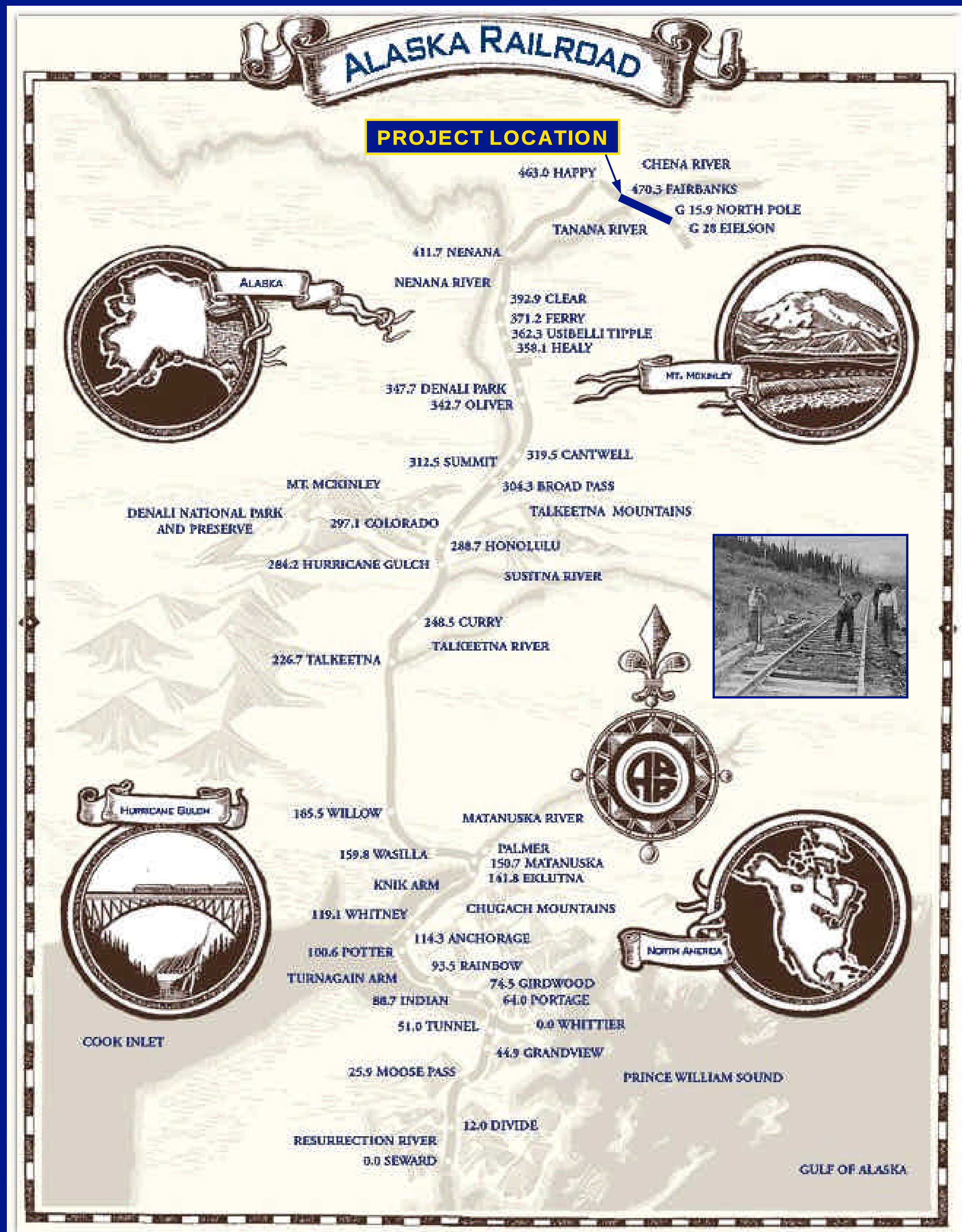


FAIRBANKS BYPASS
REALIGNMENT RECONNAISSANCE

Prepared for

ALASKA RAILROAD CORPORATION

Prepared by

THOMAS ENGINEERING

In Association with

PERATROVICH, NOTTINGHAM & DRAGE, INC.

January 2001

College Road

Old Steese Highway

New Steese Highway

Trainor Gate Road/F Street Crossing

Ft. Wainright, River Road Crossing

Ft. Wainright, Gaffney Road Crossing

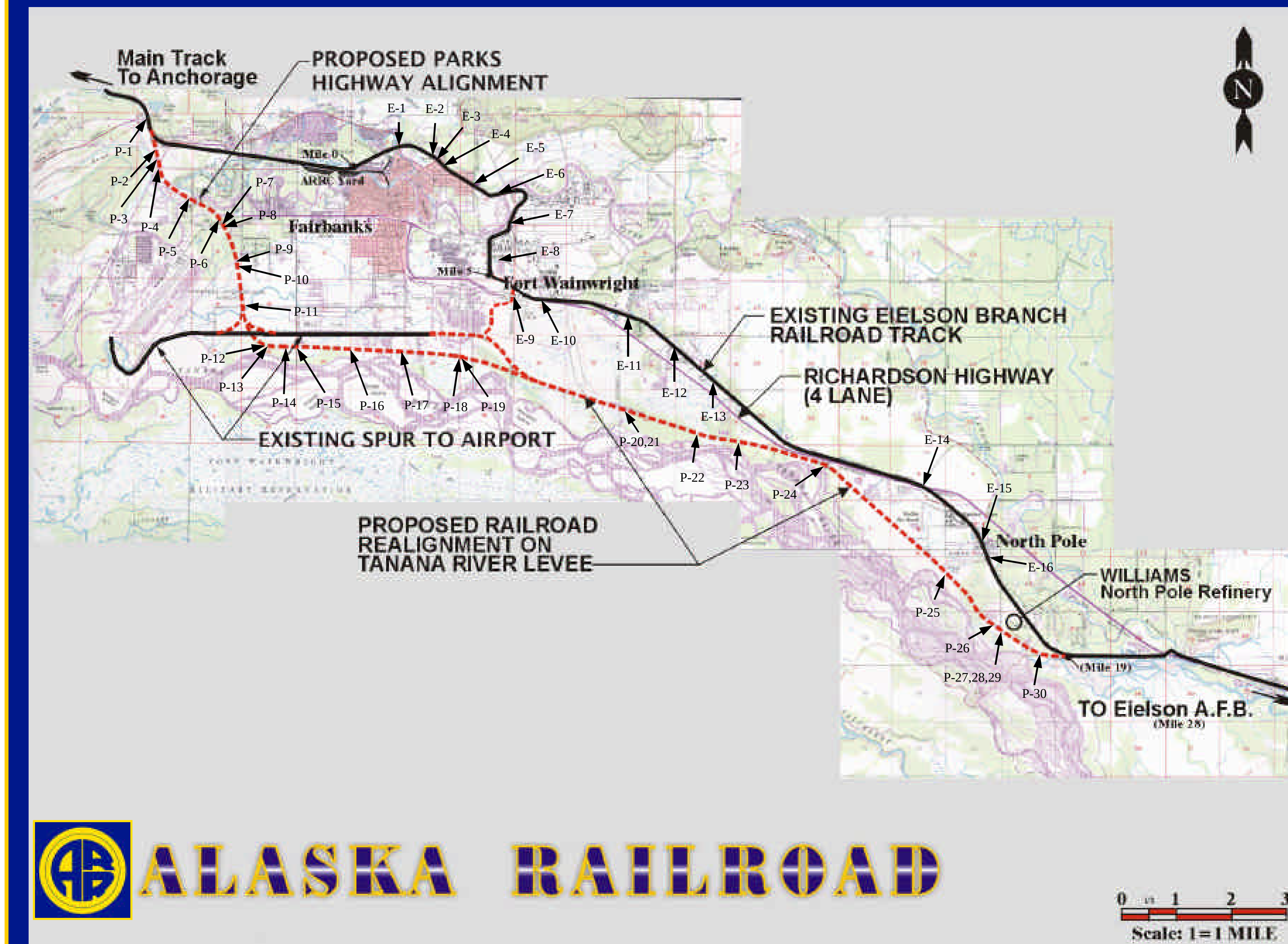
Ft. Wainright Power Plant

Trainor Gate Road/A Street Crossing

Note: Photo locations referenced to Vicinity Map on page iii.

PHOTOS – EXISTING MAINLINE

VICINITY MAP



NOTE: Photos are located on the inside front and back covers and on pages 4 and 5. Photos are referenced to the designations shown above.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

The **Fairbanks Bypass Realignment Study**, addresses the feasibility of decommissioning 18 miles of main and branch line rail through Fairbanks, Fort Wainwright, and the City of North Pole and realigning the main line "track" south and east of these areas. The 20-mile realignment results in significant improvements in safety, potential for reduced noise impacts, reduction in maintenance costs, and potential economic benefits from current and future commercial activities.

Existing Main Line Conditions

The existing main line and spurs are currently routed through both urban and rural commercial and residential areas within the City of Fairbanks, City of North Pole, Fort Wainwright, and the Fairbanks North Star Borough. Major users of these lines include Fort Wainwright, Eielson Airforce Base, Williams North Pole Refinery, Petro Star Refinery, the South Fairbanks Industrial Area and the Fairbanks International Airport. Of these, the Williams North Pole Refinery generates the most traffic. For much of its length, the existing rail is located adjacent to and crosses many primary and local roads. Access to connecting roadways and adjacent property results in up to 48 at-grade railroad/highway crossings throughout this branch, see Appendix 1. Nine of these are flashing-gated crossings over urban and rural primary highways. Train speed throughout the existing corridor is limited to 20 miles per hour or less. Right-of-way through Fort Wainwright is only 28 feet wide. Elsewhere right-of-way is nominally 200 feet wide.

Anticipated future uses of these branches include growth of current users plus new industrial businesses. In addition, the communities of Delta and Tok both have potential to become significant railroad traffic generators. Delta anticipates growth from both agriculture and military sectors, while Tok hosts known mineralization areas that would be dependant upon a heavy-haul transportation system. A rail connection to and through Canada has been proposed, and would contribute major railroad traffic that would utilize this proposed main line corridor. Further, a passenger transfer facility at the Fairbanks International Airport may be constructed in the future. The existing main line cannot readily accommodate additional rail traffic resulting from significant growth of existing businesses, new development or rail extension.

Purpose

The purpose of the **Fairbanks Bypass Realignment Study** is to present and evaluate the technical aspects of serving these businesses and destinations by a new main line. The new main line would begin just past the Alaska Railroad's Sheep Creek connector road at-grade crossing. By taking advantage of the Parks Highway's transportation corridor the new main line will connect with the Corps of Engineers (COE) Tanana River Flood Levee. From there the line would remain on the top of the levee to Moose Creek, approximately 2 miles north of the city of North Pole.

This proposed main line would eliminate all 48 of the at-grade crossings. The existing railroad bridge over the Chena River and trackage within Fort Wainwright would no longer be needed and by taking advantage of the Rails to Trails Program may be converted to a public recreational trail.

The objective of this realignment study is to determine the feasibility of the project through evaluation of alignment, costs, obstacles, and preliminary environmental analyses.

The study identifies only one alignment, beginning just east of the Alaska Railroad's track crossing the Sheep Creek Road Connector (ARRC MP 465.5) and follows the Parks Highway median southward to where the Parks Highway intersects with University Avenue. From that point the alignment maintains a southerly course until it intersects the Corps of Engineer's Tanana River Flood Levee. Upon reaching the top of the levee, the alignment then follows the levee to Station 80+00 (COE stationing), where it joins back with the existing railroad alignment.

The alignment departs from the existing levee at two locations, where Peger and South Cushman Extension roads intersect with the Tanana River Flood Levee. At both locations the alignment was moved off the levee in order to create a grade separated crossing without breaching the levee.

Concepts

Although only one alignment was identified, four conceptual track grade-lines (vertical alignment) between the beginning of the project at Sheep Creek Road Connector through University Avenue were analyzed.

The first, Concept 1, is a grade-line that adheres to the American Railroad Engineers Association (AREA) criteria for primary track. Railroad criteria require gentler grades and longer vertical curves than highway standards. Concept 1 is a best-fit match with the existing highway grade while maintaining AREA primary track criteria. Mechanically Stabilized Earth (MSE) walls up to twenty feet high are required to keep the fill for the railroad within the highway median. Track speed for

Concept 1 is 50 miles per hour.

Concept 2 is a best-fit match with the existing highway grade using AREA secondary track criteria. Because of the lower criteria, trains would have to reduce speed through the section where the route coincides with the highway. However, the majority of high retaining walls needed in Concept 1 are avoided. Concept 2 provides for a less intrusive facility (visually and quieter) and offers an estimated $8.7 million dollars in capital cost savings.

Concept 3 retains AREA primary track criteria and avoids high fills by replacing the existing Parks Highway/Geist Road grade separation with a new interchange that brings Geist Road over the Parks Highway and railroad. Concept 3 is a more efficient grade separation design because it eliminates signals for the major turning movements. Railroad noise is suppressed further with this concept. Concept 3 is the most expensive of all alternatives, costing an estimated $3.3 million higher than Concept 1. Track speed for Concept 3 is 50 miles per hour.

Concept 4 also retains AREA primary Track criteria. The grade-line differential between the highway and railroad is minimized in Concept 4 by raising the highway to match the railroad between Geist Road and the Chena River. This concept provides a less conspicuous facility. Concept 4 is the second most expensive of all alternatives, costing an estimated $1.3 million higher than Concept 1. Track speed for Concept 1 is 50 miles per hour.

In addition, to these four concepts, three additive projects are to be considered.

Option 1 is a separated grade crossing for the University Avenue/Parks Highway. While highway traffic does not warrant separating these roadways at the present time, they can be separated in the future when needed without modifying the proposed railroad overpass over these roadways. Construction costs are estimated at $5.1 million to construct the highway overpasses.
Fort Wainwright Spur replaces the existing Richardson Highway at-grade crossing with a separate-grade crossing. The railroad would be elevated over the highway. Construction cost is estimated at $5 million.

North Pole Refinery Siding provides approximately 7,800 feet of railroad siding for the North Pole Refinery (Williams) and Petro Star refineries. Construction cost is estimated at $4.1 million.

The estimated costs, in millions, are shown below and include construction, right-of-way, utility, and engineering costs for each of these concepts, Fort Wainwright Spur, North Pole Refinery, and option 1. Concepts are shown by ascending estimated cost. See appendix 2 for a detailed cost estimate.

Table 1. Estimated Cost (Millions)

Concept	**Estimated Cost**
Concept 2	$78.2
Concept 1	$86.9
Concept 4	$88.3
Concept 3	$90.3
Additive Projects	
Option 1	$5.1
Fort Wainwright Spur	$5.0*
North Pole Refinery Siding	$4.1

*Possible use of redirected DOT&PF programmed funds from Mile 12-Richardson Highway (Peridot) crossing (see narrative, pg. 2).

Photos depicting existing main line conditions and crossings are presented on the front and back inside covers. Photos representing conditions along the proposed main line realignment are shown on pages 4 and 5. Photo locations are referenced to the Vicinity Map on page iii.

SECTION 1 - PROPOSED ALIGNMENTS

ALIGNMENT CONCEPTS AND OPTIONS

Four basic concepts were identified. All four have identical horizontal alignment — they differ only in vertical alignment and roadway crossing configurations. The alignment is shown on an uncontrolled aerial map, Sheet A1 through A7, overlain by the Fairbanks North Star Borough base map. Sheet A1 is an index sheet. Sheets A2; A3; and A4 show differing highway-railroad intersection layouts. Once on the levee the alignment is identical for all concepts and is shown on Sheets A5 through A7. Sheet C1 shows typical sections for the railroad where it is located off the levee and construction sequencing for the levee portion.

Concept 1 – AREA Mainline Standard Rail – Minimized Parks Highway Modification

Concept 1 begins on the Alaska Railroad just east of the railroad's at-grade crossing on the Sheep Creek Connector Road, (Mile 465.47 on the Alaska Railroad). The proposed alignment branches in a southerly direction from the main track and accesses the median of the 4-lane Parks Highway. The outbound (to Anchorage) lanes of the Parks Highway are re-routed to pass over the railroad alignment. Sheet A2 shows the separate railroad-highway in combination with the at-grade Parks Highway-University Avenue intersection geometrics for both Concepts 1 and 2.

The railroad alignment would remain on the Parks Highway median for the next three-and-a-half miles. In that segment it would bridge over Geist Road, the Chena River, Airport Road, University Avenue, and the in-bound lanes (to North Pole) of the Parks Highway (Mitchell Expressway at this location). The railroad tracks would occupy median space now used for highway drainage and snow storage. A storm-drain system through this area will be necessary. Throughout this segment, highway and railroad grades differ by as much as twenty feet. These differences are necessary to maintain AREA standards for a 50-mile per hour track. Sheet P1 contains the proposed grade-line for Concept 1 from the beginning of the project to where it intercepts the levee. The railroad will be elevated within the median using aesthetic MSE walls.

As shown on the profile, the railroad and highway grades differ significantly, coinciding primarily at fixed points established at the Geist Road Overpass, Chena River Bridge, and the Airport Road Overpass. At these locations the railroad bridge is located in the highway median and will cross over Geist Road, the Chena River, and Airport Road respectively. At University Avenue the railroad will cross-over this arterial. Just south of University Avenue the railroad will cross over rerouted inbound lanes of the Parks Highway (named Mitchell Expressway in this segment).

Upon exiting the Parks Highway median, the railroad alignment would continue in a southerly direction crossing an undeveloped wetland area underlain by permafrost and frozen gravel. This segment is approximately one mile in length and the alignment encounters Cartwright Road, an unnamed slough, and the Alaska Railroad International Airport Spur. Concept 1 includes a road-over-railroad at Cartwright Road, a rail bridge over the slough, and 5-degree curve connections (East and West) with the airport spur and existing industrial area. The spur track between these connecting curves will be removed to make way for the Concept 1 alignment. The alignment connects with the Corps of Engineer's Tanana River Flood Levee at the end of this segment.

With two exceptions, the railroad alignment remains on the levee until it reaches the end of the project where it leaves the dike and reconnects with the existing Alaska Railroad spur to Eielson AFB.

The two exceptions are located where Peger Road and South Cushman Street cross over the levee. Peger Road is a minor crossing with sporadic use. Here, the proposed railroad alignment is located inside the levee leaving enough room for vehicles to pass beneath the railroad through a 16-foot pipe arch underpass, then use the existing "hump" to cross over the levee.

The South Cushman Street crossing over the levee is well used. The road is a haul route for trucks delivering gravel to the Fairbanks North Star Borough Sanitary Land Fill from the Goose Island material source. This section of the levee also contains three 6-degree reversing curves to be traversed by the railroad. It is proposed that the railroad alignment be shifted to the outside (south) of the levee to avoid the reversing curves and also gain adequate distance between the railroad and the levee for loaded gravel trucks to pass beneath the railroad and over the existing levee. A short railroad-over-road overpass with 16 feet of clearance is proposed at this location.

The primary drawback of Concept 1 is the high median walls necessary to maintain AREA standards for a 50 mile per hour design.

Concept 2 – AREA Mainline Secondary Standard Rail – Minimized Parks Highway Modification

The vertical alignment between the beginning of the project and University Avenue has been modified to AREA secondary track standards in Concept 2. This lower-speed grade eliminates a significant amount of the retaining wall necessary in Concept 1. Advantages are lower costs and a profile that matches more closely with the Parks Highway. Sheet P2 contains the proposed grade-line for Concept 2 from the beginning of the project to where it intercepts the levee.

The primary drawback of Concept 2 is the lower track speed. Benefits include lower cost, less MSE wall needed, and the visual and noise impacts of the railroad are decreased.

Concept 3 – AREA Mainline Standard Rail – Maximum Parks Highway Modification

Concept 3 has less visual impact than Concept 2 while adhering to AREA primary track standards. This is made possible by reversing the Parks Highway/Geist Road interchange and bringing Geist Road over the Parks Highway and railroad. Sheet A3 shows revised Giest road intersection geometrics for Concept 3.

Advantages are the lower profile while maintaining a vertical alignment that meets primary track criteria. The lower profile lends itself to noise mitigation better than any of the other concepts. The reversed highway interchange would partially shield the neighborhood from visual and noise impacts. Further, the suggested interchange layout would serve the major vehicular turning movements more efficiently than does the present interchange. Because of the amount of highway reconstruction associated with this concept, wider medians and roadway crown designs would retain snow storage areas and surface drainage systems. Concept 3 has the highest cost of all the concepts that were studied. Sheet P3 contains the proposed grade-line for Concept 3 from the beginning of the project to where it intercepts the levee.

Concept 4 – AREA Mainline Standard Rail – Medium Parks Highway Modification

Concept 4 has the same railroad grade as Concept 1, however the Parks Highway grade has been raised to nominally match the railroad grade between the Geist Road overpass and the Chena River. Residential areas on both sides of the alignment within this segment make it vulnerable to public concerns.

This concept addresses these concerns by decreasing the visual impact of the railroad within this segment. However it increases the height of the roadway by as much as 18 feet. Concept 4 costs more than Concept 1 or 2, but less than Concept 3.

Option 1- University Avenue/Parks Highway Interchange

Option 1 provides for a highway interchange at the intersection of the Parks Highway and University Avenue. This intersection is now served by traffic signals. Option 1 would add bridges over both the north and south bound lanes to facilitate through traffic on the Parks Highway. The intersection presently operates at better than a C Level Of Service (LOS) and, while not justified at this time, overpasses can be added in the future without disrupting the railroad. The geometrics for this option is shown on Sheet A4.

Spur Line to Fort Wainwright

The existing spur line from Fort Wainwright to the Fairbanks International Airport which services South Fairbanks businesses would be retained. The alignment is shown on Sheet A8. Improvements included in the upgrade are connections at both ends of the existing spur with the proposed realignment and an overpass over the Richardson Highway. Access to Fort Wainwright would be via the proposed main line railroad realignment and the upgraded spur. The profile for the spur line is shown on Sheet P4.

The Fairbanks Bypass Realignment would eliminate 48 at-grade railroad/roadway, including the Peridot crossing (Mile 12 of the Richardson Highway). The Department of Transportation and Public Facilities has programmed $5.5 million to upgrade the Peridot crossing to a separate grade crossing. However current cost for this crossing is estimated to reach as high as $15 million. Project design is on hold, pending the Fairbanks Bypass Realignment project. If redirected, the Peridot $5.5 million programmed funds would cover the proposed Richardson Highway/railroad separate grade crossing on the spur line.

Levee Crossings

There are four other roads besides Peger Road and South Cushman Extension that cross over the Levee. These are located at stations 85+00; 391+00; 500+00 (O'Neel Road) and Lathrop Street Extension at 830+00. Installing a 16-foot pipe arch underpass in the existing levee and a short bubble levee constructed to protect the underpass opening would accommodate each of these crossings. Vehicles would cross under the railroad tracks then over the bubble levee.

In addition to these levee crossings, the military maintains a tank crossing at station 698+00. It is recommended that an at-grade tank crossing be installed at this location and protocol established between the ARRC and Military to coordinate tank use.

Williams North Pole and Petro Star Refineries Siding

The proposed project includes 7,800 feet of siding connecting with the NPR loading tanks. The siding consists of three parallel tracks averaging 2,600 feet long, located adjacent to the mainline track (see sheet A7).

COST SUMMARY

The following table summarizes cost for each concept and additional projects.

Table 2. Cost Summary

Project	Estimate	PE	ROW	Utility	Total	Millions
Concept 1	75,700,659	3,028,026	1,000,000	7,220,000	86,948,685	$86.9
Concept 2	67,310,949	2,692,438	1,000,000	7,220,000	78,223,387	$78.2
Concept 3	78,452,828	3,138,113	1,500,000	7,220,000	90,310,941	$90.3
Concept 4	76,968,155	3,078,726	1,000,000	7,220,000	88,266,881	$88.3
Option 1	4,633,426	463,343			5,096,769	$5.1
Wainwright Spur*	4,574,160	457,416			5,031,576	$5.0
North Pole Refinery	3,709,224	370,922			4,080,146	$4.1

PHYSICAL AND ENVIRONMENTAL ISSUES IDENTIFIED

Wetlands and Permitting

The proposed alignment would encounter wetlands at the beginning of the project and throughout the segment between the highway median and the Tanana River Flood Levee. An estimated 45 acres of wetlands would be filled with approximately 350,000 cubic yards of fill. A Corps of Engineer's wetlands permit will be required. Preliminary coordination with the Corps did not identify any concern that would prevent a permit from being approved. Other required permits will include, but not necessarily be limited to: EPA Clean Water (with Corps wetland permit); Title 16 from Alaska Department of Fish and Game; DNR Land Use Permit to cross the Chena River, (perhaps just an amendment to the DOT&PF permit); Governor's Coordinating Office (Coastal Zone Management) permit and the various storm water runoff plans and permits.

Airport Clearances

The precision approach to Runway 19 has a 50:1 glide slope starting at the runway's extended threshold. At this time, several light standards on the Airport Road overpass penetrate this glide slope. The FAA requires 23 feet of clearance over a railroad. None of the concepts presented in this study would penetrate the glide slope, although any highway lighting modification along the end of the runway may require shorter light standards and closer spacing.

Noise

Noise impacts are likely the most sensitive environmental and political issue associated with the project. The segment of the railroad alignment beginning at Geist Road and extending to the Airport Road overpass is adjacent to residential areas. University Avenue, to the west, and extending from Geist Road to the Chena River is the most densely populated area. Portions of the railroad grade proposed in Concepts 1, 2, and 4 would be above the existing roadway. Noise levels are not expected to exceed that allowed on transportation projects. The neighborhood will not be subject to train warning whistles and there are no at-grade crossings. Braking trucks on the highway will likely remain the single loudest noise within the transportation corridor. However noise will be a public concern that will require addressing. A noise analysis required during the environmental phase will be needed. Mitigation measures include constructing noise barriers. South of the Chena River the alignment traverses through commercial development including hotels, motels, and RV campgrounds. There are no highly sensitive areas such as hospitals along the route.

This project will eliminate all train traffic south of the Fairbanks Rail Yard, including residential areas along Trainor Gate Road and by the recently constructed post housing, and residences along the Old Richardson Highway and within the City of North Pole. New railroad regulations have increased warning whistles for at-grade crossings. The numerous at-grade crossings on the existing spur will require continuous warning whistles in these areas. The proposed project would completely eliminate this noise.

Wildlife

Both the railroad and associated highway relocations would require acquiring land from the University of Alaska. The take includes portions of agriculture fields used to study grains and other crops as well as a wooded area. Adjacent fields attract waterfowl during spring and fall migrations and attract bird watchers during those periods. The proposed alignments skirt those areas that attract waterfowl. Waterfowl migration concerns will be fully addressed during the environmental phase.

Levee Recreational Trail

The Tanana River Levee is the main recreational trail between South Fairbanks and North Pole. Trail use is especially heavy during winter months. The Fairbanks North Star Borough Comprehensive Recreational Trail Plan recognizes this trail as a primary route to connect with other trails in the borough and recommends it be made into a bike path. A gravel bench located along the protected side of the levee for most of its length could be improved to bike path standards. With only minor filling and grading it would be serviceable for trail use.

All railroad tracks would be removed from the existing railroad right-of-way between Fairbanks and Moose Creek. This route includes a bridge over the Chena River. The right-of-way surface could be made available by the ARRC for recreational purposes through the federally funded Rails to Trails program.

Maintenance

The Parks Highway median is nominally 42 feet wide. Along with separating opposing traffic the median provides for drainage and snow storage. The highway is crowned to drain water from the inside lane into the median. A storm drain system has been included in the project cost to maintain this function.

Military Firing Range

A military firing range is located between station 556+00 and 636+00. The range, in its present configuration is incompatible with a railroad. Mitigative options include developing fail-safe protocol to cease firing while trains are traveling through this area and constructing a high embankment between the firing range and railroad tracks. Initially, relocating the range was considered, however this option was eliminated from further consideration because of the potential closure cost and because current military guidelines forgo any range closures.

An embankment extending approximately 30 to 40 feet above the tracks would provide the necessary protection for most operations at the range. Range closures for some weapon types will also need to be addressed during design development. The frequency of closures will likely involve only a few hours per year due to infrequent firing of specialized weaponry.

Hazardous Material

There are no readily apparent contaminated sites on the proposed railroad route.

Headlights

The effect of train headlights on approaching motorist is not known. However, railroads are located within highway median elsewhere without undue conflicts. This will be addressed in detail during project design.

Beginning of Realignment

Parks Highway Median (Forward)

Parks Highway Median (Back)

Geist Road Crossing

Chena River and Road Crossing

Airport Way Crossing

Adjacent to Fairbanks Airport

Adjacent to Fairbanks Airport

University Avenue Crossing

End Median Use, Traverse to Levee

Cartwright Road Crossing

Begin Alignment on Levee

View Back to Virgin Terrain

View along Levee at Spur Dike

Peger Road Crossing

Note: Photo locations referenced to Vicinity Map on page iii.

PHOTOS – PROPOSED REALIGNMENT

Levee near Lathrop St. Crossing

South Cushman Extension Crossing

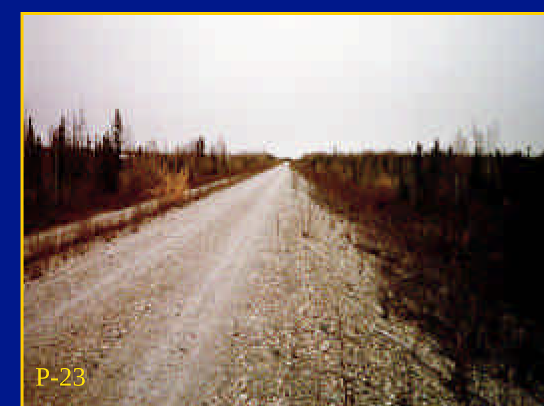
View along Levee

Access Road to Levee

View along Levee

Guard during Firing Range Practice

Typical Curve on Levee



View along Levee

Power Line Crossing

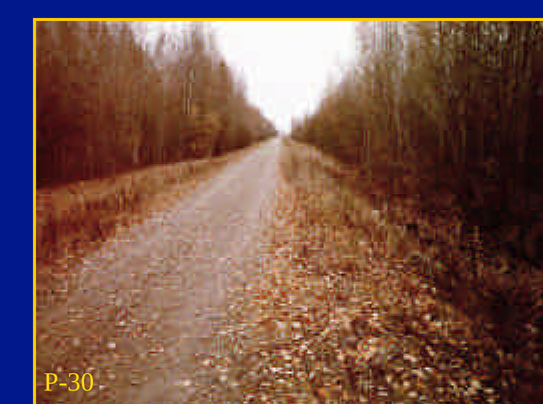
Levee Crossing

Levee near North Pole Refinery

Levee at Private Airstrip Crossing

Private Airstrip

Private Property at Levee Crossing



View along Levee

Note: Photo locations referenced to Vicinity Map on page iii.

PHOTOS – PROPOSED REALIGNMENT

SECTION 2 - GEOTECHNICAL

Geotechnical evaluation of site conditions consisted of performing data research and visual field site assessment. Test holes were not drilled as part of this realignment study.

DATA RESEARCH

The data gathered during this realignment study consists of the following:

ADOT/PF Data
The Northern Region of the Alaska Department of Transportation and Public Facilities was visited to review existing records of highway and bridge projects completed along the rail corridor. Copies of as-built plans and geotechnical reports were gathered and reviewed in evaluating soil conditions along the corridor. The data gathered during this investigation consists of:

- Plan and Profile Drawings Project NH-IR-I-0A4-4(11)/64959, Parks Highway, 4 Lane Widening, Chena River to Peger Road.
  As-built plans, March 1998.
- Plan and Profile Drawings Project NH-I-0A4-5(7)/63538
  Parks/Chena Ridge Interchange Grading, Paving, Drainage, & Bridges.
  As-built plans, March 1999.
- Plan and Profile Drawings, Project F-035-I(27)/A46782
  Parks Highway, Airport Way to Peger Road.
  As-built plans, April 1984.
- Geotechnical Report Project I-OA4-5(7)/63538.
  Parks/Chena Ridge Interchange Revision No. 1, April 1994.
- Foundation Report Project I-OA4-5(11)/64959.
  Parks Highway/4 Lane Widening, Chena River Bridge at Parks Highway, Bridge No. 1913 and Airport Way Overcrossing at Parks Highway, Bridge No. 1914, May 1992.
- Bridge Foundation Investigation Project F-035-6(12)
  Parks Highway, Airport Way to Peger Road, April 1983.
- Foundation Report Project F-037-1(15)
  Fairbanks Airport Road Overpass, April 1972.
- Foundation Report Project F-037-1(15)
  Chena River Bridge No. 1161, July 1970.
- Geotechnical and Soils Report, Project NH-I$-I-OA4-5(11), Parks Highway 4 Lane Widening, Phase II, November 1992.
- Foundation Report, Project I-OA4-5(7)/63538
  Parks Highway/Chena Ridge Interchange, Bridge No. 1878 and 1879, April 1990.
- Supplemental Foundation Report, Project I-OA4-5(7)/63538
  Parks Highway/Chena Ridge Interchange, Bridge Nos. 1878 and 1879, July 1995.

Corps of Engineers Data
Geotechnical data was gathered from the Corp of Engineers. These documents consist of the plan and profile sheets for the Tanana River Levee project completed in the 1960's. The plans contain test holes drilled by the Corp during preparation for this project.

Airphoto Data and Field Assessment
An uncontrolled color airphoto mosaic (10' per pixel) was provided by the ARR and flown by Aeromap USA. A review of the photo in combination with field review of the alignment was used to assess vegetation along the alignment and evaluate of possible soil conditions where existing data is not available.

CORRIDOR ASSESSMENT

The following summarizes our assessment of the soil conditions along the proposed rail realignment.

Sheep Creek Road to Geist Road
This segment of the rail corridor traverses virgin terrain between Sheep Creek Road and the intersection of the rail with the Parks Highway. The alignment then follows the center grassy median between the northbound and southbound lanes of the Parks Highway. The existing Parks Highway northbound lanes are realigned further east and over the proposed rail alignment at the North End Highway Bridge. This requires MSE walls at the bridge crossings at this location and at Geist Road. MSE walls and pier structures transitioning between the MSE walls may also be required.

Soil conditions between Sheep Creek Road and the intersection with the Parks Highway are based on evaluation of the airphotos and visual conditions observed in the field. There is no existing test hole data for this segment. This segment is likely to encounter silts and possibly organic soils. In virgin terrain this will likely require sub grade excavation to provide proper support for low profile grades of the rail and road. Where grades increase in height excavation of the sub grade excavation for the road may not be necessary.

The highway bridge crossing at Station "A" 79+00 (North End Highway will require pile supports into the underlying soil. We do not anticipate high visible ice contents but this should be confirmed with a drilling program in the next phase.

Geist Road to Chena River
This segment of the rail corridor is located in the center grass median of the Parks Highway. Soil conditions from the existing ADOT/PF test hole data reveal silty and organic soils closer to the Geist Road area and generally increasing sands and grovel to the south. Sporadic silt lenses are noted in the test hole logs. The original road grade was lower before widening the Parks Highway and has since been constructed to a higher profile grade with fill. Soil conditions are generally more favorable along this segment of the alignment.

Chena River Bridge
This segment of the rail corridor crosses the Chena River between the northbound and southbound lanes of the Parks Highway. The proposed 520-foot steel bridge structure is located between two existing bulb-t highway bridges.

Soil conditions are generally very favorable at this crossing of the Chena River. Soils are dense to very dense sands and sandy gravel. Near surface lenses of silt and organics are located in the soil at each bridge abutment. Visual observations in the field of pile marks indicate the piles were driven to approximately 120 feet beneath the ground surface Boring indicate dense to very dense sands and sandy gravel.

Chena River Bridge to South End Road Bridge
This segment of the rail corridor is located on the grass median between the northbound and southbound lanes of the Parks Highway. Bridge crossings of Airport Way and University Avenue are required as well as the southbound lanes of the Parks Highway where realignment is necessary. The rail corridor then deviates from the center median and traverses through virgin terrain towards the Tanana River Levee system.

Soil conditions are noted in existing test hole data from ADOT/PF through the University Avenue intersection. Soil conditions generally consist of sands, sandy gravel and interlayered sands and gravel. Surficial soils consist of silt in some areas up to 6 to 15 feet in thickness however this layer is somewhat sporadic. In general, soils encountered in the test holes revealed little visible ice content which is typical of poorly drained areas. Where the route begins to deviate from the Parks Highway, south of University Avenue, it traverses through virgin terrain. Soil conditions are expected to encounter shallow silt and possibly organic deposits over sands and gravels.

South End Road Bridge to Tanana River Levee
This segment of the rail corridor traverses across virgin terrain. A road crossing over the rail is required at Cartwright Road (formerly Van Horn Road) and over an unnamed slough.

Soil conditions are based on interpretation of airphotos and visual site assessment. Consideration was also given to conditions noted in test holes obtained from the ADOT/PF data at Parks Highway and COE data at the Tanana River Dike in assessing soil conditions.

In general it is anticipated that near surface organics and silt are present overlying sands and sandy gravel at depths approaching 15 feet. Variations may be encountered in areas where potential organic material may be present. The area is generally level and appears to have a high water table. It is anticipated that soil conditions are likely to contain little visible ice however local conditions may vary depending on water table depths at the time of permafrost formation. Soil conditions should be confirmed with test holes during the next phase.

Excavation or possibly surcharging may be necessary in areas where soft soils are encountered for the railroad. At the location of the South End Road Bridge, MSE walls may require that additional excavation be performed to properly found the structure.

Tanana River Levee (COE Station 903+00) to EOP
This segment of the rail corridor follows the existing Tanana River Levee. Soil conditions are based on COE test hole logs along the levee, visual observations of material sources along the levee and other data gathered during the investigation.

The existing dike consists of sandy gravel fill varying in thickness from 8 to 10 feet over the majority of the length of dike. Towards the EOP the dike thins to 4 to 6 feet. Gravel for construction of the levee has been obtained from material sources directly adjacent to the dike along the project length. Soil conditions within the dike appear adequate and the majority of the dike system appears to be constructed on a 2:1 (horizontal to vertical) side slope.

The underlying sub grade was evaluated by reviewing existing COE test holes, vegetation along the levee, and visual inspection of material sources along the north side of the levee system. The COE test hole data reveals the majority of the alignment contains 3 to 5 feet of silt overlying poorly graded sands and gravels. Segments of the sub grade have permafrost however we have not obtained information as yet from the Corps on the amount of visible ice that may be present. Some COE test holes revealed organic material that is consistent with the organics and ponds noted along the border of the levee in specific locations. We also observed Tamarack trees over a small segment of the alignment, which typically is indicative of permafrost and potentially ice-rich soils. However it appears the majority of the alignment would not require anything specific other than raising and widening the dike.

SUMMARY

Geotechnical conditions along the rail corridor are favorable with much of the route containing sub grade with sands and gravel soils. Areas near the rail BOP will likely require sub grade excavation to provide proper support.

The majority of the rail route following the center of the Parks Highway median will require MSE wall or pier structures. Sub grade soils have been replaced with sandy gravel fill in the majority of this segment of the alignment and underlying soils beneath this fill generally are silt from BOP to Geist Road and sandy gravel or sand for the rest of the Parks/Mitchell Highways. Cross-road on- and off-ramps may require additional excavation of silt and organic soils.

Surcharge or excavation of organics and silt may be required between the South End Rail Bridge and the levee. Additionally excavation of silt and organics is likely for the segment of road between Geist Road and the Parks Highway EOP.

Soil conditions along the levee are generally favorable and the existing dike is generally constructed on curves of 3 degrees providing adequate support and alignment for the rail. Widening and raising of the levee profile are required although the majority of the levee does not require substantial raising of the grade due to good sub grade support on sands and gravels.

Additional geotechnical investigations should be conducted during the next phase to confirm existing soil conditions, quantities of fill and excavation and proper foundation support for MSE walls and bridge supports.

SECTION 3 – STRUCTURES, UTILITIES, RIGHT-OF-WAY

Structure determination was based upon standard structure types common to the railroad and states highways. Conceptual bridge layouts are shown on Sheets B1 through B14.

STRUCTURE ASSESSMENT

The following summarizes our assessment of the structure types along the proposed rail realignment.

Parks Highway Median Structures

A mechanically stabilized earth (MSE) wall is proposed for use in the center median of the Parks Highway. The MSE wall consists of a concrete face and soil reinforcing material. MSE walls in combination with Jersey barriers on each side would be used to enhance safety. The MSE wall is also expected to reduce headlights from motorists traveling in opposite directions on the highway.

Highway Bridges Crossing over Rail

The basic structure of a highway bridge consists of concrete bulb-tee girders with a maximum span of 140 feet. The superstructure would be supported on driven steel piles with concrete pile cap and wing walls. A two-lane bridge would have a width of 40-feet including shoulders.

Two basic types of railroad bridges crossing highway or river bridge structures were investigated.

- Short Span This bridge type includes any span less than 60-feet that cannot be cleared with culverts or multi-plates. The bridge would be a ballasted deck with steel stringers below the deck plate. Overall depth of the structure from top of rail would be less than 5-feet. Bridge piers and/or abutments would be pile supported.

- Long Span Two long span bridges (up to 140-foot clear) were investigated, a fairly common I-shaped girder system and a box-girder system both with ballasted decks. Both girder types provide shallow requirements for distances between top of rail to girder soffit, which is needed to minimize approach fill heights. The cost of the two structure types are generally equal. In addition access for inspection and maintenance is equal with the inclusion of access walkways through the box girder.

Bridge piers and abutments would be pile supported with either spill through or MSE wall abutments. Table 3 summarizes bridge recommendations.

Table 3. Bridge Recommendations

Summary of Bridges	Concept 1	Concept 2	Concept 3	Concept 4	Option 1
Crossing No. 1 North End Highway Bridge	125' Concrete Bulb-Tee	Same	Same	Same	Same
Crossing No. 2 Geist Road Railroad Bridge	130' Steel Box Girder	Same	None	Same	Same
Crossing No. 2 Geist Road Highway Bridge	None	None	130' Concrete Bulb Tee	None	None
Crossing No. 3 Chena River Railroad Bridge	520' Steel Box Girder– 4 Span	Same	Same	Same	Same
Crossing No. 4 Airport Way Railroad Bridge	145' Steel Box Girder	Same	Same	Same	Same
Crossing No. 5 University Avenue Railroad Bridge	130' Steel Box Girder	Same	Same	Same	Same
Crossing No. 5 University Avenue Highway Bridge	None	None	None	None	Add two 130' Bulb Tee
Crossing No. 6 South End Railroad Bridge	80' Steel Box Girder	Same	Same	Same	Same
Crossing No. 7 Cartwright Road Highway Bridge	60' Concrete Bulb Tee	Same	Same	Same	Same
Crossing No. 8 Slough Crossing Railroad Bridge	50' Steel Wide Flange	Same	Same	Same	Same
Crossing No. 9 South Cushman Street Railroad Bridge	50' Steel Wide Flange	Same	Same	Same	Same
Crossing No. 10 Wainwright Spur Railroad Bridge	130' Steel Box Girder – 2 Span	Same	Same	Same	Same

UTILITIES

The North Pole City sewer high-pressure pipe passes through the levee at station 201+50 and the City of Fairbanks sewer outfall is located beneath the levee at station 883+70. Neither of these outfalls should be affected by routing the railroad along the levee. However, a containment area may be necessary where the high pressure pipe crosses under the railroad.

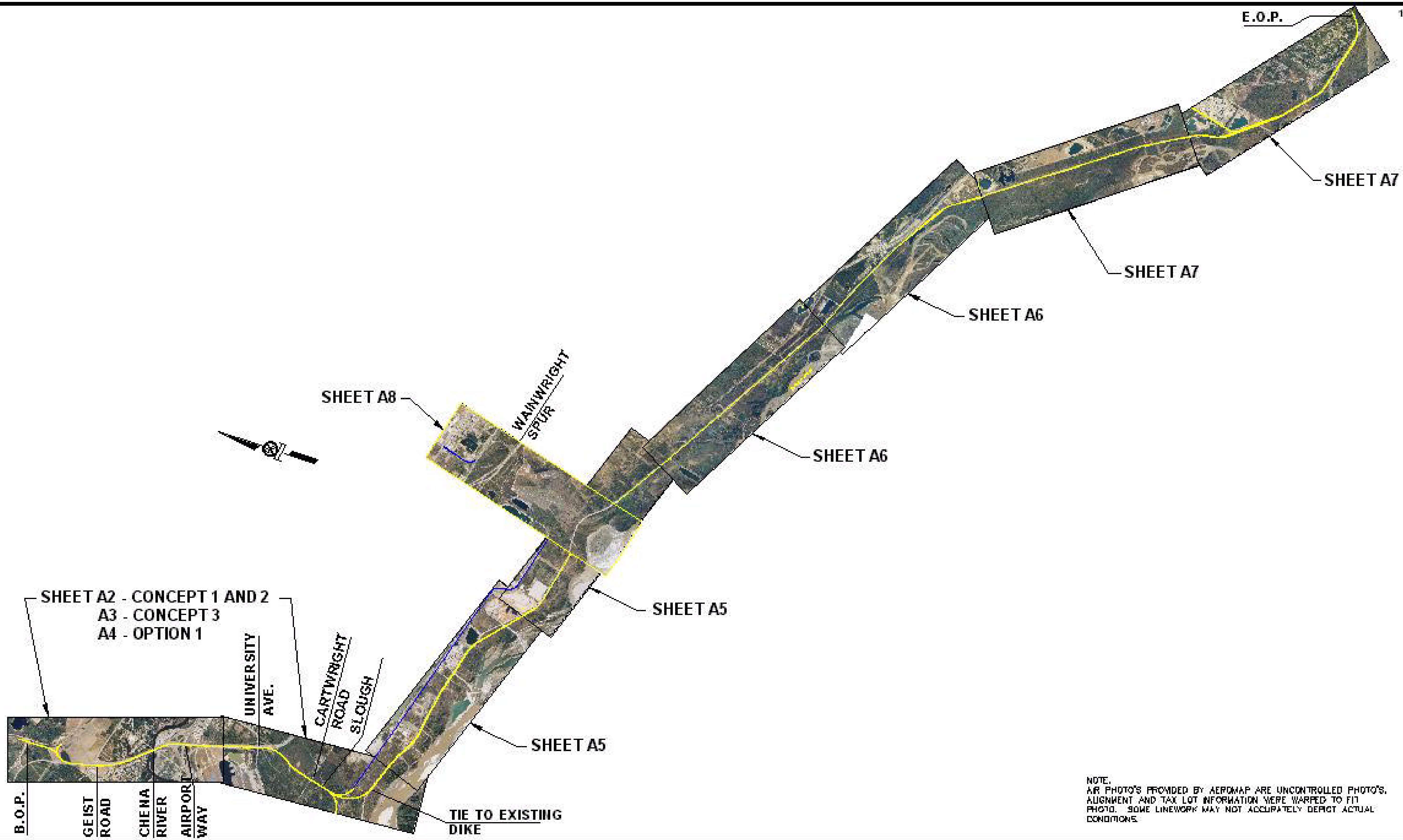
The proposed railroad alignment conflicts with power lines owned by Golden Valley Electric Association (GVEA) at the nine locations shown in Table 4. GVEA estimates costs to move or modify these power lines will be between $6.4 and 7.4 million.

Table 4. GVEA Powerline Relocation/Adjustment Estimated Cost

Location – Number & Size of Lines	Cost
Parks Hwy @ UAF – 138 kV; 2-69 kV; 7.2 kV	$3,000,000
Parks Hwy @ Trinidad Dr. –7.2 kV	$100,000
Parks Hwy @ Chena River – 69 kV	$60,000
Parks Hwy & University Avenue – 138 kV; 69 kV	$3,500,000
Cartwright Road – 7.2 kV	$50,000
Peger Road – 7.2 kV	$50,000
Van Horn Road – 7.2 kV	$10,000
Levee Crossing in TL-3200 Sec. 32, T1S, R1E – 138 kV	$200,000
Levee Crossing west of James St. (Bunge Sub) - 138 kV	$200,000
Estimated Total Cost	**$7,220,000**

RIGHT OF WAY

Right of way necessary for this project is minimal for a transportation project of this nature within an urban area. Both the Parks Highway and Tanana River Levee presents a potential transportation corridor through the community. The bulk of the right of way needed to complete this project is within that segment of alignment between the Parks Highway and the levee and crosses parcels that are mostly undeveloped. Right of Way costs are estimated at $1 million for Concepts 1, 2, and 4. Right of Way cost for Concept 3 is estimated at $1.5 million.



NOTE.
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

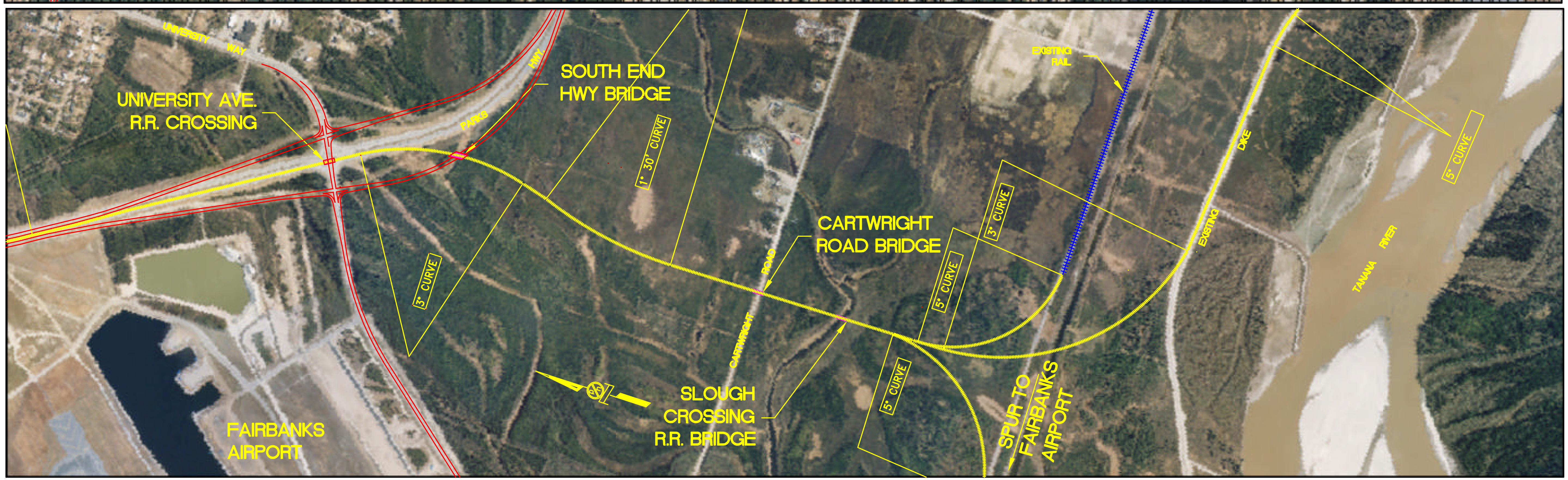
THOMAS ENGINEERING
Engineers - Surveyors - Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

NOT TO SCALE

FAIRBANKS BYPASS REALIGNMENT STUDY
ALASKA RAILROAD CORPORATION

SHEET TITLE: ALIGNMENT LOCATION SHEET

SHEET A1



REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

NOTE:
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

LEGEND
- PROPOSED RAIL
- EXISTING RAIL
- PROPOSED ROAD
- PROPOSED BRIDGE

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

DESIGN: MH/BT CHECKED:
DRAWN: TG APPROVED: DN
SCALE: GRAPHIC SCALE 0 500 1000

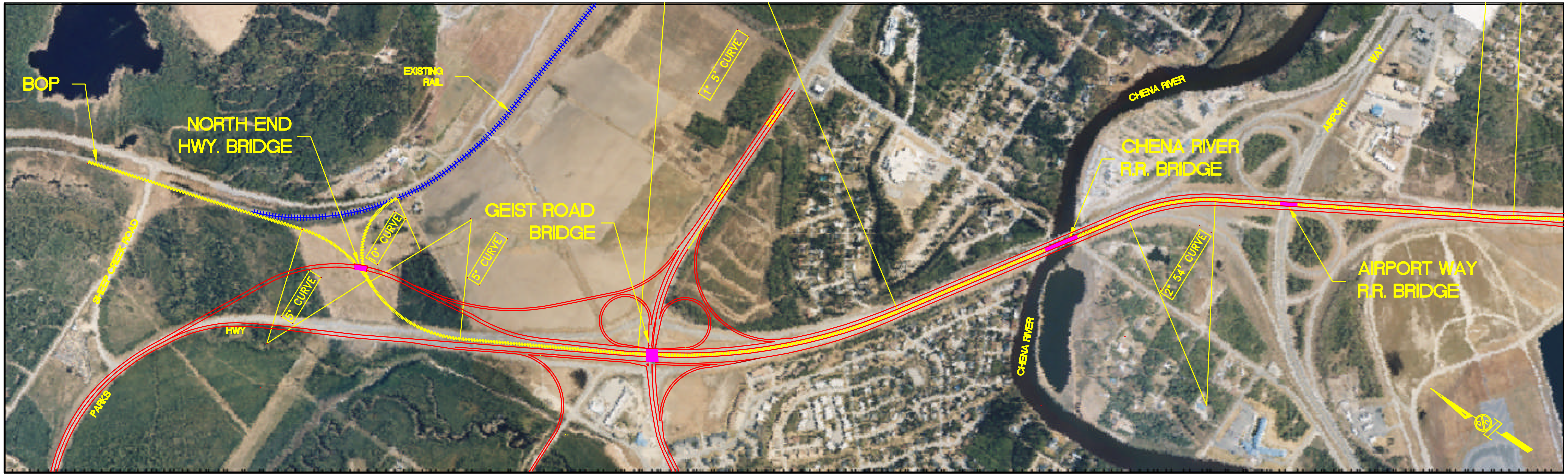
DATE: 12/5/2000

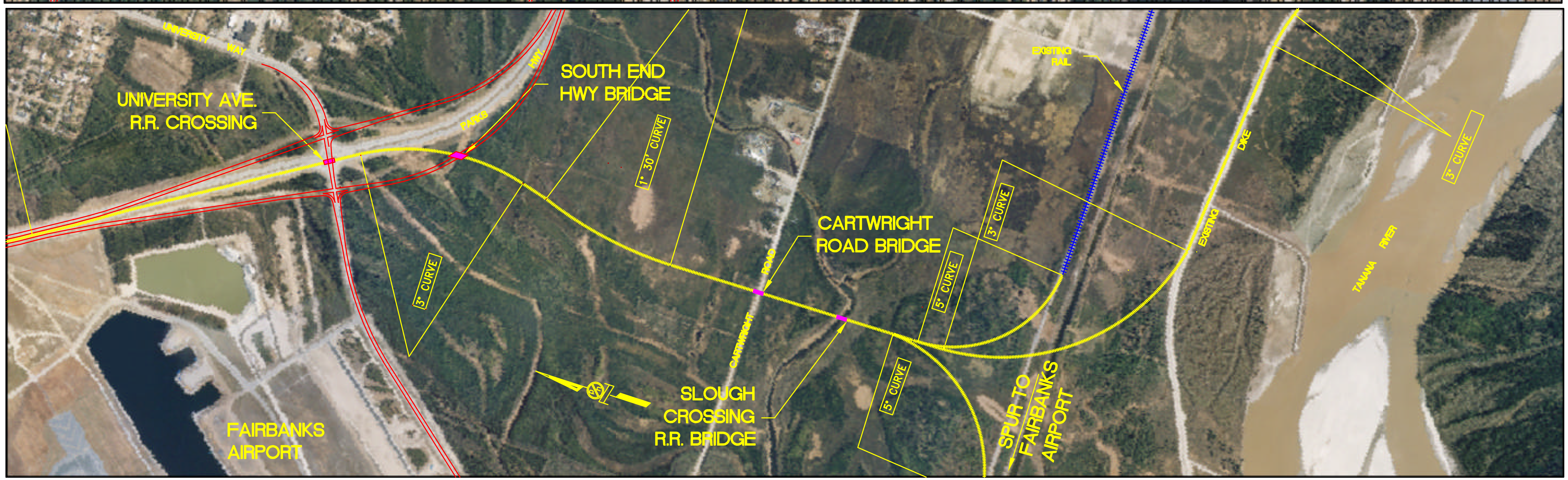
FAIRBANKS BYPASS REALIGNMENT STUDY
ALASKA RAILROAD CORPORATION

SHEET TITLE:
CONCEPT 1 AND 2 ALIGNMENT

SHEET
A2

PN&D PROJECT NO.: 000465 DWG. FILE: ARR.PRO





REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

NOTE:
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

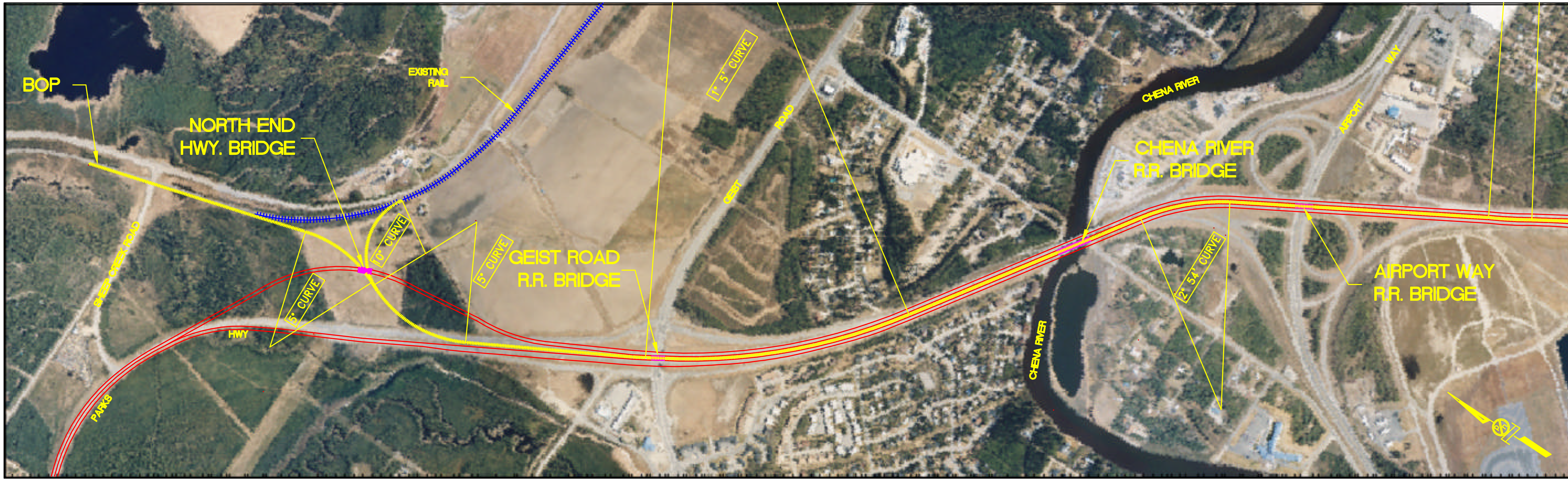
LEGEND
- PROPOSED RAIL
- EXISTING RAIL
- PROPOSED ROAD
- PROPOSED BRIDGE

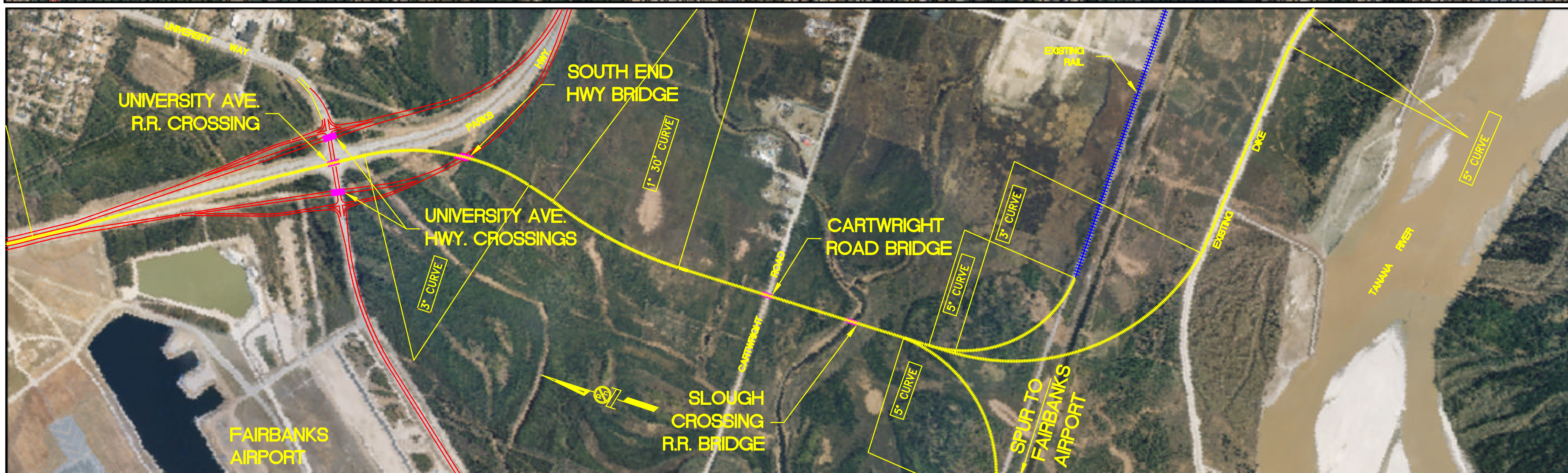
THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

DESIGN: MH/BT CHECKED: ______
DRAWN: TG APPROVED: DN
SCALE: GRAPHIC SCALE 0 500 1000

DATE: 12/5/2000

FAIRBANKS BYPASS REALIGNMENT STUDY
ALASKA RAILROAD CORPORATION
SHEET TITLE: **CONCEPT 3 ALIGNMENT**
SHEET **A3**
PN&D PROJECT NO.: 000465 DWG. FILE: ARR.PRO





REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

NOTE:
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

LEGEND

- PROPOSED RAIL
- EXISTING RAIL
- PROPOSED ROAD
- PROPOSED BRIDGE

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

DESIGN: MH/BT
DRAWN: TG
CHECKED:
APPROVED: DN
SCALE: GRAPHIC SCALE
0 500 1000

DATE: 12/5/2000

FAIRBANKS BYPASS REALIGNMENT STUDY

ALASKA RAILROAD CORPORATION

SHEET TITLE: OPTION 1 ALIGNMENT

SHEET A4

PN&D PROJECT NO.: 000465 DWG. FILE: ARR.PRO

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

NOTE:
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

LEGEND
- PROPOSED RAIL
- EXISTING RAIL
- PROPOSED ROAD
- PROPOSED BRIDGE

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

DESIGN: MH/BT CHECKED: ____
DRAWN: TG APPROVED: DN
SCALE: GRAPHIC SCALE 0 500 1000

DATE: 12/5/2000

FAIRBANKS BYPASS REALIGNMENT STUDY
ALASKA RAILROAD CORPORATION

SHEET TITLE: CONCEPT 1, 2 3, AND OPTION 1 ALIGNMENT

SHEET A5

PN&D PROJECT NO.: 000465 DWG. FILE: ARR.PRO

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

NOTE:
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

LEGEND
- PROPOSED RAIL
- EXISTING RAIL
- PROPOSED ROAD
- PROPOSED BRIDGE

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

DESIGN: MH/BT CHECKED:
DRAWN: TG APPROVED: DN

SCALE: GRAPHIC SCALE
0 500 1000

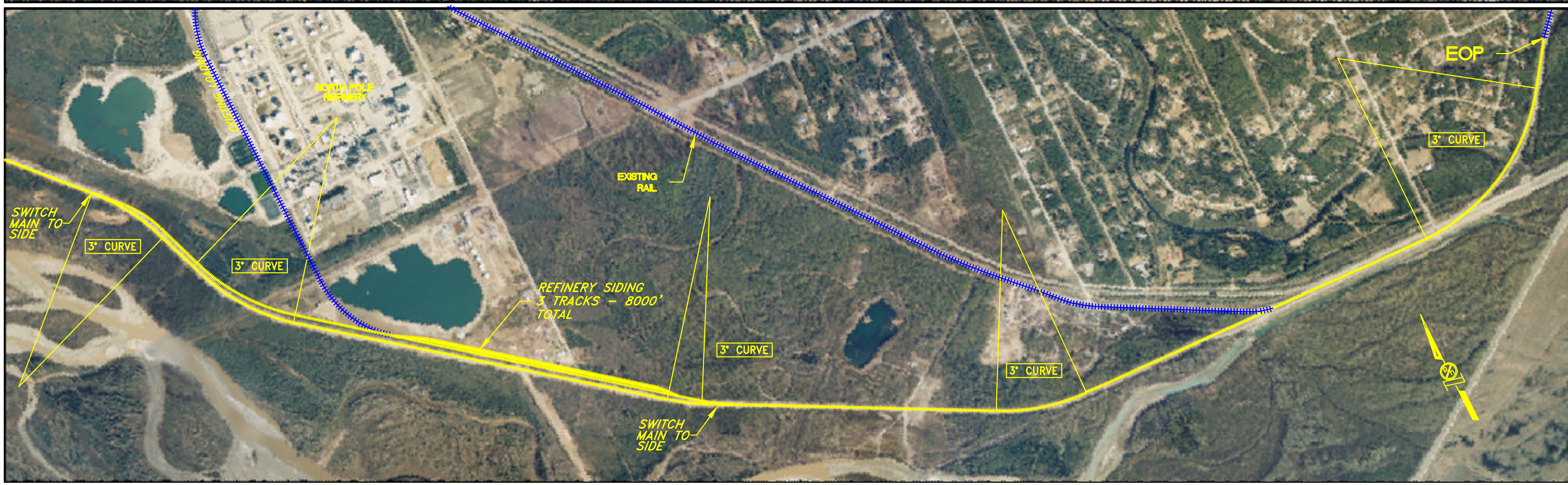
DATE: 12/5/2000

FAIRBANKS BYPASS REALIGNMENT STUDY
ALASKA RAILROAD CORPORATION

SHEET TITLE:
CONCEPT 1, 2 3, AND OPTION 1 ALIGNMENT

A6

PN&D PROJECT NO.: 000465 DWG. FILE: ARR.PRO



REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

NOTE:
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

LEGEND
- PROPOSED RAIL
- EXISTING RAIL
- PROPOSED ROAD
- PROPOSED BRIDGE

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

DESIGN: MH/BT CHECKED: ____
DRAWN: TG APPROVED: DN
SCALE: GRAPHIC SCALE 0 500 1000

DATE: 12/5/2000

FAIRBANKS BYPASS REALIGNMENT STUDY
ALASKA RAILROAD CORPORATION
SHEET TITLE: **CONCEPT 1, 2 3, AND OPTION 1 ALIGNMENT**
PN&D PROJECT NO.: 000465 DWG. FILE: ARR.PRO
A7

REV.	DATE	DESCRIPTION	DWN.	CKD.	APP.

NOTE:
AIR PHOTO'S PROVIDED BY AEROMAP ARE UNCONTROLLED PHOTO'S. ALIGNMENT AND TAX LOT INFORMATION WERE WARPED TO FIT PHOTO. SOME LINEWORK MAY NOT ACCURATELY DEPICT ACTUAL CONDITIONS.

LEGEND
- PROPOSED RAIL
- EXISTING RAIL
- PROPOSED ROAD
- PROPOSED BRIDGE

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

DESIGN: MH/BT
CHECKED:
DRAWN: TG
APPROVED: DN

SCALE: GRAPHIC SCALE
0 500 1000

DATE: 12/5/2000

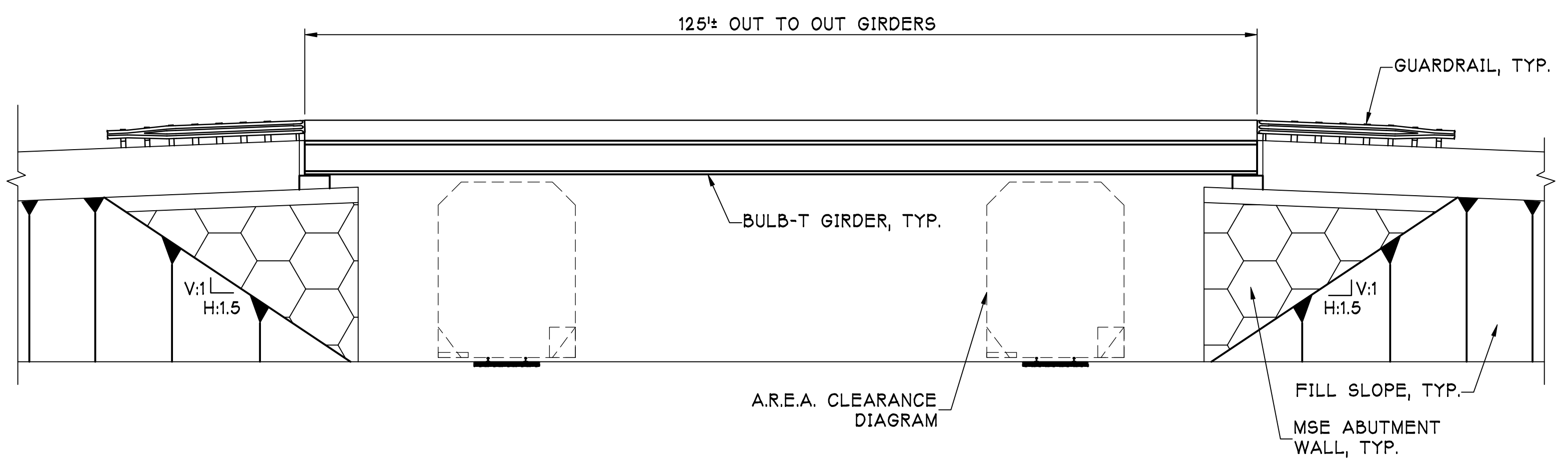
FAIRBANKS BYPASS REALIGNMENT STUDY

ALASKA RAILROAD CORPORATION

SHEET TITLE:
CONCEPT 1, 2 AND 3
WAINRIGHT SPUR

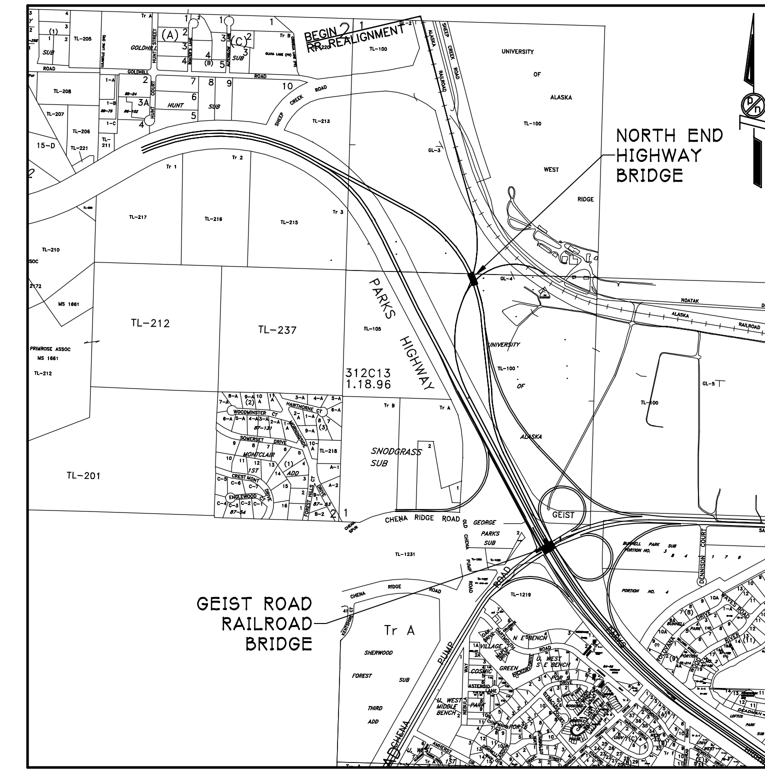
PN&D PROJECT NO.: 000465
DWG. FILE: ARR.PRO

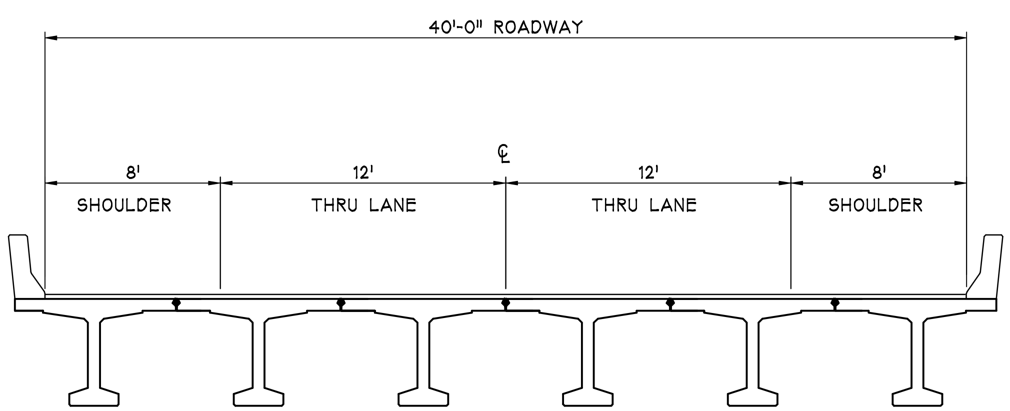
A8



ELEVATION

0 5 10 15 30 45 FT.





TYPICAL BRIDGE SECTION AT MIDSPAN

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed:	TN/TWB
Drawn:	TWB
Checked:	
Project No.:	00465
Date:	NOV. 2000
Scale:	NOTED

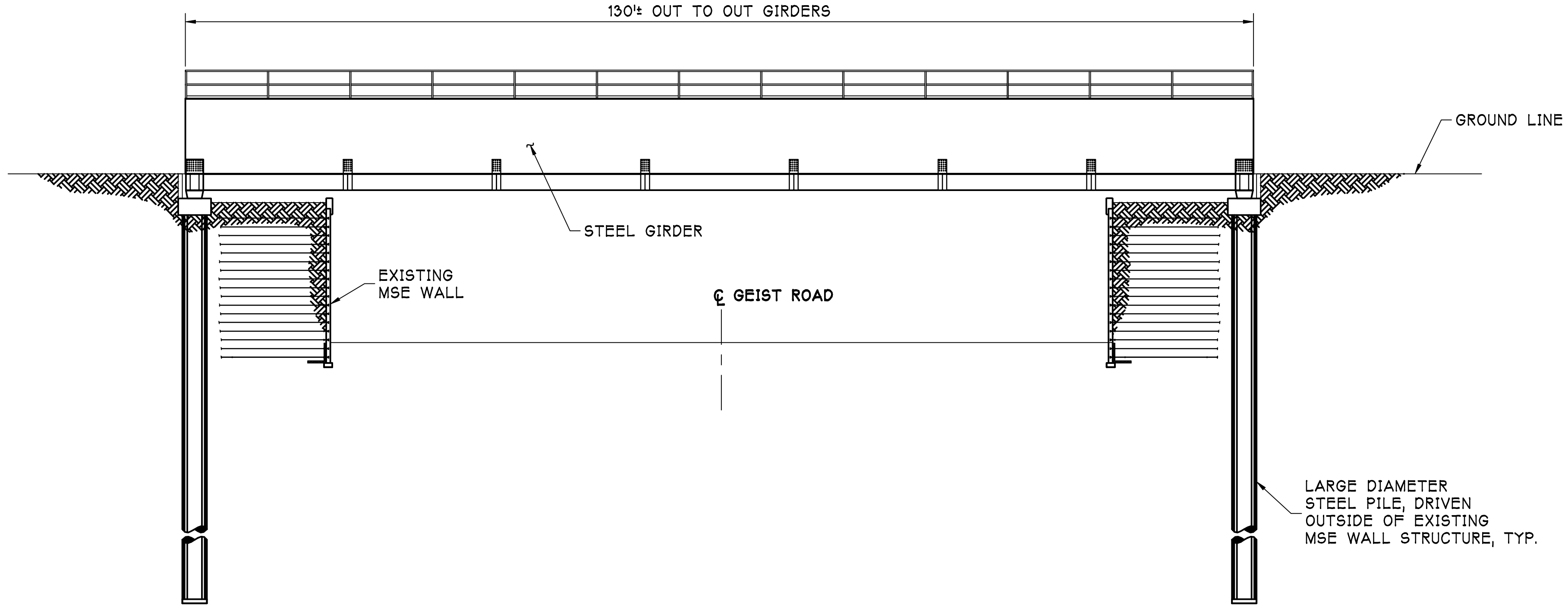
FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

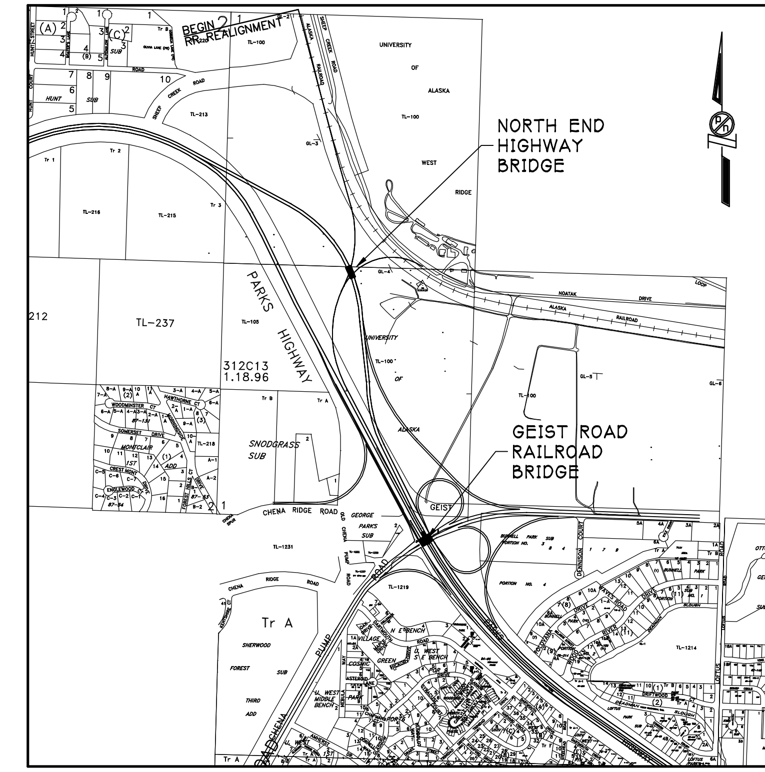
NORTH END HIGHWAY BRIDGE
STA. "A" 79+00

Figure **B1**

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\CROSSING No 1.dwg
PLOT 1: F.S. 12-03-2000



ELEVATION



Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\CROSSING No 2A.dwg
10-30-00

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

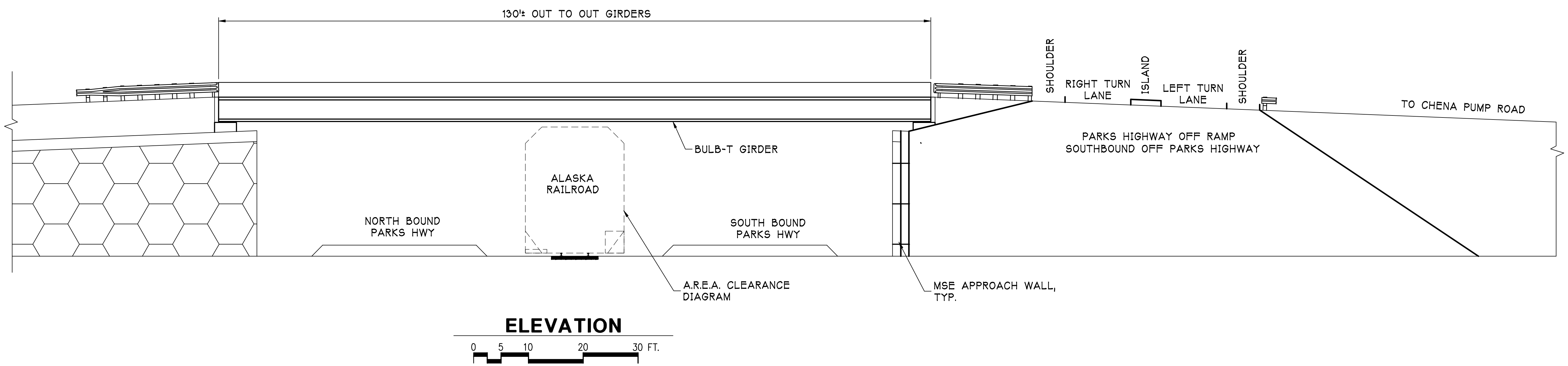
Designed:	TN/TWB
Drawn:	TWB
Checked:	
Project No.:	00465
Date:	NOV. 2000
Scale:	NOTED

FAIRBANKS BYPASS REALIGNMENT STUDY

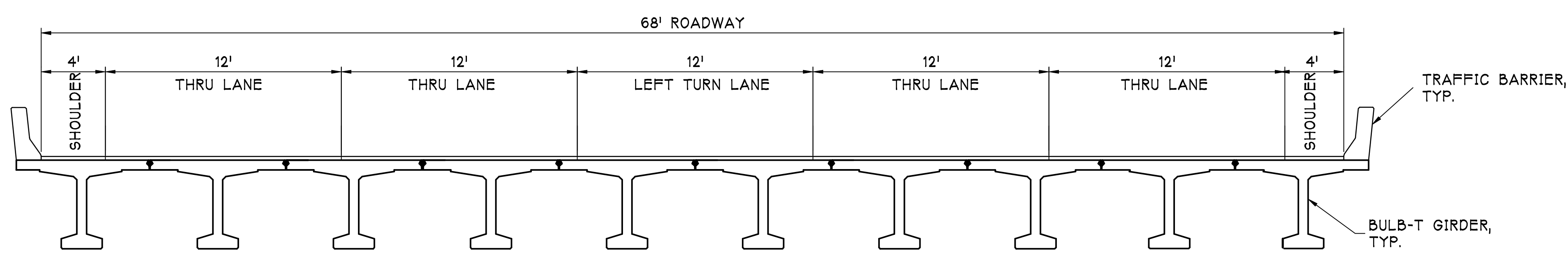
THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

GEIST ROAD RR BRIDGE
STA "A" 183+28

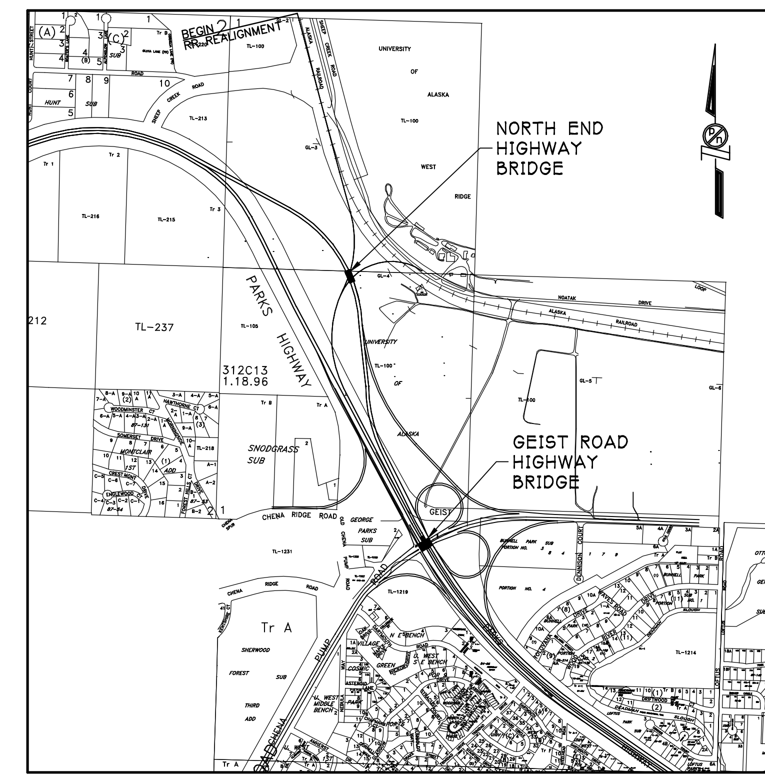
Figure
B2



ELEVATION



TYPICAL BRIDGE SECTION AT MIDSPAN



FAIRBANKS BYPASS REALIGNMENT STUDY

Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465

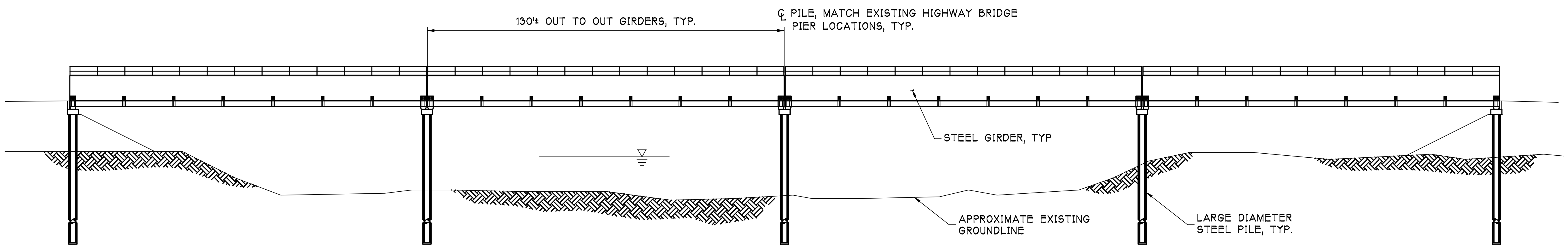
THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

Date: NOV. 2000
Scale: NOTED

GEIST ROAD HWY. BRIDGE STA. "A" 183+28

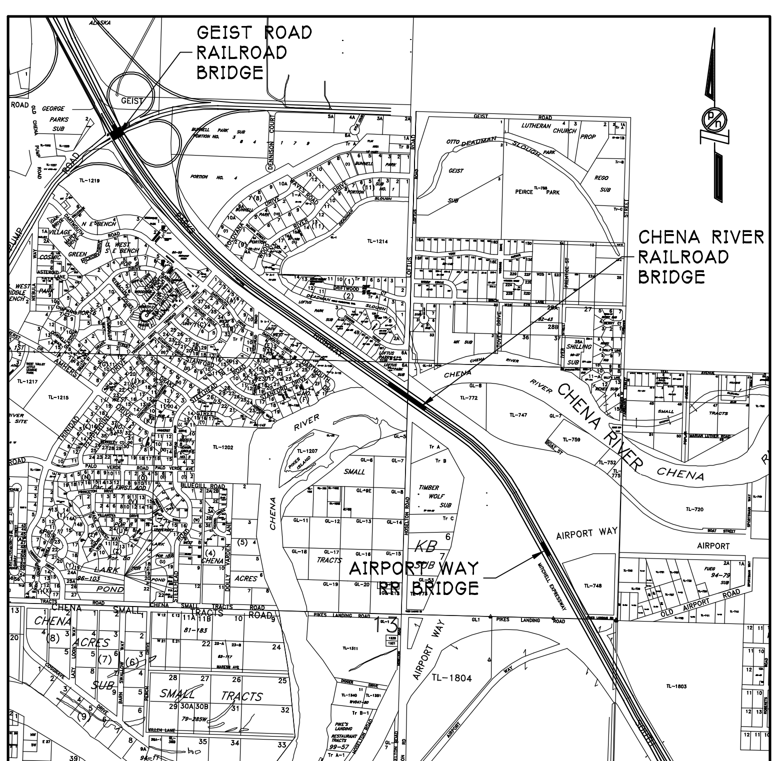
Figure B3

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\CROSSING No 2B.dwg
10-30-00



ELEVATION

0 5 10 20 40 60 FT.



Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\CROSSING No 3.dwg
10-30-00

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465

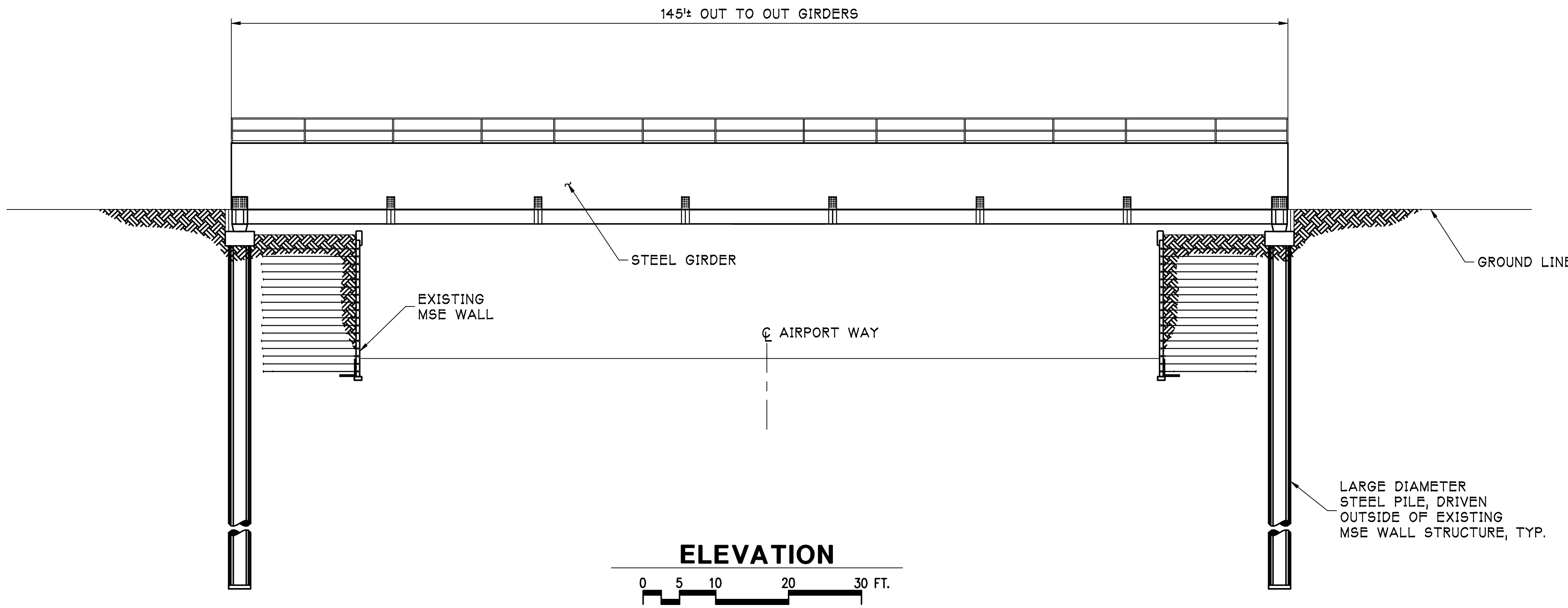
Date: NOV. 2000
Scale: NOTED

FAIRBANKS BYPASS REALIGNMENT STUDY

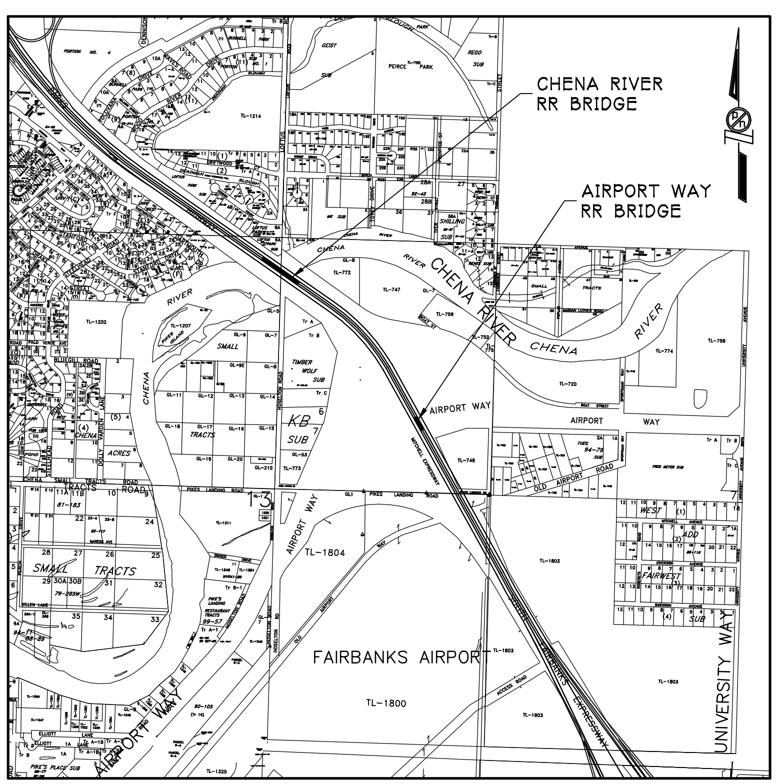
THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

CHENA RIVER RR BRIDGE
STA. "PH" 395+18 TO 400+39

Figure
B4



ELEVATION



Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\CROSSING No 4.dwg
10-30-00

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

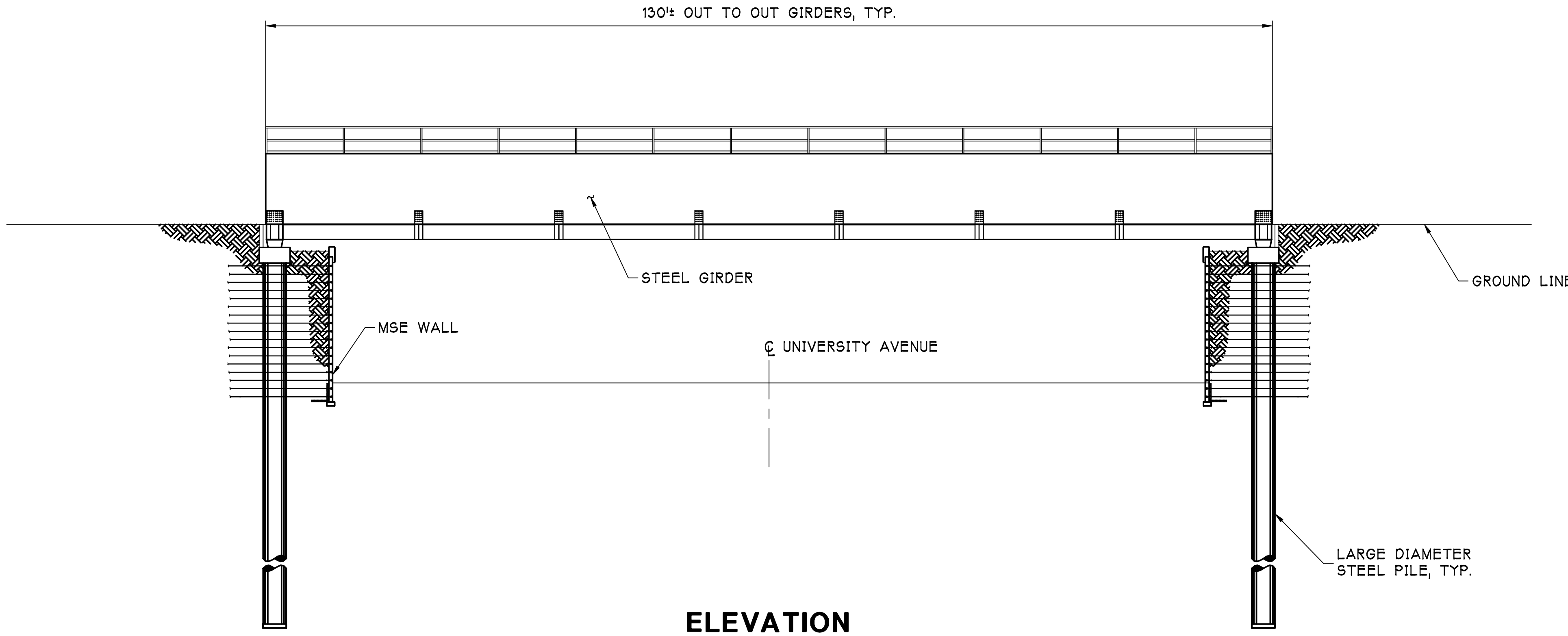
Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465
Date: NOV. 2000
Scale: NOTED

FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

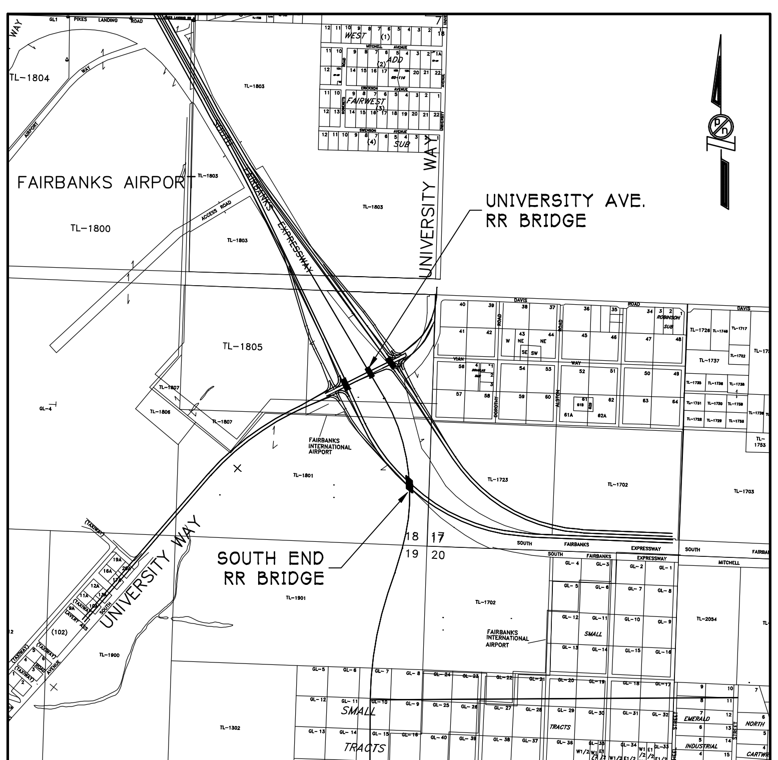
AIRPORT WAY RR BRIDGE
STA. "PH" 419+73

Figure
B5



ELEVATION

0 5 10 20 30 FT.



Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\CROSSING No 5B.dwg
12-03-00

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

FAIRBANKS BYPASS REALIGNMENT STUDY

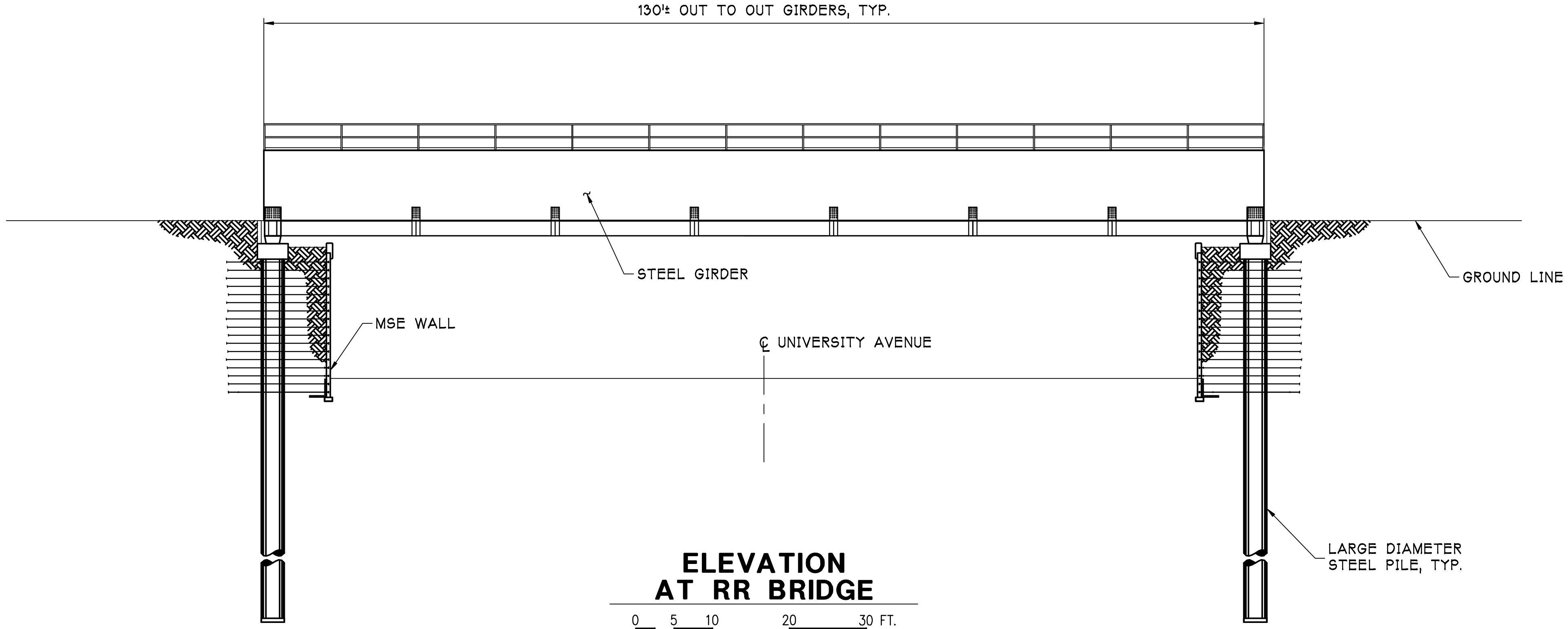
Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

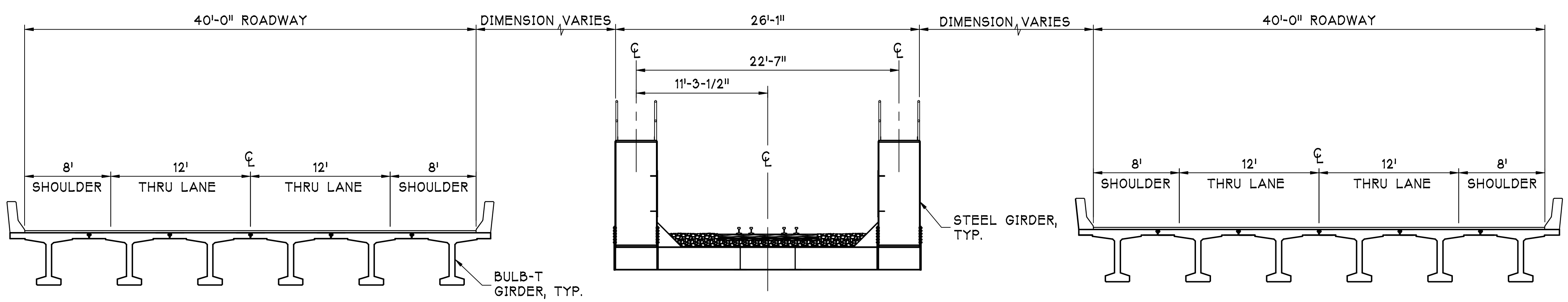
Date: NOV. 2000
Scale: NOTED

UNIVERSITY AVE. RR BRIDGE STA. "PH" 473+00

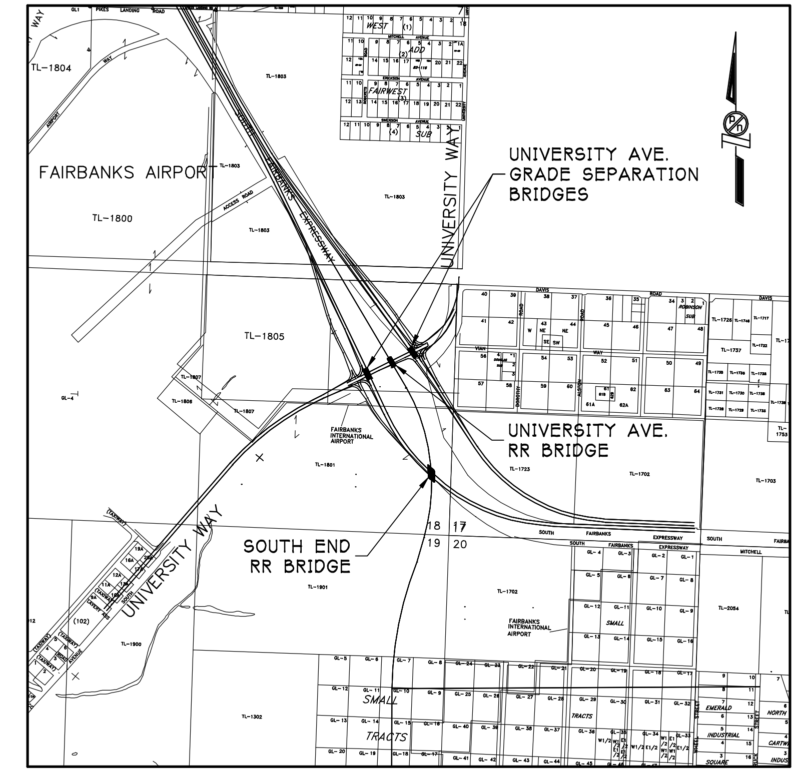
Figure **B6**



ELEVATION AT RR BRIDGE



TYPICAL SECTION AT MIDSPAN



Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\CROSSING No 5A.dwg
12-03-2000

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

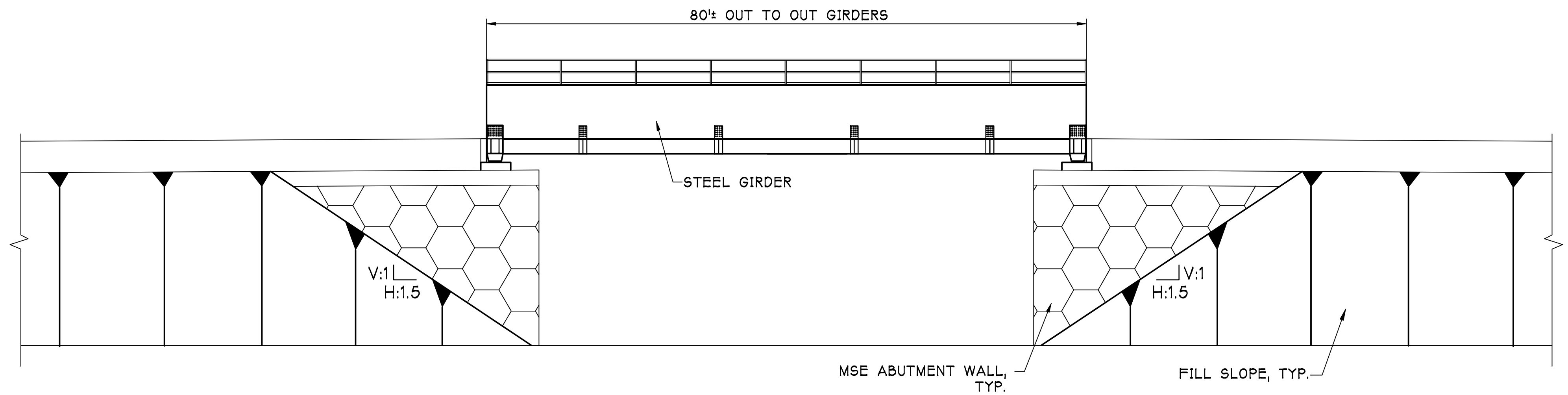
Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465
Date: NOV. 2000
Scale: NOTED

FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

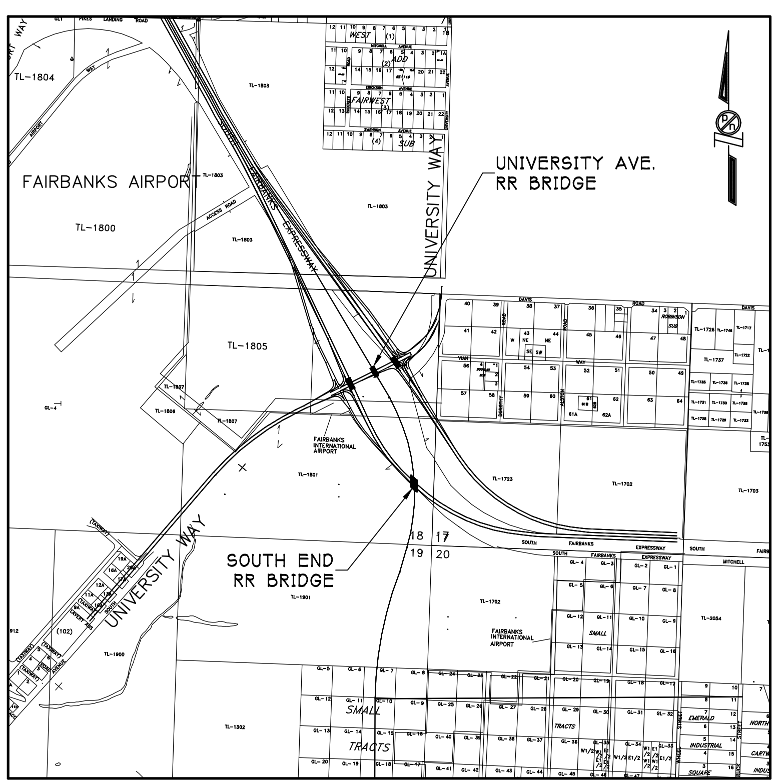
UNIVERSITY AVE. GRADE SEPARATION - STA. "PH" 473+00

Figure **B7**



ELEVATION

0 5 10 20 30 FT.



Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465

Date: NOV. 2000
Scale: NOTED

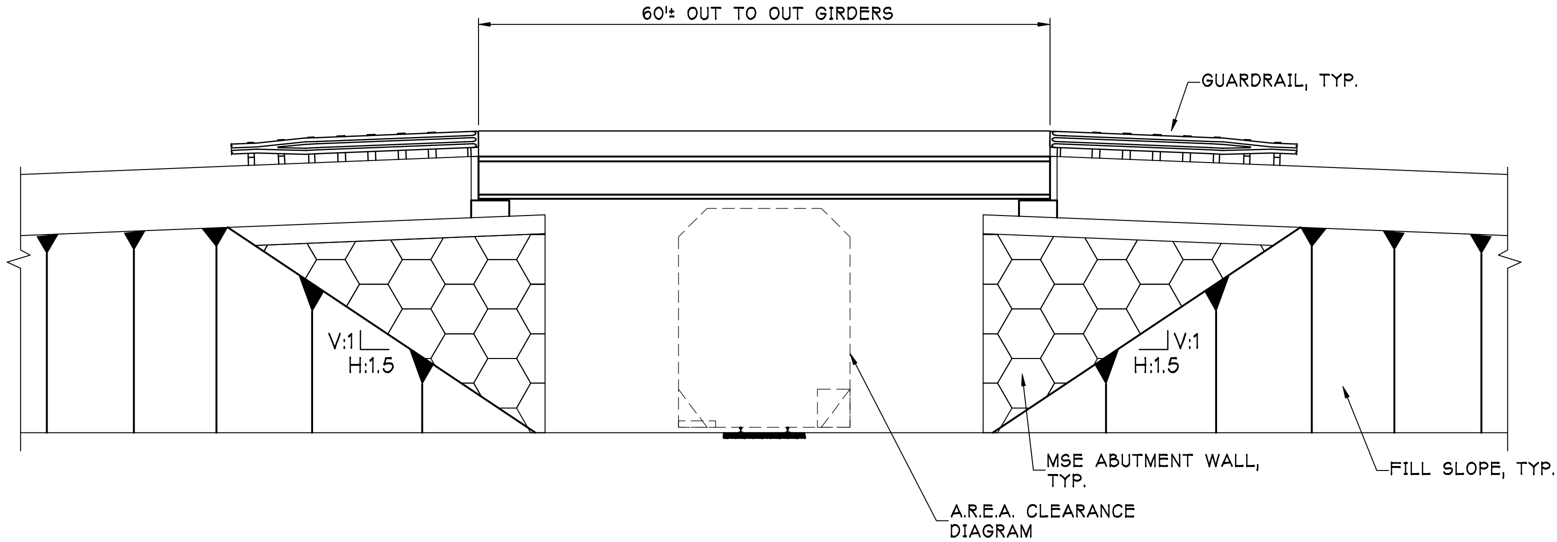
FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

SOUTH END RR BRIDGE
STA. "PH" 484+90

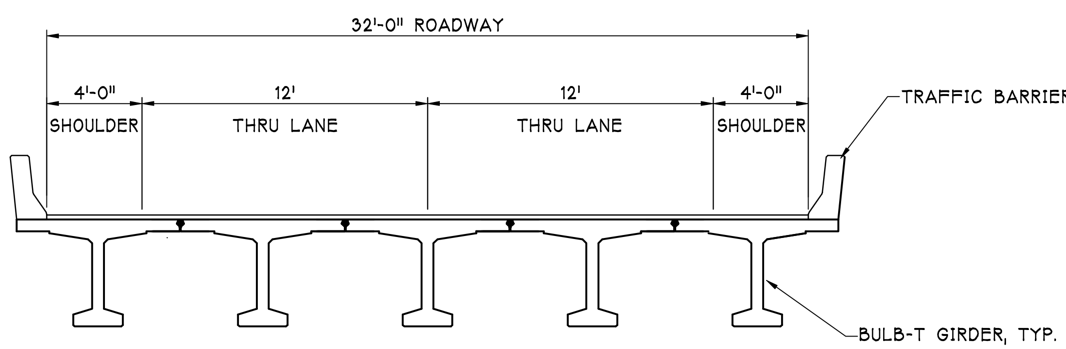
Figure
B8

LAST SAVED: \\Server\active\Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\CROSSING No 6.dwg 12/05/00 AT 10:40
12-03-00

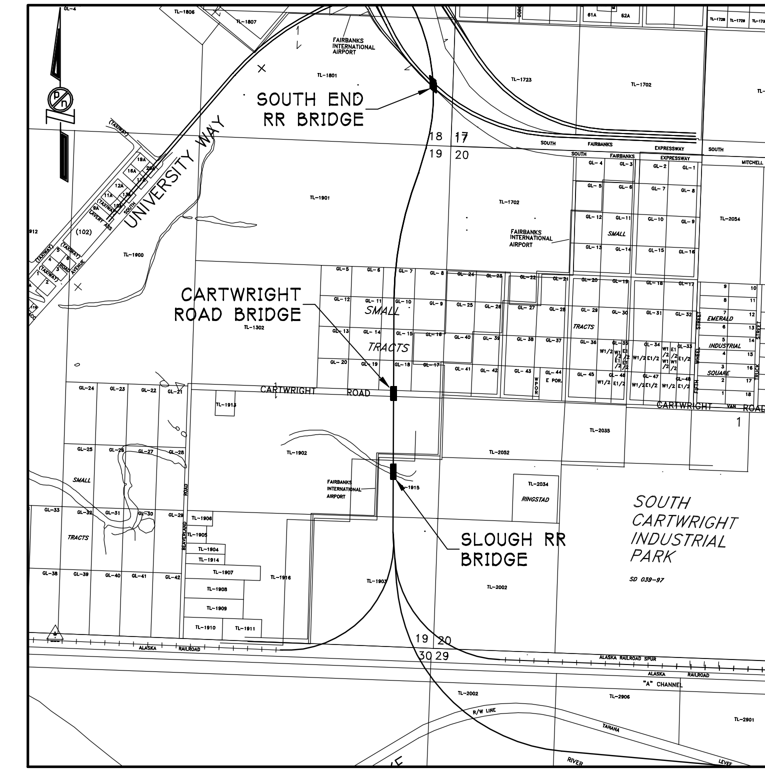


ELEVATION

0 5 10 20 30 FT.



TYPICAL BRIDGE SECTION AT MIDSPAN



FAIRBANKS BYPASS REALIGNMENT STUDY

Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465

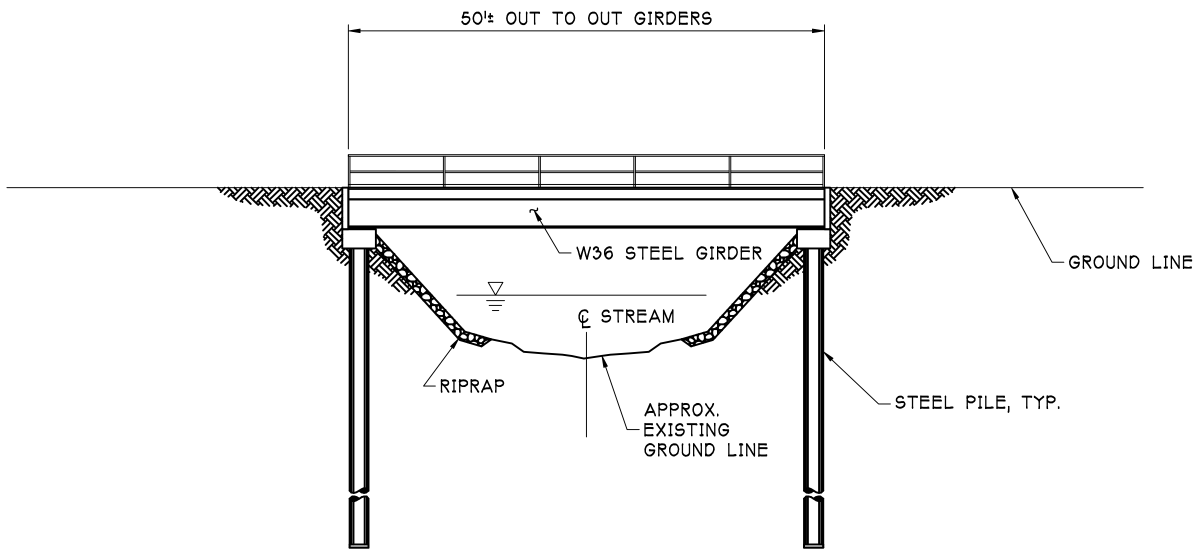
THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

Date: NOV. 2000
Scale: NOTED

CARTWRIGHT ROAD BRIDGE STA. "PH" 514+34

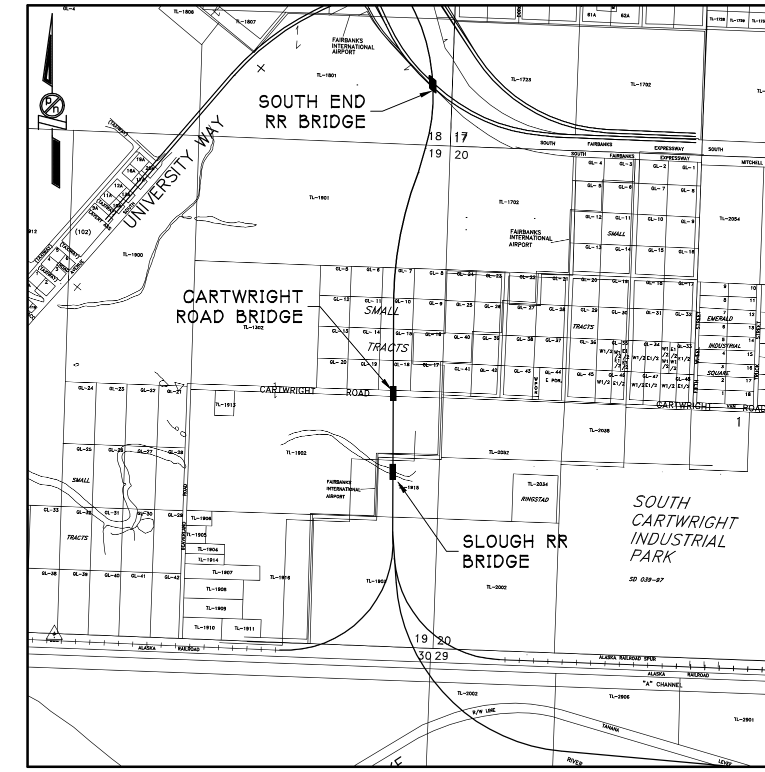
Figure B9

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\CROSSING No 7.dwg
PLOT 1:1 F.S. 12-03-2000



ELEVATION

0 5 10 20 30 FT.



FAIRBANKS BYPASS REALIGNMENT STUDY

Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465

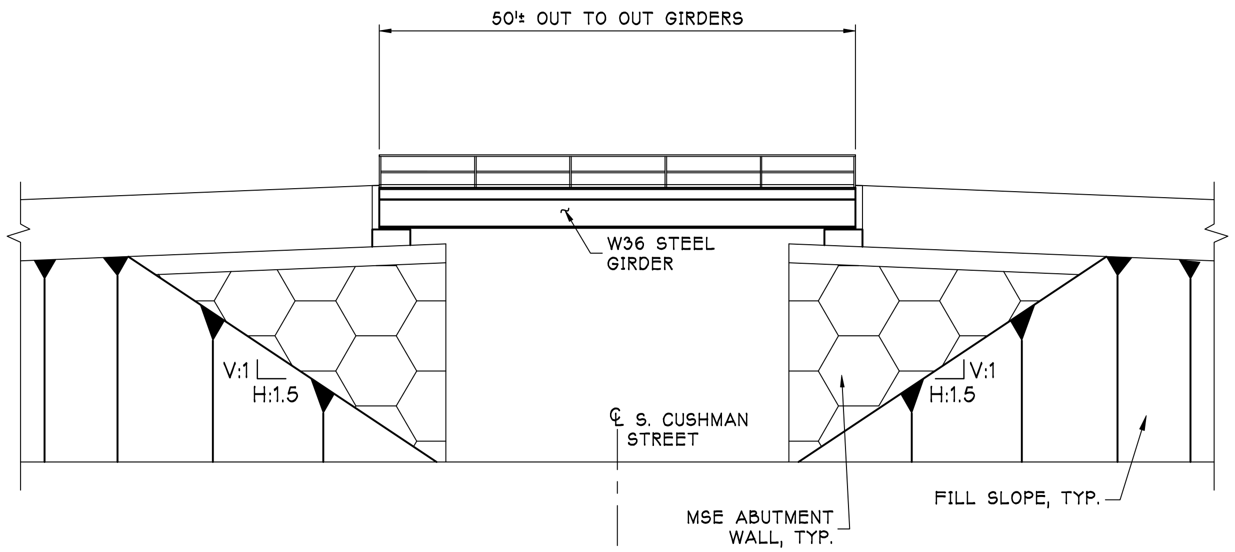
THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

Date: NOV. 2000
Scale: NOTED

SLOUGH CROSSING RR BRIDGE STA. "PH" 522+90

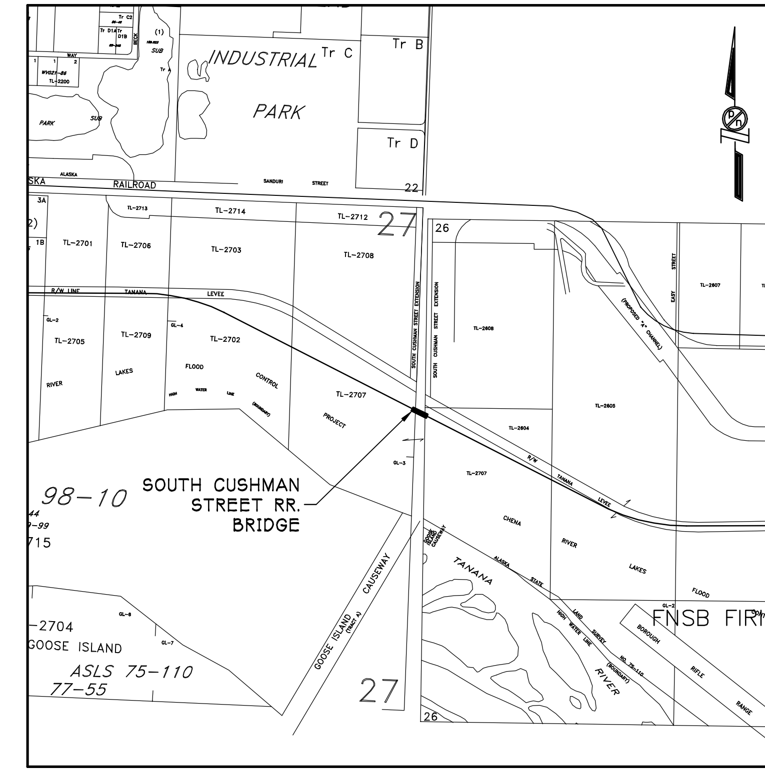
Figure
B10

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\CROSSING No 8.dwg
12-03-00



ELEVATION

0 5 10 20 30 FT.



FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

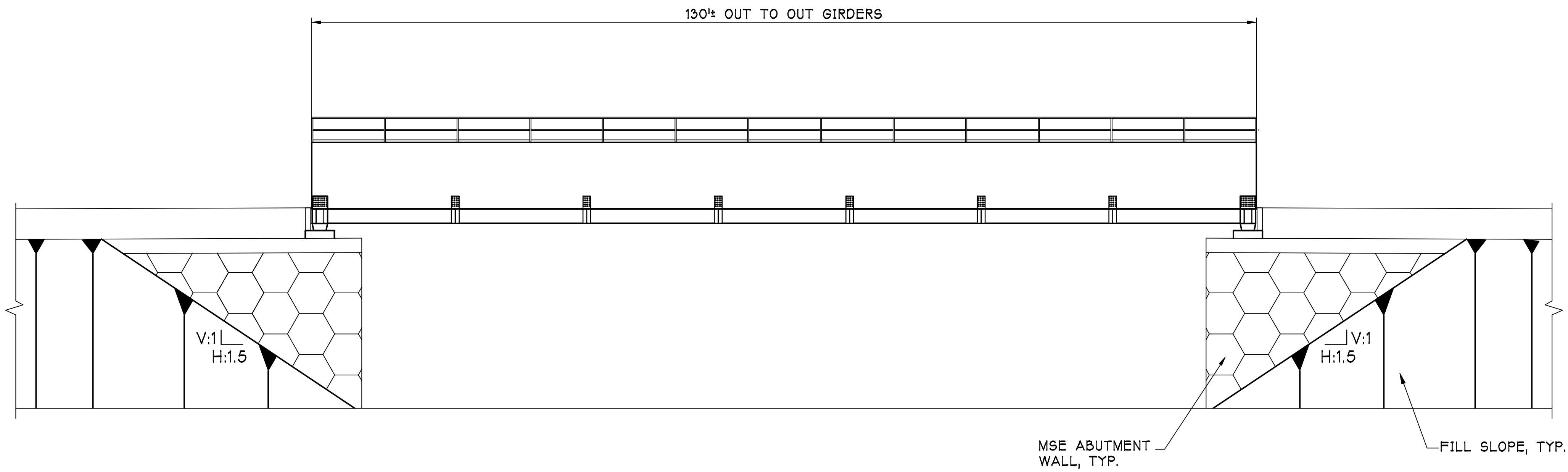
Designed: ________
Drawn: TWB
Checked: ________
Project No.: 00465
Date: NOV. 2000
Scale: NOTED

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

S. CUSHMAN ST. RR BRIDGE

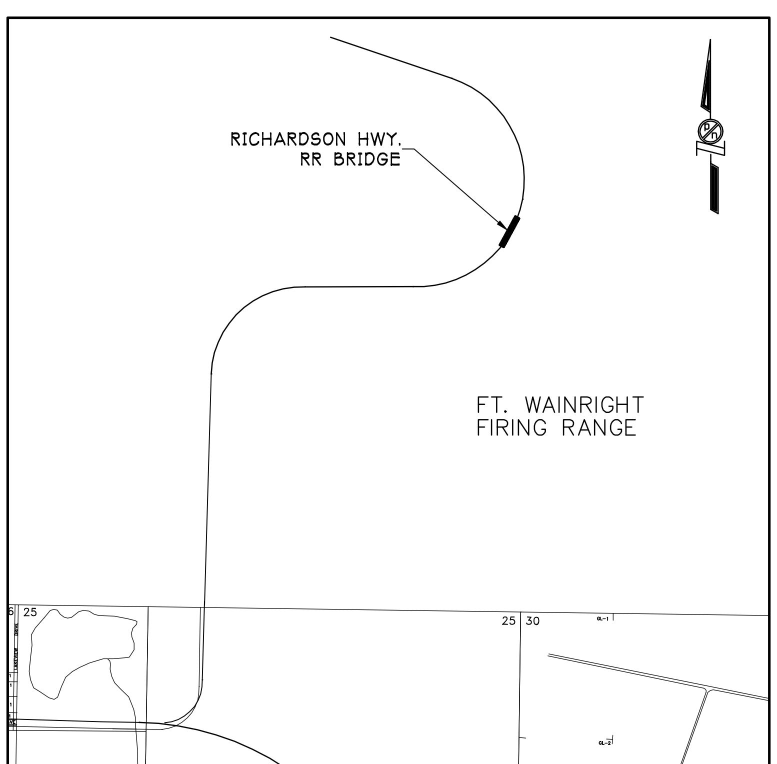
Figure B11

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\CROSSING No 9.dwg
12-03-00



ELEVATION

0 5 10 20 30 FT.



Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed:	TN/TWB
Drawn:	TWB
Checked:	
Project No.:	00465
Date:	NOV. 2000
Scale:	NOTED

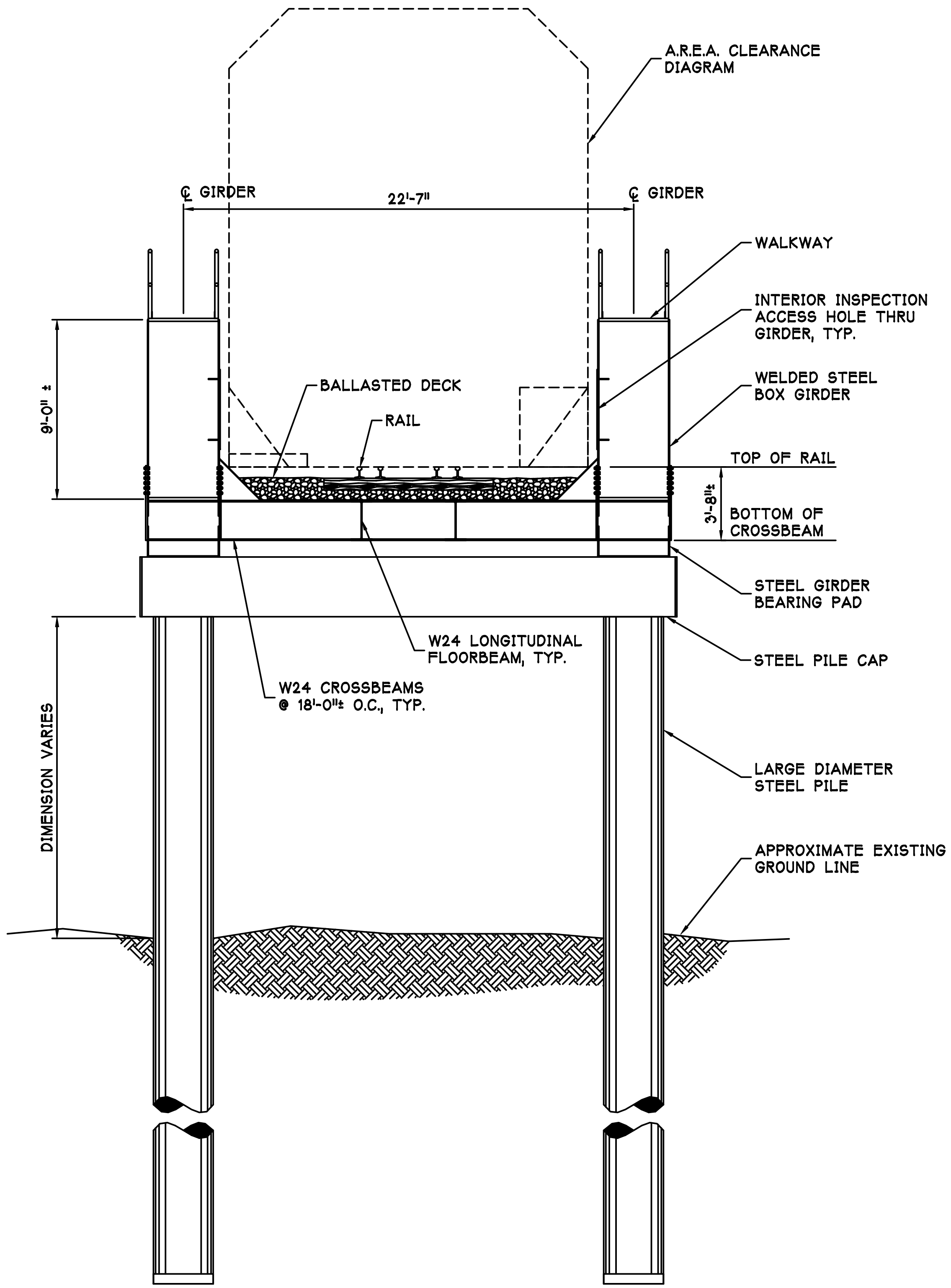
FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

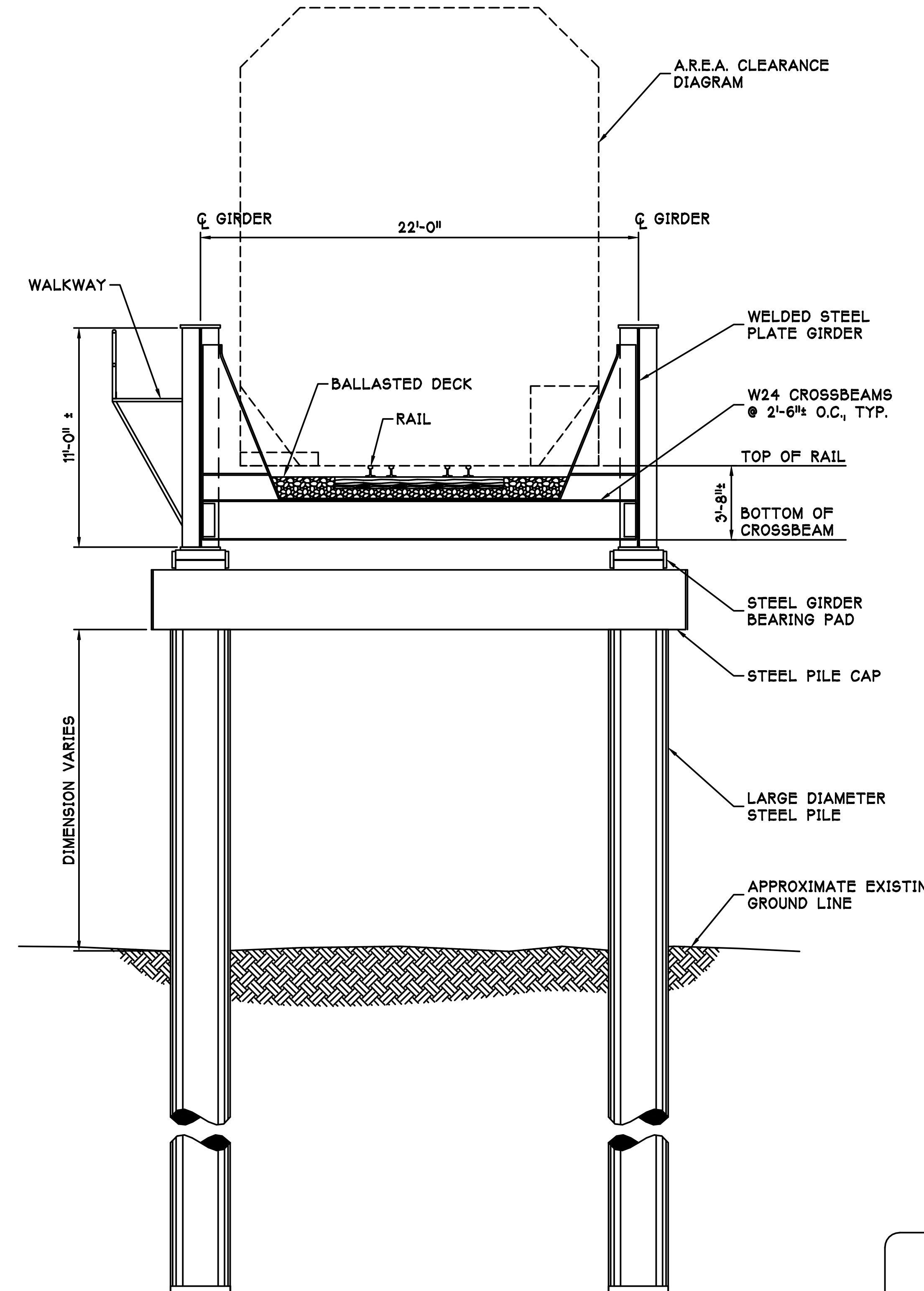
RICHARDSON HWY. RR BRIDGE

Figure **B12**

Active Drawing Files\2000\00465-Alaska Railroad Realignment\ Preliminary Drawings\DEC 2000\CROSSING No 10.dwg
12-03-00



STEEL BOX GIRDER BRIDGE
TYPICAL SECTION AT PIER



STEEL PLATE GIRDER BRIDGE
TYPICAL SECTION AT PIER

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\00465-02.dwg
12-03-00

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465

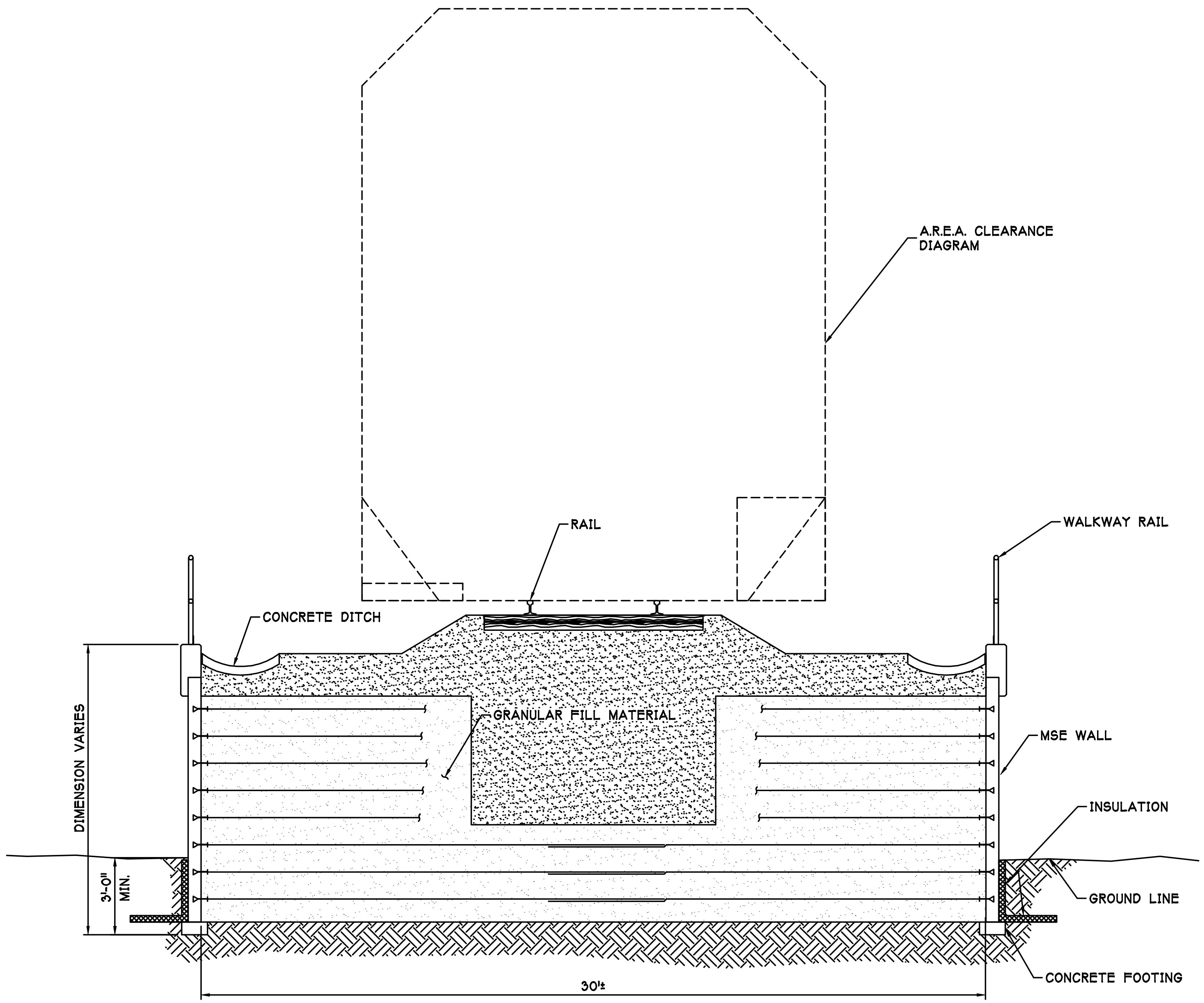
Date: NOV. 2000
Scale: NOTED

FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

BRIDGE OPTION SECTIONS

Figure
B13



MSE RETAINING WALL TYPICAL SECTION

Peratrovich, Nottingham & Drage, Inc. (PN&D) is not responsible for safety programs, methods, procedures of operation, or the construction of the design shown on these drawings. Drawings are for use on this project only and are not intended for reuse without written approval from PN&D. Drawings are also not to be used in any manner that would constitute a detriment directly or indirectly to PN&D.

Designed: TN/TWB
Drawn: TWB
Checked:
Project No.: 00465
Date: NOV. 2000
Scale: NOTED

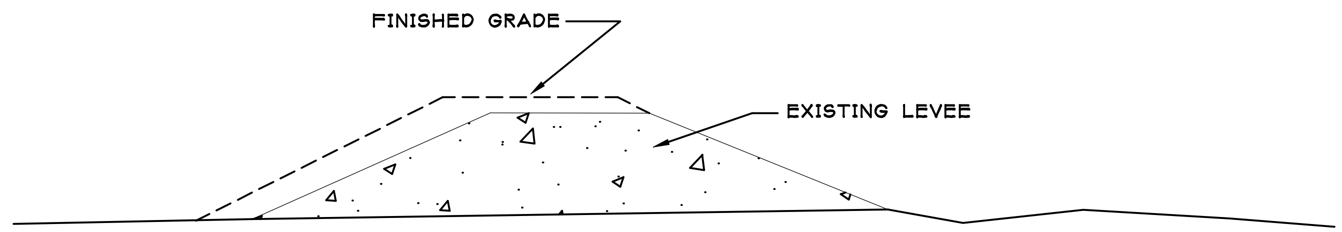
FAIRBANKS BYPASS REALIGNMENT STUDY

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

MEDIAN SECTION

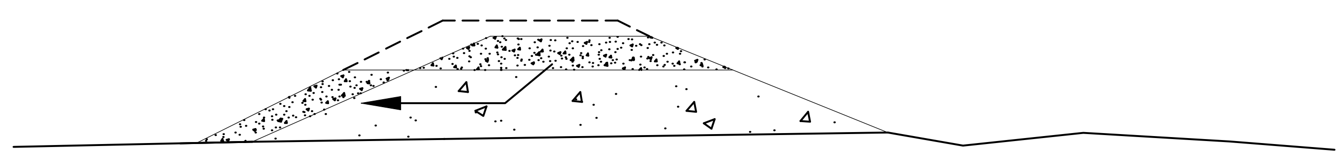
Figure B14

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\00465-01.dwg
12-03-00

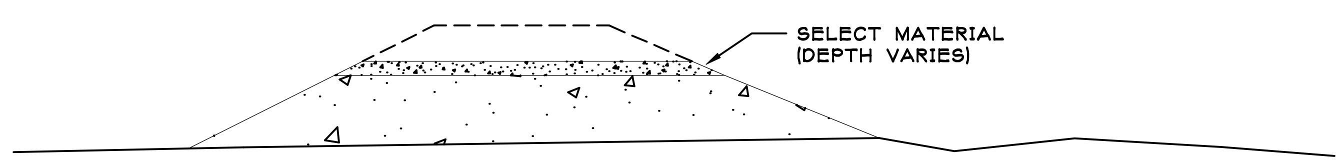


1

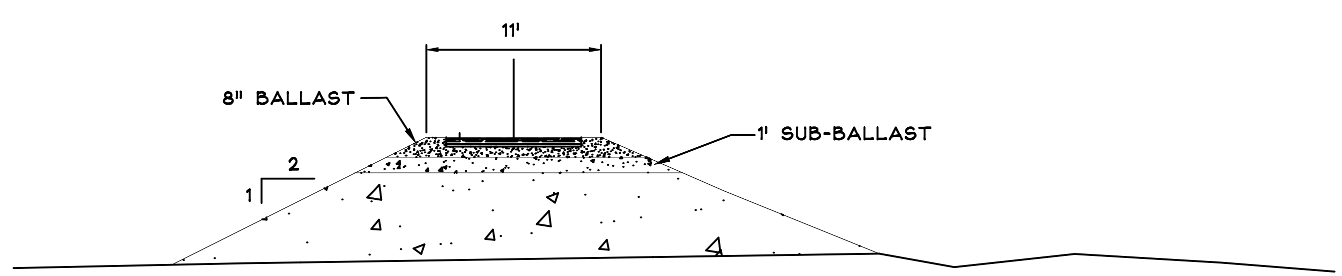
NOTE: THE EXISTING LEVEE VARIES IN HEIGHT FROM 5 FEET TO 15 FEET AND FROM 9 FEET TO 12 FEET IN WIDTH



2 WIDEN BASE

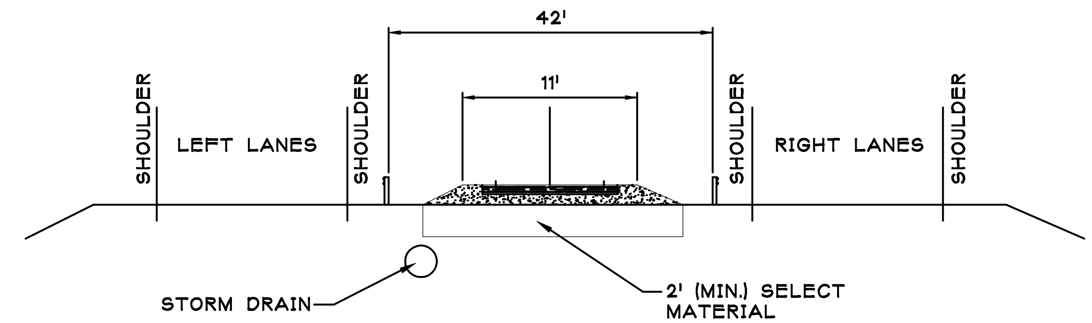


3 ADD SELECT MATERIAL TO SUBGRADE

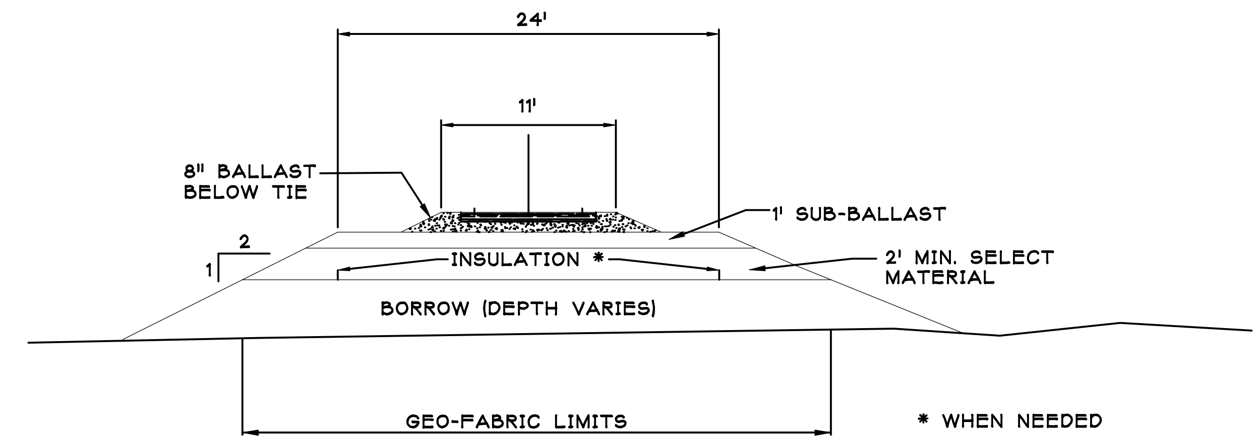


4 ADD TRACK

RAILROAD CONSTRUCTION SEQUENCING ON LEVEE



TYPICAL SECTION MEDIAN (AT GRADE)



TYPICAL SECTION OVER NATURAL GROUND

FAIRBANKS BYPASS REALIGNMENT STUDY

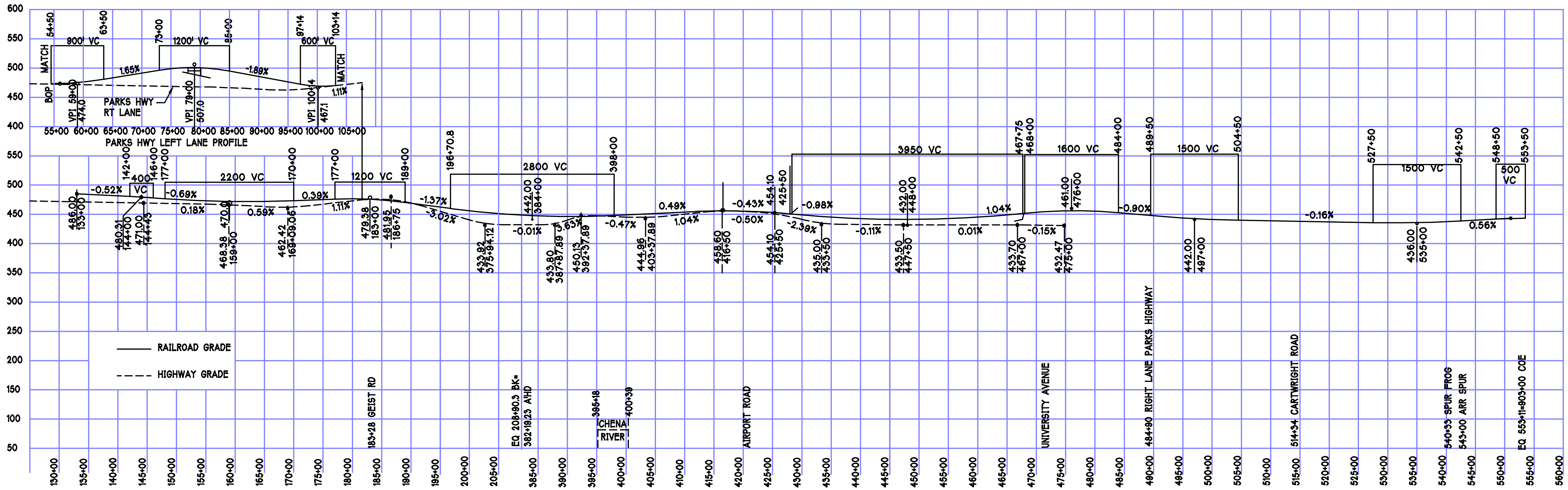
Designed:	BT/MH
Drawn:	ALR
Checked:	
Project No.:	00465.00
Date:	NOV. 2000
Scale:	NOTED

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

CONSTRUCTION SEQUENCING/SECTIONS

Figure C1

Active Drawing Files\2000\00465-Alaska Railroad Realignment\00465-C1.dwg
11-06-00



RAILROAD PROFILE BEGINNING OF PROJECT TO CORPS OF ENGINEERS LEVEE

PROFILE

0 500 1000 2000 3000 FT.

FAIRBANKS BYPASS REALIGNMENT STUDY

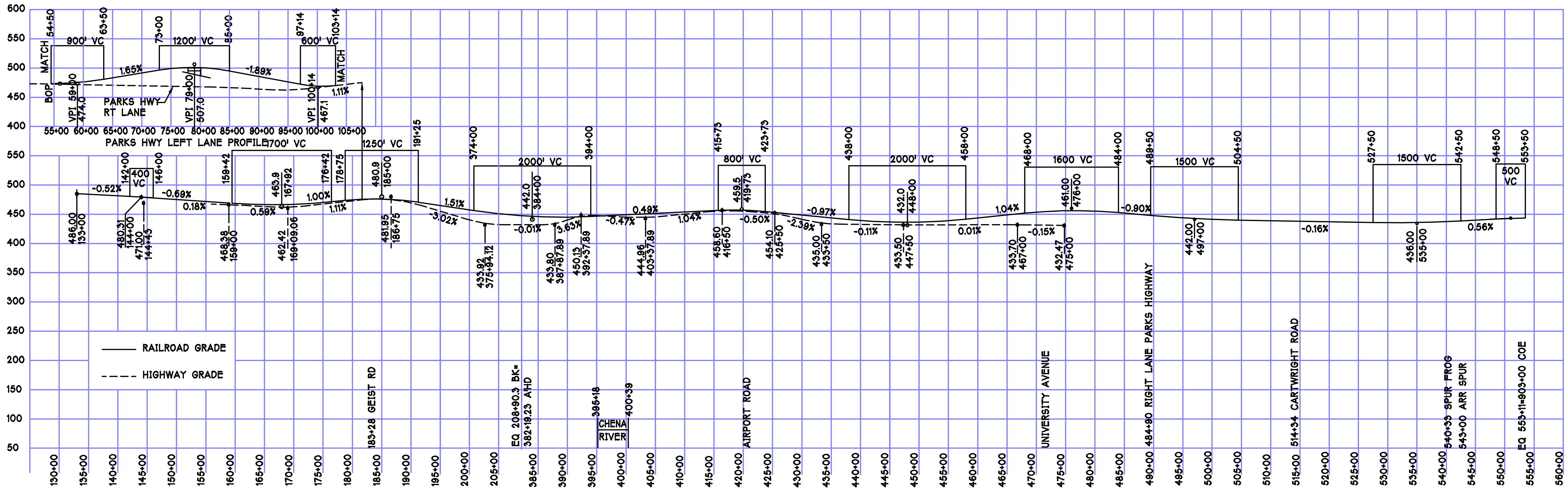
THOMAS ENGINEERING
Engineers Surveyors Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

Designed:	BT/MH
Drawn:	ALR
Checked:	
Project No.:	00465.00
Date:	NOV. 2000
Scale:	NOTED

CONCEPT 1 MAIN LINE STANDARD RAIL

Figure P1

Active Drawing Files\2000\00465-Alaska Railroad Realignment\00465-P1.dwg
10-30-00



RAILROAD PROFILE BEGINNING OF PROJECT TO CORPS OF ENGINEERS LEVEE

PROFILE

0 500 1000 2000 3000 FT.

FAIRBANKS BYPASS REALIGNMENT STUDY

Designed: BT/MH
Drawn: ALR
Checked:
Project No.: 00465.00

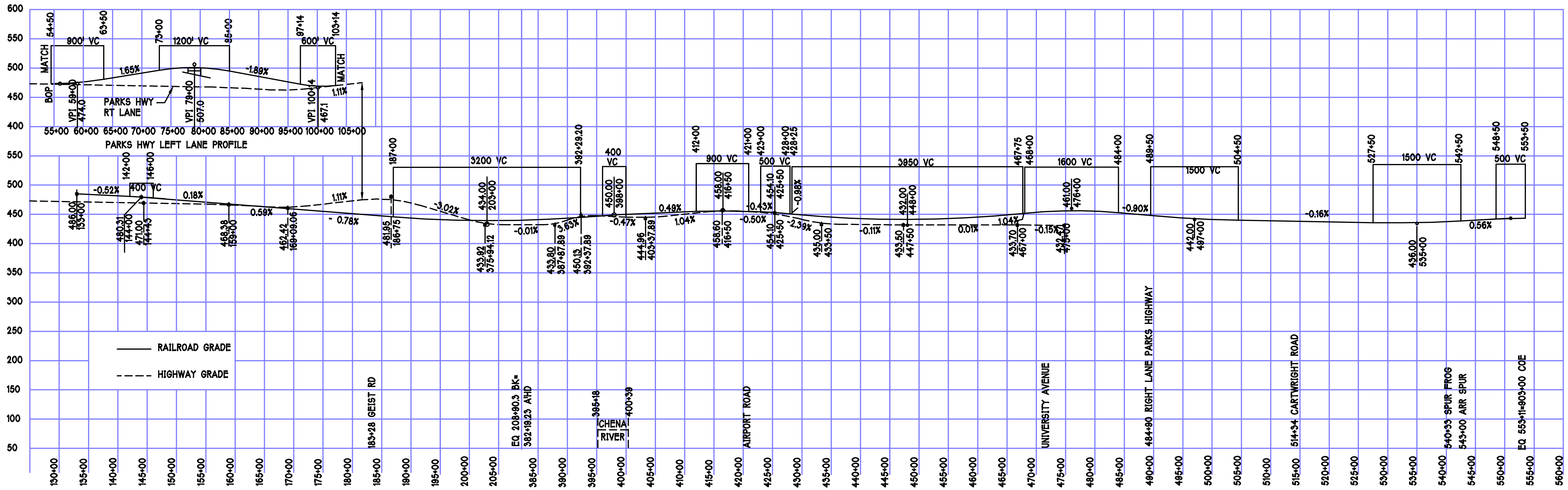
THOMAS ENGINEERING
Engineers Surveyors Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

Date: NOV. 2000
Scale: NOTED

CONCEPT 2 - MAINLINE SECONDARY STANDARD RAIL

Figure P2

Active Drawing Files\2000\00465-Alaska Railroad Realignment\00465-P2.dwg
10-30-00



RAILROAD PROFILE BEGINNING OF PROJECT TO CORPS OF ENGINEERS LEVEE

PROFILE

FAIRBANKS BYPASS REALIGNMENT STUDY

Designed: BT/MH
Drawn: ALR
Checked:
Project No.: 00465.00

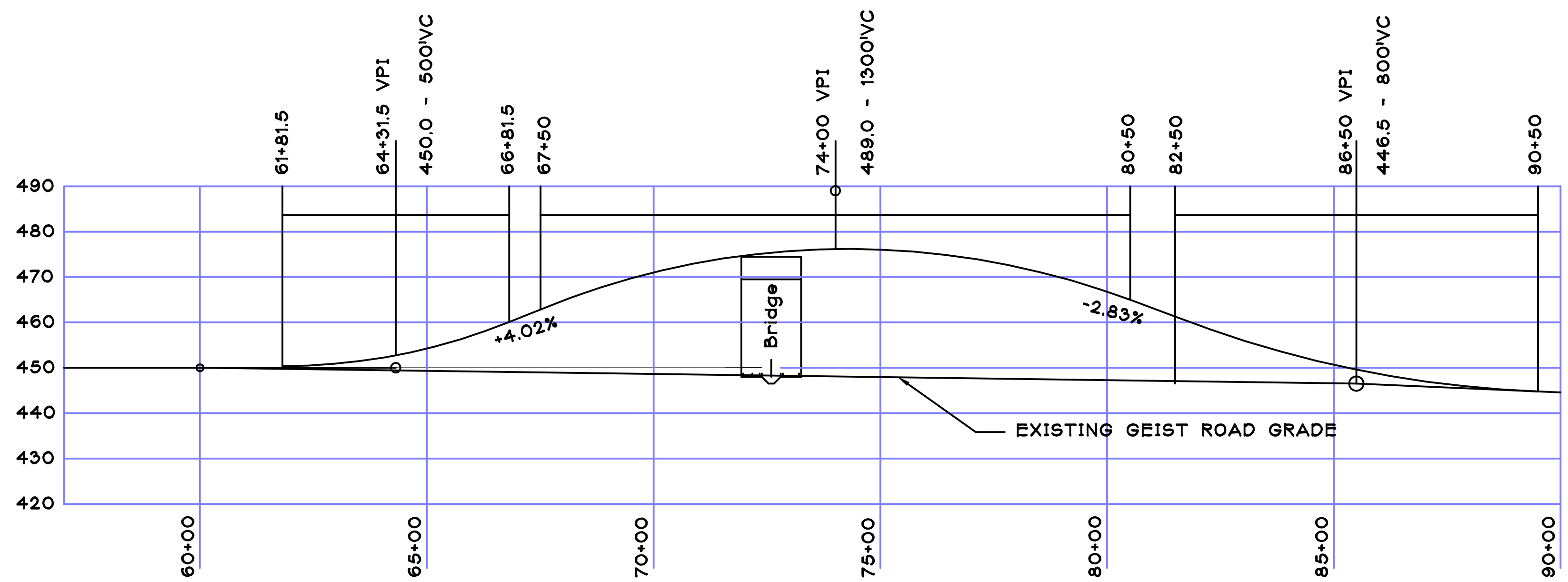
THOMAS ENGINEERING
Engineers Surveyors Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

Date: NOV. 2000
Scale: NOTED

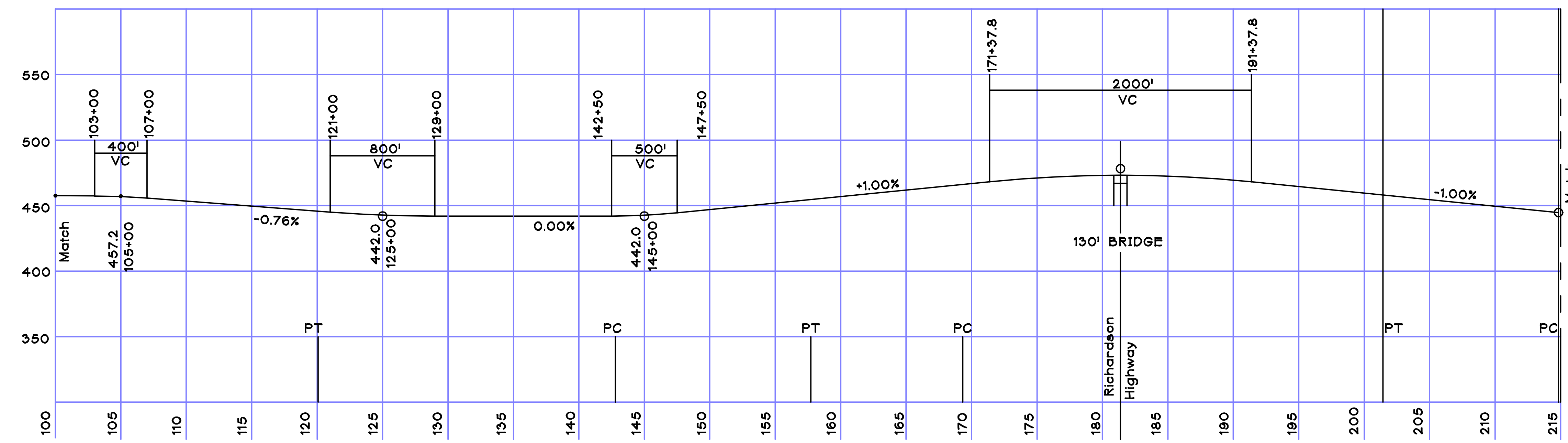
CONCEPT 3 GEIST RD GRADE SEPARATOR

Figure P3

Active Drawing Files\2000\00465-Alaska Railroad Realignment\00465-P3.dwg
10-30-00



GEIST ROAD PROFILE



FORT WAINWRIGHT SPUR LINE PROFILE

FAIRBANKS BYPASS REALIGNMENT STUDY

Designed: BT/MH
Drawn: ALR
Checked:
Project No.: 00465.00

THOMAS ENGINEERING
Engineers • Surveyors • Planners
In Conjunction With
Peratrovich, Nottingham & Drage, Inc.
Engineering Consultants

Date: NOV. 2000
Scale: NOTED

GEIST OVERPASS & FORT WAINWRIGHT SPUR LINE

Figure P4

Active Drawing Files\2000\00465-Alaska Railroad Realignment\Preliminary Drawings\DEC 2000\00465-P4.dwg
12-03-00

APPENDIX 1 – ELIMINATED RAILROAD – ROADWAY CROSSINGS

RR No.	Street Name	Auto	Xing		RR No.	Street Name	Auto	Xing
G-1	College Road		1		G-10	Public Road	1	
	Old Steese Highway		1			Public Road	1	
	Bike Crossing	1			G-11	Private Road	1	
	New Steese Highway		1		G-12	Private Road	1	
G-2	C Street	1			G-13	Private Road	1	
	D Street	1			G-14	Private Road	1	
	E Street	1				Private Road	1	
	F Street		1			Richardson Hwy		1
G-3	Fregree Road	1			G-15	Private Road	1	
	Trainor Gate Road	1				Public Road	1	
	Military Road	1				Private road	1	
	Military Road	1			G-16	5th Avenue		1
	Military Road	1				Bike Crossing	1	
G-4	Gaffney Road	1				8th Avenue	1	
	Whidden Road	1				Public Road	1	
	Montgomery Road	1			G-17	Military Pipeline	1	
G-5	Neeley Road	1				Laurance Road		1
	Alder Road	1				Public Road	1	
G-6	Military Road	1			G-18	Public Road	1	
G-7	Military Road	1			G-19	Dyke Road	1	
G-8	Badger Road		1				39	8
	Private Road	1						
	Private Road	1						
	Public Road	1			Wainwright Spur	Richardson Hwy.		1
G-9	Public Road	1						
	Bradway Road	1						
	Public Road	1						

APPENDIX 2 - ESTIMATED COST SPREADSHEET
FAIRBANKS BYPASS REALIGNMENT RECONNAISSANCE

ARRC - DEC 13, 2000		CONCEPT 1			ADJUST FOR CONCEPT 2			ADJUST FOR CONCEPT 3			ADJUST FOR CONCEPT 4			ADJUST FOR PARKS/UNIVERSITY			WAINWRIGHT SPUR			NORTH POLE REFINERY		
ITEM	**UNIT**	**QUANTITY**	**UNIT COST**	**TOTAL**	**QUANTITY**	**U. COST**	**TOTAL**	**QUANTITY**	**U. COST**	**TOTAL**	**QUANTITY**	**U. COST**	**TOTAL**	**QUANTITY**	**U.COST**	**TOTAL**	**QUANTITY**	**U. COST**	**TOTAL**	**QUANTITY**	**U. COST**	**TOTAL**
Clearing & Grubbing	Acre	75	1500	$112,500																		
Removal of Structures	Lump Sum	1	50000	$50,000				1	250000	$250,000	1	50000	$50,000									
Spread Existing Roadway	Station										22	500	$11,000									
Excavation	CY	365000	3	$1,095,000				471800	3	$1,415,400	1500	3	$4,500				1	150000	$150,000			
Borrow	Ton	1044000	3.5	$3,654,000	-50000	3.5	-$175,000	607000	3.5	$2,124,500	447300	3.5	$1,565,550	757800	3.5	$2,652,300	183000	3.5	$640,500	48700	3.5	$170,450
Select Material	Ton	380200	5	$1,901,000				133400	5	$667,000	124000	5	$620,000	48600	5	$243,000	18200	5	$91,000			
Base Course	Ton	28500	10	$285,000				29300	10	$293,000	11300	10	$113,000	10260	10	$102,600						
Pavement	Ton	19000	23	$437,000				21900	23	$503,700	6400	23	$147,200	7560	23	$173,880						
Asphalt Cement	ton	1160	215	$249,400				1340	215	$288,100	390	215	$83,850	460	215	$98,900						
Prime Coat	Ton	110	375	$41,250				127	375	$47,625	37	375	$13,875	45	375	$16,875						
Culverts	LF	3600	50	$180,000							1000	50	$50,000									
Storm Drain System	LF	15500	60	$930,000										-15500	60	-$930,000						
Guard Rail	LF	30000	15	$450,000							5300	15	$79,500									
Fence	LF	86000	12	$1,032,000							5000	12	$60,000									
Noise Abatement	Lump Sum	1	75000	$75,000							1	75000	$75,000									
Signs	Sq Ft	4000	45	$180,000							1000	45	$45,000									
Seeding/Landscaping	Lump Sum	1	100000	$100,000							1	50000	$50,000									
Soil Stabilization	Lump Sum	1	75000	$75,000							1	25000	$25,000									
Geotextile	Sq Yd	277000	1	$277,000																		
Insulation	Sq Ft	1600000	2	$3,200,000																		
Mob/Demob	Lump Sum	1	500000	$500,000																		
Erosion/Sediment Control	Lump Sum	1	10000	$10,000																		
Construction Survey	Lump Sum	1	200000	$200,000							1	50000	$50,000									
Traffic Control	Lump Sum	1	350000	$350,000							1	50000	$50,000									
Contractor Services	Lump Sum	1	50000	$50,000																		
Signals	Lump Sum	1	300000	$300,000										-1	300000	-$300,000						
Lighting	Lump Sum	1	150000	$150,000							1	75000	$75,000									
Traffic Markings	Lump Sum	1	25000	$25,000							1	25000	$25,000									
MSE Walls (retaining)	Sq Ft	249700	35	$8,739,500	-168700	35	-$5,904,500	-117000	35	-$4,095,000	-65000	35	-$2,275,000									
2-1.5 Way Duct Bank	LF	111700	7	$781,900																		
Ballast	Ton	85500	40	$3,420,000													7100	40	$284,000	9500	40	$380,000
Sub-Ballast	Ton	207000	10	$2,070,000													17100	10	$171,000	23040	10	$230,400
Hardwood Ties	Each	68700	100	$6,870,000													5900	100	$590,000	7800	100	$780,000
115 Lb Rail	LF	230500	30	$6,915,000													15000	30	$450,000	25500	30	$765,000
Switches	Each	10	50000	$500,000													2	50000	$100,000	5	50000	$250,000
Track Removal	Lump Sum	1	500000	$500,000	0	2200	$0	0	2200	$0												
Recreational Trail	Station	800	250	$200,000																		
Military Range Embankment	Ton	600000	2.25	$1,350,000																		
Bridges																						
At-grade Tank Crossing	Lump Sum	1	100000	$100,000																		
North-bound Parks Hwy/RR	Lump Sum	1	1200000	$1,200,000																		
RR/Geist	Lump Sum	1	600000	$600,000				-1	600000	-$600,000												
RR/Chena River	Lump Sum	1	2700000	$2,700,000																		
RR/Airport Rd	Lump Sum	1	700000	$700,000																		
RR/University Ave	Lump Sum	1	600000	$600,000																		
RR/South-bound Parks Hwy	Lump Sum	1	400000	$400,000																		
Cartwright Rd/RR	Lump Sum	1	300000	$300,000																		
RR/Unnamed Slough Bridge	Lump Sum	1	200000	$200,000																		
RR/South Cushman St.	Lump Sum	1	200000	$200,000																		
Access Pipe (16' Pipe Arch)	Each	4	150000	$600,000																		
Geist Rd/Parks Hwy & RR	Lump Sum							1	1100000	$1,100,000												
Parks Hwy/University Ave	Lump Sum													2	650000	$1,300,000						
RR/Richardson Hwy (Spur)	Lump Sum																1	700000	$700,000			
		Sub Total		$54,855,550	Adjustment		-$6,079,500	Adjustment		$1,994,325			$918,475	Adjustment		$3,357,555	Sub Total		$3,176,500			$2,575,850
		+ 20% Contingencies		$10,971,110	+Concept 1 Subtotal		$54,855,550	+Concept 1 Subtotal		$54,855,550	+Concept 1 Subtotal		$54,855,550	+20% Contingencies		$671,511	+ 20% Contingencies		$635,300			$515,170
		+15%Construction Engineering		$9,873,999	**Concept 2 Estimate**		**$48,776,050**	**Concept 3 Estimate**		**$56,849,875**	**Concept 4 Estimate**		**$55,774,025**	+15% Const Eng		$604,360	+15%Construction Engi		$762,360			$618,204
		Total - Concept 1		**$75,700,659**	+20% Contingencies		$9,755,210	+20% Contingencies		$11,369,975	+20% Contingencies		$11,154,805	**Total Parks/U. Ave**		**$4,633,426**	**Total Wainwright Spur**		**$4,574,160**			**$3,709,224**
					+15% Const Eng		$8,779,689	+15% Const Eng		$10,232,978	+15% Const Eng		$10,039,325	(Add to Concept 1,2, or 3)								
					Total Concept 2		**$67,310,949**	**Total Concept 3**		**$78,452,828**	**Total Concept 4**		**$76,968,155**									
					Estimated Savings		**$8,389,710**	**Est. Added Cost**		**$2,752,169**	**Estimated Added Cost**		**$1,267,496**									

SUMMARY						
	Estimate	**PE**	**ROW**	**Utility**	**Total**	**Millions**
Concept 1	$75,700,659	$3,028,026	$1,000,000	$7,220,000	$86,948,685	$86.9
Concept 2	$67,310,949	$2,692,438	$1,000,000	$7,220,000	$78,223,387	$78.2
Concept 3	$78,452,828	$3,138,113	$1,500,000	$7,220,000	$90,310,941	$90.3
Concept 4	$76,968,155	$3,078,726	$1,000,000	$7,220,000	$88,266,881	$88.3
Option 1	$4,633,426	$463,343			$5,096,768	$5.1
Wainwright Spur	$4,574,160	$457,416			$5,031,576	$5.0
North Pole Refinery	$3,709,224	$370,922			$4,080,146	$4.1

Mile 3, Richardson Highway

South Gate Crossing, Ft. Wainright

Badger Road

Dennis Road


Typical Sign

Mile 12, Richardson Highway

Fifth Avenue, North Pole

8th Avenue, North Pole

Typical Private Driveway Crossing

Note: Photo locations referenced to Vicinity Map on page iii.

PHOTOS – EXISTING MAINLINE