

Streamline your Design with Civil3D

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Stantec's stream design process has been streamlined by the application of two software algorithms that were developed internally. Stantec will discuss how internally developed technological innovations can be used to increase drawing accuracy and production speed, improve design quality and effectively utilize restoration funds.

The first program is the Stream Restoration Computer-Aided Design (CAD) Tools function of AutoCAD Civil 3D (C3D). This function is used to layout the proposed two-dimensional (2D) channel alignments. The channel layout includes variables such as: thalweg alignment (sinuosity), pool-pool spacing and riffle length as determined by the reference reach survey.

The second program is the Breakline Program which is an Excel program that interfaces with C3D. The Breakline program is used to convert the 2D alignment information, along with the proposed riffle and pool cross-sectional, to create a 3-dimensional surface. The riffle and pool cross-sections included variables such as: bankfull area, bankfull depths and side slopes as determined by the reference reach survey. The final product of the Breakline Program is a 3-dimensional surface of the watercourse up to bankfull. The surface includes pool and riffle sections, and the transition channel between these sections. Above bankfull, the user can use existing C3D grading tools to create a floodplain.

Both programs are used to go through multiple iterations of the channel design that permit the visualization of the upstream and downstream tie-ins and the establishment of floodplain boundaries. Using the existing survey and the design surface, a localized the calculation of precise cut/fill volumes can be completed. The optimized design will cut down on construction cost and allow the reuse of materials already existing onsite. Additionally, the developed 3D surface coupled with GPS-enabled construction equipment improves the accuracy and speed of construction activities.

Mention comparing to the existing surface. Existing and proposed.