

Improving Design Efficiencies with Softree Optimal

Onsite used Softree Optimal in a comparative analysis and saw a considerable improvement in the overall cost.

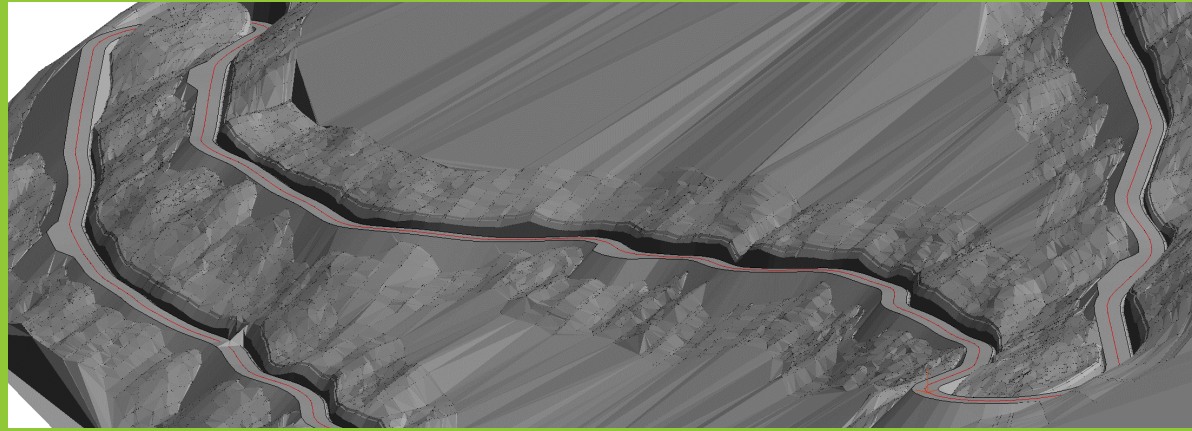
ONSITE
Engineering Ltd.

LOCATION

Salmon Arm, BC, Canada

SOFTWARE

RoadEng with
Softree Optimal



ABOUT ONSITE

Onsite was founded over a decade ago and was initially formed to provide the natural resource sector with high quality engineering services that focused on providing timely, constructable, durable, cost effectiveness solutions for access infrastructure.

The focus on high quality, timely, constructable, durable, and cost effectiveness solutions has remained and has fostered our success expanding to serve other clients involved in municipal infrastructure, land development, energy, telecom and environmental projects. The projects we are involved in range from small and simple to very large and complex.

Our client (Canoe Forest Products) requested an engineered design of a proposed haul road in the Shuswap Lake area of BC to facilitate harvesting in one of their upcoming forest developments. The design section was approximately 2km with predominantly adverse grades and two switchbacks. Layout personnel had determined the area was overlain by about ~1m of soil overlying competent bedrock. Significant drilling and blasting was expected along many sections of the alignment, particularly around the switchbacks. The horizontal and vertical alignments had already been designed, but we wanted to compare our overall costs with those produced by Optimal.

The road grades were designed at $\leq 12\%$ adverse ($\leq 5\%$ adverse through the switchbacks) with a minimum K-Value of 2.0. The standards were entered into the vertical optimization options tab with approximately 190 sampling points. The horizontal alignment was also optimized using approximately 45 IPs. The process identified an optimal vertical alignment within 1 minute and 30 seconds, and a horizontal alignment within 8 minutes. Having never used the software before, the time taken to familiarize ourselves with the software and find a solution took approximately 3 hours.

The optimized alignment was similar to our original design with respect to its deviation from the P-line, although the overall cost was slightly cheaper. The most considerable improvements with respect to the vertical alignment were driven by alterations through the two switchbacks. The costs shown below represent the total cut, fill, and haul costs accumulated along the entire road section.

	Original Alignment	Optimized	Difference (%)
Cut cost	\$191,340	\$167,400	-12.5
Fill cost	\$45,540	\$39,490	-13.3
Haul cost	\$3,440	\$3,500	1.7
Total cost	\$240,310	\$210,380	-12.4

The ability to check our own work against the results of the software was a valuable tool, and showed us where we could have improved the first time around. Alternatively, we could have benefited from using Optimal during the initial phases of the design as it would have given us an enhanced starting-point, reduced the time required to complete the design, and reduced the overall project cost.



#215-1000 ROOSEVELT CRESCENT, NORTH VANCOUVER B.C. | CANADA, V7P 3R4

WWW.SOFTREE.COM | TOLL-FREE 1-866-519-6222