

July 11th, 2024

Hydrology & Flood Mitigation Study Executive Summary

The purpose of developed hydrology and flood mitigation study is to assess and analyze the hydrological and hydraulic conditions surrounding the project area, which consists of an existing mixed-use master plan. The project area spans a total of 11.27 hectares, with certain parcels proposed for redevelopment. The proposed redevelopment plot covers approximately 31.5% of the total plot area (3.55 hectares).

The study aims to model and analyze all existing hydrological elements within the project area to identify potential flood risks. Based on the analysis, the study will propose, adequate engineering solutions as needed to ensure the safety of the site and its residents during extreme rainfall events.

To that end, all necessary data were collected from various authorities and official sources in Seychelles and international references. The data includes topographical, geological, and rainfall data. The topographic data, along with site visit results, were used to identify the location and extent of all streams and watersheds that might impact the project area. Other data, such as satellite imagery, were used to identify the different morphological aspects of the affecting watersheds.

A detailed assessment of rainfall data relative to the affecting rainfall stations in the area was also carried out. Together, the results of the rainfall and morphological analyses were utilized using the latest hydrological analysis software to identify the peak flow generated by each watershed for different return periods. The results of the hydrological modeling also allowed for the extraction of each affecting stream's hydrograph, which was adopted to generate the flood inundation maps.

The results of the developed hydraulic model, which in turn takes into consideration the existing hydraulic structures affecting the project such as the existing culverts, showed that a considerable portion of the project area would undergo flooding. The results of the model shows that while the majority of the runoff is contained inside the existing marshes and streams, the resulting flood plain will intersect with a series of both existing and proposed developments. The model results also clearly identifies the presence of low points and ponding areas in the project, which once overtops will affect some of the existing and proposed developments.

That being said, and based on the results of the hydrological and hydraulic models, the project area requires the proposition of flood mitigation measures to ensure the safety of its residents during extreme flood events. The proposed engineering solutions and recommendations includes a series of different measures which were developed while considering minimal interference on the master plan and current site topography.

The study recommendations include primarily identifying the required minimum elevations at which the proposed new developments should consider to ensure that they are not impacted by the floodwaters. The proposed measures also includes some modifications in the site grading along landscaped areas to ensure that the runoff is properly directed to adequate discharge locations. Finally, the results of the study are also coordinated and reflected on the proposed site internal drainage network to ensure an integrated network of solutions.