

NYC Transit Flood Resiliency: Case Studies of Recently Completed Mitigation Strategies

Timothy Savery, PE

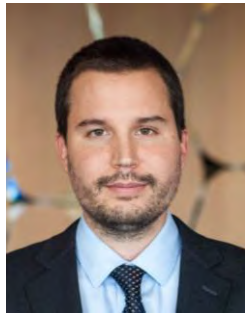
Senior Engineer

Arup

New Jersey, USA

timothy.savery@arup.com

Timothy is a Structural Engineer in Arup's New Jersey office, and has worked on the design of a broad range of projects including several to enhance storm resiliency.



Contact: timothy.savery@arup.com

1 Abstract

MTA New York City Transit (NYCT) suffered significant damage from Hurricane Sandy in 2012, and hired Arup to design flood mitigation strategies for various system vulnerabilities.

Arup developed innovative permanent solutions to mitigate the various system vulnerabilities identified, including working with specialty fabricators to develop products for these specific purposes in order to provide the required protection of up to 14 feet of flood depth.

These efforts have resulted in innovative, new, purpose driven methods of flood mitigation that were not previously available on the market. These new systems result in dramatically reduced deployment time ahead of a storm event as well as a significant increase in the performance of the mitigation including reduced leakage rates.

This paper reviews various system vulnerabilities present in transit systems and presents case studies for the various mitigation strategies that were developed.

Keywords: Flooding; Flood resilience; Transit

2 Introduction

Superstorm Sandy had devastating effects on the New York City region, causing tremendous damage to building stock and infrastructure in low lying areas. The city collectively has responded with extensive repair, reconstruction and hardening projects, together with a tightening of building standards and their enforcement. Much has been written about the effects of Sandy, and the difficulties encountered through the restoration and rebuilding projects. This is a study of flood mitigation strategies developed by Arup for New

York City Transit (NYCT) to address various system vulnerabilities identified in the wake of Superstorm Sandy and discusses some of the challenges of protecting a system as old, and with as many vulnerabilities as the New York City Subway System.

This study includes three mitigation strategies, developed by Arup for NYCT, to address vulnerabilities at subway entrances, street level grating, and above grade fan plant facilities.

At the time of this writing, these mitigation strategies have been installed at the majority of sites identified by NYCT as most critical.