

**CITY OF SAN DIEGO
M E M O R A N D U M
As-Graded Review**

DATE: August 7, 2015

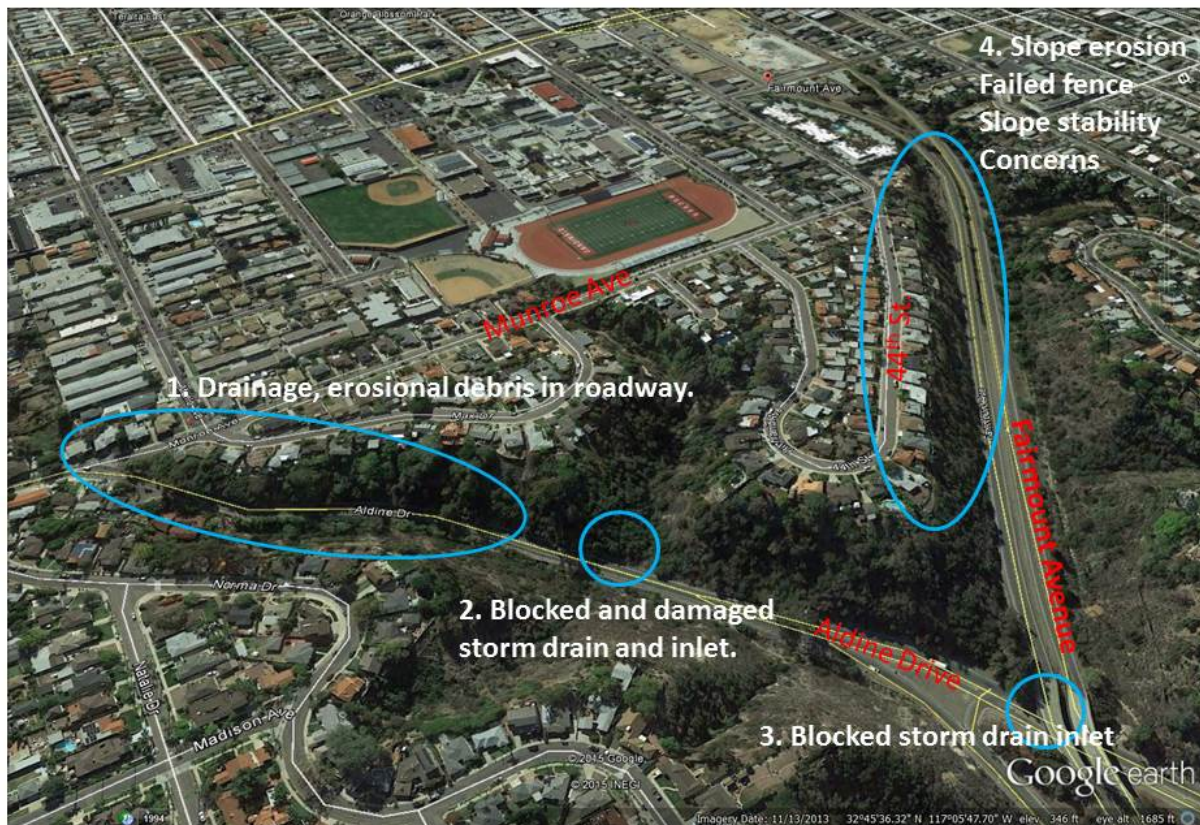
TO: James Nagelvoort, Director of Public Works, City Engineer

FROM: Robert Hawk, Senior Engineering Geologist/Deputy City Engineer

SUBJECT: Fairmount Avenue and Aldine Drive Slope and Drainage

On Wednesday, December 17, 2014, I met with David Moty, Chair of the Kensington Talmadge Planning Group, and Ralph Dimarucut, City Council District 9 Staff to view areas of Aldine Drive and Fairmount Avenue of concern to their constituency. Please refer to the photo below for the discussion of areas visited and observed.

Subject Areas on Fairmount Avenue and Aldine Drive



History:

Although the records are sparse, it is our understanding that both Fairmount Avenue and Aldine Drive were constructed in the late 1920's, probably in conjunction with access to the mesa from Mission Valley and the adjacent residential construction in Talmadge and Kensington, and were accepted as a City street sometime thereafter. It is clear that the standards for street design have undergone extensive revisions since either was accepted, but Fairmount underwent a major improvement in the 1950's.

Aldine Drive is bordered by steep ascending slopes that would not be allowed today, but were typical for roads of that era. Examination of those slopes and the geologic literature revealed that they are comprised of sandstone and conglomerate of the San Diego Formation and the Linda Vista Formation. These units typically are geologically stable, but are subject to isolated local raveling and erosion. No indications of gross geologic instability (landslides) were observed; however, talus accumulated at the toe of the slope suggests that minor erosion occurs during storm events and rocks and soil are occasionally washed onto the travel way. Based on my observations, no large or extensive geologically unstable conditions were discerned that required immediate action, although erosion and deposition during storms may remove surficial material from slopes and occasionally impact the travel way.

The adjacent streets and other infrastructure are reflective of the technology and standards of the time of construction. The roads on the mesa top are laid in a grid pattern; conversely Aldine Drive and Fairmount Avenue follow existing canyons, probably along routes established by the earliest access roads. While both roads have had some improvements over the intervening years, Aldine Drive does not meet current roadway standards for lane and shoulder width, and has a steep descending slope with the toe near the pavement. Fairmount Avenue was improved in the 1950's when the road was widened, and grading was done along the bottom of the slope ascending to 44th street to widen and straighten the paved travel way and provide adequate drainage. Specific issues for each road are discussed below.

Aldine Drive:



We began our tour of the affected areas at the intersection of Monroe Avenue and Aldine Drive. The drainage of the intersection is controlled by formed asphalt curbs which are reportedly overtopped during heavy rain, especially near the intersection. Continuing down Aldine toward Fairmount, Mr. Moty pointed out that cobbles and debris eroded from the slope on the uphill side roll into the travelway and can at times block the drainage and force water, rocks and soil into the lane, creating

traffic impediments. In addition, some of the drainage facilities, specifically inlets, are in need of maintenance, repair and/or replacement.



Fairmount Avenue:

We met with most of the neighbors whose homes occupy the side of 44th Street that borders Fairmount Avenue and share a slope with the roadway, and viewed their rear yards. The lots typically extend approximately to the midway on the slope; the property lines are shown on the topographic map below. The slope typically begins from the rear of the dwelling and descends at a variable angle of 1.5:1 and steeper to Fairmount Avenue. Each home

Aldine Drive



was visited or viewed from the neighboring property. The constituents expressed concern regarding the stability of the slope and the effect of the portion of the slope that formed the City Right-of-Way for Fairmount. Plans for the homes and



Fairmount Avenue were not available prior to the inspection.

Geology: As mentioned above, the area is underlain by generally stable sandstone and conglomerate of the Pliocene San Diego Formation, and capped with the moderately cemented resistant Pleistocene Linda Vista Formation. Both units are considered to be generally stable and no indications of landslides were observed.

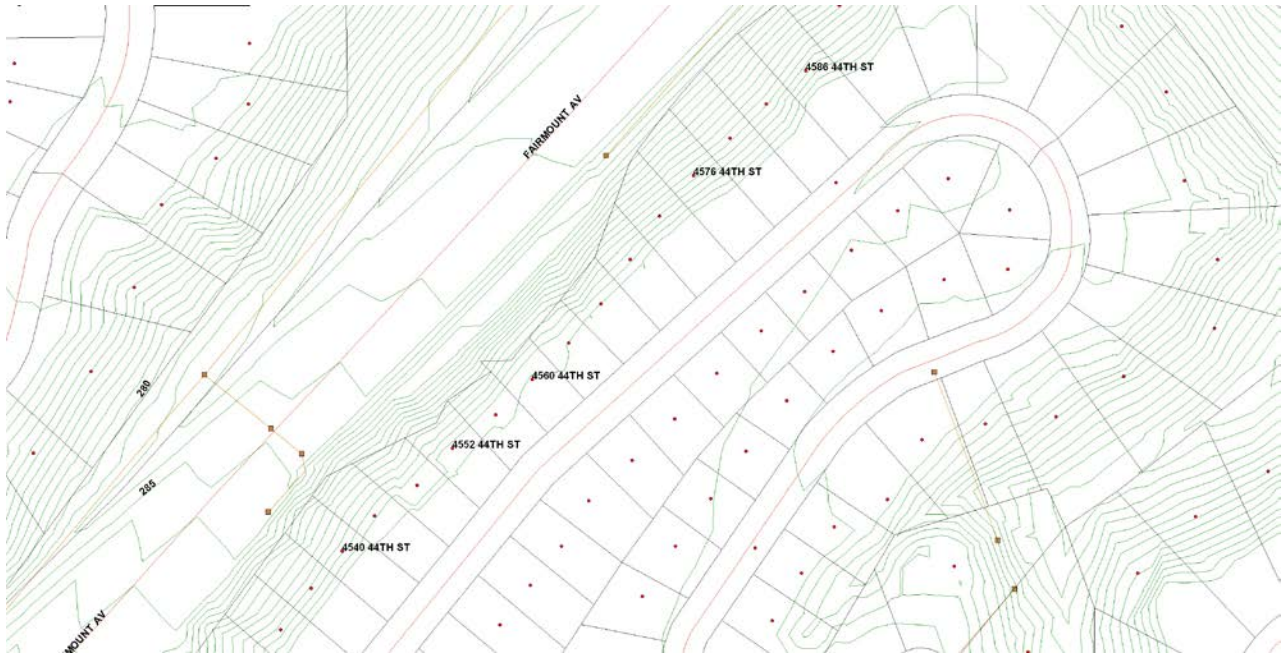
Observations: Based on a brief visual inspection, the following was noted:

Slopes: The slope behind the homes was originally steep, consistent with natural slopes in the area which range from 30 to 35 degrees. Cut slopes were created in the Fairmount right-of-way at an angle much steeper than allowed under today's standards, but typical for development of the period from the 1940's to the 1960's. The lower slope on what is described as the City easement appears to be cut steeper than the rear yard slope, and is reportedly delineated by a chain link fence that was erected along the rear of the homes approximately midway up the slope. The fence was badly deteriorated, and had fallen over or been undermined along most of the alignment.

The slope appears to be grossly stable and no discernible indications of deep seated instability or landslides were observed. However, surficial stability and erosion appear to be problematic and significant evidence of shallow surface failures and erosion on the private property was observed on several properties. Erosion is a function of gravity, slope angle, types of earth materials, types and density of vegetation, and critically, water saturation and drainage.

The earth material on the site is formational mildly cemented silty sandstone with cobble layers. This unit weathers to loose silty sand and gravel which is easily eroded unless anchored by vegetation, and is sensitive to water flow. In addition, saturated loose soil will behave like a plastic material or a viscous fluid and flow downslope. This mass wasting can remove several inches to two or three feet of soil. This phenomenon has evidently occurred in several places on the slope.

It was noted that most or all of the lots drain to the rear of the property over the slope rather than to 44th street, including drainage from the house roofs. Lot and roof drainage was directed to the rear yard and over the slope rather than to 44th Street, which was not standard at the time and may have been changed since development occurred.



Conclusions:

The problems affecting the Aldine Drive/Fairmount Avenue area are typical of older neighborhoods and streets; i.e. inadequate or modified drainage, erosion of slopes, steep slopes, and aging of roadways and sidewalks which were built to the standards of the day but not current standards. Standards have changed over the years precisely because of problems similar to those encountered, although in general the streets have performed relatively well for several decades. No geologic hazards were observed that indicate that either of the slopes is grossly unstable. The slope erosion, flooding, and clogged drains observed appear to be the result of poor drainage management on the upslope properties along Fairmount Avenue, aging legacy infrastructure like the pavement and drains on Aldine drive, and typical erosion of steep slopes.

The majority of the site drainage from the properties on 44th Street drain to the rear of the properties and over the slope toward Fairmount Avenue. This practice exacerbates the natural erosive condition of the slope from ordinary rainfall. All roof drainage, and as much lot drainage as practicable, should be captured and redirected to the street. Water that falls on the slope should be collected, if possible, and piped down the slope into drainage improvements at the bottom along Fairmount. The encroachment for private drains by property owners into the Fairmount right-of-way will require a permit from the City, but would slow erosion of the slope. In addition, a landscape architect should be consulted to recommend plantings that would anchor the soil in place. One homeowner showed that his drainage had been collected and discharged through the sidewalk, but stated that during street renovation his sidewalk was replaced, but not the drain, blocking his conduit. The drainage from the property to the street should be restored by the property owner in accordance with City standards.

It was alleged by one homeowner that the process of steepening the toe of the slope during reconstruction of Fairmount Avenue would aggravate the erosion of the upper slope. Erosion is a function of the conditions where the soil is located: i.e.; the soil is unaffected by conditions downslope. While removing soil at the toe of a slope can affect the gross stability (susceptibility to landslides), the formational material is extremely competent and gross stability is not an issue on these properties. Steepening a portion of a slope may increase the rate of erosion to the steepened section and at the junction with the less steep portion. However, soil is extremely sensitive to conditions upslope.

Recommendations:

Aldine Drive: The drainage in the Right of Way should be improved by the City to accept the water runoff from the slope and adjacent streets without overtopping existing curbs. The erosion of soil and rock from the slope onto the street must be addressed by the City. These conditions should be referred to the City's Transportation and Stormwater Department for review and design.

Fairmount Avenue: All drainage from runoff on private property should be collected and redirected away from the slope where possible, either onto 44th street or into a drain system and conveyed to Fairmount Avenue to an approved drainage facility. This will require an encroachment permit into the right-of-way by the property owners. Guttering should be installed to collect roof runoff and convey it to the street. Irrigation of slopes should be minimal and only sufficient to maintain vegetation cover. The slopes should be landscaped with drought-tolerant, deep-rooted shrubs as recommended by a landscape architect to improve surficial slope stability by anchoring surface soil.

The current fence has failed and should be removed. Replacement of the fence is at the discretion of the Transportation and Stormwater Department. It is unclear whether or not a fence is required as a barrier between Fairmount Avenue and the private property. The fence provides no positive or negative benefit with respect to slope stability.