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Kim Young
Project Manager
Integrus Architecture
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*Issaquah New Middle School #6 – Site Noise Approval
Issaquah School District #411*

Dear Kim,

This letter presents the results of the environmental noise measurements at the proposed Middle School #6 site for Issaquah School District #411. The purpose of the measurements was to determine noise compliance with Washington Administrative Code (WAC) § 246-366-030, Site Approval, and to make recommendations for building exterior envelope construction, if appropriate.

1. ACOUSTIC CRITERIA

Washington Administrative Code § 246-366-030, Site Approval

The applicable WAC sections, § 246-366-030, Site Approval and § 246-366-110, Sound Control, outline the sound limits for exterior and interior conditions for new schools. § 246-366-030(3) states that the noise from any source at a proposed site for a new school shall not exceed an hourly average of **55 dBA** ($L_{eq} - 60$ minutes) and shall not exceed an hourly maximum (L_{max}) of **75 dBA** during the times of day school is in session. Sites exceeding these sound levels are acceptable only if a plan for sound reduction is included in the new construction proposal, or if applicable sound measurements with regards to WAC § 246-366-110 can be shown to be compliant, for interior spaces.

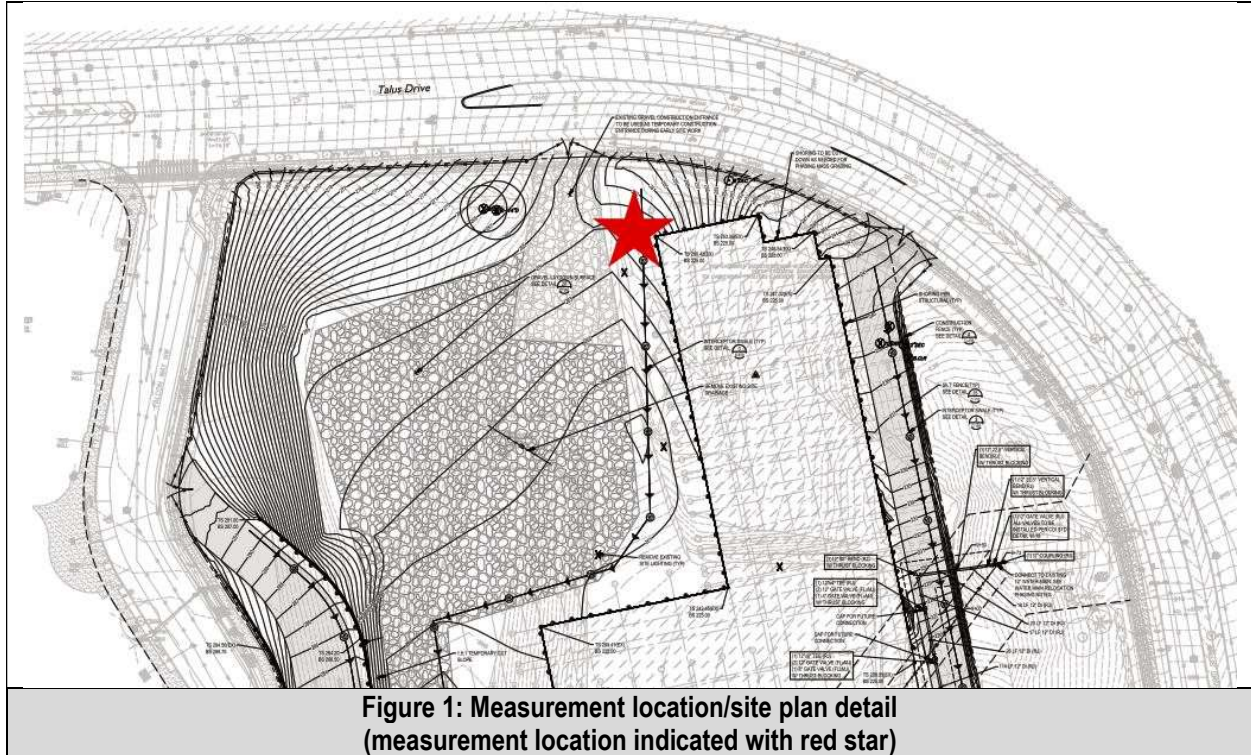
Washington Administrative Code § 246-366-110, Sound Control

WAC § 246-366-110(2) states that for new construction, the actual background noise at any *interior* student location in the classroom, factoring in mechanical systems and the exterior, cannot exceed 30-second-averageds of 45 dBA ($L_{eq} - 30$ seconds) and 70 dB ($L_{eq} - 30$ seconds, unweighted scale).

2) SITE MEASUREMENTS & RESULTS

The noise level on the proposed school site was measured from 8:00 AM to 4:00 PM on Wednesday, March 6, 2019, to test expected acoustic conditions during normal school hours for the proposed site. The sound

level was measured at the proposed site with a Svantek 971 Type 1 precision sound level meter and analyzer. The measurement location is noted in **Figure 1** on the following page, and the measurement results are shown in **Figure 2** on page 3.



The measurement location was chosen to be close to NW Talus Drive, the likeliest source of most of the background noise, while still having an acoustic line-of-sight to Highway 900, and exposure to the air and overflying aircraft.

Figure 2 below shows site noise levels measured and relative to allowed limits. L_{EQ} shows sound levels averaged hourly, and L_{Max} shows hourly maximum sound levels

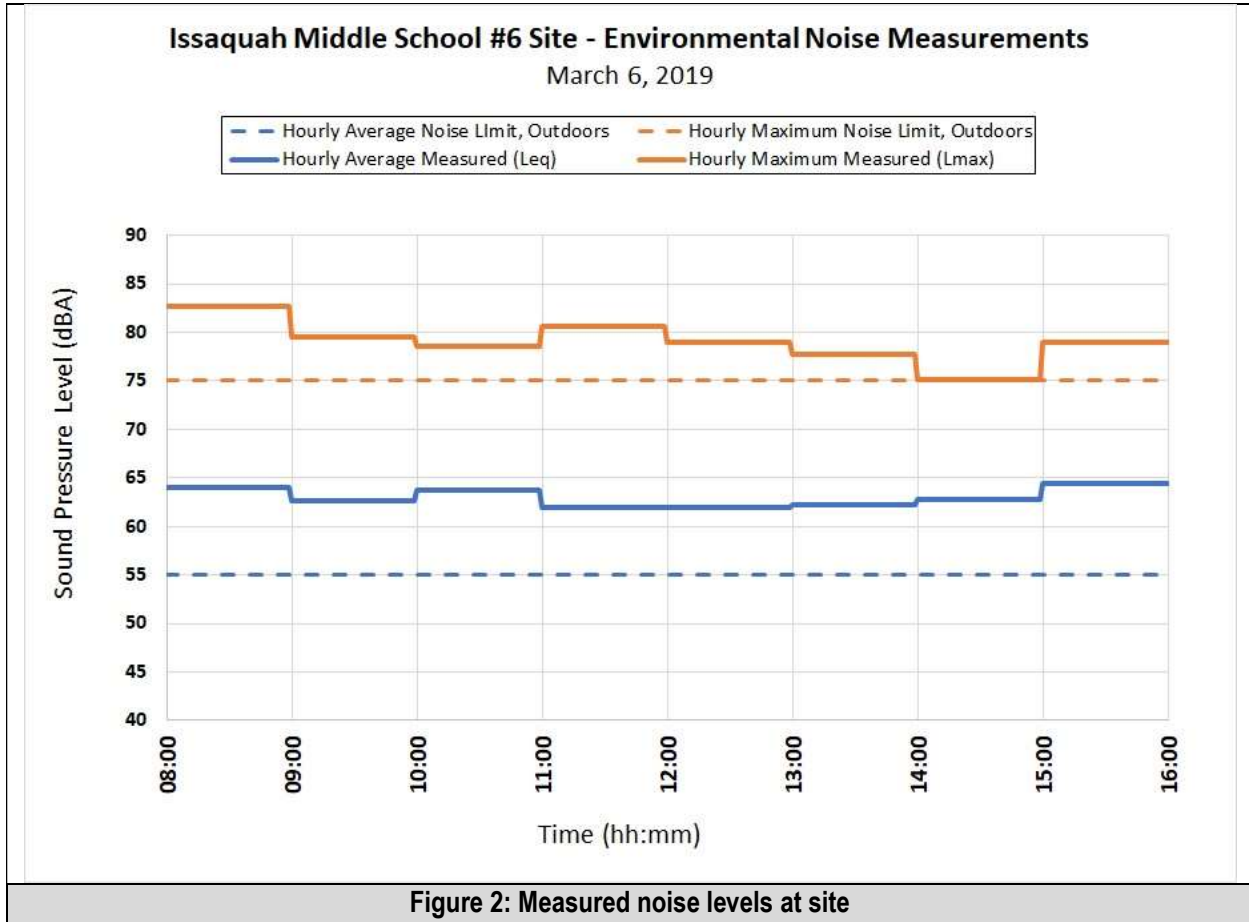


Figure 2: Measured noise levels at site

The hourly-averaged maximum sound pressure levels were above the 75 dBA WAC limit. However, the sound events that caused these levels were all recorded as lasting 7 to 18 seconds. Calculation of the levels measured, using 30-second averaging, showed a worst-case maximum of just under 75 dBA.

Primary sources of background noise were trucks driving on NW Talus Drive, and primary sources of loud noise spikes were overflying planes. During the 8am-4pm window, 17 planes were recorded, exceeding WAC limits over the site: 2 jets and 15 single- or double-propeller planes. Durations over WAC exterior limits were always less than 15 seconds. The windows used in construction – which are the weakest link in building sound reduction – must be sufficiently rated to reduce noise down to WAC limits.

3) INTERIOR NOISE PREDICTION

In order to meet the WAC allowable limit of 45 dBA at any student location, the school design must include windows with a minimum sound transmission class (STC) of 35, which equates to an outside-inside transmission class (OITC) of 28. These ratings can usually be attained with ¼” double-paned windows, separated by a ½” air gap. In addition, all window frames must be well sealed, to eliminate alternative sound entry paths.

4) **SUMMARY**

Outside noise at the Issaquah Middle School #6 site was found to exceed both hourly maximum (75 dBA) and hourly-averaged (55 dBA) background noise levels, according to WAC § 246-366-030(3). The school design must include windows rated STC 35 (OITC 28) or higher, as well as a plan for good sealing of window frames. With these recommendations implemented, noise levels within instructional spaces will be reduced to within the WAC allowable limit.

Please contact us if you have any questions, or for additional information.

Sincerely,
A3 Acoustics, LLP



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