O'Hare Residential Sound Insulation Program
Historic Homes Pilot Program
Lessons Learned

WOOD DALE HOME

BENSENVILLE HOME

CHICAGO HOME

O'HARE NOISE COMPATIBILITY COMMISSION

Program Overview

- **The Historic Homes Pilot Program was conducted on 4 dwelling units in O'Hare Phase 16.**
- **The pilot program will determine the types of sound-insulating modifications that will be performed on the contributing homes in Phase 17C in Chicago's Norwood Park community.**
- **The intent of the Historic Homes Pilot Program was to attain the 5 dB noise level reduction while maintaining the historic integrity of the home. To achieve this…**
  - Work was scheduled to be performed in different stages.
  - Acoustic tests were performed between each stage.
  - Different styles of homes were used.
  - Different types of historic window products were installed across the selected homes.
  - Each historic window product was tested to determine its impact acoustically and its effect on the overall historic integrity and character of the home.
  - Existing historic wood windows and doors were repaired and preserved when possible.

Principal Collaboration

- CDA
- IHPA (Illinois Historic Preservation Agency)
- RSIP Program Manager
- RSIP Program Architect
- FAA

Construction Stages 1-6

Stage 1

Street Façade Windows

- Modify existing sashes and install new jamb liner balance system. Install new acoustic storm windows.
- Remove existing window sashes, install new jamb liner and acoustic wood window sashes. Install new acoustic storm windows.

Non Street Façade Windows

- Remove existing window sashes, install new jamb liner and acoustic wood window sashes. Install new acoustic storm windows.
- Install new full replacement wood windows.

Street Façade Doors

- Repair existing prime doors. Install new acoustic storm doors.

Non-Street Façade Doors

- Remove existing prime doors and frames. Install new acoustic stile and rail doors and frames.

Perform Acoustic Test

Stage 1 Wood Window Work

Jamb Liner

Jamb Liner with Existing Sash

Jamb Liner with New Sash

Stage 1 Wood Window Work

New storm windows installed over the new sash kit windows

Before

After

Stage 1 Existing Prime Door Work

Before

Before

Stage 1 Existing Prime Door Work

After repairs and preservation

After with new storm door

Remaining Construction Stages (as needed)

Stages 2-6
Perform Noise Test Between Each Stage

- Replace existing street façade window sash with new acoustic wood window sash kit.
- Replace street façade prime doors with new acoustic stile and rail wood doors.
- Replace new sash kit windows with new full replacement wood windows.
- Add wall and attic insulation.
- Add drywall to the interior face of exterior walls.

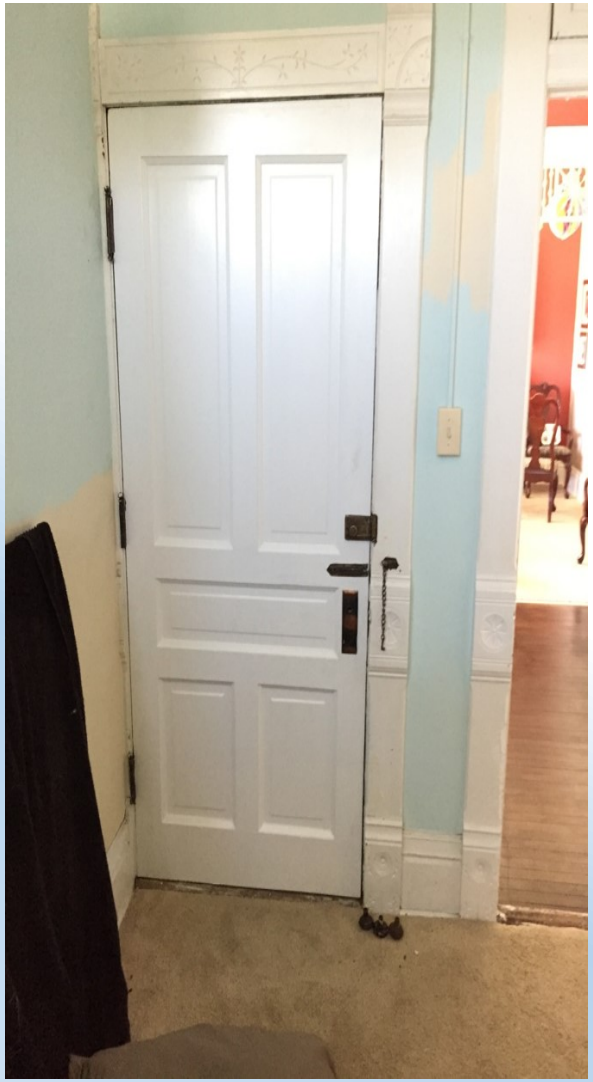
Preserving Historical Integrity

Existing door

Consolidant & Dutchman repair

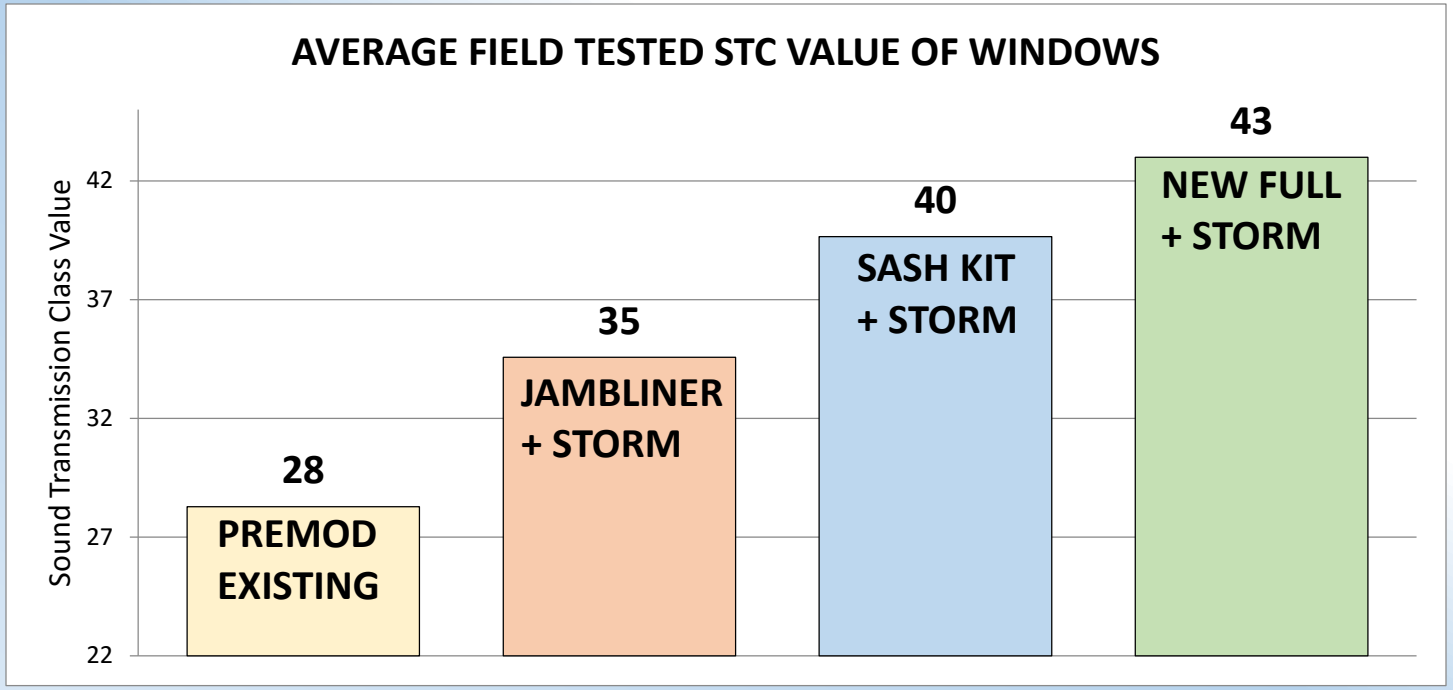
Dutchman repair

Finished door



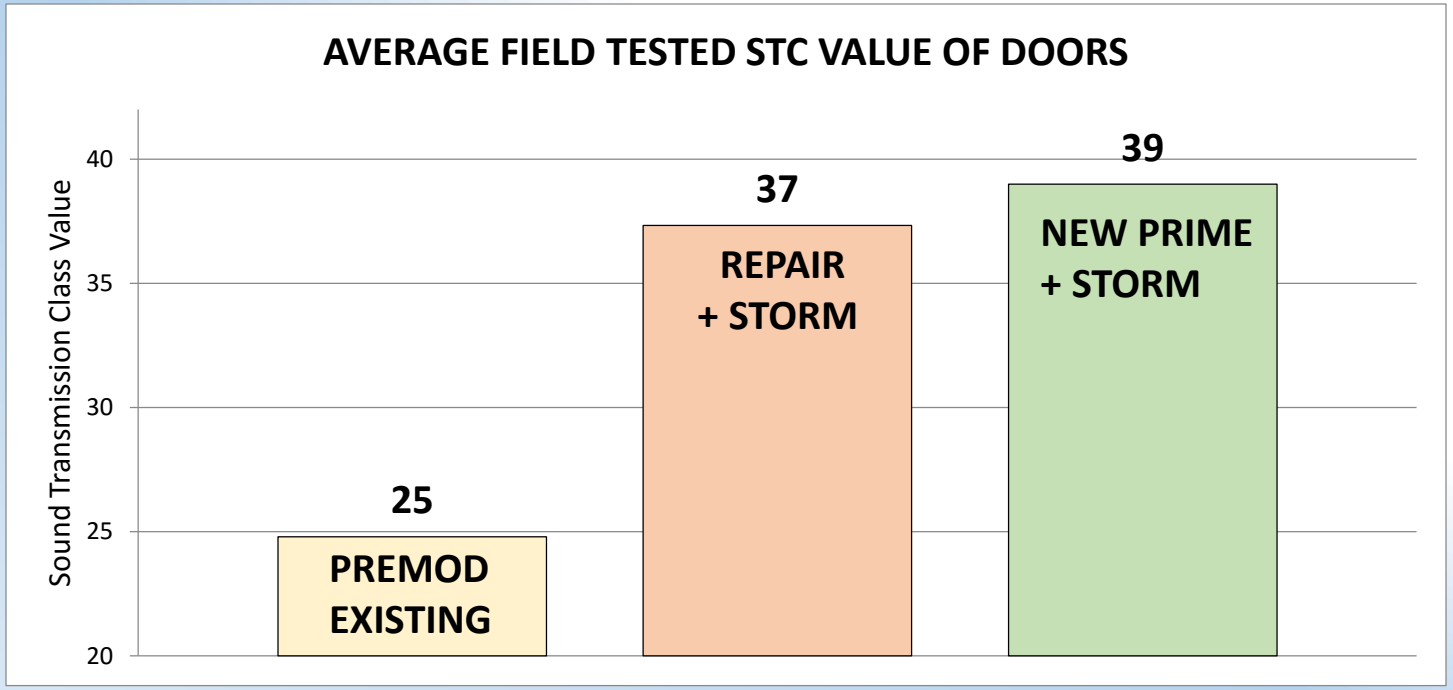
Acoustic Test Results Stage 1

WINDOW TREATMENT PERFORMANCE



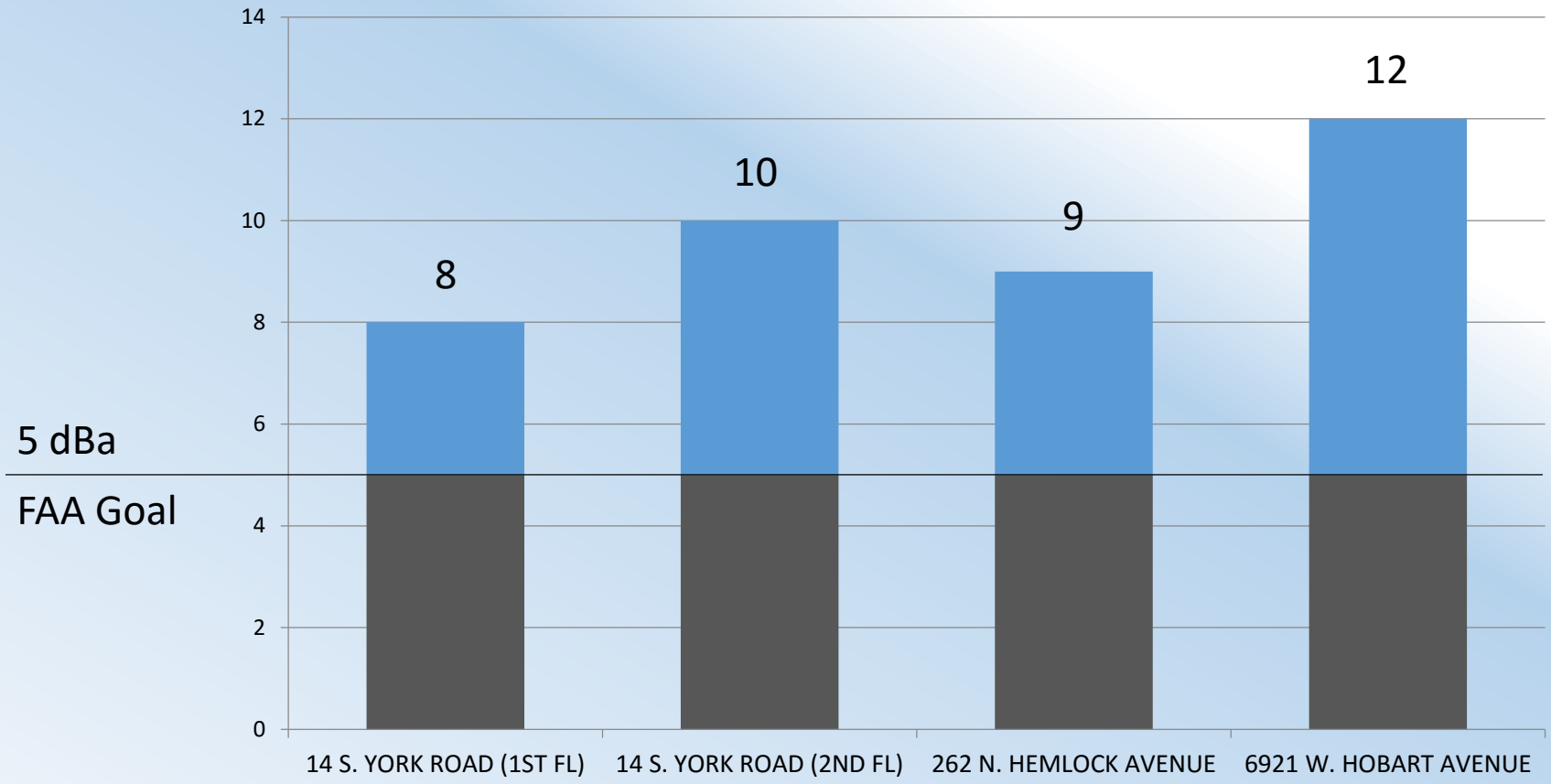
AVERAGE NOISE LEVEL REDUCTION RESULTS - ROOMS			
WINDOW TREATMENT USED (number of rooms receiving this treatment and included in the average)	Average Premod Noise Level Reduction (dBa)	Average Postmod Noise Level Reduction (dBa)	Average Improvement (dBa)
NEW FULL + STORM (6 rooms)	24.8	38.4	**13.6**
SASH KIT + STORM (14 rooms)	25.7	34.4	**9.0**
JAMBLINER + STORM (5 rooms)	23.5	30.1	**6.5**

DOOR TREATMENT PERFORMANCE



AVERAGE NOISE LEVEL REDUCTION RESULTS - ROOMS			
DOOR TREATMENT USED (number of rooms receiving this treatment and included in the average)	Average Premod Noise Level Reduction (dBa)	Average Postmod Noise Level Reduction (dBa)	Average Improvement (dBa)
NEW PRIME + STORM (2 rooms)	22.4	37.4	**14.4**
REPAIR + STORM (3 rooms)	24.5	32.1	**7.6**

FINAL AVERAGE REDUCTION IN DECIBELS (dBa) FOR EACH DWELLING UNIT



Lessons Learned

5 dB Noise Reduction Achieved in Stage 1

- Additional construction stages not required.
- This is important, because it means we can meet our 5 dB noise level reduction while having minimal impact on the historic integrity of the home.

Highly Skilled Contractor Labor Required

- This work requires the highest level of carpentry skill. This is not production work. Carpenter craftsmen are required.

Supplier / Manufacturer

- Submittals and representative vs engineer commitment, due diligence.

Window Openings / Door Openings

- Existing window frames were not always square. At side to side sloped sill conditions the bottom rail of the sash kits in some cases had to be scribed to the slope of the sill. Contractor measured and ordered the sash kits large enough to allow scribing.

Lessons Learned

Spray Foam

- Spray foam was used at least once to fill the weight pockets in lieu of filling with blocking and insulation. It was messy and it took a long time to dry. Solid blocking tests out better acoustically.

Historic Preservation Building Consultant Scope of Work

- Will be present at Home Inventories instead of later at Field Measurements.
- Allows the Program to become aware of potential challenges as early on in the process as possible.
- This will also allow RSIP to work with the IHPA sooner in the process on any situations that need an IHPA decision.

Construction Time Frame

- Although the recommended Option Packages have not yet been approved, we anticipate that for historic homes receiving the new jamb liner and sash kit windows, additional time may be required beyond the standard Option Package time frames.

In Summary

From the beginning, our main goal was to create the Historic Homes Pilot Program to enable us to determine the best methods for preserving the historic integrity of each historic home, while effectively achieving the 5dB reduction in noise levels as early as possible in the process.

Through all of our collaborative efforts, we have completed the O'Hare Phase 16 Historic Homes Pilot Program.

We now look forward to determining the Historic Homes Option Packages for O'Hare Phase 17 C contributing historic homes.

Thank You

O'HARE NOISE COMPATIBILITY COMMISSION

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