2,975 Hurricane Maria: the Role of Land Surveyors in Infrastructure Resiliency

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SUMMARY

Objectives: Describe the damage caused to Guajataca Dam during hurricane Maria. Identify mitigation strategies, reconstruction and restauration plans. Describe land-surveying techniques applied during this process.

Results: Topography and as-built of all Guajataca Dam area. Geodetic control point monitoring. Dam Instrumentation localization. New Geodetic control points establishment, even though no VRS available due to lack of internet and all other forms of communication. UAVs used to access dangerous areas. All field spatial data was completed during a two weeks window. The following software was used to complete spatial work: Drones made easy for DJI, Agisoft Photoscan, Global Mapper and AutoCAD 14 with Carlson Civil. Some additional fieldwork was performed including: stakeout of drill holes for soil test and fifty-four inches siphon stakeout that will connect derivation canal with the dam.

Conclusions: The professional skills and knowledge of land surveyors where employed in helping communities as they struggled with issues regarding infrastructure resilience during the emergency. Land Surveyors played an important role in protecting human life during the disaster.

Significance: On September 20, 2017, hurricane Maria hit Puerto Rico with disastrous force, taking thousands of lives, devastating communities, infrastructure and the environment. Time stood still for too long after the catastrophic strength of this natural disaster left our territory. Critical infrastructure was severely damage, threatening thousands of people. Guajataca Dam, one of the principal dams in Puerto Rico that serves many municipalities, suffered damage due to water accumulation and spillway failure. Land surveyors provided precise data measurement needed to ensure the success of fast reconstruction and restoration of this infrastructure.