



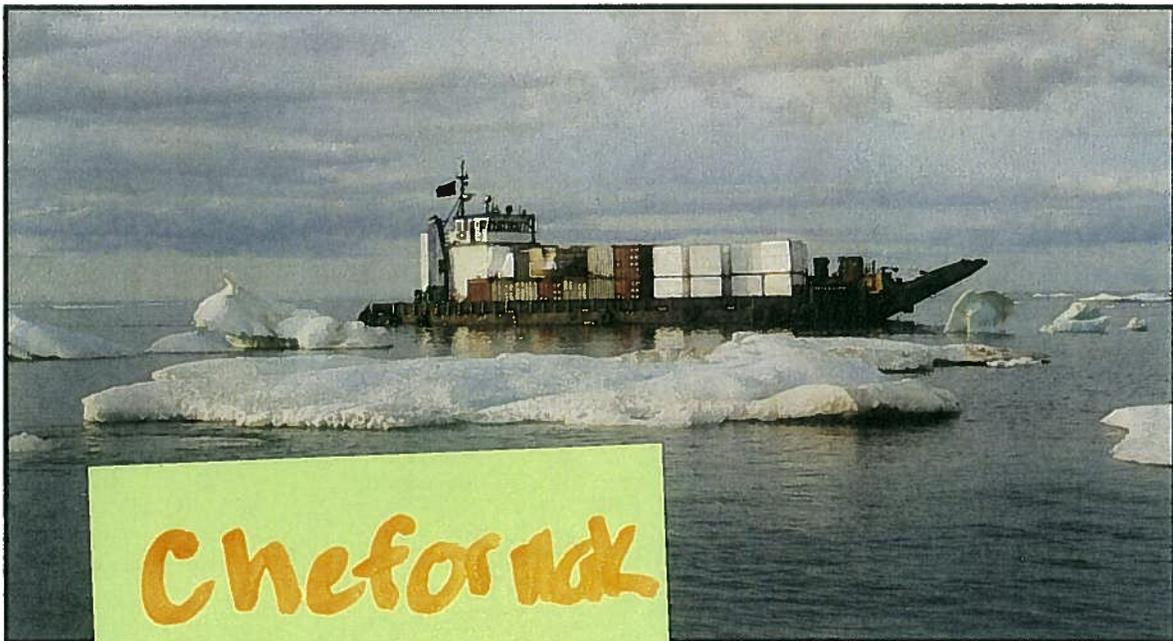
**US Army Corps
of Engineers**

Alaska District

**ALASKA BARGE LANDING
SYSTEM DESIGN
STATEWIDE
PHASE 1**

Various Locations, Alaska

FINAL REPORT



Cheforak

excerpts

*prelim site plan -
E20*

JANUARY 2009

**Alaska Barge Landing System Design
Data Gathering Study and Preliminary Design
Planning**

**Various Locations,
Statewide, Alaska
Phase 1**

Prepared for:

**U.S. Army Engineer District, Alaska
Anchorage, Alaska**

Prepared by:

**URS Corporation (formerly Tryck Nyman Hayes, Inc.)
(W911KB-07-D-004)**

January 2009

Region	Community	Dwg No.*	Brief Description of Recommended Barge Landing Facility Improvements
Kuskokwim River Delta	Goodnews Bay	E15	Provide dedicated upland staging areas and 5 mooring points at the existing beach landing areas. Additionally, conduct a study to determine the feasibility of deepening the existing channel from Platinum to allow passage of vessels drawing 6-ft or more.
	Quinhagak (Kwinhagak)	E16	<p>A <u>feasibility study</u> is a priority to analyze alternatives for long-term access to this site. Some alternatives suggested include:</p> <p>Option A: Dredge an access channel to the existing City dock. This is the user groups' preference, at least for short term. Periodic maintenance dredging would likely be required.</p> <p>Option B: For a long term solution, consider providing a new dock at a landing site that is not experiencing problems with sediment accretion.</p> <ul style="list-style-type: none"> o One alternate for a new dock landing site is depicted on the Site Plan. A residential house is nearby, and property ownership issues would need to be resolved. <p>Another option, not shown on the Site Plan (shown on figure in report), is to study whether Arolik Creek is accessible by barge and constructing a new landing facility at the end of Arolik Rd.</p>
	Kongiganak	E17	Provide a sheetpile dock and staging area. A 500 to 1000-ft long access road to the staging area may be required to reach uplands area (Another project is possibly underway to accomplish some of this work as part of airport work). Also, provide mooring points at two upriver fuel barge landing sites.
	Kwigillingok	E18	Provide a co-located fuel/freight landing at the downriver fuel landing area by installing an upland staging area using a thick layer of crushed rock and gravel to create dry ground. Install mooring points at this landing area as well as at the downriver fuel landing, located near the Native Corp. building.
	Kipnuk	E19	Provide 3 mooring points at the fuel header/landing site. Provide a sheetpile dock and ramp, and a gravel pad at the existing upland staging area at the freight landing site.
	Chefornak	E20	Improve and widen existing gravel causeway with new armor rock and smaller 6" minus rock at landing end. Dredge boulders from shallow area (<6ft) around causeway.
	Toksook Bay	E21	Provide gravel ramp to extend 100-ft or more to reach deeper water and improve existing road with gravel. At a minimum, consider dredging out large rocks in shallows near the landing.
	Chevak	E22	Provide three mooring points at the existing beach landing site.
	Lower Kuskokwim River	Eek	E23
Nunapitchuk		E24	<p>Option A in Drawing D28-A presents one possible co-located fuel/freight ramp landing located on the same side of the river as the main part of the community. Requires a site investigation to determine whether sufficient depth available for freight barge access in this area.</p> <p>Alternately, Option B in Drawing D28-B presents an option for development of the existing landing site at the fuel barge landing area located north of the airport landing area, across the river from the community. For this option, provide a co-located fuel/freight barge ramp landing and staging area. This is low elevation and likely susceptible to flooding and would require more fill for a dry staging area.</p>

mooring points because the current runs swiftly and the landing site is at the outside bend of the river, which makes holding position difficult. Mooring points should be installed sufficiently inland to allow for some protection from erosion.

Recommendations include enlarging the existing staging area and stabilizing it by installing a gravel pad. With anticipated increase in activity at the landing areas at this community, installation of a ramp and/or sheetpile bulkhead dock may be warranted to reduce potential environmental impacts that would be expected from increased usage of an unimproved landing site. Drawing E19 in Appendix E illustrates the proposed layout for a dock, downstream graded ramp, and upland staging area at the freight barge landing site as well as three mooring points at the fuel barge landing site.



Figure 6.6.7: Staging area at Kipnuk.

6.6.7 *Chefornak*

Chefornak is on the south bank of the Kinia River, at its junction with the Keguk River in the Yukon-Kuskokwim Delta. The community lies within the Clarence Rhode National Wildlife Refuge, established for migratory waterfowl protection. Chefornak is 98 air miles southwest of Bethel and 490 miles southwest of Anchorage. Chefornak is located in a marine climate. Precipitation averages 22 inches with 43 inches of snowfall annually. Summer temperatures range from 41 to 57°F. Winter temperatures range 6 to 24°F (DCCED 2008).

The population of Chefornak appears to be growing, with a current population of 460, compared to 394 in 2000 and 320 in 1990. Other than government positions, most employment in Chefornak is seasonal, supplemented by subsistence activities. Twenty-seven residents hold commercial fishing permits for herring roe and salmon fisheries. Coastal Villages Seafood, Inc., processes halibut and salmon in Chefornak. Trapping is also a source of income (DCCED 2008).

A State-owned gravel airstrip provides air access year-round, and a seaplane base is available during summer (DCCED 2008).

Access to the landing site is made difficult due to the many large rocks in the channel and near shore area as well as on the beach in front of the residential area of the community. The barge landing consists of rock/gravel causeway that juts out into the river and ramps up to an upland staging area. Barge operators report that this facility needs some maintenance. The ice and waves likely takes some of the rock and gravel material away with it each season. They suggested installing sheetpile or small rocks to protect against erosion. According to barge operators, rock that is less than 8 inches is generally considered acceptable for barges to land safely. An evaluation of the site currents, erosion and ice flow would be required to determine whether rock of this size would be sufficient for use as erosion protection armor. However, it is likely that current conditions require larger armor rock to keep the material in place. This could be provided along the sides of the causeway and the end could be sloped down with smaller rock added to allow landing at the end of the ramp. This material could be protected somewhat by extending the ends of each side of the armor rock. The smaller "landing" material may be plucked by ice each year and require regular maintenance. This concept is depicted in Drawing E20 of Appendix E.

Alternately, sheetpile could be installed around the existing causeway, and a protective cap installed on top of the sheetpile on which barges could ground. Geotextiles and concrete planks could also be installed, similar to the sheetpile and concrete plank ramp concept design shown in Drawing 4 of the Concept Drawings in Appendix D, except most of the fill for the ramp is already in place. For this scenario, driving of the sheets would essentially require removing the armor rock, stockpiling it, and possibly using it for scour protection on the upstream side of the sheets.

Cargo offloading is considered relatively easy at this landing site. The landing is connected by road to a small staging area. The staging area is relatively dry and stable, but could be expanded to allow staging of a full barge load of freight.

Fuel barge operators don't use the dedicated landing because the area in front of it is too rocky. There are some large boulders that present a hazard and they recommended removing these to improve safety. There is one marine fuel header for the community that is located just downstream of the landing. They land at a flat shelf there at high water and then go dry and spend 24 hours there for each fuel delivery.

CVRF has a fish processing plant at Chefornek and they mentioned that the fishing boats also have had problems navigating into the landing because of the exposed boulders. The landing craft that is used to haul fish from the processing plant draws 6 feet when fully loaded. They recommend that any boulder that is higher than this should be removed. Drawing E20 in Appendix E depicts the proposed ramp improvements and boulder removal.

6.6.8 *Nightmute*

Nightmute is on Nelson Island, in western Alaska. It is 18 miles upriver from Toksook Bay and 100 miles west of Bethel. Nightmute is influenced by a marine

Region	Community	Dead-men	Staging Area	Dock	Ramp	Dredging or Rock Removal	Co-locate Fuel Header or Tanks ¹	Other ²
	Kotlik	X	X	X	X	--	--	--
	Marshall	X	X	--	X	--	X	--
	Mountain Village	X	X	--	X	--	--	--
	Nunam Iqua (Sheldon Pt)	X	--	--	--	--	--	X
	Pilot Station	X	--	--	X	--	--	X
	Pitkas Point	X	--	--	--	--	--	X
	Russian Mission	X	X	--	X	--	X	X
	Saint Mary's	X	--	--	--	X	--	X
	Shageluk	X	X	--	X	--	X	X
Middle Yukon River	Galena	X	--	--	--	--	--	X
	Kaitag	X	--	--	X	--	--	--
	Koyukuk	--	--	--	--	--	--	--
	Nulato	X	--	--	--	--	X	--
	Ruby	X	--	--	X	--	--	--
	Tanana	X	--	--	--	--	X	--
Upper Yukon River	Beaver	X	--	--	X	--	--	--
	Circle	--	--	--	--	--	--	--
	Eagle	--	--	--	--	--	--	--
	Eagle Village	--	--	--	--	--	--	--
	Fort Yukon	X	--	--	--	--	X	--
	Stevens Village	X	--	--	--	--	--	--
Kuskokwim River Delta	Chefornak	--	--	--	X	X	--	X
	Chevak	X	--	--	--	--	X	X
	Goodhews Bay	X	X	--	--	X	X	--
	Hooper Bay	--	--	--	--	--	X	X
	Kipnuk	X	X	X	X	--	--	--
	Kongiganak	X	X	X	X	X	X	X
	Kwigillingok	X	X	--	--	--	X	X
	Mekoryuk	--	X	--	--	X	X	--
	Newtok	--	--	--	--	--	--	--
	Nightmute	--	X	--	--	X	X	--
	Platinum	--	--	X	--	X	X	--
	Quinhagak (Kwinhagak)	--	--	X	--	X	X	--
	Scammon Bay	X	X	--	--	--	X	--
	Toksook Bay	--	--	--	X	X	X	--
	Tununak	X	X	--	X	X	--	X
Lower Kuskokwim River	Akiachak	X	--	--	--	--	X	--
	Akiak	X	X	--	--	--	X	--
	Bethel	--	--	--	--	--	--	--
	Eek	X	X	--	X	--	X	--
	Kasigluk	X	X	--	X	--	--	--
	Kwethluk	--	X	X	X	--	X	--
	Napakiak	--	X	X	X	--	--	X
	Napaskiak	X	X	--	X	X	--	--
Nunapitchuk	--	X	--	X	--	--	X	

Notes on each community based on interview with: Northland Services
2008.03.04 – Sean Hochanadel and Larry Staffer

- Stony River
 - No info provided.
- McGrath
 - Water levels are very shallow
 - For cargo destined for McGrath, they deliver to Bethel – recipients find their own way to get it to McGrath
 - River current past Sleetmute moves fasts and it is too shallow
- Nikolai
 - No info provided.
- Kongiganak
 - one of the most difficult sites for deliveries--narrow channel, can't turn around, cut bank, nose into the mud, and there is a boardwalk at edge of shoreline conflicts with offloading
 - gravel parking lot/staging
 - putting in a school \$21m over 100 loads
 - biggest obstacle for the school construction will be logistics and where they set the school
 - this year, put gravel down and place to put cargo
 - staging is the key – storage area needs to be larger than amount they can get off the vessel
 - Use a barge with crane or a landing craft (bow with ramp)
 - need a “place to go” when get off
 - can crane off a piece of equipment and move it out of the way
 - needs hard bottom – steel on top of cement
 - prefer 4 to 6” of rock
 - loader stays on vessel, does a high tide reach
 - QAP doing airport, includes a road between airport and beach, about 1 mile of road
 - Lots of barge loads of gravel – heavy equipment and gravel there and they could make a permanent landing
 - AK Mechanical has school job coming up
 - STG also has village work
 - Recommend Gravel ramp, staging area, dredge turning basin
 - Alternately, sheetpile and fill structure – but concern with sloughing off
 - best is a road to the beach if you can keep it there
 - low bulkhead – more than a couple feet is too high
 - not enough room to turn around
 - no real staging area most of existing area is below high water mark
 - primary landing site is south by fuel storage
 - equipment to offload the barge is brought on the vessel
 - talked with Denali Commission about dredging at the turn around
 - WISH LIST: gravel ramp to pull up next to with a gravel staging area offset of the landing area.
- Kwigillingok
 - No info provided.
- Kipnuk
 - Needs staging/storage area
 - Good landing
- Cherfornak
 - Causeway out – small rock
 - Has small machinery, do cover some roads

Notes on each community based on interview with: Northland Services
2008.03.04 – Sean Hochanadel and Larry Staffer

- Need to maintain
- Sheet pile may keep worst ice from taking it off
- Nice ramp that requires little maintenance
- Has preparation before they come in
- Teksook Bay
 - No info provided.
- Nightmute
 - Good landing
 - Gravel road to beach
- Tununak
 - No info provided.
- Umkumiut
 - No info provided.
- Hooper Bay
 - Can't get into
 - Has a point on back side
 - 6 miles to intersect with airport road stage at end of airport
 - If weather is perfect they can land on the beach
- Chevak
 - No info provided.
- Scammon Bay
 - Landing can get to and is firm
 - Needs staging area – currently stage along built up road in swampy on both sides
 - Possibly could use old airport for staging
- Newtok
 - Don't go there
 - Beach is slumping
 - No landing or staging

Bristol Bay & Nunivak Island Region

Northland serves all of these sites except Twin Hills.

- Togiak
 - No info provided.
- Twin Hills
 - No info provided.
- Dillingham
 - No info provided.
- Clark's Point
 - No info provided.
- Naknek (regular service)
 - Haul all the sockeye to Dutch Harbor (regular run)
 - Priboilof crab – St. Paul and Dutch harbor
 - Fish
 - Large hub one of the nicest
 - Move lots of cargo – 12000 containers of cargo
 - Dock can't support the weight that moves across it
 - Concrete panels on wood piles

Notes on each community based on interview with: Crowley and Delta Western
2008.03.05 – Crowley: Sharm Setterquist and Greg
Delta Western: Richard Moody

- OK
- Dead men would be nice
- Upper Kalskag
 - OK
 - Tie off to trees
- Aniak
 - Beach, pull in at 45 degrees and hold there by keeping power
 - Mooring posts (2) would help upstream, see Aniak graphic for typical layout, spaced about 60-100 ft
- Chuathbaluk
 - Very shallow – use small vessels
 - Small delivery
- Napaimiut No info provided.
- Crooked Creek
 - Need marine site, centralize tank farms
 - Shallow water, farther up river
 - Needs dead men
- Red Devil
 - Shallow – have to come in on high tide
- Steetmute
 - Shallow – have to come in on high tide
- Stony River: No info provided.
- McGrath
 - OK, except need high water to get to it.
- Nocolai: No info provided.
- Kongiganak
 - Have put in a couple dead men, but real ones would be nice
 - Requires multiple stops
 - Need one centralized tank farm – VSW, 3- 10,000 gal tanks in a different location, causing a 24 hour stop to off-load
 - Tank farm pumps fast and well
- Kwigillingok
 - Have to make multiple stops. Corporation and VSW are off the grid
 - Need centralized tank farm
 - Need dead men
 - Generally ok
- Kipnuk
 - Have one header and centralized tank farm
 - Generally ok
 - Current runs good
 - Need Dead men – current configuration is hard to work with
- Cherformak
 - Has one marine header – downstream of jetty
 - Existing Jetty is rocky – don't use
 - Go In and go dry, good nice flat area to sit on – spend 24 hours there
 - No need for dead men

Notes on each community based on interview with: CVRF

2008.03.24 – Neil Rodriguez

- Nanapitchuk
- Kasigluk
- Napakiak
 - Landing is eroding, almost no existent now
 - Sheet pile project
 - Current is hitting the shore
 - Steep bank
- Napaskiak
 - Barge landing is filling in, barges need to pass and turn back to land, use to come straight into the landing
 - Sand bar in front of landing – could dredge it out
 - Now using airport landing
- Oscarville
 - No landing anymore – it has eroded away
 - Haven't been there in about 4 years
 - They get power from Bethel
 - Got CAT stuck
- Kongiganak
 - Can get in, but CAN NOT turn around
 - Have to back out
 - Steep bank – 4-5 ft drop off
 - NRCS is doing erosion protection project this summer
- Kwigillingok
 - Very narrow
- Kipnuk
 - Needs pad stabilization
 - Sheet pile or deadmen would be helpful
 - Muddy
 - Good access
 - New fisheries support center going in
- Cherfornak
 - 4th or 5th highest fish plant producer
 - Boulders exposed – tear up fishing boats, block the passage in
 - Have hauled from Kongiganak with snowmachines
 - Fully loaded
 - Landing craft draws 6ft
 - Talk to Brenda Ken at Corp
- Teksook Bay
 - Highest fish plant producer
- Nightmute
 - Not frequent visit
 - Heard it is shallow with lots of turns
 - Fish support center there
- Tununak
 - 3rd highest fish plant producer
 - Don't go in there much
 - Fish is flown out

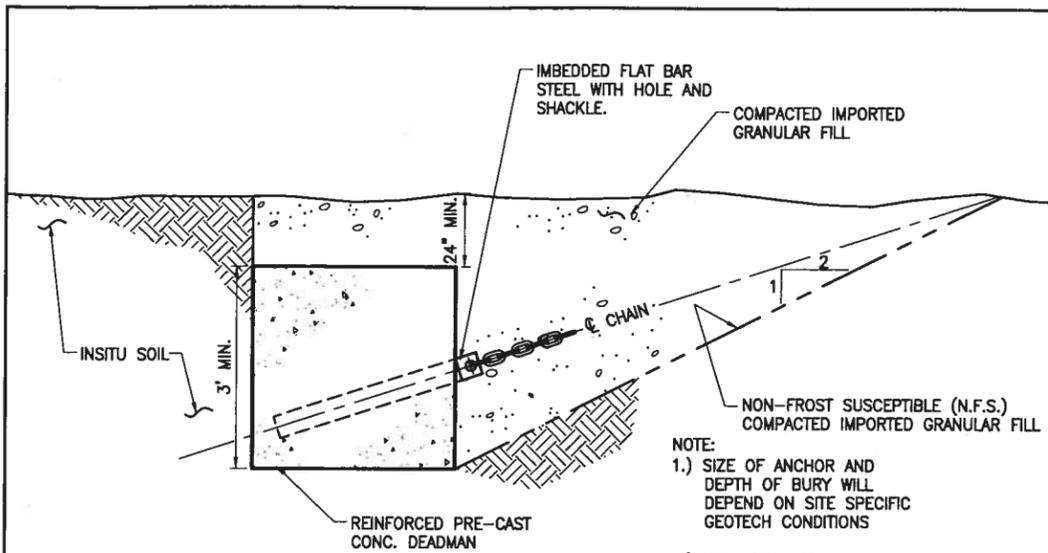
Notes on each community based on interview with: CVRF

2008.03.24 – Neil Rodriguez

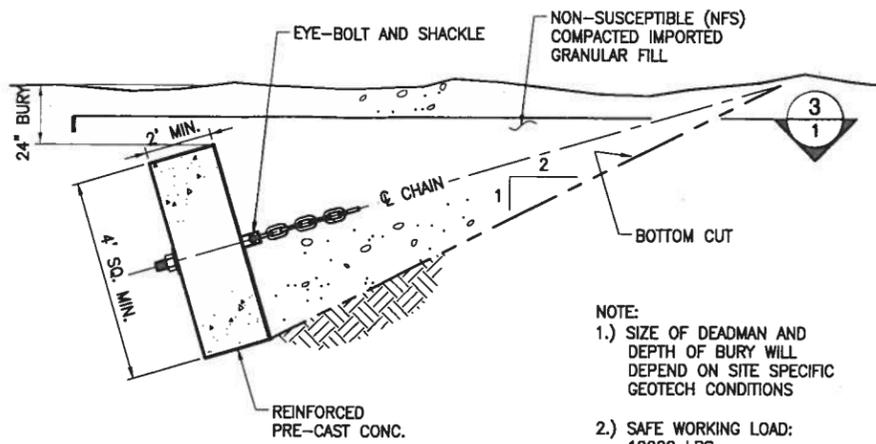
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- Tununak
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Notes on each community based on interview with: STG
2008.03.04 – James St. George

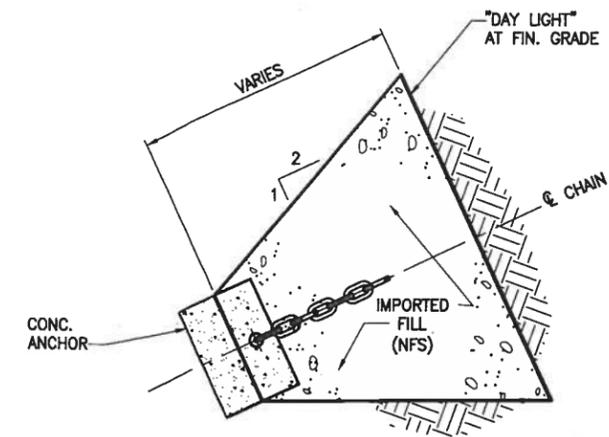
- Kwethluk
 - Pretty good – can drive around
 - There is erosion – moving target
 - Gravel with erosion protection would be good – sheet piles
- Tuluksak
 - Mow alders up the bank and make additional room
 - Off load at the airport, no staging area
 - Not much erosion
- Lower Kalskag
 - Good gravel
 - Up river – conditions improve
- Kongiganak
 - Mucky
 - Difficult to unload barges – boardwalk/locals in the way
 - Overhead utilities are close to landing site – need to be moved/buried
 - Cargo sinks into tundra, stack with cranes, move in the winter
 - Use crane mats for temporary work – not a permanent fix
 - Needs good staging area
 - Needs some dredging to be able to turn around with less fear of damaging the barge
- Kwigillingok
 - Erosion problem
 - Mucky
 - Similar problems as Chevak
 - Village does flood – cables over boardwalks to keep from floating away
 - Maybe put 3” + crushed rock down – would be good
- Cherformak
 - Pushed causeway out
 - Needs shoring up – sheet piles
 - ADOT land issues
- Teksook Bay
 - 3 wind turbines and new power plant last year
 - Ok gravel source, but high Formica content
 - Has a wharfage and handling fee
 - Airport is used as a staging area
 - Is a bit of a hub – protected water
 - Need to dredge out rocks
- Nightmute
 - Has lots of rocks
 - Some erosion
- Tununak
 - Eroding
 - Weather issues
- Umkumiut
- Hooper Bay
 - Population: 1,000
 - Build a landing at protected site
 - Northland hub



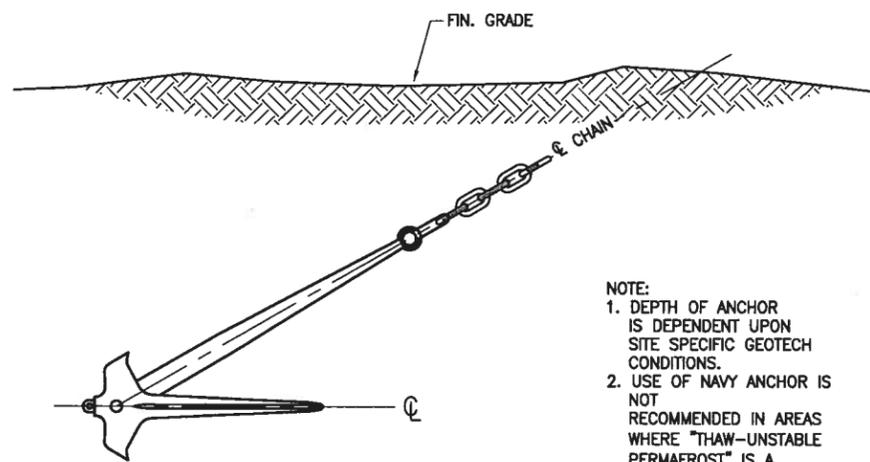
1 GRAVITY ANCHOR DEADMAN
SCALE: N.T.S.



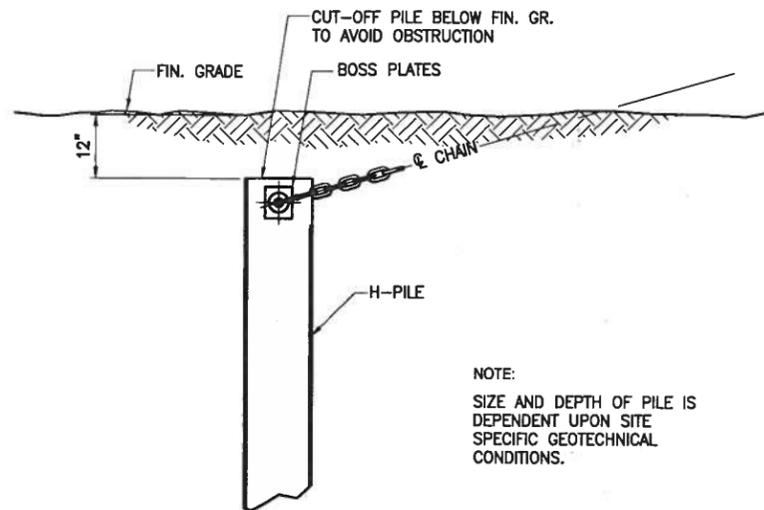
2 CONCRETE BLOCK DEADMAN - SIDE VIEW
SCALE: N.T.S.



3 CONCRETE BLOCK DEADMAN - PLAN VIEW
SCALE: N.T.S.



4 NAVY ANCHOR
SCALE: N.T.S.



5 STAKE PILE
SCALE: N.T.S.

NOTE:
1.) SIZE OF ANCHOR AND DEPTH OF BURY WILL DEPEND ON SITE SPECIFIC GEOTECH CONDITIONS
2.) SAFE WORKING LOAD: 10000 LBS

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2.) SAFE WORKING LOAD: 10000 LBS

NOTE:

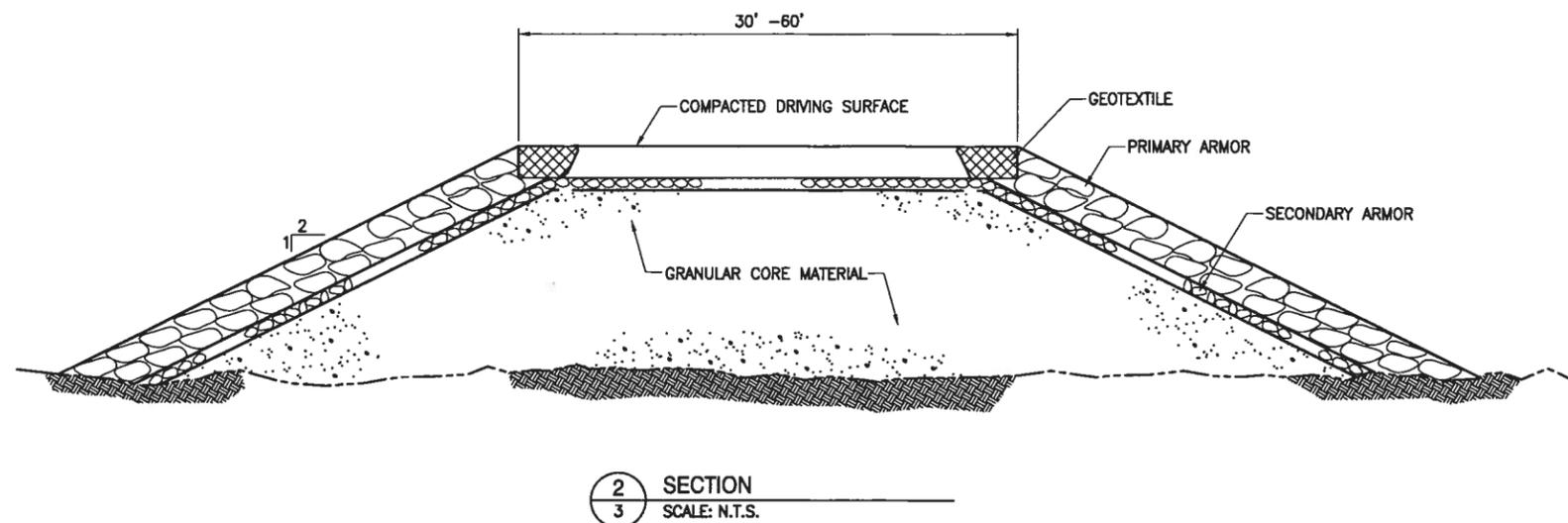
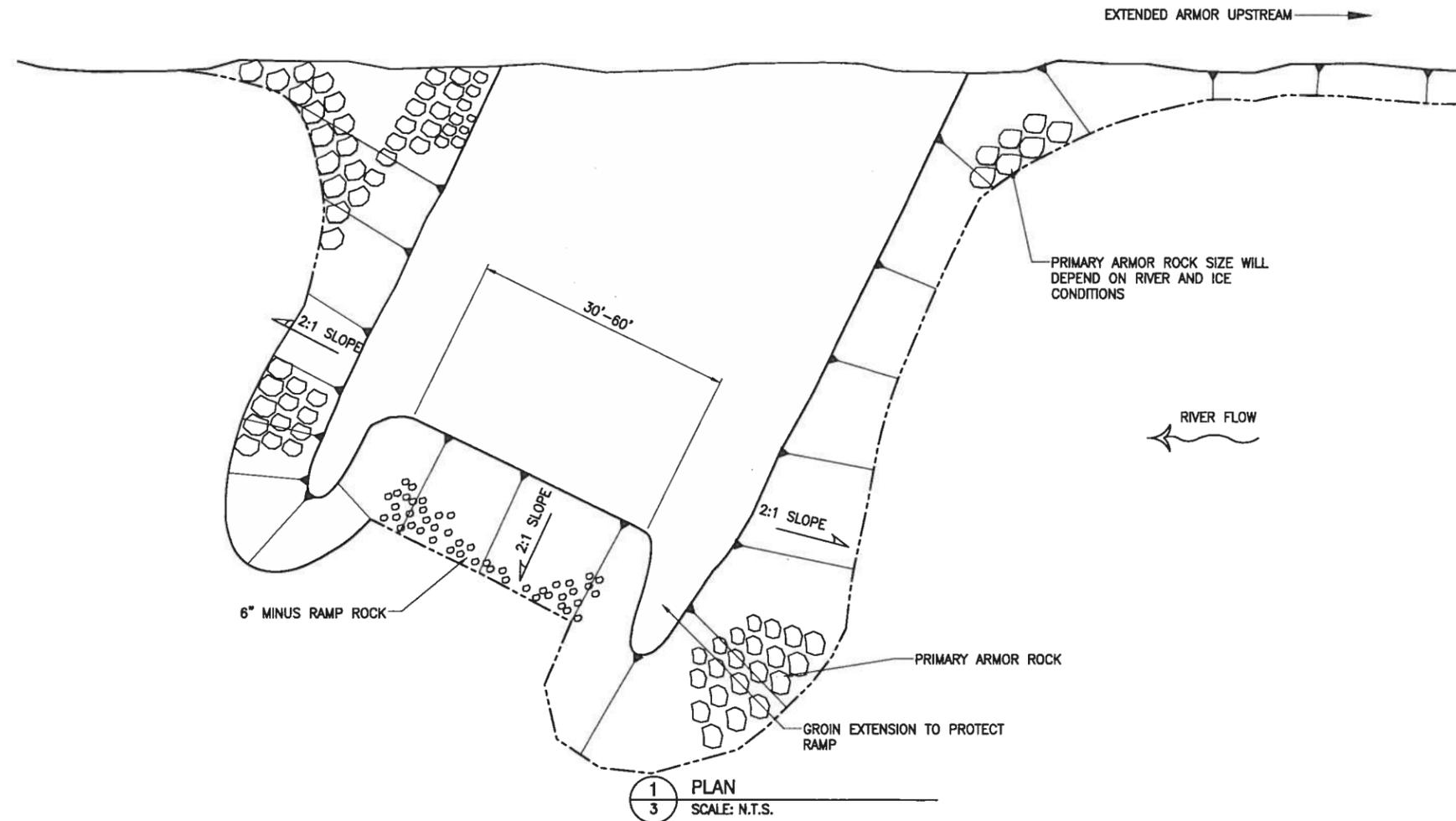
MOORING POINTS SHALL BE PLACED SUFFICIENTLY BACK FROM THE TOP OF THE BANK WHERE PRACTICAL TO AVOID EXPOSURE TO EROSION AND TO DEVELOP ADEQUATE PASSIVE SOIL PRESSURE. CURRENTS, PROPERTY OWNERSHIP, EXISTING SITE TOPOGRAPHY, AND OTHER SITE CONDITIONS WILL AFFECT ULTIMATE MOORING POINT LAYOUT. PLACE MOORING POINTS AT RIVER LANDINGS IN ORDER OF PRIORITY:

- 1.) 125' TO 150' UPSTREAM OF EACH LANDING.
- 2.) ONLY IN LOCATIONS WITH STRONG RIVER CURRENTS, INSTALL A SECOND MOORING POINT 100'-125' UPSTREAM OF THE LANDING.
- 3.) 75'-125' DOWNSTREAM OF LANDING.

NOTES / REVISIONS:

ALASKA BARGE LANDING
CONCEPT DESIGN
MOORING POINTS

PROJECT No: 05049.006
DATE: 06/13/08
DESIGNED:
DRAWN BY:
CHECKED BY:
SHEET:
PAGE:
1 OF 6



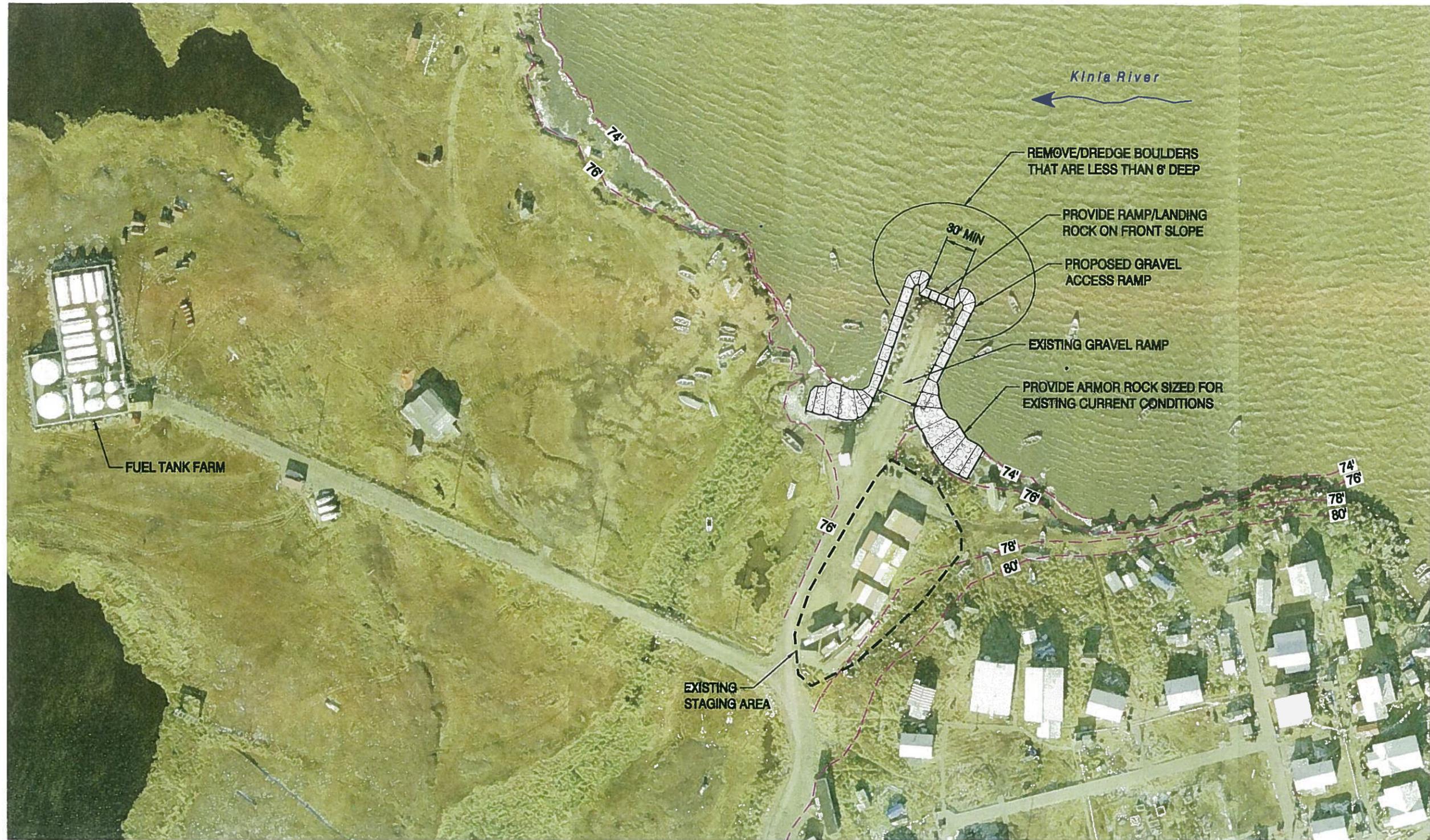
NOTES:

1. PRIOR TO FINAL DESIGN A DETAILED STUDY OF THE EFFECTS ON EROSION SEDIMENT TRANSPORT, AND POSSIBLE COASTAL PROTECTION NEEDS MUST BE COMPLETED.
2. GRAVEL RAMP PLACEMENT IS PREFERRED AT LOCATIONS WHERE RIVER CHANNEL ENERGY IS THE LOWEST.

NOTES / REVISIONS:

ALASKA BARGE LANDING
CONCEPT DESIGN
GRAVEL ACCESS RAMP

PROJECT No:	05049.006
DATE:	06/13/08
DESIGNED BY:	CF
DRAWN BY:	SJ
CHECKED BY:	KN
SHEET:	3
PAGE:	3 OF 6



AERO-METRIC
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 FIELD DRIVE ANCHORAGE,
 AK 99501-4116
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NOTES / REVISIONS:

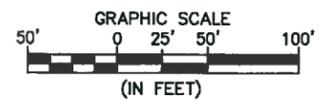
CHEFORNAK
KUSKOKWIM RIVER DELTA REGION

PROJECT No: 05049.006
 DATE: 01/20/09
 DESIGNED: KN/CF
 DRAWN BY: SJ
 CHECKED BY: JD
 SHEET:

E20

NOTES:

1. ALL PROPOSED NEW DEVELOPMENT IS PRELIMINARY PLANNING LEVEL ONLY. ACTUAL FACILITY/IMPROVEMENTS LOCATIONS, LAYOUT, DIMENSIONS, ETC. WILL REQUIRE SITE VISITS/ INVESTIGATION TO DETERMINE SITE CONDITIONS, PROPERTY OWNERSHIP AND OTHER INFORMATION NEEDED PRIOR TO FINAL DESIGN.
2. ELEVATIONS SHOWN ARE ESTIMATES ONLY, APPROXIMATED FROM ADCED COMMUNITY MAPS. UPDATED SURVEY IS REQUIRED PRIOR TO FINAL DESIGN.
3. PRIOR TO FINAL DESIGN OF ANY COASTAL STRUCTURES A DETAILED STUDY OF EROSION, SEDIMENT TRANSPORT AND COASTAL PROTECTION NEEDS MUST BE COMPLETED.
4. SHALLOW PERMAFROST IS EXPECTED NEAR THE SHORELINE AND MAY BECOME DISCONTINUOUS, ABSENT AND AT GREATER DEPTHS FURTHER INTO THE CHANNEL.



PLOTTS: 7/17/2008 10:58 AM 05049.006.dwg 10:58 AM 05049.006.dwg 10:58 AM 05049.006.dwg 10:58 AM 05049.006.dwg 10:58 AM 05049.006.dwg