

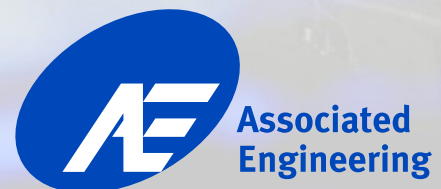
9th Street (Nisku Spine Road) Functional Planning Study

August 2008

2008 Update

Plan Update between 25 Avenue and the
City of Edmonton Corporate Limits

9th street



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1 Introduction

1.1 Study Background

Nisku Spine Road (locally known as 9 Street) is an important north-south corridor through Nisku in Leduc County. The Nisku Spine Road is located within the eastern portion of the Nisku Industrial Business Park and will function as a major arterial roadway connecting major economic centers in the region including the Edmonton International Airport, the Nisku Business Park, the City of Edmonton and the City of Leduc. The Nisku Spine Road is identified as an important regional link between the Nisku area and other major industrial zones in south Edmonton in regional transportation plans. The Nisku Industrial Business Park is western Canada's largest business and industrial park, encompassing roughly 2,200 hectares of industrially zoned land. Currently the Nisku Industrial Business Park has grown to accommodate over 400 companies, employing more than 14,000 highly skilled trades and professional workers.

The Nisku Spine Road is currently a minor arterial roadway extending from Airport Road (10 Avenue) in the south to Township Road 510 in the north. The future Nisku Spine Road alignment is planned to extend north-east from Township Road 510 along Range Road 244 (Edmonton's 101 Street) to 41 Avenue SW at the City of Edmonton's south corporate limits.

Leduc County prepared a Functional Planning Study for the Nisku Spine Road in 1985. At the time that the Functional Planning Study was completed, approximately 800 hectares were developed as medium density industrial land. Today there are more than 2,000 hectares of developed or developing land in the Nisku area. Therefore the previous functional plan required updating to reflect existing and future planned development trends in the area. The Leduc County Transportation Master Plan prepared in 2001 identifies Nisku Spine Road as a major north-south arterial roadway in Leduc County connecting the City of Edmonton. Associated Engineering developed the 9th Street (Nisku Spine Road) Functional Planning study in 2006 to address these changes in the region.

Alberta Transportation's (AT) future regional ring road plans identifies the Nisku Spine Road as a major connector between Anthony Henday Drive and Highway 625. The plan prepared in 1985 required updating to reflect the current geometric design standards, these updates were taken into consideration in the 2006 plan.

1.2 Study Purpose and Scope

In 2006 Associated Engineering completed the 9th Street (Nisku Spine Road) Functional Planning Study for Leduc County. This study established the alignment of the Nisku Spine Road within the eastern portion of the Nisku Industrial Business Park. Shortly thereafter, some new issues were discovered that would substantially impact the alignment of the Nisku Spine Road. Leduc County requested that Associated Engineering investigate options for the Nisku Spine Road that would

take these new issues into consideration. The purpose of this functional plan update is to outline additional issues that impact the road plan and provide an updated plan and costs for the Nisku Spine Road. The affected area of Nisku Spine Road that will be covered in this update is from just north of 25th Avenue to 41st Avenue SW at the City of Edmonton's south corporate limit.

2 Issues

2.1 East/West Freeway

Alberta Transportation has identified that it is developing plans for a potential "East / West Freeway" as part of the future Edmonton region ring road plan. Alberta Transportation has advised Leduc County where the future Nisku Spine Road interchange will be located. This interchange location requires a revision to the Nisku Spine Road alignment and will impact the staging plans for the roadway. Associated Engineering has investigated options for the proposed location of the Nisku Spine Road, considering Alberta Transportation's proposed interchange plan. These updates involved realigning the Nisku Spine Road to the east, between 25th Avenue and 41 Avenue SW. As a result of this realignment, the Township Road 510 intersection also required relocation.

Based on work completed by Alberta Transportation, proposed interchange fill limits were identified by Alberta Transportation and incorporated into the redesign of the Nisku Spine Road. However, Associated Engineering understands that these proposed fills are based on conceptual design data and a number of generalized assumptions. For the purposes of this update to the Nisku Spine Road Functional Plan, the information used to define the interchange fill limits has been supplied by Alberta Transportation. Further detailed plans of this future interchange will be required to confirm the exact location of the interchange fill limits. The interim stage alignment of the Nisku Spine Road was identified to provide optimal functionality while minimizing encroachment on the proposed interchange fills.

The interim alignment is also dependant on the revised Township Road 510 intersection and the proposed Right-of-Way requirements for the lands surrounding the interchange. Once aligned with the East / West Freeway, the Nisku Spine Road ties back into the original design just south of the intersection with the roadway identified as Collector Road 3.

2.2 Building in NW ¼ of 31-50-24

The original design for the Nisku Spine Road NW ¼ -31-50-4-W4M was developed to avoid impact on a proposed new building east of the proposed roadway. Leduc County approved a development application for the building and ensured that the proposed Nisku Spine Road would not impact this new development. However, the building footprint was not built in the location identified in the development plan. As constructed, the new building fell within the proposed Nisku Spine Road right of way.

Upon discovering that the new building appeared to be within the proposed right of way, Leduc County instructed Associated Engineering to revise the Nisku Spine Road alignment so as to avoid the newly constructed building. Associated Engineering proceeded to survey the exact location of the building and adjacent site, and attempted to realign the proposed alignment through the NW ¼ - 31-50-24 section. The Nisku Spine Road alignment curve radii were reduced from 700 metres to 500 metres; these radii are still within the minimum design curves as specified in the geometric design criteria for the Nisku Spine Road. The alignment for the proposed roadway was also shifted north and west to provide adequate right of way for a potential additional service road east of the proposed Nisku Spine Road. These changes to the proposed Nisku Spine Road also required a shift of the Township Road 510 intersection to adequately tie back into the Nisku Spine Road to the north.

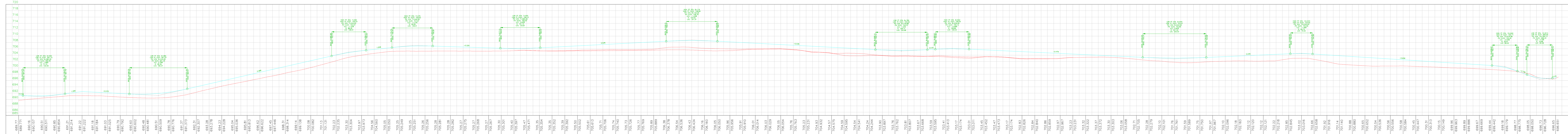
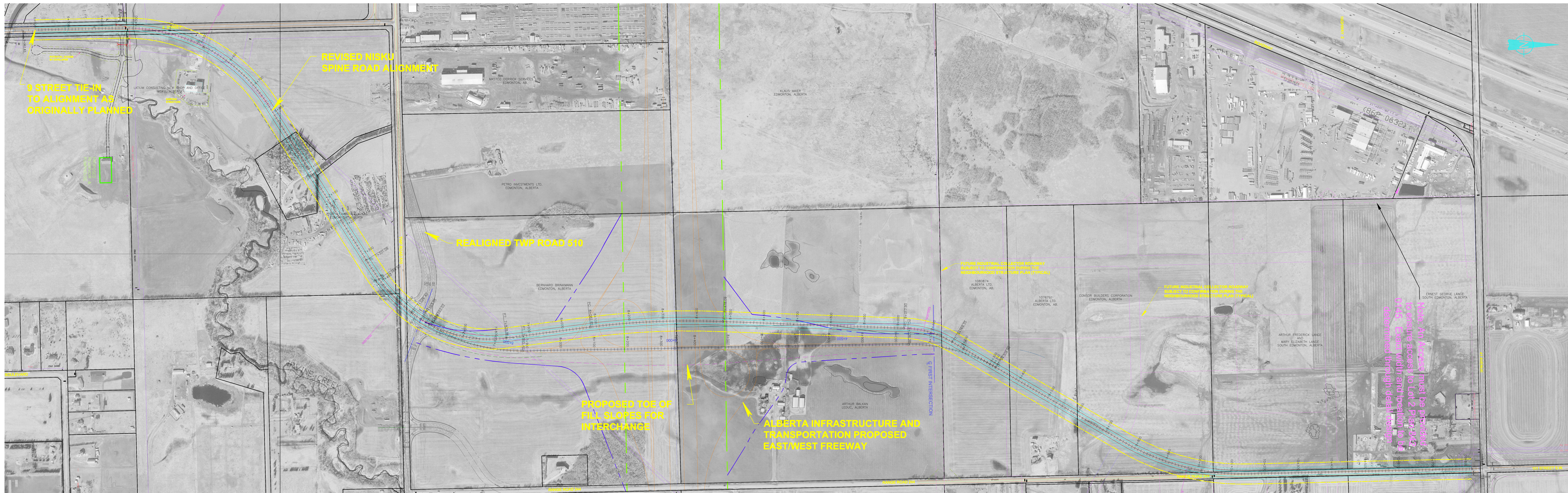
2.3 Western Asset Management (WAM) development

Leduc County received a detailed design for the WAM development located near 41 Avenue SW and the Nisku Spine Road. Upon review, Leduc County and Associated Engineering identified the development plan did not match the Nisku Spine Road alignment or proposed intersections outlined in the 9th Street (Nisku Spine Road) Functional Planning Study. Leduc County requested that Associated Engineering match the Nisku Spine Road alignment with the centerline of the Rights-of-Way provided on the WAM development plans. This involved shifting the alignment generally southeast between the proposed “East / West Freeway” and 41 Avenue SW.

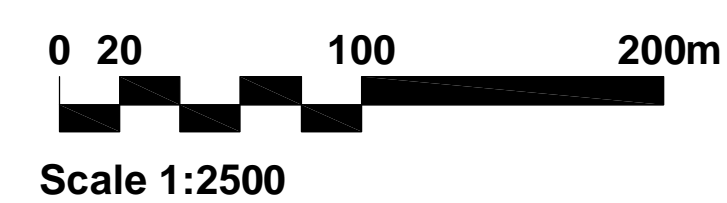
3 Revised Plan

In dealing with all the above mentioned issues, Associated Engineering completed a redesigned alignment for the Nisku Spine Road that meets or exceeds standards set by the Geometric Design Criteria in the original 9th Street (Nisku Spine Road) Functional Planning Study. The Nisku Spine Road design also reflects the most up to date layouts for Township Road 510 and 41 Avenue SW. The figure titled **Proposed Nisku Spine Road – Revised Alignment** provides the realigned plan and profile for the roadway within the update area. Two additional figures have been developed to illustrate the interim and ultimate configuration of the Nisku Spine Road near Alberta Transportation’s proposed East/West freeway. These two additional figures are included in **Appendix A**.

Provisions for interim sound attenuation such as earth berms near existing residential development have not been addressed explicitly within the Functional Planning Study. Ultimately, land uses surrounding the Nisku Spine Road will be industrial or commercial, and therefore there would be no need for sound attenuation at that time. In the interim, however, if there are existing residential properties adjacent to the proposed Nisku Spine Road, Associated Engineering recommends that an interim sound attenuation be investigated through the detailed design phase.



9th Street (Nisku Spine Road)
Proposed Nisku Spine Road - Revised Alignment
Functional Planning Study
AUGUST 2008



4 Cost Estimates

4.1 Quantities and Breakdown Strategy

Associated Engineering has updated the original Nisku Spine Road cost estimates to reflect the alignment and profile changes. Costs have been separated into two general categories, the cost to build the Nisku Spine Road and the incremental cost associated with building each intersection. Costs associated with each major intersection (Reservoir Road, Township Road 510, and 41 Avenue) include all incremental costs of building these intersections up to the beginning/end of all tapers or added lanes. The Nisku Spine road will be largely funded by the offsite levies; Leduc County uses these to recover capital costs incurred for improvements carried out to accommodate new development. This ensures that those who benefit from the capital infrastructure pay a fair share of the construction cost. The cost of the intersections will be recovered by other means, and have therefore been separated from the typical roadway costs.

4.2 Unit Costs

The unit prices used in the cost estimates are derived from similar recent construction projects in Edmonton and northern Alberta.

4.3 Summary of Cost Estimates

Associated Engineering developed cost estimates for the realigned portion of the Nisku Spine Road between station 6+000 (near 25 Avenue) and the north project limits at 41 Avenue SW. These costs are considered order of magnitude based on the functional design, and should be regarded to have an accuracy of $\pm 50\%$.

The total construction cost estimated for the realigned section of the Nisku Spine Road is \$34,561,000. A summary of the total construction cost broken down by major item and road section is presented in the table below. A detailed breakdown of these estimates are included in **Appendix B**.

Item	Description	Street Sections				Amount
		NSR STA 6+000 to 10+816	Reservoir Rd Intersection	Twp Rd 510 Intersection	41 Ave SW Intersection	
1	Roadwork	\$17,711,918	\$86,008	\$2,612,653	\$3,019,486	\$23,430,065
2	Electrical	\$1,212,500	\$500,000	\$700,000	\$750,000	\$3,162,500
3	Drainage	-	\$23,762	\$78,100	\$14,532	\$116,394
Sub-Total		\$18,924,418	\$609,770	\$3,390,753	\$3,784,018	\$26,708,959
Contingencies (15%)		\$2,839,000	\$92,000	\$509,000	\$568,000	\$4,008,000
Total		\$21,764,000	\$702,000	\$3,900,000	\$4,353,000	\$30,719,000
Engineering and Administration (12.5%)		\$2,721,000	\$88,000	\$488,000	\$545,000	\$3,842,000
Grand Total		\$24,485,000	\$790,000	\$4,388,000	\$4,898,000	\$34,561,000



5 Closure

This report was prepared for Leduc County to update the 2006 9th Street (Nisku Spine Road) Functional Planning Study between Nisku's 25th Avenue and the City of Edmonton's corporate limits (41 Avenue SW).

The services provided by Associated Engineering Alberta Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,
Associated Engineering Alberta Ltd.

[Signed]

[Signed]

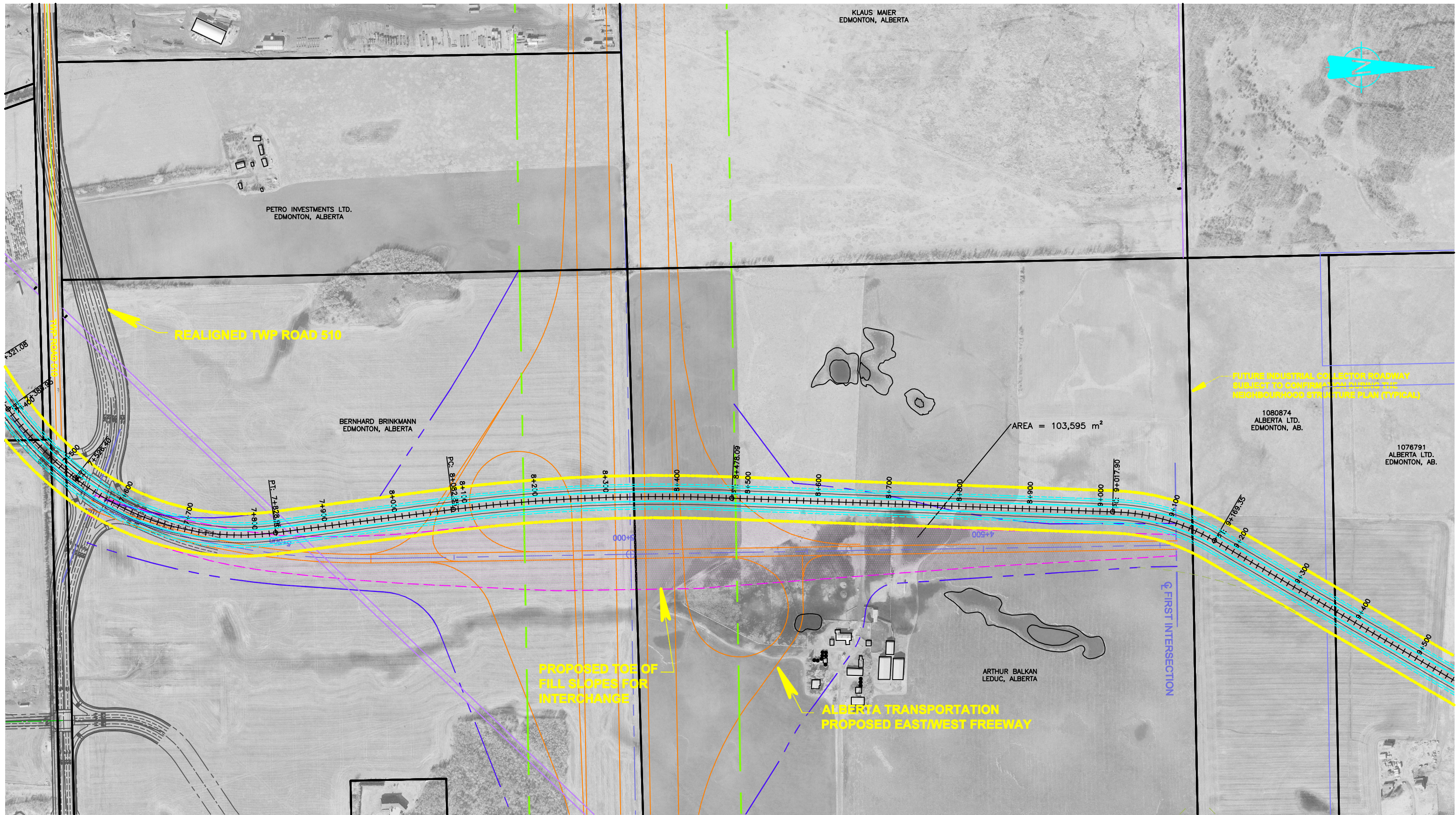
Bryan Petzold, MBA, P.Eng.
Alberta Manager, Transportation

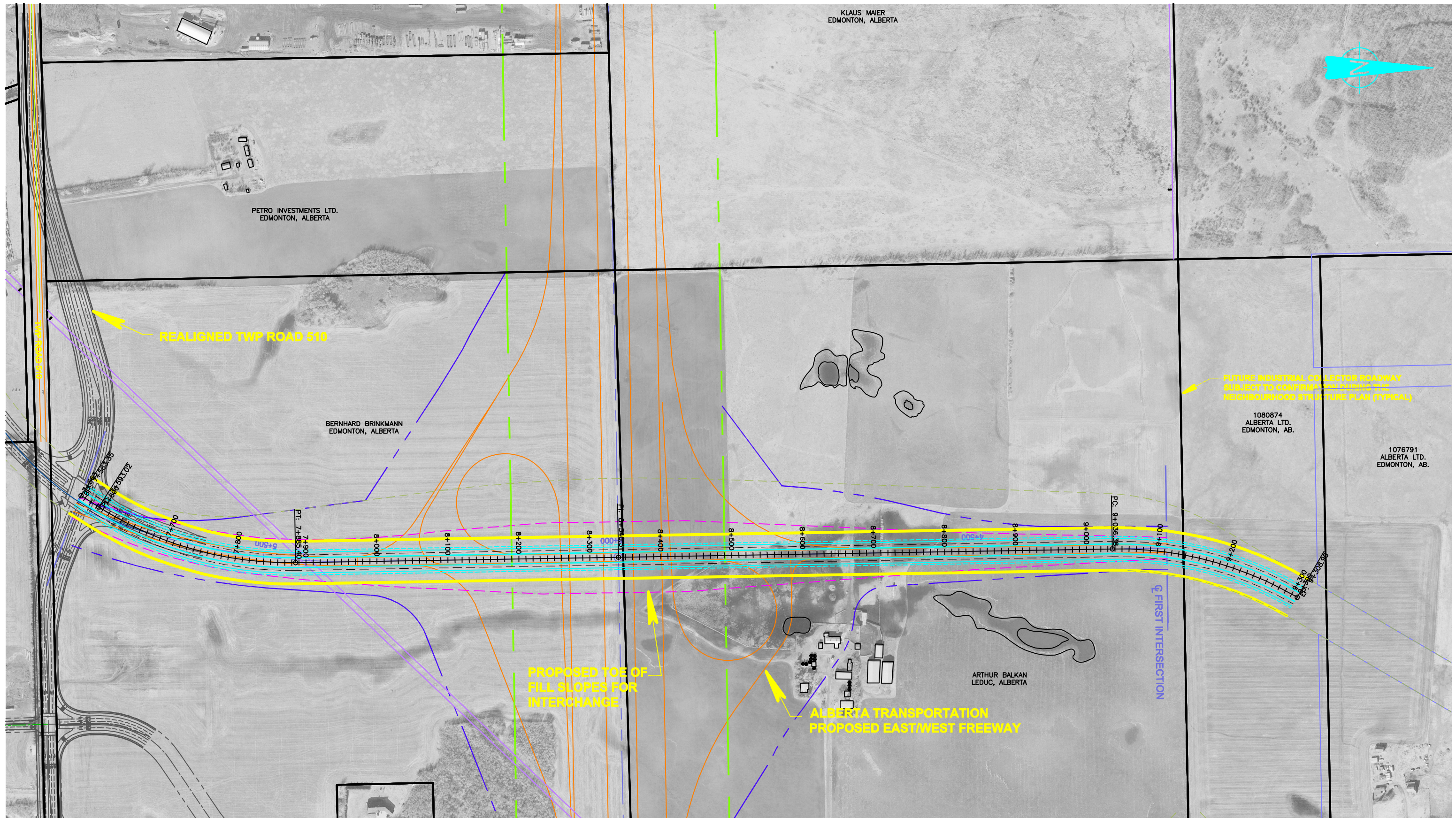
Shawn Benbow, E.I.T.
Project Manager

[Signed]

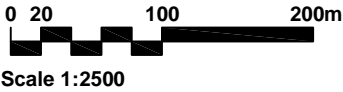
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APPENDIX A - STAGING PLANS





9th Street (Nisku Spine Road)
Proposed Nisku Spine Road -Ultimate Alignment
Functional Planning Study
AUGUST 2008



APPENDIX B - COST ESTIMATES

9th STREET (NISKU SPINE ROAD)

FUNCTIONAL PLANNING STUDY

ROAD FULL DEVELOPMENT SUMMARY

Filename: P:\20053920\00_9thStFPStudy\Engineering\04.00_Preliminary_Design\Transportation\Functional Study\estimate

Item	Description	Street Sections				Amount
		NSR STA 6+000 to 10+816	Reservoir Rd Intersection	Twp Rd 510 Intersection	41 Ave Sw Intersection	
1	Roadwork	\$17,711,918	\$86,008	\$2,612,653	\$3,019,486	\$23,430,065
2	Electrical	\$1,212,500	\$500,000	\$700,000	\$750,000	\$3,162,500
3	Drainage	-	\$23,762	\$78,100	\$14,532	\$116,394
Sub-Total		\$18,924,418	\$609,770	\$3,390,753	\$3,784,018	\$26,708,959
Contingencies (15%)		\$2,839,000	\$92,000	\$509,000	\$568,000	\$4,008,000
Total		\$21,764,000	\$702,000	\$3,900,000	\$4,353,000	\$30,719,000
Engineering and Administration (12.5%)		\$2,721,000	\$88,000	\$488,000	\$545,000	\$3,842,000
Grand Total		\$24,485,000	\$790,000	\$4,388,000	\$4,898,000	\$34,561,000

Note:

- (1) All unit prices are based on 2008 dollars.
- (2) Costs for the removal and relocation power lines to be determined by others during detailed design phase of this project.
- (3) Cost of water main, sanitary sewer and storm upgrades required in the study area due to 9th Street Roadway Reconstruction is to be determined by others during detailed design phase of this project.
- (4) The Drainage costs shown are the costs for the upgrades required to the storm sewer system within the road right-of-way.

9th STREET (NISKU SPINE ROAD)
FUNCTIONAL PLANNING STUDY
25 AVENUE TO 41 AVENUE – FULL DEVELOPMENT
STATION: 6+000 TO 10+849

Filename: P:\20053920\00_9thStFPStudy\Engineering\04.00_Preliminary_Design\Transportation\Functional Study\estimate

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL</u>
1.0 ROADWORK					
1.01	125mm ACP	28765	t	\$100.00 /t	2,876,504
1.02	300mm Gravel Base Course	91346	t	\$33.00 /t	3,014,406
1.03	300mm Pit Run	99745	t	\$26.00 /t	2,593,377
1.04	Sub-grade Preparation	104995	m ²	\$0.50 /m ²	52,498
1.05	600mm Width Concrete Curb and Gutter	0	m	\$182.00 /m	0
1.06	900mm Width Concrete Curb and Gutter	9632	m	\$230.00 /m	2,215,360
1.07	150mm Curb and Cutter Gravel Base	0	t	\$33.00 /t	0
1.08	200mm Curb and Gutter Gravel Base	5779	t	\$33.00 /t	190,714
1.09	Median Strip	0	m ²	\$320.00 /m ²	0
1.10	Pavement Marking	9632	m	\$1.00 /m	9,632
1.11	100mm Top Soil	183977	m ²	\$5.00 /m ²	919,885
1.12	Seeding	183977	m ²	\$2.00 /m ²	367,954
1.13	Clearing R.O.W.	290940	m ²	\$3.00 /m ²	872,820
1.14	Common Excavation	142318	m ³	\$30.00 /m ³	4,269,537
1.15	Borrow Excavation	26136	m ³	\$12.00 /m ³	313,632
1.16	Traffic Signs	1	LS	\$15,600	15,600
			Sub Total		\$17,711,918
2.0 ELECTRICAL					
2.01	Illumination	97	lights	\$12,500 /light	1,212,500
			Sub Total		\$1,212,500

SUMMARY	
1.0 ROADWORK	\$17,711,918
2.0 ELECTRICAL	\$1,212,500
TOTAL	\$18,924,418

Note:

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- (2) Costs for the removal and relocation power lines to be determined by others during detailed design phase of this project.
- (3) Cost of water main, sanitary sewer and storm upgrades required in the study area due to 9th Street Roadway Reconstruction is to be determined by others during detailed design phase of this project.
- (4) The Drainage costs shown are the costs for the upgrades required to the storm sewer system within the road right-of-way.

9th STREET (NISKU SPINE ROAD)
FUNCTIONAL PLANNING STUDY
RESERVOIR ROAD INTERSECTION
STATION: 6+240 TO 6+280

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<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL</u>
1.0 ROADWORK					
1.01	125mm ACP	277 t		\$100.00 /t	27,739
1.02	300mm Gravel Base Course	790 t		\$33.00 /t	26,070
1.03	300mm Pit Run	863 t		\$26.00 /t	22,429
1.04	Sub-grade Preparation	908 m ²		\$0.50 /m ²	454
1.05	600mm Width Concrete Curb and Gutter	0 m		\$182.00 /m	0
1.06	900mm Width Concrete Curb and Gutter	0 m		\$230.00 /m	0
1.07	150mm Curb and Cutter Gravel Base	0 t		\$33.00 /t	0
1.08	200mm Curb and Gutter Gravel Base	0 t		\$33.00 /t	0
1.09	Median Strip	0 m ²		\$320.00 /m ²	0
1.10	Pavement Marking	374 m		\$1.00 /m	374
1.11	100mm Top Soil	450 m ²		\$5.00 /m ²	2,250
1.12	Seeding	450 m ²		\$2.00 /m ²	900
1.13	Clearing R.O.W.	800 m ²		\$3.00 /m ²	2,400
1.14	Common Excavation	46 m ³		\$30.00 /m ³	1,392
1.15	Excess Material	0 m ³		\$12.00 /m ³	0
1.16	Traffic Signs	1 LS		\$2,000	2,000
				Sub Total	\$86,008
2.0 ELECTRICAL					
2.01	Illumination	4 lights		\$12,500 /light	50,000
2.02	Traffic Signals	1 LS		\$450,000	450,000
				Sub Total	\$500,000
3.0 DRAINAGE					
3.01	Culverts (800mm dia C.S.P.)	47.8 m		\$290.00 /m	13,862
3.02	Riprap	66 m ³		\$150 /m ³	9,900
				Sub Total	\$23,762
SUMMARY					
	1.0 ROADWORK				\$86,008
	2.0 ELECTRICAL				\$500,000
	3.0 DRAINAGE				\$23,762
	TOTAL				\$609,770

Note:

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- (3) Cost of water main, sanitary sewer and storm upgrades required due to 9th Street Roadway Reconstruction is to be determined by others during detailed design phase of this project.
- (4) The Drainage costs shown are the costs for the upgrades required to the storm sewer system within the road right-of-way.

9th STREET (NISKU SPINE ROAD)
FUNCTIONAL PLANNING STUDY
TOWNSHIP ROAD 510 INTERSECTION
STATION: 7+390 to 7+754

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<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL</u>
1.0 ROADWORK					
1.01	125mm ACP	4169 t		\$100.00 /t	416,934
1.02	300mm Gravel Base Course	13455 t		\$33.00 /t	444,000
1.03	300mm Pit Run	14692 t		\$26.00 /t	381,986
1.04	Sub-grade Preparation	15465 m ²		\$0.50 /m ²	7,733
1.05	600mm Width Concrete Curb and Gutter	0 m		\$182.00 /m	0
1.06	900mm Width Concrete Curb and Gutter	2607 m		\$230.00 /m	599,610
1.07	150mm Curb and Cutter Gravel Base	0 t		\$33.00 /t	0
1.08	200mm Curb and Gutter Gravel Base	1564 t		\$33.00 /t	51,619
1.09	Median Strip	502 m ²		\$320.00 /m ²	160,640
1.10	Pavement Marking	2222 m		\$1.00 /m	2,222
1.11	100mm Top Soil	3000 m ²		\$5.00 /m ²	15,000
1.12	Seeding	3000 m ²		\$2.00 /m ²	6,000
1.13	Clearing R.O.W.	16820 m ²		\$3.00 /m ²	50,460
1.14	Common Excavation	15815 m ³		\$30.00 /m ³	474,450
1.15	Excess Material	0 m ³		\$12.00 /m ³	0
1.16	Traffic Signs	1 LS		\$2,000	2,000
				Sub Total	\$2,612,653
2.0 ELECTRICAL					
2.01	Illumination	20 lights		\$12,500 /light	250,000
2.02	Traffic Signals	1 LS		\$450,000	450,000
				Sub Total	\$700,000
3.0 DRAINAGE					
3.01	Culverts (800mm dia C.S.P.)	260 m		\$290.00 /m	75,400
3.02	Riprap	18 m ³		\$150 /m ³	2,700
				Sub Total	\$78,100
SUMMARY					
	1.0 ROADWORK				\$2,612,653
	2.0 ELECTRICAL				\$700,000
	3.0 DRAINAGE				\$78,100
	TOTAL				\$3,390,753

Note:

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- (3) Cost of water main, sanitary sewer and storm upgrades required in the study area due to 9th Street Roadway Reconstruction is to be determined by others during detailed design phase of this project.
- (4) The Drainage costs shown are the costs for the upgrades required to the storm sewer system within the road right-of-way.

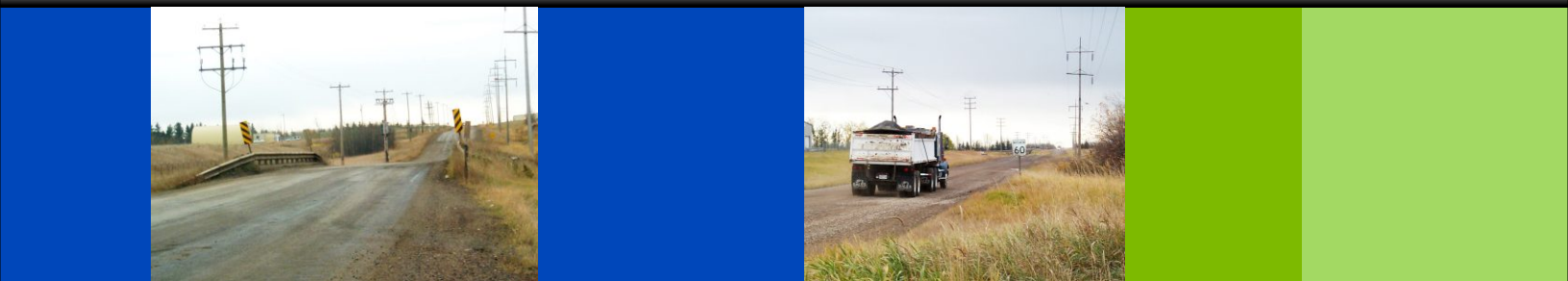
9th STREET (NISKU SPINE ROAD)
FUNCTIONAL PLANNING STUDY
41 AVENUE INTERSECTION
STATION: 10+661 to 10+849

Filename: P:\20053920\00_9thStFPStudy\Engineering\04.00_Preliminary_Design\Transportation\Functional Study\estimate

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>UNIT</u>	<u>UNIT PRICE</u>	<u>TOTAL</u>
1.0 ROADWORK					
1.01	125mm ACP	6668 t		\$100.00 /t	666,754
1.02	300mm Gravel Base Course	16278 t		\$33.00 /t	537,164
1.03	300mm Pit Run	17775 t		\$26.00 /t	462,137
1.04	Sub-grade Preparation	18710 m ²		\$0.50 /m ²	9,355
1.05	600mm Width Concrete Curb and Gutter	0 m		\$182.00 /m	0
1.06	900mm Width Concrete Curb and Gutter	2927 m		\$230.00 /m	673,210
1.07	150mm Curb and Cutter Gravel Base	0 t		\$33.00 /t	0
1.08	200mm Curb and Gutter Gravel Base	1756 t		\$33.00 /t	57,955
1.09	Median Strip	316 m ²		\$320.00 /m ²	101,120
1.10	Pavement Marking	3376 m		\$1.00 /m	3,376
1.11	100mm Top Soil	3225 m ²		\$5.00 /m ²	16,125
1.12	Seeding	3225 m ²		\$2.00 /m ²	6,450
1.13	Clearing R.O.W.	25630 m ²		\$3.00 /m ²	76,890
1.14	Common Excavation	13565 m ³		\$30.00 /m ³	406,950
1.15	Excess Material	0 m ³		\$12.00 /m ³	0
1.16	Traffic Signs	1 LS		\$2,000	2,000
				Sub Total	\$3,019,486
2.0 ELECTRICAL					
2.01	Illumination	24 lights		\$12,500 /light	300,000
2.02	Traffic Signals	1 LS		\$450,000	450,000
				Sub Total	\$750,000
3.0 DRAINAGE					
3.01	Culverts (800mm dia C.S.P.)	40.8 m		\$290.00 /m	11,832
3.02	Riprap	18 m ³		\$150 /m ³	2,700
				Sub Total	\$14,532
SUMMARY					
	1.0 ROADWORK				\$3,019,486
	2.0 ELECTRICAL				\$750,000
	3.0 DRAINAGE				\$14,532
	TOTAL				\$3,784,018

Note:

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- (3) Cost of water main, sanitary sewer and storm upgrades required in the study area due to 9th Street Roadway Reconstruction is to be determined by oth
- (4) The Drainage costs shown are the costs for the upgrades required to the storm sewer system within the road right-of-way.



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