demand, a growth rate has been assumed to project future demand based on the variations discussed above. For the purpose of this report, a projected minimum of 1.5% to a maximum of 3% annual population growth rate was used for gasoline and diesel consumption. The resulting total demand, over a 10-year period for the facility, is roughly 34% to 55% over the current use. The proposed facility capacity is sufficient to provide for a minimum of 12 months of storage. The capacity also considers increase in demand for the future facilities such as the proposed roads and triplex.

The projected future fuel storage requirements are summarized in Table 3. The minimum and maximum include a 15% additional reserve.

Table 3: Projected Future Fuel Storage Requirements

ANC Tank Farm	Minimum Future Annual Use	Maximum Annual Future Use
Gasoline	137,500	159,200
Diesel	126,300	146,200
Total	263,800	305,400

III. PROPOSED NEW FACILITY

The proposed new fuel facility includes seven (7) 50,000 gallon vertical tanks and one (1) 6,000 gallon dual product dispensing tank constructed in “bath-tub” style steel containment supported by driven piles. Containment will be constructed with capacity for an additional vertical 50,000 gallon diesel tank to be installed in the future to meet increased demand. The improvements include associated tank farm piping, a new dual product marine header, gasoline and diesel fill lines, a dual product dispenser, and a retail sales building. This tank farm will be located south of and adjacent to Anderson Street, west of the existing ANC tank farm.

A. SITE SELECTION

AVEC and ANC examined multiple locations for the proposed tank farm site. The selected site was chosen based on reduced potential for flooding, availability of the property, easy access, distance from the town, and preference of the ANC Board of Directors.

1. SITE DESCRIPTION

The proposed site is located approximately 0.22 miles west of the existing tank farm on the south side of Anderson Street the main road from the school to the eastern portion of the village. The site is relatively flat and lower than the existing grade of the road. A site map is presented in Appendix A.

2. SITE CONTROL

The proposed tank farm will be located within a large Interim Conveyance parcel IC No 294. In order to construct the project, a subdivision plat must be prepared and recorded for the new tank farm parcel. The new marine header will be located next to the river on ANC land across Anderson Street. Fuel fill lines will be routed to across this parcel and across Anderson Street, and easements will need to be created for the lines.

3. SOIL CONDITIONS

A geotechnical study was performed by Hattenburg Dilley and Linnell in April 2010. The results of this study are presented in the Alakanuk Native Corporation Bulk Fuel Storage Facilities Geotechnical Report dated June 2, 2010. This report is included in Appendix B. Generally, the site has layers of fine-grained sands and silty sands overlain by silts and sandy silts. Soils are thawed. Please see Appendix B for additional details.

4. COMMUNITY FLOOD DATA

The flood of record in Alakanuk occurred in 1952 and was marked by the Corps of Engineers (COE) in 1989 by attaching washers to the side of a house and telephone pole. Based on these High Water Marks (HWM), a flood gage was placed on the tribal office with the flood of record corresponding to 5.1 feet on the gage. Recommended building elevation corresponds to 6.1 feet on the COE flood gauge.

Significant flooding also occurred in 2009. The COE performed a site survey at that time and determined that the 2009 flood measured approximately 1.3 feet on the flood gauge, which is 3.8 feet lower than the flood of record. Additional information about the COE survey is included in Appendix C.

Alakanuk residents report that significant flooding occurs approximately once every 5 years. However, due to changing climatic conditions, floods are more difficult to predict than they were in previous years.

A topographic survey of the proposed tank farm site has not been conducted at the time of this report. HDL surveyors correlated the existing ground surface elevations of the proposed tank farm site to the COE flood gauge with a closed level loop. Site elevations range from approximately 4 to 8 feet below the 100 year flood event as identified on the COE flood gauge.

B. LOCAL FILL MATERIAL

The new tank farm will be supported by a pile foundation. Fill material will be required for construction of a working a gravel pad and access drive for the facility.

There are no local sources of gravel or sand in Alakanuk. Potential sources of borrow material were identified in the 2001 CDR. The Alaska Department of Transportation and Public Facilities (ADOT&PF) conducted a study to find sufficient base and subbase for the current airport runway construction. The nearest source of acceptable material was identified to be the state-owned quarry in St. Mary's. St. Mary's is located approximately 75 miles southeast of Alakanuk. Andy Journey who is the water/sewer/gravel contact for St. Mary's stated that when ANC is ready to begin construction of the proposed tank farm, the City of St. Mary's would like to submit a bid for the fill material to be purchased for the project.

C. TANK FARM DESIGN

The proposed tank farm configuration was selected based on ANC's annual fuel consumption and on tank farm designs that AVEC has used successfully in other communities. Two options were considered for the type of tanks, vertical and horizontal. Horizontal tanks generally require a larger footprint than vertical tanks which makes them less efficient for tank farms with high capacity requirements. Based on the necessary capacity, horizontal tanks were considered not desirable, and only vertical tank designs were included in the preliminary design.

The total amount of storage for the ANC tank farm was based on the projected 10-year capacity plus a 15% reserve. Conceptual design drawings of the proposed tank farm layout are presented in Appendix A. Due to the condition and age of the existing ANC tanks, only new tanks were considered for this project. The tank farm design also incorporates a dispensing area for both gasoline and diesel fuel sales.

The existing header and fill lines for ANC are located approximately 0.22 miles from the proposed tank farm site. Routing fill piping this distance is costly and presents concerns for maintaining the piping and assuring adequate spill protection. For these reasons, the design includes a new marine header located across Anderson Street from the proposed tank farm site. The fuel fill lines will be routed approximately 500 feet to the tank farm via property that is owned by ANC. (See Appendix A.) Fuel fill lines will be schedule 80, welded steel pipe with appropriate low temperature properties. The fill lines will be constructed above grade except where they cross Anderson Street.

The design consists of a total of 7 vertical 50,000 gallon tanks and one 6,000 gallon dual product dispensing tank. Four of the vertical tanks will be gasoline tanks and three will be diesel tanks. The design will include capacity and sufficient containment volume for an eighth vertical diesel tank to be added in the future, if desired. Additionally, the population of cities along the Lower Yukon River commonly changes as residents migrate between neighboring communities. ANC's fuel sales fluctuate as populations of neighboring communities fluctuate. The proposed fuel storage is sufficient to accommodate potential increased fuel use from residents of Emmonak and from travelers along the Yukon River as seen in 2008.

The vertical tanks will be shop-constructed tanks built to API 650 design standards. Until 2009, larger vertical tanks were constructed to UL 142 standards. Effective December 2009, UL 142 restricted the design of vertical tanks to a diameter not exceeding 14 feet and a height not exceeding 50 feet. The new 50,000 gallon tanks will have a diameter of approximately 22 feet making them too large for UL 142 standards. Therefore, API 650 will be the design criteria for the proposed tanks. API 650 is a more stringent design criteria

with increased welding and inspection requirements. The tanks will be approximately 18 feet tall.

Although the API 650 requirements will make the tanks somewhat more expensive to fabricate than UL 142 tanks, having fewer large tanks will save money over multiple smaller tanks by maximizing efficiency and decreasing the necessary tank farm foot print. There is also less piping and fewer appurtenances required with vertical tanks, and there will be fewer tanks to maintain and inspect.

Table 4 shows the tank farm proposed gross and net storage capacities. Net capacity is based on 90% of the gross capacity.

Table 4: Proposed Fuel Storage Capacity

Gasoline Storage		Diesel Storage	
Gross Capacity	Net Capacity	Gross Capacity	Net Capacity
200,000	180,000	150,000	135,000

D. TANK FARM FOUNDATION

Recommendations for the tank farm foundation are presented in the Alakanuk Bulk Fuel Storage Facilities Geotechnical Report. This report identifies that design of any structure's foundation must consider the bearing support capabilities of the supporting soils as well as the expected settlements and effects of seasonal frost action. The soils are predominantly loose silty sands to soft sandy silts. Piles are the recommended foundation type for the facility due to the nature of the site. Several types of foundations were considered including a pad with shallow foundations, and driven piles. The observed thermal regime indicates the soils are thawed.

A shallow foundation is not a suitable option due to the anticipated heavy tank loads which will cause differential settlement of the soft and loose soils. In addition, flooding on the order of 8 feet at the site may be anticipated for a 100-year event. Settlement estimates for a shallow tank foundation and 8-foot pad are estimated to be on the order of 10 inches to 24 inches of total settlement and 6 inches to 12 inches of differential settlement. Depending on the time of construction these settlements may take up to 3 years to reach equilibrium. Overconsolidation of the pad for several years would likely be required prior to construction and filling of the fuel storage tanks in order to reduce the effects of the differential settlement on the tanks and containment liner. Therefore, a

driven pile foundation is recommended. Please see the geotechnical report in Appendix B for detailed analysis and recommendations.

A comparative analysis was performed to determine if horizontal tanks could be constructed on an 8-foot gravel pad without several years of overconsolidation. A 27,000 gallon skidded horizontal tank on sleepers was used for this analysis. The analysis showed that surface loading is significantly higher for the horizontal tank than for the proposed vertical tanks, based on standard construction techniques. This is due to the reduced area available to distribute the weight of the horizontal tank. Total and differential settlements are expected to be significantly higher for the increased loading scenario. Although horizontal tanks can be leveled to certain degree, the leveling effort is expected to be extensive, and there is a high potential for system failure in the containment diaphragm and the system as a whole. Therefore, overconsolidation would still be required prior to horizontal tank construction and use.

E. SECONDARY CONTAINMENT

Secondary containment is required around the tank farm. Secondary containment will be provided with a steel containment dike. A steel containment dike is composed of steel posts supporting steel plates that are typically ¼ inch thick. The steel is protected from UV degradation and water damage by a 3-part coating system.

The secondary containment area must be designed to contain the volume of the largest tank in the containment area plus the volume required for the 25-year, 24-hour rainfall event. The displaced volume from tank structures in the containment area must be included in the containment volume calculation. The containment should also be sufficient for snow and precipitation accumulation between periodic removals by pumping. The dikes shown in the conceptual drawings in Appendix A are 36-inches high. This includes 30-inches for spill containment and another six inches for the required rainfall event. The estimated 25-year, 24-hour rainfall event in Alakanuk is 3 inches (TP 47, 1963). Therefore, the design containment volume is somewhat conservative.

F. FUEL DISTRIBUTION

The new ANC bulk tank farm will include facilities for retail fuel dispensing.

1. Retail Dispensing

ANC's fuel is to be distributed for retail sale. Retail sales include both vehicle filling and container filling. In order to meet the State regulations for dispensing fuel from aboveground tanks to vehicles, an approved dispensing station must be installed. The design includes an automated dispensing station housed within a lockable steel enclosure, and a small

pre-fabricated timber framed building for retail sales. The metering and receipt logs are both printed for the purchaser and maintained as a data log. This data can then be distributed to the tank farm tenants for their separate reporting and auditing requirements. The Coast Guard and state would also have access to the data for referencing during site inspections.

G. OWNERSHIP AND OPERATION

The proposed tank farm will be owned and operated by ANC. ANC will be responsible for overall maintenance and repair of the facility.

H. SPILL RESPONSE REGULATORY PLANS

Spill Response and Regulatory Plans will include an EPA Facility Response Plan (required for all tank farms with more than 42,000 gallon capacity, which are filled from a vessel), an EPA Spill Prevention and Control Countermeasure plan, a US Coast Guard Oil Spill Response Plan, and a US Coast Guard Operations Manual.

Regulatory Plan Implementation Schedule:

- The EPA Facility Response Plan must be submitted prior to receiving fuel;
- The EPA SPCC Plan must be prepared prior to receiving fuel;
- The US Coast Guard Operations Manual must be submitted and approved, with a Letter of Intent to Operate, prior to receiving fuel.

Because the facility will have more than 42,000 gallons of storage capacity, a State of Alaska Oil Discharge Prevention and Contingency Plan (C-Plan) will be required.

ANC recommends that that spill response equipment be stored in a conex so that the equipment can be moved as needed.

I. PERMITTING

Typical permitting requirements for a new tank farm and fuel distribution system include submittal of the construction documents to the State Fire Marshal for review and approval, obtaining a US Army Corps of Engineers Wetlands Permit to place fill on wetlands, obtaining concurrence from the State Historic Preservation Office (SHPO), obtaining a determination from US Fish and Wildlife that no endangered species are effected, and obtaining a Coastal Zone Permit.

1. Fire Marshal Review

The construction of the new tank farm and fuel distribution systems will require submittal of a complete set of construction documents to the State

of Alaska, Department of Public Safety, Division of Fire Prevention (Fire Marshal) for plan review and approval. Typical review periods range from 3 – 5 weeks.

2. US Army Corps of Engineers Wetlands Permit

Village bulk fuel facilities previously have fallen under the COE General Permit (GP) 96-7M and only require a letter of notification to the COE that wetlands would be impacted. This GP expired July 15, 2009 and a new one has not been approved at this time. Therefore, an COE 404 Individual Permit will need to be obtained. The associated wetlands mitigation is typically not required In the case of municipalities or small governmental entity-owned projects.

3. SHPO Concurrence

The Alakanuk area does not have any known or potential historic or cultural sites in the Alaska Historical Resource Survey (AHRS). Although it is not anticipated that an archaeological survey will be required, a concurrence from the SHPO that “no historic properties will be affected” is required for federal funding.

4. Costal Zone Consistency Determination

Alakanuk is located in the Ceñaliulriit CRSA Coastal District. Under the Alaska Coastal Management Program any project located in a coastal district must submit a Coastal Zone Questionnaire illustrating how the project is in compliance with coastal management practices within that district.

5. US Fish and Wildlife

Any project with federal funding is required under Section 7 of the Threatened and Endangered Species Act to consult with the US Fish & Wildlife Service (FWS) to determine if there are any species of concern in the project area.

J. CONSTRUCTION METHOD

This project will be constructed through public bid. This process provides the most competitive construction costs. An estimated construction schedule is presented in Section K. Bidder may be able to use some local equipment for the work.

1. Local Equipment

The list of equipment available for rent in Alakanuk is presented in Table 5.

Table 5: Equipment for Rent

Equipment	Type/Model	Owner
Front End Loader	John Deere/75A	ANC
Dump Truck	Auto	City of Alakanuk
Grader	Champion	City of Alakanuk
Excavator	Caterpillar	City of Alakanuk
End Loader	Katmatsu	ANC
Skid Steer	Bob Cat	ANC

K. SCHEDULE

The following design and construction schedule assumes that materials will be delivered by barge from Seattle to Alakanuk. Additionally, fill material may come from St. Mary's or other locations. The proposed schedule is dependent upon many inter-related factors, such as project start time, material availability and weather. Procurement or shipping delays could cause the project to run into the following season, which will increase the construction costs. In order to address this potential delay and increased cost, a 15% construction contingency was used in cost estimating for the project.

Table 6: Approximate Project Schedule

Work Description	Approximate Time
Design Survey and Permitting Process	Summer 2010
Detailed Design	Fall - Winter 2010
Bid Project and Award of Contract	Spring 2011
Begin Construction	Summer 2011
Substantial Completion	Summer 2012
Final Completion	Fall 2012

L. CONSTRUCTION COST ESTIMATE

A construction cost estimate has been prepared for the project as presented on the conceptual design drawings. The estimate is based on historical construction costs for recent tank farm projects in western Alaska. The total estimated cost for 350,000 gallons of fuel with the structural and containment capacity to add an additional 50,000 gallons of fuel in the future is $5,808,400.00. The detailed cost estimate is presented in Appendix D.

M. SUSTAINABILITY

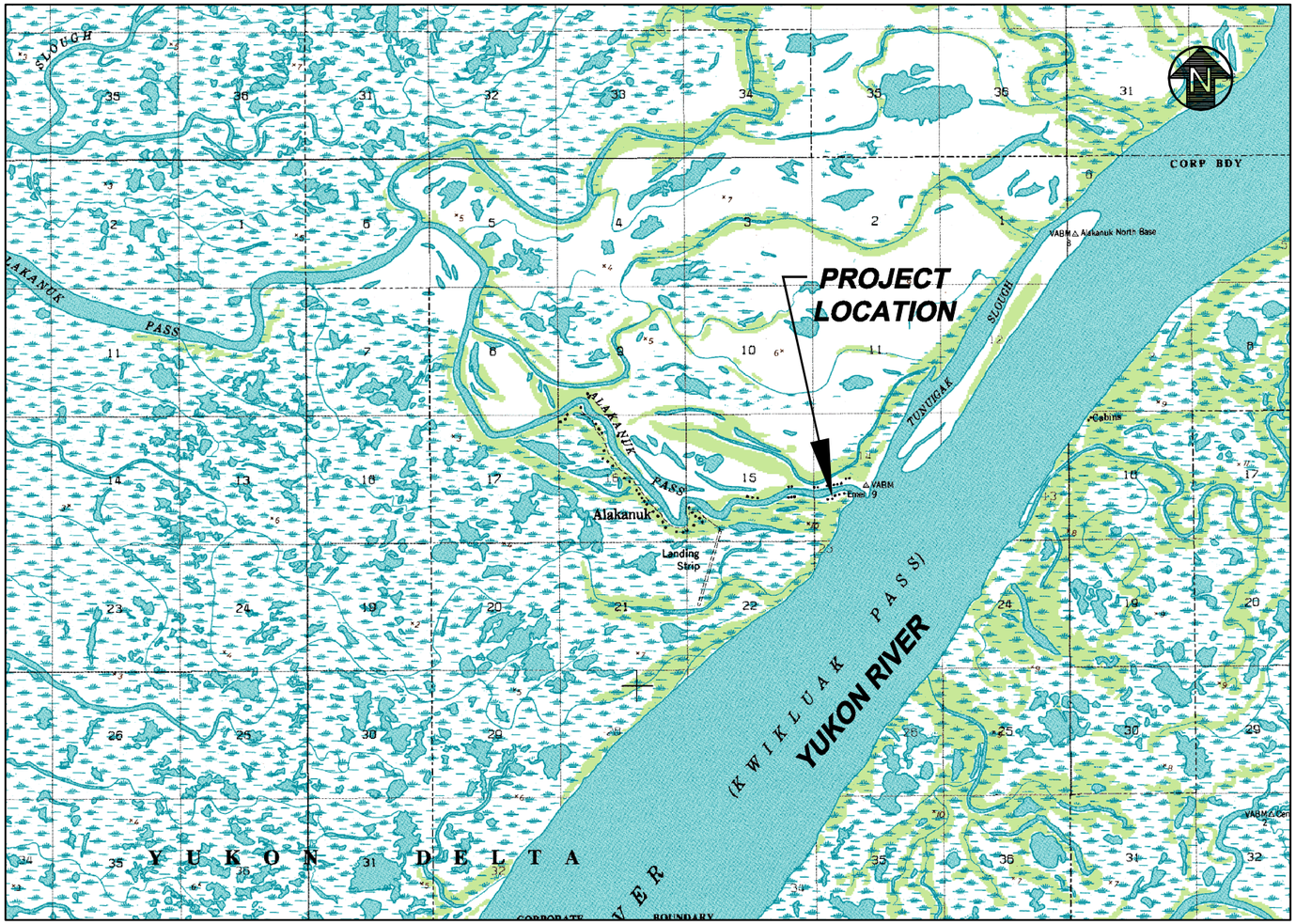
Sustainability of the tank farm is a critical issue in funding the project. ANC needs to demonstrate that the bulk fuel facility can be operated and sustained as a business. A business plan with a financial analysis is being developed by ANC.

Appendix A

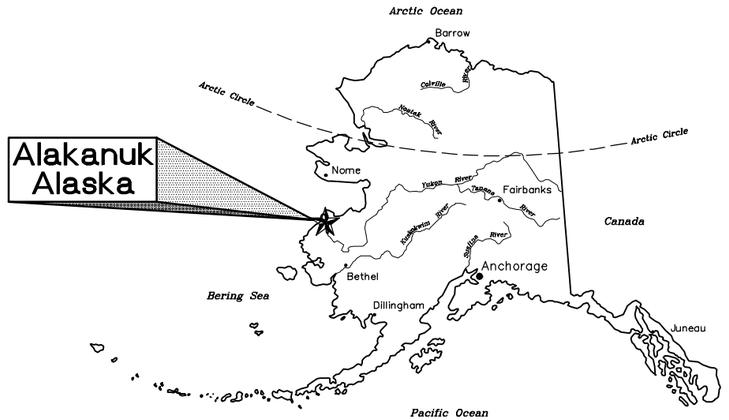
Conceptual Design Drawings

ALAKANUK NATIVE CORPORATION
BULK FUEL UPGRADES

ALAKANUK, ALASKA



VICINITY MAP



LOCATION MAP

SHEET INDEX

REVISIONS

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ALAKANUK NATIVE CORPORATION BULK FUEL UPGRADES

ALASKA VILLAGE ELECTRIC COOPERATIVE

ALAKANUK, ALASKA

ALASKA VILLAGE ELECTRIC COOPERATIVE
4831 Eagle Street
Anchorage, Alaska 99503

SHEET TITLE
COVER SHEET, LOCATION MAP, AND SHEET INDEX

SHEET
G1.01

DRAWN BY:	CHECKED BY:
HDL	LMH
DATE:	SCALE:
07/16/10	NONE

JOB NUMBER:
10-007

GENERAL

1. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THESE PLANS AND THE BIDDING AND CONTRACT DOCUMENTS TITLED "ALAKANUK NATIVE CORPORATION BULK FUEL UPGRADES".
2. THESE PLANS ARE BASED ON INFORMATION PROVIDED FROM A FIELD SURVEY PERFORMED _____.
3. THE CONTRACTOR SHALL VERIFY SITE CONDITIONS, DIMENSIONS, AND DETAILS PRIOR TO THE START OF CONSTRUCTION. IF ANY DISCREPANCIES AND/OR UNKNOWN CONDITIONS WHICH AFFECT THE PROJECT ARE FOUND, THE CONSTRUCTOR SHALL NOTIFY THE ENGINEER. THE CONSTRUCTOR WILL BE REQUIRED TO PROVIDE MINOR LAYOUT CHANGES IN THE FIELD, SUBJECT TO APPROVAL BY THE ENGINEER.
4. NOT ALL UTILITIES MAY BE SHOWN ON THE PLANS. CONTRACTOR SHALL FIELD VERIFY EXISTING UTILITIES BEFORE CONSTRUCTION. CONTRACTOR SHALL PROTECT UTILITIES AT ALL TIMES DURING CONSTRUCTION, AND REPAIR ALL DAMAGES IN ACCORDANCE WITH THE RESPECTIVE UTILITY COMPANIES REQUIREMENTS.
5. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL SIGNS, BARRICADES AND WARNING LIGHTS AND OTHER PROTECTIVE DEVICES NECESSARY FOR SAFETY.
6. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH U.S. ENVIRONMENTAL PROTECTION AGENCY, ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION, AND STATE AND FEDERAL OCCUPATIONAL HEALTH AND SAFETY REGULATIONS.
7. ALL WORK SHALL COMPLY WITH ASME B31.4–1998 & B31.4A–2001 ADDENDUM, AND THE MOST CURRENT INTERNATIONAL FIRE CODE, INTERNATIONAL BUILDING CODE, AND THE INTERNATIONAL MECHANICAL CODE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WORK WITH OTHER CONTRACTORS, HIS SUBCONTRACTORS, THE OWNER, AND STATE AND FEDERAL AUTHORITIES.
9. THE SPECIFICATION OF A NAME BRAND PRODUCT, OR EQUAL, IS DONE MERELY TO ESTABLISH THE LEVEL OF QUALITY OF MATERIALS AND EQUIPMENT REQUIRED AND IS NOT A PRODUCT ENDORSEMENT. SUBMIT SUBSTITUTIONS IN WRITING FOR REVIEW AND APPROVAL, UNLESS "NO SUBSTITUTIONS" IS SPECIFIED.
10. THE CONTRACTOR SHALL SCHEDULE AND COORDINATE DEMOLITION AND NEW CONSTRUCTION/RENOVATION ACTIVITIES SUCH THAT A COMPLETE AND OPERABLE BULK FUEL STORAGE AND TRANSFER SYSTEM IS MAINTAINED AT ALL TIMES.
11. THE CONTRACTOR SHALL PROVIDE TANK FARM SIGNAGE PER INTERNATIONAL FIRE CODE AND AS SHOWN ON THE DRAWINGS.
12. INSTALL FIRE EXTINGUISHERS WHERE SHOWN ON DRAWINGS. FIRE EXTINGUISHERS 11. SHALL HAVE A MINIMUM RATING OF 2–A, 20–B.C.
13. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND SUBMITTALS TWO WEEKS PRIOR TO FABRICATION. SUBMIT VENDOR LIST WITH A LIST OF EQUIPMENT TO BE PROVIDED BY EACH VENDOR. SUBMIT OPERATION AND MAINTENANCE LITERATURE FOR ALL MATERIALS AND EQUIPMENT TO THE ENGINEER FOR INCLUSION IN THE OPERATION MAINTENANCE MANUALS. PLEASE CONTACT ENGINEER AT (907) 564–2120.
14. ALL ITEMS SHOWN ARE NEW UNLESS SPECIFICALLY INDICATED AS EXISTING. INSTALL ALL MATERIAL AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, INSTRUCTIONS, AND INSTALLATION DRAWINGS UNLESS INDICATED OTHERWISE.
15. PERFORM WORK WITH SKILLED CRAFTSMEN SPECIALIZING IN THE REQUIRED WORK. INSTALL ALL MATERIALS IN A NEAT, ORDERLY, AND SECURE FASHION, AS REQUIRED BY THESE SPECIFICATIONS AND COMMONLY RECOGNIZED STANDARDS OF GOOD WORKMANSHIP.
16. MARK UP DESIGN DRAWINGS TO REFLECT FIELD CHANGES THROUGH–OUT CONSTRUCTION. TURN OVER "RED LINE" CONSTRUCTION DRAWINGS TO ENGINEER AT COMPLETION OF THE PROJECT.
17. PIPELINES, TANKS, AND EQUIPMENT REMOVED FROM SERVICE SHALL BE EMPTIED OF FUEL AND CLEANED TO MEET STATE OF ALASKA UST REGULATIONS. TANKS REMOVED FROM SERVICE SHALL ALSO BE RENDERED USELESS FOR FUEL STORAGE.

TESTING, START–UP, AND COMMISSIONING

1. PERFORM SYSTEM TESTING, STARTUP AND COMMISSIONING IN ACCORDANCE WITH THE FOLLOWING PROCEDURES. LEAVE ALL WORK SITES IN AN ORDERLY CONDITION CONSISTENT WITH THAT FOUND UPON ARRIVAL.
2. PRESSURE TEST ALL PIPING AND FILL OUT AN AVEC PIPELINE PRESSURE TEST REPORT. DELIVER ORIGINAL REPORT TO AVEC PROJECT MANAGER AND GIVE A COPY TO THE ENGINEER.
3. UPON FILLING OF TANKS VERIFY PRODUCT LEVEL WITH GUAGING STICK AND CALIBRATE ALL TANK GUAGES.
4. CHECK ALL PUMPS FOR PROPER ROTATION. PRIOR TO OPERATING CENTRIFUGAL PUMPS PRIME THE PUMP CAVITY WITH FUEL. ON INITIAL STARTUP WARM PUMP BODY IF AMBIENT TEMPERATURE IS BELOW 40°F.
5. CHECK ALL CONTROL AND ALARM FUNCTIONS. MANIPULATE FLOATS TO SIMULATE LOW AND HIGH LEVEL CONDITIONS. SET TIMING RELAYS FOR 30 SECONDS AND VERIFY TIME–OUT FUNCTION. RE–SET TIMERS TO VALUES INDICATED. VERIFY LATCHING AND RESET FUNCTIONS, EMERGENCY STOP FUNCTION, AND OPERATION OF ALL SIGNAL LAMPS AND HORNS. OBSERVE OPERATION OF ACTUATED VALVES. CHECK AREA LIGHTING AND VERIFY OPERATION OF PHOTOCELL CONTROLS.
6. FILL DISPENSING AND INTERMEDIATE TANKS. REMOVE AND CLEAN STRAINER SCREENS UPON COMPLETION OF INITIAL FILLING OF TANKS. REPLACE FILTER AT DISPENSER AFTER FIRST 100 GALLONS OF PRODUCT HAS BEEN PUMPED THROUGH DISPENSER.
7. FILL DAY TANKS AFTER FILLING INTERMEDIATE TANKS.
8. TEST ALL DISPENSING FUNCTIONS INCLUDING REMOTE CONTROL.
9. VERIFY ALL SIGNS, PLACARDS, AND VALVE TAGS ARE PROPERLY LOCATED. VERIFY PROPER COLOR CODE AND LABELING FOR ALL PRODUCTS.

TUNDRA PROTECTION

1. VEHICLES OR EQUIPMENT MAY NOT BE OPERATED ON UNFROZEN NATIVE VEGETATION WITHOUT AN APPROVED METHOD OF PROTECTION. ALL TRAFFIC WILL BE RESTRICTED TO THE ESTABLISHED ROADS DURING A PERIOD OF THAW. DURING THE MONTHS WHEN THE ACTIVE LAYER IS THAWED, EXTREME CARE MUST BE UTILIZED TO AVOID DISTURBANCE OF THE RELATIVELY THIN TUNDRA MANTLE.

WARNING SIGN AND INFORMATIONAL PLACARD REQUIREMENTS

WARNING SIGNS AND INFORMATIONAL PLACARDS – PROVIDE ALL SIGNS INDICATED IN THE SCHEDULE BELOW, QUANTITY & LOCATION AS INDICATED ON DRAWINGS. ALL SIGNS SHALL BE 0.08" ALUMINUM PLATE, 10"x14" UNLESS INDICATED OTHERWISE OR REQUIRED TO BE LARGER FOR SPECIFIED LETTER SIZE. PROVIDE 3/16" HOLES IN ALL FOUR CORNERS. WHITE NON–REFLECTIVE VINYL BACKGROUND, 3M 3650–10, WITH 3M SERIES 225 HIGH PERFORMANCE VINYL LETTERS, ONE SIDE ONLY. WARNING LITES OR EQUAL.

WARNING SIGNS – RED LETTERING ON WHITE BACKGROUND.

- (A) DANGER – FLAMMABLE, NO SMOKING (3" HIGH 1/2" STROKE LETTERS – 24"X18")
- (B) IN CASE OF SPILL CALL DEC 1–800–478–9300
- (C) DANGEROUS CARGO, NO VISITORS, NO SMOKING, NO OPEN LIGHTS (3" HIGH 1/2" STROKE LETTERS – 36"x24")
- (D) EMERGENCY PUMP SHUT OFF
- (E) IN CASE OF FIRE OR SPILL TURN OFF MAIN BREAKER

INFORMATIONAL PLACARDS – BLACK LETTERING ON WHITE BACKGROUND.

- (F) CLOSE & LOCK BULK TANK MAIN VALVES AFTER EACH TRANSFER
- (G) TURN OFF MAIN POWER EACH NIGHT
- (H) PRIOR TO FILLING BULK TANKS CEASE TRANSFER OPERATIONS
- (I) CHECK INTERMEDIATE TANK LEVEL DAILY, FILL WHEN BELOW 2'–0"
- (J) MAXIMUM PRESSURE = 90 PSI DO NOT OPERATE PIPELINES WITH PRESSURES IN EXCESS OF MAXIMUM
- (K) DISPENSING NOT PERMITTED WHILE DISPENSING TANK IS BEING FILLED. DISPENSING INTO UNAPPROVED CONTAINERS PROHIBITED.

INSTALLATION – ATTACH TO FENCING WITH HOG RINGS OR STAINLESS STEEL CABLE TIES. ATTACH TO STRUCTURES WITH LAGS OR BOLTS.

SIGNAGE

1. INSTALL SIGNS IN ACCORDANCE WITH THE INTERNATIONAL FIRE CODE REQUIREMENTS.

SETBACK/SEPARATION REQUIREMENTS

ALL TANKS ARE INSTALLED ABOVE GROUND. TO COMPLY WITH THE REQUIREMENTS OF THE 2003 INTERNATIONAL FIRE CODE. THE 2004 ALASKA ENERGY AUTHORITY/DIVISION OF FIRE PREVENTION MEMORANDUM OF AGREEMENT, AND STATE OF ALASKA REGULATIONS THE FOLLOWING MINIMUM CLEARANCES ARE REQUIRED. IF CONTRACTOR DISCOVERS A CONFLICT BETWEEN DESIGN AND REQUIREMENTS BELOW, OR MAKES A CHANGE THAT MAY RESULT IN NONCOMPLIANCE WITH REQUIREMENTS BELOW, CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY FOR RESOLUTION:

10' FROM THE DISPENSER TO ALL BUILDINGS AND PROPERTY LINES.

20' FROM THE DISPENSER TO FIXED SOURCES OF IGNITION.

50' FROM THE DISPENSER TO ALL UNPROTECTED TANKS.

50' FROM THE DISPENSER TO THE BULK TRANSFER AREA.

50' FROM UNPROTECTED DISPENSING TANKS TO THE NEAREST IMPORTANT BUILDING OR NEAREST SIDE OF A PUBLIC WAY.

100' FROM UNPROTECTED DISPENSING TANKS TO THE NEAREST PROPERTY LINE WHICH IS OR CAN BE BUILT UPON.

5' FROM PROTECTED DISPENSING TANKS (6,000 GAL. MAX) TO THE NEAREST IMPORTANT BUILDING OR NEAREST SIDE OF PUBLIC WAY.

15' FROM PROTECTED DISPENSING TANKS (6,000 GAL. MAX) TO THE NEAREST PROPERTY LINE WHICH IS OR CAN BE BUILT UPON.

30' FROM 751–12,000 GAL. BULK STORAGE TANKS TO THE NEAREST PROPERTY LINE WHICH IS OR CAN BE BUILT UPON.

40' FROM 12,001–30,000 GAL. BULK STORAGE TANKS TO THE NEAREST PROPERTY LINE WHICH IS OR CAN BE BUILT UPON.

60' FROM 30,001–50,000 GAL. BULK STORAGE TANKS TO THE NEAREST PROPERTY LINE WHICH IS OR CAN BE BUILT UPON.

25' FROM THE BULK TRANSFER HOSE STAND TO THE NEAREST TANK, THE NEAREST IMPORTANT BUILDING, THE NEAREST PROPERTY LINE WHICH IS OR CAN BE BUILT UPON, COMBUSTIBLE MATERIALS, AND FIXED SOURCES OF IGNITION. DISTANCE MAY BE REDUCED TO 15' IF NOT USED FOR TRANSFER OF CLASS 1 LIQUIDS.

25' FROM FUEL TANKS AND PIPELINES TO RESIDENTIAL WATER WELLS.

100' FROM FUEL TANKS AND PIPELINES TO PUBLIC WATER WELLS.

LEGEND

- EXISTING PROPERTY LINE
- PROPOSED FENCE
- EXISTING VEGETATION
- EXISTING SHORELINE
- 21 EXISTING CONTOUR
- PROPOSED FILL
- EXISTING FILL
- GRADE BREAK
- VERTICAL PIPE TRANSITION
- DRAINAGE ARROW
- EXIST POWER POLE W/ GUY
- PROPOSED POWER POLE
- PROPOSED LIGHT POLE
- 100.4' EXISTING GRADE SPOT ELEVATION
- 101.0 FINISH GRADE ELEVATION

ABBREVIATIONS

ACI	AMERICAN CONCRETE INSTITUTE
ADEC	ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
API	AMERICAN PETROLEUM INSTITUTE
ASME	AMERICAN SOCIETY MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
AWPA	AMERICAN WOOD PROTECTION ASSOCIATION
AWS	AMERICAN WELDING SOCIETY
BTM	BOTTOM
BTU	BRITISH THERMAL UNITS
℄	CENTER LINE
CLR	CLEAR
CONT'D	CONTINUED
CMP	CORRUGATED METAL PIPE
DFT	DRY FILM THICKNESS
DIA,ø	DIAMETER
DOT	DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
EG	EXISTING GRADE
EPA	ENVIRONMENTAL PROTECTION AGENCY
F	FAHRENHEIT
FG	FINISH GRADE
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FPT	FEMALE PIPE THREAD
FT	FEET
GA	GAUGE
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HR	HOUR
IAW	IN ACCORDANCE WITH
INC	INCORPORATED
L	ANGLE IRON
LB	POUND
LF	LINEAR FEET
MAX	MAXIMUM
MECH	MECHANICAL
MIL	0.001 INCH
MIN	MINIMUM
N.C.	NORMALLY CLOSED
NFS	NON–FROST SUSCEPTIBLE
N.O.	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OZ	OUNCE
PL	STEEL PLATE
PRV	PRESSURE RELIEF VALVE
PSF	POUND PER SQUARE FOOT
PSI	POUND PER SQUARE INCH
PSIG	POUND PER SQUARE INCH GAUGE
PT	PRESSURE TREATED
SCH	SCHEDULE
SI	SQUARE INCH
SIM	SIMILAR
SS	STAINLESS STEEL
SSPC	STEEL STRUCTURES PAINTING COUNCIL
STD	STANDARD
STL	STEEL
SY	SQUARE YARD
TS	TUBE STEEL
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UST	UNDERGROUND STORAGE TANKS
W/	WITH
WP	WORKING PRESSURE

ONE INCH

REVISIONS MARK	DATE	DESCRIPTION
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ALAKANUK NATIVE CORPORATION BULK FUEL UPGRADES

ALASKA VILLAGE ELECTRIC COOPERATIVE

ALAKANUK, ALASKA

SHEET TITLE
GENERAL NOTES, LEGEND AND ABBREVIATIONS

SHEET
G1.02

DRAWN BY:	CHECKED BY:
HDL	LMH
DATE:	SCALE:
07/16/10	NONE

JOB NUMBER:
10–007

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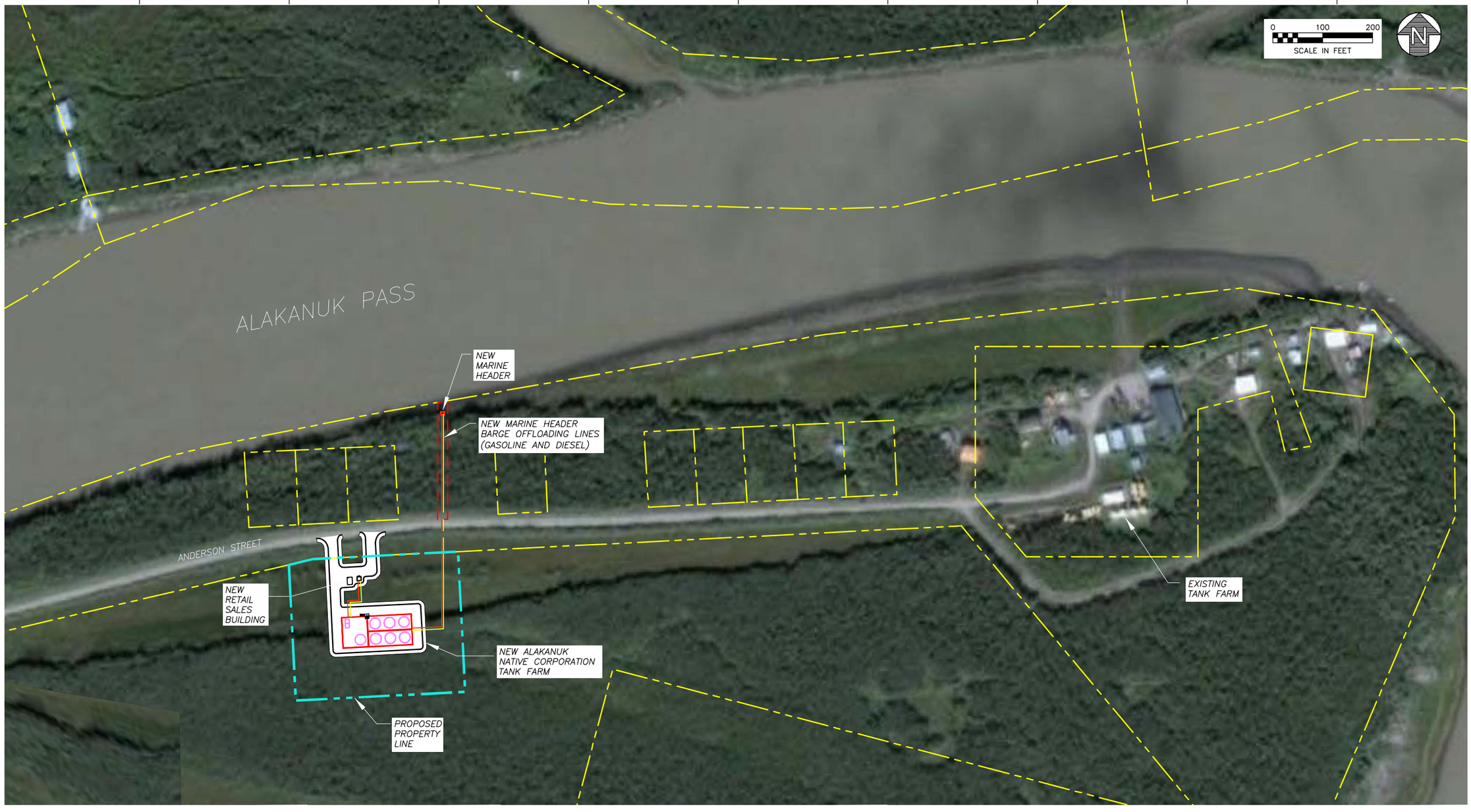
XREF: 10007_00_B0001



PROJECT LAYOUT PLAN

SCALE: 1" = 100'

LEGEND

- PROPOSED PROPERTY LINE
- EXISTING PROPERTY LINE
- PROPOSED EASEMENT LINE

ONE INCH

REVISIONS		
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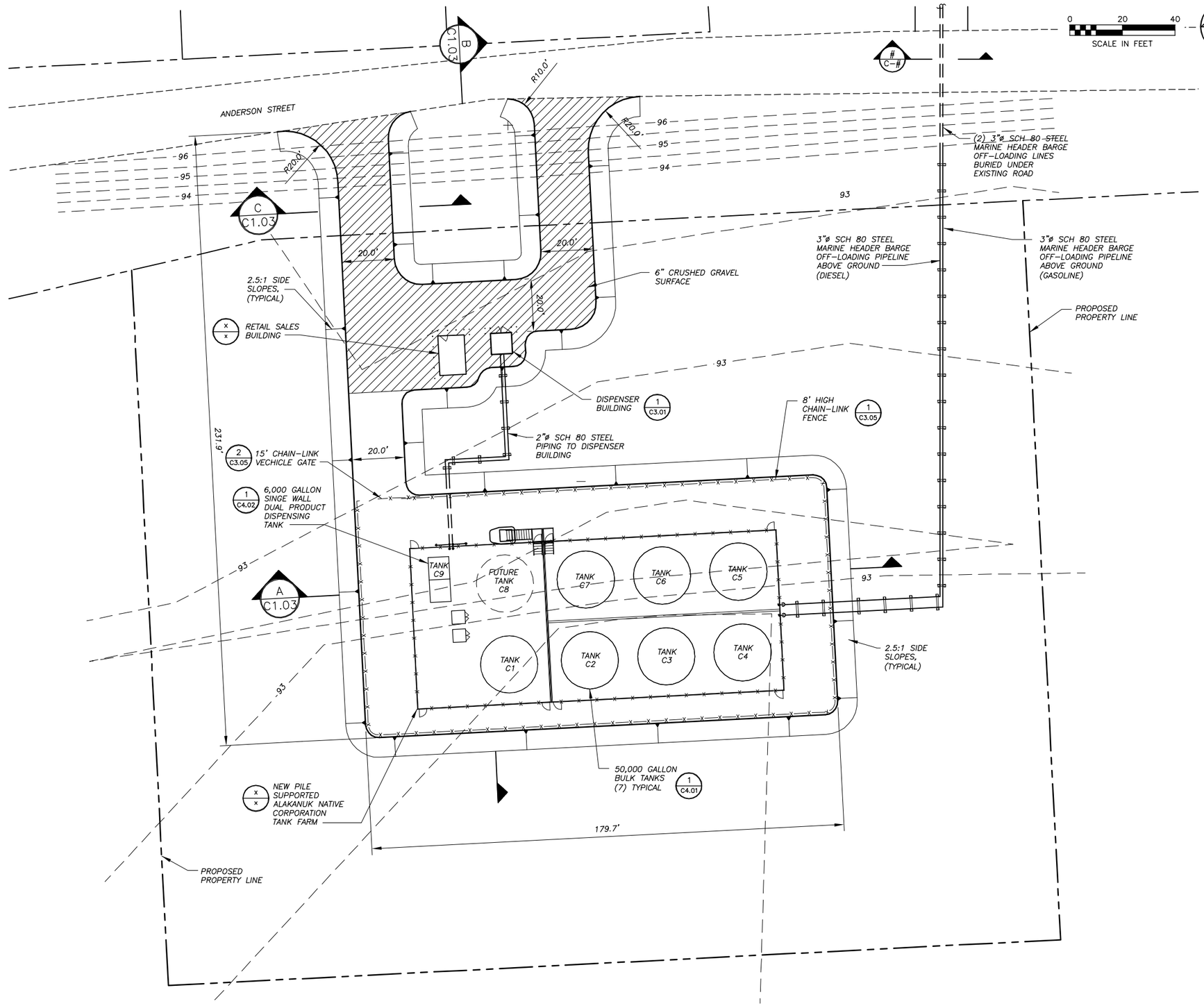
ALAKANUK, ALASKA

SHEET TITLE: PROJECT LAYOUT PLAN

SHEET: C1.01

DRAWN BY:	CHECKED BY:
KK	MRS
DATE: 07/16/10	SCALE: AS SHOWN

JOB NUMBER: 10-007



SITE PLAN

SCALE: 1" = 20'

NOTES:

1. SEE SHEET G1.02 FOR GENERAL NOTES, LEGEND, SYMBOLS, ABBREVIATIONS AND MATERIAL SPECIFICATIONS.
2. SEE SHEET C1.03 FOR GRADING SECTIONS.
3. SEE ELECTRICAL DRAWINGS FOR ELECTRICAL DESIGN.
4. INSTALL EROSION CONTROL MEASURES ON ALL SIDE SLOPES.
5. SEE SHEET C2.01 FOR PIPING PLANS.
6. SEE GENERAL NOTES SHEET G1.02 FOR BASIS OF CONTROL.

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ALAKANUK, ALASKA

AVEC
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4831 EIDER STREET ANCHORAGE, ALASKA 99503

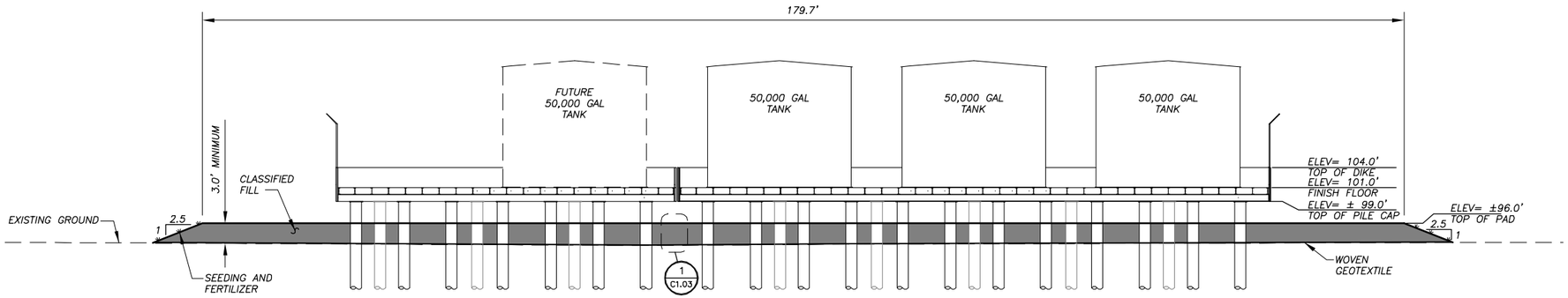
SHEET TITLE: SITE PLAN

SHEET: C1.02

DRAWN BY:	CHECKED BY:
KK	MRS
DATE: 07/16/10	SCALE: AS SHOWN
JOB NUMBER: 10-007	

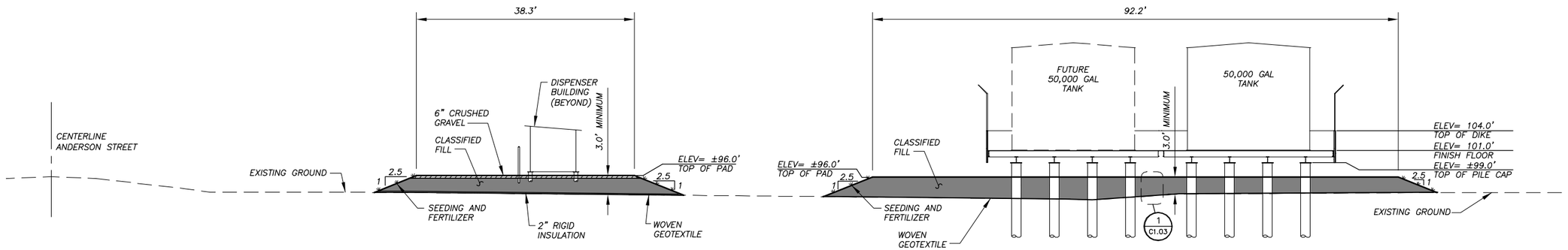
NOTES:

1. SEE SHEET C1.02 FOR GENERAL NOTES, LEGEND, SYMBOLS, ABBREVIATIONS AND MATERIAL SPECIFICATIONS.
2. INSTALL EROSION CONTROL MEASURES ON ALL SIDE SLOPES.



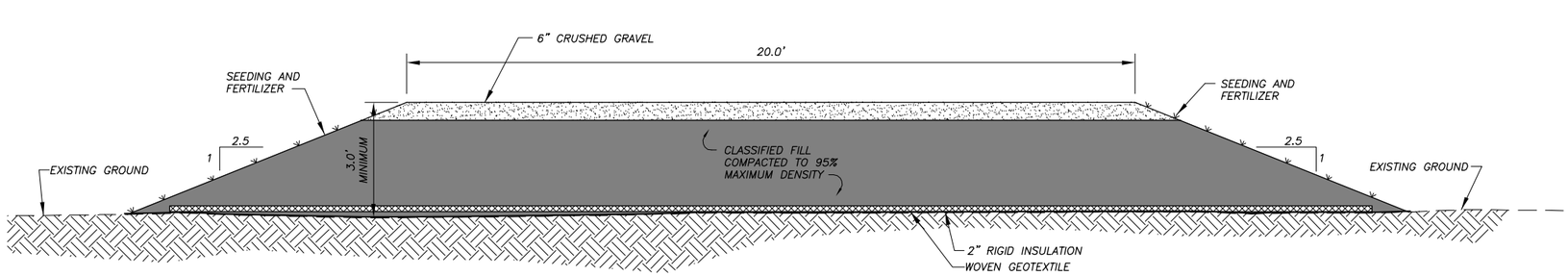
A C1.03 SECTION - ALAKANUK NATIVE CORPORATION TANK FARM

SCALE: 1" = 10'



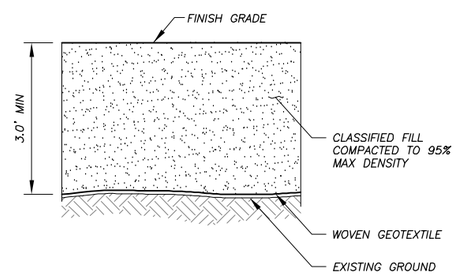
B C1.03 SECTION - ALAKANUK NATIVE CORPORATION TANK FARM

SCALE: 1" = 10'



C C1.03 SECTION - TYPICAL TANK FARM ROAD WAY

SCALE: 1" = 2'



1 C1.03 SECTION - TYPICAL TANK FARM PAD

SCALE: 1" = 2'

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ALAKANUK, ALASKA

SHEET TITLE: CIVIL SECTIONS

SHEET: C1.03

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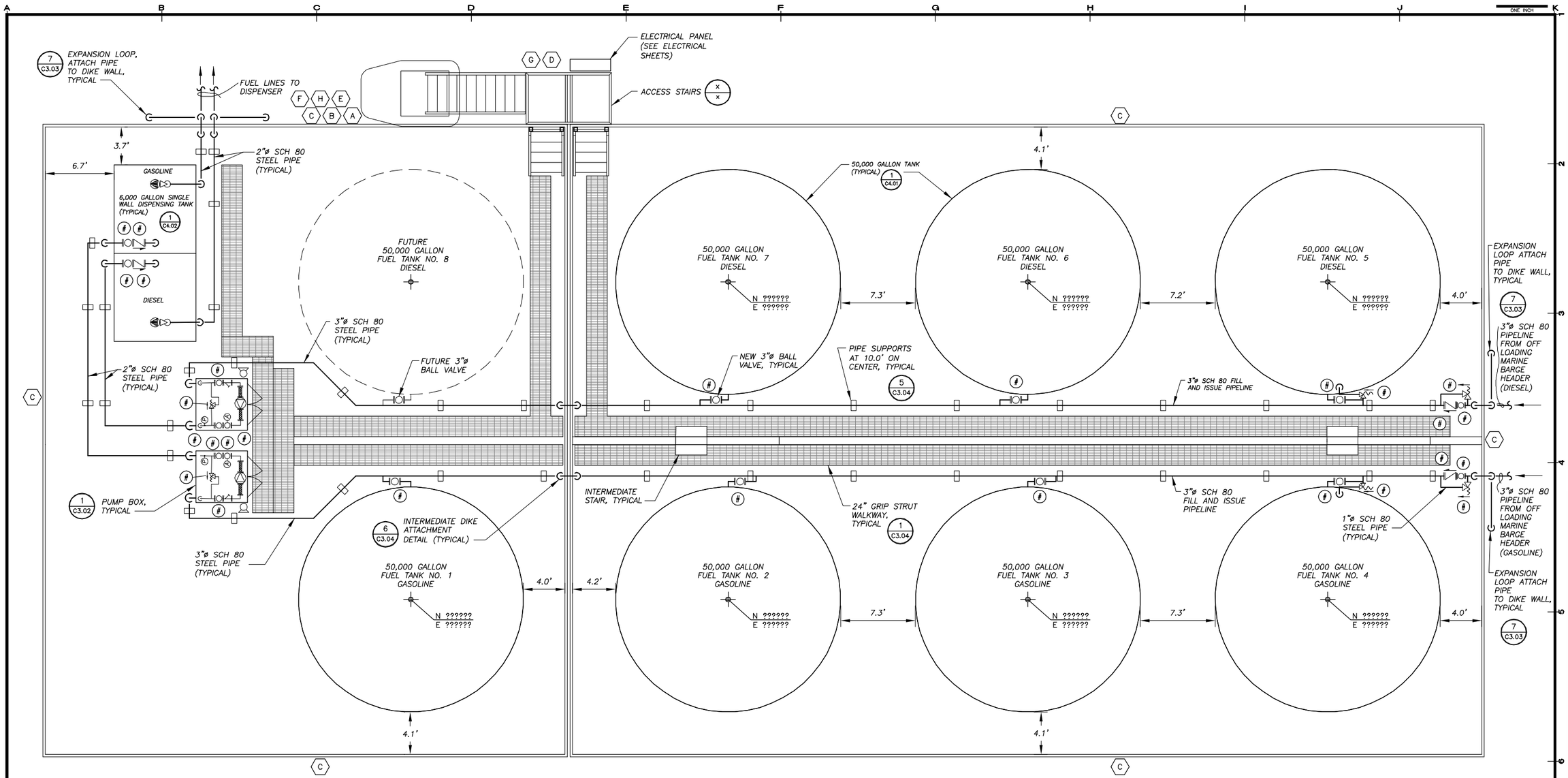
KK	MRS
DATE: 07/16/10	SCALE: AS SHOWN

JOB NUMBER: 10-007



1 C2.01 ALAKANUK NATIVE CORPORATION TANK FARM LAYOUT AND PIPING PLAN

SCALE: 1" = 5.0'

LEGEND

- FLANGED BALL VALVE
- FLANGED CHECK VALVE
- FLANGED FLEX FITTING
- VERTICAL TRANSITION
- SOLENOID VALVE
- ACTUATED BALL VALVE
- CAMLOCK
- FLANGED STRAINER
- ANTI–SYPHON VALVE
- PRESSURE RELIEF VALVE WITH FLOW DIRECTION
- FILL LIMITING VALVE
- VALVE TAG
- PLACARD – SEE SHEET ????
- CENTRIFUGAL PUMP
- SUBMERSIBLE PUMP
- REDUCER
- FIRE EXTINGUISHER
- PRESSURE GAUGE

NOTES

1. SEE SHEET G1.02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND MATERIAL SPECIFICATIONS.
2. SEE PROJECT LAYOUT PLAN SHEET C1.01 FOR TANK FARM LOCATION AND PIPELINE ROUTING.
3. SEE SHEET ???? FOR VALVE TAG SCHEDULE.
4. SEE SHEET ???? FOR SIGN AND PLACARD LEGEND.
5. SEE SHEET ???? FOR TANK SCHEDULE.
6. SEE STRUCTURAL SHEETS FOR CONTAINMENT DETAILS.

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ALAKANUK, ALASKA

SHEET TITLE: TANK FARM LAYOUT AND PIPING PLAN

SHEET: C2.01

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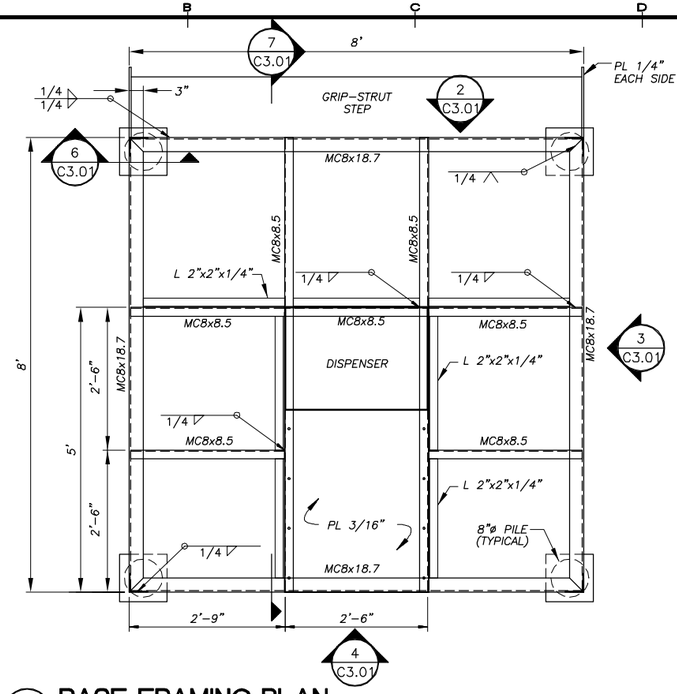
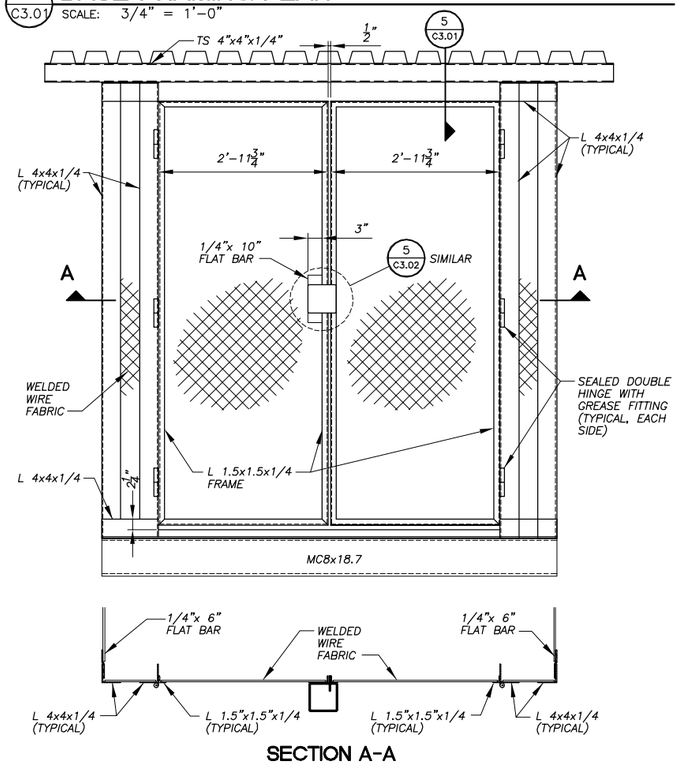
KK	MRS
DATE: 07/16/10	SCALE: AS SHOWN

JOB NUMBER: 10-007



1 C3.01 BASE FRAMING PLAN

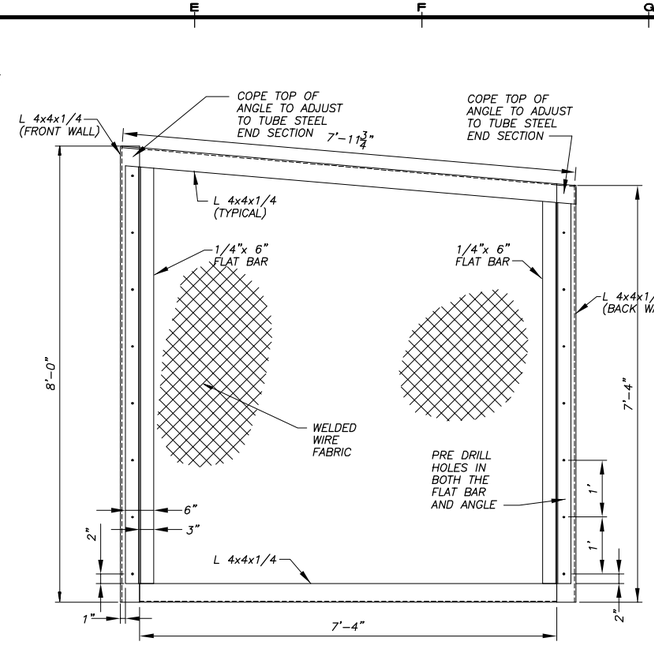
SCALE: 3/4" = 1'-0"



2 C3.01 FRONT PANEL ELEVATION

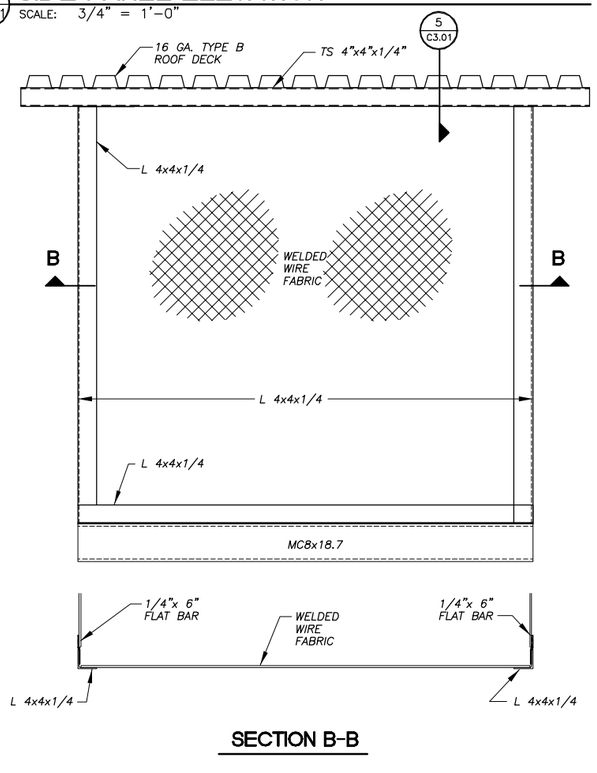
SCALE: 3/4" = 1'-0"

SECTION A-A



3 C3.01 SIDE PANEL ELEVATION

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



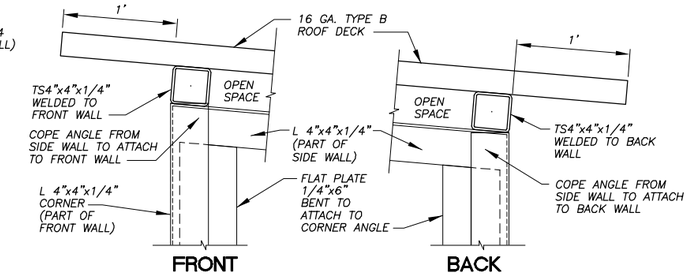
SECTION B-B

4 C3.01 BACK PANEL ELEVATION

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

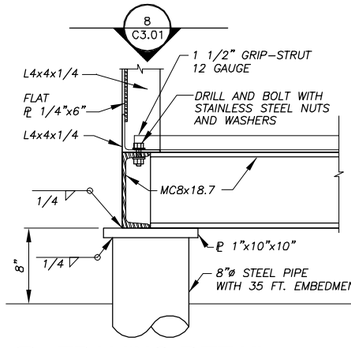
NOTES

1. SEE SHEET G1.02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND MATERIAL SPECIFICATIONS. \
2. SET SHEAR VALVE WITH PLANE OF SHEAR AT TOP OF DISPENSER MOUNT.
3. SEE SHEETS _____ AND _____ FOR DISPENSING ENCLOSURE SIGNAGE.
4. HOT DIP GALVANIZE STRUCTURE, FLOOR, AND DISPENSER BASE IN ACCORDANCE WITH ASTM A123. BOLTS, NUTS AND WASHERS SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A 153.
5. 4" SQUARE WIRE MESH WITH 3/8" WIRE. McNICHOLS CATALOG WITH GALVANIZE COATING.
6. ALL DISPENSERS SHALL HAVE PILE FOUNDATIONS.
7. PROVIDE FIRE EXTINGUISHERS FOR THE DISPENSERS PER THE INTERNATIONAL FIRE CODE AND THE 7. INTERNATIONAL BUILDING CODE.



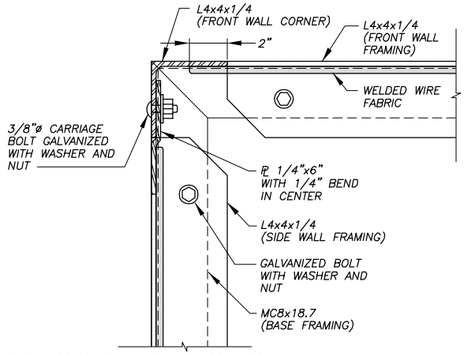
5 C3.01 ROOF CONNECTION DETAIL

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



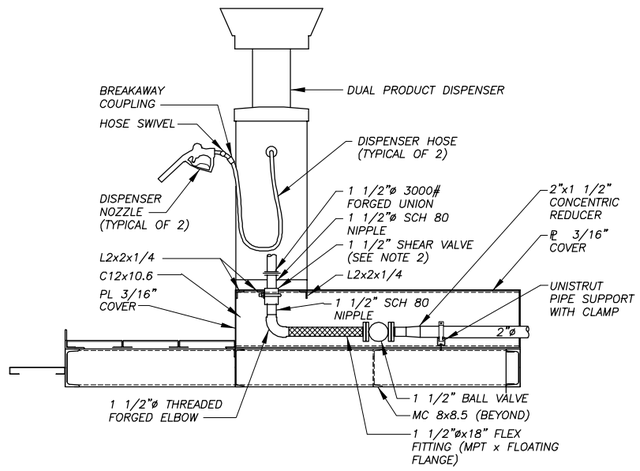
6 C3.01 FRAMING DETAIL

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



8 C3.01 CORNER SECTION

SCALE: 3" = 1'-0"



7 C3.01 DISPENSER SECTION

SCALE: NONE

REVISIONS		
MARK	DATE	DESCRIPTION
1		
2		
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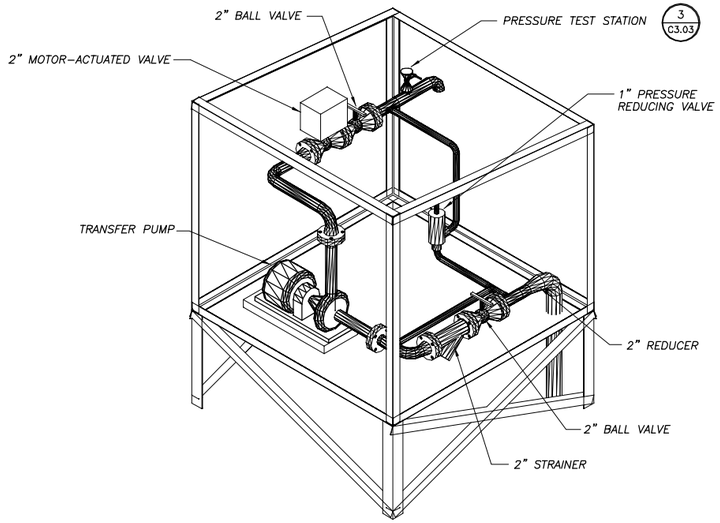
SHEET TITLE
DISPENSER DETAILS

SHEET
C3.01

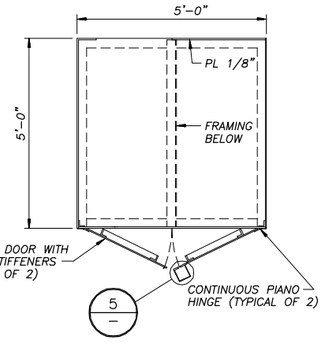
DRAWN BY:	CHECKED BY:
KK	LMH
DATE: 07/16/10	SCALE: AS NOTED
JOB NUMBER: 10-007	

NOTES

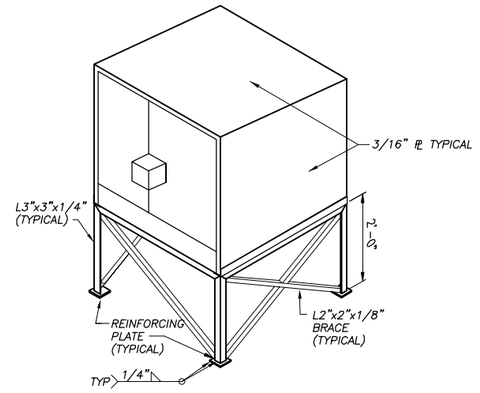
1. SEE SHEET G1.02 FOR GENERAL NOTES, AND SPECIFICATIONS, LEGEND, AND ABBREVIATIONS.
2. ALL CONNECTIONS SHALL BE CONTINUOUSLY WELDED UNLESS OTHERWISE NOTED.
3. PUMP BOX SHALL BE FROM A36 STEEL.
4. PUMP BOX SHALL HAVE A 6" SILL FOR SECONDARY CONTAINMENT AND SHALL BE DRAINED VIA A 1"ø THREADED STEEL DRAIN PLUG.
5. PUMP BOX SHALL BE PAINTED PER SPECIFICATIONS.



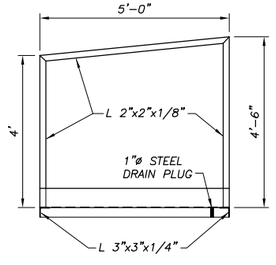
6 / C3.02 PUMP BOX PIPING DIAGRAM
SCALE: NONE



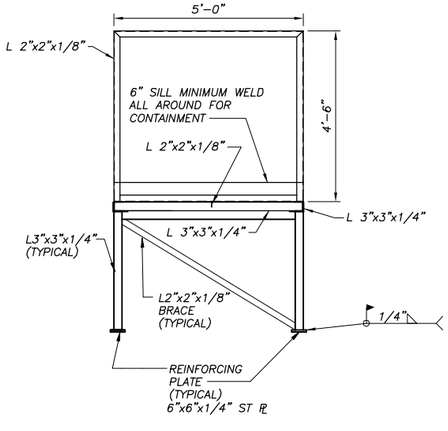
1 / C3.02 PUMP BOX PLAN
SCALE: NONE



3 / C5.02 PUMP BOX BASE ISOMETRIC
SCALE: NONE

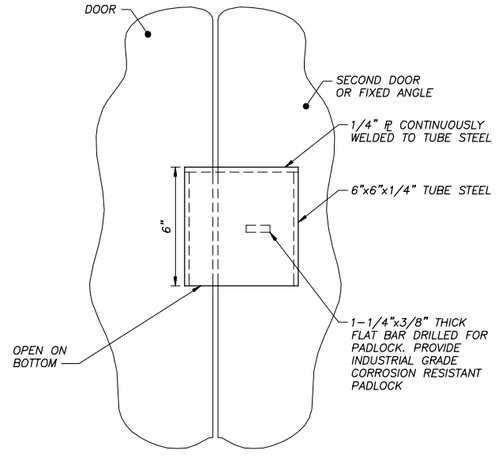


2 / C3.02 SECTION: PUMP BOX
SCALE: NONE



4 / C3.02 PUMP ENCLOSURE FRAMING
SCALE: NONE

PLAN



5 / C3.02 DOOR LOCK DETAIL
SCALE: NONE

REVISIONS		
MARK	DATE	DESCRIPTION
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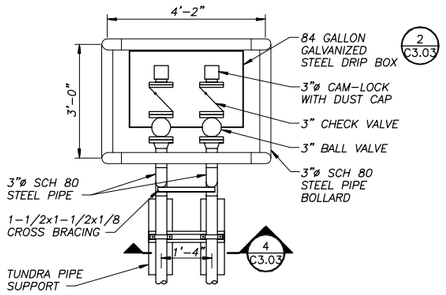
SHEET TITLE: PUMP BOX DETAILS

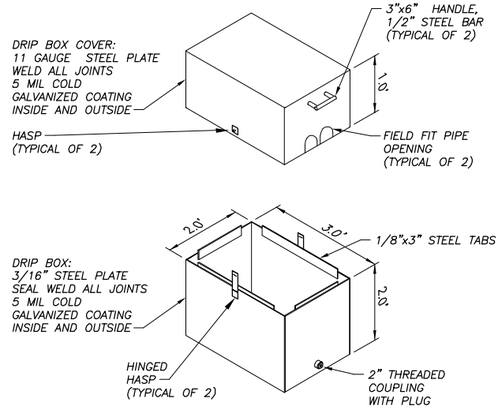
SHEET: C3.02

DRAWN BY:	CHECKED BY:
KK	LMH
DATE: 07/16/10	SCALE: AS NOTED
JOB NUMBER: 10-007	



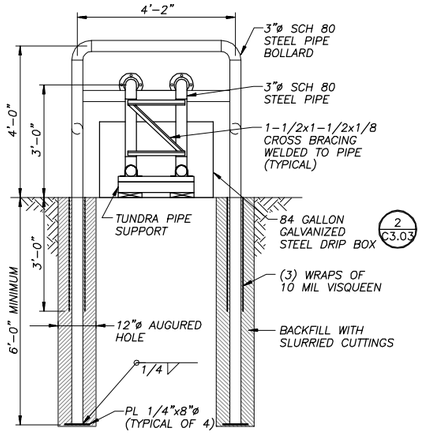
1 C3.03 PLAN - DOUBLE MARINE HEADER DETAIL

SCALE: NONE



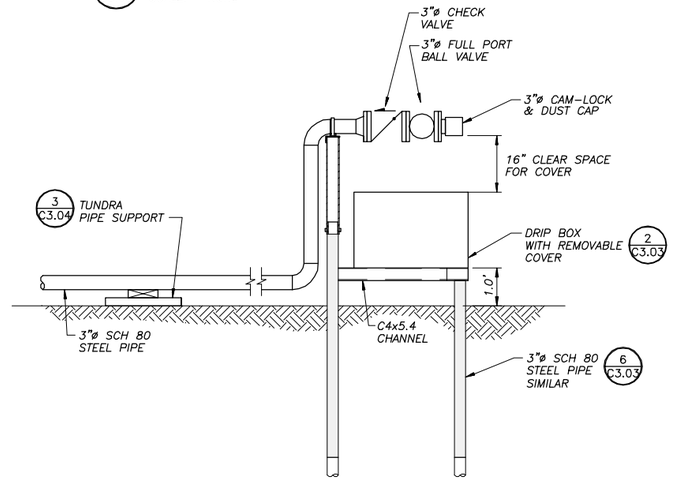
2 C3.03 DRIP BOX WITH COVER DETAIL

SCALE: NONE



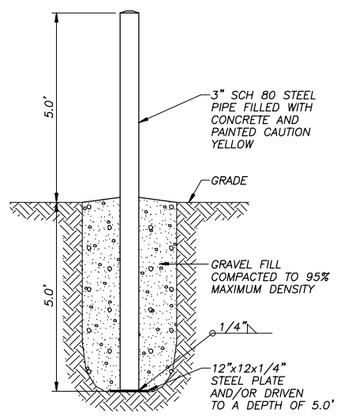
4 C3.03 SECTION - MARINE HEADER DETAIL

SCALE: NONE



5 C3.03 SECTION - MARINE HEADER DETAIL

SCALE: NONE

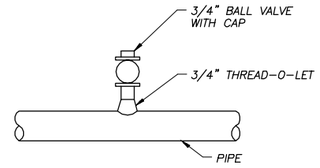


6 C3.03 BOLLARD DETAIL

SCALE: 1" = 2'

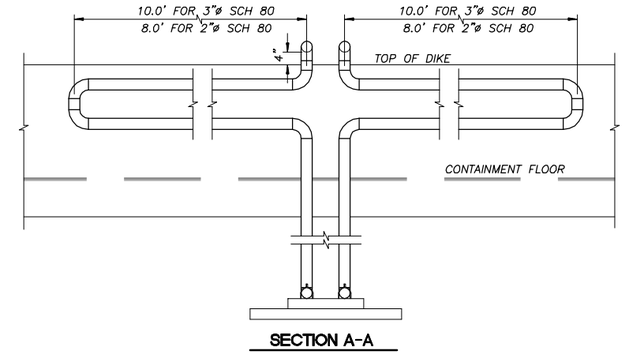
NOTES

1. SEE SHEET G1.03 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND MATERIAL SPECIFICATIONS.

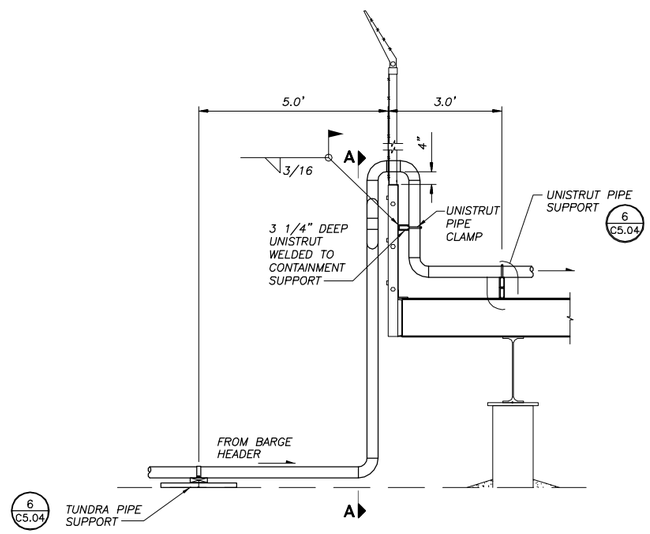


3 C3.03 PRESSURE TEST CONNECTION

SCALE: NONE



SECTION A-A



7 C3.03 PIPE ATTACHMENT DETAIL

SCALE: 1" = 2'

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MARK	DATE	DESCRIPTION
1		
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SHEET TITLE: PIPING DETAILS

SHEET: C3.03

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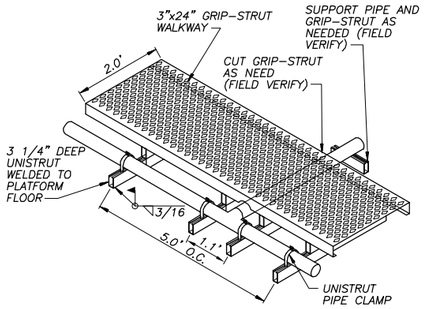
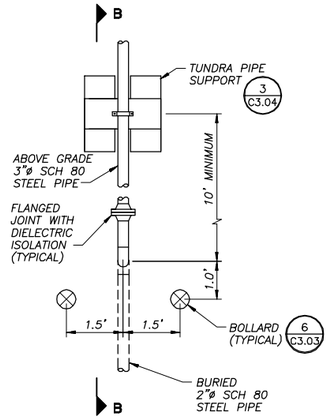
HDL	LMH
DATE:	SCALE:
07/16/10	AS NOTED

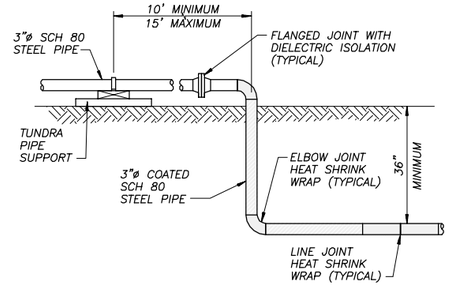
JOB NUMBER: 10-007



1 C5.04 CONTAINMENT WALKWAY DETAIL

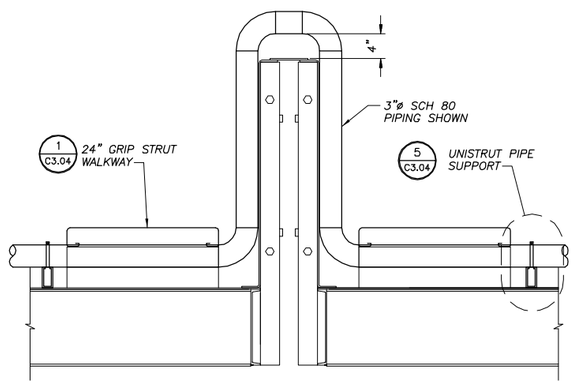
SCALE: 1" = 2'





2 C3.04 VERTICAL TRANSITION

SCALE: 1" = 2'

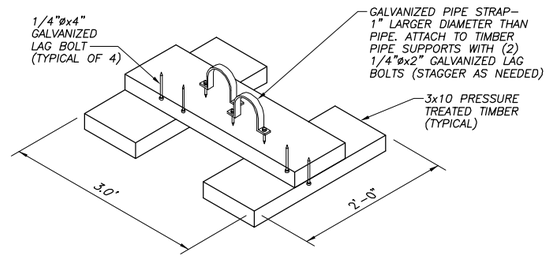


4 C3.04 INTERMEDIATE DIKE CROSSING

SCALE: NONE

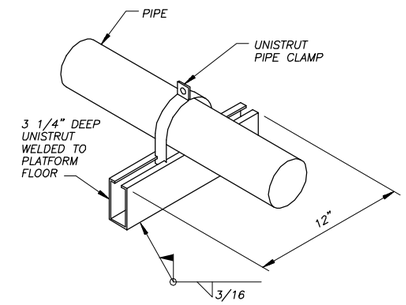
NOTES

1. SEE SHEET G1.02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND MATERIAL SPECIFICATIONS.
2. LOCALLY GRADE AND STACK 3X10 PRESSURE TREATED TIMBER BELOW TUNDRA PIPE SUPPORTS AS NEEDED FOR LEVEL PIPE SUPPORT SURFACE ON CROSS SLOPE.



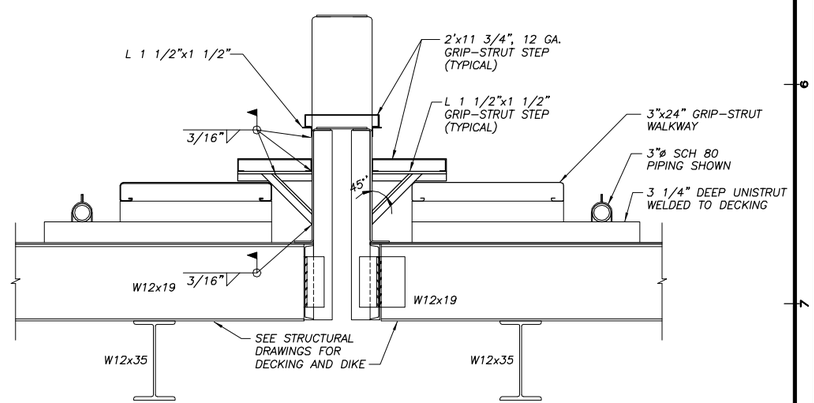
3 C3.04 TUNDRA PIPE SUPPORT (OUTSIDE TANK FARM)

SCALE: NONE



5 C3.04 UNISTRUT PIPE SUPPORT (INSIDE TANK FARM)

SCALE: NONE



6 C3.04 INTERMEDIATE DIKE STAIR DETAIL

SCALE: NONE

REVISIONS			
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1			
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SHEET TITLE: PIPING DETAILS

SHEET: C3.04

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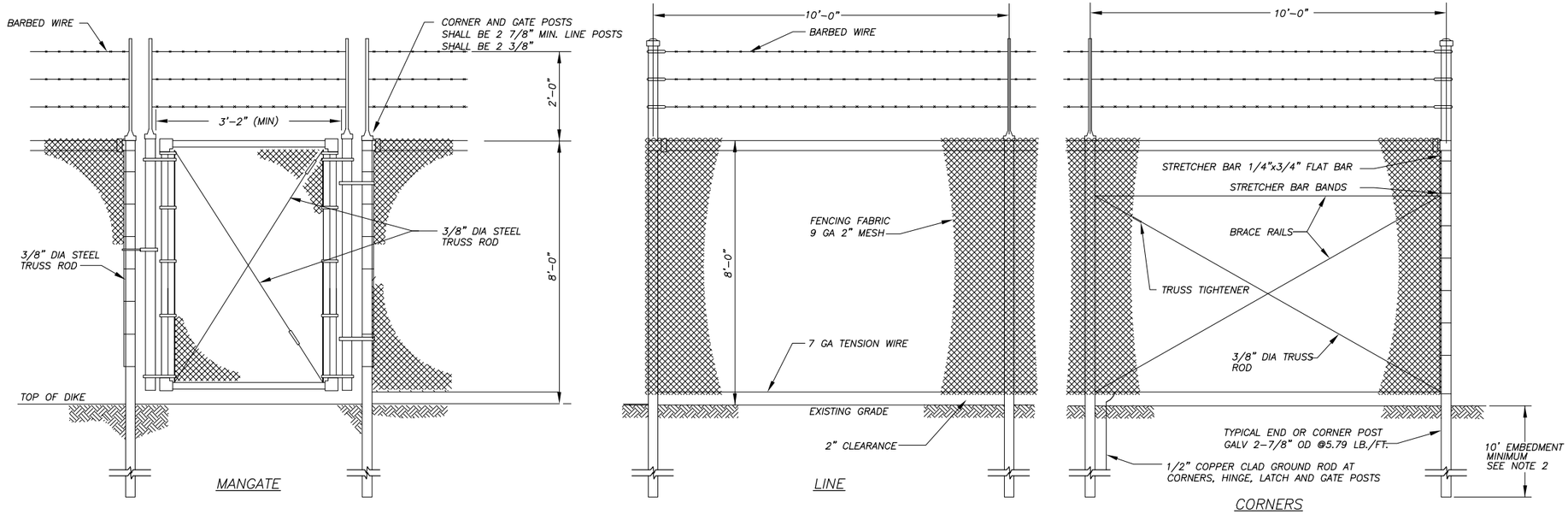
DATE: 07/16/10	SCALE: AS NOTED

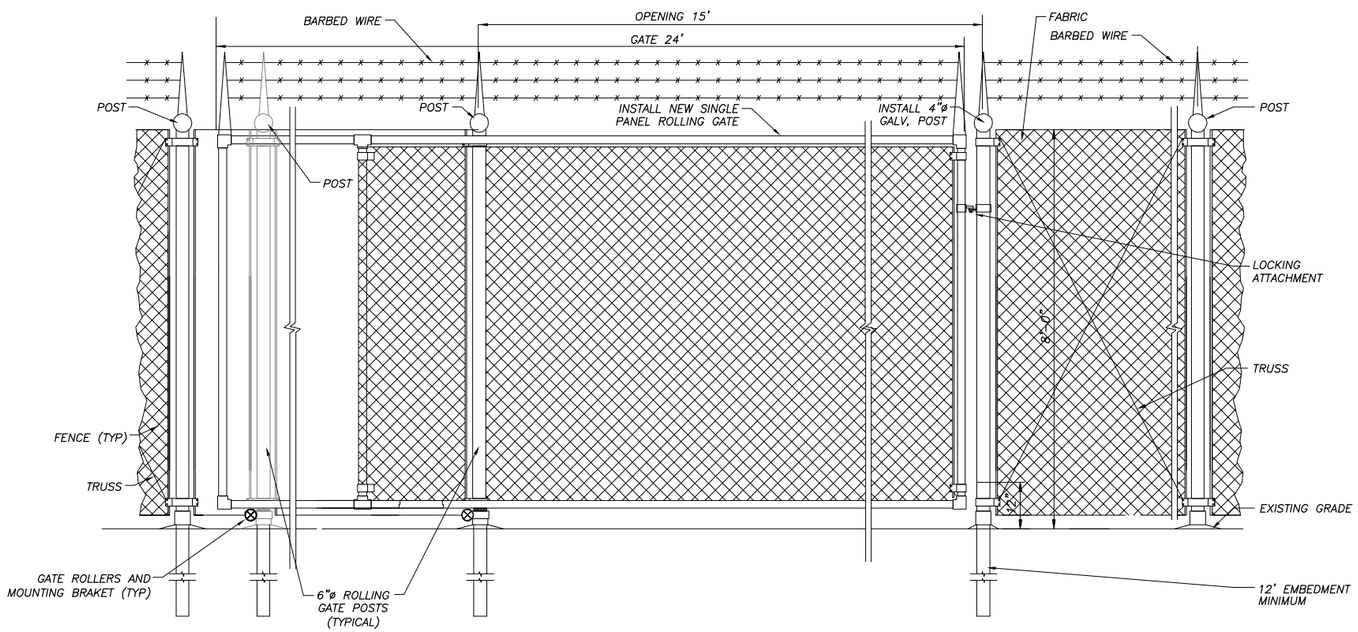
JOB NUMBER: 10-007

H:\jobs\10-007 Alakanuk CDR and Geotech (AVEC Base 2009)\CAD\Drawings\10007_00_C304, 1=1, 07/15/10 at 13:47 by jkk
LAYOUT: C5.04
XREF: 10007_00_B0001



1 C3.05 **CHAIN LINK FENCE DETAIL**

SCALE: NONE



2 C3.05 **CHAIN LINK FENCE VEHICLE GATE**

SCALE: NONE

H:\Jobs\10-007 Alakanuk CDR and Geotech (AVEC Base 2009)\CAD\Drawings\10007_00_C305, 1=1, 07/15/10 at 13:48 by jkk
LAYOUT: C5.01
XREFs: 10007_00_BK001

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PERIMETER FENCE DETAILS

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C3.05

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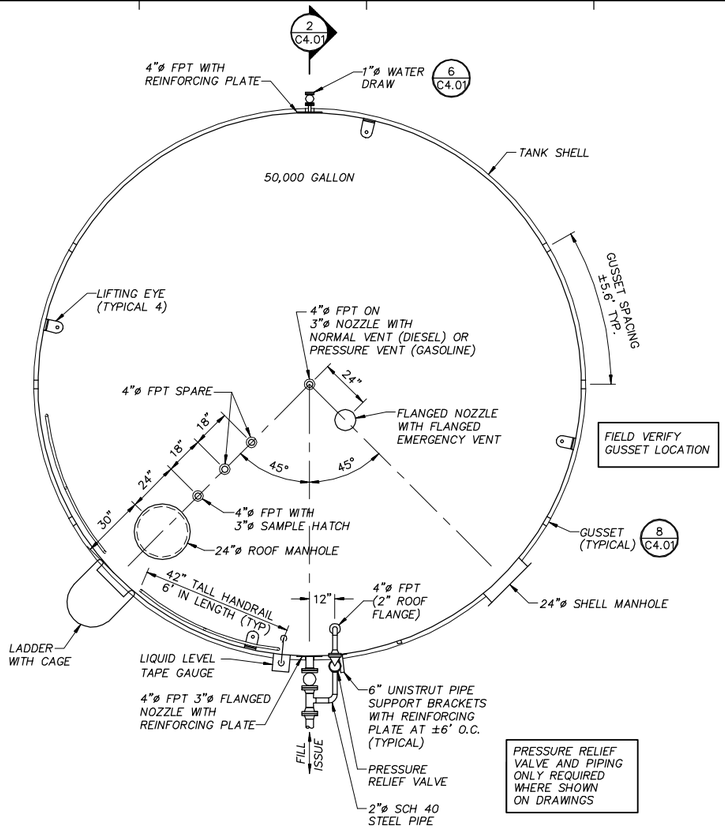
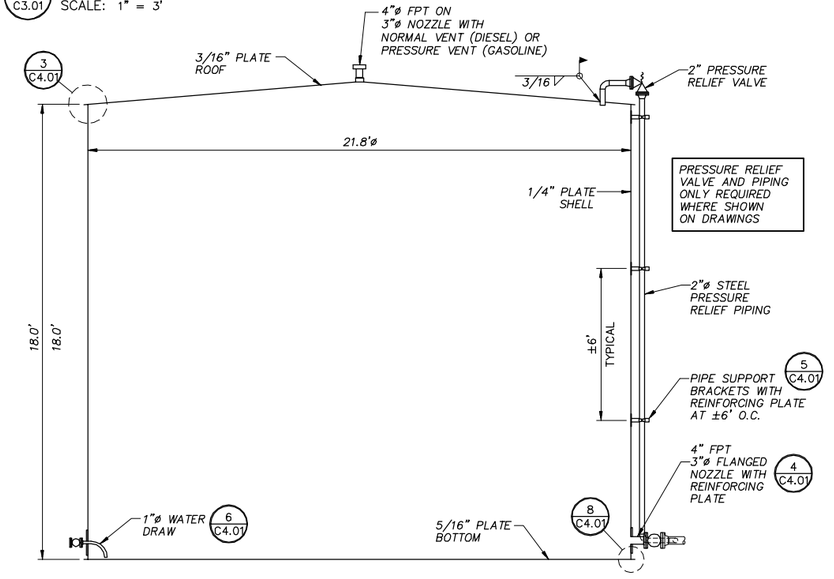
DATE:	SCALE:
07/16/10	AS NOTED

JOB NUMBER: 10-007



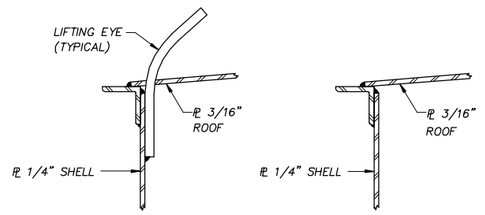
1 C3.01 ROOF LAYOUT PLAN

SCALE: 1" = 3'



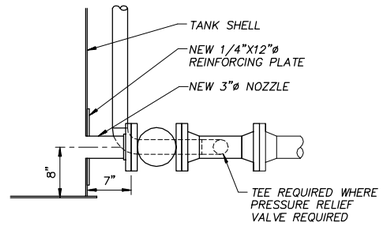
2 C4.01 TANK SECTION

SCALE: 1" = 3'



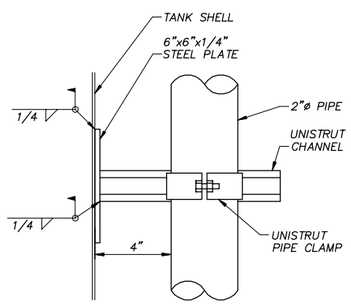
3 C4.01 ROOF CONNECTION DETAILS

SCALE: 3" = 1'-0"



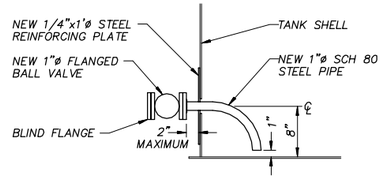
4 C4.01 FILL/ISSUE DETAIL

SCALE: 1" = 1'-0"



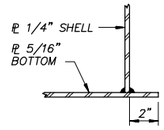
5 C4.01 PIPE SUPPORT DETAIL

SCALE: NTS



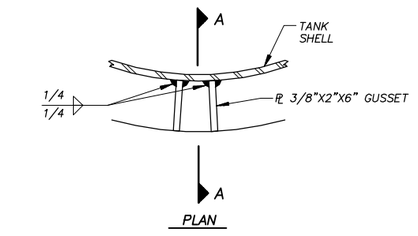
6 C4.01 WATER DRAW DETAIL

SCALE: 1" = 1'-0"



7 C4.01 BOTTOM SECTION DETAIL

SCALE: 3" = 1'-0"



8 C4.01 TANK GUSSET DETAIL

SCALE: 1" = 3'

NOTES

1. SEE SHEET G1.02 FOR GENERAL NOTES, ABBREVIATIONS, LEGEND AND MATERIAL SPECIFICATIONS.
2. VERTICAL TANK SHALL BE NEW API 650 LISTED AND LABELED.
3. ALL PIPING SHALL BE SCHEDULE 80 WITH WELDED JOINTS UNLESS SHOWN OTHERWISE.
4. TANKS SHALL BE PAINTED PER THE SPECIFICATIONS.

REVISIONS		
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ALASKA VILLAGE ELECTRIC COOPERATIVE

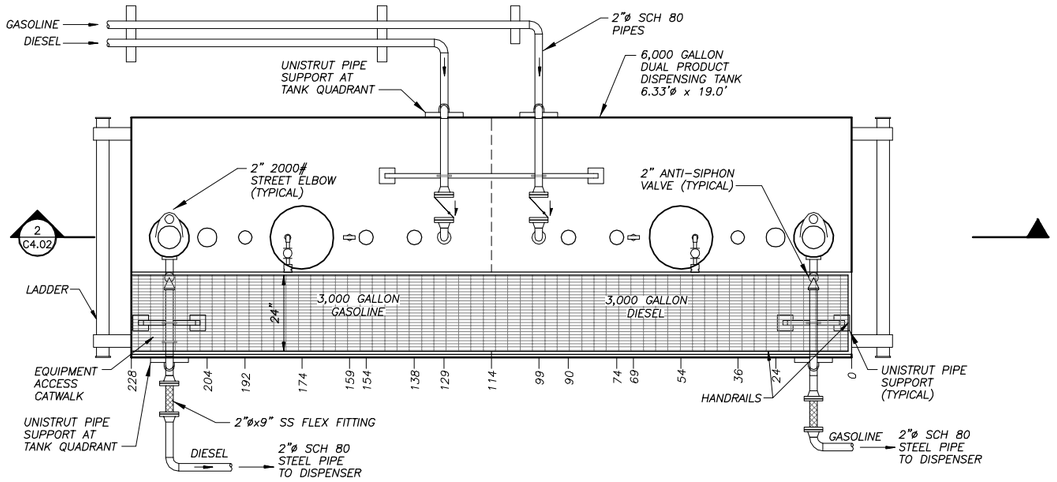
ALAKANUK, ALASKA

SHEET TITLE
50,000 GALLON BULK TANK DETAILS

SHEET
C4.01

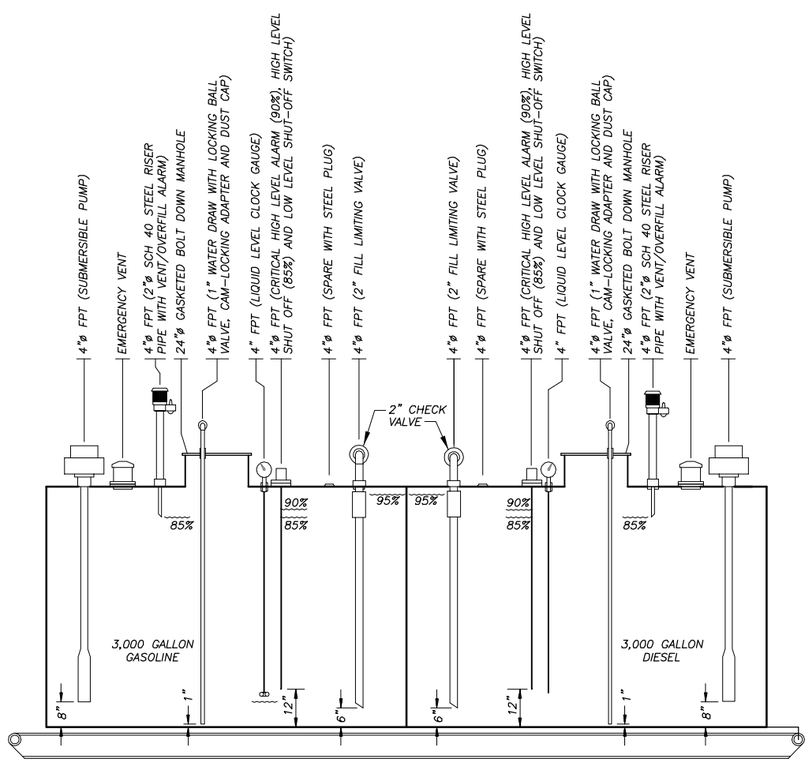
DRAWN BY:	CHECKED BY:
KK	MRS
DATE:	SCALE:
07/16/10	AS SHOWN

JOB NUMBER: 10-007



1 C4.02 **PLAN - 6,000 GALLON DUAL PRODUCT SINGLE WALL DISPENSING TANK**

SCALE: NONE



2 C4.02 **PLAN - 6,000 GALLON DUAL PRODUCT SINGLE WALL DISPENSING TANK**

SCALE: NONE

NOTES

1. SEE SHEET G1.02 AND FOR GENERAL NOTES, LEGEND, ABBREVIATIONS, AND MATERIAL SPECIFICATIONS.
2. THE TANK AND APPURTENANCES SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE STATE OF ALASKA FIRE AND LIFE SAFETY REGULATIONS (13 AAC50), ASME B31.3, ASME B31.4, AND B31.4A.
3. TANK SHALL BE NEW UL142 LISTED AND LABELED.
4. SHELL JOINTS WILL BE FULL PENETRATION BUTT WELDS PER U.L. 142, FIG. 6.1, NO. 3.
5. HEAD TO SHELL JOINTS WILL BE FULL FILLET LAP WELDS PER U.L. 142, FIG. 6.2, NO. 6.
6. TANK SHALL BE CONSTRUCTED OF ASTM A-36 PLATE AND STRUCTURAL STEEL.
7. TANK SADDLES AND SKIDS: PROVIDE TANK SADDLES AND SKID SYSTEMS DESIGNED IN ACCORDANCE WITH UL142. TANK SADDLES AND SKIDS SHALL BE SUITABLE FOR SKIDDING EMPTY TANK INTO POSITION AT SITE DURING INSTALLATION. PROVIDE A MINIMUM OF FOUR SADDLES. SKIDS SHALL BE W8x35, OR APPROVED EQUAL.
8. ALL PRIMARY TANKS SHALL BE EQUIPPED WITH A HEAVY EMERGENCY VENT.
9. PROVIDE LABELING ON TANK IN ACCORDANCE WITH THE INTERNATIONAL FIRE CODE, INCLUDING BUT NOT LIMITED TO:
   - PRODUCT IDENTIFICATION
   - COMPARTMENT STORAGE CAPACITY
   - TARE WEIGHT
   - NFPA 704
   - INTERNATIONAL FIRE CODE CHAPTER 34.
10. ALL PRIMARY TANKS SHALL BE EQUIPPED WITH A COMBINATION VENT/OVERFILL ALARM IN PLACE OF THE NORMAL VENT. SET WHISTLE TO START AT 85% OF TANK CAPACITY.
11. LADDER, HANDRAILS, AND CATWALK MUST MEET ALL APPLICABLE OSHA AND UL142 STANDARDS. LADDER, HANDRAILS, AND CATWALK SHALL BE BOLT-ON UNITS, AND COATED WITH A HOT DIP ZINC GALVANIZE.
12. NORMAL VENT MUST BE MINIMUM OF 12 FEET ABOVE ADJACENT FINISH GRADE.
13. THIS DRAWING IS A PROTOTYPICAL TANK DRAWING. CONTRACTOR SHALL MOVE FILL AND ISSUE BUNG LOCATIONS TO MATCH EACH TANK'S PIPING LOCATION REQUIREMENTS.
14. TANK SHALL BE PAINTED PER SPECIFICATIONS.

REVISIONS		
MARK	DATE	DESCRIPTION
1		
2		
3		
4		
5		

NOT FOR CONSTRUCTION

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4831 Eagle Street
Anchorage, Alaska 99503

ALAKANUK NATIVE CORPORATION BULK FUEL UPGRADES

ALASKA VILLAGE ELECTRIC COOPERATIVE

ALAKANUK, ALASKA

SHEET TITLE
6,000 GALLON DUAL PRODUCT DISPENSER TANK DETAILS

SHEET
C4.02

DRAWN BY:	CHECKED BY:
HDL	LMH
DATE: 07/16/10	SCALE: AS NOTED
JOB NUMBER: 10-007	

Appendix B

Geotechnical Report

Appendix C

US Army Corps of Engineers – Flood Plain management Services

Alaskan Communities Flood Hazard Data 1998 Publication Information

Alakanuk | City Office: (907) 238-3313 | Revised: 3/8/10

STATUS	2nd class city	LAST FLOOD EVENT	2009
POPULATION	670	FLOOD CAUSE	Break-up/Ice Jam
BUILDINGS		ELEVATION	
RIVER SYSTEM	Yukon River	FLOOD OF RECORD	1952
COASTAL AREA	none	FLOOD CAUSE	Ice Jam
		ELEVATION	
NFIP STATUS	not participating	WORST FLOOD EVENT	
FLOODPLAIN REPORT	Field Trip	FLOOD CAUSE	
FLOOD INSURANCE STUDY	no	FLOOD GAUGE	yes

Comments: The following elevations are based on the staff gauge. Zero on the gauge is ground level at the gauge.

SURVEY INFORMATION AS OF JUNE 1997	
Recommended building elevation	6.1
1952 flood elevation	5.1
School floor	8.3
Power plant floor	3.3

In 2009, the state experienced a period of below average temperatures followed by above average temperatures. This caused rapid snow-pack melting resulting in high flows in many basins, including the Yukon River. The 2009 flood measured 1.3 feet on the flood gage; 3.8 feet lower than the flood of record.

High Water Marks (HWM) established by the Corps are based on the water level of the 1952 flood and are considered to represent the Base Flood Elevation (100-year flood level). Estimated zero damage is approximately 3 ft below HWM #1. The estimated zero damage for the downstream end of the village would be 2 ft lower.

HWM #1(RP-1) Located on the downstream, riverside of the support piling of John Hanson's house (NW corner).

HWM #2(Rp-2) Located on the utility pole downstream and inland (approximately 100 yards SW) of John Hanson's house.

2009 Flood Stage Measurement of Alakanuk

Floodplain Manager |
(907) 753-2610

CEPOA-EN-CW-HH

MEMORANDUM FOR RECORD

SUBJECT: Flood Stage Measurement of Alakanuk, Alaska Trip Report

1. Purpose of Visit. On 5 June 2009, Crane Johnson and Nathan Epps from the U.S. Army Corps of Engineers Alaska District visited the community of Alakanuk, Alaska to measure high water marks from the break-up flood of 2009 on the Yukon River. This work was performed under Corps of Engineers authority to provide emergency assistance under PL 84-99. This memorandum describes the physical measurements performed at Alakanuk.

2. Location and Background. Alakanuk is a community of 670 people located on the south bank of the Alakanuk Pass of the Yukon River approximately 8 air miles southeast of Emmonak, 128 air miles south of Nome and 160 air miles northwest of Bethel. Late this April, the state experienced a period of below average temperatures followed by a period of higher than average temperatures. This caused a rapid melting of snow packs resulting in high flows in many basins, including the Yukon River.

3. Flood of Record. The flood of record in Alakanuk occurred in 1952 and was marked by Corps of Engineers by placing washers in a house and telephone pole in 1989 based on the accounts of residents. A flood gage was placed on the tribal office with the flood of record corresponding to 5.1 feet on the gage. The 2009 flood was 3.8 feet lower than the flood of record and measured 1.3 feet on the flood gage. The team located the washer placed on a telephone pole with high water marks from the recent flood nearby. The foundation of the house which had the other washer was replaced, but from the record account and photographic evidence, the team determined the equivalent elevation to be one foot below the siding of the house. The 2009 flood was estimated to be 3.2’ below the 1952 flood of record in this upstream survey area.

4. Survey of High Water Marks. Since the community covers a long stretch of river bank, two survey areas were established to measure water levels. Survey Area 1 covers the upstream extent of Alakanuk including the residences upstream of the Native Store. Survey Area 2 covers the portion of Alakanuk from the barge landing at the bend in Alakanuk Pass to the location of the survey monument near the last pole on Anderson Street. At Survey Area 1, a temporary benchmark was established using the high water mark washer mounted on a telephone pole near the Native Store. At Survey Area 2, a temporary benchmark was established on a foundation bolt of a satellite dish. This benchmark was tied into the Corps of Engineers flood gage mounted on the back of the city and tribal office building. This gage was installed in 1989 as part of the Corps of Engineers flood plain management program. All elevations in Survey Areas 1 are referenced to this Corps of Engineers flood gage. The flood elevation in Survey Area 1 based on good to excellent high water marks was 7.16 feet, which is 2.84 feet below the

flood of record. The flood elevation in Survey area 2 near the flood gage was 1.33 feet, which is 3.77 feet below the flood of record.

5. Vertical Control. The team attempted to locate vertical control monuments to use as a datum for these measurements without success. A search through the online NGS database revealed 1 vertical control monument in Alakanuk set by BLM named C3TRG at the downstream end of Survey Area 2. This monument is also used as the basis for the DCED community map. A thorough search of the coordinates revealed a pipe firmly embedded into the ground with no cap which appeared to have been damaged. Ground elevation was measured at this location, but the monument itself was destroyed.

Lewis Nathan Epps
Structural/Hydraulic Engineer

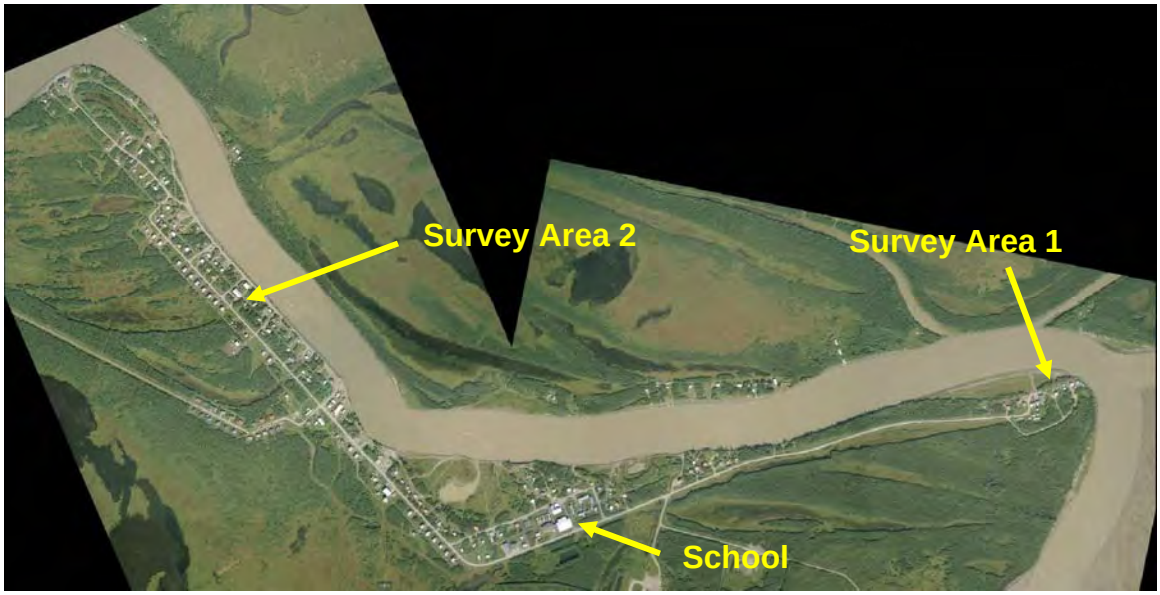

Figure 1: Overview of Alakanuk Surveys.

Figure 2: High water marks in Survey Area 1. Note that Figures 2 and 3 have different scales.

Figure 3: High water marks in Survey Area 2. Note that Figures 2 and 3 have different scales.

Table 1: High Water Marks at Alakanuk

Water Level Mark	Description	Latitude[2]	Longitude[2]	Quality	Elevation	Water Depth
ARHW	COE HWM Marker from 1952 flood	N62°41'13.58"	W164°37'12.19"	N/A	10.00[1]	3.60
AHW1	Silt line on moss	N62°41'13.45"	W164°37'12.44"	Fair	6.80[1]	N/A
AHW2	Silt line on moss	N62°41'13.62"	W164°37'12.16"	Fair	6.84[1]	N/A
AHW4	Silt line on buried snow machine	N62°41'15.21"	W164°37'13.67"	Good	7.16[1]	0.68
ASTAFF1	COE FLOOD GAGE	N62°41'28.01"	W164°40'24.48"	N/A	1.33[2]	1.30
AHW10	Water stain on piling	N62°41'28.01"	W164°40'24.48"	Fair	1.46[2]	1.35
AHW11	Silt line on culvert	N62°41'15.54"[3]	W164°40'09.72"[3]	Good	0.10[2]	1.15
AHW14	Water stain on piling	N62°41'23.47"	W164°40'27.85"	Fair	1.00[2]	2.05
AHW15	Silt line on piling	N62°41'23.47"	W164°40'27.85"	Good	1.00[2]	2.24
AHW16	Debris line on skirt fence	N62°41'28.01"	W164°40'24.48"	Good	0.80[2]	1.33

[1]Vertical survey control in Survey Area 1 was ARHW which was a high water mark washer mounted on a telephone pole near the Native Store. ARHW was assigned an arbitrary elevation of 10.0 feet.
[2]Vertical survey control in Survey Area 2 was ATBM1 which was a bolt in the foundation in the satellite dish near the City Office. The elevation assigned to this bolt is 4.035 feet referenced to the flood gage on the city office set by the Corps of Engineers. No monuments were found intact in the community.
[3]Horizontal datum for all coordinates obtained by handheld GPS unless noted (WGS84 Datum).
[4]Horizontal coordinates estimated from geo-referenced aerial photography (WGS94 Datum).

Alakanuk, Alaska 4 June 2009

N 62° 41.226' W 164° 37.205' 0 ft

Photo 1: High water marker indicating the level of the flood of record designated ARHW in this survey.

Alakanuk, Alaska 4 June 2009

N 62° 41.226' W 164° 37.206' 0 ft

Photo 2: Height of ARHW above ground.

Alakanuk, Alaska 4 June 2009

N 62° 41.227' W 164° 37.203' 7 ft

Photo 3: AHW 1 was a silt line found on a moss covered tree.

Alakanuk, Alaska 4 June 2009

N 62° 41.247' W 164° 37.255' 10 ft

Photo 4: AHW 4 was a silt line found on the inside of the engine compartment of a partially buried snow machine.

Alakanuk, Alaska 4 June 2009

N 62° 41.226' W 164° 40.085' 13 ft

Photo 5: Location of AHW10 on Alakanuk tribal office.

Alakanuk, Alaska 4 June 2009

N 62° 41.227' W 164° 40.080' 0 ft

Photo 6: Measurement of AHW10 showed the line to be 1.46 feet above ground.

Alakanuk, Alaska 4 June 2009

N 62° 41.259' W 164° 40.162' 43 ft

Photo 7: Location of AHW11. This culvert appeared to have remained in place during the flood. Other marks found on sewer pipes were not used since the pipes may have floated during the flooding.

Alakanuk, Alaska 4 June 2009

N 62° 41.579' W 164° 40.790' 10 ft

Photo 8: Assumed remains of C3TRG found in the field.

Alakanuk, Alaska 4 June 2009

N 62° 41.567' W 164° 40.756' 7 ft

Photo 9: Location of the pipe assumed to be C3RTG.

Alakanuk, Alaska 4 June 2009

N 62° 41.469' W 164° 40.399' 10 ft

Photo 10: Location of AHW16 on the skirt fence of a house.

Alakanuk, Alaska 4 June 2009

N 62° 41.228' W 164° 40.090' 46 ft

Photo 11: Location of temporary benchmark used for elevation control in Survey Area 2.

Appendix D

Construction Cost Estimate

Alakanuk Native Corporation
Bulk Fuel Upgrades
35% Construction Cost Estimate

Item No.	ITEM	QUAN.	UNIT	MATERIAL		LABOR	EQUIPMENT	WEIGHT (lbs)	FREIGHT	ITEM TOTAL
				UNIT COST	($) MATL	($) LABOR	($) EQUIP		($) FREIGHT	
1	Mobilization and Demobilization	1	LS							$ 659,000.00
Civil Work										
2	Classified Fill	3,415	CY	$ 120.00	$ 409,800.00					$ 409,800.00
3	Woven Geotextile Fabric	3,464	SF	$ 4.00	$ 13,856.00					$ 13,856.00
4	Insulation	9,800	SF	$ 15.00	$ 147,000.00					$ 147,000.00
5	6-inch Crushed Gravel Surfacing Course	112	CY	$ 150.00	$ 16,800.00					$ 16,800.00
6	Civil Construction Labor and Equipment	1	LS			$ 24,937.60	$ 37,406.40			$ 62,344.00
Piling, Structural Steel Containment, Deck, and Stairs										
	Piling									
7	16" Dia Steel Piles - 60' Long	119	EA.	$ 4,500.00	$ 535,500.00			742,560	$371,280	$ 906,780.00
8	6" Dia Steel Piles - 35' Long	2	EA.	$ 1,155.79	$ 2,311.58			2,002	$1,001	$ 3,312.58
9	1"x20"x20" A36 Pile Caps	119	EA.	$ 139.10	$ 16,553.38			12,947	$6,474	$ 23,026.98
10	1"x10"x10" A36 Pile Caps	2	EA.	$ 24.15	$ 48.30			57	$28	$ 76.63
	Structural Steel Containment									
11	3/8"x 4"x8" A36 Plate, Bridging Tabs	240	EA	$ 3.15	$ 756.00			816	$408	$ 1,164.00
12	5/8"X3.25"x11.5" A36 Plate, Bm Stiffeners	254	EA	$ 5.25	$ 1,333.50			1,681	$841	$ 2,174.05
13	W12x35x50'-4" A36 Main Beams	8	EA	$ 1,534.30	$ 12,274.42			14,093	$7,047	$ 19,321.04
14	W12x35x47'-8" A36 Main Beams	4	EA	$ 1,462.08	$ 5,848.33			6,673	$3,337	$ 9,184.99
15	W12x35x44'-1" A36 Main Beams	5	EA	$ 1,364.00	$ 6,820.00			7,714	$3,857	$ 10,677.00
16	W12x35x40'-5" A36 Main Beams	4	EA	$ 1,255.50	$ 5,022.00			5,658	$2,829	$ 7,851.17
17	W12x19 A36 Purlins 29'-9" Long	118	EA	$ 629.31	$ 74,259.16			66,700	$33,350	$ 107,608.91
18	W12x19 A36 Purlins Blocking	57	EA	$ 40.08	$ 2,284.77			2,708	$1,354	$ 3,638.52
19	MC12x10.6x50'-4.5" Edge Beams	2	EA	$ 648.42	$ 1,296.84			1,068	$534	$ 1,830.82
20	MC12x10.6x44'-1" Edge Beams	5	EA	$ 564.96	$ 2,824.80			2,336	$1,168	$ 3,992.92
21	1/4" Deck Floor Plate	8,540	SF	$ 10.62	$ 90,656.37			87,108	$43,554	$ 134,210.37
22	1/4" Dike Wall Plate	2,920	SF	$ 10.50	$ 30,660.00			29,784	$14,892	$ 45,552.00
23	TS 1/4"x3"x3"x 4'-8" Dike Wall Posts	146	EA	$ 36.09	$ 5,269.10			5,982	$2,991	$ 8,260.18
24	TS 1/4"x6"x6"x 16'-0" Light Wall Posts	6	EA	$ 70.00	$ 420.00			1,824	$912	$ 1,332.00
25	3/8"x 1-1/2" Self Tapping Screws	6	Box	$ 7.00	$ 42.00			30	$15	$ 57.00
26	3/4" Anchor Bolts & Nuts	1	Box	$ 15.00	$ 15.00			5	$3	$ 17.50
27	Angle 2"x2"x3/16"x1'-5.25"	114	EA	$ 3.15	$ 359.10			280	$140	$ 499.32
28	Plate 3/8"x4"x8" A36	57	EA	$ 16.00	$ 912.00			403	$202	$ 1,113.57
29	Angle 4"x4"x3/16"x0-8"	29	EA	$ 16.00	$ 464.00			467	$234	$ 697.70
30	Angle 3"x3"x3/16"x0-8"	58	EA	$ 12.00	$ 696.00			237	$118	$ 814.32
	Bracing under Deck									
31	TS 3"x3"X1/4"x 12'-0" Bracing	119	EA	$ 40.00	$ 4,760.00			12,538	$6,269	$ 11,028.92
32	Plate 3/8"x8"x8" A36 Steel	238	EA	$ 16.00	$ 3,808.00			1,619	$810	$ 4,617.58

Alakanuk Native Corporation
Bulk Fuel Upgrades
35% Construction Cost Estimate

	Stairs (Exterior)									
33	MC 12 x 10.6 Channel	13	LF	$ 630.00	$ 8,190.00			138	$69	$ 8,258.90
34	C6x8.2 x 5' A36 Walkway Cross Ties	18	LF	$ 630.00	$ 11,340.00			148	$74	$ 11,413.80
35	C8 x 8.5 x 5' A36 Walkway Cross Tie	5	LF	$ 630.00	$ 3,150.00			43	$21	$ 3,171.25
36	L2 x 2 x 1/4 A36 Support Angles	13	LF	$ 3.15	$ 40.95			42	$21	$ 61.82
37	L4 x 4 x 1/4 A36 Support Angle	5	LF	$ 4.20	$ 21.00			33	$16	$ 37.45
38	3/8" x 6" x 12" A36 Plate, Brace Tabs	12	EA	$ 5.25	$ 63.00			92	$46	$ 108.96
39	C12x10.6 A36 Walkway Stringers	49	LF	$ 525.00	$ 25,725.00			519	$260	$ 25,984.70
40	1 1/4" Sch40 Pipe Handrail	270	LF	$ 4.20	$ 1,134.00			613	$306	$ 1,440.45
41	1 1/4" Sch40 Pipe Handrail Posts	16	LF	$ 4.20	$ 67.20			36	$18	$ 85.36
42	3/16 x 1.5 x1.5 A36 Grip Strut Support Angle	44	LF	$ 4.20	$ 184.80			108	$54	$ 238.92
43	2" x 11.75" - 12 Ga. Galv. Grip Strut	130	SF	$ 6.00	$ 780.00			806	$403	$ 1,183.00
44	6 x 12 P.T. Timber Mudsill	5	LF	$ 12.60	$ 63.00			40	$20	$ 83.00
	Stairs (Interior)									
45	C10 x 15.3 A36 Stair Stringers	13	LF	$ 10.00	$ 130.00			199	$99	$ 229.45
46	2" x 11.75" x 12 Ga. Galv. Grip Treads	20	SF	$ 4.20	$ 84.00			124	$62	$ 146.00
47	3/16 x 1.5 x 1.5 A36 Angle, Stairs	10	LF	$ 3.00	$ 30.00			25	$12	$ 42.30
48	1 1/4" Sch40 Pipe Handrailing	22	LF	$ 4.20	$ 92.40			50	$25	$ 117.37
	Fencing									
49	6-foot Chain Link Fencing	402	LF	$ 31.50	$ 12,663.00			2,814	$1,407	$ 14,070.00
50	4' Man Gates	4	EA	$ 157.50	$ 630.00			112	$56	$ 686.00
	Labor, Equipment and Fuel									
51	Piling Driving					$ 217,800.00	$ 130,680.00			$ 348,480.00
52	Steel Construction					$ 303,800.00	$ 151,900.00			$ 455,700.00
53	Fence Construction					$ 32,160.00	$ 16,080.00			$ 48,240.00
54	Fuel	250	GAL	$ 6.00	$ 1,500.00					$ 1,500.00
Tanks and Appurtenances										
55	50,000 Gal Vertical Tank and Appurtenances	7	EA	$ 52,500.00	$ 367,500.00			182,000	$273,000	$ 640,500.00
56	10,000 Gal Intermediate Tank and Appurtenances	1	EA	$ 30,000.00	$ 30,000.00			5,000	$7,500	$ 37,500.00
57	Tank Construction					$ 259,000.00				$ 259,000.00

Alakanuk Native Corporation
Bulk Fuel Upgrades
35% Construction Cost Estimate

Tank Farm, Dispensing, and Marine Header Piping										
58	3" Sch80 Pipe	1,524	LF	$ 12.60	$ 19,202.40			15,697	$7,849	$ 27,051.00
59	3" Sch80 Tees	7	EA	$ 15.75	$ 110.25			60	$30	$ 140.00
60	3"Sch80 90s	34	EA	$ 16.80	$ 571.20			221	$111	$ 681.70
61	3" Ball Valve, Flanged	9	EA	$ 441.00	$ 3,969.00			513	$257	$ 4,225.50
62	3" Check Valve, Flanged	1	EA	$ 294.00	$ 294.00			53	$26	$ 320.46
63	3" Weld Neck Flanges	18	EA	$ 63.00	$ 1,134.00			207	$104	$ 1,237.50
64	3" Cam Lock	2	EA	$ 40.00	$ 80.00			2	$1	$ 81.00
65	3" x 3" x 1" Sch80 Tee	2	EA	$ 173.25	$ 346.50			15	$8	$ 354.10
66	3" x 3" x 2" Sch80 Tee	1	EA	$ 178.50	$ 178.50			8	$4	$ 182.50
67	2" Sch80 Pipe	145	LF	$ 7.35	$ 1,065.75			729	$365	$ 1,430.43
68	2" Sch80 Tees	1	EA	$ 24.15	$ 24.15			4	$2	$ 26.28
69	2" Sch80 90s	39	EA	$ 10.50	$ 409.50			86	$43	$ 452.40
70	2" Ball Valve, Flanged	1	EA	$ 252.00	$ 252.00			31	$16	$ 267.50
71	2" Check Valve, Flanged	2	EA	$ 244.65	$ 489.30			62	$31	$ 520.16
72	2" Pressure Reducing Valve	1	EA	$ 908.25	$ 908.25			7	$4	$ 911.85
73	2" Weld Neck Flanges	4	EA	$ 34.65	$ 138.60			24	$12	$ 150.60
74	2" x 2" x 1" Sch80 Tee	1	EA	$ 34.65	$ 34.65			4	$2	$ 36.70
75	2" Weld Neck Flanges	6	EA	$ 34.65	$ 207.90			36	$18	$ 225.90
76	2" Flanged Flex 2"x9" or 18"	1	EA	$ 6.00	$ 6.00			5	$3	$ 8.50
77	2" x 2" x 1" Sch80 Tee	1	EA	$ 34.65	$ 34.65			4	$2	$ 36.70
78	2" Strainer	1	EA	$ 30.00	$ 30.00			31	$16	$ 45.50
79	2" Valve w/ Actuator	1	EA	$ 525.00	$ 525.00			35	$18	$ 542.50
80	1" Thermal Relief Loop	1	EA	$ 400.00	$ 400.00			7	$4	$ 403.60
81	1" Sch80 Pipe	5	LF	$ 3.15	$ 15.75			11	$5	$ 21.18
82	Unistrut Pipe Supports	175	LF	$ 5.00	$ 875.00			438	$219	$ 1,093.75
83	24" Grip Strut Decking	300	LF	$ 52.50	$ 15,750.00			3,120	$1,560	$ 17,310.00
84	12" CMP Culvert	200	LF	$ 75.00	$ 15,000.00			600	$300	$ 15,300.00
85	Tundra Supports	42	EA	$ 52.50	$ 2,205.00			210	$105	$ 2,310.00
86	Pipe Installation	1	LS			$ 45,720.00	$ 22,098.00			$ 67,818.00
Dispensing Facilities										
87	Duel Product Dispensers	1	EA	$ 8,327.55	$ 8,327.55			522	$261	$ 8,588.55
88	Hanging Hardware	1	LS	$ 630.00	$ 630.00			200	$100	$ 730.00
89	Dispenser Enclosure	1	EA	$ 39,900.00	$ 39,900.00				$8,000	$ 47,900.00
90	Retail Sales Building	1	EA	$ 29,400.00	$ 29,400.00				$10,000	$ 39,400.00
91	Dispenser Labor and Equipment	1	LS			$ 50,000.00	$ 25,000.00			$ 75,000.00

Alakanuk Native Corporation
Bulk Fuel Upgrades
35% Construction Cost Estimate

Pump Boxes										
92	5' X 5' Steel Pump Box	2	EA	$ 1,200.00	$ 2,400.00			7,000	$3,500	$ 5,900.00
93	Mechanical Systems	2	EA	$ 21,000.00	$ 42,000.00				$0	$ 42,000.00
94	3"x2" Reducer	2	EA	$ 15.75	$ 31.50			13	$7	$ 38.00
95	2" Actuated Ball Valve, Flanged	2	EA	$ 525.00	$ 1,050.00			62	$31	$ 1,081.00
96	2" Ball Valve, Flanged	4	EA	$ 252.00	$ 1,008.00			124	$62	$ 1,070.00
97	2" Strainer, Flanged	2	EA	$ 425.25	$ 850.50			60	$30	$ 880.50
98	2" Transfer Pump	2	EA	$ 3,990.00	$ 7,980.00			70	$35	$ 8,015.00
99	2" Flex Hose	4	EA	$ 15.75	$ 63.00			4	$2	$ 65.00
100	2" Sch 80 Pipe	30	LF	$ 5.25	$ 157.50			151	$75	$ 232.95
101	2" Sch80 90s	6	EA	$ 10.50	$ 63.00			13	$7	$ 69.60
102	2"x1" Sch80 Tees	4	EA	$ 34.65	$ 138.60			16	$8	$ 146.80
103	2" Weld Neck Flanges	12	EA	$ 34.65	$ 415.80			24	$12	$ 427.80
104	1" Pressure Reducing Valve	2	EA	$ 577.50	$ 1,155.00			14	$7	$ 1,162.20
105	1" Sch 80 Pipe	10	LF	$ 3.15	$ 31.50			22	$11	$ 42.35
106	Pump Box Labor and Equipment	1	LS			$ 26,000.00	$ 15,000.00			$ 41,000.00
Decomission Existing Tank Farm										
107	Decommission and Dispose of Existing Tanks and Pipelines	1	LS	$ 67,500.00	$ 67,500.00					$ 67,500.00
108	Manifesting, Transport and Disposal of RCRA Hazardous Waste	4	Drum (55 gal)	$ 5,800.00	$ 23,200.00					$ 23,200.00
109	Manifesting, Transport and Disposal of State Regulated Non RCRA Hazardous Waste	6	Drum (55 gal)	$ 7,700.00	$ 46,200.00					$ 46,200.00
Spill Response Equipment										
110	Spill Response Equipment	1	LS	$ 21,000.00	$ 21,000.00					$ 21,000.00
	Subtotal				**$ 2,213,800**	**$ 959,400**	**$ 398,200**	**$ 1,230,700**	**$ 820,400**	**$ 5,050,800**
									Construction Contingency 15%	**$ 757,600**
									Estimate Total	**$ 5,808,400**

Appendix E

Resolution of Agreement

ALAKANUK NATIVE CORPORATION

BOARD OF DIRECTORS
Resolution No. 2010-03

WHEREAS, the Alakanuk Native Corporation ("Corporation") is pursuing a new bulk fuel tank farm facility for Alakanuk; and

WHEREAS, the Corporation has completed a draft of its Business Operating Plan for the new bulk fuel tank facility; and

WHEREAS, the Corporation has instigated the design engineering portion of the project through Hattenburg Dilley & Linnell ("HDL") and obtained a Conceptual Design Report ("CDR"); and

WHEREAS, the Corporation has coordinated community meetings regarding the new bulk fuel tank facility and obtained community buy-in for the project; and

WHEREAS, the Corporation presented the CDR for the project to the community, which was accepted thereby;

> THEREFORE, IT IS RESOLVED, that the Corporation move forward with the CDR, pursue funding for the project with the Denali Commission and other funding resources, enter into a long-term lease with the Village of Alakanuk for site control, obtain surveys, and do all things necessary and advisable to prepare for the construction phase of the bulk fuel tank farm project to begin during the construction season of the summer of 2011.
>
> FURTHER RESOLVED, that the President of the Corporation is authorized to enter into such contracts or similar instruments to pursue funding and prepare for the construction phase of the bulk fuel tank farm project.

APPROVED July 23, 2010 at a special meeting of the Board, by a vote of 7 in favor, and 0 opposed.

Martin J. Harry
Martin Harry, President

ATTEST:

Carla Mayhew
,Secretary

Resolution of Agreement for
The Alakanuk Native Corporation
Bulk Fuel Upgrades Concept Design Report

The following parties have reviewed this Concept Design Report and accept the document and its contents.

Alakanuk Native Corporation:

Martin Harry, President — Date: 6-30-10

City of Alakanuk:

Michael James
City Representative — Date: 6/30/10

Alakanuk Tribal Council

Village Representative — Date: 30 June 2010

Alaska Village Electric Cooperative

~~Matt Metcalf, Project Manager~~ Mesa Kohler, President/CEO — Date: 8/5/10

7/23/10 Sign-up for Meeting:
@ 9Am

1.	John Agunnerak	ANC.
2.	Cora Lindley	ANC.
3.	Brian L. Williams	ANC
4.	Mary Agunnerak	T.C.
5.	[illegible]	T.C.
6.	Martha Hanson	ANC
7.	Sally Leopold	ANC
8.	Elizabeth Kikigak	ANC General Manager – Tribal Council
9.	Ray Gray	AVKTC Admin.
10.	James Agunerak	A.N.C
11.	Edward Pat	ANC
12.	Theresa Romain	Tribal Council
13.	Anthony P. Sheldon	ANC
14.		
15.		

Sign up Sheet
for July 22 2010

1. [illegible] - ANC sec. Tre.
2. [illegible] - ANC member
3. Theresa Damian — Tribal Council
4. Edward Post - ANC member
5. Brian L. Williams — Vice chair ANC
6. Mary Agyeneah - T.C. member
7. [illegible] - Pres. T.C.
8. Sally Leopold - ANC member
9. [illegible] - ANC corp. Add.
10. [illegible] - T.C. Addmember.
11. James Agyeneah - ANC member
12. Anthony P. Shelton - ANC member
13. [illegible] ANC - Pres.
14.

ALAKANUK NATIVE CORPORATION
PO BOX 148
ALAKANUK AK 99554
PH: (907) 238-3117 FAX:(907) 238-3120
EMAIL: ANCORP@YAHOO.COM

FACSIMILE TRANSMITTAL SHEET

TO: Matt	FROM: Martin
COMPANY: AVEC, Inc.	DATE: 7/23/2010
FAX NUMBER: (907) 561-2388	TOTAL NO. OF PAGES INCLUDING COVER: Seventeen (17)
PHONE NUMBER: (907) 561-7927	SENDER'S REFERENCE NUMBER:
RE: Land Lease Agreement Resolution 2010-03	OUR REFERENCE NUMBER:

X URGENT X FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Hi Matt,

ANC Board of directors meet with Alakanuk Tribal Council yesterday & today. We went over the Business Operating Plan & made slight revisions. ANC Board Members & Tribal Council Members read, passed & signed the Bulk Fuel Tank Farm Ground Lease Agreement. ANC Board Members read, passed & signed Resolution 2010-03. Included are sign up sheets of signatures from Tribal & Corporation board members attending the meeting 07/22/10 & 07/23/10.

Sincerely,
Martin

[CLICK HERE AND TYPE RETURN ADDRESS]