5.1 Noise and Vibration

The Renton Nickel Improvement Project will increase noise levels in some areas. WSDOT will construct a noise wall along the north edge of South 14th Street on Talbot Hill to reduce traffic noise in this area.

Sound is an element of daily life that people call noise when they perceive it as unpleasant, unwanted, or disturbingly loud. WSDOT considered this project's effect on noise so that we could understand the potential effect of traffic and construction noise on public health and welfare.

How noisy is the project area?

Some places in the study area already approach or exceed the noise abatement criteria (NAC) for sensitive receptors. Most exceedances are at residences. The NAC for recreational areas and residences is 67 decibels (dBA) measured during the loudest hours of the day when traffic volumes are high but not congested. The places currently approaching or exceeding 67 dBA include approximately:

- 105 residences[1]
- 2 parks
- 2 trails
- 1 aquatic center

Ten of these residences exceed the criteria because of noise from local traffic on Main Avenue South, SW Grady Way, and Southcenter Boulevard.

Currently, no existing noise walls are located parallel to I-405 within the project limits. However, existing retaining

Noise from traffic is an issue for many freeway neighbors

Please refer to the Renton Nickel Improvement Project Noise and Vibration Discipline Report in Appendix Q for a complete discussion of the noise and vibration analyses.

What is noise?

Noise is unwanted sound. A meter measures sound electronically and combines the overall sound frequency into one level that simulates how a typical person hears sound.

Loudness, in contrast to sound level, refers to how people subjectively perceive a sound. This varies from person to person, but most people judge relative loudness between sound levels similarly. The human ear can barely perceive a 3-dBA increase, but a 5- or 6-dBA increase is readily noticeable and seems as if the sound is about one and one-half times as loud. A 10-dBA increase seems to be twice as loud to most listeners.

[1] These numbers are residential equivalents. This term is defined on page B-1 of the Renton Nickel Improvement Project Noise and Vibration Discipline Report in Appendix P.

walls, limited jersey barriers, and topography shield some residential areas.

How will project construction affect noise?

Construction activities will generate noise. Construction is usually carried out in several reasonably discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. Adverse effects may result from construction noise levels generated by heavy equipment including heavy trucks, excavators, jackhammers, and pile drivers. However, these noises would be temporary, occurring only during the construction period.

How will the completed project affect noise levels?

The project will increase noise levels primarily at residences in the Renton Hill, Steeplechase, and Talbot Hill neighborhoods. Noise levels will slightly rise over time with an increase of 0 to 3 dBA by the year 2030. A 3 dBA increase in noise levels is barely recognizable by the human ear. If no noise walls are built, the project would increase the noise levels at thirty-nine residences from below the NAC to at or above the NAC. These 39 residences added to the existing 105 residences make a total of 144 residences that are predicted to experience noise levels at or above the NAC of 67 dBA set for residences in 2030. If this project is not built, no additional residence(s) would approach or exceed the NAC until at least 2030. Exhibits 5-2 through 5-7 illustrate how noise levels will be affected by this project.

What measures are proposed to minimize noise effects during construction?

Construction noise will be reduced, when feasible, by using enclosures or walls to surround noisy equipment, installing mufflers on engines, using quieter equipment or construction methods, minimizing operation time, and locating equipment far from sensitive receptors such as residences. For a complete list of proposed mitigation measures, see Appendix B.

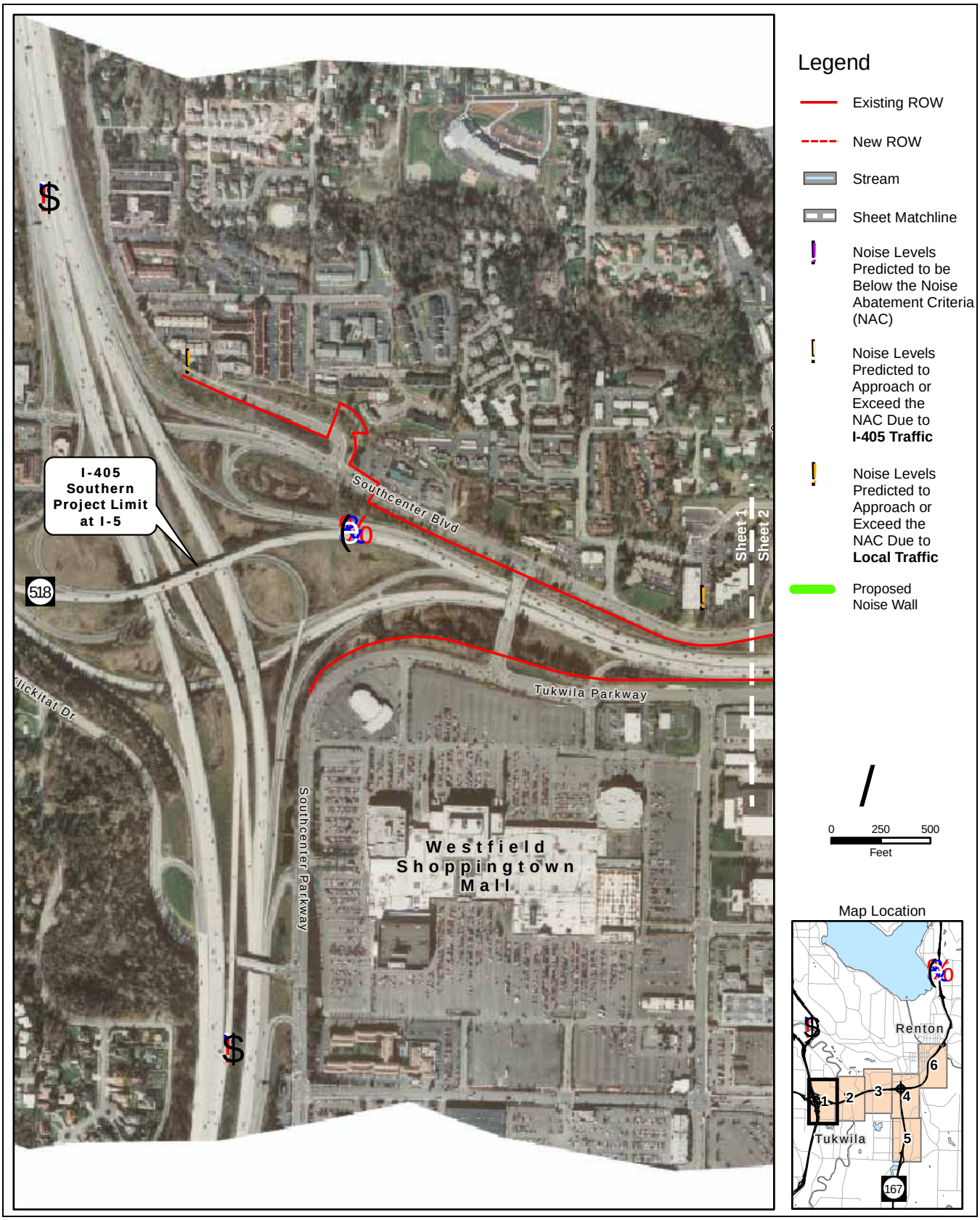

Exhibit 5-2. Predicted Noise Levels in 2030 with Project Built (sheet 1 of 6)

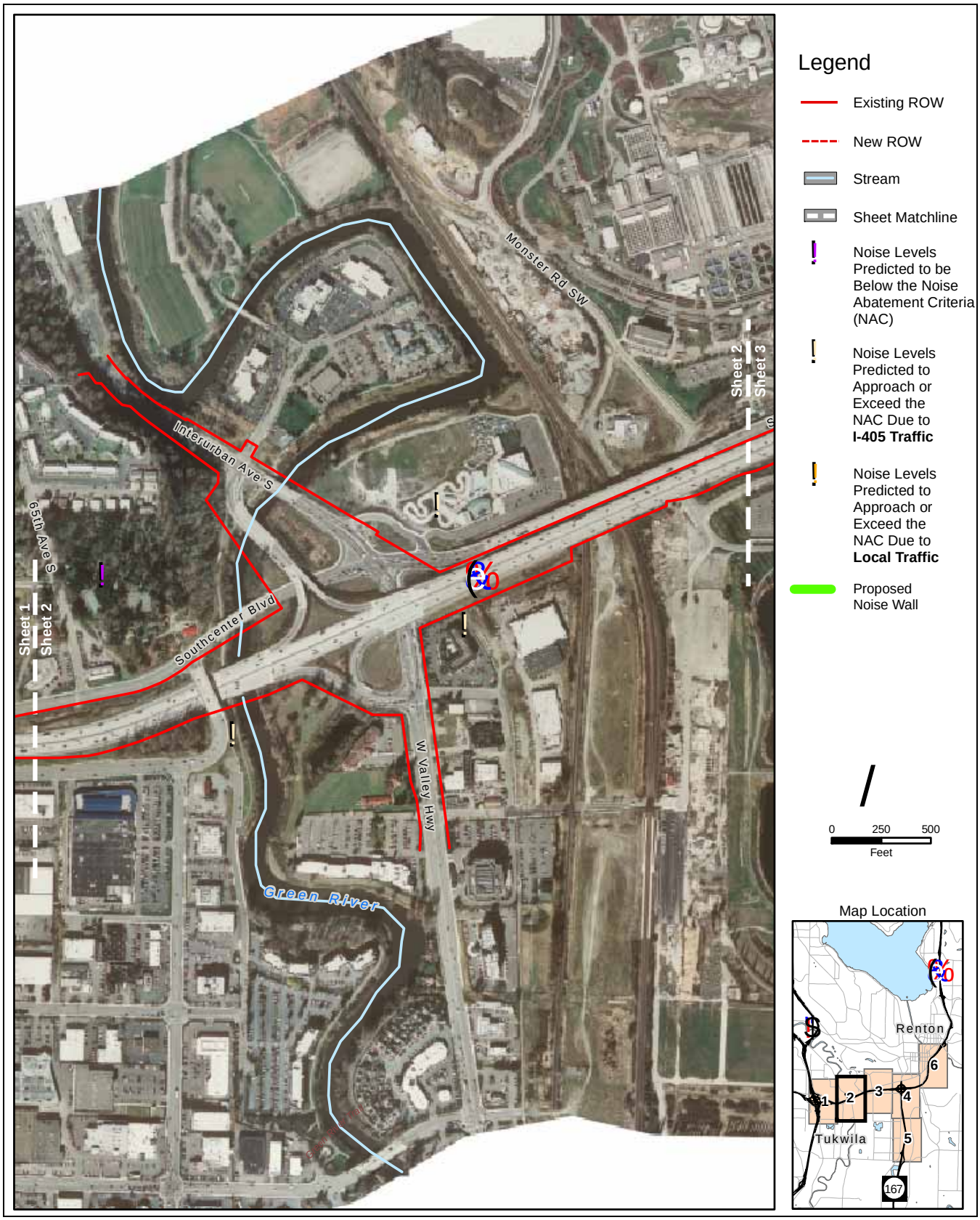

Exhibit 5-3. Predicted Noise Levels in 2030 with Project Built (sheet 2 of 6)

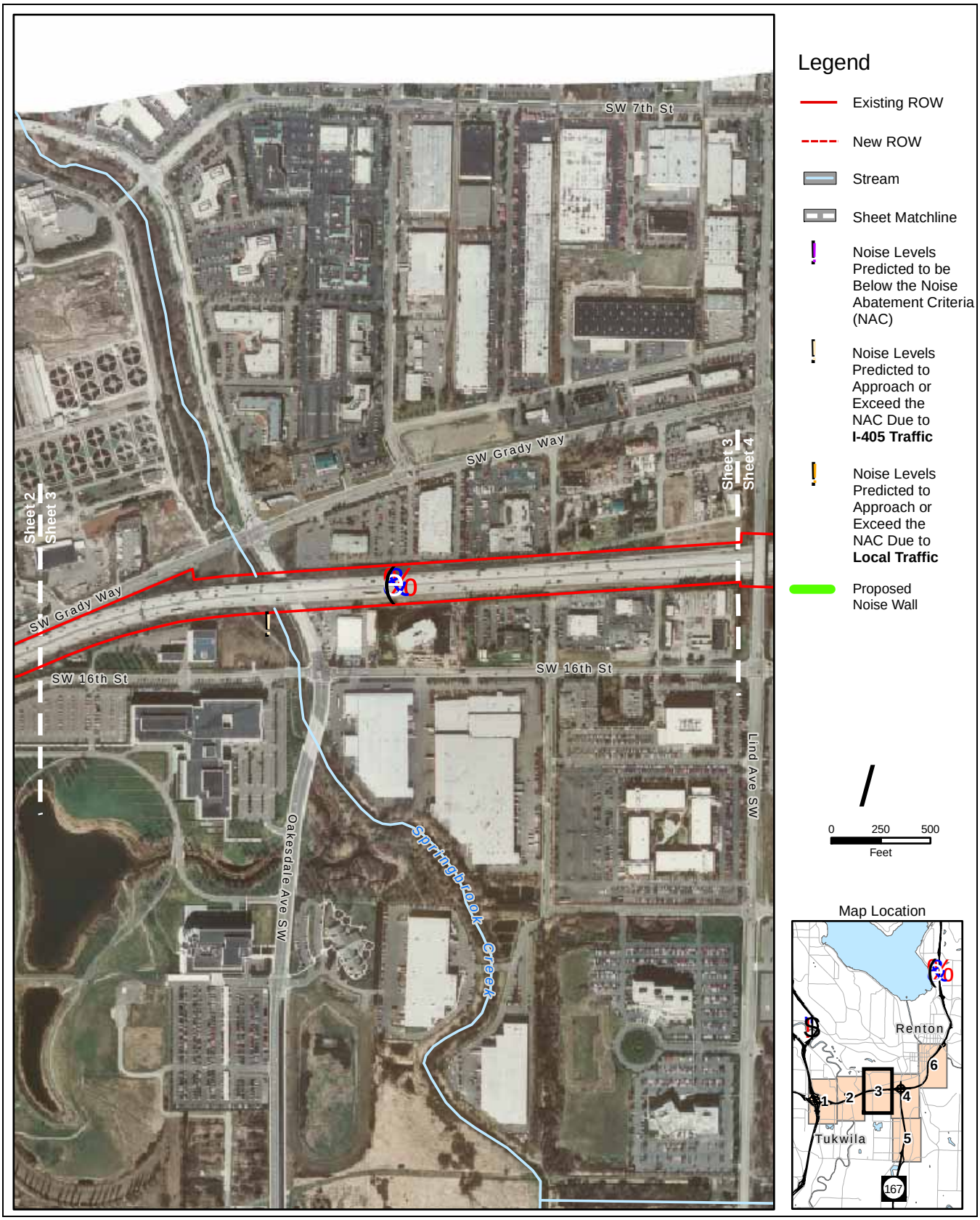

Exhibit 5-4. Predicted Noise Levels in 2030 with Project Built (sheet 3 of 6)

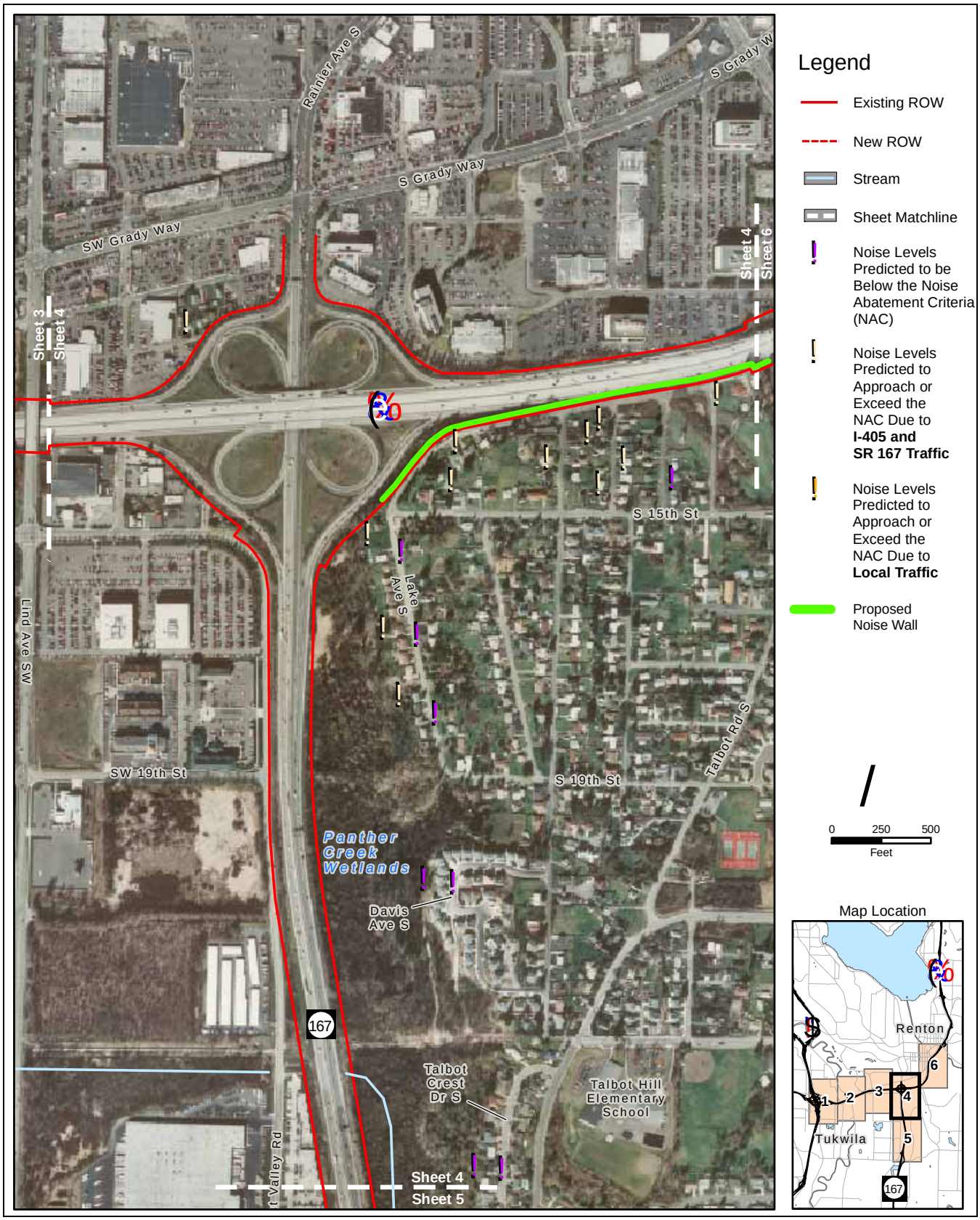

Exhibit 5-5. Predicted Noise Levels in 2030 with Project Built (sheet 4 of 6)

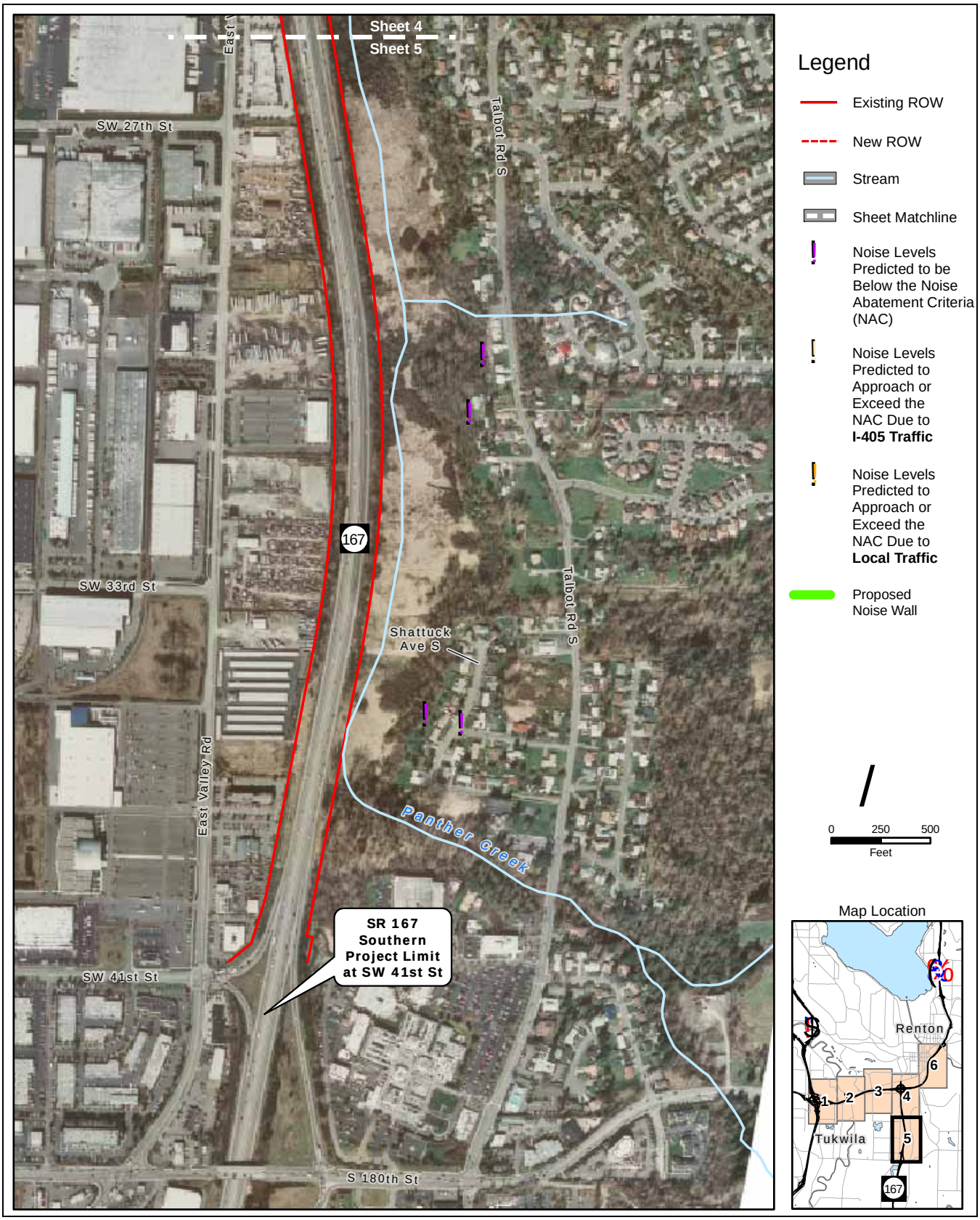

Exhibit 5-6. Predicted Noise Levels in 2030 with Project Built (sheet 5 of 6)

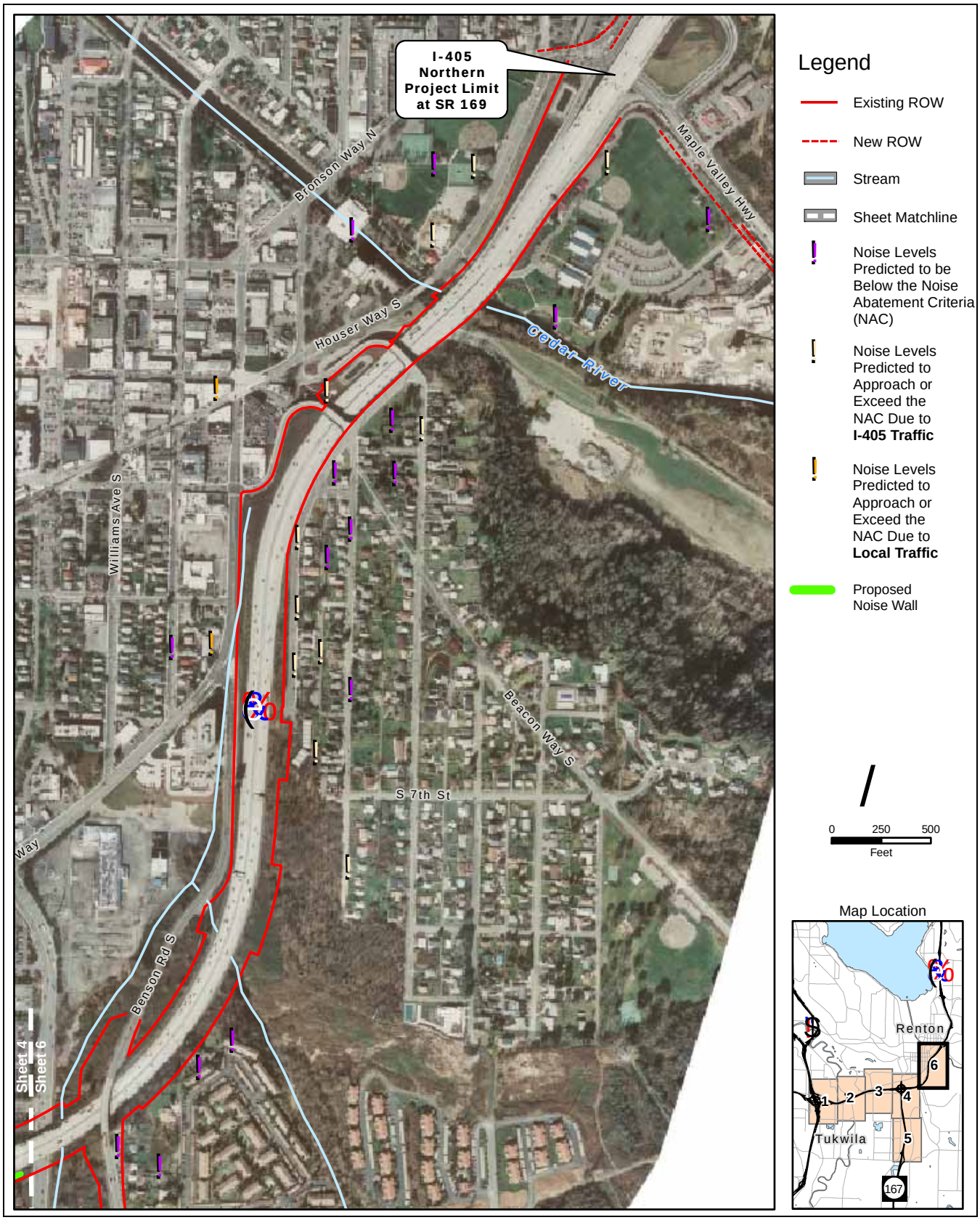

Exhibit 5-7. Predicted Noise Levels in 2030 with Project Built (sheet 6 of 6)

What measures are proposed to minimize noise effects during operation?

The I-405 Project Team determined that one noise wall is both reasonable and feasible for the study area. The noise wall will be built along the northbound I-405 ROW along South 14th Street beginning west of the South 14th Street/South 15th Street intersection and ending east of Talbot Road. Exhibit 5-8 displays this location. This noise wall will reduce noise levels below the NAC at 43 residences.

Another 101 residences in other areas of the project will still approach or exceed the NAC in 2030, but walls for these residences are not reasonable, not feasible, or both.

What do the terms feasible and reasonable mean?

WSDOT evaluates many factors to determine whether barriers will be feasible and/or reasonable. To be feasible, a barrier must be constructible where noise levels will be reduced at least 7 dBA for one or more receptors and will be reduced at least 5 dBA at most of the first row of receptors.

WSDOT determines reasonableness based on how many receptors benefit by a reduction in noise of at least 3 dBA, the cost effectiveness of the barriers, and concerns such as aesthetics, safety, and the desires of nearby residents.

Project noise effects without noise wall

Project noise effects with noise wall

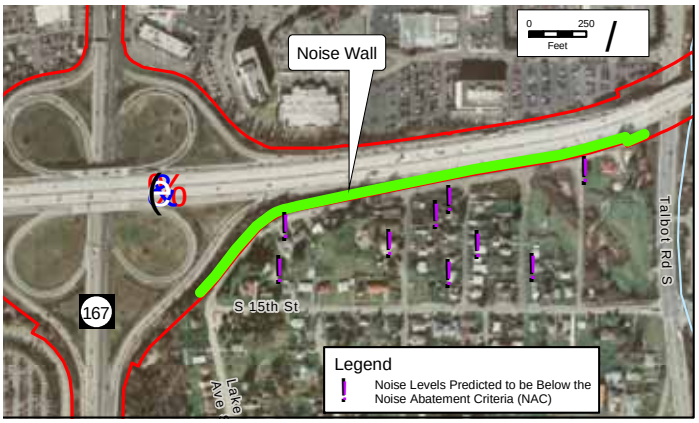

Exhibit 5-8. Effect of Noise Wall Along Northbound I-405 Right-of-way

This simulation visualizes how the proposed noise wall in the I-405 right of way will appear to drivers on I-405 southbound

This page intentionally blank.