

28 March 2022

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**Subject: Kaka’oka – Block I
Environmental Noise Study (DRAFT)
Salter Project 22-0073**

Dear Kevin:

We have conducted an environmental noise study for the project. The purpose of the study is to quantify the noise environment at the site, compare the measured data with applicable standards, and propose mitigation measures as necessary. This report summarizes the results.

PROJECT CRITERIA

The Hawai’i Building Code (i.e., 2012 International Building Code) does not include standards for environmental noise intrusion. However, the Department of Housing and Urban Development (HUD) has a criterion of DNL¹ 45 dB for multi-family residential projects, which matches the criterion in the California Building Code and is used by many residential developers, including in Hawai’i. We have used that as the criterion for this project.

NOISE ENVIRONMENT

The project is a new 39-story condominium tower bounded by Ala Moana Boulevard, Koula Street, and Auahi Street, just west of Ward Avenue. The noise environment at the site is predominantly controlled by vehicular traffic on Ala Moana Boulevard and Ward Avenue.

1 DNL (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. DNL is sometimes written as L_{dn} .



To quantify the existing noise environment, we conducted two continuous long-term noise measurements from 20 to 24 February 2022. The monitors were at a height of 12 feet above grade. See **Figure 1** for the measurement locations and measured noise levels.

Based on our measured data, we used a 3-D noise model to calculate noise levels at the building facade. A future traffic analysis was not provided for this project. However, we have added 1 dB to the data in our calculations to account for future traffic increases.

RECOMMENDATIONS

We used the Schematic Design – Progress Set drawings received 25 February 2022, which show room sizes and locations. We calculated the window STC² ratings needed to meet the project criterion (see **Figures 2 to 7**). Our calculations are based on the following:

- All rooms will have hard-surfaced flooring
- The reserve housing residences (Levels 1 to 5) will have punched windows
- The tower residences (Levels 6 to 39) will have a window-wall system; the window-wall structure is separate from the framing support of the interior gypsum board

The recommended STC ratings are for full window assemblies (glass and frame) rather than just the glass itself. Tested sound-rated assemblies should be used.

For reference, typical one-inch glazing assemblies (two 1/4-inch thick panes with a 1/2-inch airspace) achieve approximately STC 32. Where STC ratings above 33 are required, at least one pane will need to be laminated.

Where windows need to be closed to meet the project criterion, an alternative method of supplying fresh air (e.g., mechanical ventilation) should be considered. This applies to all residences. This issue should be discussed with the project mechanical engineer.

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2 STC (Sound Transmission Class) – A single-number rating defined in ASTM E90 that quantifies the airborne sound insulating performance of a partition under laboratory conditions. Increasing STC ratings correspond to improved airborne sound insulation.

This concludes our environmental noise study for Kaka'oka – Block I. Should you have any questions, please give us a call.

Best,

SALTER

Austin Zambito-Valente
Consultant

Eric Mori, PE
Senior Vice President

Enclosures as noted

DRAFT





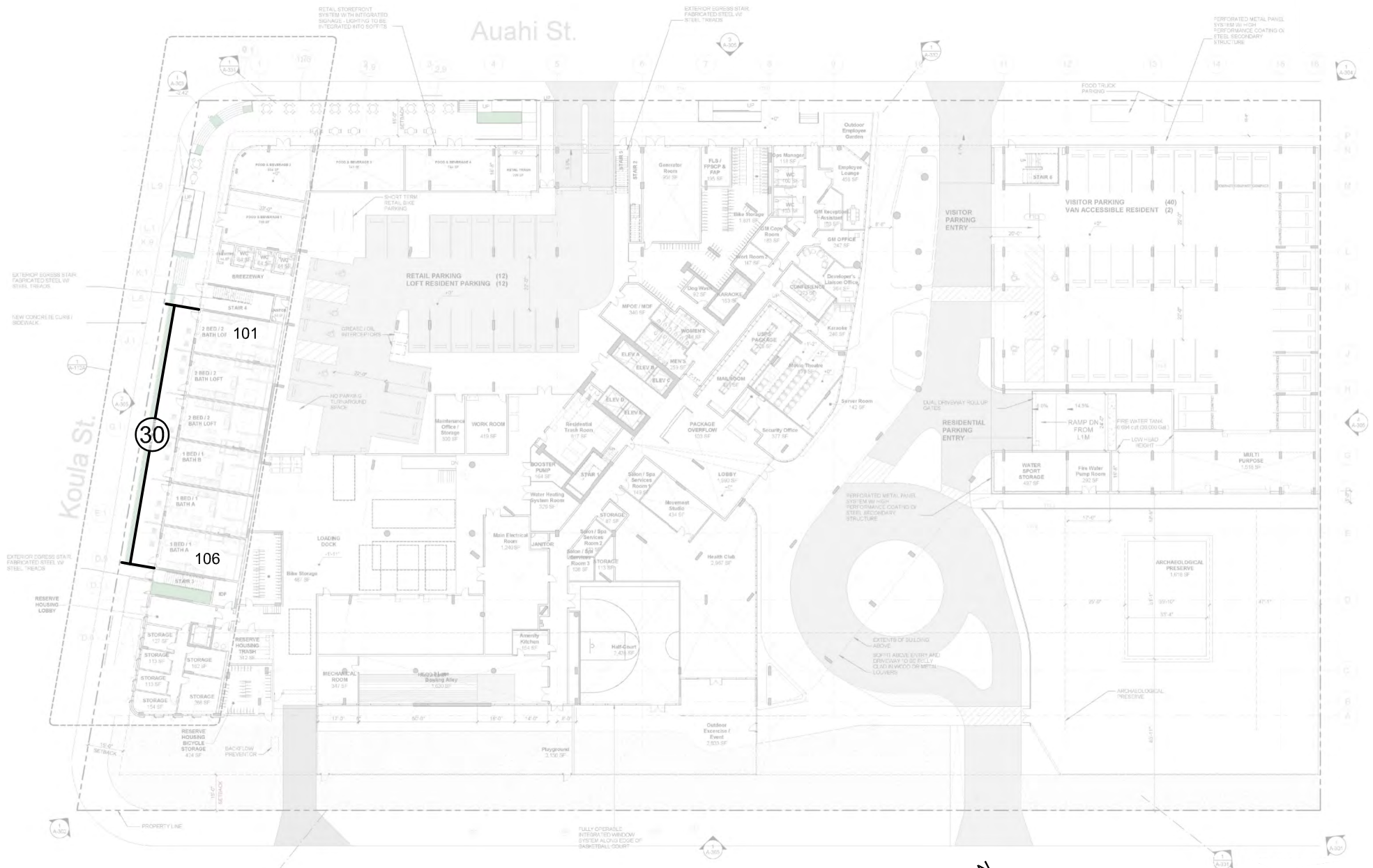
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KAKA'OKA BLOCK I MEASUREMENT LOCATIONS AND MEASURED NOISE LEVELS

FIGURE 1

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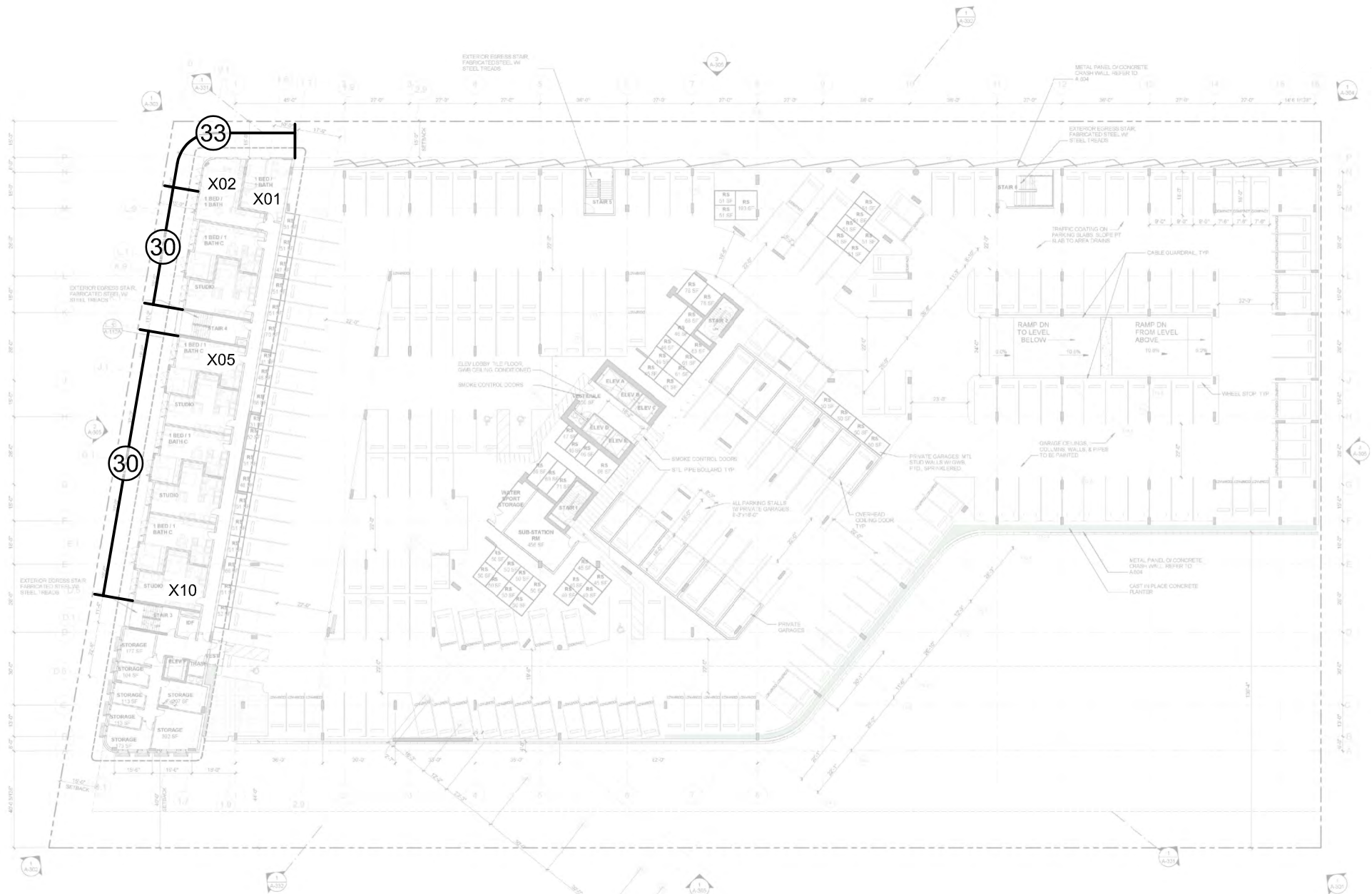


KAKA'OKO BLOCK I MINIMUM CODE-REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 1 AND 1M)

FIGURE 2

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NOTE: STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB



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KAKA'OKO BLOCK I MINIMUM CODE-REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 2 TO 5)

FIGURE 3

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NOTE: STC RATINGS ARE FOR THE COMPLETE ASSEMBLY (E.G., GLASS, FRAME, AND OPERABLE SECTIONS) BASED ON TEST REPORTS FROM AN NVLAP-ACCREDITED LAB



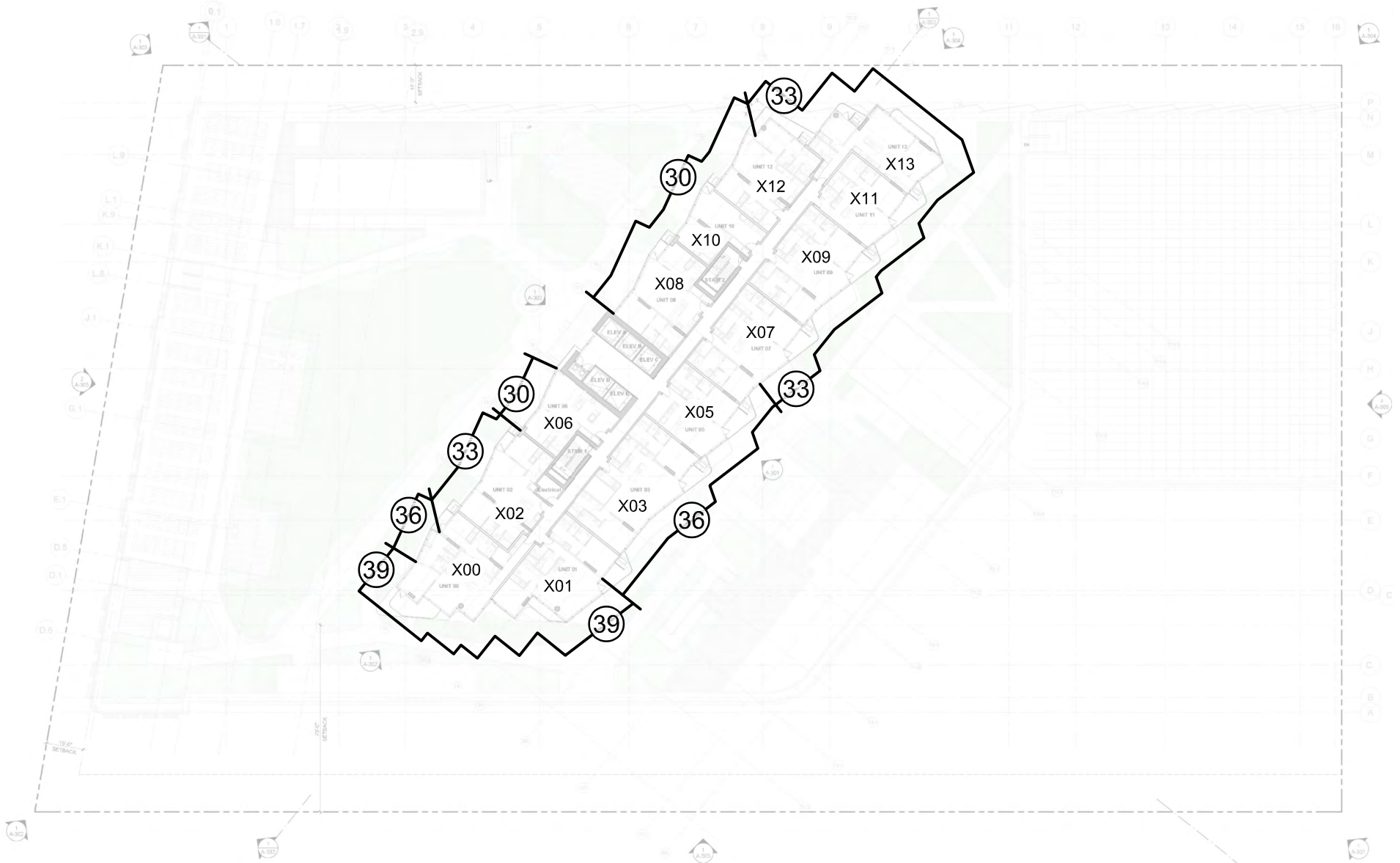
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KAKA'OKO BLOCK I MINIMUM CODE-REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 6)

FIGURE 4

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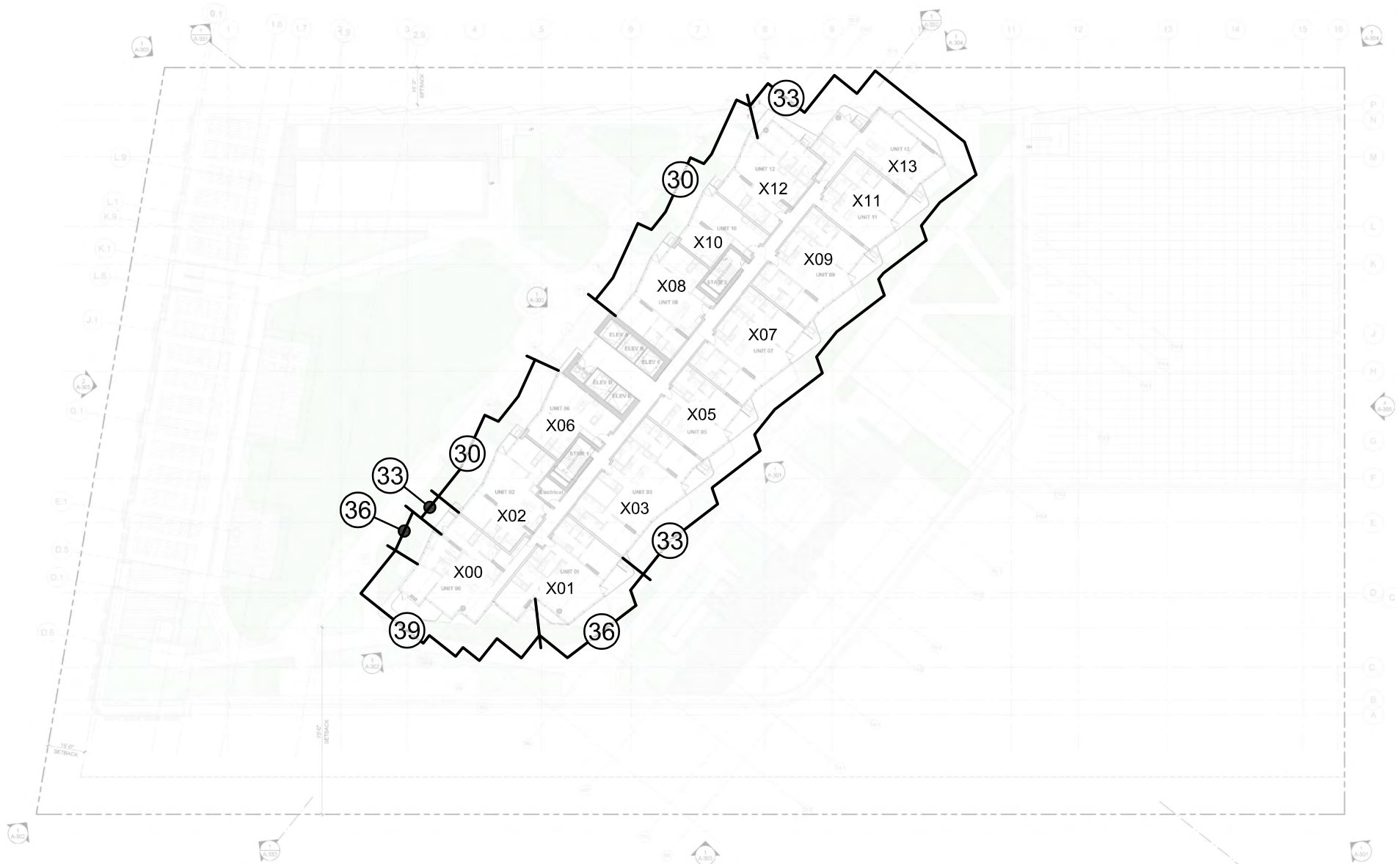
KAKA'OKO BLOCK I

MINIMUM CODE-REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 7 TO 15)

FIGURE 5

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KAKA'OKO BLOCK I MINIMUM CODE-REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 16 TO 23)

FIGURE 6

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KAKA'OKO BLOCK I MINIMUM CODE-REQUIRED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 24 TO 39)

FIGURE 7

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