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Memo

Date: August 6, 2019

To: Fiona Phung
David J. Powers & Associates, Inc.

From: Michael S. Thill
Illingworth & Rodkin, Inc.

SUBJECT: **Related Mixed Use – Tasman East, Santa Clara, California**
Interior Noise Assessment
(IR Job # 19-072)

This memo summarizes preliminary noise insulation recommendations for the Related Mixed Use project proposed within the Tasman East Specific Plan Area in Santa Clara, California. The project would construct 732 residential units in two buildings (multi-family market rate apartments and home for ambulatory aged). The proposed multi-family building would be located on the northeastern portion of the site. The building would be 22 stories tall (approximately 237 feet to the mechanical roof) with 542 residential units. Floors one to seven would consist of parking and residential units. The remaining floors would have residential units. The home for the ambulatory aged would be located on the northwestern portion of the site. The building would be 19 stories tall (approximately 205 feet to the top of the coping) with 190 units.

REGULATORY CRITERIA

2016 California Building Code, Title 24, Part 2. The current version of the California Building Code (CBC) requires interior noise levels attributable to exterior environmental noise sources to be limited to a level not exceeding 45 dBA L_{dn}/CNEL in any habitable room.

City of Santa Clara General Plan. The City of Santa Clara's General Plan identifies noise and land use compatibility standards for various land uses and establishes policies to control noise within the community. Noise levels within residential land uses are considered compatible where noise levels are maintained at or below 45 dBA L_{dn}/CNEL.

FUTURE NOISE ENVIRONMENT

Illingworth & Rodkin, Inc. calculated future noise levels expected along Lafayette Street and Tasman Drive as part of the Tasman East Specific Plan Noise and Vibration Assessment[1]. At a

[1] Tasman East Specific Plan Noise and Vibration Assessment, Illingworth & Rodkin, Inc., July 2, 2018.

distance of 50 feet from the southern and western border of the proposed plan area, near Lafayette Street and Tasman Drive, sound levels are expected to range from 72 to 74 dBA CNEL. Noise levels are expected to range from 62 to 67 dBA CNEL throughout the remainder of the site due to local traffic along Calle De Luna and Calle Del Sol, as well as, from aircraft associated with Norman Y. Mineta San Jose International Airport.

Where exterior noise levels range from 60 to 65 dBA CNEL, the inclusion of adequate forced-air mechanical ventilation is often the method selected to reduce interior noise levels to acceptable levels by closing the windows to control noise. Where noise levels exceed 65 dBA CNEL, forced-air mechanical ventilation systems and sound-rated construction methods are normally required. Such methods or materials may include a combination of smaller window and door sizes as a percentage of the total building façade facing the noise source, sound-rated windows and doors, sound rated exterior wall assemblies, and mechanical ventilation so windows may be kept closed at the occupant's discretion. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA DNL with proper wall construction techniques, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

Interior noise levels would vary depending upon the design of the buildings (relative window area to wall area) and the selected construction materials and methods. Standard residential construction provides approximately 15 dBA of exterior to interior noise reduction, assuming the windows are partially open for ventilation. Standard construction with the windows closed provides approximately 20 to 25 dBA of noise reduction in interior spaces. Future interior noise levels at the plan area would be up to 55 dBA CNEL, exceeding the 45 dBA CNEL threshold of the Santa Clara General Plan.

Floor plans and elevations prepared by *Steinberg Hart* (100% Schematic Design dated May 31, 2019) were reviewed, and calculations were made to quantify the transmission loss provided by the proposed building elements and to estimate interior noise levels resulting from exterior noise sources. The relative areas of the building elements (walls, windows, and doors) were then input into an acoustical model to calculate interior noise levels. Figures 1 summarizes the noise control recommendations for the proposed project. To maintain a habitable interior environment, all units should be mechanically ventilated so that windows and doors can be kept closed at the occupant's discretion to control noise intrusion indoors.

- Preliminary calculations indicate that the north, west, and south facades of home for the ambulatory aged, having line-of-sight to Lafayette Street, would require windows and doors with a minimum STC rating of 35 to 38 to meet the interior noise threshold established by the City.

- Along the south façade of the home for the ambulatory aged, and the south, west, and east facades of the multi-family market rate apartments, having direct line-of-sight to Tasman Drive, the required STC for windows and doors would be 30 to 35.

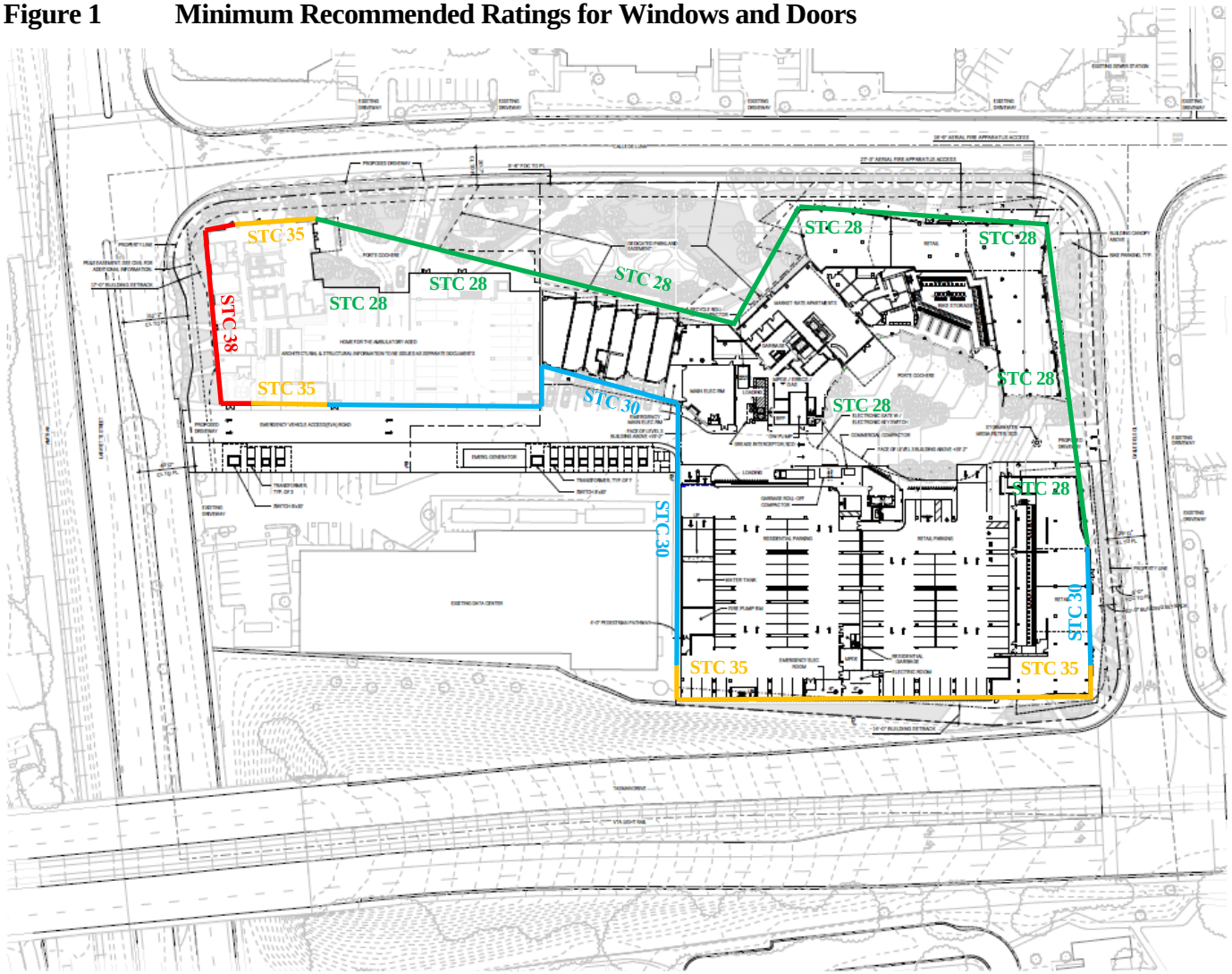
- Remaining facades throughout the site shall require STC 28 windows and doors.

- Provide a suitable form of forced-air mechanical ventilation, as determined by the local building official, for all residential units in the plan area so that windows can be kept closed at the occupant's discretion to control interior noise and achieve the interior noise standards.

- If substantive changes are made to the design of the project prior to building department submittal, a qualified acoustical consultant shall confirm the noise insulation recommendations based on the final site plans, building elevations, and floor plans of the proposed residential buildings. Results of the analysis, including the description of the necessary noise control treatments, shall be submitted to the City, along with the building plans and approved design, prior to issuance of a building permit.

With the incorporation of noise insulation, interior noise levels would be maintained below 45 dBA CNEL with an adequate margin of safety.

Figure 1 Minimum Recommended Ratings for Windows and Doors



GENERAL NOTES

TASMAN EAST
PARCEL 3

NOTE:

FOR REFERENCE ONLY; REFER TO SITE WORK DOCUMENTATION FOR AT-GRADE LANDSCAPE DESIGN, CIVIL ENGINEERING, AND JOINT TRENCH UTILITIES. THE DRAWING DOCUMENTATION FOR SITE WORK HAS BEEN ISSUED SEPERATELY.

SITE PLAN

A101