

# APPENDIX A

## COST ESTIMATES

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**Kelowna International Airport**  
**Class "C" Estimate of Probable Costs**  
**Option 1A**



**EBA Project V13203027 - Mill Creek Relocation Pre-design**

Item	Preliminary Estimate of Probable Costs Summary				Total
1.0	Preliminaries				\$183,984
2.0	Earthworks				\$1,477,000
3.0	Demolition and Removal				\$14,000
4.0	Storm Sewers				\$1,176,450
5.0	Headwalls and Handrails				\$30,000
6.0	Service Roads				\$169,500
7.0	Landscaping				\$290,000
8.0	Miscellaneous				\$532,650
Sub-Total Construction Costs					\$3,873,584
9.0	Project Contingencies 15.0%				\$581,038
Total Estimated Construction Cost					\$4,454,622
10.0	Engineering Design / Construction Inspection / Record Drawings 10.0%				\$445,462
Total Estimated Project Cost Forecast - Excluding GST/HST					\$4,900,100
1.0	Preliminaries	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Mob / Demob / Temporary Facilities - Security, Barricades, Red Lights, Survey, Quality Control, etc.	lump sum	1	\$148,984.00	\$148,984
2	Erosion and Sediment Control	lump sum	1	\$20,000.00	\$20,000
3	Location of Existing Services	lump sum	1	\$5,000.00	\$5,000
4	Co-ordination with Service Authorities	lump sum	1	\$10,000.00	\$10,000
Sub-total Item 1.0					\$183,984
2.0	Earthworks	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Clearing and Grubbing	Ha	7.4	\$5,000.00	\$37,000
2	Excavation and Onsite / Offsite Disposal	cu.m	96,000	\$15.00	\$1,440,000
Sub-total Item 2.0					\$1,477,000
3.0	Demolition and Removal	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Removal of Headwalls	each	4	\$2,000.00	\$8,000
2	Removal of Culverts	each	6	\$1,000.00	\$6,000
Sub-total Item 3.0					\$14,000

4.0	Storm Sewers	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
2	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	60	\$4,500.00	\$270,000
3	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	84	\$4,500.00	\$378,000
4	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
5	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
6	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
7	Geogrid	sq.m	890	\$5.00	\$4,450
8	Non-Woven Geotextile	sq.m	32,500	\$2.00	\$65,000
9	Cleaning of Existing Culverts	lump sum	1	\$5,000.00	\$5,000
Sub-total Item 4.0					\$1,176,450
5.0	Headwalls and Handrails	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place Concrete Headwall	each	12	\$2,000.00	\$24,000
2	Supply and Install Handrail	each	12	\$500.00	\$6,000
Sub-total Item 5.0					\$30,000
6.0	Service Roads	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place 100mm - 25 mm Granular Base	sq.m	11,300	\$5.00	\$56,500
2	Supply and Place 200mm - 75 mm Sub-Base	sq.m	11,300	\$10.00	\$113,000
Sub-total Item 6.0					\$169,500
7.0	Landscaping	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Import Topsoil (Provisional Quantity)	cu.m	3,100	\$30.00	\$93,000
2	Riparian Revegetation	lump sum	1	\$150,000.00	\$150,000
3	Hydroseeding	sq.m	47,000	\$1.00	\$47,000
Sub-total Item 7.0					\$290,000
8.0	Miscellaneous	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Sediment Trap	lump sum	1	\$120,000.00	\$120,000
2	Rip-Rap (450mm thickness)	sq.m	30,300	\$10.00	\$303,000
3	Pea Gravel (100mm thickness)	sq.m	4,930	\$5.00	\$24,650
4	Install Root Wad	each	20	\$250.00	\$5,000
5	Electrical	lump sum	1	\$15,000.00	\$15,000
6	Supply and Installation of Electrical Ducts	lim.m	400	\$100.00	\$40,000
7	Dewatering	lump sum	1	\$25,000.00	\$25,000
Sub-total Item 8.0					\$532,650
<b>Notes:</b> 1 Cost estimate is for planning & budgeting purposes only, and does not constitute a guarantee on the part of Tetra Tech. Actual costs will be determined by the tendering and construction processes. 2 Costs do not include GST/HST. 3 Costs do not include right-of-way acquisition cost.					

**Kelowna International Airport**  
**Class "C" Estimate of Probable Costs**  
**Option 1B**



**EBA Project V13203027 - Mill Creek Relocation Pre-design**

Item	Preliminary Estimate of Probable Costs Summary				Total
1.0	Preliminaries				\$284,484
2.0	Earthworks				\$3,764,500
3.0	Demolition and Removal				\$14,000
4.0	Storm Sewers				\$1,176,450
5.0	Headwalls and Handrails				\$30,000
6.0	Service Roads				\$169,500
7.0	Landscaping				\$365,000
8.0	Miscellaneous				\$682,650
Sub-Total Construction Costs					\$6,486,584
9.0	Project Contingencies 15.0%				\$972,988
Total Estimated Construction Cost					\$7,459,572
10.0	Engineering Design / Construction Inspection / Record Drawings 10.0%				\$745,957
Total Estimated Project Cost Forecast - Excluding GST/HST					\$8,205,500
1.0	Preliminaries	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Mob / Demob / Temporary Facilities - Security, Barricades, Red Lights, Survey, Quality Control, etc.	lump sum	1	\$249,484.00	\$249,484
2	Erosion and Sediment Control	lump sum	1	\$20,000.00	\$20,000
3	Location of Existing Services	lump sum	1	\$5,000.00	\$5,000
4	Co-ordination with Service Authorities	lump sum	1	\$10,000.00	\$10,000
Sub-total Item 1.0					\$284,484
2.0	Earthworks	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Clearing and Grubbing	Ha	14.9	\$5,000.00	\$74,500
2	Excavation and Onsite / Offsite Disposal	cu.m	246,000	\$15.00	\$3,690,000
Sub-total Item 2.0					\$3,764,500
3.0	Demolition and Removal	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Removal of Headwalls	each	4	\$2,000.00	\$8,000
2	Removal of Culverts	each	6	\$1,000.00	\$6,000
Sub-total Item 3.0					\$14,000

4.0	Storm Sewers	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
2	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	60	\$4,500.00	\$270,000
3	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	84	\$4,500.00	\$378,000
4	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
5	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
6	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
7	Geogrid	sq.m	890	\$5.00	\$4,450
8	Non-Woven Geotextile	sq.m	32,500	\$2.00	\$65,000
9	Cleaning of Existing Culverts	lump sum	1	\$5,000.00	\$5,000
Sub-total Item 4.0					\$1,176,450
5.0	Headwalls and Handrails	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place Concrete Headwall	each	12	\$2,000.00	\$24,000
2	Supply and Install Handrail	each	12	\$500.00	\$6,000
Sub-total Item 5.0					\$30,000
6.0	Service Roads	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place 100mm - 25 mm Granular Base	sq.m	11,300	\$5.00	\$56,500
2	Supply and Place 200mm - 75 mm Sub-Base	sq.m	11,300	\$10.00	\$113,000
Sub-total Item 6.0					\$169,500
7.0	Landscaping	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Import Topsoil (Provisional Quantity)	cu.m	3,100	\$30.00	\$93,000
2	Riparian Revegetation	lump sum	1	\$150,000.00	\$150,000
3	Hydroseeding	sq.m	122,000	\$1.00	\$122,000
Sub-total Item 7.0					\$365,000
8.0	Miscellaneous	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Sediment Trap	lump sum	1	\$120,000.00	\$120,000
2	Control Structure	lump sum	1	\$150,000.00	\$150,000
3	Rip-Rap (450mm thickness)	sq.m	30,300	\$10.00	\$303,000
4	Pea Gravel (100mm thickness)	sq.m	4,930	\$5.00	\$24,650
5	Install Root Wad	each	20	\$250.00	\$5,000
6	Electrical	lump sum	1	\$15,000.00	\$15,000
7	Supply and Installation of Electrical Ducts	lim.m	400	\$100.00	\$40,000
8	Dewatering	lump sum	1	\$25,000.00	\$25,000
Sub-total Item 8.0					\$682,650
<b>Notes:</b> <ol style="list-style-type: none"> <li>Cost estimate is for planning &amp; budgetting purposes only, and does not constitute a guarantee on the part of Tetra Tech. Actual costs will be determined by the tendering and construction processes.</li> <li>Costs do not include GST/HST.</li> <li>Costs do not include right-of-way acquisition cost.</li> </ol>					

**Kelowna International Airport**  
**Class "C" Estimate of Probable Costs**  
**Option 2A**



**EBA Project V13203027 - Mill Creek Relocation Pre-design**

Item	Preliminary Estimate of Probable Costs Summary				Total
1.0	Preliminaries				\$229,644
2.0	Earthworks				\$2,459,000
3.0	Demolition and Removal				\$14,000
4.0	Storm Sewers				\$996,600
5.0	Headwalls and Handrails				\$50,000
6.0	Service Roads				\$169,500
7.0	Landscaping				\$365,000
8.0	Miscellaneous				\$777,000
	<b>Sub-Total Construction Costs</b>				<b>\$5,060,744</b>
9.0	Project Contingencies		15.0%		\$759,112
	<b>Total Estimated Construction Cost</b>				<b>\$5,819,856</b>
10.0	Engineering Design / Construction Inspection / Record Drawings		10.0%		\$581,986
	<b>Total Estimated Project Cost Forecast - Excluding GST/HST</b>				<b>\$6,401,800</b>
<b>1.0</b>	<b>Preliminaries</b>	<b>Unit</b>	<b>Est Quantity</b>	<b>Est. Unit Price</b>	<b>Est. Total</b>
1	Mob / Demob / Temporary Facilities - Security, Barricades, Red Lights, Survey, Quality Control, etc.	lump sum	1	\$194,644.00	\$194,644
2	Erosion and Sediment Control	lump sum	1	\$20,000.00	\$20,000
3	Location of Existing Services	lump sum	1	\$5,000.00	\$5,000
4	Co-ordination with Service Authorities	lump sum	1	\$10,000.00	\$10,000
	<b>Sub-total Item 1.0</b>				<b>\$229,644</b>
<b>2.0</b>	<b>Earthworks</b>	<b>Unit</b>	<b>Est Quantity</b>	<b>Est. Unit Price</b>	<b>Est. Total</b>
1	Clearing and Grubbing	Ha	11.8	\$5,000.00	\$59,000
2	Excavation and Onsite / Offsite Disposal	cu.m	160,000	\$15.00	\$2,400,000
	<b>Sub-total Item 2.0</b>				<b>\$2,459,000</b>
<b>3.0</b>	<b>Demolition and Removal</b>	<b>Unit</b>	<b>Est Quantity</b>	<b>Est. Unit Price</b>	<b>Est. Total</b>
1	Removal of Headwalls	each	4	\$2,000.00	\$8,000
2	Removal of Culverts	each	6	\$1,000.00	\$6,000
	<b>Sub-total Item 3.0</b>				<b>\$14,000</b>

4.0	Storm Sewers	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
2	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
3	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
4	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
5	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
6	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
7	Supply and Install 1000 mm CMP Culvert.	lin.m	8	\$2,500.00	\$20,000
8	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
9	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
10	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
11	Supply and Install 1500 mm Circular Culvert	lin.m	60	\$2,500.00	\$150,000
12	Geogrid	sq.m	800	\$5.00	\$4,000
13	Non-Woven Geotextile	sq.m	54,800	\$2.00	\$109,600
14	Cleaning of Existing Culverts	lump sum	1	\$5,000.00	\$5,000
Sub-total Item 4.0					\$996,600
5.0	Headwalls and Handrails	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place Concrete Headwall	each	20	\$2,000.00	\$40,000
2	Supply and Install Handrail	each	20	\$500.00	\$10,000
Sub-total Item 5.0					\$50,000
6.0	Service Roads	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place 100mm - 25 mm Granular Base	sq.m	11,300	\$5.00	\$56,500
2	Supply and Place 200mm - 75 mm Sub-Base	sq.m	11,300	\$10.00	\$113,000
Sub-total Item 6.0					\$169,500
7.0	Landscaping	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Import Topsoil (Provisional Quantity)	cu.m	5,400	\$30.00	\$162,000
2	Riparian Revegetation	lump sum	1	\$150,000.00	\$150,000
3	Hydroseeding	sq.m	53,000	\$1.00	\$53,000
Sub-total Item 7.0					\$365,000
8.0	Miscellaneous	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Sediment Trap	lump sum	1	\$120,000	\$120,000
2	Rip-Rap (450mm thickness)	sq.m	52,900	\$10	\$529,000
3	Pea Gravel (100mm thickness)	sq.m	8,600	\$5	\$43,000
4	Install Root Wad	each	20	\$250	\$5,000
5	Electrical	lump sum	1	\$15,000	\$15,000
6	Supply and Installation of Electrical Ducts	lim.m	400	\$100	\$40,000
7	Dewatering	lump sum	1	\$25,000	\$25,000
Sub-total Item 8.0					\$777,000
<b>Notes:</b> <ol style="list-style-type: none"> <li>Cost estimate is for planning &amp; budgetting purposes only, and does not constitute a guarantee on the part of Tetra Tech. Actual costs will be determined by the tendering and construction processes.</li> <li>Costs do not include GST/HST.</li> <li>Costs do not include right-of-way acquisition cost.</li> </ol>					

**Kelowna International Airport**  
**Class "C" Estimate of Probable Costs**  
**Option 2B**



**EBA Project V13203027 - Mill Creek Relocation Pre-design**

Item	Preliminary Estimate of Probable Costs Summary				Total
1.0	Preliminaries				\$330,144
2.0	Earthworks				\$4,746,500
3.0	Demolition and Removal				\$14,000
4.0	Storm Sewers				\$996,600
5.0	Headwalls and Handrails				\$50,000
6.0	Service Roads				\$169,500
7.0	Landscaping				\$440,000
8.0	Miscellaneous				\$927,000
Sub-Total Construction Costs					\$7,673,744
9.0	Project Contingencies 15.0%				\$1,151,062
Total Estimated Construction Cost					\$8,824,806
10.0	Engineering Design / Construction Inspection / Record Drawings 10.0%				\$882,481
Total Estimated Project Cost Forecast - Excluding GST/HST					\$9,707,300
1.0	Preliminaries	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Mob / Demob / Temporary Facilities - Security, Barricades, Red Lights, Survey, Quality Control, etc.	lump sum	1	\$295,144.00	\$295,144
2	Erosion and Sediment Control	lump sum	1	\$20,000.00	\$20,000
3	Location of Existing Services	lump sum	1	\$5,000.00	\$5,000
4	Co-ordination with Service Authorities	lump sum	1	\$10,000.00	\$10,000
Sub-total Item 1.0					\$330,144
2.0	Earthworks	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Clearing and Grubbing	Ha	19.3	\$5,000.00	\$96,500
2	Excavation and Onsite / Offsite Disposal	cu.m	310,000	\$15.00	\$4,650,000
Sub-total Item 2.0					\$4,746,500
3.0	Demolition and Removal	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Removal of Headwalls	each	4	\$2,000.00	\$8,000
2	Removal of Culverts	each	6	\$1,000.00	\$6,000
Sub-total Item 3.0					\$14,000



4.0	Storm Sewers	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
2	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
3	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
4	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
5	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
6	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	8	\$4,500.00	\$36,000
7	Supply and Install 1000 mm CMP Culvert.	lin.m	8	\$2,500.00	\$20,000
8	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
9	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
10	Supply and Install 1500 mm Circular Culvert	lin.m	44	\$2,500.00	\$110,000
11	Supply and Install 1500 mm Circular Culvert	lin.m	60	\$2,500.00	\$150,000
12	Geogrid	sq.m	800	\$5.00	\$4,000
13	Non-Woven Geotextile	sq.m	54,800	\$2.00	\$109,600
14	Cleaning of Existing Culverts	lump sum	1	\$5,000.00	\$5,000
Sub-total Item 4.0					\$996,600
5.0	Headwalls and Handrails	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place Concrete Headwall	each	20	\$2,000.00	\$40,000
2	Supply and Install Handrail	each	20	\$500.00	\$10,000
Sub-total Item 5.0					\$50,000
6.0	Service Roads	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place 100mm - 25 mm Granular Base	sq.m	11,300	\$5.00	\$56,500
2	Supply and Place 200mm - 75 mm Sub-Base	sq.m	11,300	\$10.00	\$113,000
Sub-total Item 6.0					\$169,500
7.0	Landscaping	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Import Topsoil (Provisional Quantity)	cu.m	5,400	\$30.00	\$162,000
2	Riparian Revegetation	lump sum	1	\$150,000.00	\$150,000
3	Hydroseeding	sq.m	128,000	\$1.00	\$128,000
Sub-total Item 7.0					\$440,000
8.0	Miscellaneous	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Sediment Trap	lump sum	1	\$120,000	\$120,000
2	Control Structure	lump sum	1	\$150,000.00	\$150,000
3	Rip-Rap (450mm thickness)	sq.m	52,900	\$10	\$529,000
4	Pea Gravel (100mm thickness)	sq.m	8,600	\$5	\$43,000
5	Install Root Wad	each	20	\$250	\$5,000
6	Electrical	lump sum	1	\$15,000	\$15,000
7	Supply and Installation of Electrical Ducts	lim.m	400	\$100	\$40,000
8	Dewatering	lump sum	1	\$25,000	\$25,000
Sub-total Item 8.0					\$927,000
<b>Notes:</b>					
1 Cost estimate is for planning & budgeting purposes only, and does not constitute a guarantee on the part of Tetra Tech. Actual costs will be determined by the tendering and construction processes.					
2 Costs do not include GST/HST.					
3 Costs do not include right-of-way acquisition cost.					

**Kelowna International Airport**  
**Class "C" Estimate of Probable Costs**  
**Option 3A**



**EBA Project V13203027 - Mill Creek Relocation Pre-design**

Item	Preliminary Estimate of Probable Costs Summary				Total
1.0	Preliminaries				\$162,970
2.0	Earthworks				\$690,500
3.0	Demolition and Removal				\$26,000
4.0	Storm Sewers				\$1,767,250
5.0	Headwalls and Handrails				\$35,000
6.0	Service Roads				\$25,500
7.0	Landscaping				\$202,000
8.0	Miscellaneous				\$418,000
	<b>Sub-Total Construction Costs</b>				<b>\$3,327,220</b>
9.0	Project Contingencies				15.0% \$499,083
	<b>Total Estimated Construction Cost</b>				<b>\$3,826,303</b>
9.0	Engineering Design / Construction Inspection / Record Drawings				10.0% \$382,630
	<b>Total Estimated Project Cost Forecast - Excluding GST/HST</b>				<b>\$4,208,900</b>
<b>1.0</b>	<b>Preliminaries</b>	<b>Unit</b>	<b>Est Quantity</b>	<b>Est. Unit Price</b>	<b>Est. Total</b>
1	Mob / Demob / Temporary Facilities - Security, Barricades, Red Lights, Survey, Quality Control, etc.	lump sum	1	\$127,970.00	\$127,970
2	Erosion and Sediment Control	lump sum	1	\$20,000.00	\$20,000
3	Location of Existing Services	lump sum	1	\$5,000.00	\$5,000
4	Co-ordination with Service Authorities	lump sum	1	\$10,000.00	\$10,000
	<b>Sub-total Item 1.0</b>				<b>\$162,970</b>
<b>2.0</b>	<b>Earthworks</b>	<b>Unit</b>	<b>Est Quantity</b>	<b>Est. Unit Price</b>	<b>Est. Total</b>
1	Clearing and Grubbing	Ha	3.1	\$5,000.00	\$15,500
2	Excavation and Onsite / Offsite Disposal	cu.m	45,000	\$15.00	\$675,000
	<b>Sub-total Item 2.0</b>				<b>\$690,500</b>
<b>3.0</b>	<b>Demolition and Removal</b>	<b>Unit</b>	<b>Est Quantity</b>	<b>Est. Unit Price</b>	<b>Est. Total</b>
1	Removal of Headwalls	each	10	\$2,000.00	\$20,000
2	Removal of Culverts	each	6	\$1,000.00	\$6,000
	<b>Sub-total Item 3.0</b>				<b>\$26,000</b>

4.0	Storm Sewers	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	66.5	\$4,500.00	\$299,250
2	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
3	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
4	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	84	\$4,500.00	\$378,000
5	Supply and Install 2400 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
6	Supply and Install 1500 mm Circular Culvert	lin.m	97	\$2,500.00	\$242,500
7	Supply and Install 1500 mm Circular Culvert	lin.m	85	\$2,500.00	\$212,500
8	Geogrid	sq.m	1,400	\$5.00	\$7,000
9	Non-Woven Geotextile	sq.m	14,500	\$2.00	\$29,000
10	Cleaning of Existing Culverts	lump sum	1	\$5,000.00	\$5,000
Sub-total Item 4.0					\$1,767,250
5.0	Headwalls and Handrails	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place Concrete Headwall	each	14	\$2,000.00	\$28,000
2	Supply and Install Handrail	each	14	\$500.00	\$7,000
Sub-total Item 5.0					\$35,000
6.0	Service Roads	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place 100mm - 25 mm Granular Base	sq.m	1,700	\$5.00	\$8,500
2	Supply and Place 200mm - 75 mm Sub-Base	sq.m	1,700	\$10.00	\$17,000
Sub-total Item 6.0					\$25,500
7.0	Landscaping	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Import Topsoil (Provisional Quantity)	cu.m	1,100	\$30.00	\$33,000
2	Riparian Revegetation	lump sum	1	\$150,000.00	\$150,000
3	Hydroseeding	sq.m	19,000	\$1.00	\$19,000
Sub-total Item 7.0					\$202,000
8.0	Miscellaneous	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Sediment Trap	lump sum	1	\$120,000.00	\$120,000
2	Rip-Rap (450mm thickness)	sq.m	20,300	\$10.00	\$203,000
3	Pea Gravel (100mm thickness)	sq.m	2,000	\$5.00	\$10,000
4	Install Root Wad	each	20	\$250.00	\$5,000
5	Electrical	lump sum	1	\$15,000.00	\$15,000
6	Supply and Installation of Electrical Ducts	lim.m	400	\$100.00	\$40,000
7	Dewatering	lump sum	1	\$25,000.00	\$25,000
Sub-total Item 8.0					\$418,000
<b>Notes:</b> <ol style="list-style-type: none"> <li>Cost estimate is for planning &amp; budgeting purposes only, and does not constitute a guarantee on the part of Tetra Tech. Actual costs will be determined by the tendering and construction processes.</li> <li>Costs do not include GST/HST.</li> <li>Costs do not include right-of-way acquisition cost.</li> </ol>					

**Kelowna International Airport**  
**Class "C" Estimate of Probable Costs**  
**Option 3B**



**EBA Project V13203027 - Mill Creek Relocation Pre-design**

Item	Preliminary Estimate of Probable Costs Summary				Total
1.0	Preliminaries				\$263,470
2.0	Earthworks				\$2,978,000
3.0	Demolition and Removal				\$26,000
4.0	Storm Sewers				\$1,767,250
5.0	Headwalls and Handrails				\$35,000
6.0	Service Roads				\$25,500
7.0	Landscaping				\$277,000
8.0	Miscellaneous				\$568,000
Sub-Total Construction Costs					\$5,940,220
9.0	Project Contingencies 15.0%				\$891,033
Total Estimated Construction Cost					\$6,831,253
10.0	Engineering Design / Construction Inspection / Record Drawings 10.0%				\$683,125
Total Estimated Project Cost Forecast - Excluding GST/HST					\$7,514,400
1.0	Preliminaries	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Mob / Demob / Temporary Facilities - Security, Barricades, Red Lights, Survey, Quality Control, etc.	lump sum	1	\$228,470.00	\$228,470
2	Erosion and Sediment Control	lump sum	1	\$20,000.00	\$20,000
3	Location of Existing Services	lump sum	1	\$5,000.00	\$5,000
4	Co-ordination with Service Authorities	lump sum	1	\$10,000.00	\$10,000
Sub-total Item 1.0					\$263,470
2.0	Earthworks	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Clearing and Grubbing	Ha	10.6	\$5,000.00	\$53,000
2	Excavation and Onsite / Offsite Disposal	cu.m	195,000	\$15.00	\$2,925,000
Sub-total Item 2.0					\$2,978,000
3.0	Demolition and Removal	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Removal of Headwalls	each	10	\$2,000.00	\$20,000
2	Removal of Culverts	each	6	\$1,000.00	\$6,000
Sub-total Item 3.0					\$26,000

4.0	Storm Sewers	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	66.5	\$4,500.00	\$299,250
2	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
3	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
4	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	84	\$4,500.00	\$378,000
5	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
6	Supply and Install 1500 mm Circular Culvert	lin.m	97	\$2,500.00	\$242,500
7	Supply and Install 1500 mm Circular Culvert	lin.m	85	\$2,500.00	\$212,500
8	Geogrid	sq.m	1,400	\$5.00	\$7,000
9	Non-Woven Geotextile	sq.m	14,500	\$2.00	\$29,000
10	Cleaning of Existing Culverts	lump sum	1	\$5,000.00	\$5,000
Sub-total Item 4.0					\$1,767,250
5.0	Headwalls and Handrails	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place Concrete Headwall	each	14	\$2,000.00	\$28,000
2	Supply and Install Handrail	each	14	\$500.00	\$7,000
Sub-total Item 5.0					\$35,000
6.0	Service Roads	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place 100mm - 25 mm Granular Base	sq.m	1,700	\$5.00	\$8,500
2	Supply and Place 200mm - 75 mm Sub-Base	sq.m	1,700	\$10.00	\$17,000
Sub-total Item 6.0					\$25,500
7.0	Landscaping	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Import Topsoil (Provisional Quantity)	cu.m	1,100	\$30.00	\$33,000
2	Riparian Revegetation	lump sum	1	\$150,000.00	\$150,000
3	Hydroseeding	sq.m	94,000	\$1.00	\$94,000
Sub-total Item 7.0					\$277,000
8.0	Miscellaneous	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Control Structure	lump sum	1	\$150,000.00	\$150,000
2	Sediment Trap	lump sum	1	\$120,000.00	\$120,000
3	Rip-Rap (450mm thickness)	sq.m	20,300	\$10.00	\$203,000
4	Pea Gravel (100mm thickness)	sq.m	2,000	\$5.00	\$10,000
5	Install Root Wad	each	20	\$250.00	\$5,000
6	Electrical	lump sum	1	\$15,000.00	\$15,000
7	Supply and Installation of Electrical Ducts	lin.m	400	\$100.00	\$40,000
8	Dewatering	lump sum	1	\$25,000.00	\$25,000
Sub-total Item 8.0					\$568,000
Notes:					
1 Cost estimate is for planning & budgeting purposes only, and does not constitute a guarantee on the part of Tetra Tech. Actual costs will be determined by the tendering and construction processes.					
2 Costs do not include GST/HST.					
3 Costs do not include right-of-way acquisition cost.					

**Kelowna International Airport**  
**Class "C" Estimate of Probable Costs**  
**Option 4**



**EBA Project V13203027 - Mill Creek Relocation Pre-design**

Item	Preliminary Estimate of Probable Costs Summary				Total
1.0	Preliminaries				\$234,238
2.0	Earthworks				\$1,960,000
3.0	Demolition and Removal				\$14,000
4.0	Storm Sewers				\$2,051,950
5.0	Headwalls and Handrails				\$19,000
6.0	Service Roads				\$168,000
7.0	Landscaping				\$528,000
8.0	Miscellaneous				\$205,000
Sub-Total Construction Costs					\$5,180,188
9.0	Project Contingencies 15.0%				\$777,028
Total Estimated Construction Cost					\$5,957,216
10.0	Engineering Design / Construction Inspection / Record Drawings 10.0%				\$595,722
Total Estimated Project Cost Forecast - Excluding GST/HST					\$6,552,900
1.0	Preliminaries	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Mob / Demob / Temporary Facilities - Security, Barricades, Red Lights, Survey, Quality Control, etc.	lump sum	1	\$199,238.00	\$199,238
2	Erosion and Sediment Control	lump sum	1	\$20,000.00	\$20,000
3	Location of Existing Services	lump sum	1	\$5,000.00	\$5,000
4	Co-ordination with Service Authorities	lump sum	1	\$10,000.00	\$10,000
Sub-total Item 1.0					\$234,238
2.0	Earthworks	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Clearing and Grubbing	Ha	11.0	\$5,000.00	\$55,000
2	Excavation and Onsite / Offsite Disposal	cu.m	127,000	\$15.00	\$1,905,000
Sub-total Item 2.0					\$1,960,000
3.0	Demolition and Removal	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Removal of Headwalls	each	4	\$2,000.00	\$8,000
2	Removal of Culverts	each	6	\$1,000.00	\$6,000
Sub-total Item 3.0					\$14,000

4.0	Storm Sewers	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	66.5	\$4,500.00	\$299,250
2	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
3	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
4	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	84	\$4,500.00	\$378,000
5	Supply and Install 3000 x 2400 mm Box Culvert	lin.m	44	\$4,500.00	\$198,000
6	Supply and Install 1500 mm Circular Culvert	lin.m	97	\$2,500.00	\$242,500
7	Supply and Install 1500 mm Circular Culvert	lin.m	85	\$2,500.00	\$212,500
8	Supply and Install 1500 mm Circular Culvert	lin.m	85	\$2,500.00	\$212,500
9	Geogrid	sq.m	1,400	\$5.00	\$9,000
10	Non-Woven Geotextile	sq.m	49,600	\$2.00	\$99,200
11	Cleaning of Existing Culverts	lump sum	1	\$5,000.00	\$5,000
Sub-total Item 4.0					\$2,051,950
5.0	Headwalls and Handrails	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place Concrete Headwall	each	6	\$2,000.00	\$12,000
2	Supply and Install Handrail	each	14	\$500.00	\$7,000
Sub-total Item 5.0					\$19,000
6.0	Service Roads	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Supply and Place 100mm - 25 mm Granular Base	sq.m	11,200	\$5.00	\$56,000
2	Supply and Place 200mm - 75 mm Sub-Base	sq.m	11,200	\$10.00	\$112,000
Sub-total Item 6.0					\$168,000
7.0	Landscaping	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Import Topsoil (Provisional Quantity)	cu.m	9,400	\$30.00	\$282,000
2	Riparian Revegetation	lump sum	1	\$150,000.00	\$150,000
3	Hydroseeding	sq.m	96,000	\$1.00	\$96,000
Sub-total Item 7.0					\$528,000
8.0	Miscellaneous	Unit	Est Quantity	Est. Unit Price	Est. Total
1	Sediment Trap	lump sum	1	\$120,000.00	\$120,000
2	Install Root Wad	each	20	\$250.00	\$5,000
3	Electrical	lump sum	1	\$15,000.00	\$15,000
4	Supply and Installation of Electrical Ducts	lin.m	400	\$100.00	\$40,000
5	Dewatering	lump sum	1	\$25,000.00	\$25,000
Sub-total Item 8.0					\$205,000
Notes:					
1 Cost estimate is for planning & budgeting purposes only, and does not constitute a guarantee on the part of Tetra Tech. Actual costs will be determined by the tendering and construction processes.					
2 Costs do not include GST/HST.					
3 Costs do not include right-of-way acquisition cost.					

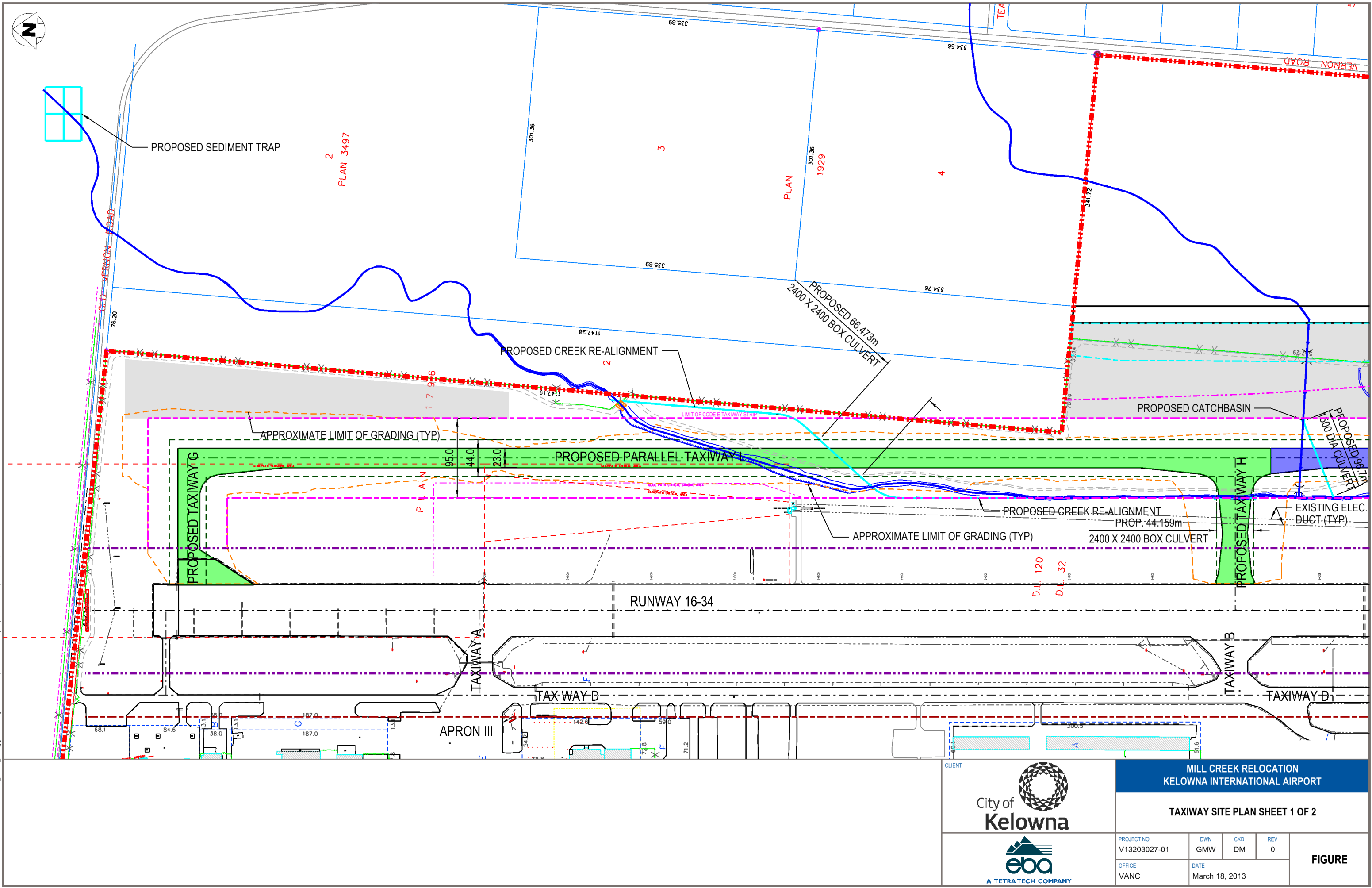
# APPENDIX B

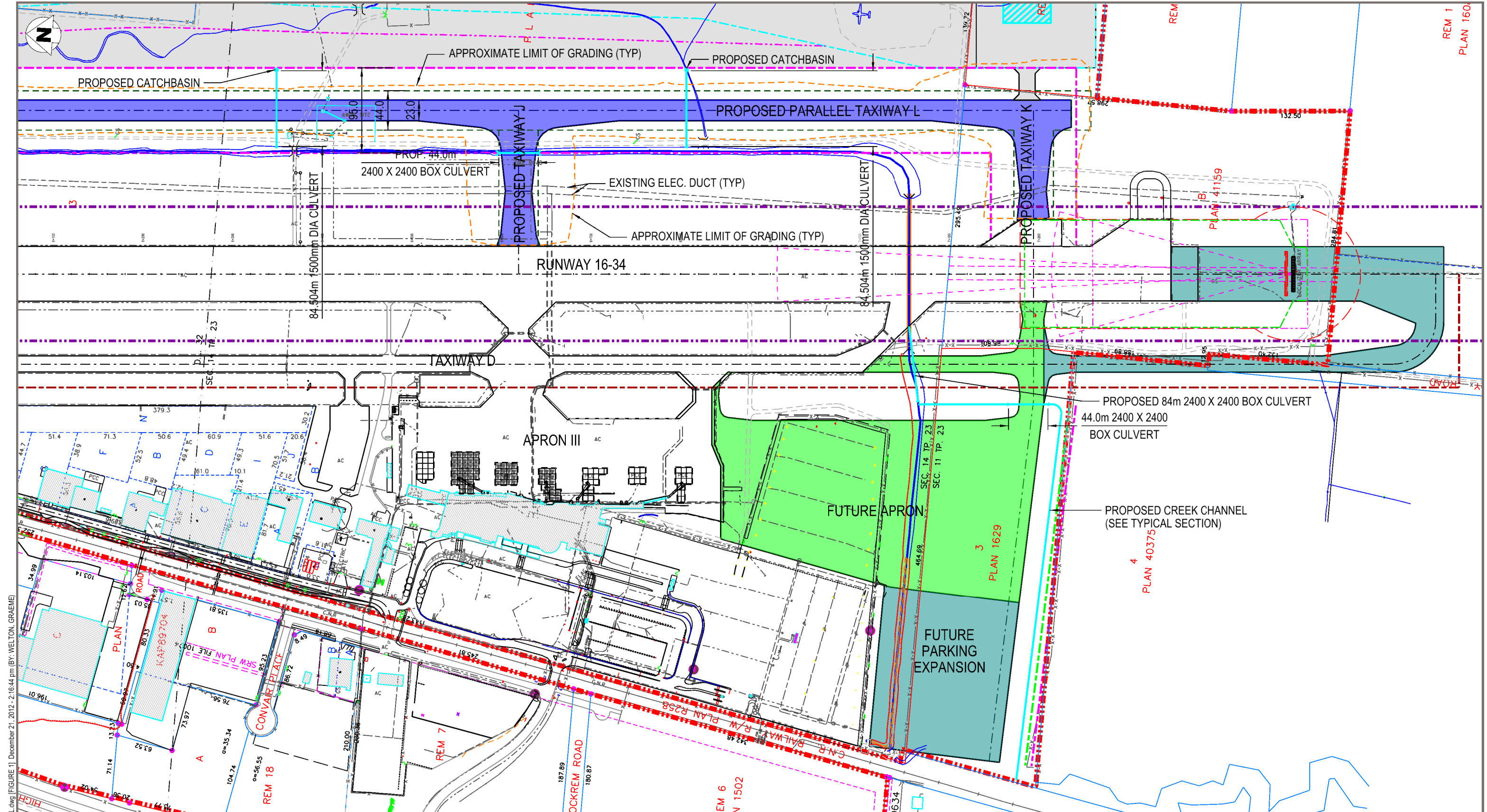
## TAXIWAY PLANS AND PROFILES

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K:\V\13203027\31 - mill creek\EBATB FIG. 11x17\_L.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (BY: WELTON, GRAEME)

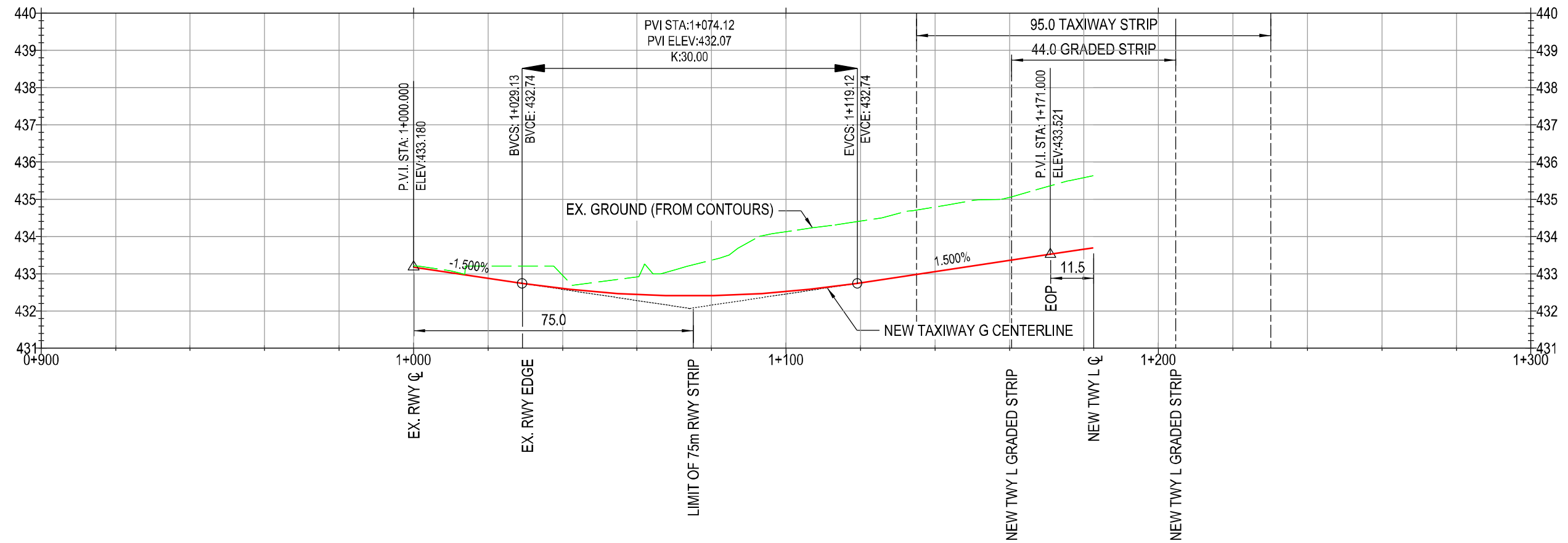




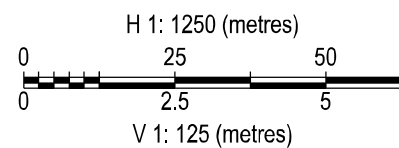
K:\V\13203027-01 - mill creek\EBATB FIG. 11x17.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (BY: WELTON, GRAEME)

 City of Kelowna		MILL CREEK RELOCATION KELOWNA INTERNATIONAL AIRPORT			
		TAXIWAY PLAN SHEET 2 OF 2			
PROJECT NO. V13203027-01	DWN GMW	CKD DM	REV 0	FIGURE	
OFFICE VANC	DATE March 18, 2013				

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (By: WELTON, GRAEME)



**NEW TAXIWAY G PROFILE**



CLIENT



**MILL CREEK RELOCATION  
KELOWNA INTERNATIONAL AIRPORT**

**NEW TAXIWAY G PROFILE**

PROJECT NO.  
V13203027-01

DWN  
GMW

CKD  
DM

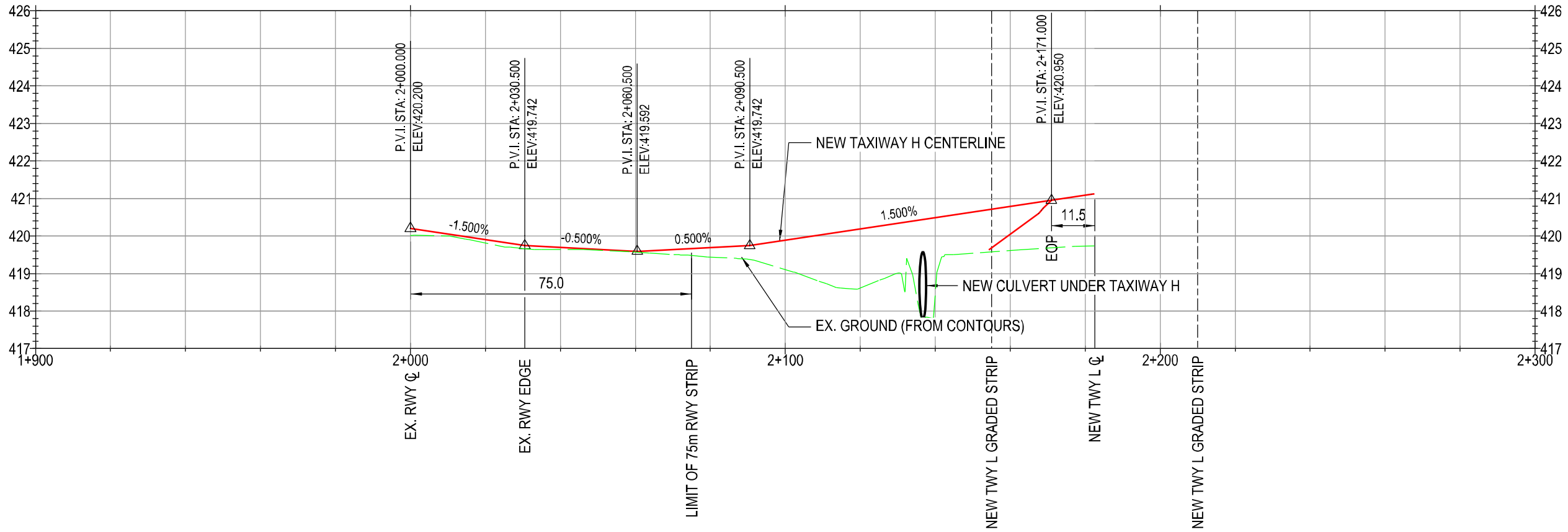
REV  
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OFFICE  
VANC

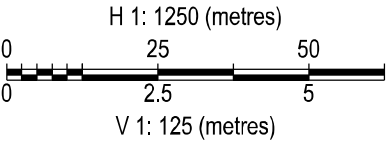
DATE  
January 30, 2013

**FIGURE**

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_L.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (By: WELTON, GRAEME)



NEW TAXIWAY H PROFILE



CLIENT



MILL CREEK RELOCATION  
KELOWNA INTERNATIONAL AIRPORT

NEW TAXIWAY H PROFILE

PROJECT NO.  
V13203027-01

DWN  
GMW

CKD  
DM

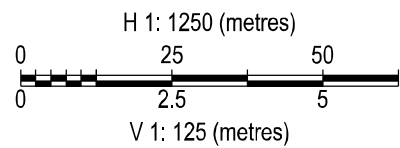
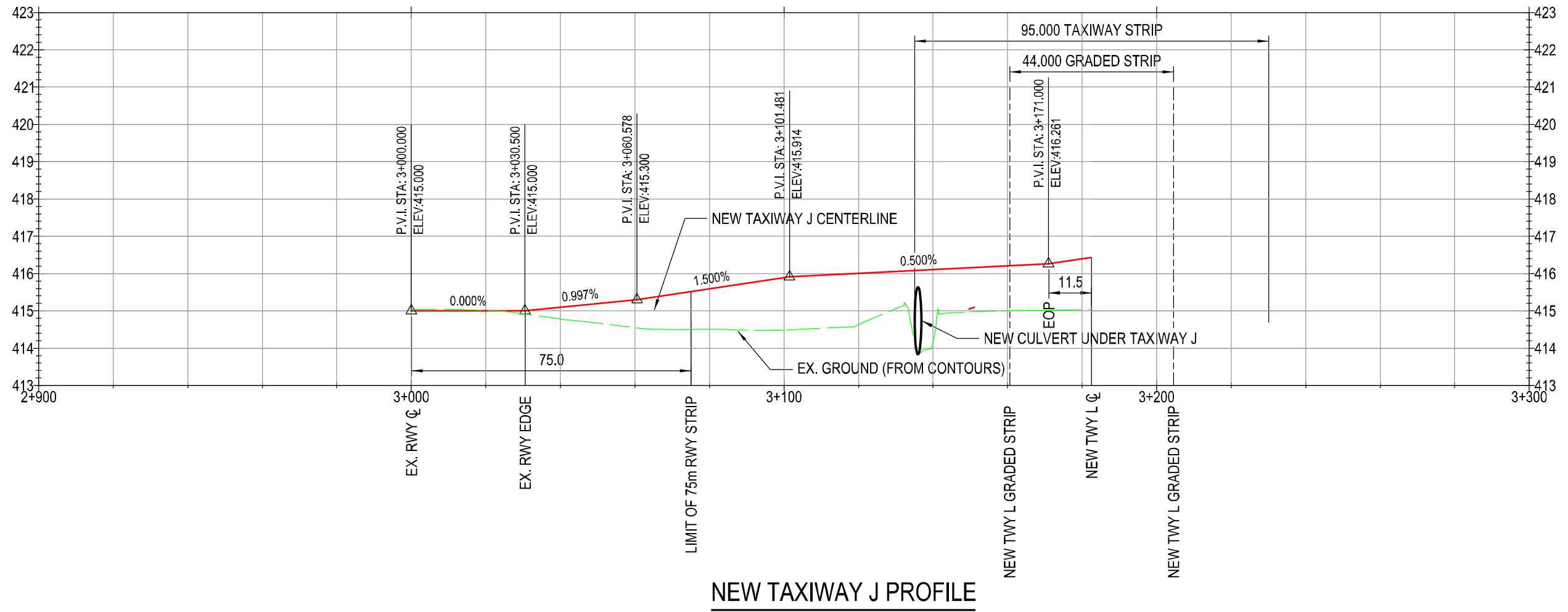
REV  
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OFFICE  
VANC

DATE  
January 30, 2013

FIGURE

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_L.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (By: WELTON, GRAEME)



CLIENT



MILL CREEK RELOCATION  
KELOWNA INTERNATIONAL AIRPORT

NEW TAXIWAY J PROFILE

PROJECT NO.  
V13203027-01

DWN  
GMW

CKD  
DM

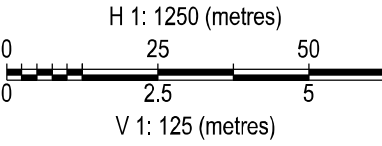
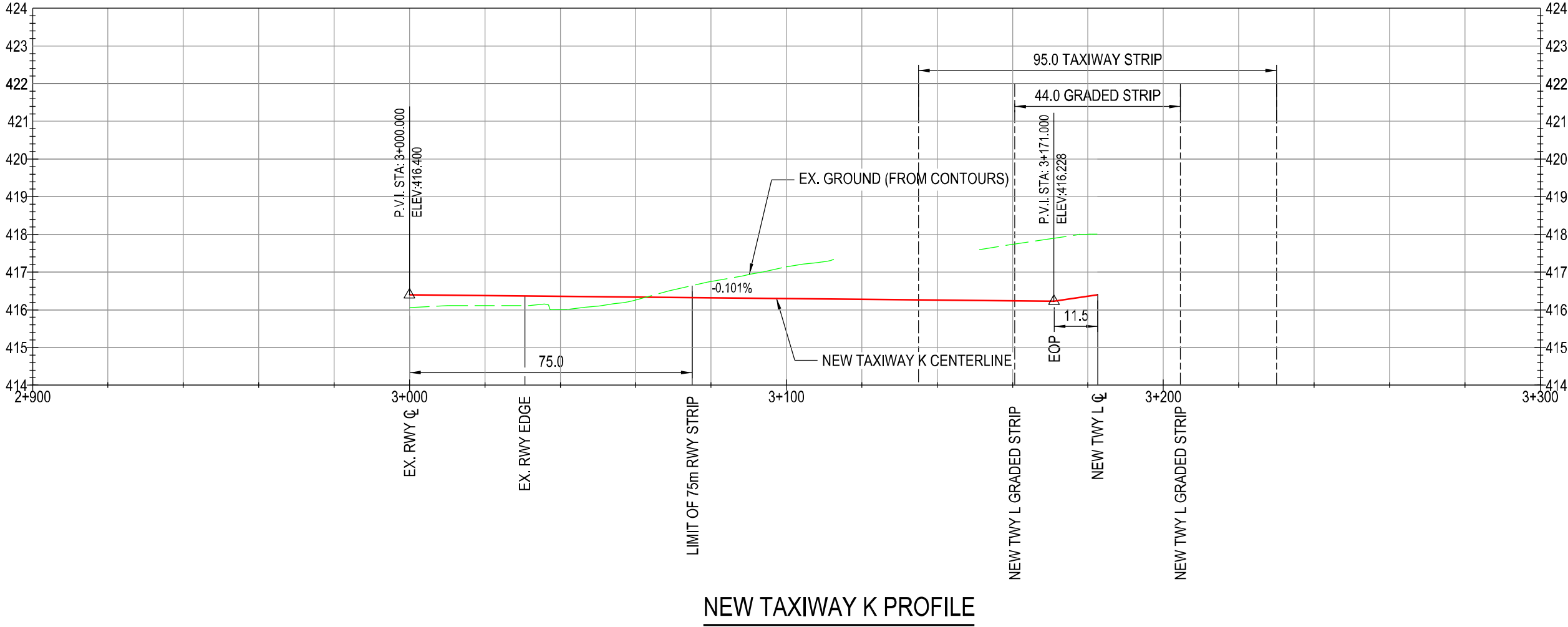
REV  
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OFFICE  
VANC

DATE  
January 30, 2013

FIGURE

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (By: WELTON, GRAEME)



CLIENT



MILL CREEK RELOCATION  
KELOWNA INTERNATIONAL AIRPORT

NEW TAXIWAY K PROFILE

PROJECT NO.  
V13203027-01

DWN  
GMW

CKD  
DM

REV  
0

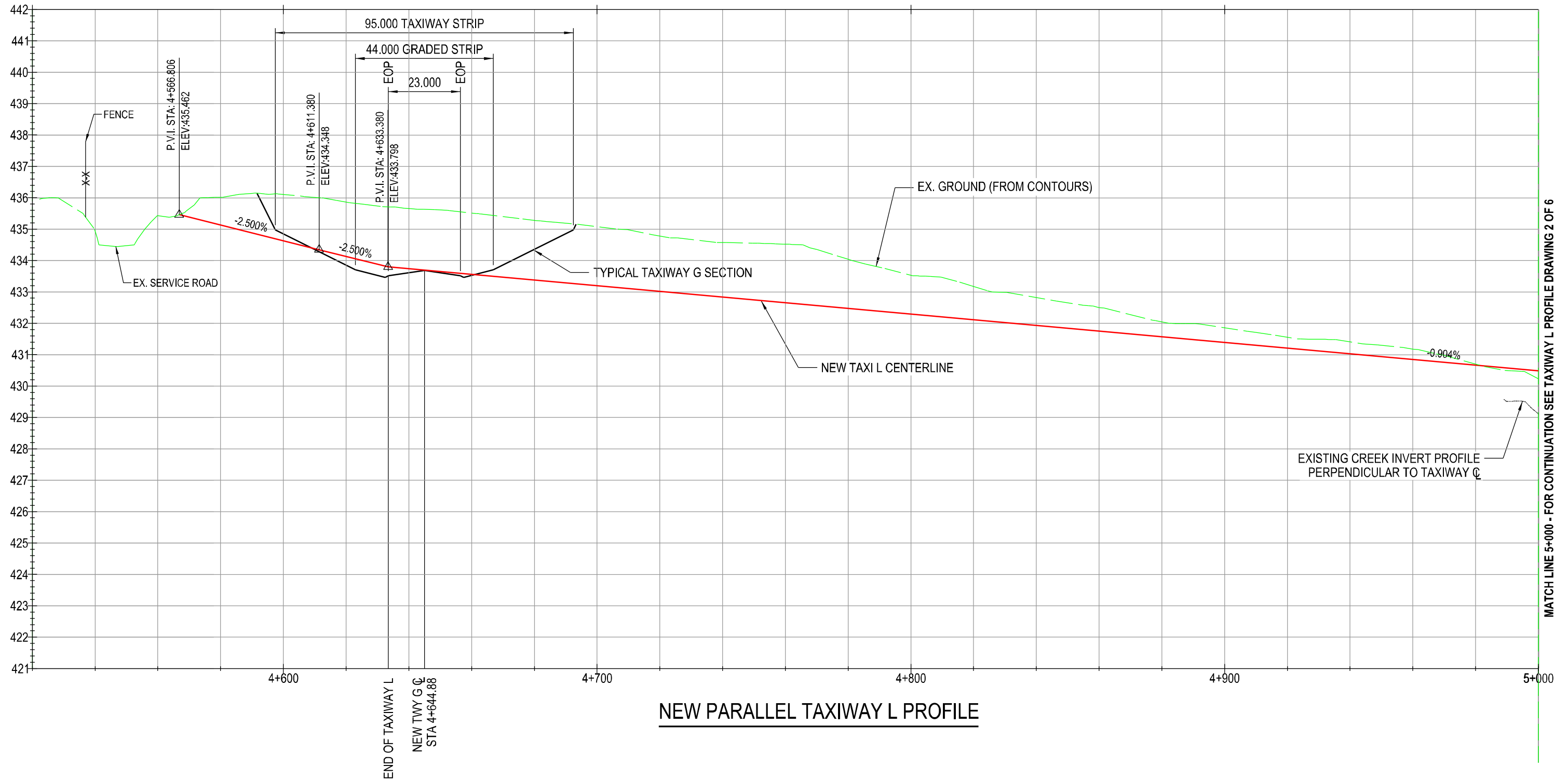
OFFICE  
VANC

DATE  
January 30, 2013

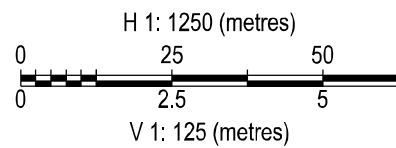
FIGURE





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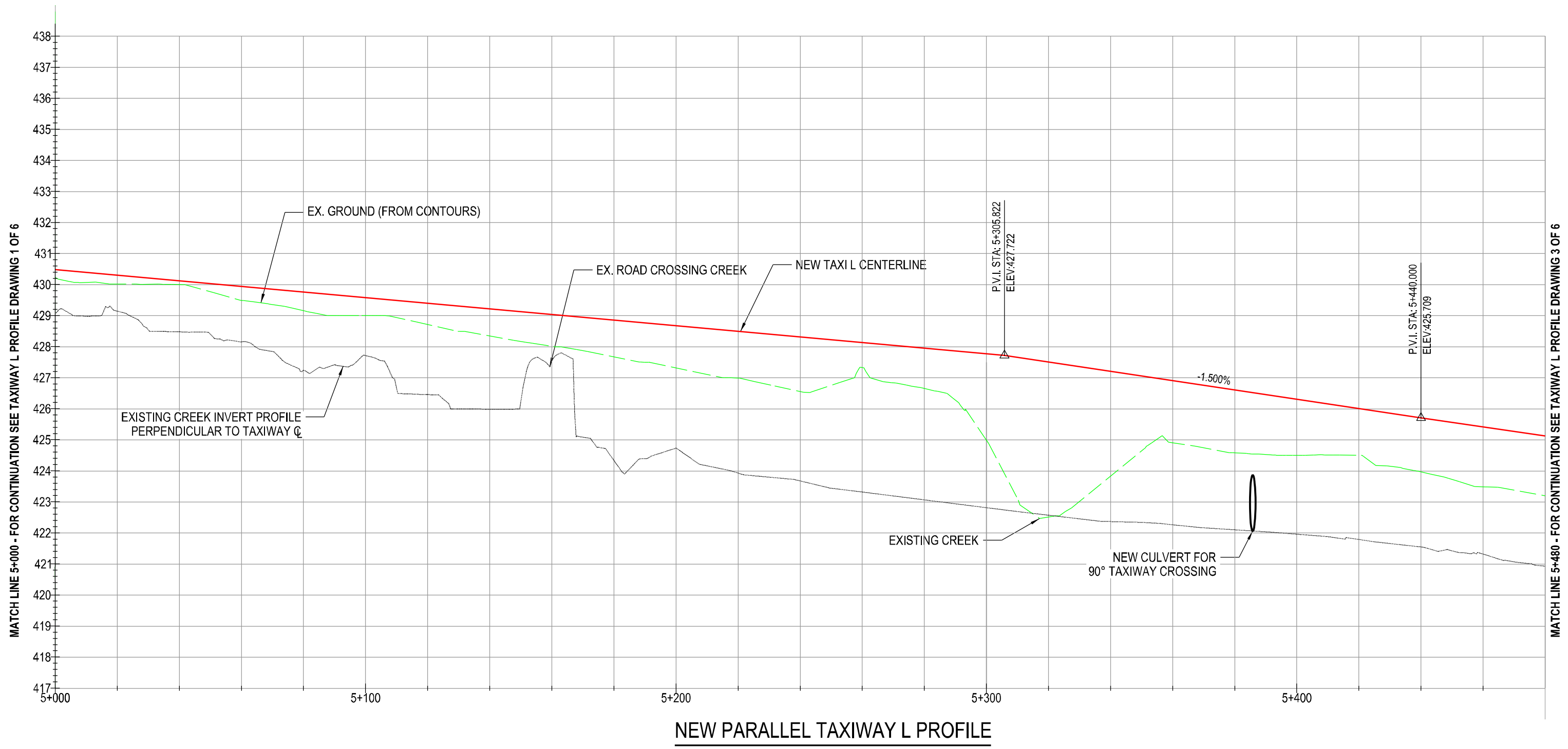


NOTE: NEW PARALLEL TAXIWAY L STATIONING MATCHES EXISTING RUNWAY STATIONING

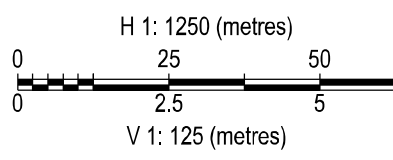


CLIENT	<div><div>City of <b>Kelowna</b></div></div>	MILL CREEK RELOCATION KELOWNA INTERNATIONAL AIRPORT				
		NEW PARALLEL TAXIWAY L PROFILE SHEET 1 OF 6				
<div><div>A TETRA TECH COMPANY</div></div>	PROJECT NO. V13203027-01	DWN GMW	CKD DM	REV 0	FIGURE	
	OFFICE VANC	DATE January 30, 2013				

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_L.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (BY: WELTON, GRAEME)



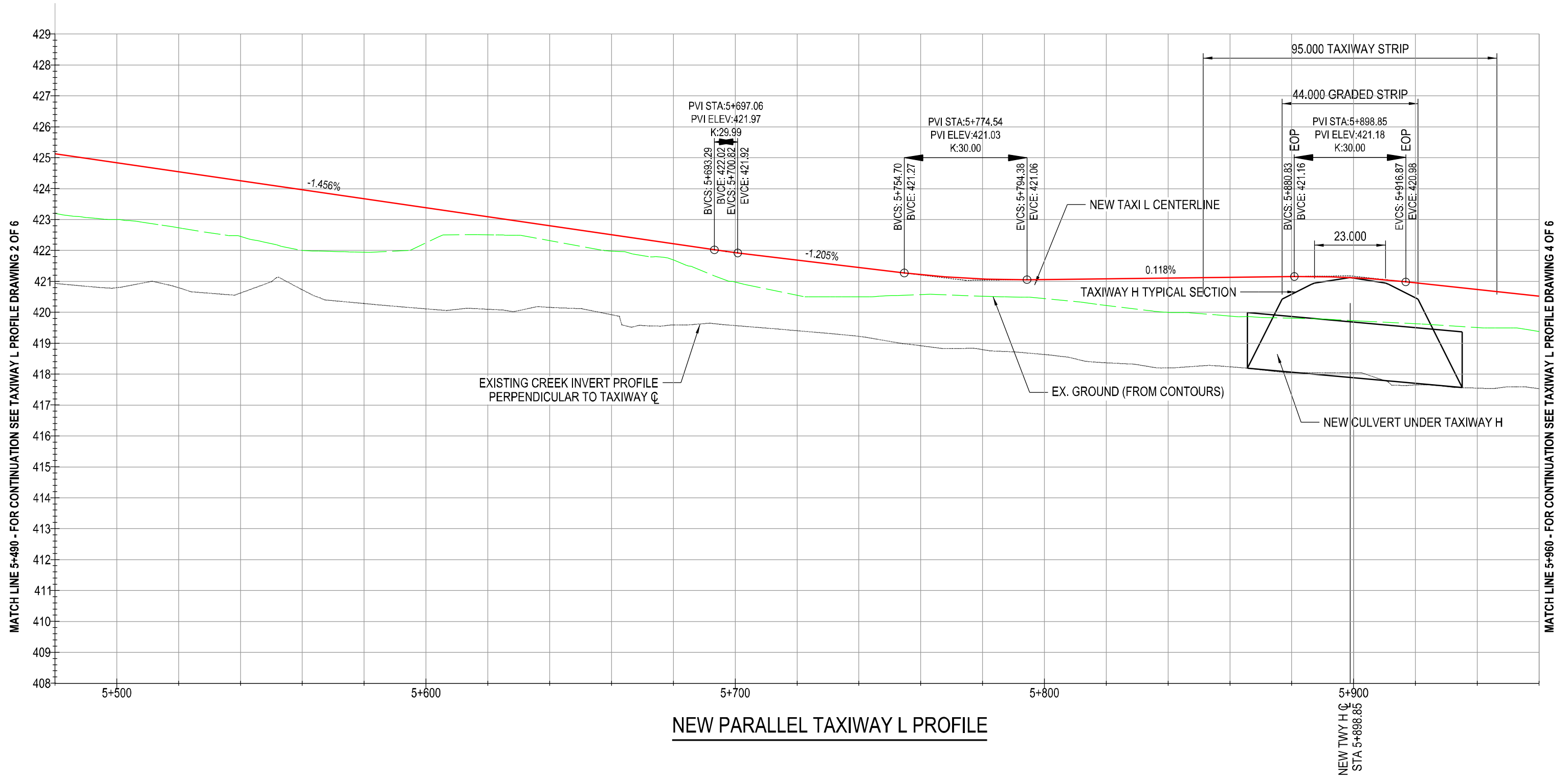
NOTE: NEW PARALLEL TAXIWAY L STATIONING MATCHES EXISTING RUNWAY STATIONING



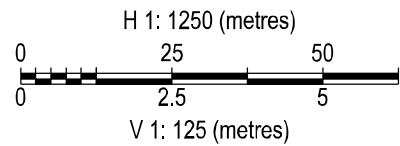
<b>CLIENT</b>  	<b>MILL CREEK RELOCATION KELOWNA INTERNATIONAL AIRPORT</b>			
	<b>NEW PARALLEL TAXIWAY L PROFILE SHEET 2 OF 6</b>			
PROJECT NO. V13203027-01	DWN GMW	CKD DM	REV 0	<b>FIGURE</b>
OFFICE VANC	DATE January 30, 2013			



K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_L.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (BY: WELTON, GRAEME)



NOTE: NEW PARALLEL TAXIWAY L STATIONING MATCHES EXISTING RUNWAY STATIONING



CLIENT



MILL CREEK RELOCATION  
KELOWNA INTERNATIONAL AIRPORT

NEW PARALLEL TAXIWAY L PROFILE  
SHEET 3 OF 6

PROJECT NO.  
V13203027-01

DWN  
GMW

CKD  
DM

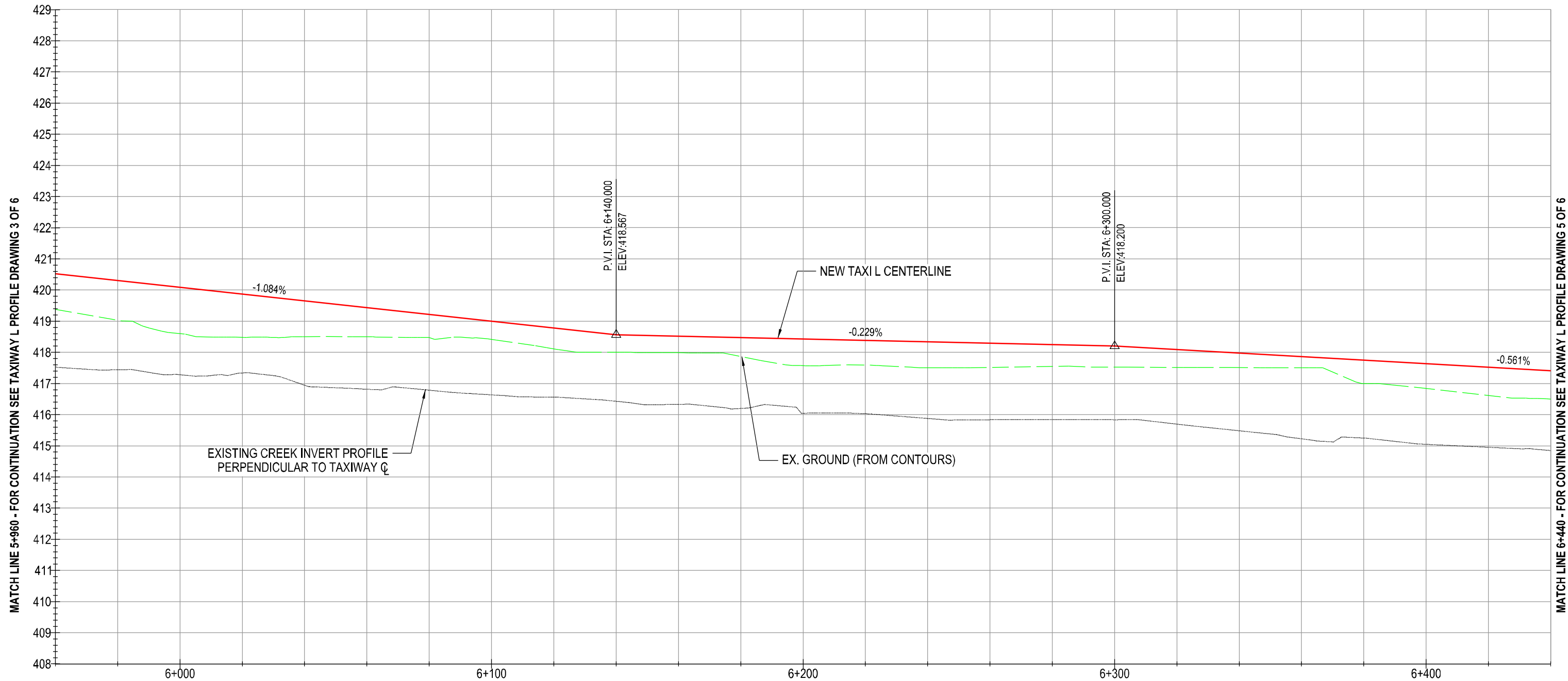
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OFFICE  
VANC

DATE  
January 30, 2013

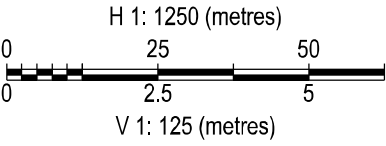
FIGURE

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_L.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (BY: WELTON, GRAEME)



NEW PARALLEL TAXIWAY L PROFILE

NOTE: NEW PARALLEL TAXIWAY L STATIONING MATCHES EXISTING RUNWAY STATIONING

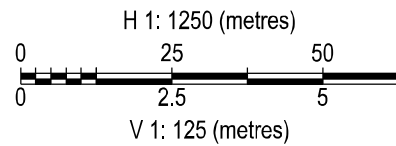


CLIENT		MILL CREEK RELOCATION KELOWNA INTERNATIONAL AIRPORT			
 		NEW PARALLEL TAXIWAY L PROFILE SHEET 4 OF 6			
		PROJECT NO. V13203027-01	DWN GMW	CKD DM	REV 0
OFFICE VANC		DATE January 30, 2013			FIGURE

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (BY: WELTON, GRAEME)



NOTE: NEW PARALLEL TAXIWAY L STATIONING MATCHES EXISTING RUNWAY STATIONING



CLIENT



MILL CREEK RELOCATION  
KELOWNA INTERNATIONAL AIRPORT

NEW PARALLEL TAXIWAY L PROFILE  
SHEET 5 OF 6

PROJECT NO.  
V13203027-01

DWN  
GMW

CKD  
DM

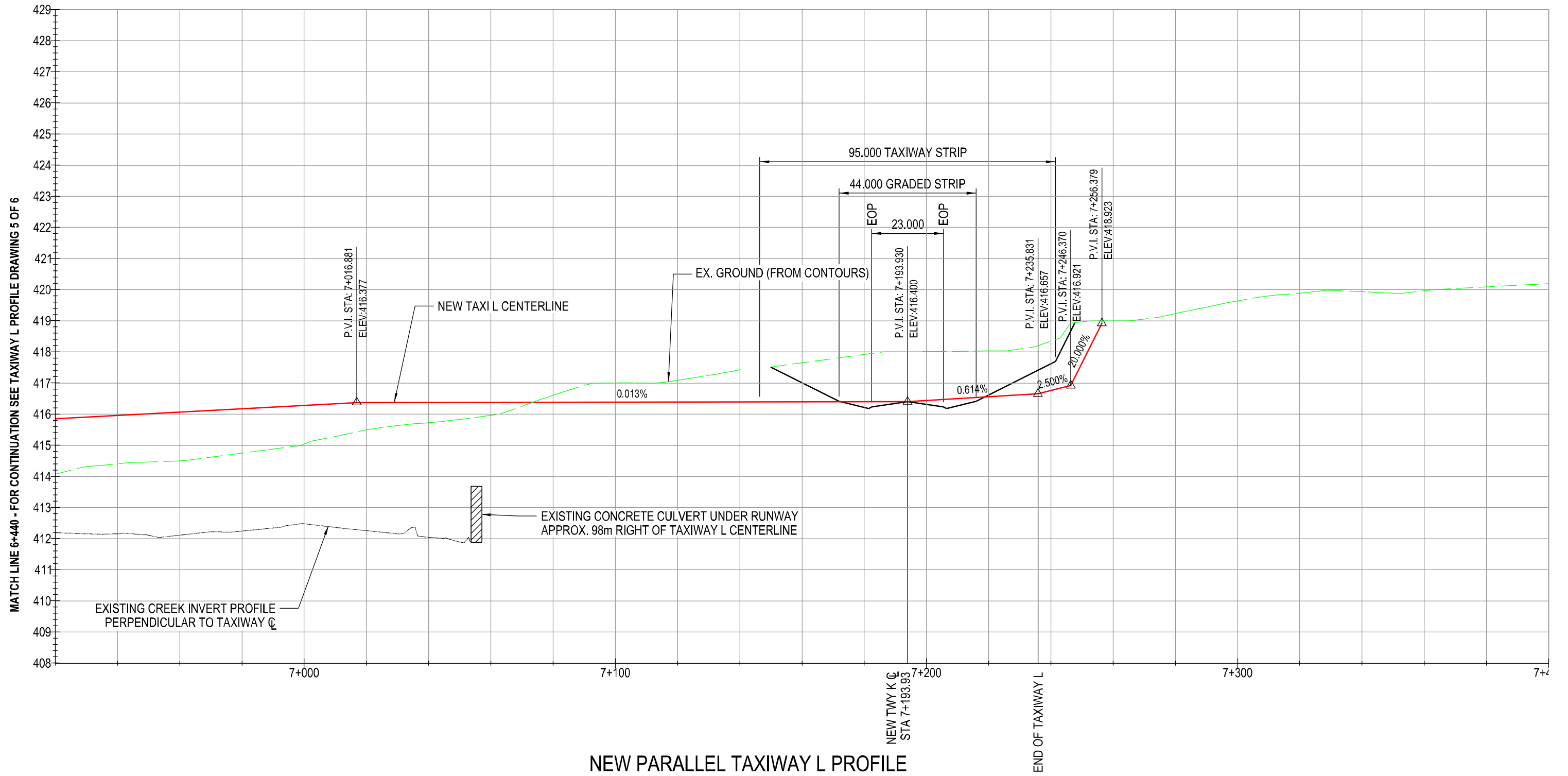
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OFFICE  
VANC

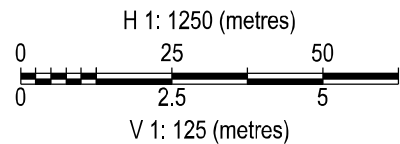
DATE  
January 30, 2013

FIGURE

K:\V13203027-01 - mill creek\EBATB FIG\_11x17\_L.dwg [FIGURE 1] December 21, 2012 - 2:16:44 pm (BY: WELTON, GRAEME)



NOTE: NEW PARALLEL TAXIWAY L STATIONING MATCHES EXISTING RUNWAY STATIONING



CLIENT



MILL CREEK RELOCATION  
KELOWNA INTERNATIONAL AIRPORT

NEW PARALLEL TAXIWAY L PROFILE  
SHEET 6 OF 6

PROJECT NO.  
V13203027-01

DWN  
GMW

CKD  
DM

REV  
0

OFFICE  
VANC

DATE  
January 30, 2013

FIGURE

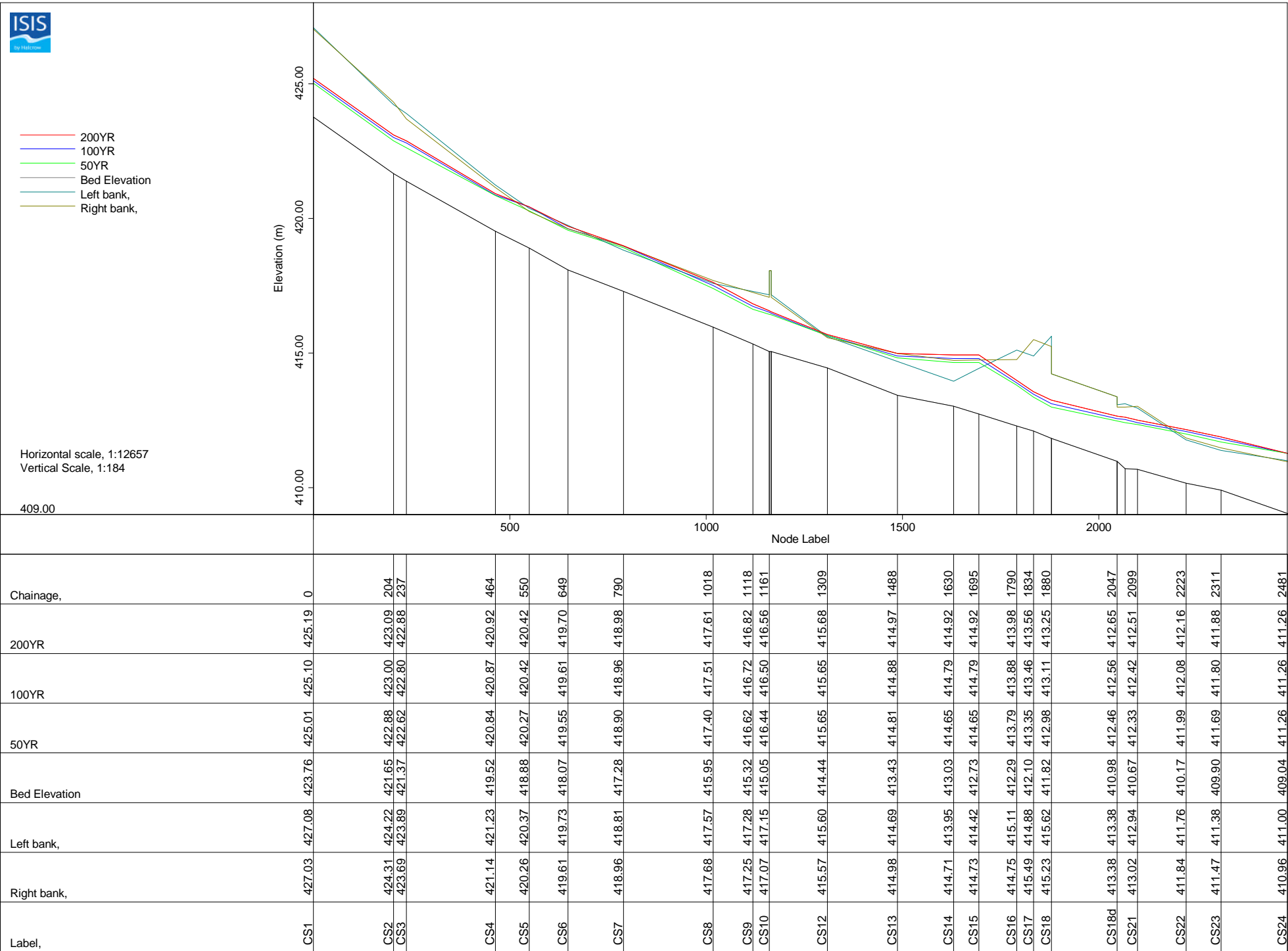
# APPENDIX C

## MODELLING RESULTS

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Mill Creek Baseline Condition  
Long Section: CS1 - CS24

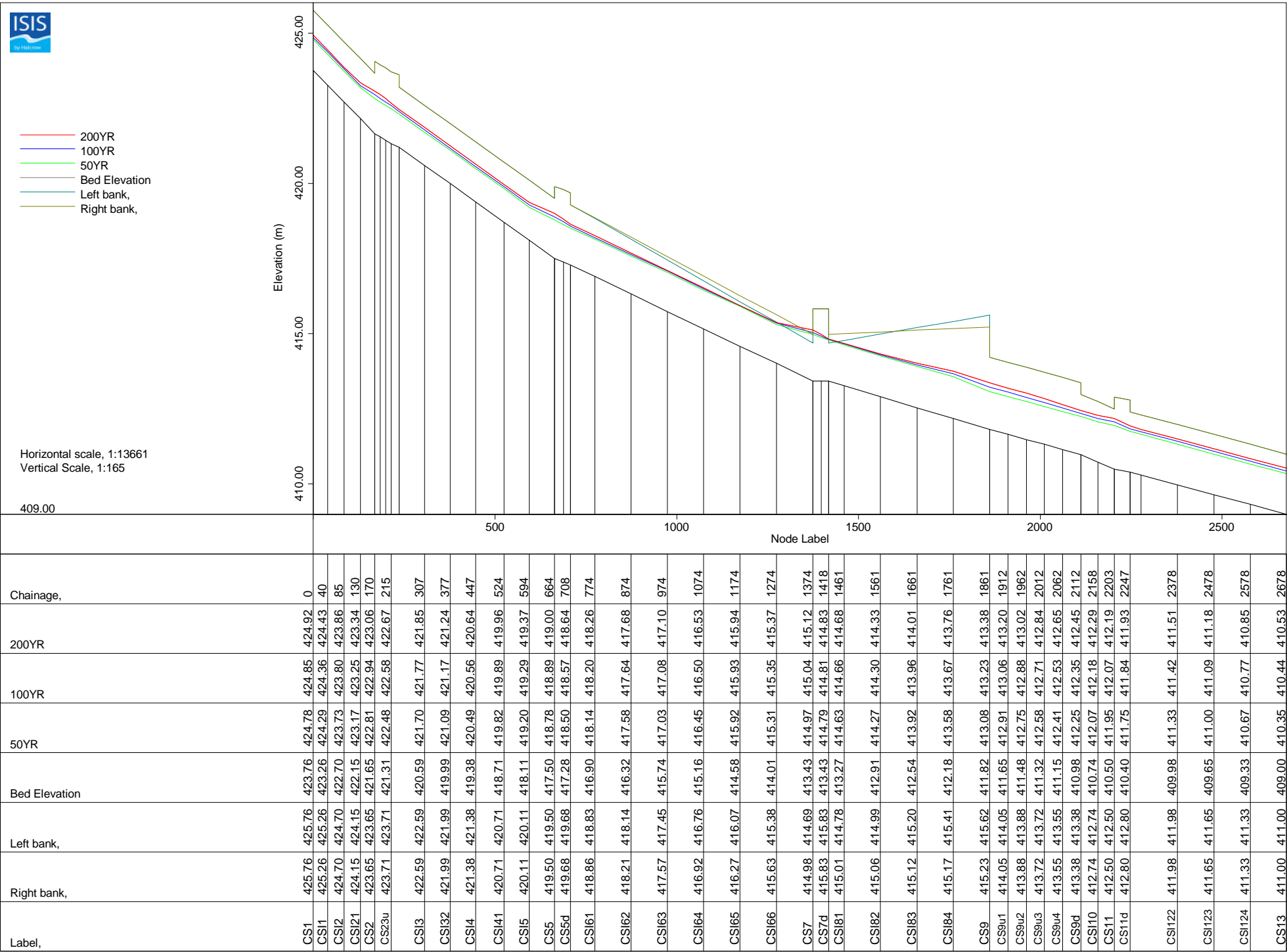
Node,: CS1



Mill Creek Post Scheme Condition

Long Section: CS1 - CS13

Node,: CS1



## Time Series: CS13 - Flow

Data file,  
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Time (h)	50YR Flow (m3/s)	100YR Flow (m3/s)	200YR Flow (m3/s)
0	3.72	3.72	3.72
1	6.83	6.03	4.02
2	8.66	6.42	4.09
3	8.82	6.43	4.11
4	8.84	6.43	4.14
5	8.83	6.43	4.17
6	8.86	6.45	4.20
7	8.87	6.48	4.22
8	8.87	6.50	4.25
9	8.93	6.53	4.29
10	8.94	6.56	4.31
11	8.94	6.60	4.34
12	9.02	6.61	4.36
13	9.02	6.63	4.37
14	9.06	6.65	4.40
15	9.08	6.68	4.43
16	9.10	6.72	4.47
17	9.32	6.76	4.56
18	9.52	7.03	4.99
19	10.12	7.49	5.58
20	10.56	7.92	6.19
21	11.27	8.64	6.61
22	11.83	9.35	7.13
23	12.47	10.05	7.69
24	13.35	11.23	8.59
25	14.19	12.02	9.70
26	14.94	12.64	10.39
27	15.70	13.20	11.18
28	16.15	13.72	11.54
29	16.29	13.83	11.62
30	16.55	14.08	11.92
31	16.71	14.29	12.07
32	16.80	14.35	12.10
33	16.81	14.36	12.11
34	16.81	14.36	12.11
35	16.79	14.37	12.11
36	17.09	14.64	12.46
37	17.41	15.02	12.81
38	17.55	15.12	12.88
39	17.62	15.24	12.95
40	17.57	15.21	12.89
41	16.80	14.50	12.01
42	16.13	13.77	11.25
43	15.42	13.02	10.55
44	14.60	11.84	9.69
45	13.61	10.87	8.91
46	12.82	10.35	8.31
47	12.11	9.78	7.64
48	11.40	9.17	6.85
49	10.51	8.53	5.53
50	9.74	7.49	4.74
51	9.26	6.91	4.54
52	9.19	6.77	4.48
53	9.14	6.73	4.45
54	9.11	6.68	4.41
55	8.98	6.65	4.39
56	9.03	6.62	4.35
57	9.02	6.58	4.31
58	8.98	6.53	4.26
59	8.93	6.49	4.23
60	8.90	6.46	4.20
61	8.88	6.44	4.17
62	8.88	6.41	4.14
63	8.82	6.38	4.11
64	8.78	6.35	4.07

Data file,

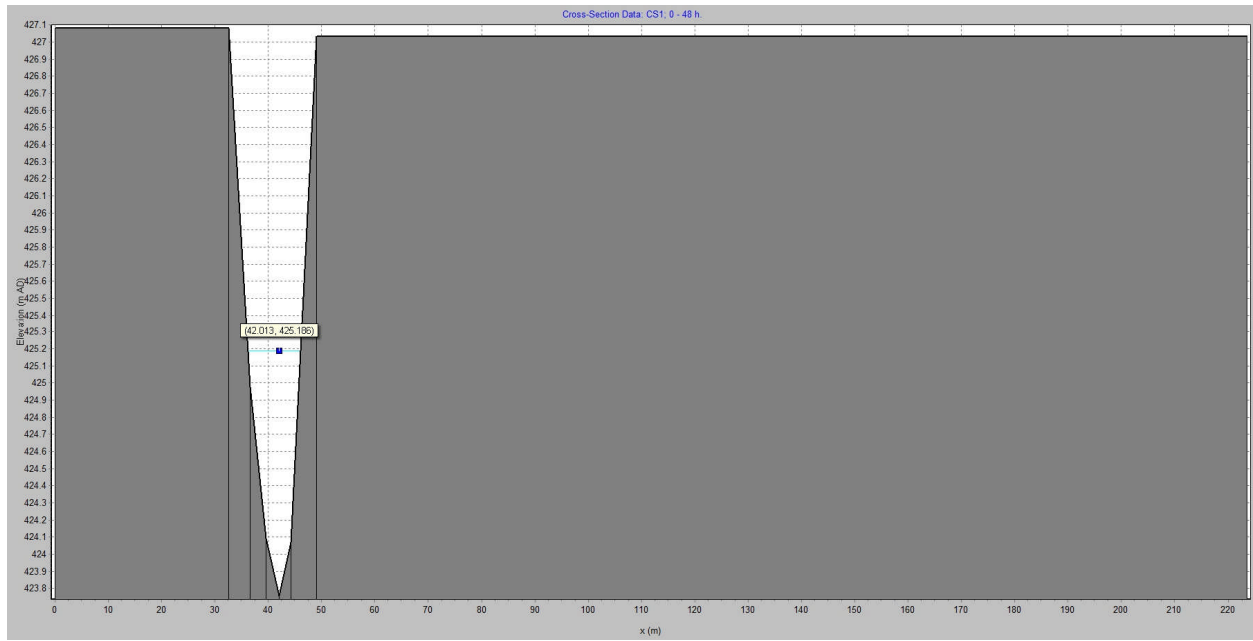
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2.00

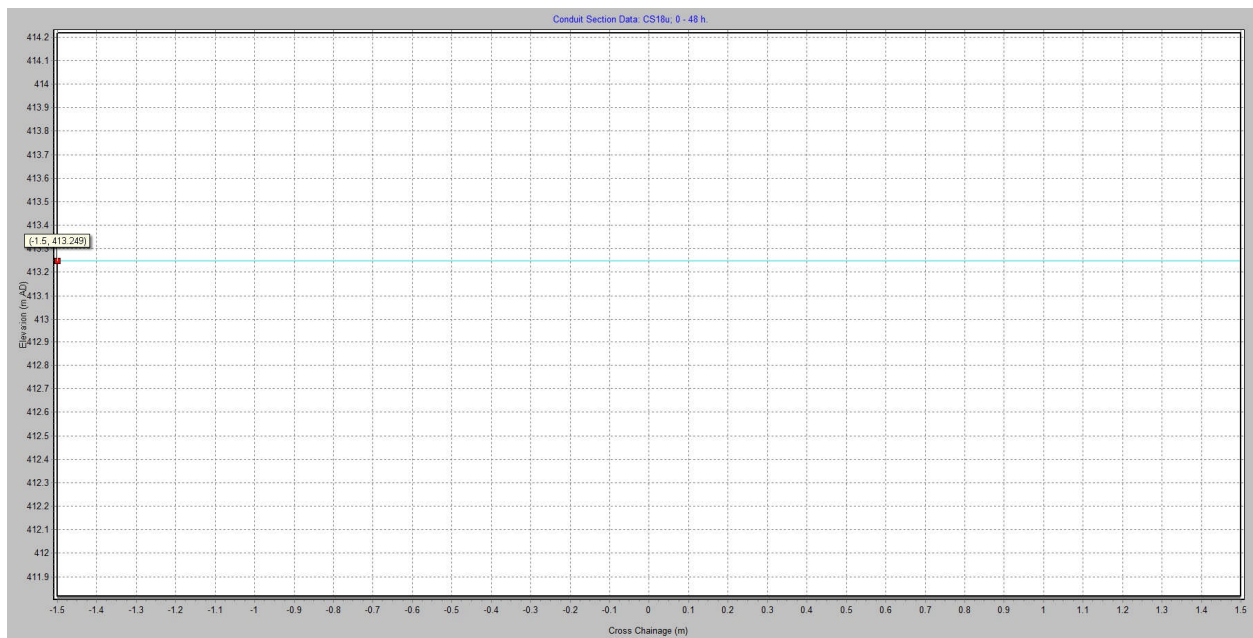


Baseline Model Maximum Water Levels (m)				
Location	Label	50 YEAR	100 YEAR	200 YEAR
	CS1	425.01	425.10	425.19
	CS2	422.88	423.00	423.09
	CS3	422.62	422.80	422.88
	CS4	420.84	420.87	420.92
	CS5	420.27	420.42	420.42
	CS6	419.55	419.61	419.70
	CS7	418.91	418.96	418.98
	CS8	417.40	417.51	417.61
	CS9	416.62	416.72	416.82
5.6m circular culvert (1.76m dia) at Mill Creek adjacent the runway	CS10u	416.44	416.51	416.56
	CS10	416.44	416.51	416.56
	CS10d	416.41	416.48	416.52
	CS11	416.41	416.48	416.52
	CS12	415.65	415.66	415.68
	CS13	414.81	414.88	414.97
	CS14	414.65	414.79	414.92
	CS15	414.65	414.79	414.92
	CS16	413.79	413.88	413.98
	CS17	413.35	413.46	413.57
167m single 3.0m x 2.4m box culvert under runway	CS18u	412.98	413.11	413.25
	CS18	412.98	413.11	413.25
	CS18d	412.46	412.56	412.65
	CS19	412.46	412.56	412.65
	CS20	412.42	412.52	412.61
	CS21	412.33	412.42	412.51
	CS22	411.99	412.08	412.16
	CS23	411.69	411.80	411.88
	CS24	411.26	411.26	411.26

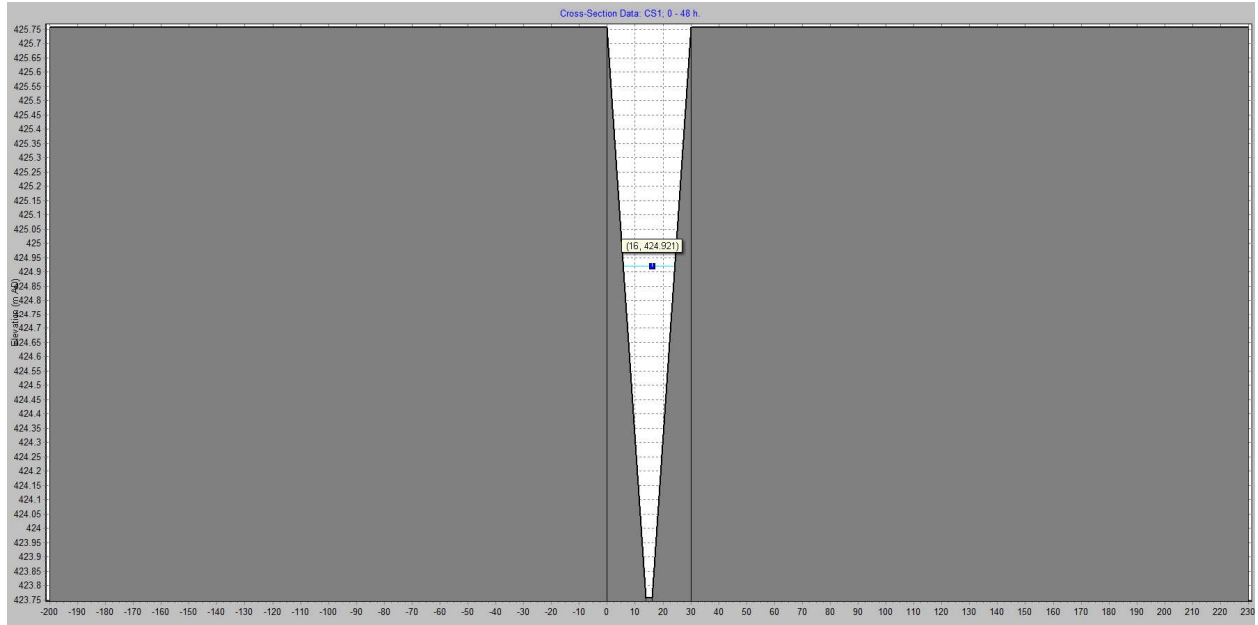
Post Construction Modelled Maximum Water Levels (m)				
Location	Label	50 YEAR	100 YEAR	200 YEAR
	CS1	424.78	424.85	424.92
	CS11	424.29	424.36	424.43
	CS12	423.73	423.80	423.86
	CS121	423.17	423.25	423.34
	CS2	422.82	422.94	423.06
66.50m Single 2.4m x 2.4 m box culvert	CS2u	422.82	422.94	423.06
	CS2d	422.30	422.38	422.45
	CS3	422.30	422.38	422.45
	CS13	421.70	421.78	421.85
	CS132	421.09	421.17	421.24
	CS14	420.49	420.56	420.64
	CS141	419.82	419.89	419.96
	CS15	419.20	419.29	419.37
	CS5	418.78	418.89	419.00
44m Single 2.4m x 2.4m box culvert	CS5u	418.78	418.89	419.00
	CS5d	418.50	418.57	418.64
	CS6	418.50	418.57	418.64
	CS161	418.14	418.21	418.26
	CS162	417.58	417.64	417.68
	CS163	417.03	417.08	417.10
	CS164	416.45	416.50	416.53
	CS165	415.92	415.93	415.94
	CS166	415.31	415.35	415.38
	CS7	414.97	415.04	415.12
44m Single 2.4m x 2.4m box culvert	CS7u	414.97	415.04	415.12
	CS7d	414.79	414.81	414.83
	CS8	414.79	414.81	414.83
	CS181	414.63	414.66	414.68
	CS182	414.27	414.30	414.33
	CS183	413.92	413.96	414.01
	CS184	413.58	413.67	413.76
	CS9	413.08	413.23	413.38
84m extension to existing 167m single 3.0m x 2.4m box culvert	CS9u	413.08	413.23	413.38
	CS9d	412.25	412.35	412.45
	CS10	412.25	412.35	412.29
	CS110	412.07	412.18	412.19
44m Single 2.4m x 2.4m box culvert	CS11u	411.95	412.07	412.19
	CS11	411.95	412.07	411.93
	CS11d	411.75	411.84	411.93
	CS12	411.75	411.84	411.83
	CS1121	411.65	411.74	411.51
	CS1122	411.33	411.42	411.18
	CS1123	411.00	411.09	410.85
	CS1124	410.68	410.77	410.53
	CS13	410.35	410.44	410.53



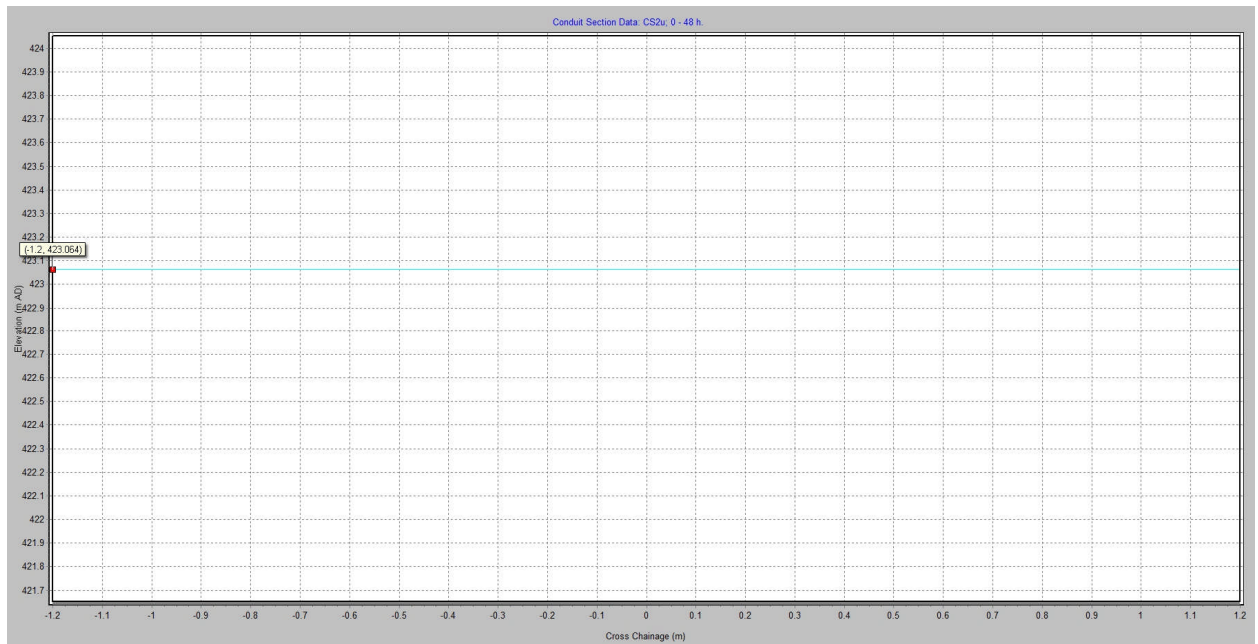
Baseline Condition - Model Node CS1 – Upstream Extent



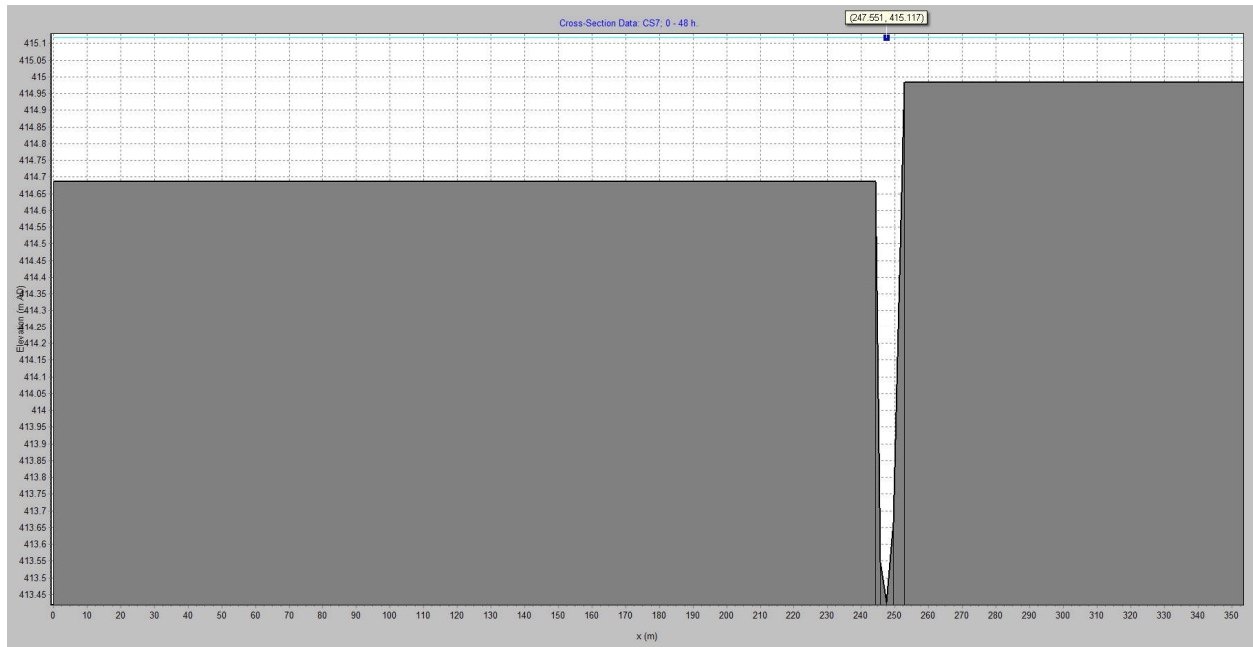
Baseline Condition - Model Node CS18u – 3.0m x 2.4m Box Culvert under runway.



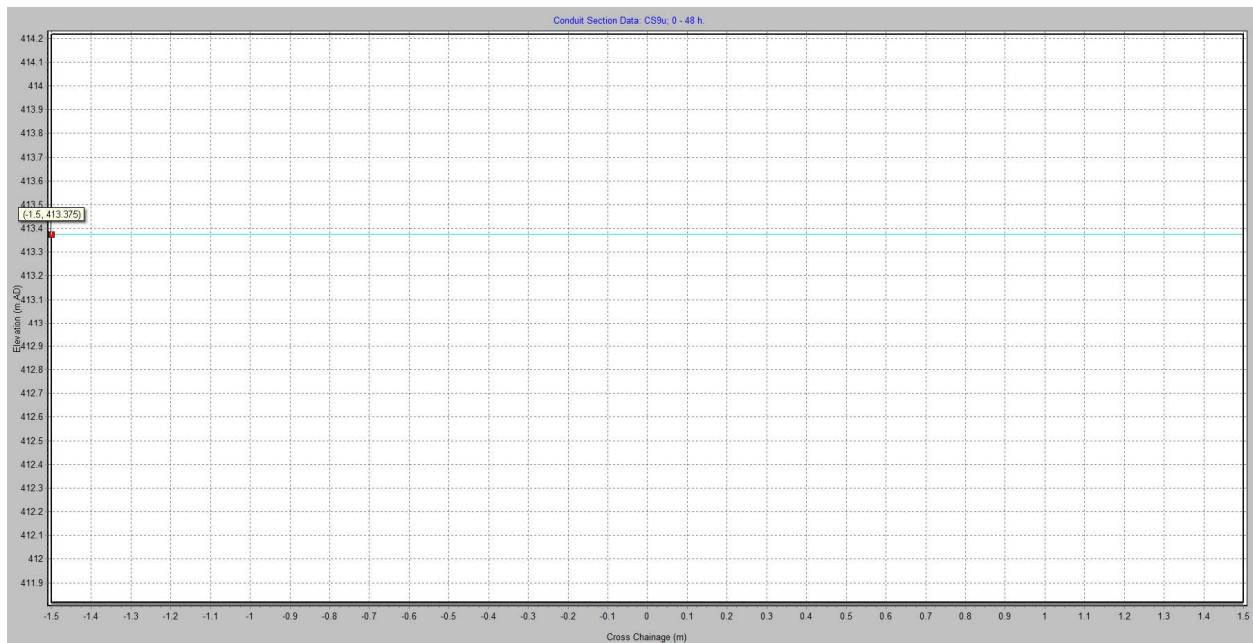
Post Construction Condition - Model Node CS1 – Upstream Extent – 200 Year flood level.



Post Construction Condition - Model Node CS2u – 44m long single 2.4m x 2.4m box culvert located 1200m upstream of Runway box culvert – 200 Year flood level.



Post Construction Condition - Model Node CS7 – unchanged Mill Creek Section showing overbank flooding – 200 Year flood level.



Post Construction Condition - Model Node CS9u – 84m extended 3.0m x 2.4m Box Culvert located under Runway – 200 Year flood level.

# APPENDIX D

## EBA'S GENERAL CONDITIONS

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# GENERAL CONDITIONS

## DESIGN REPORT

This Design Report incorporates and is subject to these “General Conditions”.

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### 1.0 USE OF REPORT AND OWNERSHIP

This Design Report pertains to a specific site, a specific development, and a specific scope of work. The Design Report may include plans, drawings, profiles and other support documents that collectively constitute the Design Report. The Report and all supporting documents are intended for the sole use of EBA's Client. EBA does not accept any responsibility for the accuracy of any of the data, analyses or other contents of the Design Report when it is used or relied upon by any party other than EBA's Client, unless authorized in writing by EBA. Any unauthorized use of the Design Report is at the sole risk of the user.

All reports, plans, and data generated by EBA during the performance of the work and other documents prepared by EBA are considered its professional work product and shall remain the copyright property of EBA.

### 2.0 ALTERNATIVE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

### 3.0 ENVIRONMENTAL AND REGULATORY ISSUES

Unless so stipulated in the Design Report, EBA was not retained to investigate, address or consider, and has not investigated, addressed or considered any environmental or regulatory issues associated with the project specific design.

### 4.0 CALCULATIONS AND DESIGNS

EBA has undertaken design calculations and has prepared project specific designs in accordance with terms of reference that were previously set out in consultation with, and agreement of, EBA's client. These designs have been prepared to a standard that is consistent with industry practice. Notwithstanding, if any error or omission is detected by EBA's Client or any party that is authorized to use the Design Report, the error or omission should be immediately drawn to the attention of EBA.

### 5.0 GEOTECHNICAL CONDITIONS

A Geotechnical Report is commonly the basis upon which the specific project design has been completed. It is incumbent upon EBA's Client, and any other authorized party, to be knowledgeable of the level of risk that has been incorporated into the project design, in consideration of the level of the geotechnical information that was reasonably acquired to facilitate completion of the design.

If a Geotechnical Report was prepared for the project by EBA, it will be included in the Design Report. The Geotechnical Report contains General Conditions that should be read in conjunction with these General Conditions for the Design Report.

### 6.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.