2550 IRVING STREET

Tenderloin Neighborhood
Development Corporation
Solar/Shadow Model

5.26.2021

PYATOK

EXECUTIVE SUMMARY

TNDC received requests from neighbors looking to understand how shadows from the proposed 7-story building at 2550 Irving will differ from those created by the existing building, so we asked Pyatok Architects to create a visual representation to illustrate the current conditions overlaid with new shadow patterns.

This is not a formal shadow study intended to comply with San Francisco's Proposition K, which is not required for this development. Rather we're presenting these models in the spirit of open communication with neighbors, with whom we'll review the findings and our shadow mitigation strategies, and allow space for questions and answers.

The model assumes the maximum possible impact based on maximum height allowable under zoning combined with state density bonus height, for a total of 7 stories. The model does not represent the likely architectural details or contours of the building, which are not yet final and will likely result in smaller shadow zones than the shadow model suggests.

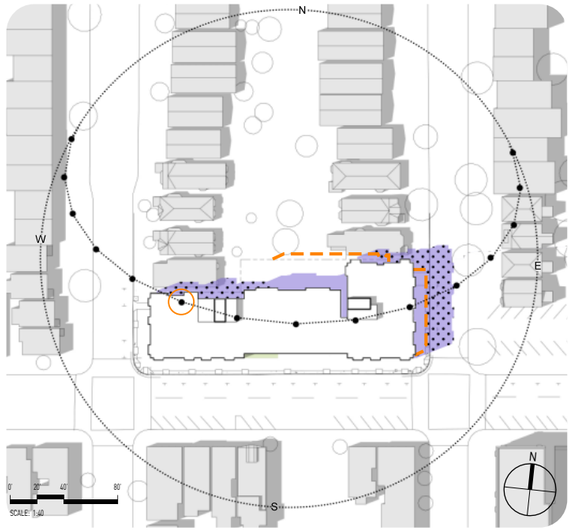
When reviewing the materials, it's important to examine seasonal patterns in each of the represented times of day for a complete understanding.

HOW TO USE THIS DOCUMENT

The modeled shadows that are light purple with dots, and outside of the orange dashed line, represent total new shadows created by the new proposed structure on the site when compared to existing conditions.

LEGEND FOR SHADOW DIAGRAMS ON PGS. 4-6

OUTLINE OF EXISTING SITE BUILDING SHADOW	
CONTEXT (EXISTING BUILDINGS) SHADOWS	
PROPOSED BUILDING SHADOW	
PROPOSED BLDG. SHADOW OVERLAP W/ EXISTING SHADOWS	
TOTAL NEW SHADOW	



**Note: This computer simulation of cast shadows accounts for primary structures such as neighborhood existing buildings and does not take into effect other secondary three-dimensional existing objects such as backyard fences, sheds or vegetation such as trees and hedges which would interact with cast shadows in the real world.*

SITE DATA:

2550 Irving Street, San Francisco, CA

Lat: 37.7634735107422

Long: -122.485023498535

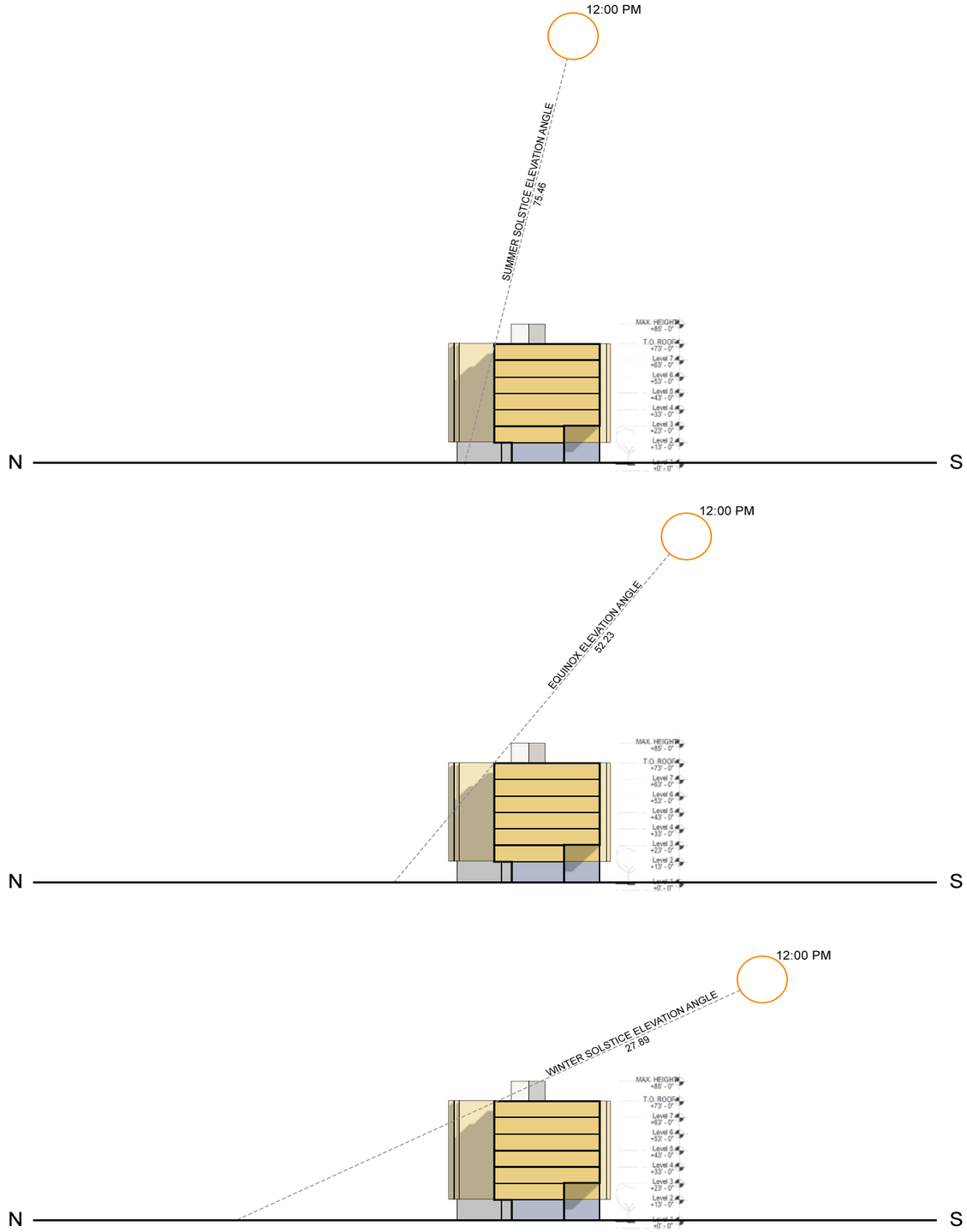
CLIMATE DATA SOURCE:

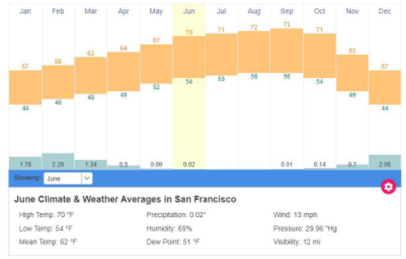
Climate & Weather Averages in San Francisco

(https://www.timeanddate.com/weather/usa/san-francisco/climate)

LEGEND FOR SHADOW DIAGRAMS ON PGS. 4-6

OUTLINE OF EXISTING SITE BUILDING SHADOW	
CONTEXT (EXISTING BUILDINGS) SHADOWS	
PROPOSED BUILDING SHADOW	
PROPOSED BLDG. SHADOW OVERLAP W/ EXISTING SHADOWS	
TOTAL NEW SHADOW	

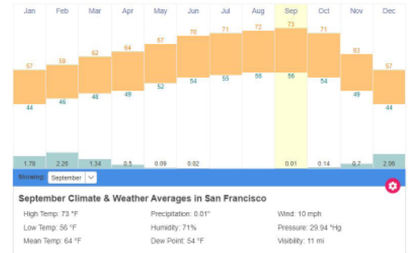




SUMMER SOLSTICE - JUNE 21

SUNRISE: 4:49AM | SUNSET: 7:33PM (NO DST ADJUSTMENT)

AVERAGE TEMPERATURE: 70 °F HIGH | 54 °F LOW



AUTUMNAL & VERNAL EQUINOX - SEPTEMBER 21 & MARCH 21

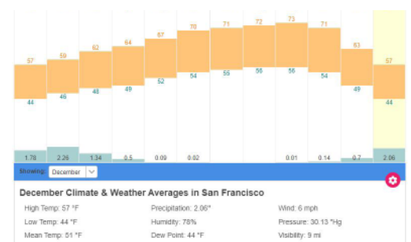
SEPTEMBER 21

SUNRISE: 5:57AM | SUNSET: 6:08PM (NO DST ADJUSTMENT)

MARCH 21

SUNRISE: 6:13AM | SUNSET: 6:21PM (NO DST ADJUSTMENT)

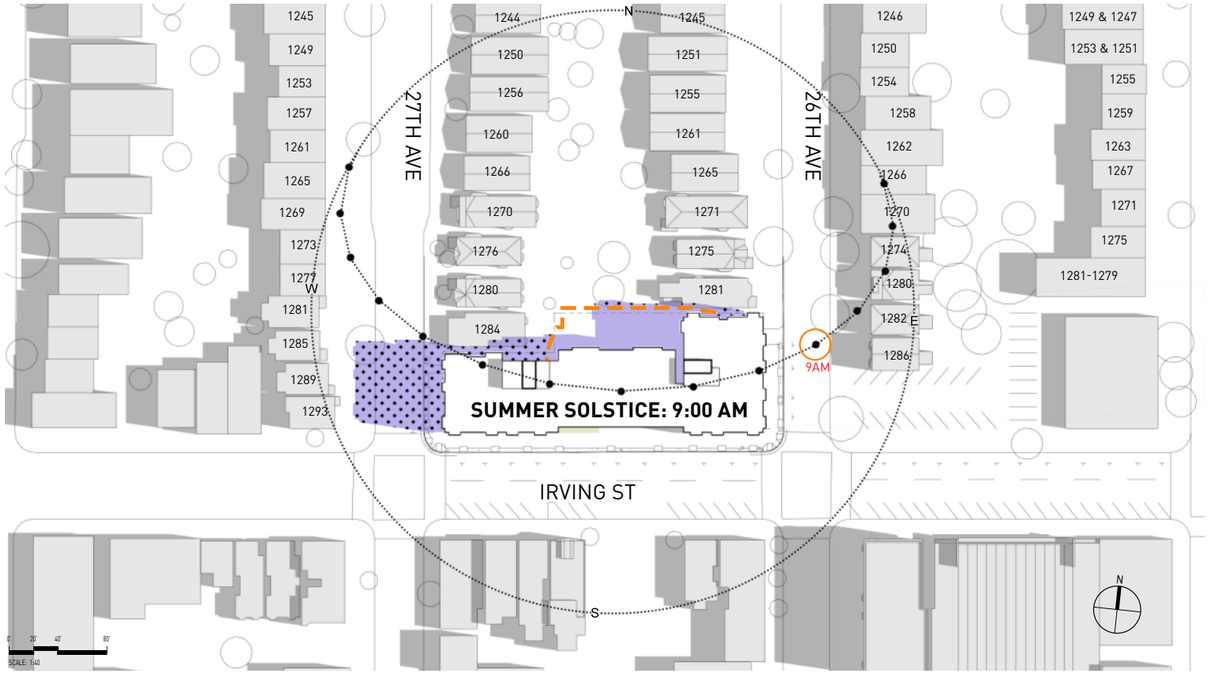
AVERAGE TEMPERATURE: 73 °F HIGH | 56 °F LOW



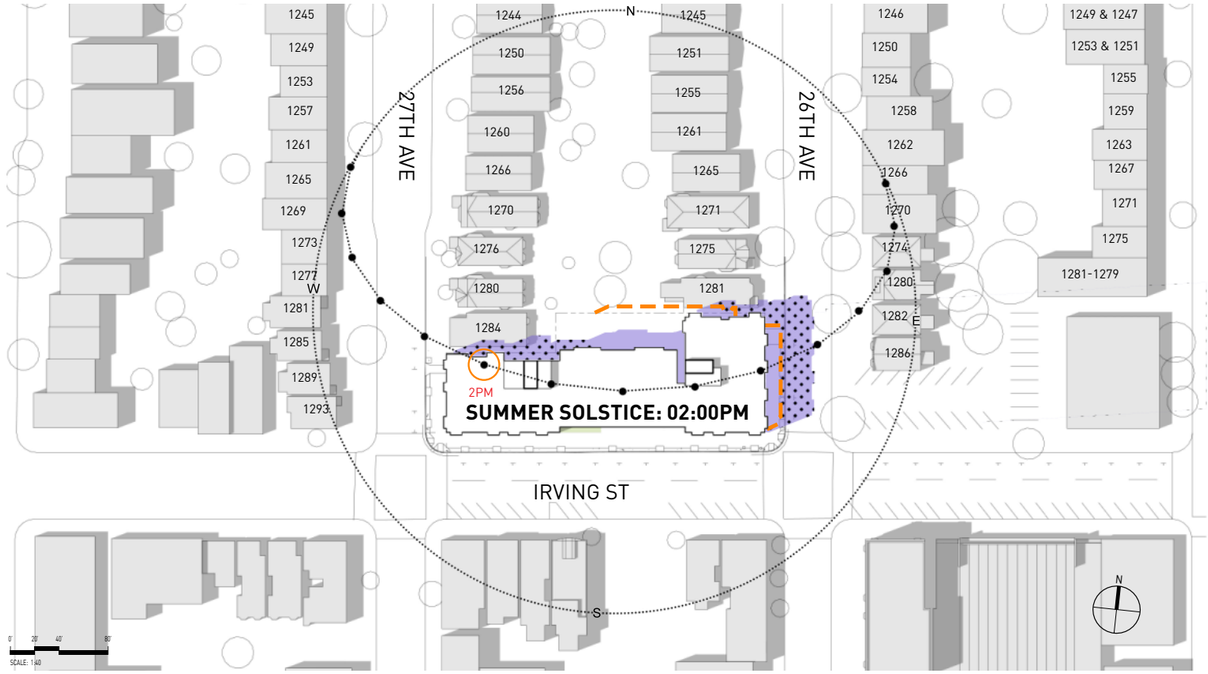
WINTER SOLSTICE - DECEMBER 21

SUNRISE: 7:23AM | SUNSET: 4:52PM (NO DST ADJUSTMENT)

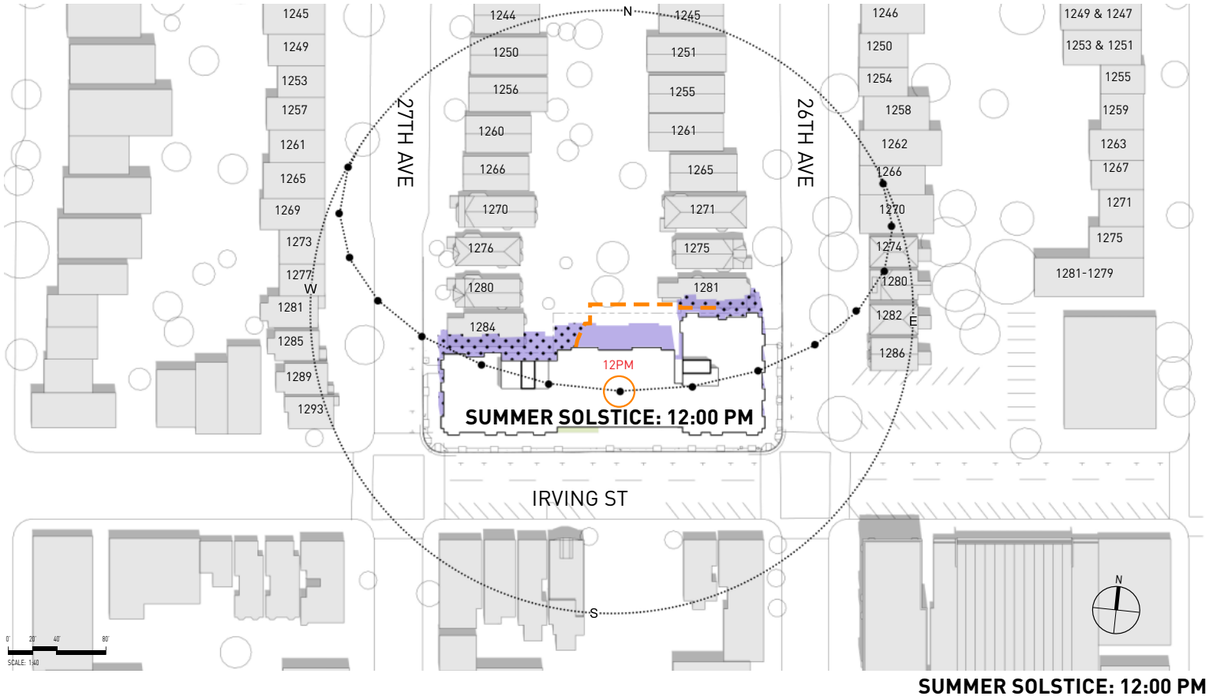
AVERAGE TEMPERATURE: 57 °F HIGH | 44 °F LOW



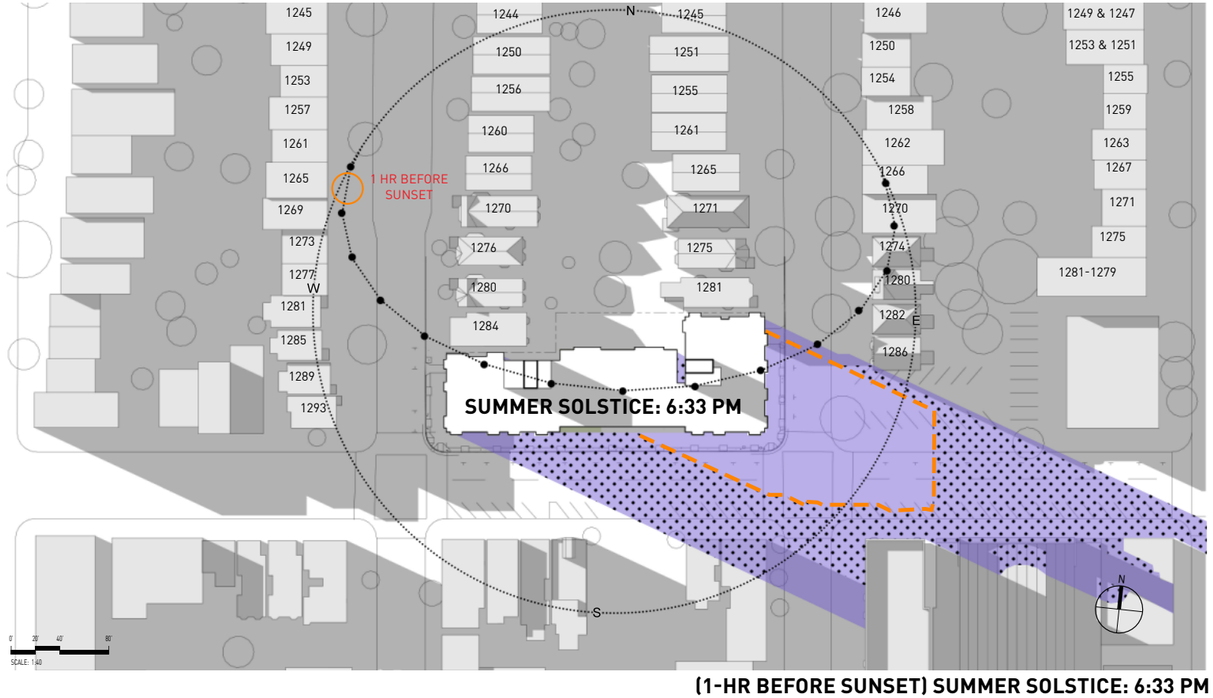
SUMMER SOLSTICE: 9:00 AM



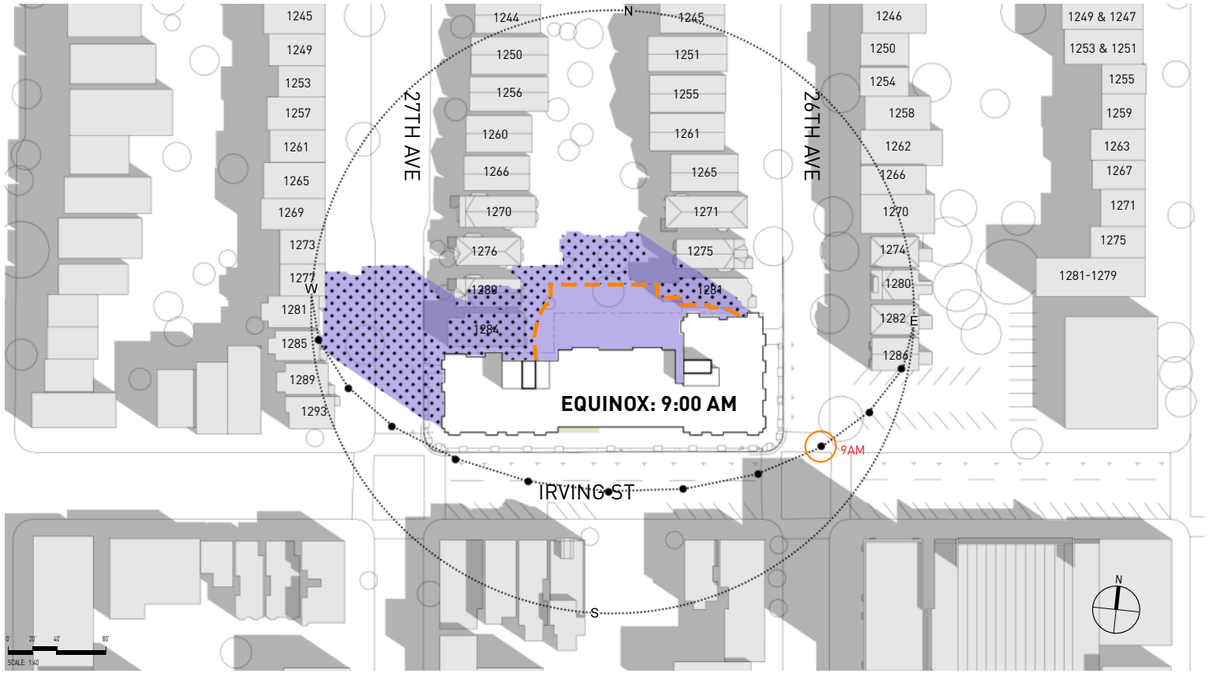
SUMMER SOLSTICE: 02:00PM



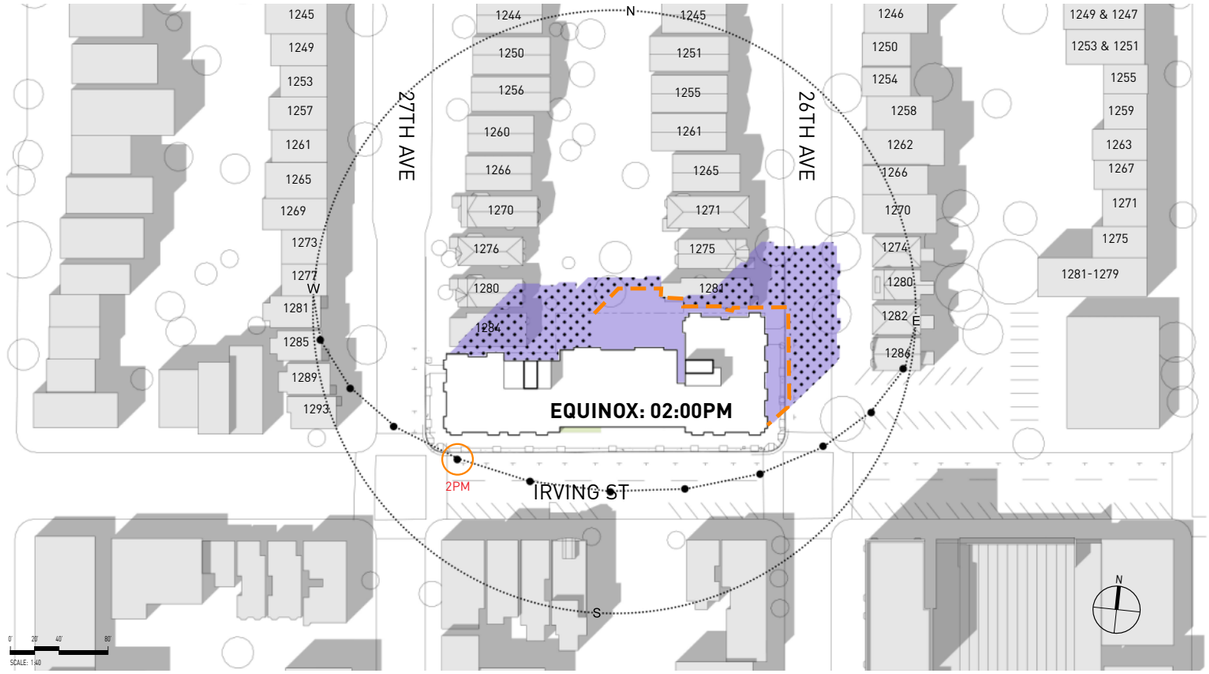
SUMMER SOLSTICE: 12:00 PM



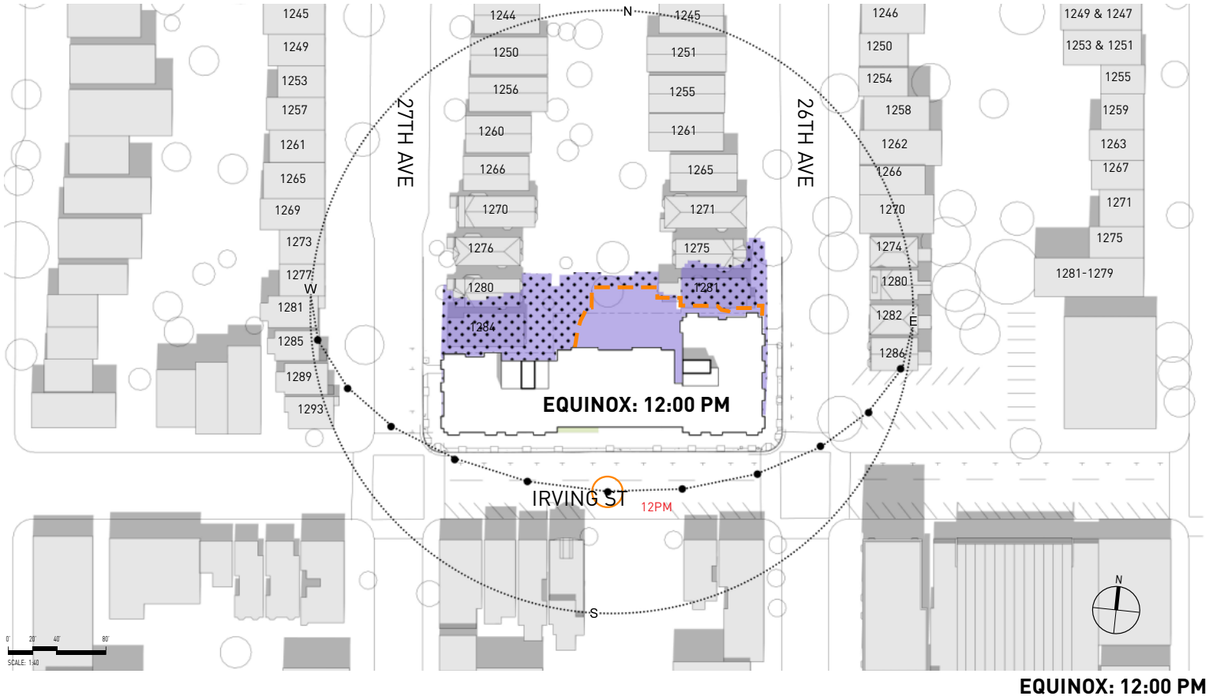
(1-HR BEFORE SUNSET) SUMMER SOLSTICE: 6:33 PM



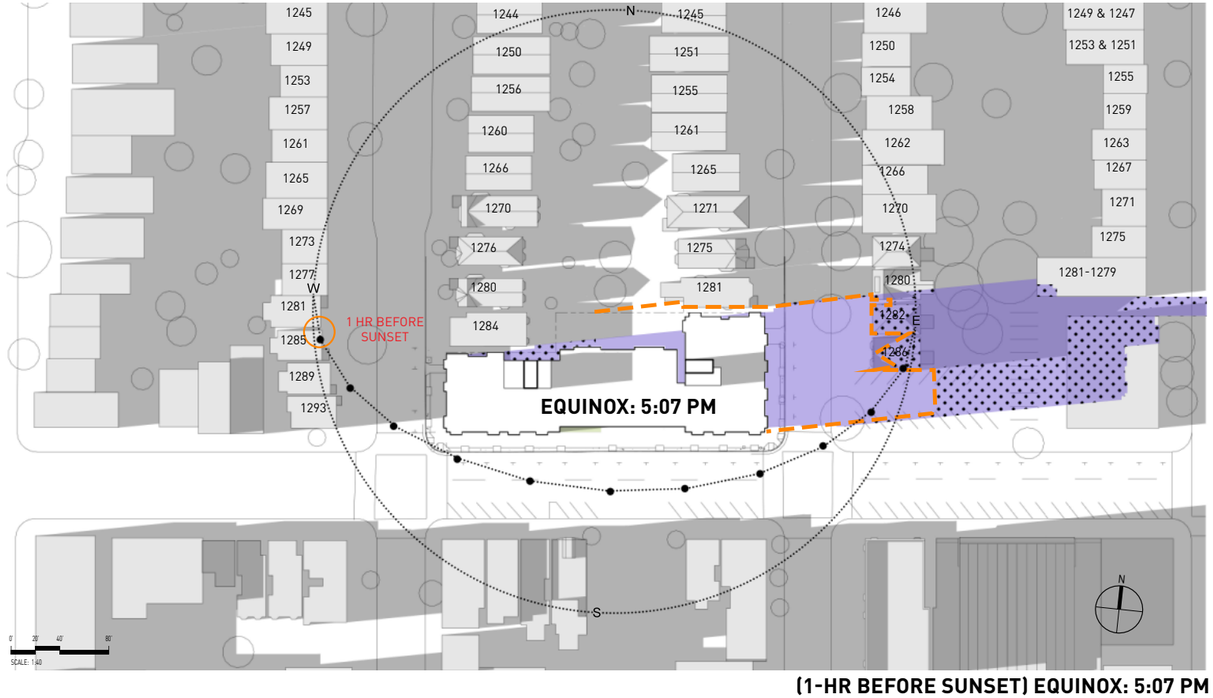
EQUINOX: 9:00 AM



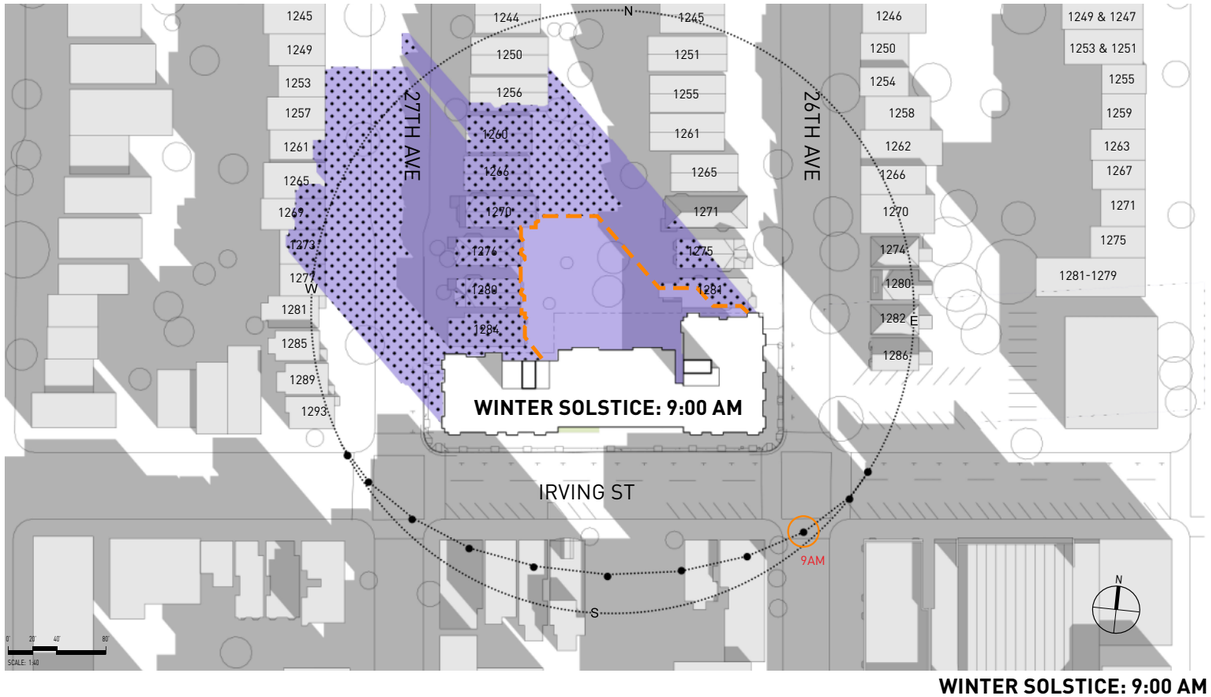
EQUINOX: 02:00PM



EQUINOX: 12:00 PM

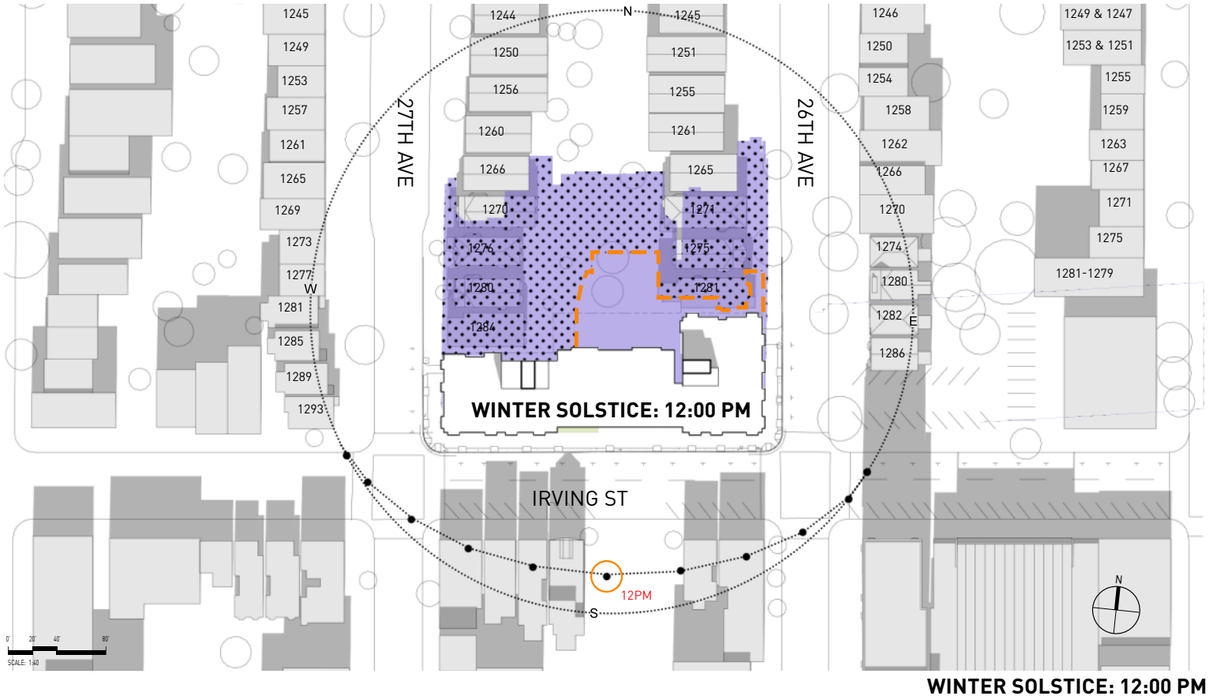


(1-HR BEFORE SUNSET) EQUINOX: 5:07 PM

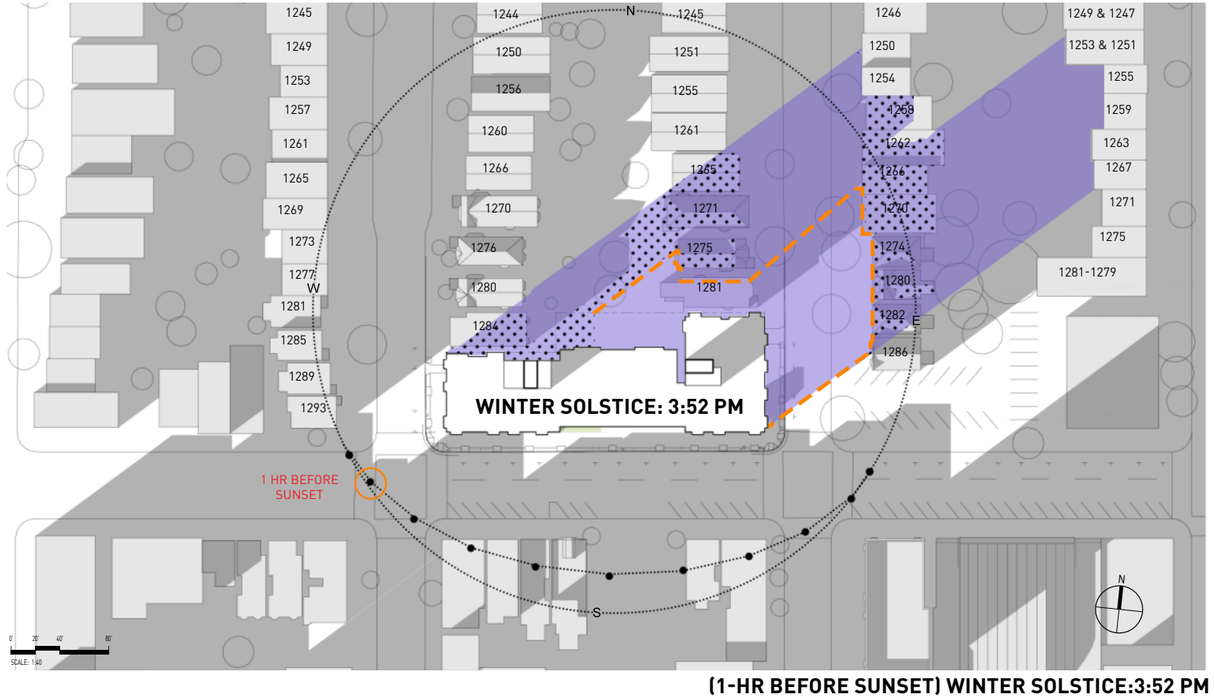


WINTER SOLSTICE: 9:00 AM

WINTER SOLSTICE: 2:00PM



WINTER SOLSTICE: 12:00 PM



(1-HR BEFORE SUNSET) WINTER SOLSTICE:3:52 PM

HOW DID WE PREPARE THE SOLAR / SHADOW MODELS?

The Solar/Shadow Model was conducted using the following site information and the proposed building configuration on the site.

1. Site information was gathered from a combination of sources:
   - Survey completed by a licensed survey engineer
   - Topography and existing building data from Google Earth and SF Planning PIM
   - Climate and solar information from Time & Date.com (https://www.timeanddate.com/weather/usa/san-francisco/climate)
   - NOAA solar positions (https://www.esrl.noaa.gov/gmd/grad/solcalc/)
   - Site observations of the existing conditions to confirm data from Google Earth

2. A three-dimensional computer model was developed from the site information described above, with simple mass elements to represent existing structures.
   - The model simulates the sun at specified dates and times based on the longitude and latitude of the site
     Latitude: 37.7634735107422 Longitude: -122.485023498535
   - Solar angles are documented for the spring and fall equinoxes, as well as the summer and winter solstices.
   - The summer solstice (June 21) is the day with the longest daylight hours of the year, and shortest night;
     conversely the winter solstice (December 21) is the day with the shortest daylight hours of the year, and longest night;
     The equinoxes represent roughly equal hours of daylight and night.
   - The difference between the spring and fall equinox (March 21 and September 21) vary only slightly and are represented in the analysis as a single set of images.
     https://www.weather.gov/cle/seasons

3. The existing neighborhood, site and current building's shadows were modeled at each of the dates and times represented in the study. Then, the current building was replaced with the new proposed structure and shadows were modeled for the same dates and times.
   - The shape and mass of the new proposed structure are based on a massing study and do not represent the likely architectural details or contours of the building.
   - The study assumes the maximum density allowable under zoning combined with state density bonus, at seven stories.

4. The two images (existing and proposed) are overlaid and color-coded.
   - The shadow of the existing building is represented as an orange dashed line emanating from the existing structure.
   - The shadows of existing structures are shown as neutral gray. The shadows created by the new proposed structure are shown in light purple.
   - Where the shadows of the new proposed structure overlap with those of existing structures, the shadows are represented as a darker shade of purple.
   - The total new shadow added is colored a light purple with a dot pattern.

5. The sun's path is overlaid on the shadow model representation, indicating the location of the sun over the course of the day for each specific date of the year.
   A north arrow and graphic scale are provided.