ODTÜ KIBRIS'LA BİLİM EĞLENCELİDİR.

Culvert Design for Lefkoşa-Girne Highway

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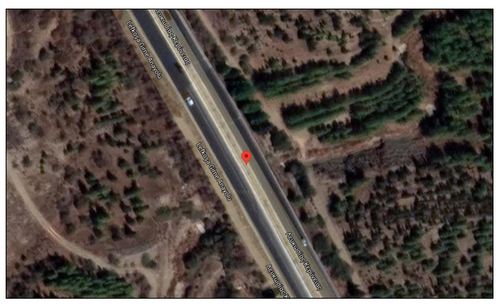
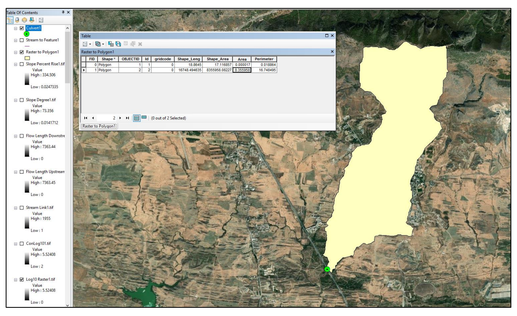
Climate change due to global warming causes extreme weather conditions to occur. The most noticeable problem that will be caused by climate change in the future is that the risk of flooding will increase due to excess precipitation, higher average annual runoff rates, and higher velocity in streams. Northern Cyprus is also affected by flooding problems and in order to solve these problems, great attention should be paid to the analysis and construction of hydraulic structures such as culverts. In order to prevent flooding problems in Lefkoşa-Girne Highway, a new culvert design was necessary.

Lefkoşa-Girne Highway

Current Culvert

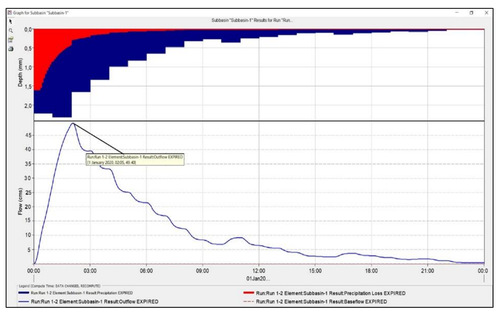


Culvert Location: 35°14'50.1"N, 33°18'22.4"E.

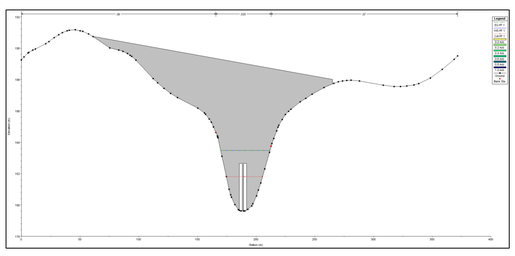


Watershed Delineation Process

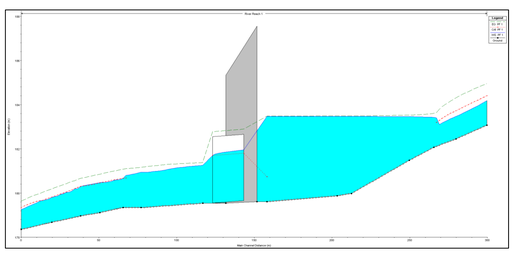
River Modeling



Precipitation and Flow Graph



Upstream Cross Section of the Culverts

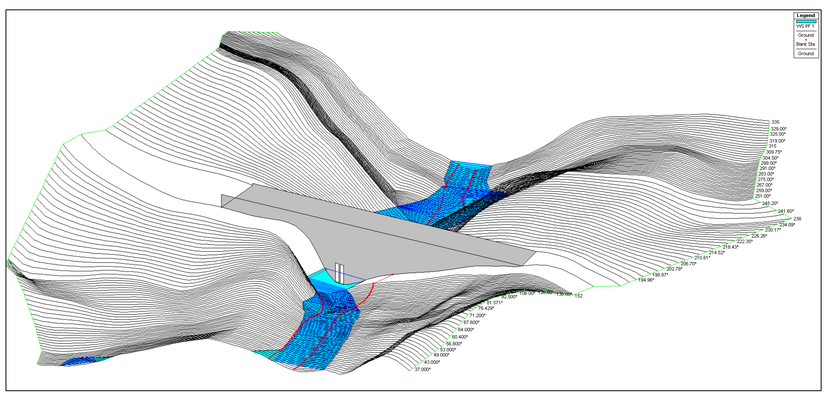


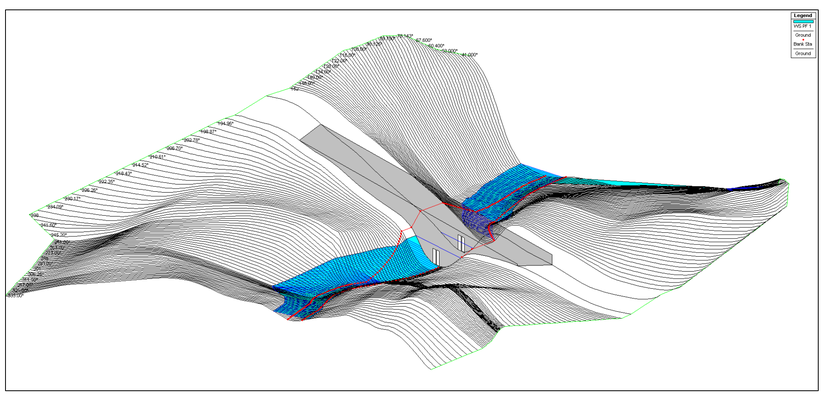
Profile Plot of the River Section

By performing watershed delineation in ArcGIS software, hydrological analysis in HEC-HMS software and hydraulic analysis in HEC-RAS software respectively, two rectangular concrete culverts were able to be designed. The culverts share the same sizes:

Height: 3 m
Width: 2.5 m
Length: 20 m
Gap between the culverts: 0.98 m

After performing a steady flow simulation, the results proved that the design of the culverts are successful. Therefore, this is a suitable design for Lefkoşa-Girne Highway.





3D Perspective Plots of the Designed Culverts