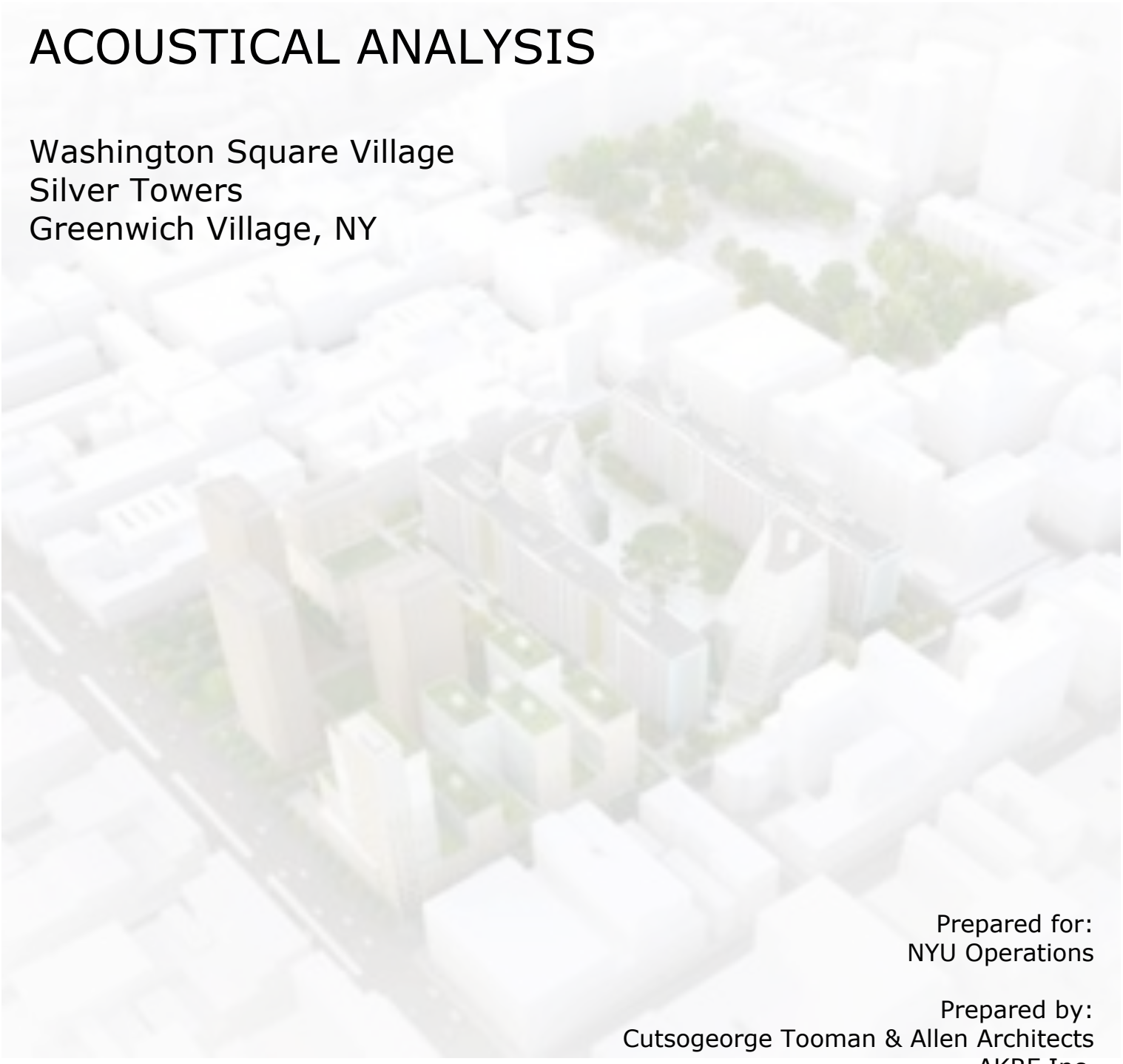
ACOUSTICAL ANALYSIS

Washington Square Village
Silver Towers
Greenwich Village, NY



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EXECUTIVE SUMMARY

INTRODUCTION

As a result of anticipated construction noise associated with the NYU 2031 Plan, Cutsogeorge Tooman & Allen Architects and AKRF were tasked with scoping a series of acoustical tests with varied products and assemblies at Washington Square Village (WSV) and Silver Towers (ST). The purpose of the assessment was to quantify the acoustical benefit, necessary coordination details and associated cost of each option tested. The EIS report dated May 2012 identified a potential acoustical improvement of 5 dBA for Washington Square Village and of 7 dBA for Silver Towers [EIS p. 21-20] by providing the EIS minimum as defined further in the tests outlined below.

In addition to testing the EIS minimum requirements, NYU requested a series of tests on assemblies that would likely exhibit acoustical improvement over the required minimum (assemblies as selected by the consultants). The tests as described below were run during the months of June, July and August 2012. The purpose of the tests was to determine the order of magnitude of the incremental improvements as relates to perceived acoustical benefit (as further described in the report).

Data attached to this report provide acoustical improvement analysis on a per test basis as well as budget numbers for the various solutions.

TESTING - WASHINGTON SQUARE VILLAGE

All tests at WSV were performed at 1 WSV, Apartment 2G, which is a south facing studio apartment with two sets of an individual double hung window paired with a fixed window, one through wall air conditioner and one radiator.

The improvements in façade attenuation outlined in the testing below are comparable to or greater than those predicted in the 2012 NYU Core FEIS and would be sufficient to fully mitigate the construction noise impacts projected in the FEIS at Washington Square Village. For more detail, please refer to the Acoustical portion of the report.

TEST #1: The in situ conditions were tested in order to establish a baseline off of which the remainder of the tests would be judged. This condition consists of single pane double hung windows paired with a fixed window with a mill finish aluminum window frame and a through the wall air conditioner that appeared to be close to 10 years old. No sealing work, etc. was installed.

TEST #2A: The EIS report provided for two variations on the minimum requirement of which this test was the first. This test included resealing of the existing single pane windows, metal to metal and metal to glass components, installation of a standard aluminum frame double hung interior storm window and the installation of a new through wall air conditioner unit. The air gap between the existing glazing and the interior storm was measured as 8", the gap was lined with homasote at its perimeter. The storm windows consisted of 1/8" thick single pane glazing.

TEST #2B: The second EIS minimum included the same aluminum frame storm window assembly with the new through wall air conditioner unit, some sealing of the air conditioner sleeve perimeter and the installation of a custom fabricated sound attenuating wood and glass air conditioner cover. The wood cover extends around the air conditioner and has a removable glass door at the face of the air conditioner. When the air conditioner is in use, the cover must be removed.

TEST #3A: This test is the first improvement test over the EIS minimum requirements. This test included the resealed existing double hung single pane aluminum window, the installation of a horizontal sliding acoustical interior storm window, spaced 8" from the existing window, with homasote lining at the

perimeter of the air gap. The acoustical interior windows consisted of 1/4" laminated glass. The new air conditioner with perimeter weather stripping remained in place. This assembly was tested both with and without the cover on the noise blocking AC assembly. Additional sealant work was performed at the radiator enclosure, where pipes penetrated the wall of the cabinet and where the cabinet was found to be open along the bottom edge.

TEST #3B: This test replicates test #3A with the additional improvement of 3/8" laminated glazing on the acoustical interior windows in lieu of the 1/4" laminated. This test was also run both with and without the cover on the noise blocking AC assembly.

TEST #4A: This test provides for the installation of a retrofit aluminum framed window assembly. This assembly includes the removal of the existing frame (except the perimeter members) as well as the existing glazing and louvers. New fixed and double hung sashes replicating the existing configuration were installed, comprised of a 3/16" clear annealed exterior lite, a 5/8" spacer and a 1/8" clear annealed interior lite with argon gas between the inner and outer panes. New louvers and insulated panels were installed over the existing panels, with insulation in between. The new through wall AC unit was installed with the sealing of the AC perimeter. This test was also run both with and without the interior sound attenuating air conditioner unit cover. Batt insulation was installed between the new blank panel and the existing blank panel at the exterior, in front of the radiator cavity. The previous sealant work remained in place.

TEST #4B: This test replicates test #4A with the additional improvement of a 1/4" clear annealed exterior lite, a 9/16" spacer and a 1/2" clear laminated interior light with argon gas between the panes in lieu of the non laminated glass package. This test was also run both with and without the sound attenuating air conditioner cover in place.

TEST #4C: This test replicates tests #4A and B with the additional improvement of a 1/4" clear annealed exterior lite, a 5/8" spacer and a 3/16" clear laminated interior lite with Safeflex silent glass 0.30 interlayer in lieu of the glass packages noted in 4A and B. This test was also run both with and without the sound attenuating air conditioner cover in place.

TESTING - SILVER TOWERS

All tests at Silver Towers were performed at 100 Bleecker Street, Apartment 2A, in the south facing living room. This room contains two window / louver / PTAC assemblies interrupted by concrete structural columns. All improvements were performed at both south facing window assemblies.

The final improvements in façade attenuation outlined in Tests 3C and 3D below are greater than those predicted in the 2012 NYU Core FEIS and would be sufficient to fully mitigate the construction noise impacts projected in the FEIS at Silver Towers. Tests 2, 3A and 3B as previously reported were just short of sufficient to fully mitigate the construction noise impacts projects in the FEIS at Silber Towers. For more detail, please refer to the Acoustical portion of the report.

TEST #1: The in situ conditions were tested in order to establish a baseline off of which the remainder of the tests would be judged. This includes large single glazed sliding windows, and Remington Model K PTAC unit surrounded by an open metal cabinet with a louver and blank metal panel facing. There is no back up masonry wall.

TEST #2: This test was run to address the EIS minimum requirement. This test included resealing of the existing single pane sliding windows, metal to metal, metal to concrete and metal to glass components and installation of an aluminum frame sliding interior storm window. The air gap between the existing glazing and the interior storm was measured as 2-5", as it is limited by the vents on top of the PTAC enclosure. The storm windows consisted of 1/8" thick single pane glazing.

The scope also included the installation of an acoustically improved Remington Type K PTAC unit within the existing sleeve. There were no improvements to the surrounding area within the under window enclosure.

TEST #3A: This test is the first improvement test over the EIS minimum requirements. This test included the resealed existing sliding single pane aluminum window, the installation of a horizontal sliding acoustical interior window, spaced 2-5" from the existing window. The acoustical interior windows consisted of 1/4" laminated glass. The acoustically improved Remington Type K PTAC used in Test #2B was reinstalled for this test.

Sealant work, batt insulation installation and the installation of a 5/8" Type X gypsum wall board barrier separating the interior from the exterior were performed as part of the improvements in the under window cabinet area.

TEST #3B: This test replicates test #3A with the additional improvement of 3/8" laminated glazing on the acoustical interior windows in lieu of the 1/4" laminated.

TEST #3C: This test included the resealed existing single pane sliding windows, the installation of a 1/4" laminated glass acoustical interior window spaced 9" from the existing window, the installation of a replacement sound attenuated PTAC and retrofit sleeve, the construction of a double layer 5/8" Type X gypsum wall board barrier separating the interior from the exterior, acoustical mat installation on existing surfaces, and a new MDF PTAC cabinet (replacing the existing metal cabinet).

TEST #3D: This test replicates test #3C with the additional improvement of 3/8" laminated glazing on the acoustical interior windows in lieu of the 1/4" laminated.

PHOTOGRAPHS - WASHINGTON SQUARE VILLAGE


Interior acoustical air conditioner cover


Interior storm windows

Interior acoustical windows

Improvements at area in radiator cabinet

Complete window replacement, in progress

PHOTOGRAPHS - SILVER TOWERS

Typical interior condition (unimproved), living room

PTAC cabinet interior conditions (unimproved)

Replacement PTAC with acoustical improvements

Interior storm windows

Interior acoustical windows

Test 3C / 3D improvements within PTAC cabinet area (original PTAC in place at time of photo).

Test 3C / 3D completed interior partitions, retrofit PTAC sleeve in place.

Test 3C / 3D Completed installation.