

Title: Hwy 14:06 Intersection Improvements at Hwy 824:02, South Cooking Lake/RR 221 and RR 220.

Memorandum (or Approval) Date: April 27, 2012

Design Exception Request Date: April 18, 2012

Region: North Central

Approval Status: Approved

Project Locations					
Highway	Control Section	At km	From km	To km	Existing AADT
14	06	7.33	-	-	7020
14	06	-	9.13	9.63	7020
14	06	11.45	-	-	7020

Project Type (Mark all that apply with an X)			
Functional Planning:	New Construction:	Reconstruction:	Paving/Surfacing: X
Bridge:	Operations:	Geotechnical:	Environmental:
Other:			

Summary
<p>The following design exception request is for the following:</p> <p><u>Design Exception Request 1: Highway 14:06 / Highway 624:02</u> Based on (Alberta Transportation, Highway Geometric Design Guide. 1995, Updated 1999, (ATHGDG) Chapter D.7 and projected 20 year traffic projected volumes, a Type IVb would be warranted at the intersection of Highway 14/ Highway 824. The request is to maintain the intersection in its current Type 1 configuration due to the conflict with the existing transition from two lane undivided highway to four lane divided highway located immediately west of this intersection</p> <p><u>Design Exception Request 2: Highway 14:06 / South Cooking Lake Access (SCLA)/ Range Road 221</u> Based on ATHGDG - Chapter D.7 and projected 20 year traffic volumes, Hwy 14/SCLA and Hwy 14/Range Road 221 warrants a Type IVa and Type IIIa intersection treatment respectively. The existing T-intersections of SCLA and Range Road 221 are spaced about 500 m and on opposite sides of highway 14. The warranted typical intersection treatments would overlap each other. The design exception request is to modify the typical intersection treatments to create a separation of about 100m between the two intersection tapers</p> <p><u>Design Exception Request 3: Highway 14:06 / Range Road 220</u> Major intersections on horizontal curves may be permitted where the combination of design</p>

speed and radius as indicated in Table B3.6a of the ATHGDG. The request is for a Type IVb intersection treatment on an existing R1180 m horizontal curve. Based on a design speed of 120 km/h for an intersection on a curve, the existing radius is below the R1800. For major intersection on curves with design speeds greater than 100 km/h, the superelevation rate of 3.2% is also be exceeded.

Rationale for Approval/Rejection

Design exception 1:

- The collision history for the five year period from 2005 to 2009 is considered good with 1 minor injury and 4 PDO. In addition, there has been no rear end type collisions reported for this period.
- Introducing an EB left turn lane may cause confusion motorist and increase workload as they transition from the divided highway section.
- The intersection sight distance of 500 m is adequate for all design vehicles.

Design exception 2.

- The separation of 100m between the two intersection tapers will reduce the amount of weaving and confusion for motorist between the two intersections.
- For a Type IIIa intersection a 87.5 m @ 25:1 deceleration taper is typically used for design speed of 110 km/h. Highway 14:06 is currently posted at 100 km/h.
- The intersection sight distance is over 500 m at both intersections and adequate for all design vehicles.
- The existing Hwy 14/SCLA intersection has a treatment similar to a Type 4a but the tapers and shoulder widths are deficient. Hwy 14/RR221 intersection has a Type 1a treatment. The collision history for the five year period from 2005 to 2009 is considered good at both intersections.

Design exception 3.

- The collision history for the five year period from 2005 to 2009 is considered good
- The collision history for the five year period from 2005 to 2009 at the intersection has 4 non animal reported collisions with 2 minor injuries and 2 PDO. Of the four reported collisions, one collision could be attributed to the intersection configuration. The propose Type IVb will improve the safety/ operation for vehicles turning on and off of Highway 14.
- The intersection sight distance (ISD) of 500 m to the east is adequate for all design vehicles.
- The ISD to the west of 460 m to the west is below the 500 m ISD for a WB-21/WB-23 design vehicle. Based on the collision history for the five year period from 2005 to 2009, none of the 4 non-animal reported collisions appear to have been due to the ISD to the west.

Additional Mitigation Required

Design exception 1.

- Approach sideslopes improvements at the intersection are in accordance with AT's 3R/4R Guidelines, Chapter G.6.4.

Design exception 3.

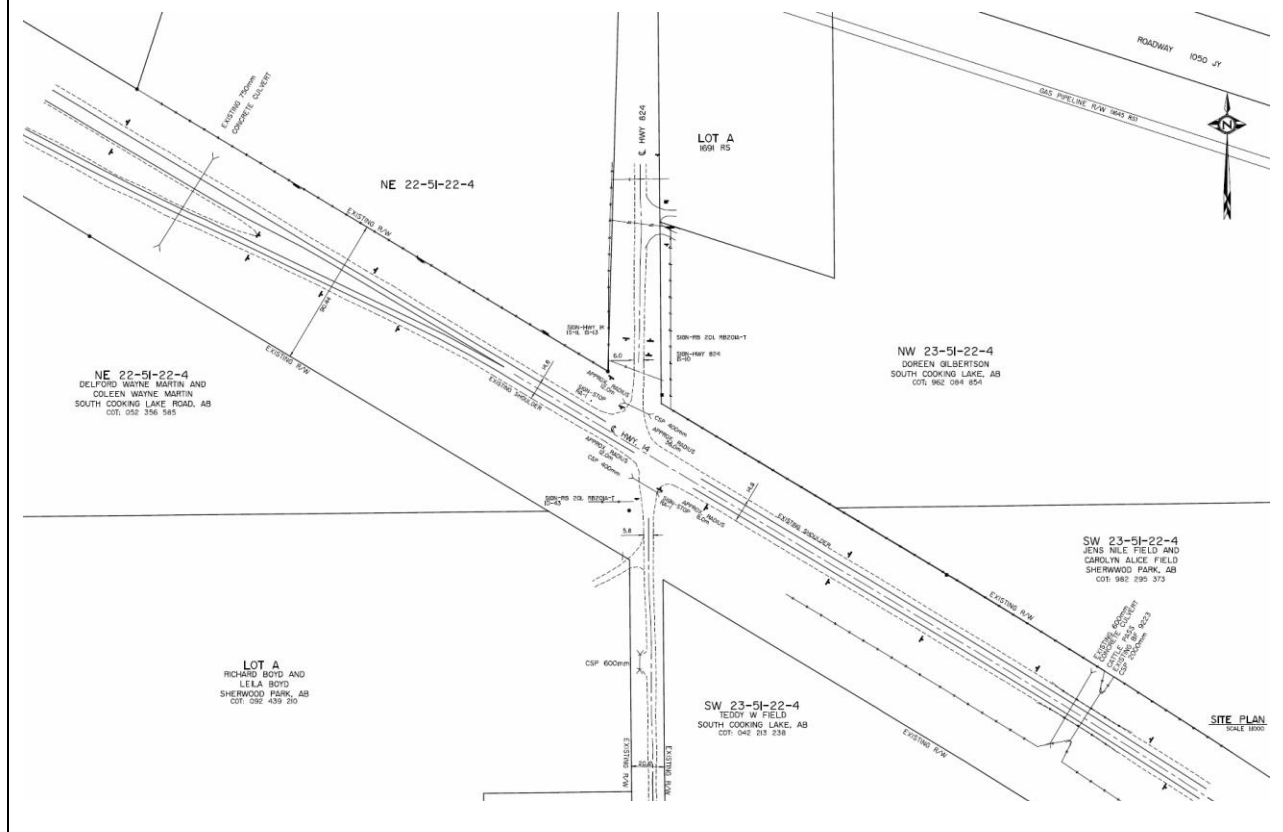
- Recommend that the intersection be monitored and if require, a WA-11 four legged concealed road sign be installed.

Key Words

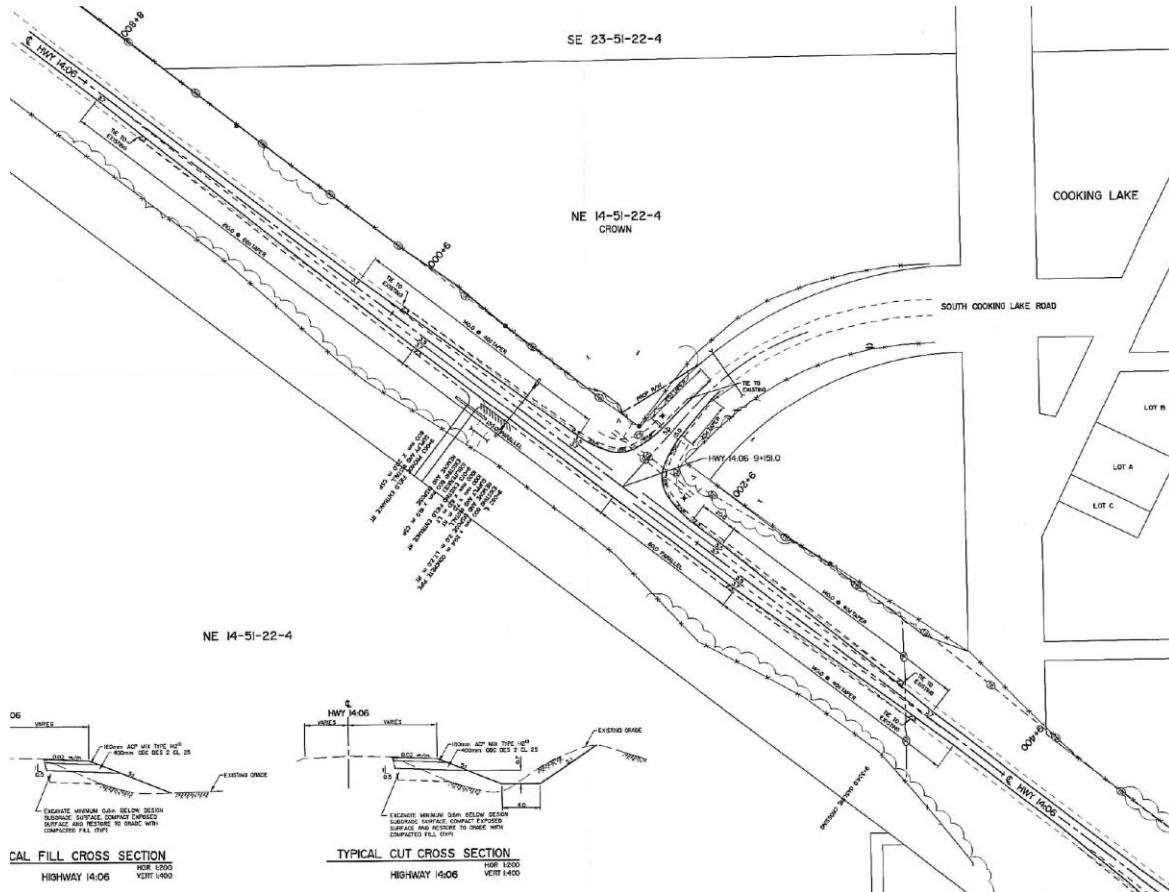
Intersection warrant, Intersection Type, Intersection Sight Distance, Horizontal Curves, 3R/4R Guidelines, Design Vehicles, Superelevation

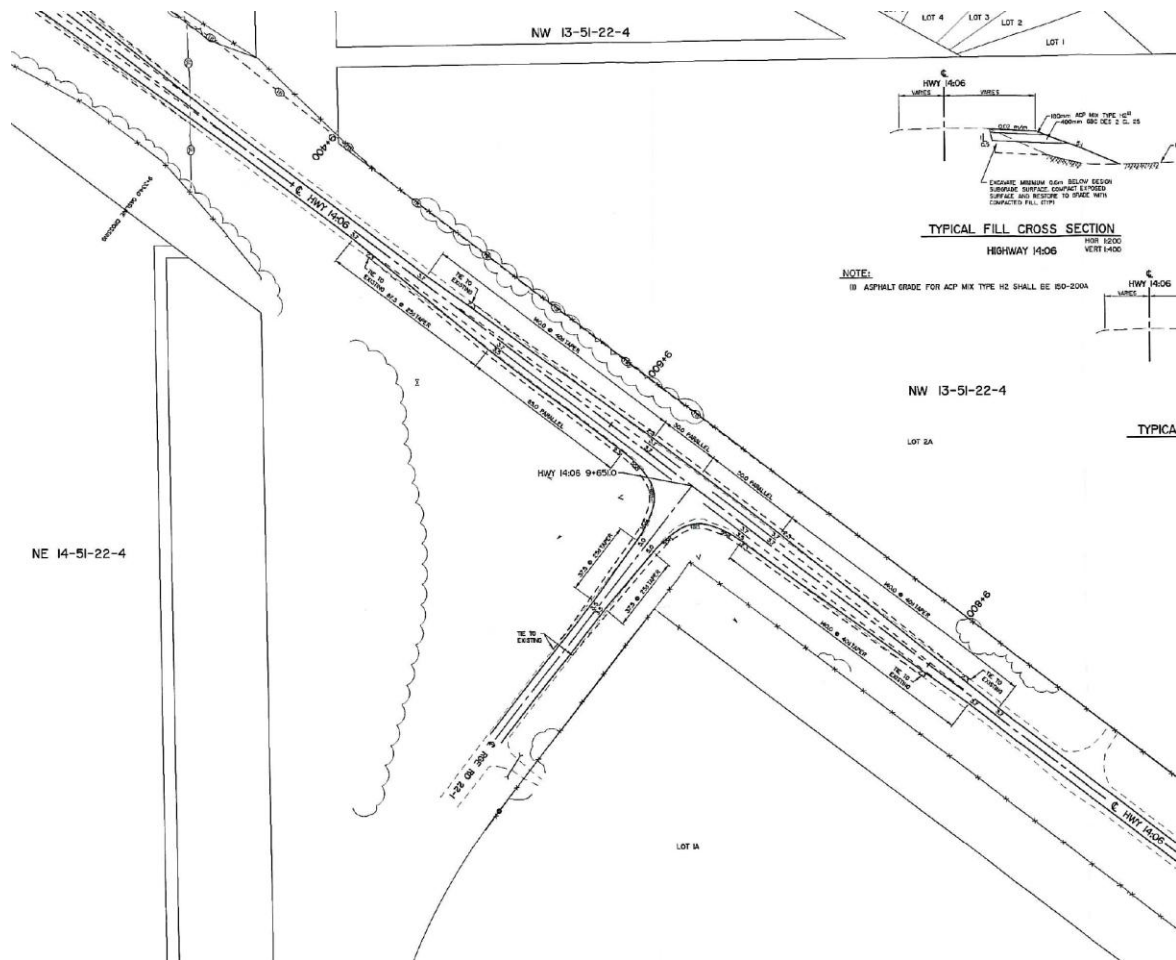
Photograph/Diagram

Design Exception Request 1: Highway 14:06 / Highway 624:02



Design Exception Request 2: Highway 14:06 / South Cooking Lake Access (SCLA)/ Range Road 221





Design Exception Request 3: Highway 14:06 / Range Road 220

