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16 October 2012

Alicia Klein
Resources for Community Development
2220 Oxford Street
Berkeley, CA 94704
Email: aklein@rcdev.org

Subject: **Ashland Family Housing – Ashland, CA**
Environmental Noise Study
CSA Project: 12-0473

Dear Alicia:

As requested, we have conducted an environmental noise study for the Ashland Family Housing project. The purpose of the study is to determine the noise environment at the proposed site, compare the measured data with applicable standards, and propose mitigation measures as necessary. This report summarizes the results of our study.

PROJECT CRITERIA

The project site is subject to noise criteria from the Eden Area General Plan, County of Alameda and also the California Building Code. The specific criteria for each of these are discussed below.

Eden Area General Plan, County of Alameda

Goal N-1 of the noise element for the Eden Area General Plan, County of Alameda addresses environmental noise. Policies P4 and P5 establish exterior and interior noise guidelines for land-use compatibility as follows:

- New multi-family residential developments shall be designed to maintain a standard of 65 dB L_{dn}[1] maximum in community outdoor recreation areas. Balconies shall not be considered outdoor recreation areas, thus no noise standards shall apply to these areas.
- All new residential land uses shall be designed to maintain a standard of 45 dB L_{dn} maximum in building interiors.

California Building Code

The California Building Code (Title 24, Chapter 12) requires that the indoor noise level in new multi-family housing not exceed DNL 45 dB where the exterior noise level is greater than DNL 60 dB.

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1 Day-Night Average Sound Level (DNL) – A descriptor established by the U.S. Environmental Protection Agency to represent a 24-hour average noise level with a 10 dB penalty applied to noise occurring during the nighttime hours (10 pm to 7 am) to account for the increased sensitivity of people during sleeping hours.

The CBC also states that if windows must be closed to meet the interior standard, the design must include a ventilation or air-conditioning system to provide a habitable interior environment.

NOISE ENVIRONMENT

The project site is located in Ashland, California at the southeast corner of E 14th Street and Kent Avenue. The project site is bordered by baseball fields to the west and single-family housing to the south. The major noise source is vehicle traffic on the nearby roadways.

To quantify the existing noise environment, we conducted three long-term noise measurements and two-short term (15-minute) measurements at the project site between 8 and 11 October 2012. An offset in noise levels between long-term and short-term monitor locations was used to estimate the L_{dn} at short-term locations (northwest and southwest corners of the project). The attached Figure 1 shows the locations for the long-term (M1, M2, and M3) and short-term (S1 and S2) measurements and the measured L_{dn}.

Long-term monitors were attached to utility poles at a height of 12 feet above grade. The two short-term measurements were conducted at approximately 40 feet above grade to represent the upper floors of the housing project.

Based on the above data, we calculated the expected L_{dn} at the various facades and elevations. The L_{dn} ranged between 58 and 75 dB across the site. The Eden Area General Plan defines this as a "conditionally acceptable" exterior noise exposure. We have added 1 dB to the expected L_{dn} to account for future traffic increases[2].

RECOMMENDATIONS

To meet the interior L_{dn} 45 dB requirement, it will be necessary for all of the facades to be sound-rated. We used the first floor plan dated 25 September 2012, the upper level floor plans dated 7 September 2012, and the elevations dated 5 October 2012 to measure the layout of the units.

Based on the above drawings, we calculated the window and exterior door STC[3] ratings needed to meet the project criterion as shown on Figures 2 to 4. If unit layout and elevations are changed significantly, the STC ratings may need to be revised.

Typical construction-grade dual-pane thermal windows achieve an STC rating of 28; one-inch assemblies (two ¼-inch thick panes with a ½-inch airspace) typically achieve an STC rating

[2] Caltrans assumes a traffic volume increase of three-percent per year, which corresponds to a 1 dB increase over ten years. In the absence of City data, we have used this same formula for the local roads.

[3] Sound Transmission Class (STC) – A single-figure rating standardized by ASTM and used to rate the sound insulation properties of building partitions. The STC rating is derived from laboratory measurements of a particular building element and as such is representative of the maximum sound insulation. Increasing STC ratings correspond to improved noise isolation.

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of 32. Depending on the window manufacturer, STC ratings of approximately 35 or higher may require one pane to be laminated.

It is important to note that the STC ratings recommended are for full window assemblies (glass and frame) rather than just the glass itself. Tested sound-rated assemblies should be used. If non-tested assemblies were to be used, the STC rating of the glass would likely need to be increased.

The building code requires that where windows need to be closed to achieve an indoor L_{dn} of 45 dB, an alternative method of supplying fresh air (e.g., mechanical ventilation) must be provided. This applies to all units where sound-rated windows are indicated in Figures 2 to 4. This issue should be discussed with the project mechanical engineer.

* * *

This concludes our environmental noise study for the Ashland Family Housing project. Should you have any questions, please give us a call.

Sincerely,

CHARLES M. SALTER ASSOCIATES, INC.

Valerie C. Smith
Consultant

Alexander K. Salter, PE
Principal Consultant

VCS/AKS/lwd

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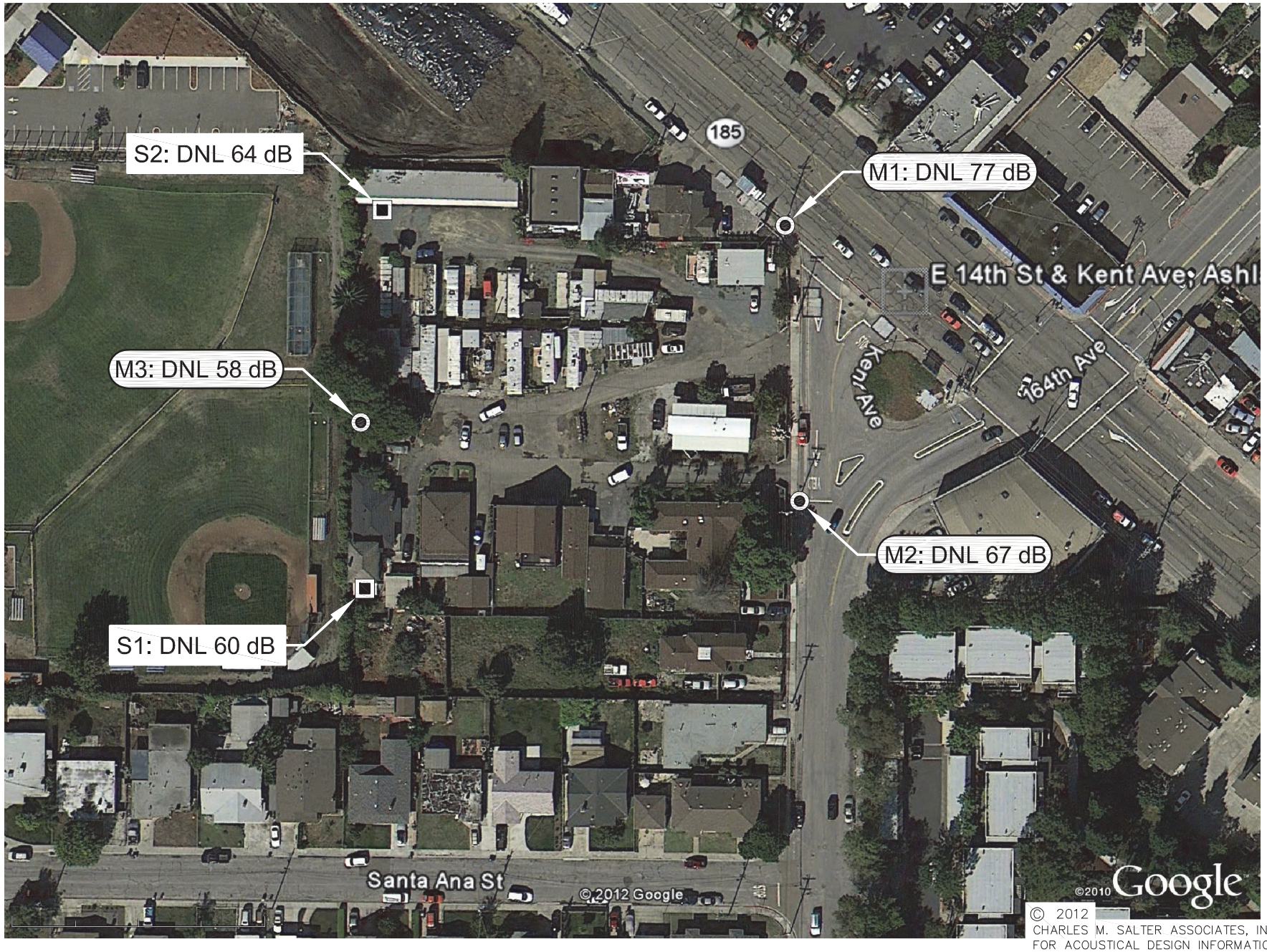

ASHLAND FAMILY HOUSING
MEASUREMENT LOCATIONS AND MEASURED DNL

FIGURE 1

CSA # 12-0473

AKS/VS 10.16.12

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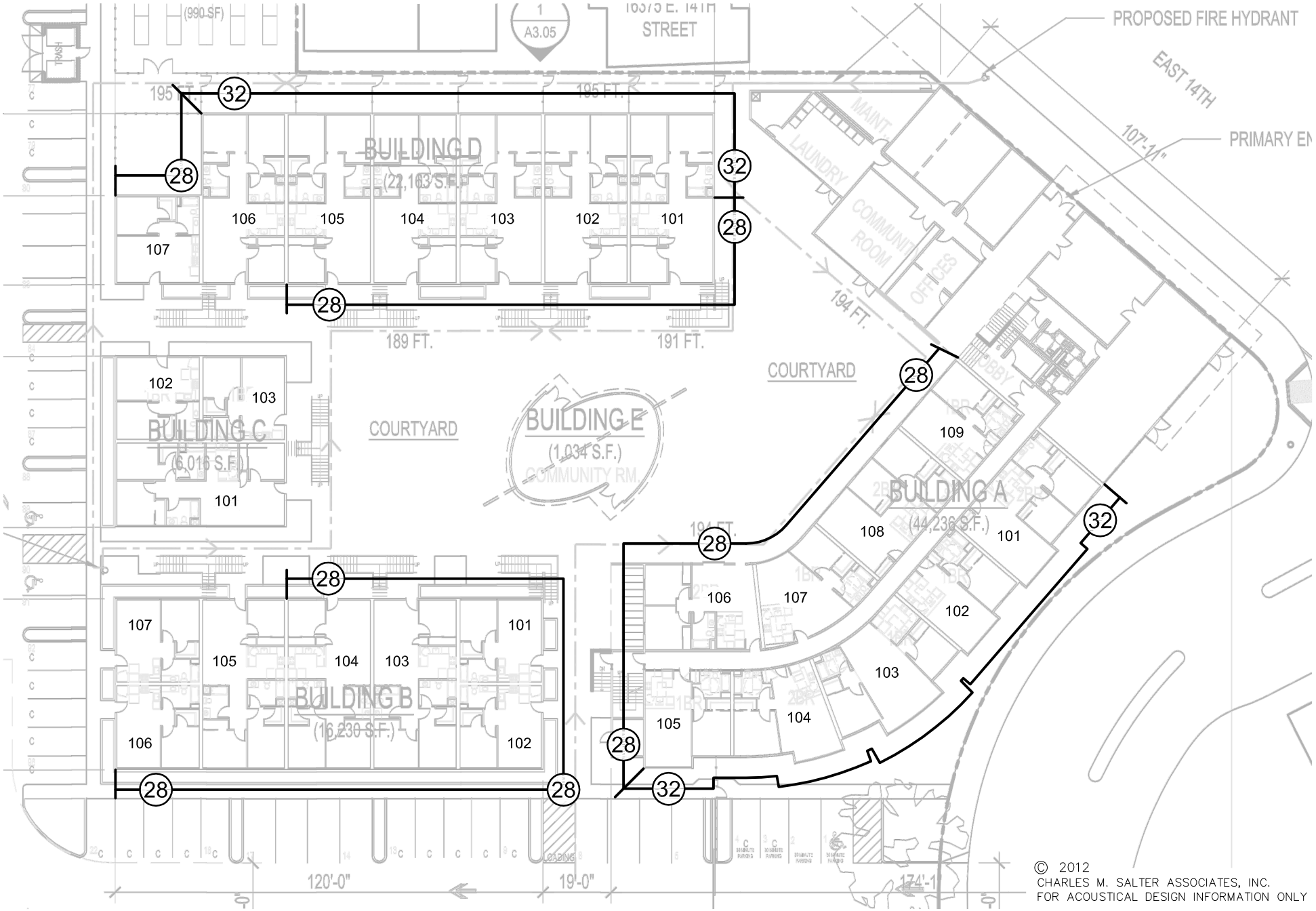

ASHLAND FAMILY HOUSING
MINIMUM RECOMMENDED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 1)

FIGURE 2

CSA # 12-0473

AKS/VS 10.16.12

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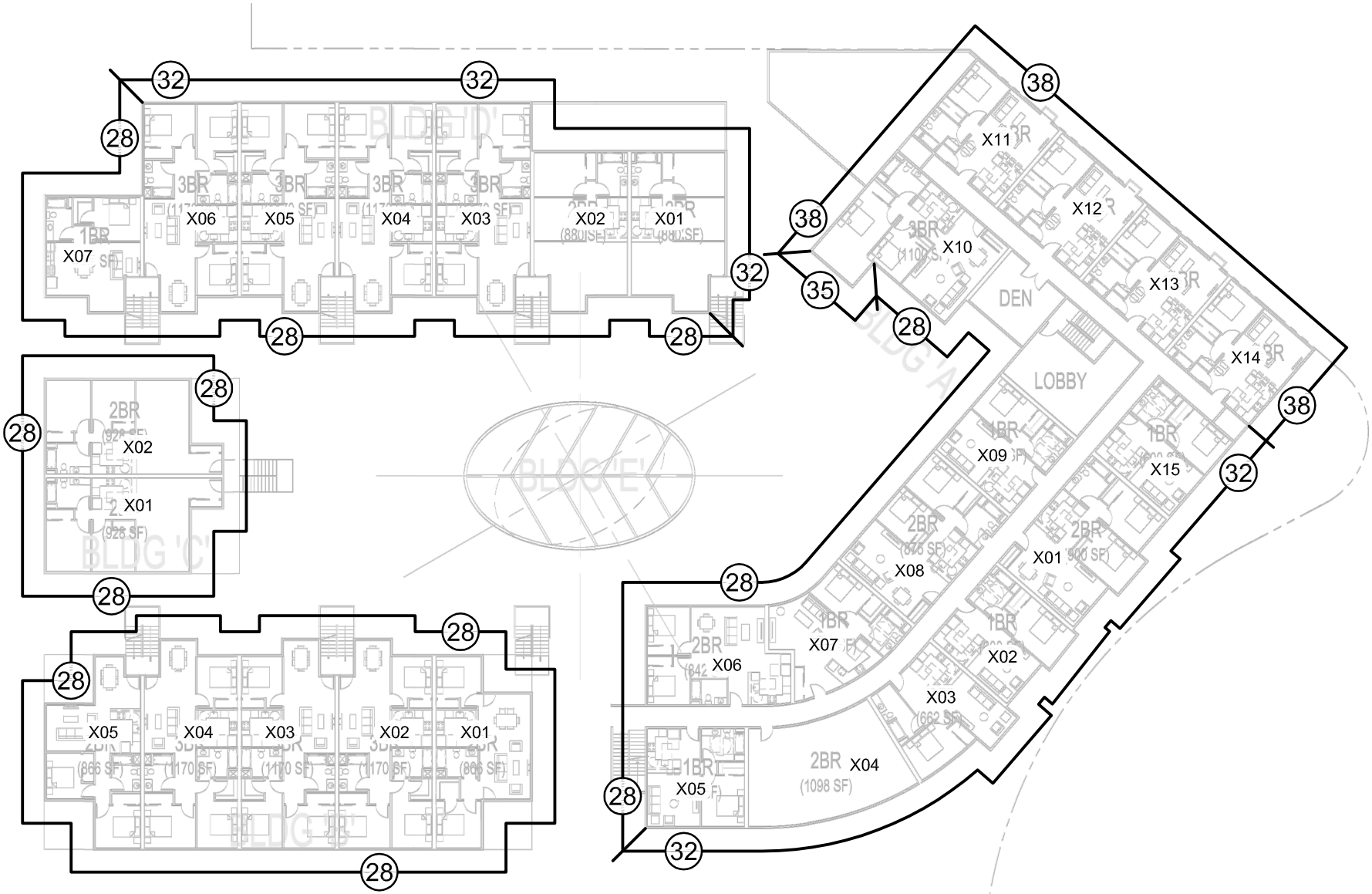

ASHLAND FAMILY HOUSING
MINIMUM RECOMMENDED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOORS 2 & 3)

FIGURE 3

CSA #	AKS/VS
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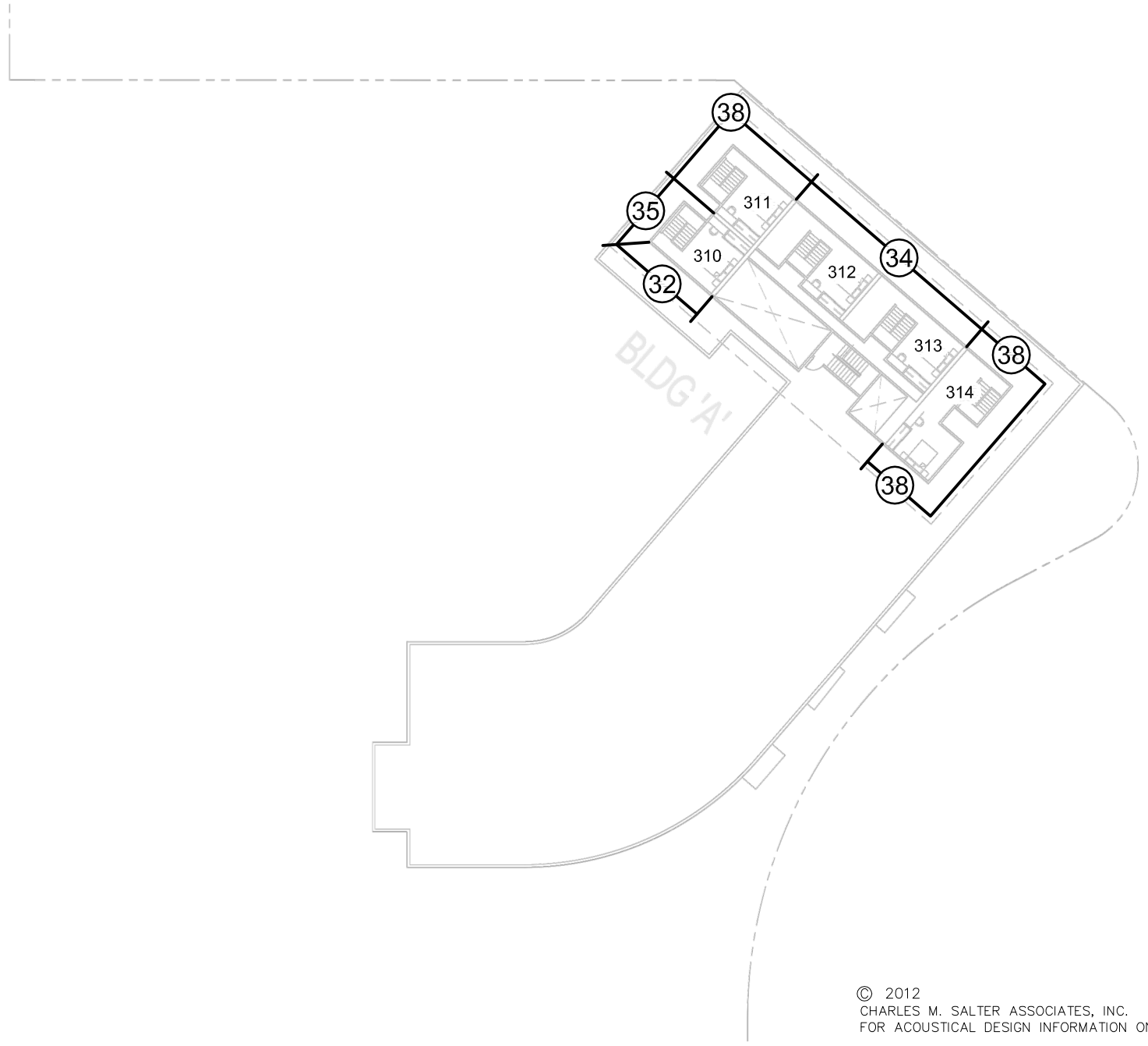

ASHLAND FAMILY HOUSING
MINIMUM RECOMMENDED STC RATINGS FOR WINDOWS AND EXTERIOR DOORS (FLOOR 4)

FIGURE 4

CSA #	AKS/VS
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