

ENGINEERING DESIGN MEETS GEOMORPHIC DESIGN

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This paper presents the evolution of the integration of engineering and geomorphology in channel designs. The work provides a synopsis of past roles and how the work of the two disciplines has not always been complimentary. In fact, there are legislation challenges regarding the professional practice of a P.Eng and a P.Geo. The engineering design is often associated with infrastructure protection and bank stabilization and has the expectation of designs that are rigid or static. The geomorphic design embraces dynamic stability and encourages channel processes, including erosion and scour.

Over time we have found that the interaction of two of the primary disciplines becoming more and more complimentary. However, there are still far too many instances where the disciplines are 'duelling', which can be product of outdated client expectations as much as the practitioners not seeing eye to eye. In our recent experiences in channel designs, especially the suite of designs associated with the Highway 407 extension, the disciplines have been successfully blended in a complimentary way. In actuality, the work of the two disciplines can result in a design optimization exercise, with each bringing varying perspectives and insight to the design process. For instance, there are many advantages associated with optimizing channel form and floodplain connections through the combined input on design flows and the entire suite of the flow regime. The same benefit can be seen in stone sizing and the degree of channel dynamics associated with erosion and scour. Finally, the experience of collaborating has been found to better facilitate the incorporation of additional disciplines, including the fisheries perspective, vegetative restoration and groundwater-surface water interactions.