

STORMWATER MANAGEMENT REPORT

for

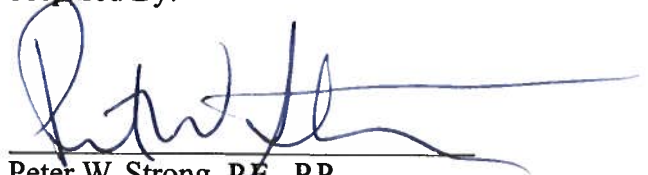
COMPASS SELF STORAGE

Lot 7, Block 404
1109 Ninth Avenue
Neptune Township, Monmouth County, NJ

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File #N-5369

Prepared By:



Peter W. Strong, P.E., P.P.
N.J.P.E. License #22370

INTRODUCTION

The subject site contains 2.22 acres and is situated between Ninth and Tenth Avenues at their intersection with Memorial Drive, a Monmouth County road. The site is improved with a self storage facility, which has been in existence for over 30 years and contains four buildings, three of which (A, B & C) are attached to each other and one of which (D) is free-standing. Parking for 18 vehicles is accommodated onsite with a driveway connecting Ninth and Tenth Avenues running between buildings C and D near the easterly (Memorial Drive) side of the site. Within this driveway is an 18" RCP storm drain which takes runoff from Ninth Avenue, the onsite parking and parts of the buildings, plus the driveway to Tenth Avenue. The 18" RCP joins another storm drain, a 27" RCP, which drains Ninth Avenue and passes under buildings A & B to Tenth Avenue. Thereafter, the combined flows from the 18" and 27" RCP's continues northerly through a 27" RCP.

PROPOSED CONDITIONS

It is intended to remove buildings C and D, consisting of one-story each with areas of 8,500 s.f. and 5,253 s.f., respectively. In their place, it is proposed to construct a new 4-story climate controlled, self-storage building consisting of 84,436 s.f. This building would occupy the area of the two existing buildings plus the current driveway space between the buildings. As a consequence, the existing 18" RCP storm drain in the driveway needs to be removed and an alternative method to convey the stormwater flow, around the new building, installed.

The existing 18" RCP consists of three lengths of pipe between inlets, totaling 300 feet. The upstream invert at the beginning inlet is 8.54 and the downstream invert at the ending inlet (in Tenth Avenue) is 7.64, per field survey information recently obtained. The vertical fall of the pipe (0.9') divided by the length (300') results in an average slope of 0.30%. Utilizing Manning's equation for pipe flow and a standard roughness coefficient of 0.013 for RCP, the pipe system can carry a flow of 5.77 c.f.s. (cubic feet per second) when flowing full.

In order to route a new pipe around the proposed new building, the length will need to increase. However, the vertical fall of 0.9', will not change, as both the upper and lower inverts are fixed. Design of this alternate pipe route has resulted in a new length of 375 feet and a new slope of 0.24%.

Because of this flatter slope, a different type of pipe has been chosen. A high density polyethylene pipe (HDPE), of the same diameter (18") as the RCP, has a roughness coefficient of 0.10, because it has a smoother finished surface than concrete. Again, applying the flatter slope and lower roughness coefficient into the Manning equation results in the HDPE pipe being able to carry a flow of 6.60 c.f.s., which is greater than the current pipe capacity of 5.77 c.f.s. Therefore, the alternative pipe design has greater capacity to accommodate stormwater flows than the existing pipe system and will not result in any adverse effects to the onsite drainage or the Ninth Avenue drainage.

PRE- AND POST-DEVELOPMENT RUNOFF CONSIDERATIONS

In it's current condition, the project site has a total impervious cover of 87.53%, of which 68.24% is building coverage, with the remainder being paved areas and sidewalks. Under the proposed conditions, the building coverage will actually increase to 75.85% but the overall site impervious cover will decrease to 85.18%. This decrease is due to a more efficient parking layout on the Ninth Avenue side of the site, removing excess pavement not needed for the required driveway and parking

stall dimensions. In addition, along Tenth Avenue, the trash/recycling enclosure is made smaller and relocated for more efficient use, resulting in the removal of existing pavement.

The site changes have a two-fold effect on stormwater quantity and quality. The reduction in overall site impervious cover immediately results in a reduction in runoff from the site, compared to current conditions. Additionally, the increase in building coverage, combined with the overall decrease in impervious cover, means that quality of the site runoff will increase. The pavement and sidewalk are subject to adding grease, oil, sand and salts to the stormwater that runs off from them, while roof runoff is considered (by NJDEP standards) to be "clean" runoff. Additionally, the ground water recharge potential of the site will increase due to the reduced impervious cover.

CONCLUSION

The proposed re-development of a portion of the existing self-storage site will not result in any drainage issues, as the replacement storm drain will actually have slightly higher water carrying capacity than the pipe that currently exists, while the site runoff will decrease due to the impervious cover of the site being reduced by about 2.5% (0.05 acres). With regards to potential Township and NJDEP concerns over runoff quantity and quality, the foregoing has demonstrated that runoff quantity will decrease and quality plus ground water recharge will be enhanced over current conditions due to the nature of the site modifications.