

FAIRBANKS TO NORTH POLE REALIGNMENT PROJECT

PHASING REPORT



PREPARED FOR

ALASKA RAILROAD CORPORATION

PREPARED BY

THOMAS ENGINEERING

IN ASSOCIATION WITH

PERATROVICH, NOTTINGHAM & DRAGE, INC

MARCH 2002

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Background and Purpose

The Alaska Railroad proposes to improve the railroad tracks between Fairbanks and Moose Creek to enhance public safety, convenience, and to improve the railroad’s operational efficiency.

Eielson AFB, Fort Wainwright, and the Williams Refinery, three of Alaska Railroad’s major customers, are located to the east of Fairbanks, and are served via the Eielson Branch Line. One, Williams Refinery, generates two trains each day. The Eielson Spur Line traverses through Fairbanks residential areas, Fort Wainwright, and the community of North Pole, crossing highways, roads, streets, and driveways over 49 times between the Fairbanks train yards and the Williams Refinery. School busses use the crossings 442 times each day during the school year. Regulations require school buses, and trucks hauling material deemed hazardous, to stop at these crossings regardless of whether or not train traffic is present. This in itself creates a hazardous situation during periods of darkness, extreme cold, icy surfaces, and poor visibility conditions. Those vehicles that are not required to stop run the risk of rear-ending vehicles queued behind a school bus or fuel truck in such situations.

The Richardson Highway crossing is especially vulnerable to reduced visibility conditions from fog/ice fog created by the Fort Wainwright power plant cooling ponds.

The Eielson branch contains undesirable alignments through Fort Wainwright, restricting the train speed to 20 mph through that section. The route encounters curves up to approximately 14 degrees and skews across Fort Wainwright’s arterial roadway (Gaffney Road) at an approximate 65-degrees angle. The right of way within the base is only 28 feet wide.

In 2001, the Alaska Rail Road investigated the possibility of rerouting the Eielson Branch to the west of Fairbanks within the median of Parks Highway from the Sheep Creek crossing to the east side of the Fairbanks International Airport (University Avenue); then continuing east until

the route intercepts the Corps of Engineer’s levee. The track would then follow the levee to Moose Creek where it would tie back into the existing track. See Appendix B, Project Overview Map (located in back cover pocket). The concept proved feasible and is estimated to cost ninety million dollars. While the idea gained the endorsement of all local governments, the school district, and the school bus provider, some neighborhoods opposed it.

A supplementary study examined all alternative routings, which resulted in identifying four possible alignment alternatives. Of these, only the Fort Wainwright Alternative C has potential to compare favorably with the Parks Highway routing. However, the others are viable enough to be considered in an environmental document. The four alternatives deemed feasible are shown in Appendix B.

The obvious safety benefits of the bypass project were instrumental in garnering the backing of the affected communities, school district, student transportation providers, and PTA’s. Another community benefit is cleaner air because vehicles will no longer have to queue at busy highway/railroad crossings. Fairbanks suffers from very low inversions during the winter months and air quality is a serious problem. Vehicle queues are a major contributor to the degradation of air quality. Timesavings for motorists is also a significant benefit that accrues to all elements of the community.

Bringing this project to fruition is a community priority. The time frame to resolve conflicts and gain environmental approvals is the main hindrance to timely construction. The significant investment required to construct the project also contributes to construction delays.

For these reasons, the ARRC decided to investigate the possibility of phasing the project so the communities could begin realizing benefits at an early date. The result of the investigation is the subject of this report.

Under Phase 1, the eastern portion of the project would be constructed first. The primary



objective would be to eliminate the proposed crossing at Peridot and Richardson Highway, all crossings within the North Pole community, and as many other crossings as possible.

Under Phase 2, the western portion of the project would be constructed. The preferred alignment would follow the Corps of Engineer's Levee and the Parks Highway median. However, four alternates have been identified, any of which could be selected.

The project includes a siding facility to serve the North Pole Refinery (Williams). The siding consists of approximately 7,800 feet of railroad siding. Project cost is estimated at \$3.9 million.

Phase 1 – Eastern Portion

The proposed project has two logical points where it can be separated and still eliminate railroad crossings within the North Pole Community.

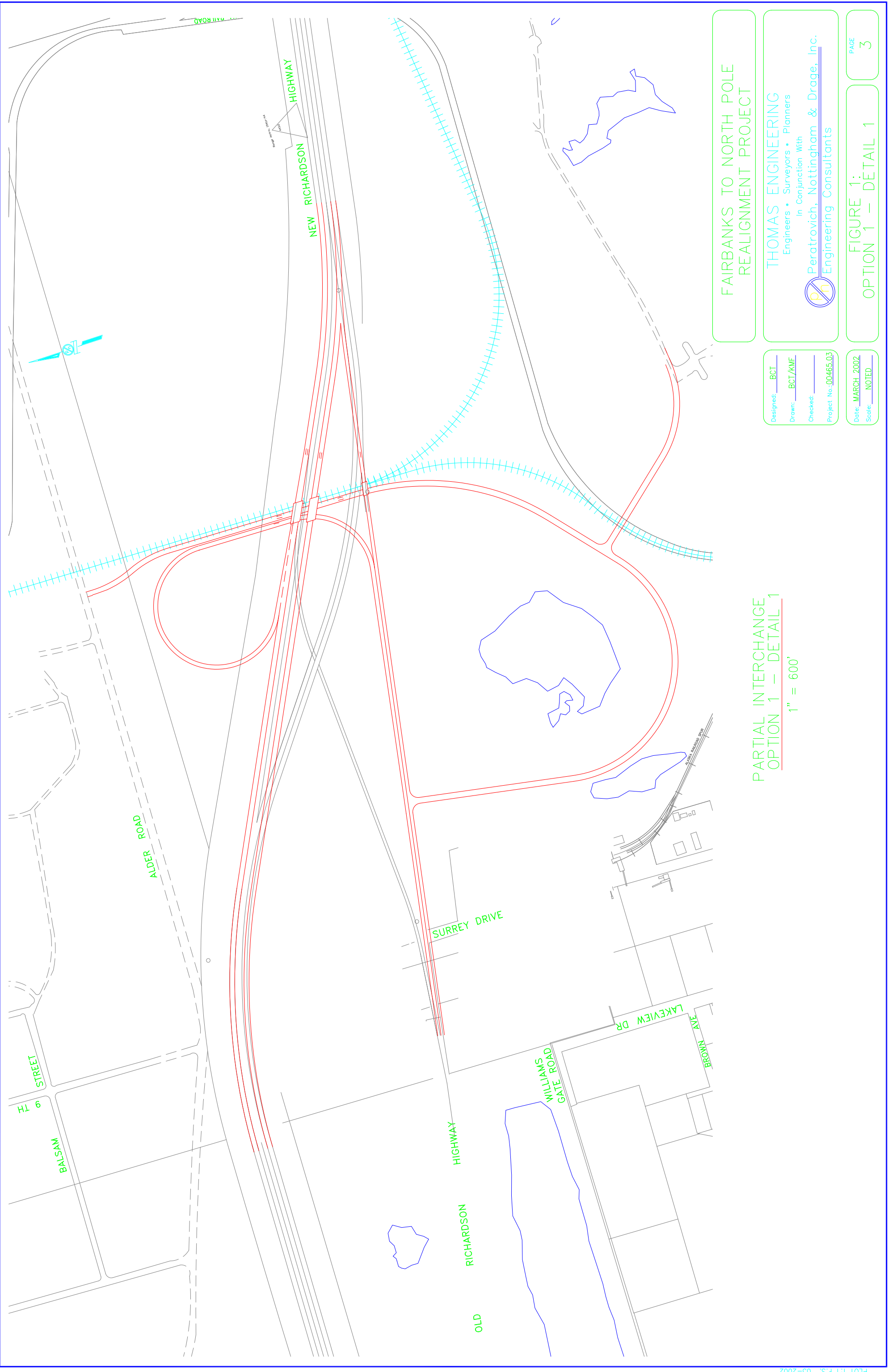
Option 1. The first logical point of beginning is in the vicinity of the ARRC 3-Mile at-grade crossing of the Richardson Highway, MP 359.6, and where the Richardson Highway westbound lane cross the east bound lane to access the Old Richardson Highway. The existing track from the railroad yard to this point would continue to be used to the Fort Wainwright power plant. The new rail would begin at the power plant and continue due south crossing under both the Richardson Highway and the Old Richardson Highway. It would then turn eastward and remain adjacent to the Richardson Highway until it reached the end of the north boundary of the Military firing range, where it would turn due south again. The alignment would remain due south until it intersected with the COE levee and then remain on the top of the levee to Moose Creek. See Appendix B.

The most costly segment of Option 1 is the 3-Mile Richardson Highway/railroad highway at-grade crossing. This segment contains 5,000 feet of new railroad track, a highway interchange with 2,100 feet of access ramps, 2,900 feet of 2-lane/1-lane highway replacing the Old Richardson Highway, and 5,100 feet of new access road to the military firing range. See

Figure 1, page 3. The interchange complex will require approximately 9,300 feet of new 4-lane highway, two 130-foot and one 80-foot highway bridges (Figures 1 through 3, pages 3 through 5). Exit ramp speed is 30 mph. Project cost is estimated at \$77.3 million.

Advantages of Option 1:

1. Eliminates the at-grade 'scissors' (where the Richardson Highway west bound lane cross the east bound lane to access the Old Richardson Highway);
2. Provides both vehicles and pedestrians direct access from Fort Wainwright to the military firing range, without having to cross the Richardson Highway at-grade;
3. Provides convenient off-base access to the firing range using the Old Richardson Highway;
4. Can be up-graded to provide interchange access to Fort Wainwright, thus eliminating the need for the 3-Mile Fort Wainwright gate at-grade entrance. The upgrade consists of adding two access ramps to the interchange complex. See Figure 4, page 6;
5. Will convert the Badger Road access to the firing range, currently under construction, into a railroad roadbed. This conversion will provide significant cost savings to the railroad realignment project, as it will eliminate the need for a railroad overpass to cross over both the firing range access road and the drainage channel. The DOT&PF's firing range road under construction will cross the drainage channel with four 10-foot pipes. The firing range access road provided by Option 1 provides more convenient single-point access to the range, and enhances range security, thus freeing the Badger Road access road for railroad purposes;
6. Provides good rail access to the existing airport rail spur and the industrial area served by the spur;



PARTIAL INTERCHANGE
 OPTION 1 – DETAIL 1

1" = 600'

FAIRBANKS TO NORTH POLE
 REALIGNMENT PROJECT

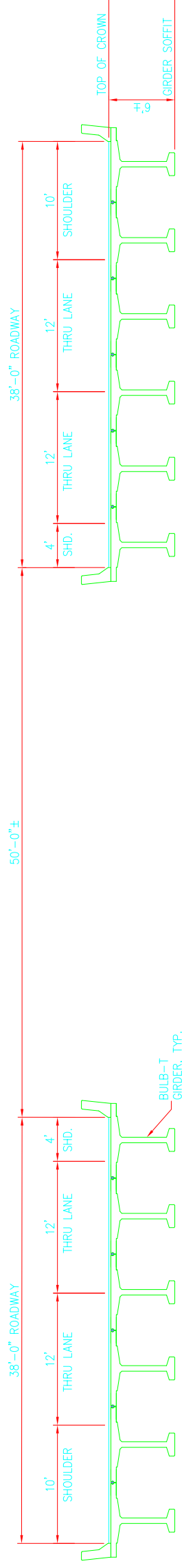
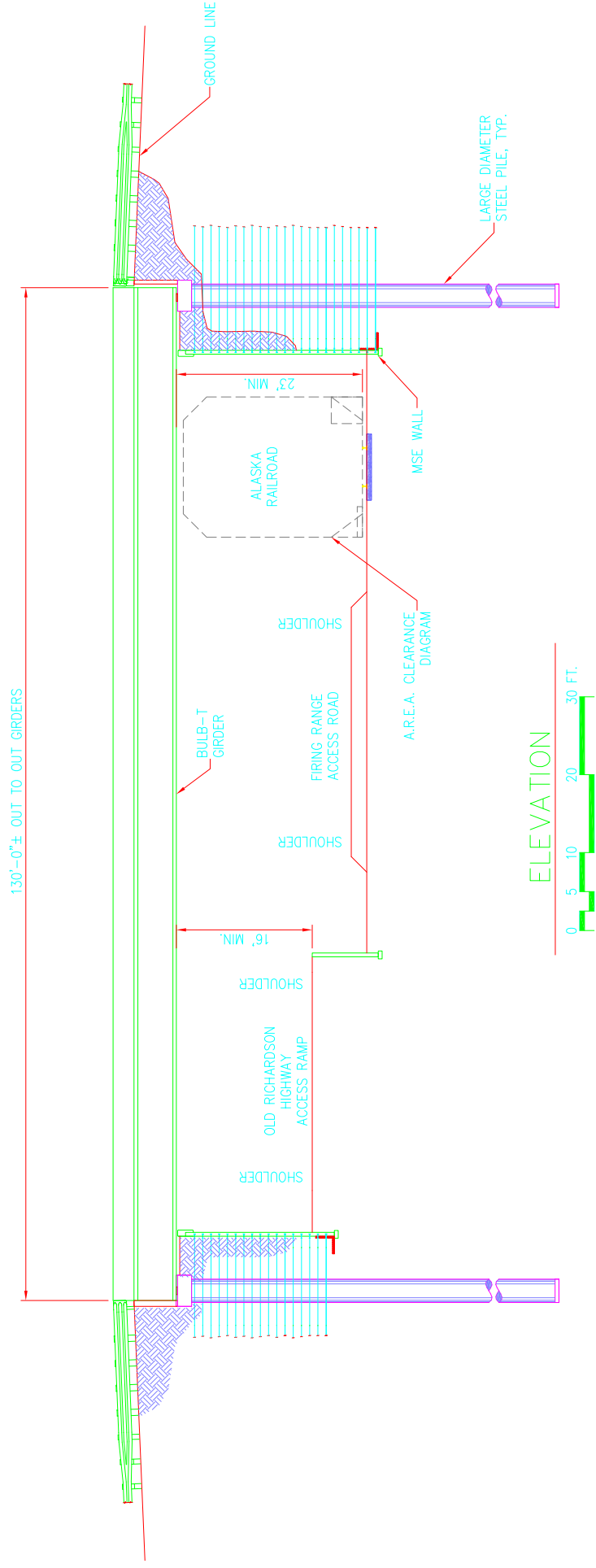
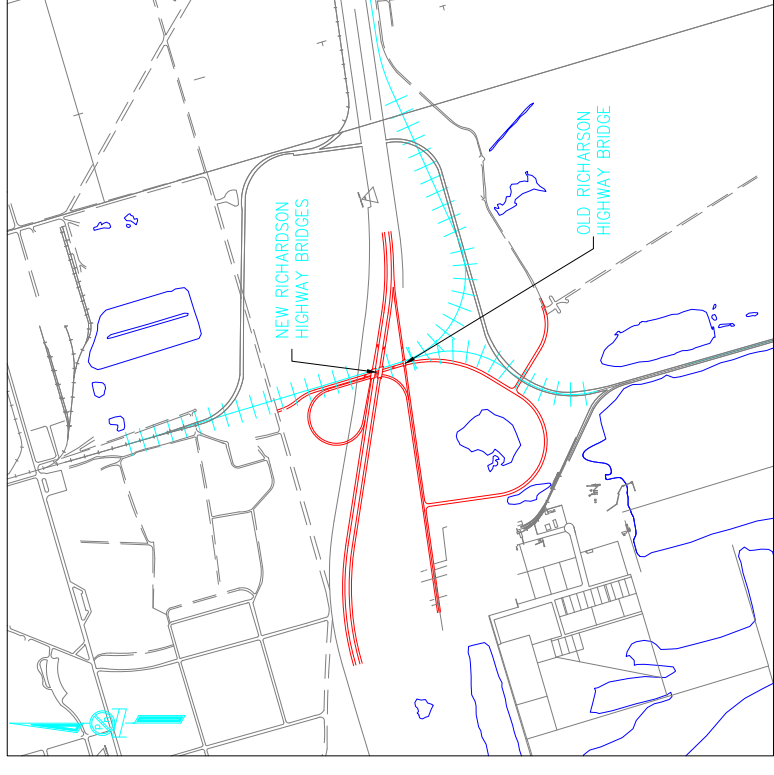
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FIGURE 1:
 OPTION 1 – DETAIL 1

PAGE
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TYPICAL BRIDGE SECTION
AT MIDSPAN

FAIRBANKS TO NORTH POLE
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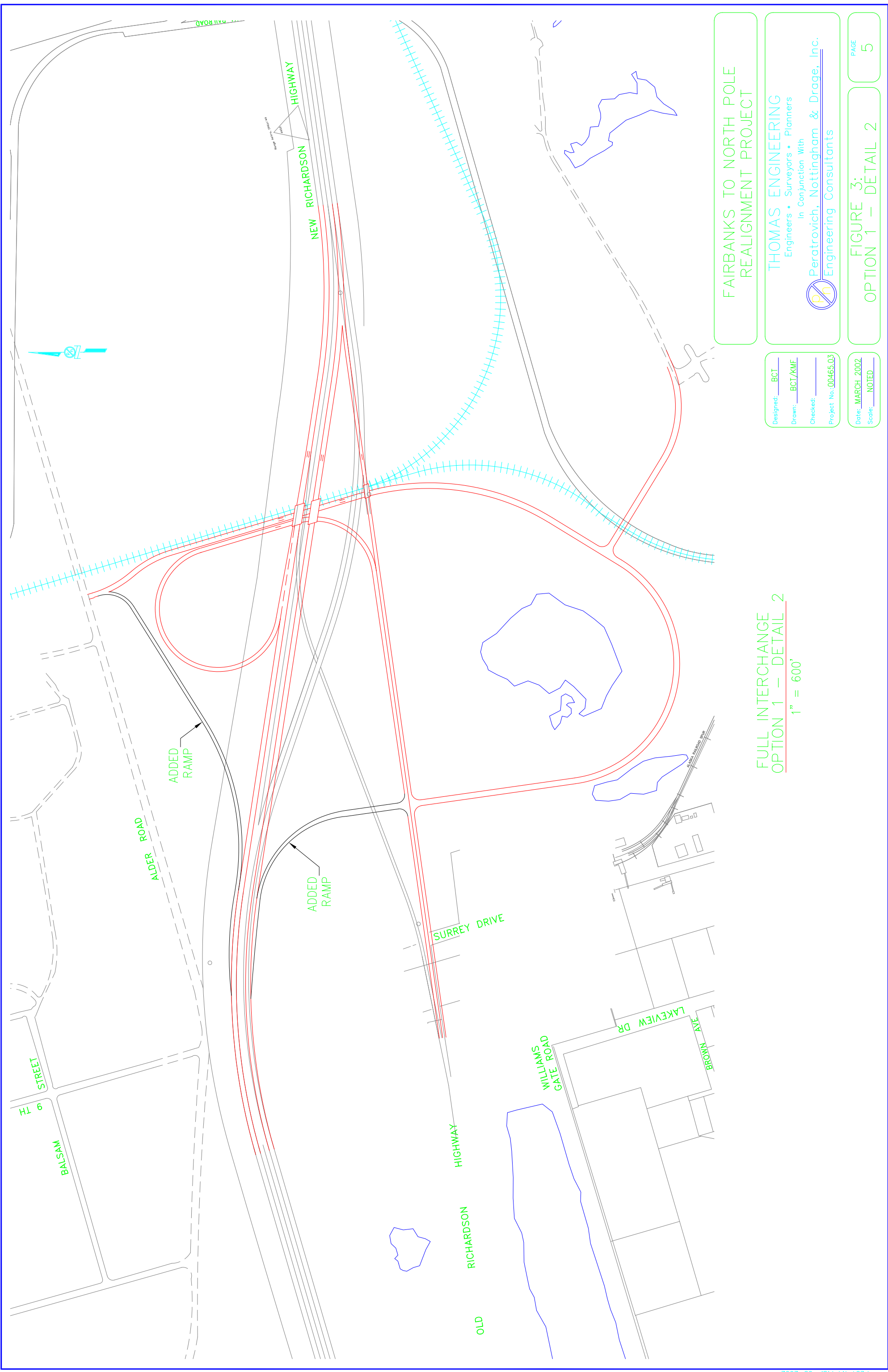
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FIGURE 2:
OPTION 1 -- DETAIL 1 BRIDGE

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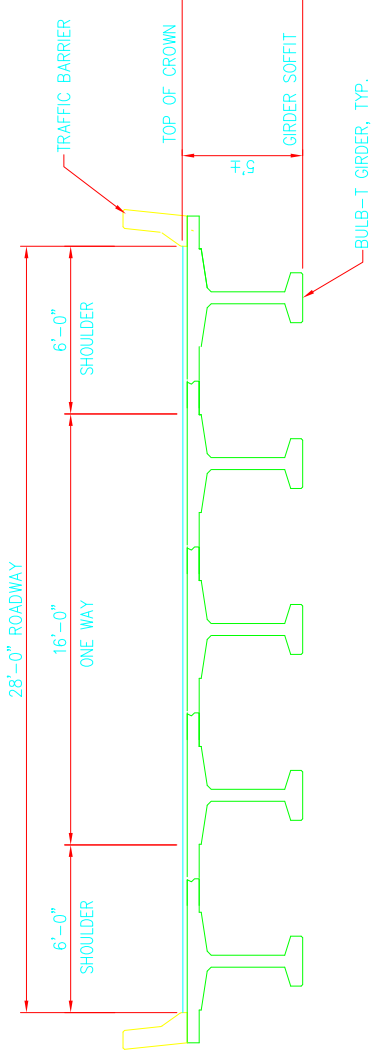
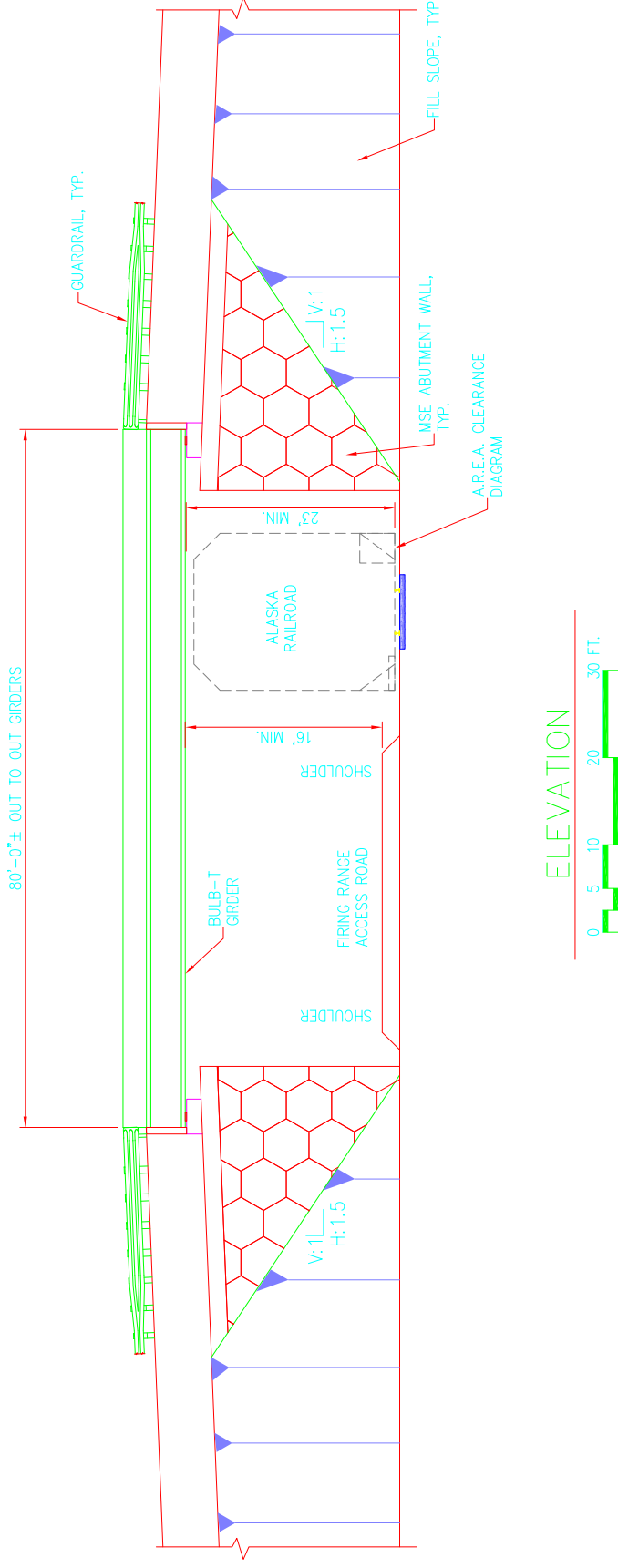
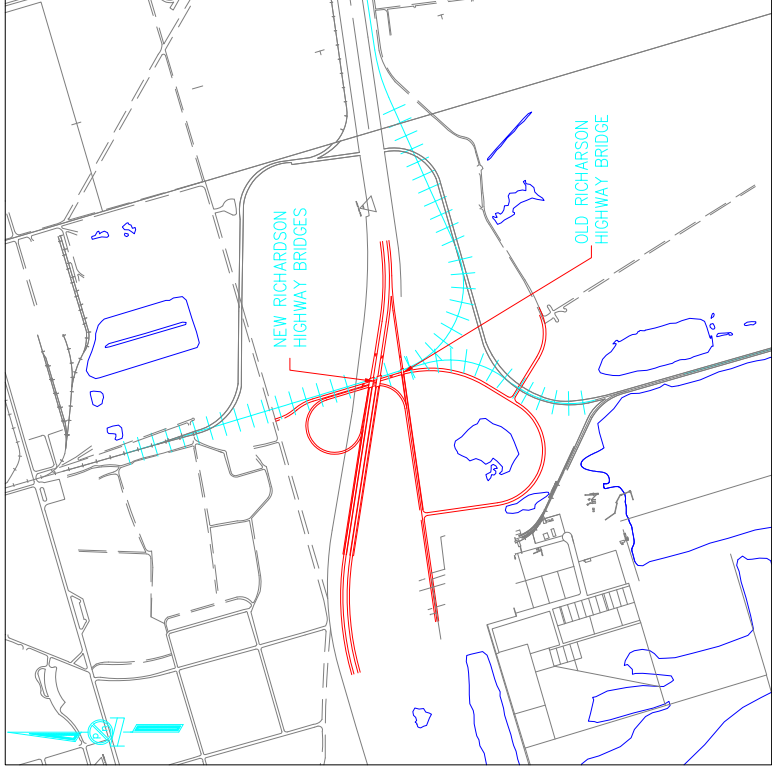
FULL INTERCHANGE
 OPTION 1 – DETAIL 2
 1" = 600'

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TYPICAL BRIDGE SECTION
AT MIDSPAN

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FIGURE 4:
OPTION 1 – DETAIL 2 BRIDGE

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7. Is a stand-alone project, however, it is completely compatible with the Parks Highway segment, or any of the possible alternates of the original concept, of eliminating all main and branch line at-grade roadway crossings within the Fairbanks area;
8. Because it is stand-alone and with little controversy, environmental impacts can be addressed with an Environmental Assessment (EA) rather than an Environmental Impact Statement (EIS) – thus providing significant project development time savings;
9. Eliminates 28 at-grade roadway crossings, including Badger Road and all crossings within the city limits of North Pole;
10. The railroad will be built to 50-mph criteria;
11. Eliminates the need for DOT&PF’s proposed Peridot separate grade railroad crossing;
12. Would be compatible with any future expansion of the railroad to Fort Greely or the ‘Lower-48’;
13. Can be constructed with little or no impact to existing railroad traffic.

Disadvantages are:

1. The project cost is significantly higher than Option 2 - \$77.3 million versus \$17 million;
2. It does not eliminate railroad at-grade crossings within the Fairbanks Community, including those in the Trainor Gate area;
3. It does not eliminate the existing 20-mph slow track and at-grade roadway crossings within Fort Wainwright;
4. It eliminates the track that currently serves three, little used, sidings between Badger Road and North Pole;
5. If the railroad is extended to Fort Greely or the ‘Lower-48’, all trains will still be routed

through Fort Wainwright’s slow track and numerous crossings.

Option 2. The second logical point of beginning is near 9-mile on the Richardson Highway (MP 353). Here the COE levee, Richardson Highway, and the Alaska Railroad are adjacent and approximately parallel for a short distance. See Figure 5, page 8 and Figure 6, page 9. The Railroad will cross over the Richardson Highway and tie into the levee then continue on the levee to Moose Creek. Geometric restrictions result in crossing the Richardson Highway at a 60-degree skew angle requiring a 240-foot bridge. See Figures 6, page 9. Option 2 consists of 7.01 miles of new railroad track in addition to the structure over the Richardson Highway.

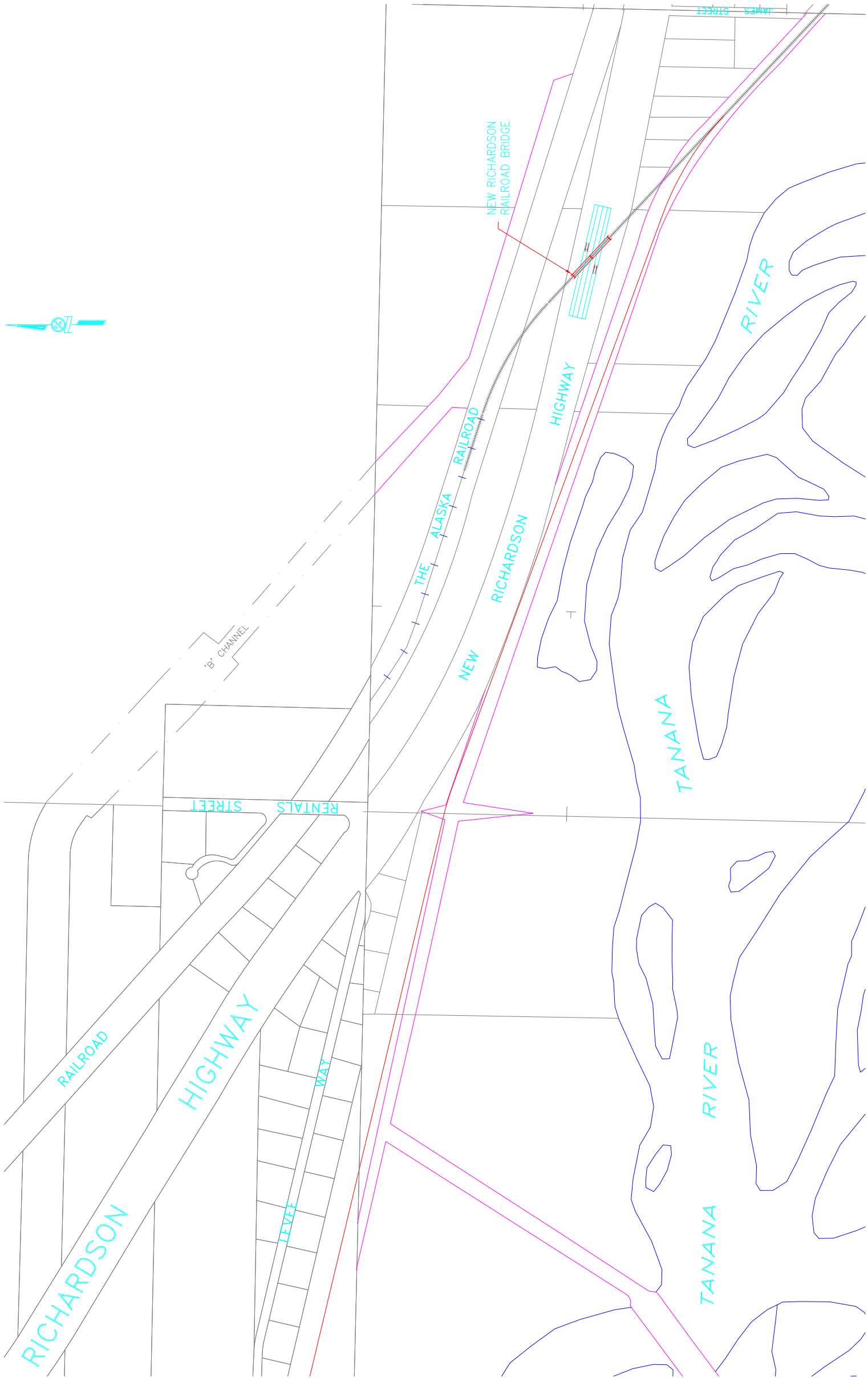
Project cost is estimated at \$17.3 million.

Advantages of Alternative 2:

1. The project cost is significantly less than Option 1 - \$17 versus \$77.3 million;
2. It continues to serve the three sidings between Badger Road and North Pole;
3. Eliminates the need for DOT&PF’s proposed Peridot separate grade railroad crossing;
4. Eliminates all at-grade railroad crossings within the community of North Pole;
5. Can be constructed with little or no impact to existing railroad traffic.

Disadvantages are:

1. While Option 2 is a stand-alone project, it is not readily compatible with further efforts to relocate the track on the COE’s levee, nor is it readily compatible with the Parks Highway concept or any of the other alternatives studied;
2. It will not eliminate the need for the DOT&PF to construct a separate grade connection between the Richardson 4-lane and the Old Richardson Highway at the ‘scissors’ location;



OPTION 2 - DETAIL

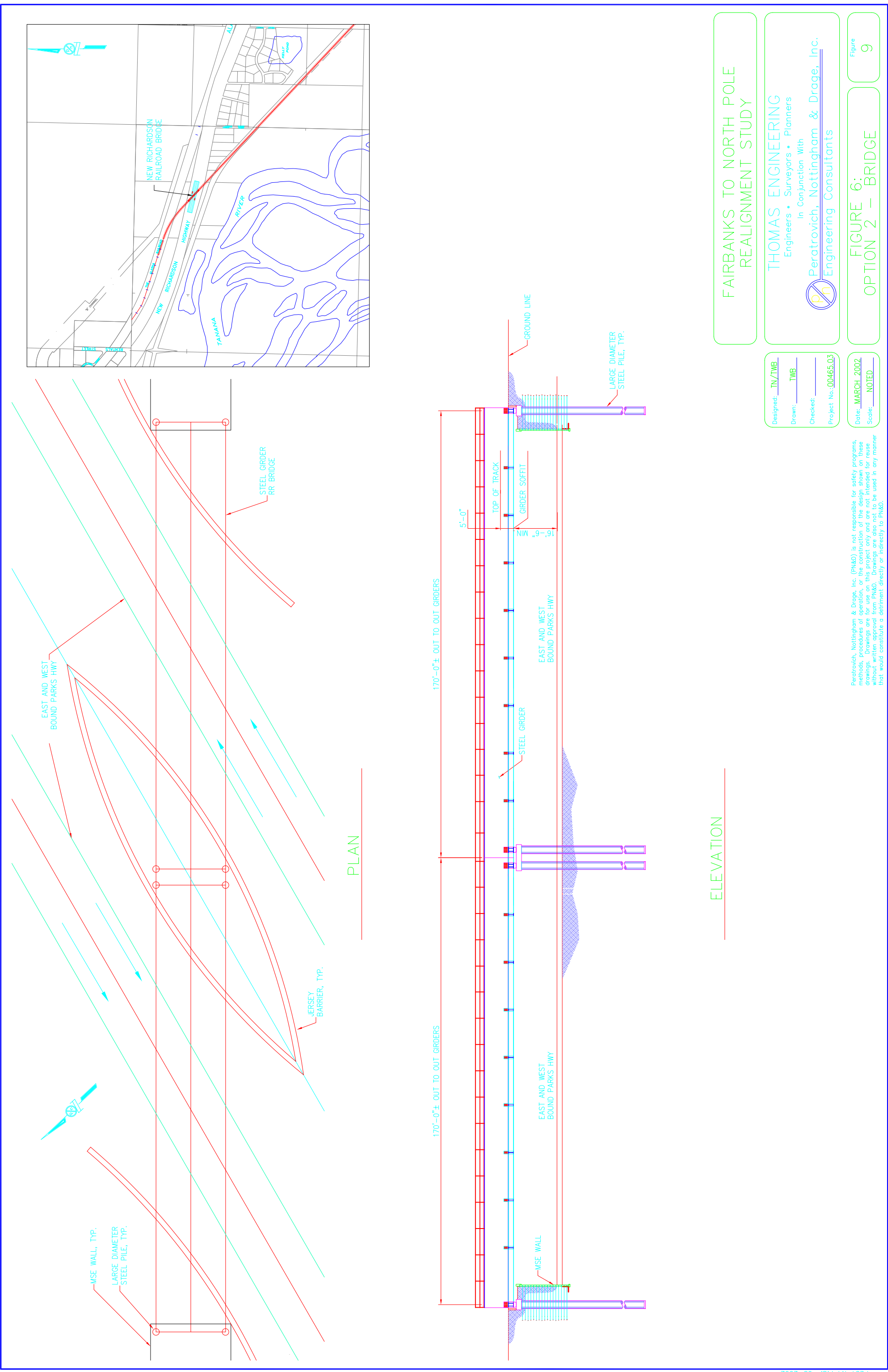
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FIGURE 5:
 OPTION 2 - DETAIL



PLAN

ELEVATION

FAIRBANKS TO NORTH POLE
REALIGNMENT STUDY

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FIGURE 6:
OPTION 2 – BRIDGE

Figure
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3. It will not eliminate Fort Wainwright’s 3-Mile gate at-grade approach;
4. It will not eliminate the railroad at-grade crossing at three mile on the Richardson Highway or on Badger Road;
5. It will not provide direct access from Fort Wainwright to the military firing range;
6. It will not eliminate the need for an EIS. An EIS affords the obligatory assessment of the impacts resulting from foreclosing upon those needs described in disadvantages 2 through 5. In contrast, Option 1 provides a solution to all those needs, and is compatible with all feasible alternatives identified in previous studies;
7. If the railroad is extended to Fort Greely or the ‘Lower-48’, all trains will still be routed through Fort Wainwright’s slow track and numerous crossings.

Utilities

Option 1 - A 138 KV line crossing the Richardson Highway at the location of the proposed overpasses will have to be relocated. This is the primary line serving Fort Wainwright. Cost to relocate is estimated at \$1,600,000.

The North Pole sewer high-pressure pipe passes through the levee and the City of Fairbanks sewer outfall is located beneath the levee. 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.

Environmental

Option 1- Option 1 resolves pending DOT&PF and military needs, while remaining compatible with all reasonable alternatives to eliminate all mainline at-grade crossings in the Fairbanks area. The environmental and public issues for these pending needs and track improvement within Option 1 are minor in nature.

Since Phase 1 is a stand-alone project, an EA will provide adequate environmental

documentation and public participation. An EA will be required to address the NoBuild (Phase 1) and both Option 1 and 2. Because of the shorten review time, an EA will allow Phase 1 of the project to be completed at least a year earlier than an EIS. (Phase 2 will require an EIS, which could be completed during design and construction of Phase 1.)

Option 2 – Initially, Option 2 is estimated to cost \$60.3 million less than Option 1. However, contrary to Option 1, it does not offer any synergy in resolving urgent transportation improvements envisioned by the ARRC, DOT&PF, and the military. The DOT&PF will continue to seek solutions for the Richardson Highway at-grade access to the Old Richardson Highway. Since the most obvious solution contains most, if not all the elements of Option 1 at that location, the end result will be a duplication of public funding.

Further, the potential to further utilize the COE levee, or any of the other alternatives identified, within the foreseeable future is jeopardized. Future use of the levee would relegate the 9-mile crossing, costing over \$3 million, to a dead end spur that serves three privately owned spur tracks with sporadic needs.

The potential to utilize the existing railroad right of way as a public trail would be foregone.

The loss of opportunity to realize synergy in achieving needed transportation improvements; the incompatibility with alternatives, and foregoing the use of the existing track for a public trail are important effects that will have to be addressed in an EIS.

Right of Way

Option 1 - The interchange/firing range access/railroad alignment can be contained within the existing DOT&PF right of way and military lands. Military lands are used as buffer areas, and are suitable for locating a transportation facility. Associated interchange right of way expenses are estimated at \$1.2 million.



The firing range access road scheduled for construction this summer in conjunction with the Badger Road Interchange, will serve the firing range on an interim basis. Option 1 will provide the ultimate access to the firing range, since it provides superior access from both Fort Wainwright and the community. The interim access road and drainage ditch crossing will be utilized for Option 1’s railroad bed, providing substantial cost savings. Retaining both accesses to the firing range (Badger Road Interchange and Option 1) will require the railroad to cross over the Badger Road access and the drainage ditch, thus adding an overpass to Option 1.

Tax lot 2101 & 2102, located within T2S/R2E, Section 21 contain a structure within 100 feet of the levee. The owner also maintains a short

airstrip on FNSB land on the riverside of the levee. He taxis his aircraft (Cessna 150) over the levee to reach the airstrip. Assessed property value is \$160,000.

Option 2 - Property will be needed from Lots 1A and 2 in Bunge Subdivision. Both are undeveloped lots with a combined assessed value of \$35,000. Three other parcels will be needed as well, Tax Lots 106, 104, 107 T2S/R1E Section 1. These are undeveloped property owned by the FNSB. Portions of these parcels needed are located between the Richardson Highway and the levee.

Estimated Options Cost

The following table shows a comparison of estimated costs between Option 1 and Option 2.

TABLE OF ESTIMATED COSTS (\$ millions)

DESCRIPTION	CONST	UTILITY	ROW	DESIGN	TOTAL
Option 1	68.9	1.7	1.4	5.3	77.3
Option 2	15.9		0.1	1.0	17.0

A spreadsheet showing a more detailed cost breakdown is contained in Appendix A.

Option 1 Cost Breakdown. The estimated cost for Option 1 is divided into three segments. Each segment contains features that benefit governmental entities other than the railroad, and is provided to assist in exploring sources of project funding.

1. Three-Mile Interchange. (Military, and DOT&PF) - The Richardson Highway interchange concept with the military firing range access and associated railroad realignment;
2. Firing Range. (Military) - The railroad realignment not included within the Richardson Highway interchange complex, but still on military land;

3. Levee. (FNSB) - The railroad realignment is located on the COE’s levee, which is maintained by the FNSB.

Three-Mile Interchange.

DOT&PF - The Richardson Highway concept replaces the DOT&PF’s at-grade intersection with the Old Richardson Highway with a separate grade interchange, a project under consideration by the DOT&PF.

The concept also eliminates the need for the Peridot separate-grade railroad crossing, a project the DOT&PF has under design. In addition, it eliminates the Richardson Highway 3-Mile at-grade railroad crossing, also a project under consideration by the DOT&PF. Further, it eliminates all road at-grade railroad crossings west of Moose Creek, including Badger Road, a major roadway, and all streets within the community of North Pole.



DOT&PF and Military - The concept also has the ability to provide direct interchange access to Fort Wainwright, thus eliminating the 3-Mile at-grade access to Fort Wainwright. All of these features are highly desirable because together they will eliminate all at-grade access to or from the Richardson Highway from Gaffney Road through Badger Road.

Military - The Concept provides direct vehicular and pedestrian access from Fort Wainwright to the military firing range as well as convenient off-base access to the firing range.

Firing Range.

Military -The proposed railroad alignment better defines the firing range’s boundary and, with the proposed fencing, enhances the security and safety.

Levee.

COE and FNSB – Throughout this segment, the railroad is located on the levee. The levee was constructed in the 1970s in response to the 1967 flood. Signs of consolidation and erosion are becoming more evident as the levee ages. This project will provide for a complete rehabilitation of the levee, bringing it back to its original height and increasing its width.

A portion of the FNSB operating fund goes to maintain this segment of the levee. The railroad will become responsible for maintenance and will essentially be inspecting the levee four times each day. The following table shows estimated costs by segment.

**TABLE OF ESTIMATED COSTS (\$ millions)
FOR OPTION 1 BY SEGMENT**

SEGMENT	CONST	UTILITY	ROW	DESIGN	TOTAL
Three-Mile Interchange	37.1	1.6	1.2	3.7	43.6
Firing Range	13.2			0.7	13.9
Levee	18.6	0.1	0.2	0.9	20.0

No breakdown of cost was made for Option 2, however it is noted that a portion of the FNSB operating fund goes to maintain this segment of the levee. The railroad would rehabilitate that portion of the levee utilized by Option 2, and assume maintenance responsibilities.

Phase 2 – Western Portion

The western phase is a stand-alone project. Its completion is dependant upon funding and environmental approval. At this time, the Parks Highway alignment is the Preferred Alternative for the western portion, however four other alternatives have been identified that would provide similar benefits. Of these, the Fort Wainwright Alternative C appears to be the most viable alternative. The NoBuild Alternative always remains a possible course of action.

Public opinion and concerns will be sought and evaluated through the EIS process before any alternative can be decided upon. The EIS process is expected to take two years to select an acceptable alternative and gain environmental approval. Final design would follow. Ideally, Phase 2 of the proposed project could be designed and ready for construction immediately following the completion of Phase 1.

The Preferred or Chena Pump alternatives would connect with Phase 1 by replacing the existing 5.75-degree railroad curve connecting the Airport Spur track and the track constructed during Phase 1 with a three-degree curve and a separate-grade crossing for the firing range access road.



Any of the Fort Wainwright alternatives would connect with Phase 1 on the east side of the Richardson Highway near the power plant.

Williams North Pole Refinery 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 Figure 7 page 14. The geometrics and lengths of the siding tracks allows the ARRC to spot empty tank cars on two tracks

then pick up a full train of full southbound tank cars. The refinery would then fill the empty tanks and make up a new train.

The following Table shows the estimated cost for both Phase 1 and 2. Estimated costs are based upon Option 1 (Phase 1) and the preferred Parks Highway Alternate (Phase 2).

Total project cost using other than the Preferred Alternative has not been included in this report.

TABLE OF TOTAL COSTS (\$ millions) BY PHASE

SEGMENT	CONST	UTILITY	ROW	DESIGN	TOTAL
Phase 1	68.9	1.7	1.4	5.3	77.3
Phase 2	48.4	9.2	1.0	2.5	61.1
Refinery Siding	3.5			0.4	3.9
Grand Total	120.8	10.9	2.4	8.2	142.3

Recommendations

Early completion for the eastern part of the Fairbanks Bypass Realignment Project is the most compelling reason to divide the project into two phases.

Phase 1/Option 2 promises earlier completion because the scale of the project is greatly reduced. However, the environmental document will be required to address all options that could be reasonably precluded by this option. This will include further railroad use of the COE levee in the foreseeable future, and the loss of synergy to resolve other transportation needs.

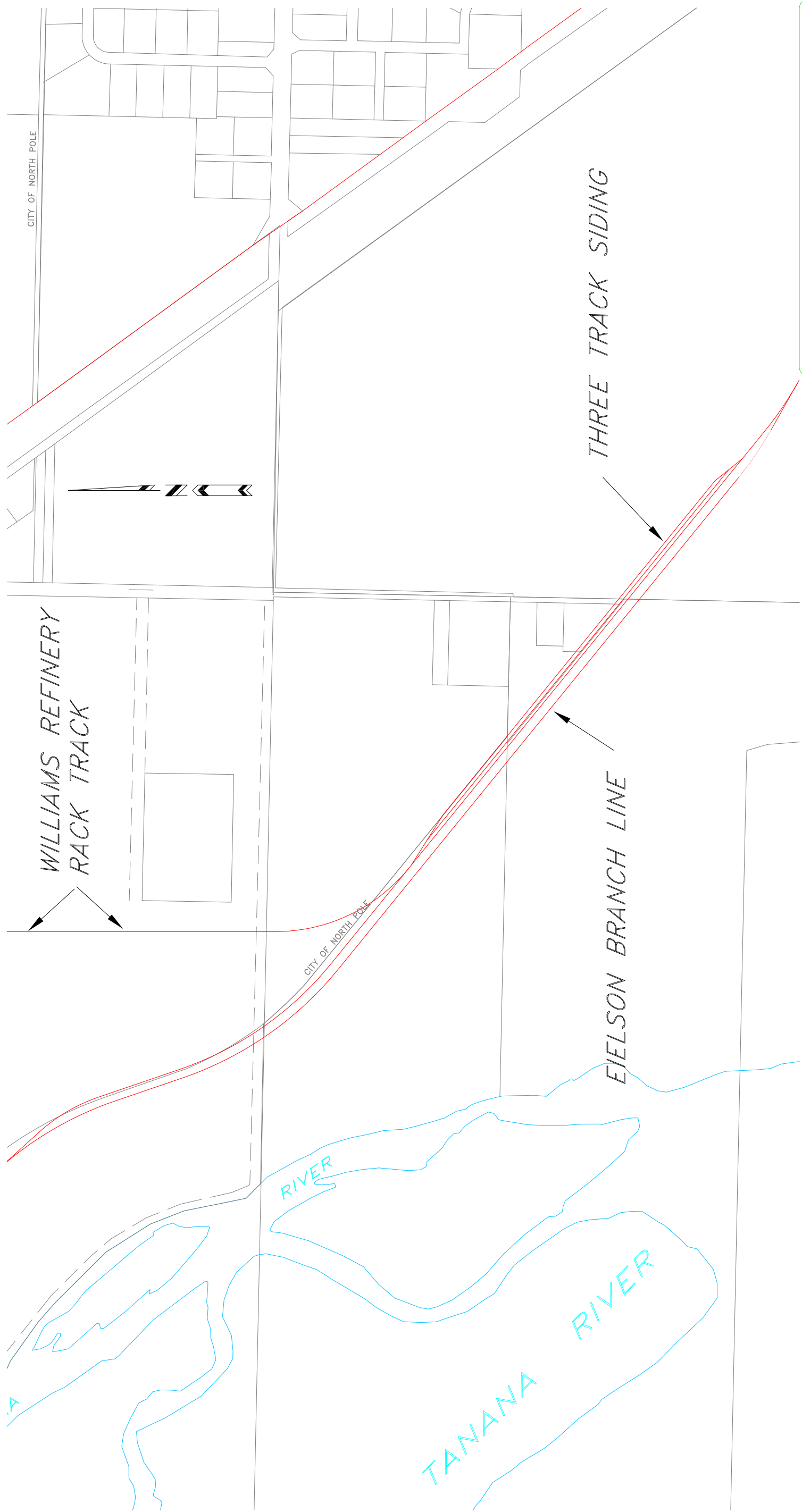
Phase 1/Option 1 does not promise any significant construction cost savings, but because of the magnitude of the total project cost, phasing offers flexibility in term of contracting and funding schedules.

Phase1/Option 1 promises early completion of the eastern part, thus realizing public safety benefits much sooner, and reducing operating cost for both the Alaska Railroad and the

traveling public. Air quality benefits and a reduction in public funding for levee maintenance will accrue sooner as well.

An environmental document for Phase 1/Option 1 ought to be less complex and completed in a shorter time frame because the issues and concerns are less complex. Phase 1/Option 1 is a stand-alone project because none of the safety and economic benefits gained is dependant upon completion of Phase 2. More importantly, Phase 1/Option 1 does NOT foreclose on the preferred Phase 2 routing or any of the alternates studied. Thus, the more complex issues and concerns of Phase 2 can be resolved while Phase 1 is being built and utilized.

It is recommended that the Fairbanks Bypass Realignment Project be divided into two phases: Phase 1/Option 1 and Phase 2, Alternative to be decided.



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FIGURE 7:
WILLIAMS REFINERY SIDING

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**Appendix A -
Engineer's Cost Estimate**

FAIRBANKS BYPASS REALIGNMENT PROJECT
PHASING REPORT
APPENDIX A

	Three Mile Interchange Section			Firing Range Section			Levee Section			OPTION 1 Nine Mile Overpass			OPTION 2 Nine Mile Overpass			REFINERY TRACK YARD			
	Unit	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total	Quantity	Unit Cost	Total
Clearing & Grubbing	Acre	60	1,500	90,000	23	1,500	34,500	32	1,500	48,000	24	1,500	36,000						
Removal of Structures	Lump Sum	1	50,000	50,000	1	30,000	30,000	0	0	0	0	0	0	0	0	0	0	0	0
Spread Existing Roadway	Station	120	600	72,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Excavation	CY	400,000	3	1,200,000	131,700	3	395,100	117,400	3	352,200	56,000	3	168,000						
Borrow	Ton	4,700,000	3.5	16,450,000	1,095,120	3.5	3,832,920	6,700	3.5	23,450	343,250	3.5	1,201,375						
Select Material	Ton	400,000	5	2,000,000	99,840	5	499,200	379,071	5	1,895,355	112,000	5	560,000						
Base Course	Ton	75,000	10	750,000	0	0	0	0	0	0	0	0	0						
Pavement	Ton	6,500	23	149,500	0	0	0	0	0	0	0	0	0						
Asphalt Cement	Ton	400	215	86,000	0	0	0	0	0	0	0	0	0						
Prime Coat	Ton	40	20	800	0	0	0	0	0	0	0	0	0						
Culverts	LF	1,230	50	61,500	600	50	30,000	0	50	0	0	50	0						
Storm Drain System	LF	1	10,000	10,000	0	0	0	0	0	0	0	0	0						
Guard Rail	LF	13,800	7	96,600	0	0	0	0	0	0	0	0	0						
Fence	LF	23,600	12	283,200	29,250	12	351,000	55,750	12	669,000	34,400	12	412,800						
Noise Abatement	Lump Sum	0	0	0	0	0	0	0	0	0	0	0	0						
Signs	Sq Ft	200	50	10,000	0	0	0	0	0	0	0	0	0						
Seeding/Landscaping	Lump Sum	1	150,000	150,000	0	50,000	0	0	50,000	0	0	30,000	0						
Soil Stabilization	Lump Sum	0	0	0	0	0	0	0	0	0	0	150,000	0						
Geotextile	Sq Yd	178,500	1	178,500	78,000	1	78,000	9,600	1	9,600	0	1	0						
Insulation	Sq Ft	321,300	2	642,600	351,000	2	702,000	1,920	2	3,840	0	2	0						
Mob/Demob	Lump Sum	1	200,000	200,000	1	100,000	100,000	1	200,000	200,000	1	100,000	100,000						
Erosion/Sediment Control	Lump Sum	1	10,000	10,000	1	10,000	10,000	1	10,000	10,000	1	10,000	10,000						
Construction Survey	Lump Sum	1	250,000	250,000	1	60,000	60,000	1	75,000	75,000	1	100,000	100,000						
Traffic Control	Lump Sum	1	300,000	300,000	0	250,000	0	0	250,000	0	1	50,000	50,000						
Contractor Services	Lump Sum	1	50,000	50,000	1	50,000	50,000	1	50,000	50,000	1	50,000	50,000						
MSE Walls	Sq Ft	19,200	35	672,000	0	0	0	0	0	0	4,800	35	168,000						
Lighting	Lump Sum	1	250,000	250,000	0	0	0	0	0	0	0	0	0						
Traffic Marking	Lump Sum	1	60,000	60,000	0	0	0	0	0	0	0	0	0						
At Grade RR x-ing	Each	1	20,000	20,000	0	0	0	0	0	0	0	0	0						
2-1.5 Duct Bank	LF	5,000	7	35,000	19,500	7	136,500	55,800	7	390,600	37,000	7	259,000						
Ballast	Ton	3,700	40	148,000	14,500	40	580,000	41,400	40	1,656,000	27,500	40	1,100,000						
Sub-Ballast	Ton	9,000	10	90,000	35,100	10	351,000	100,400	10	1,004,000	66,260	10	662,600						
Hardwood Ties	Each	3,100	100	310,000	12,050	100	1,205,000	34,150	100	3,415,000	22,600	100	2,260,000						
115 Lb Rail	LF	10,000	30	300,000	39,000	30	1,170,000	111,500	30	3,345,000	74,000	30	2,220,000						
Switches	Each	1	50,000	50,000	0	50,000	0	2	50,000	100,000	2	50,000	100,000						
Track Removal	Lump Sum	0	0	0	0	0	0	1	250,000	250,000	0	500,000	0						
Bridges	Lump Sum	1	1850000	1,850,000	0	0	0	0	0	0	1	2,000,000	2,000,000						
Total				26,875,700			9,565,221			13,497,045			11,487,775						2,575,850
+20% Contingencies				5,375,140			1,913,044			2,699,409			2,297,555						515,170
+15% Const Engineering				4,837,626			1,721,740			2,429,468			2,067,800						463,653
Construction Estimate				37,088,466			13,200,005			18,625,922			15,853,130						3,554,673
Right-of-Way				1,200,000			200,000			200,000			100,000						
Utilities				1,600,000			0			70,000									
Design Engineering				3,708,847			660,000			931,296			1,030,453						355,467
Section Total				43,597,313			13,860,005			19,827,218			16,983,583						3,910,140
3-MI SECTION TOTAL				43,597,313			13,860,005			19,827,218			16,983,583						3,910,140
OPTION 1				77,284,536									16,983,583						
REFINERY				3,910,140									20,893,723						
GRAND TOTAL				81,194,676									37,877,306						



**Appendix B –
Project Overview Map
(located in back cover pocket)**