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**To:** Max Shahbazian, San Francisco Bay Regional Water Quality Control Board

**CC:** Melanie Morash, United States Environmental Protection Agency  
Hector Vargas, Texas Instruments

**From:** Joshua Graber, Senior Project Manager  
Annie Lee, PE, Project Engineer

**Date:** 12 March 2015

**Re:** Addendum to Work Plan for Off-Property Vapor Intrusion Assessment  
Building SU3-8  
Sunnyvale, California  
Langan Project No.: 750620724

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This addendum presents the proposed vapor intrusion evaluation approach for the Apartment Community located at 1257 Lakeside Drive in Sunnyvale, California (Site). The Site was not proposed for indoor air or pathway sample collection in our *Work Plan for Off-Property Vapor Intrusion Assessment, National Semiconductor and Monolithic Memories Superfund Sites, Operable Unit 1, Subunits 1 and 3* dated 28 August 2014 (Work Plan) because the Site does not overlie shallow groundwater concentrations of trichloroethylene (TCE) greater than 100 micrograms per liter ( $\mu\text{g/L}$ ). However, in an email dated 20 November 2014, the United States Environmental Protection Agency (USEPA) recommended that an external, visual survey of the Site be completed to assess whether sampling during the heating season was appropriate. The San Francisco Bay Regional Water Quality Control Board (Water Board) concurred with the USEPA's comments on 21 November 2014.

Langan Treadwell Rollo visited the Site to gather information related to the layout and construction of the buildings on 29 January 2015. The information obtained during the 29 January 2015 Site visit was summarized in an email to USEPA and Water Board representatives on 3 February 2015 along with a recommended evaluation approach for assessing vapor intrusion risk. This work plan addendum presents our evaluation approach and recommendations for sampling at the Site.

### **BUILDING AND AREA DESCRIPTION**

The Site is located in a residential area of Sunnyvale, California (Figure 1) and is comprised of an apartment community. A Site-specific identification number was not identified in our Work Plan for this site. SU3-8 has been assigned for sample identification and reporting purposes.

Groundwater is expected to be present at approximately 12 feet below ground surface with TCE concentrations beneath the Site estimated to be between 5 and 15  $\mu\text{g/L}$ .

# Addendum

Langan representatives visited the Site on 29 January 2015 to perform a walkthrough to document building construction and general Site use and conditions. The Site is comprised of 12 apartment buildings constructed over at least one, and in many cases, two levels of ventilated parking or storage (Figure 2). None of the apartments or normally-occupied spaces (i.e. leasing offices) are constructed on-grade. Each level of parking and/or storage has a grated gate that opens directly outside to allow for constant outside air ventilation and is mechanically ventilated automatically when carbon monoxide levels (due to vehicle exhaust) exceed pre-determined levels. In addition to the grated gates, several grated windows are present in the parking areas that allow for additional ventilation. A photographic log from the Site walk is provided as Attachment A.

Additional building information is provided below.

- Buildings 1257, 1259, 1261, 1263, and 1265 all have two levels of ventilated parking beneath the apartments and share a G1 (subsurface level) parking garage.
- Buildings 1245 and 1247 are constructed similarly and have two levels of ventilated parking beneath the apartments.
- Buildings 1249, 1267, 1269, 1271, and 1273 are also constructed similarly with one level of ventilated parking and no elevators.
- The 7 buildings with elevators (1245, 1247, 1257, 1259, 1261, 1263, and 1265), all have one elevator area per building. None of the elevators open directly into any apartments, but rather open into unoccupied common areas.
  - The elevators associated with Buildings 1259, 1261, 1263, and 1265 all open to common areas open to outside air.
  - The elevators associated with Buildings 1245, 1247, and 1257 all open into enclosed common areas that are not open to outside air.

## EVALUATION APPROACH

Based on the construction of the buildings (all buildings located above ventilated garages), the Water Board and USEPA concurred (email dated 6 February 2015) with our recommended evaluation approach to only assess potential pathways associated with the elevators and areas outside the elevators on the parking garage level directly beneath the apartments in Buildings 1245, 1247 and 1257, as these are the only buildings with elevators that open into enclosed, common spaces. No other potential pathways for vapor intrusion were identified. Our proposed evaluation approach is based on information obtained during our building surveys and walkthroughs, which also assessed parking garages, storage units, mechanical and electrical rooms, elevator pits, as described below.

## **BUILDING SURVEY AND INVENTORY**

Building surveys and inventories were completed at Buildings 1245, 1247, 1257 on 19 February 2015 by Langan personnel at the Site. The building survey and inventory was completed to identify potential preferential pathways for vapor migration, potential indoor sources of volatile organic compounds (VOCs), and appropriate indoor, pathway, and ambient air sample locations. The surveys consisted of evaluating: parking garages, some storage units, mechanical and electrical rooms, elevator rooms, and lobbies using a photoionization detector (PID) capable of measuring volatile organic vapors down to the part per billion (ppb) level. During the survey, the PID was used to assess background indoor air concentrations and possible preferential pathways for soil vapor migration such as gaps and cracks in building foundations, slab penetrations (such as piping and utility lines), floor drains, elevators, sumps, fire suppression lines, crawl spaces, and sanitary sewer cleanouts.

### **Building Observations**

All areas evaluated are well-ventilated and readings on the PID were generally consistent with outdoor readings. No elevated PID readings were recorded at the elevator pits or the storm drains present in the garage spaces. Langan personnel surveyed the common spaces in the interior of the buildings, noting the presence and use of any chemicals, slab penetrations (including floor drains), and the general condition of the building's concrete slab. The building survey results are summarized below.

#### Chemical use and storage

No chemicals or cleaning supplies were noted in the parking and storage areas or in the elevator, mechanical or electrical rooms.

None of the chemicals present in groundwater appear to be used at the facility.

#### Presence of floor drains and slab penetrations

Storm drains were observed in the parking garage areas. PID readings at the floor drains were equivalent to background readings measured at the Site. No other slab penetrations were observed in the areas evaluated.

#### Concrete slab conditions

The concrete slab appeared to be in good condition.

### **Potential Preferential Pathways for Soil Vapor Migration**

The potential preferential pathways identified include the elevators and their associated pits, although no elevated PID readings were noted at the elevators or from the elevator pits associated with Building 1245, 1247, and 1257.

### **Potential Indoor Contaminant Sources**

No potential indoor contaminant sources were identified during the building survey in the areas proposed for evaluation.

## Ventilation Systems

The parking and storage areas are naturally ventilated and open to outside air. In addition to the natural ventilation and air exchange, the parking garages are also mechanically ventilated automatically when carbon monoxide concentrations exceed pre-determined levels.

## PROPOSED SAMPLE LOCATIONS

Based on building surveys, only pathway and ambient air samples are proposed. Pathway sample locations (identified on Figure 2 with a 'PS' in the sample designation) are samples collected to evaluate potential vapor intrusion in areas that are either not accessed by residents or are not normally occupied over the course of a full day, such as storage areas and elevator lobbies. Pathway sample locations were selected to evaluate the potential pathway associated elevators in Buildings 1245, 1247, and 1257, as described below.

### Building 1245 Sample Locations

- One sample in the elevator lobby of the first floor apartments.
- One sample in the elevator lobby of the ground level garage located below the first floor apartments.
- One sample in the ground level parking garage area (beneath the first floor apartments) to evaluate air concentrations in the parking garage.

### Building 1247 Sample Locations

- One sample in the elevator lobby of the first floor apartments.
- One sample in the elevator lobby of the ground level garage located below the first floor apartments.
- One sample in the ground level parking garage area (beneath the first floor apartments) to evaluate air concentrations in the parking garage.

### Building 1257 Sample Locations

- One sample in the elevator lobby of the first floor apartments.
- One sample in the elevator lobby of the ground level garage located below the first floor apartments
- One sample in the ground level parking garage area (beneath the first floor apartments) to evaluate air concentrations in the parking area.

Based on the results of the building survey, the above sample locations were identified and are summarized in Table 1 and are illustrated on Figure 2. A total of nine pathway sample locations are proposed.

Due to the multitude of influences on air quality, an ambient air sample is also proposed to evaluate potential non-groundwater sources of chemicals in outside air. The ambient sample will be collected outside of the building footprint near the entrance to the parking garage. Duplicate samples will be collected at a frequency of 10%, or one per laboratory submittal, whichever is greater, for quality control purposes.

## **DEVIATIONS FROM WORK PLAN**

The following are deviations to the sampling methodology presented in the Work Plan:

- Pathway samples will be collected in summa canisters over a 24-hour period to more accurately reflect the residential use of the buildings and to evaluate diurnal fluctuations in vapor intrusion.
- Sampling with the HVAC systems operating will not be performed because the sample locations are located in areas with natural ventilation, automatic ventilation based on carbon monoxide set points, or are not controlled by an HVAC system.
- An Indoor Air Building Survey and Sampling Form was not completed by the Site owner as buildings overlie ventilated parking garages and no chemicals present in groundwater appear to be in use in the areas proposed for evaluation.

There are no other anticipated deviations to the sampling methodology presented in the Work Plan.

## **SCHEDULE**

We are working with the Site owner to obtain formal access to the Site. Sampling will be scheduled as soon as an access agreement is executed. If possible, we will perform the sampling in March 2015. Sample results will be compared to criteria identified in the Work Plan. If screening level criteria are exceeded, the Water Board and USEPA will be notified within one week of the receipt of laboratory results. If no screening levels are exceeded, a summary of the sampling results will be prepared and transmitted to you within six weeks of receiving analytical results from the laboratory.

### Attachments:

Table 1 - Sample Summary  
Figure 1 - Site Location Map  
Figure 2 - Proposed Sampling Locations  
Attachment A – Photographic Log

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## TABLE

**Table 1**  
**Sample Summary**  
**Building SU3-8**  
**Sunnyvale, CA**

Langan Project: 750620724  
 March 2015

Sample ID	Location Notes	HVAC Off
<b>Pathway Samples</b>		
SU3-8-PS1-2015-XX-XX	Building 1245 Ground Level Elevator Lobby	X
SU3-8-PS2-2015-XX-XX	Building 1245 Ground Level Outside Elevator Lobby	X
SU3-8-PS3-2015-XX-XX	Building 1245 First Occupied Floor Lobby Area	X
SU3-8-PS4-2015-XX-XX	Building 1247 Ground Level Elevator Lobby	X
SU3-8-PS5-2015-XX-XX	Building 1247 Ground Level Outside Elevator Lobby	X
SU3-8-PS6-2015-XX-XX	Building 1247 First Occupied Floor Lobby Area	X
SU3-8-PS7-2015-XX-XX	Building 1257 Ground Level Elevator Lobby	X
SU3-8-PS8-2015-XX-XX	Building 1257 Ground Level Outside Elevator Lobby	X
SU3-8-PS9-2015-XX-XX	Building 1257 First Occupied Floor Lobby Area	X
SU3-8-DUP1-2015-XX-XX	TBD	X
<b>Ambient Samples</b>		
SU3-8-AA1-2015-XX-XX	Outdoor	X
Total		11

Notes:

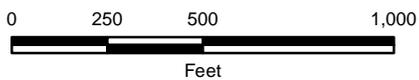
TBD: to be determined during sampling event  
 HVAC - heating, ventilation, and air conditioning

## **FIGURES**



**Notes:**

1. Aerial Orthophoto mosaic is provided by Santa Clara County and the United States Geological Survey (USGS). Imagery was captured in April, 2011.
2. Map displayed in California State Plane Coordinate System , Zone III, North American Datum of 1983 (NAD83) , US Survey Feet.



**1257 LAKESIDE DRIVE**  
Sunnyvale, California

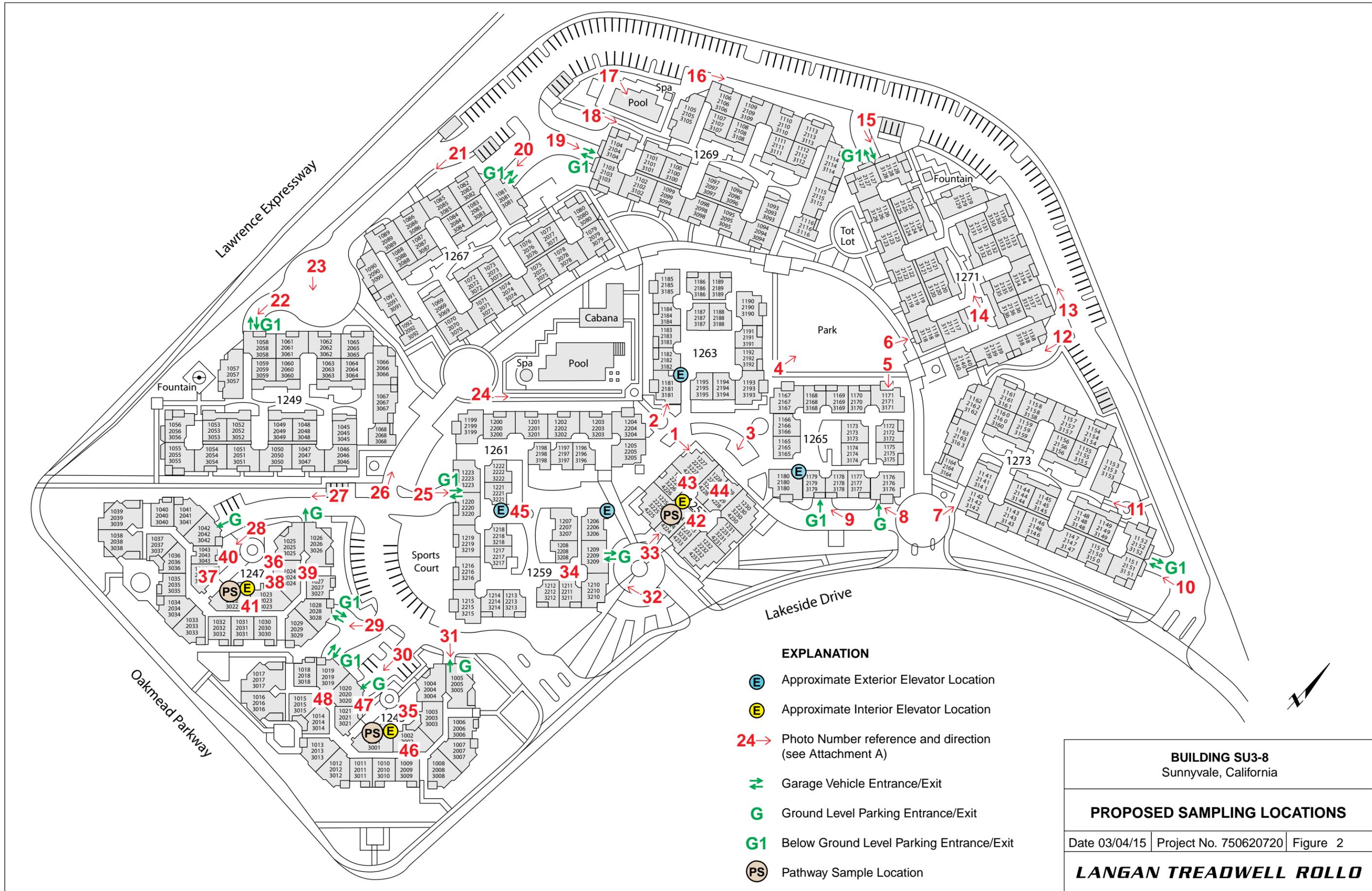
**SITE LOCATION MAP**

**LANGAN TREADWELL ROLLO**

Date 3/2/2015

Project 750620720

Figure 1



**EXPLANATION**

- ⓔ Approximate Exterior Elevator Location
- ⓔ Approximate Interior Elevator Location
- 24→ Photo Number reference and direction (see Attachment A)
- ↔ Garage Vehicle Entrance/Exit
- G Ground Level Parking Entrance/Exit
- G1 Below Ground Level Parking Entrance/Exit
- Ⓧ Pathway Sample Location

<b>BUILDING SU3-8</b> Sunnyvale, California		
<b>PROPOSED SAMPLING LOCATIONS</b>		
Date 03/04/15	Project No. 750620720	Figure 2
<b>LANGAN TREADWELL ROLLO</b>		

**ATTACHMENT A  
PHOTOGRAPHIC LOG**



**Photograph 1 – Looking east at Bldg 1257**



**Photograph 2 – Looking north at Bldg 1263**



**Photograph 3 – Looking south at 1257**



**Photograph 4 – Looking north across park at 1271**



**Photograph 5 – Looking southeast at ground level parking associated with Bldg 1265 (open grated windows allow for ventilation)**



**Photograph 6 – Looking northeast at Bldg 1271**



**Photograph 7 – Looking north at Bldg 1273**



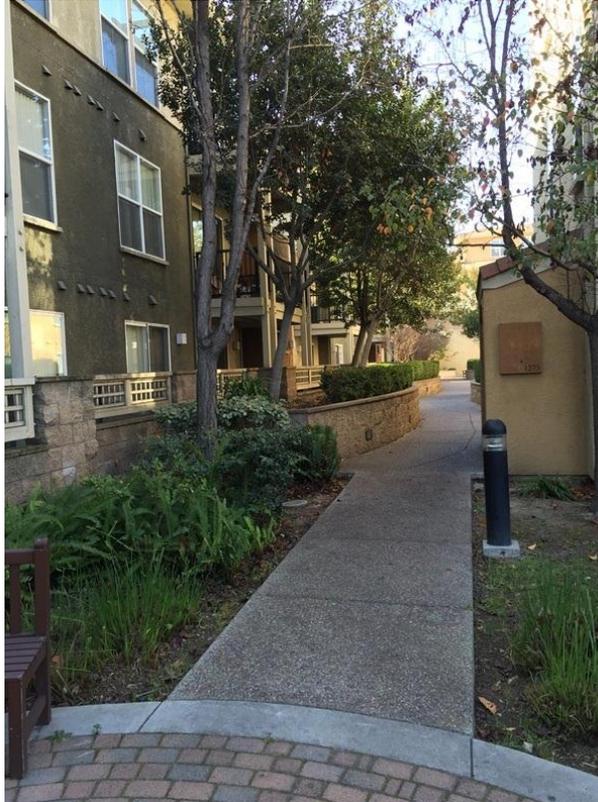
**Photograph 8 – Looking west at ground level parking associated with Bldg 1265**



**Photograph 9 – Looking west at ground level and subsurface parking entrances associated with Bldg 1265**



**Photograph 10 – Looking west at subsurface parking entrance associated with Bldg 1273**



**Photograph 11 – Looking southwest at Bldg 1273**



**Photograph 12 – Looking south between Bldgs 1271 and 1273**



**Photograph 13 – Looking northwest behind Bldg 1271**



**Photograph 14 – Looking northwest**



**Photograph 15 – Looking east at parking entrance to Bldg 1271**



**Photograph 16 – Looking northeast along Bldg 1269**



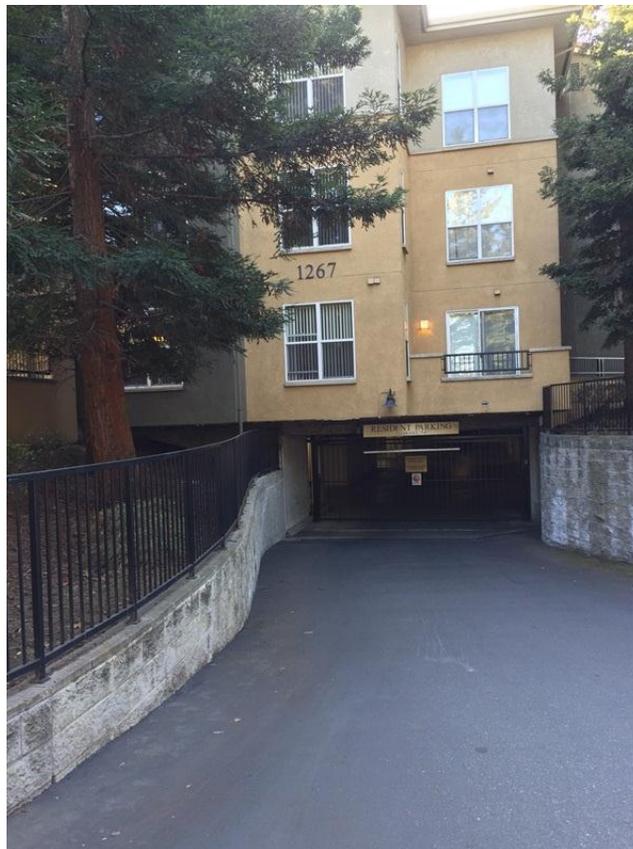
**Photograph 17 – Looking east across the pool area**



**Photograph 18 – Looking east at Bldg 1269 – note vehicle entrance beneath apartments**



**Photograph 19 – Looking east at parking entrance associated with Bldg 1269**



**Photograph 20 – Looking south at parking entrance associated with Bldg 1267**



**Photograph 21 – Looking south at Bldg 1267**



**Photograph 22 – Looking south at parking entrance to Bldg 1249**



**Photograph 23 – Looking east at Bldgs 1249 and 1267**



**Photograph 24 – Looking northeast at Bldg 1261 and pool area**



**Photograph 25 – Looking northeast at parking entrance associated with Bldg 1261**



**Photograph 26 – Looking northwest at Bldgs 1249, 1261, and 1267**



**Photograph 27 – Looking southwest at parking exit associated with Bldg 1247**



**Photograph 28 – Looking southwest at parking entrance associated with Bldg 1247**



**Photograph 29 – Looking southwest at parking entrances associated with Bldgs 1247 and 1245**



**Photograph 30 – Looking south at parking entrance associated with Bldg 1245**



**Photograph 31 – Looking southeast at parking exit associated with Bldg 1245**



**Photograph 32 – Looking west at parking entrance associated with Bldg 1259**



**Photograph 33 – Looking north at Bldg 1257**



**Photograph 34 – Bldg 1259 - Ceiling of ground level parking garage showing penetrations**



**Photograph 35 – Bldg 1245 - Ground level elevator lobby**



**Photograph 36 – Bldg 1247 – Mechanical Room**



**Photograph 37 – Bldg 1247 – G1 Level Elevator Room (no penetrations)**



**Photograph 38 – Bldg 1247 – Ground level Electrical Room. This room is above the lower garage level (no subsurface penetrations).**



**Photograph 39 – Bldg 1247 – Ground level Boiler Room (no subsurface penetrations)**



**Photograph 40 – Bldg 1247 – G1 level fire suppression (no subsurface penetrations)**



**Photograph 41 – Bldg 1247 – First floor elevator lobby**



**Photograph 42 – Bldg 1257 – Fire suppression for Bldgs 1257, 1259, 1261, 1263, 1265 (no subsurface slab penetrations)**



**Photograph 43 – Bldg 1257 – Ground level elevator lobby**



**Photograph 44 – Bldg 1257 – First floor elevator lobby**



**Photograph 45 – Bldg 1259 – First floor elevator lobby (open to outside air)**



**Photograph 46 – Bldg 1245 – First floor elevator lobby**



**Photograph 47 – Bldg 1245 – G1 level garage drain (no elevated PID readings)**



**Photograph 48 – Bldg 1245 – G1 level garage (no elevated PID readings)**