Stormwater Management System: TCNJ Townhouses South

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**Abstract:**

The College of New Jersey’s Townhouses South residences experience water infiltration and persistent dampness in their crawlspaces. Townhouses South is comprised of 26 individual units each of which has a crawlspace extending approximately 3 feet below the surface. Of the 26 units, standing water was detected in the crawlspaces of 15 of them, and all but 6 have noticeable moisture. This study is intended to determine the foremost cause of the water infiltration and propose a solution to maintain the structural integrity of the Townhouses. Through the use of geotechnical, hydrologic, and hydraulic analysis, data was collected to allow for proper analysis and the proposal of adequate solutions. Geotechnical testing was conducted in accordance with ASTM standards, and soil was classified using Burmister classification system to produce a soil profile. The profile is comprised of four stratums; the top three consist of brown sand with trace amounts of silt. The final stratum, located seven feet below the surface, is brown sand with clayley silt. The hydraulic conductivity of the first five feet of the soil profile was determined to be 0.001323 ft/min. A ground water well was installed in close proximity to the most critical crawlspaces and extended to a depth of seven feet below the surface. Although no groundwater table was found, continuous monitoring will occur. With the use of topographic maps, watershed properties were obtained and used in combination with rainfall estimates to predict the volume of infiltrated water for a 2 year, 24 hour storm event. The watershed was divided into two separate areas, impervious and pervious. The areas were found to be 0.98 acres and 0.94 acres, respectively. The computer modeling software HEC-HMS was utilized and returned total absorbed water of 0.12 inches and 2.47 inches for the respective areas. During Senior Project II, designs to remediate this problem will be considered for future use. Potential solutions include an underground storm water collection and recycling system, regrading of the soil surrounding the townhouses, a rooftop rainwater catchment system, and a design for sump pumps in the crawlspaces.

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