TECHNICAL APPENDIX

- **Air Quality - Urbemis Report, BAAQMD Screening Criteria**
- **Tree Analysis - Michael L. Bench, Consulting Arborist**
- **Historical and Architectural Evaluation - Urban Programmers**
- **Environmental Noise Study – Edward L. Pack Associates, Inc.**
- **Traffic Evaluation – Fehr & Peers**

6/9/2011 9:06:32 AM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\mcampbell\Application Data\Urbemis\Version9a\Projects\Harker Master Plan - Existing.urb924

Project Name: Harker School Master Plan - Existing

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

6/9/2011 9:06:32 AM

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2007 TOTALS (tons/year unmitigated)	0.04	0.35	0.19	0.00	0.86	0.02	0.88	0.18	0.02	0.20	27.91
2008 TOTALS (tons/year unmitigated)	2.25	1.90	2.41	0.00	0.36	0.13	0.49	0.08	0.12	0.19	264.75

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.21	0.30	0.39	0.00	0.00	0.00	363.06

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.52	0.45	4.07	0.00	0.04	0.02	383.81

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.73	0.75	4.46	0.00	0.04	0.02	746.87

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\mcampbell\Application Data\Urbemis\Version9a\Projects\Harker Master Plan - Project.urb924

Project Name: Harker School Master Plan - Project

Project Location: Bay Area Air District

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

6/9/2011 9:00:47 AM

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2007 TOTALS (tons/year unmitigated)	0.04	0.35	0.19	0.00	0.86	0.02	0.88	0.18	0.02	0.20	27.91
2007 TOTALS (tons/year mitigated)	0.04	0.35	0.19	0.00	0.86	0.02	0.88	0.18	0.02	0.20	27.91
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2008 TOTALS (tons/year unmitigated)	4.80	2.18	4.19	0.00	0.37	0.14	0.50	0.08	0.13	0.21	419.18
2008 TOTALS (tons/year mitigated)	4.80	2.18	4.19	0.00	0.37	0.14	0.50	0.08	0.13	0.21	419.18
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.49	0.71	0.74	0.00	0.00	0.00	853.02

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.22	1.07	9.56	0.01	1.68	0.32	902.12

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	1.71	1.78	10.30	0.01	1.68	0.32	1,755.14

AN EVALUATION OF THE ESTABLISHED TREES AT HARKER SCHOOL 500 SARATOGA AVENUE SAN JOSE, CALIFORNIA

PREPARED AT THE REQUEST OF
MR. MIKE CAMPBELL
HMH ENGINEERING, INC.
1570 OAKLAND ROAD
SAN JOSE, CA

PREPARED BY
MICHAEL L. BENCH
CONSULTING ARBORIST
JULY 14, 2010

An Evaluation of the Established Trees at
Harker School, 500 Saratoga Avenue
San Jose, California

Table of Contents

Prepared by
Michael L. Bench, Consulting Arborist

July 14, 2010

Evaluation of the Established Trees at
Harker School, 500 Saratoga Avenue
San Jose, California

Assignment

I have been asked by Mr. Mike Campbell, HMH Engineering, Inc., to evaluate the existing established or mature trees on the entire campus at Harker School, 500 Saratoga Avenue, California.

The plan provided for this evaluation is a Site Plan, prepared by HMH Engineering, Inc. undated.

Summary

There are a total of 228 trees established/mature trees (approximately 6 inches in diameter or larger) currently on this property. Included are a few exceptions (small trees) because of their location in a cluster or a row.

All of the 228 trees are identified by species, briefly described (trunk diameter, height, spread, health, structural integrity) and given both health and structure ratings of Excellent(1), Good(2), Fair(3), Poor(4), and Extremely Poor(5).

Several individual trees or groups of trees are described in greater detail to include disease, structural weakness, or site conditions, which may affect their potential for survival.

Of the total 228 trees, there are 156 trees are protected by the City of San Jose regulation. The protected trees are Trees # 1-5, 7-27, 29-59, 61-65, 68-77, 80-82, 84, 86-88, 93, 99, 100, 102, 103, 105, 106, 108-116, 118, 119, 121-130, 132-138, 141, 142, 144-151, 155, 156, 157, 159, 160, 167, 169, 170, 186, 190-195, 197, 199, 200, 203, 205, 206, 207, 213-218, 221, 224, 225, and 226.

Trees that appear to be in conflict with Proposed New Structures are noted. For these trees a course of action concerning their disposition is recommended.

Some of the common risks to trees during construction are briefly described. General procedures for preservation are noted.

Methods

The measurement of the trunks of the majority of the trees was done using a standard measuring tape at 4 ½ feet above soil grade (referred to as DBH or Diameter at Breast Height), except those specimens whose form does not allow for a representative measurement at this height. When possible, the trunk measurement is taken below the lowest fork on the trunk of a dual or multi-stem specimen. A forestry service Diameter Tape was used on many of the larger specimens, because of the greater accuracy with the use of this tool. The canopy height and spread are estimated using visual references only. The estimated shape of the canopy relative to the other nearby trees has been added to the attached map.

The locations of the trees were not shown on the Site Plan provided by HMH Engineering. I have added the 228 trees to the HMH Site Plan using visual references only. A reduced copy of this plan with estimates of the existing mature tree locations is attached.

Observations

There are 228 significant trees at this time on the campus of Harker School, 500 Saratoga Avenue, San Jose, California. In this case, a "significant tree" is defined as having a trunk measurement of 6 inches or larger DBH (Diameter at Breast Height = 54 inches above soil grade). I have included a few specimens smaller than 6 inches in diameter DBH, because of their location in a cluster or in a row of larger trees, usually of the same species. The attached map shows the estimated locations of all 228 trees. Metallic labels have been affixed to all of the 228 trees for field reference. The metallic labels, used for this evaluation, are round aluminum tags, 1 ¼ inch in diameter, and stamped by number.

A summary of the 228 trees by species is as follows:

160 – Coast redwood (*Sequoia sempervirens*) – Trees # 1-80, 82-100, 104-138, 140-151, 213-219, 221-227
1 – Lombardy poplar (*Populus nigra 'Italica'*) – Tree # 81
3 – California pepper (*Schinus molle*) – Trees # 101, 102, 103
4 – Victorian box (*Pittosporum undulatum*) – Tree # 139
6 – Coast live oak (*Quercus agrifolia*) – Trees # 152-157
1 – Raywood ash (*Fraxinus oxycarpa 'Raywood'*) – Tree # 158
1 – Monterey pine (*Pinus radiata*) – Tree # 159
1 – Deodar cedar (*Cedrus deodara*) – Tree # 160
1 – Maple (*Acer species*) – Tree # 161
4 – Norway maple cultivar (*Acer platanoides*) – 162, 189, 190, 204
3 – Common hackberry (*Celtis occidentalis*) – Trees # 163, 164, 165
1 – Grecian laurel (*Laurus nobilis*) – Tree # 168
9 – American sweet gum (*Liquidambar styraciflua*) – Trees # 167, 168, 169, 192-197
1 – African sumac (*Rhus lancea*) – Tree # 170
19 – Aristocrat pear (*Pyrus calleryana 'Aristocrat'*) – Trees # 176-183, 208-212, 228
1 – Pin oak (*Quercus palustris*) – Tree # 184
1 – California black oak (*Quercus kellocggii*) – Tree # 185
1 – Cypress (*Cupressus species*) – Tree # 186
2 – Maytens (*Maytenus boaria*) – Trees # 187, 188
1 – Samuel Sommer Magnolia (*Magnolia grandiflora 'Samuel Sommer'*) Tree # 191
3 – European white birch (*Betula pendula*) – Trees # 198, 201, 202
3 – Interior live oak (*Quercus wislizenii*) – Trees # 199, 200, 203
2 – Elm (*Ulmus species*) – Trees # 205, 206
1 – Shamel or Evergreen Ash (*Fraxinus uhdei*) – Tree # 207
1 – Japanese maple (*Acer palmatum*) – Tree #220

The particulars of these 228 trees (trunk diameter, height, spread) are included in the Field Data Sheets that follow this text. The data sheets rate the health and structure of each specimen on a scale of 1-5: (1) Excellent, (2) Good, (3) Fair, (4) Poor, (5) Extremely Poor.

In addition to the 228 established trees, there are numerous young trees on the campus that have been planted in the past 2-3 years. The majority of these young trees (estimated to be approximately 100-150 trees) are located on the front half (west side) of the property.

Comments about Specific Trees

The majority of the coast redwood trees are only in fair condition overall. Although the lower half of most of these redwood trees is quite dense, it is typically the top half of the canopy that provides a more realistic assessment of the tree's overall condition. The top 1/3 of most of these redwood trees is quite sparse. This is particularly noticeable by comparisons with healthy specimens. For example, the Trees # 2, 15, 218, and 226 have healthy dense canopies completely to their tops. If one were to find these and then compare them to nearby specimens, the difference would become obvious. The cause of the decline is primarily drought stress. Although the coast redwood species (*Sequoia sempervirens*) is indigenous to coastal areas of California, it is not indigenous to this inland site. As such, the redwood trees require thorough irrigation during the dry months of the year to maintain healthy dense canopies. Where they are not adequately irrigated, they typically decline from the top downward. The Trees # 1-80 are receiving some irrigation from the neighboring landscape, but it appears inadequate for most of specimens on the north side.

It may be noted that some trees are naturally less dense than others, which we refer to as "seedling variation." However, this can only be judged where the moisture levels are sufficient to eliminate the variable of drought stress.

The tops of several of the coast redwood trees have died, resulting in being naturally "topped." The "topping" of a redwood tree means the reduction of the central leader, either naturally (by natural die-back) or mechanically (by pruning). The resulting structure becomes problematic and possibly hazardous over time. The resulting structure takes on either or both of the following two forms: (1) a side branch takes over the role of the central leader, but does not have the integral strength of the original leader and often breaks; (2) the primary growth is diverted to the side branches, which may become too long and heavy, eventually breaking. From a management perspective, "topped" trees require frequent monitoring and regular pruning (approximately every 5-7 years) for the life of the tree. Tree # 33 is an example of a "topped" tree that is developing long extended side branches, but there are several others, as noted by the Field Data Sheets.

I recommend that permanent irrigation with bubblers be considered for the coast redwood trees. In this event, it would be essential to install the lines on-grade, perhaps adjacent to the fences.

Trees # 90-126, most of which are coast redwoods, have been topped for power line clearance. Some of these trees have been topped numerous times.

Most of the coast redwood trees have "shoots" growing around the base of their trunks. At least one company offers a chemical control of these "shoots" with a growth regulator. I strongly advise against the use of such chemical controls. In my opinion, the only way to control the shoots is to prune them by hand annually.

Several of the coast redwood trees are dual stem specimens, for example Trees # 42, 48, 56, and 218. Those stems that are the more inclined toward horizontal of the two stems occasionally splits apart and falls. I recommend that these be considered for cabling.

There exists a "hanging" branch in Tree # 38. I recommend that this "hanger" be removed immediately.

Tree # 170, an African sumac (*Rhus lancea*), is severely infected with a serious fungus disease called Artist's conk (*Ganoderma applanatum*). The fruiting bodies (in other fungi these are referred to as the mushroom caps) are prominent at several locations on the tree's trunk. This disease slowly digests the interior wood causing loss of strength. In time the tree will fail. I did a simple sound inspection of the trunk and the major limbs. The trunk and two of the major limbs sound hollow. **I consider Tree # 170 to be hazardous and recommend removal.**

A percentage of the Aristocrat pear trees have bacterial disease called Fireblight (*Erwinia amylovora*), which causes terminal branch die-back. This disease is spread by insects and enters through the flowers in the Spring. The diseased wood is recommended to be removed by pruning back into the healthy wood at least 6 inches. At this point, none of the Aristocrat pear trees are seriously threatened by this disease. Pruning is recommended to limit spread of the disease.

There is a small monument noting the planting of a California black oak (*Quercus kelloggii*) by the Class of 1997 adjacent to Tree # 152, which is a Coast live oak (*Quercus agrifolia*). I suggest that this monument be relocated adjacent to Tree # 185, a California black oak (*Q. kelloggii*).

Trees # 199, an Interior live oak (*Quercus wislizenii*), is in good condition. Roots of this tree are starting to lift the pavers in the courtyard. If this tree would be expected to remain in good condition, roots must **not** be severed and removed to "level" the pavers. I suggest

that the roots be preserved by performing a repair, involving removing a large section of pavers, installing sand to raise the elevation 3-6 inches, and reinstalling the pavers. Compaction of the sand over soil areas must be limited to 80%.

Tree # 203, an Interior live oak (*Quercus wislizenii*), is in poor condition. Its canopy is sparse. There is significant quantity of branch tip die-back, and the tree has suffered a major limb failure in the recent past (2-3 years estimated). The die-back and decline is symptomatic of root loss or damage. I suspect that the primary cause may be soil compaction as a result of heavy usage. All of the symptoms suggest this possibility. For example, every day that I visited, a truck was parked inside the root zone on the east side. A remediation plan would involve minimal or usage of the area inside the root zone for several years and a progressive renovation of the soil in small areas at a time. Even if a restoration process were to be attempted, which I would describe in much greater detail if requested, it appears that this oak tree could improve, but it is unlikely that the tree could make a full recovery. Even if a heroic efforts were to be attempted, I would predict only a moderately successful recovery.

Tree # 203 has suffered a major limb failure. One cable has been installed to support the south facing leader, which I consider essential. However, bear in mind that a tree that has suffered a major limb failure has a high risk of additional limb failures (Dr. Ed Gilman, University of Florida). If Tree # 203 would be preserved, I recommend that all of the major limbs be cabled, considering the high use area of its location.

Protected Trees

The City of San Jose municipal code (Chapter 13.28) states: "The term 'tree' shall mean any growing plant exceeding six feet in height, whether planted singly or in a hedge."

Also, (13.28.330) "Any tree which, because of factors including but not limited to its history, girth, height, species or unique quality, has been found by the city council to have a special significance to the community shall be designated a heritage tree. Such trees shall be placed on a heritage tree list, which shall be adopted by the city council by resolution, which resolution may be amended from time to time to add to or delete certain trees there from"(13.28.330).

Chapter 13.32.020 (Sections F and I) states that an "ordinance tree…means any live or dead woody perennial plant characterized by having a main stem or trunk which measures fifty-six inches or more in circumference at a height of twenty-four inches above the natural grade slope."

The City of San Jose Tree Removal Application (Rev. 9/29/05) states "A multi-trunk tree shall be considered a single tree and measurement of that tree shall include the sum of circumference of the trunks of that tree at a height of twenty-four (24) inches above natural grade slope."

Of the total 228 established trees, 156 trees are protected by City of San Jose regulation. The trees protected by the City of San Jose regulation are Trees # 1-5, 7-27, 29-59, 61-65, 68-77, 80-82, 84, 86-88, 93, 99, 100, 102, 103, 105, 106, 108-116, 118, 119, 121-130, 132-138, 141, 142, 144-151, 155, 156, 157, 159, 160, 167, 169, 170, 186, 190-195, 197, 199, 200, 203, 205, 206, 207, 213-218, 221, 224, 225, and 226.

Risks to Trees By Proposed Construction

The Coast redwood Trees # 15-80 are located approximately 12-18 inches from the edge of existing paved parking. Assuming these trees would be preserved, it would not be feasible to widen the parking closer to these existing trees.

Also, it must be noted that the coast redwood species (*Sequoia sempervirens*) has a bulb like structure usually just below grade called a lignotuber, which grows about twice the diameter of the trunk and at about the same rate. The lignotuber is an adaptation for forest fire and is responsible for the creation of a coast redwood cathedral in old stands of trees. Some of these lignotuber structures are visible above grade, for example Trees # 36 and 149. This structure is significant because it will likely start to raise the edge of the paving or cause the paved edge to buckle in the near future (the next few years). It will not be possible to trim or shave the edge of this lignotuber because of the risk of trunk failure. For the same reason, it will not be possible to severe large roots (approximately 2 ½ - 3 inches in diameter or larger) for the same reason.

Trees # 152-157, coast live oak (*Quercus agrifolia*) appear to be in conflict with the proposed Performing Arts Center. Trees # 153-157 are very healthy specimens and would have a good chance of successful transplant. Tree # 152 is only in fair condition, and for this reason would not be a good candidate for transplant. Because the cost of transplant increases dramatically with size, I suggest that consideration be given to transplant sooner than later.

Tree # 159, a Monterey pine (Pinus radiata) and Tree # 160, a topped Deodar cedar (*Cedrus deodara*) appear to be in conflict with the proposed New Entry Plaza. I recommend that these be replaced with Deodar cedar specimens, a species which performs very well in this area.

Trees #163-166 and Trees # 172-182 appear to be in conflict with the proposed new Gymnasium. It would not be economically practical to transplant these trees, in my opinion. Replacement would be the preferred option.

Trees # 184 and #185 are healthy oak specimens and may be considered for transplant if they could not be integrated into the New Orchard Quad.

Trees # 161, 162, 167, 168, 169, 183, and 186-203 would be in conflict with the proposed new Student Union. For these trees I recommend removal and/or replacement.
It appears that at least the Trees # 205-212 would be in conflict with the new Mulit-Purpose Playing Field. If a soil cut of approximately 6-12 inches would be required to construct this field, Trees # 86-100 and 104 may be at risk. I recommend that the field on the south side be limited sufficiently to preserve the existing Versa-Lock retaining wall, which should preserve Trees # 213, 220, and 225-227.

General Risks to Trees posed during Construction and General Procedures for Preservation
The management of materials and equipment, often as part of the staging area(s), commonly poses significant risks to existing trees. Protective fencing is the primary defense for existing trees. Prevention is key to tree protection, because repair or remediation is usually ineffective or unable to restore a damaged tree.

The trees at this site would likely be at risk of damage by construction or construction procedures that are common to most construction sites. These procedures may include the dumping or the stockpiling of materials over root systems, may include the trenching across the root zones for utilities or for landscape irrigation, or may include construction traffic across the root system resulting in soil compaction and root die back.

If any underground utilities are to be replaced or upgraded, it will be essential that the location of trenches be planned prior to construction and those locations are shown on plans, and that the trenches be dug at the locations shown on the plans.

Trees usually require supplemental irrigation and mulching during the construction period to prevent decline or death.

Respectfully submitted,

Michael L. Bench, Consulting Arborist
ISA – WC # 1897
American Society of Consulting Arborists Member

Tree Evaluation Field Data

		Measurements						Condition													Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
	Michael L. Bench Consulting Arborist *7327 Langley Canyon Road* *Prunedale, CA 93907* michaelbench@sbcglobal.net (831) 594-5151																				
1	Coast Redwood	50.0			57.0	110	50	3	3	x										x	Top Half of Canopy Sparse
	Sequoia sempervirens																				3 Leaders in Top 20'
2	Coast Redwood	20.0			22.0	100	30	1	1											x	
	Sequoia sempervirens																				
3	Coast Redwood	26.0			29.0	100	35	2	2											x	
	Sequoia sempervirens																				
4	Coast Redwood	30.0			34.0	110	35	3	2											x	Sparse Canopy
	Sequoia sempervirens																				
5	Coast Redwood	23.0			26.0	105	25	2	1											x	
	Sequoia sempervirens																				
6	Coast Redwood	11.0			14.0	85	25	2	2												
	Sequoia sempervirens																				
7	Coast Redwood	20.0			23.0	65	20	2	1											x	
	Sequoia sempervirens																				
8	Coast Redwood	17.0			19.0	85	25	3	3		x									x	
	Sequoia sempervirens																				
9	Coast Redwood	21.0			24.0	110	25	4	3											x	Very Sparse Canopy
	Sequoia sempervirens																				
10	Coast Redwood	28.0			32.0	110	25	4	3		x									x	Very Sparse Canopy
	Sequoia sempervirens																				

Job Name: Harker School
Job # 06-10-123
Date: 06-24-10

* CD W/IB = CODOMINANT LEADERS WITH INCLUDED BARK
* RECOMMEND: P = PRESERVE, T = TRANSPLANT, R = REMOVE

1=Best, 5=Worst

Tree Evaluation Field Data

Michael L. Bench
Consulting Arborist
7327 Langley Canyon Road
Prunedale, CA 93907
michaelbench@sbcglobal.net
(831) 594-5151

Tree #	Tree Name	Measurements: DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	Condition: HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	Notes: NOTES AND COMMENTS
11	Coast Redwood	23.0			27.0	100	30	2	2											x	
	Sequoia sempervirens																				
12	Coast Redwood	31.0			35.0	90	30	4	2											x	
	Sequoia sempervirens																				
13	Coast Redwood	28.0			31.0	100	35	2	4		x									x	Extended Side Branches
	Sequoia sempervirens																				
14	Coast Redwood	26.0			29.0	90	45	3	4		x									x	Sparse Canopy
	Sequoia sempervirens																				Extended Side Branches
15	Coast Redwood	39.0			42.0	140	30	1	1											x	
	Sequoia sempervirens																				
16	Coast Redwood	25.0			28.0	100	30	1	2											x	
	Sequoia sempervirens																				
17	Coast Redwood	37.0			41.0	100	40	2	2											x	
	Sequoia sempervirens																				
18	Coast Redwood	25.0			27.0	85	30	2	4		x									x	Topped at approx. 75'
	Sequoia sempervirens																				
19	Coast Redwood	33.0			38.0	120	35	2	3											x	Extended Side Branches
	Sequoia sempervirens																				
20	Coast Redwood	29.0			32.0	100	40	3	3		x									x	Extended Side Branches
	Sequoia sempervirens																				

Job Name: Harker School
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1=Best, 5=Worst

Tree Evaluation Field Data

Michael L. Bench
Consulting Arborist
7327 Langley Canyon Road
Prunedale, CA 93907
michaelbench@sbcglobal.net
(831) 594-5151

		Measurements						Condition													Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
21	Coast Redwood	25.0			28.0	90	30	2	4		x									x	Topped at approx. 80'
	Sequoia sempervirens																				
22	Coast Redwood	28.0			31.0	100	35	1	2											x	
	Sequoia sempervirens																				
23	Coast Redwood	23.0			26.0	110	35	1	2											x	
	Sequoia sempervirens																				
24	Coast Redwood	29.0			33.0	110	35	1	2											x	
	Sequoia sempervirens																				
25	Coast Redwood	28.0			31.0	100	35	1	4		x									x	Topped at approx. 80'
	Sequoia sempervirens																				
26	Coast Redwood	26.0			30.0	110	30	1	2		x									x	
	Sequoia sempervirens																				
27	Coast Redwood	34.0			39.0	110	40	3	3											x	
	Sequoia sempervirens																				
28	Coast Redwood	8.0			9.0	30	20	1	3		x										
	Sequoia sempervirens																				
29	Coast Redwood	25.0			29.0	90	40	2	4		x									x	Extended Side Branches
	Sequoia sempervirens																				
30	Coast Redwood	28.0			31.0	90	40	2	4		x									x	Extended Side Branches
	Sequoia sempervirens																				

Job Name: Harker School
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1=Best, 5=Worst

Tree Evaluation Field Data

Michael L. Bench
Consulting Arborist
7327 Langley Canyon Road
Prunedale, CA 93907
michaelbench@sbcglobal.net
(831) 594-5151

Tree #	Tree Name	Measurements						Condition													Notes
		DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
31	Coast Redwood	18.0			23.0	70	25	1	4		x										x	Extended Side Branches
	Sequoia sempervirens																					
32	Coast Redwood	21.0			25.0	90	30	1	4		x										x	
	Sequoia sempervirens																					
33	Coast Redwood	29.0			31.0	80	50	2	4		x										x	Toppped at approx. 80'
	Sequoia sempervirens																					Extended Side Branches
34	Coast Redwood	24.0			28.0	90	25	1	1												x	
	Sequoia sempervirens																					
35	Coast Redwood	28.0			32.0	100	35	2	2												x	
	Sequoia sempervirens																					
36	Coast Redwood	25.0			28.0	95	30	2	2		x										x	Topped at approx. 85'
	Sequoia sempervirens																					
37	Coast Redwood	24.0			27.0	80	35	2	2												x	
	Sequoia sempervirens																					
38	Coast Redwood	30.0			33.0	60	35	1	4		x										x	Hanging branch in Canopy
	Sequoia sempervirens																					
39	Coast Redwood	38.0			42.0	110	30	1	4		x										x	Topped at approx. 90'
	Sequoia sempervirens																					
40	Coast Redwood	21.0			25.0	90	25	2	2												x	
	Sequoia sempervirens																					

Job Name: Harker School
Job # 06-10-123
Date: 06-24-10

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		Measurements						Condition													Notes
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41	Coast Redwood	15.0			18.0	25	30	1	4		x									x	Topped at approx. 20'
	Sequoia sempervirens																				
42	Coast Redwood	24.0			27.0	85	35	2	4	x			x							x	Co-Dominant Leaders at 10'
	Sequoia sempervirens																				
43	Coast Redwood	28.0			31.0	140	30	1	1											x	
	Sequoia sempervirens																				
44	Coast Redwood	17.0			20.0	80	15	4	3											x	
	Sequoia sempervirens																				
45	Coast Redwood	36.0			41.0	90	35	1	1											x	
	Sequoia sempervirens																				
46	Coast Redwood	24.0			27.0	90	35	1	1											x	
	Sequoia sempervirens																				
47	Coast Redwood	31.0			35.0	90	35	1	4		x									x	
	Sequoia sempervirens																				
48	Coast Redwood	38.0			41.0	100	35	2	2				x							x	Dual stems at 4.5'
	Sequoia sempervirens																				
49	Coast Redwood	31.0			35.0	100	35	3	2		x									x	Topped at approx. 80'
	Sequoia sempervirens																				
50	Coast Redwood	18.0			20.0	75	15	3	2											x	
	Sequoia sempervirens																				

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51	Coast Redwood	19.0			22.0	100	25	1	1											x	
	Sequoia sempervirens																				
52	Coast Redwood	34.0			39.0	150	40	1	1											x	
	Sequoia sempervirens																				
53	Coast Redwood	20.0			23.0	90	25	2	4		x									x	
	Sequoia sempervirens																				
54	Coast Redwood	21.0			25.0	120	25	2	4											x	
	Sequoia sempervirens																				
55	Coast Redwood	35.0			39.0	130	35	2	3		x									x	
	Sequoia sempervirens																				
56	Coast Redwood	23.0	21.0		36.0	110	35	1	2				x							x	Dual Stems
	Sequoia sempervirens																				
57	Coast Redwood	31.0			34.0	130	30	3	2											x	Sparse Canopy Top 35'
	Sequoia sempervirens																				
58	Coast Redwood	39.0	at	3'	41.0	90	30	1	2											x	
	Sequoia sempervirens																				
59	Coast Redwood	28.0			31.0	80	45	2	4		x									x	Topped at approx. 65'
	Sequoia sempervirens																				
60	Coast Redwood	4.0			5.0	12	12	1	2												
	Sequoia sempervirens																				

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		Measurements						Condition													Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
61	Coast Redwood	34.0			53.0	140	40	1	1											x	
	Sequoia sempervirens																				
62	Coast Redwood	18.0	10.0		24.0	70	20	1	2											x	
	Sequoia sempervirens																				
63	Coast Redwood	34.0			39.0	130	40	1	2											x	Sparse Canopy Top 10'
	Sequoia sempervirens																				
64	Coast Redwood	24.0			27.0	100	35	2	2											x	
	Sequoia sempervirens																				
65	Coast Redwood	25.0			28.0	140	40	3	2											x	
	Sequoia sempervirens																				
66	Coast Redwood	4.0			5.0	12	12	1	2												
	Sequoia sempervirens																				
67	Coast Redwood	4.0			5.0	12	12	1	2												
	Sequoia sempervirens																				
68	Coast Redwood	26.0			29.0	130	32	2	2											x	
	Sequoia sempervirens																				
69	Coast Redwood	33.0			36.0	140	40	1	1											x	
	Sequoia sempervirens																				
70	Coast Redwood	17.0			19.0	70	30	2	2											x	
	Sequoia sempervirens																				

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71	Coast Redwood	31.0			34.0	130	30	2	2											x	
	Sequoia sempervirens																				
72	Coast Redwood	32.0			35.0	100	45	1	3		x									x	
	Sequoia sempervirens																				
73	Coast Redwood	27.0			31.0	125	30	2	2											x	
	Sequoia sempervirens																				
74	Coast Redwood	22.0			25.0	90	35	2	2											x	
	Sequoia sempervirens																				
75	Coast Redwood	22.0			26.0	100	30	3	3	x										x	CD Stems at approx. 80'
	Sequoia sempervirens																				
76	Coast Redwood	21.0			24.0	100	30	3	2											x	
	Sequoia sempervirens																				
77	Coast Redwood	28.0			34.0	110	35	2	3		x									x	Topped at approx. 100'
	Sequoia sempervirens																				
78	Coast Redwood	14.0			16.0	80	25	2	2												
	Sequoia sempervirens																				
79	Coast Redwood	10.0			12.0	50	15	5	2												
	Sequoia sempervirens																				
80	Coast Redwood	22.0			25.0	100	35	2	2											x	
	Sequoia sempervirens																				

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81	Lombardy Poplar	26.0			28.0			x	x											x	Dead
	Populus nigra 'Italica'																				
82	Coast Redwood	18.0			21.0	80	30	4	3											x	Not Likely to Recover
	Sequoia sempervirens																				
83	Coast Redwood	13.0			15.0	60	20	5	3												Near Dead
	Sequoia sempervirens																				
84	Coast Redwood	25.0			28.0	120	40	1	3											x	CD @ 40'
	Sequoia sempervirens																				
85	Coast Redwood	9.0			10.0	50	15	2	2												
	Sequoia sempervirens																				
86	Coast Redwood	19.0			21.0	110	30	2	3											x	Extended Side Branches
	Sequoia sempervirens																				
87	Coast Redwood	13.0			18.0	60	25	1	4		x									x	
	Sequoia sempervirens																				
88	Coast Redwood	18.0			20.0	50	30	1	4		x									x	
	Sequoia sempervirens																				
89	Coast Redwood	14.0			16.0	60	25	1	4		x										
	Sequoia sempervirens																				
90	Coast Redwood	11.0			12.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				

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91	Coast Redwood	11.0			12.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
92	Coast Redwood	15.0			16.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
93	Coast Redwood	18.0			20.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
94	Coast Redwood	14.0			16.0	40	25	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
95	Coast Redwood	12.0			13.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
96	Coast Redwood	14.0			16.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
97	Coast Redwood	12.0			14.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
98	Coast Redwood	12.0			13.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
99	Coast Redwood	12.0			18.0	50	25	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
100	Coast Redwood	18.0			20.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				

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101	California Pepper	14.0			16.0	12	12	1	4		x										Topped for Line Clearance
	Schinus molle																				
102	California Pepper	15.0			17.0	10	10	1	4		x										Topped for Line Clearance
	Schinus molle																				
103	California Pepper	17.0	14.0		25.0	15	15	1	4		x									x	Topped for Line Clearance
	Schinus molle																				
104	Coast Redwood	14.0			16.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
105	Coast Redwood	15.0	14.0	14.0	16.0	30	30	1	4		x									x	3 Stems at Grade
	Sequoia sempervirens				15.0																Topped for Line Clearance
106	Coast Redwood	17.0	15.0	15.0	18.0	30	30	1	4		x									x	3 Stems at Grade
	Sequoia sempervirens				16.0																Topped for Line Clearance
107	Coast Redwood	14.0			16.0	30	30	1	4		x										Topped for Line Clearance
	Sequoia sempervirens																				
108	Coast Redwood	15.0			17.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
109	Coast Redwood	15.0			18.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
110	Coast Redwood	15.0			17.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				

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111	Coast Redwood	17.0			19.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
112	Coast Redwood	18.0			20.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
113	Coast Redwood	20.0	8.0		30.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
114	Coast Redwood	19.0	15.0	8.0	31.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
115	Coast Redwood	18.0	17.0		28.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
116	Coast Redwood	20.0	16.0		26.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
117	Coast Redwood	10.0			11.0	30	30	1	4		x											Topped for Line Clearance
	Sequoia sempervirens																					
118	Coast Redwood	14.0	14.0		22.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
119	Coast Redwood	16.0	11.0		19.0	30	30	1	4		x										x	Topped for Line Clearance
	Sequoia sempervirens																					
120	Coast Redwood	15.0			16.0	30	30	1	4		x											Topped for Line Clearance
	Sequoia sempervirens																					

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121	Coast Redwood	17.0	8.0	5.0	22.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
122	Coast Redwood	17.0			19.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
123	Coast Redwood	20.0			22.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
124	Coast Redwood	24.0			26.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
125	Coast Redwood	8.0	7.0	5.0	21.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens			5.0																	
126	Coast Redwood	18.0	17.0	15.0	21.0	30	30	1	4		x									x	Topped for Line Clearance
	Sequoia sempervirens																				
127	Coast Redwood	32.0			37.0	110	35	2	1											x	
	Sequoia sempervirens																				
128	Coast Redwood	30.0			32.0	110	35	3	2											x	Sparse Canopy
	Sequoia sempervirens																				
129	Coast Redwood	34.0			36.0	110	40	3	2											x	Sparse Canopy
	Sequoia sempervirens																				
130	Coast Redwood	46.0			48.0	140	35	4	2											x	Very Sparse Canopy
	Sequoia sempervirens																				

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131	Coast Redwood	10.0			11.0			x	x												Dead
	Sequoia sempervirens																				
132	Coast Redwood	25.0			27.0	80	40	3	4		x									x	Sparse Canopy
	Sequoia sempervirens																				
133	Coast Redwood	47.0			51.0	120	45	2	1											x	
	Sequoia sempervirens																				
134	Coast Redwood	24.0			26.0	100	25	4	3											x	
	Sequoia sempervirens																				
135	Coast Redwood	38.0			40.0	135	40	3	1											x	
	Sequoia sempervirens																				
136	Coast Redwood	27.0			29.0	125	40	2	1											x	
	Sequoia sempervirens																				
137	Coast Redwood	45.0			49.0	150	40	1	1											x	
	Sequoia sempervirens																				
138	Coast Redwood	23.0			26.0	120	35	2	1											x	
	Sequoia sempervirens																				
139	Victorian Box	8.0			9.0	30	25	1	2												
	Pittosporum undulatum																				
140	Coast Redwood	6.0			8.0	25	15	2	1												
	Sequoia sempervirens																				

Job Name: Harker School
Job # 06-10-123
Date: 06-24-10

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1=Best, 5=Worst

Tree Evaluation Field Data

Tree #	Tree Name	Measurements						Condition													Notes
	Michael L. Bench Consulting Arborist *7327 Langley Canyon Road* *Prunedale, CA 93907* michaelbench@sbcglobal.net (831) 594-5151	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
141	Coast Redwood	26.0			28.0	110	30	2	3		x										x	
	Sequoia sempervirens																					
142	Coast Redwood	28.0			31.0	90	35	1	4		x										x	
	Sequoia sempervirens																					
143	Coast Redwood	15.0			17.0	60	25	1	1													
	Sequoia sempervirens																					
144	Coast Redwood	21.0			24.0	90	30	2	2												x	
	Sequoia sempervirens																					
145	Coast Redwood	26.0			29.0	90	35	1	4		x										x	
	Sequoia sempervirens																					
146	Coast Redwood	33.0			37.0	120	45	2	1												x	
	Sequoia sempervirens																					
147	Coast Redwood	25.0			28.0	80	50	1	3												x	Extended Side Branches
	Sequoia sempervirens																					
148	Coast Redwood	17.0			19.0	35	30	2	4		x										x	
	Sequoia sempervirens																					
149	Coast Redwood	29.0			31.0	100	30	3	2												x	Sparse Canopy
	Sequoia sempervirens																					
150	Coast Redwood	24.0			26.0	75	25	2	2												x	
	Sequoia sempervirens																					

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		Measurements						Condition													Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
151	Coast Redwood	23.0			25.0	75	25	2	1											x	
	Sequoia sempervirens																				
152	Coast Live Oak	9.0			11.0	15	25	2	2					x							Oak Bark Beetle Attack
	Quercus agrifolia																				Sparse Canopy on S. Side
153	Coast Live Oak	8.0			10.0	20	25	1	3	x											
	Quercus agrifolia																				
154	Coast Live Oak	7.0			9.0	20	20	1	1												
	Quercus agrifolia																				
155	Coast Live Oak	17.0			19.0	25	40	1	2											x	Long Extended Branches
	Quercus agrifolia																				
156	Coast Live Oak	16.0			18.0	25	30	1	1											x	
	Quercus agrifolia																				
157	Coast Live Oak	18.0			20.0	30	50	1	2	x										x	CD - NE Facing Branch
	Quercus agrifolia																				
158	Raywood Ash	7.0			8.0	15	20	2	3												Die-Back in Top of Canopy
	Fraxinus oxycarpa 'Raywood'																				
159	Monterey Pine	29.0			31.0	60	70	3	2											x	Moderately Sparse Canopy
	Pinus radiata																				
160	Deodar Cedar	25.0			29.0	30	60	1	3		x									x	Topped at approx. 30 feet
	Cedrus deodara																				Long Extended Branches

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Tree #	Tree Name	Measurements						Condition													Notes
		DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
161	Maple	6.0			7.0	30	15	1	2												
	Acer species																				
162	Norway Maple	14.0			16.0	30	15	1	2		x										Topped at 7 feet
	Acer platanoides																				
163	Common Hackberry	7.0			8.0	30	30	2	1					x							Moderately Dense Canopy
	Celtis occidentalis																				Aphid Attack
164	Common Hackberry	7.0			8.0	30	25	2	1					x							Moderately Dense Canopy
	Celtis occidentalis																				Aphid Attack
165	Common Hackberry	7.0			8.0	25	30	2	1					x							Moderately Dense Canopy
	Celtis occidentalis																				Aphid Attack
166	Grecian Laurel	9.0			11.0	30	25	1	2												
	Laurus nobilis																				
167	American Sweet Gum	16.0			18.0	70	25	1	3	x											x	Lifting Pavers
	Liquidambar styraciflua																				
168	American Sweet Gum	8.0			10.0	35	15	1	3	x												
	Liquidambar styraciflua																				
169	American Sweet Gum	18.0			20.0	70	25	1	3	x											x	Lifting Pavers
	Liquidambar styraciflua																				
170	African Sumac	28.0			30.0	25	40	4	5						x						x	Sparse Canopy -
	Rhus lancea																				Numerous Ganoderma Fruiting Bodies

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Tree Evaluation Field Data

		Measurements						Condition													Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
	Michael L. Bench Consulting Arborist *7327 Langley Canyon Road* *Prunedale, CA 93907* michaelbench@sbcglobal.net (831) 594-5151																				
171	Aristocrat Pear	5.0			7.0	25	15	1	1												
	Pyrus calleryana 'Aristocrat'																				
172	Aristocrat Pear	9.0			10.0	30	20	2	2		x				x						Fireblight
	Pyrus calleryana 'Aristocrat'																				
173	Aristocrat Pear	7.0			9.0	30	20	2	3	x					x						Fireblight
	Pyrus calleryana 'Aristocrat'																				
174	Aristocrat Pear	7.0			8.0	30	20	2	3	x					x						Fireblight
	Pyrus calleryana 'Aristocrat'																				
175	Aristocrat Pear	7.0			8.0	30	20	2	3	x											
	Pyrus calleryana 'Aristocrat'																				
176	Aristocrat Pear	8.0			9.0	30	20	2	3	x					x						Fireblight
	Pyrus calleryana 'Aristocrat'																				
177	Aristocrat Pear	7.0			8.0	30	20	2	2												
	Pyrus calleryana 'Aristocrat'																				
178	Aristocrat Pear	7.0			8.0	30	20	2	3	x											
	Pyrus calleryana 'Aristocrat'																				
179	Aristocrat Pear	8.0			8.0	30	20	2	2												
	Pyrus calleryana 'Aristocrat'																				
180	Aristocrat Pear	7.0			8.0	25	20	2	1												
	Pyrus calleryana 'Aristocrat'																				

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Tree Evaluation Field Data

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Tree #	Tree Name	Measurements: DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	Condition: HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	Notes: NOTES AND COMMENTS
181	Aristocrat Pear	13.0			15.0	35	35	1	2												
	Pyrus calleryana 'Aristocrat'																				
182	Aristocrat Pear	14.0			16.0	35	35	1	2												
	Pyrus calleryana 'Aristocrat'																				
183	Aristocrat Pear	9.0			10.0	30	25	1	4	x	x										
	Pyrus calleryana 'Aristocrat'																				
184	Pin Oak	12.0			13.0	20	35	1	3												Extended Limbs
	Quercus palustris																				
185	California Black Oak	13.0			14.0	30	35	1	2												
	Quercus kelloggii																				
186	Cypress	6.0			7.0	30	15	1	2												
	Cupressus species	(x4)			x4																
187	Maytens	15.0			16.0	15	35	1	3	x											
	Maytenus boaria																				
188	Maytens	9.0			10.0	15	15	1	3	x											
	Maytenus boaria																				
189	Norway maple	14.0			16.0	25	30	1	3												
	Acer platanoides																				
190	Norway maple	15.0			17.0	25	30	1	3											x	Partially Topped
	Acer platanoides																				

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Tree #	Tree Name	Measurements						Condition													Notes
		DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
191	Samuel Sommer Magnolia	24.0			27.0	40	40	1	1											x	
	Magnolia grandiflora 'Samuel Sommer'																				
192	American Sweet Gum	16.0			18.0	55	30	1	4	x										x	
	Liquidambar styraciflua																				
193	American Sweet Gum	22.0			24.0	60	35	1	3											x	
	Liquidambar styraciflua																				
194	American Sweet Gum	18.0			19.0	60	30	1	3											x	
	Liquidambar styraciflua																				
195	American Sweet Gum	22.0			24.0	60	30	1	3											x	
	Liquidambar styraciflua																				
196	American Sweet Gum	14.0			16.0	50	25	1	4	x											
	Liquidambar styraciflua																				
197	American Sweet Gum	17.0			18.0	50	35	1	3											x	
	Liquidambar styraciflua																				
198	European White Birch	9.0			11.0	50	20	1	3												
	Betula pendula																				
199	Interior Live Oak	29.0			31.0	60	60	1	2											x	Rasising Pavers
	Quercus wislizenii																				
200	Interior Live Oak	27.0			29.0	60	45	1	2											x	
	Quercus wislizenii																				

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Tree Evaluation Field Data

		Measurements						Condition													Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
201	European White Birch	12.0			13.0	50	30	3	2												Canopy Die Back-
	Betula pendula																				Compaction Suspected
202	European White Birch	14.0			16.0	50	35	3	2												
	Betula pendula																				
203	Interior Live Oak	32.0			34.0	65	60	4	3											x	Sparse - Canopy Die Back -
	Quercus wislizenii																				Major Limb Failure S Side
204	Norway Maple cultivar	6.0			7.0	12	20	1	2												
	Acer platanoides																				
205	Elm	19.0			21.0	45	55	2	1											x	Minor Canopy Die Back
	Ulmus species																				
206	Elm	20.0			22.0	40	60	1	2											x	
	Ulmus species																				
207	Shamel or Evergreen Ash	28.0			30.0	60	75	2	3	x										x	Leaf Tip Burn
	Fraxinus uhdei																				Branch Tip Die Back
208	Aristocrat Pear	8.0			9.0	35	20	1	3	x					x						Fireblight - Minor
	Pyrus calleryana 'Aristocrat'																				
209	Aristocrat Pear	10.0			11.0	35	25	1	2	x					x						Fireblight - Minor
	Pyrus calleryana 'Aristocrat'																				
210	Aristocrat Pear	11.0			12.0	35	25	1	2						x						Fireblight - Minor
	Pyrus calleryana 'Aristocrat'																				

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		Measurements						Condition												Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
211	Aristocrat Pear	8.0			9.0	20	15	1	2												
	Pyrus calleryana 'Aristocrat'																				
212	Aristocrat Pear	6.0			8.0	20	10	2	3	x					x						Fireblight - Minor
	Pyrus calleryana 'Aristocrat'																				
213	Coast Redwood	33.0			35.0	90	30	2	1											x	
	Sequoia sempervirens																				
214	Coast Redwood	31.0	12.0		38.0	100	35	2	1											x	
	Sequoia sempervirens																				
215	Coast Redwood	20.0			23.0	80	30	2	1											x	
	Sequoia sempervirens																				
216	Coast Redwood	18.0			20.0	80	30	1	1											x	
	Sequoia sempervirens																				
217	Coast Redwood	21.0			23.0	80	25	1	1											x	
	Sequoia sempervirens																				
218	Coast Redwood	40.0	at	2'	40.0	120	50	1	3	x			x							x	Dual Stems
	Sequoia sempervirens																				
219	Coast Redwood	6.0			7.0	45	12	1	1												
	Sequoia sempervirens																				
220	Japanese Maple	8.0	at	1'	8.0	15	15	1	3		x										Partially Topped
	Acer palmatum																				Transplanted to this Location

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Tree Evaluation Field Data

		Measurements						Condition													Notes
Tree #	Tree Name	DIAMETER @ 4-1/2 FEET	DBH	DBH	DIAMETER @ 2 FEET	HEIGHT	SPREAD	HEALTH	STRUCTURE	CD with I.B. *see below	TOPPED CROWN	HEAVY ENDWEIGHT	CABLES INDICATED	INSECTS	DISEASE	DEADWOOD	ROOT COLLAR COVERED	NEEDS WATER	PLANTED BELOW GRADE	PROTECTED TREE	NOTES AND COMMENTS
	Michael L. Bench Consulting Arborist *7327 Langley Canyon Road* *Prunedale, CA 93907* michaelbench@sbcglobal.net (831) 594-5151																				
221	Coast Redwood	28.0			30.0	90	35	2	1											x	
	Sequoia sempervirens																				
222	Coast Redwood	11.0			12.0	60	25	2	1												
	Sequoia sempervirens																				
223	Coast Redwood	15.0			17.0	60	25	2	1												
	Sequoia sempervirens																				
224	Coast Redwood	27.0			29.0	90	30	2	1											x	
	Sequoia sempervirens																				
225	Coast Redwood	18.0			20.0	90	30	2	1											x	
	Sequoia sempervirens																				
226	Coast Redwood	37.0			40.0	100	35	1	1											x	
	Sequoia sempervirens																				
227	Coast Redwood	12.0			14.0	60	30	2	1												
	Sequoia sempervirens																				
228	Aristocrat Pear	10.0			11.0	40	30	1	4	x											
	Pyrus calleryana 'Aristocrat'																				
229																					
230																					

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Tree # 1, a coast redwood (*Sequoia sempervirens*), has a sparse canopy in the top 30 feet. This occurs after prolonged periods of drought stress. Partial recovery is possible if given abundant frequent irrigation.

A high percentage of the coast redwood specimens along the north and south boundaries of this site are in similar condition.

Seen here are the coast redwood trees along the north side property boundary. This photo was taken from the football field toward the northwest. Tree # 1 stands adjacent to the light post. Most of these have sparse canopies in the top ¼ of their canopies. The tops of some have died resulting in being naturally "topped". The results of "topping" is a poor structure for the life of the tree. Topping will be described in greater detail in later photos.

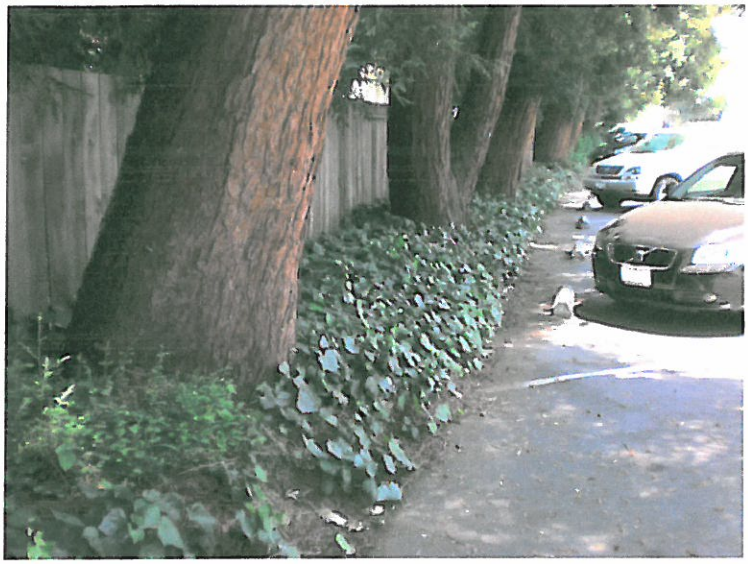
At the far right is Tree # 15, a coast redwood in excellent condition. Tree # 2, which stands just to the left of Tree # 15 here, is located on this side of the driveway adjacent to the building. One may ask, "Why is Tree # 15 performing so well compared to the other nearby coast redwood trees?" I am confident that Tree # 15 has managed to tap into an underground source of water.

The top of coast redwood Tree # 33 is seen below. The central leader is seen in the lower center of the photo. This central leader ends with a spray of side branches in all directions. These side branches sprouted when the top was removed or died. They are very weak because they sprouted from the outer growth ring formed the year that the top died. They are only attached to the depth of that growth ring. As the length and weight of these side branch increases, the risk of failure increases.

Long extended side branches are seen here from Tree # 33 in the upper middle of this photo. There are extended side branches along the entire trunk of Tree # 33, but only a portion of these show in the photo.

The development of extended side branches is a result of having been "topped". The energy that would have gone into growth of the central leader has been diverted to side branches. Because these side branches are not always able to support the additional weight, they break.

Several trees in the row of coast redwood trees on the north side of the property have this weak structure.



Coast redwood Tree # 47 is seen on the left, looking down the row of coast redwood trees toward the east. The trunk of Tree # 47 is located approximately 2 feet from the edge of the paving. If the new paving were to be relocated toward the trunks of the coast redwood trees by only a few inches, it is likely that some if not several of these trees would be exposed to significant risk of root loss.

Coast redwood Tree # 36. The raised area around the trunk is a bulb like structure called a lignotuber, which is an adaptation for forest fires. The numerous sprouts around the base of the tree are from the lignotuber, and would compete to become a dominant new tree, if the tree were to be burned to the ground.

The lignotuber is part of the tree's structure and may not be removed or reduced, if the tree would be expected to remain alive and stable. In my opinion, hand pruning of the new shoots is the only way to maintain them. The lignotuber may be expected to lift or to buckle the paving in the near future.

Tree # 170, an African sumac (*Rhus lancea*), is under attack by a serious fungus disease (*Ganoderma applanatum*), which destroys the interior wood eventually causing the tree to collapse. Although this is a poor photo, there are numerous fruiting bodies in the cavities of the main trunk and on two of the primary limbs. It appears that this infection is quite advanced. There is no treatment for this disease. For this reason, **I recommend removal of Tree # 170.**

Tree # 192, an American sweet gum (*Liquidambar styraciflua*). This structure is called "co-dominant leaders with included bark". At the base of the connection there is a bulge in the opposite direction of the two stems (north and south), which indicates that each of these stems is exerting significant pressure on the other. The pressure increases with each new growth ring. This structure often results in the splitting out of one of the two leaders, usually the one with the most lean (in this case, the one on the right or south side).
Several trees on site have this structure (indicated on the Field Data Sheets), though not as prominent as this tree. Pruning can usually reduce the risk, but may not completely eliminate the risk.

Tree # 203, an Interior Live oak (Quercus wislizenii), has a sparse canopy. It has suffered a large limb failure facing southeast and has a cable supporting a weak limb facing south. The area around this tree has been used extensively. Each day that I visited, there was a truck parked inside this tree's root zone. I suspect that a major cause of decline is soil compaction. It may not be possible to restore this tree to its former healthy condition, but I believe that it could improve. However, several procedures would be required and restoration would likely take several years.

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Subject: Harker School
500 Saratoga Avenue
San Jose, CA

July 14, 2010

Assumptions and Limiting Conditions

1. Any description provided to the appraiser/consultant is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for legal matters in character nor is any opinion rendered as to the quality of any title.

2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes, or other govermental regulations.

3. Care has been taken to obtain information from reliable sources. All data has been verified insofar as reasonably possible. However, the appraiser/consultant can neither guarantee nor be responsible for the accuracy of information provided by others.

4. The appraiser/consultant shall not be required to give testimony or to attend court by reason of this appraisal unless written arrangements are made, inclucing payment of additional fees for services.

5. Loss or removal of any part of this report invalidates the entire appraisal/evaluation.

6. Possession of this report, or any copy thereof, does not imply right of publication or use for any purpose by any person other than to whom this report is addressd without writen consent of this appraiser/consultant.

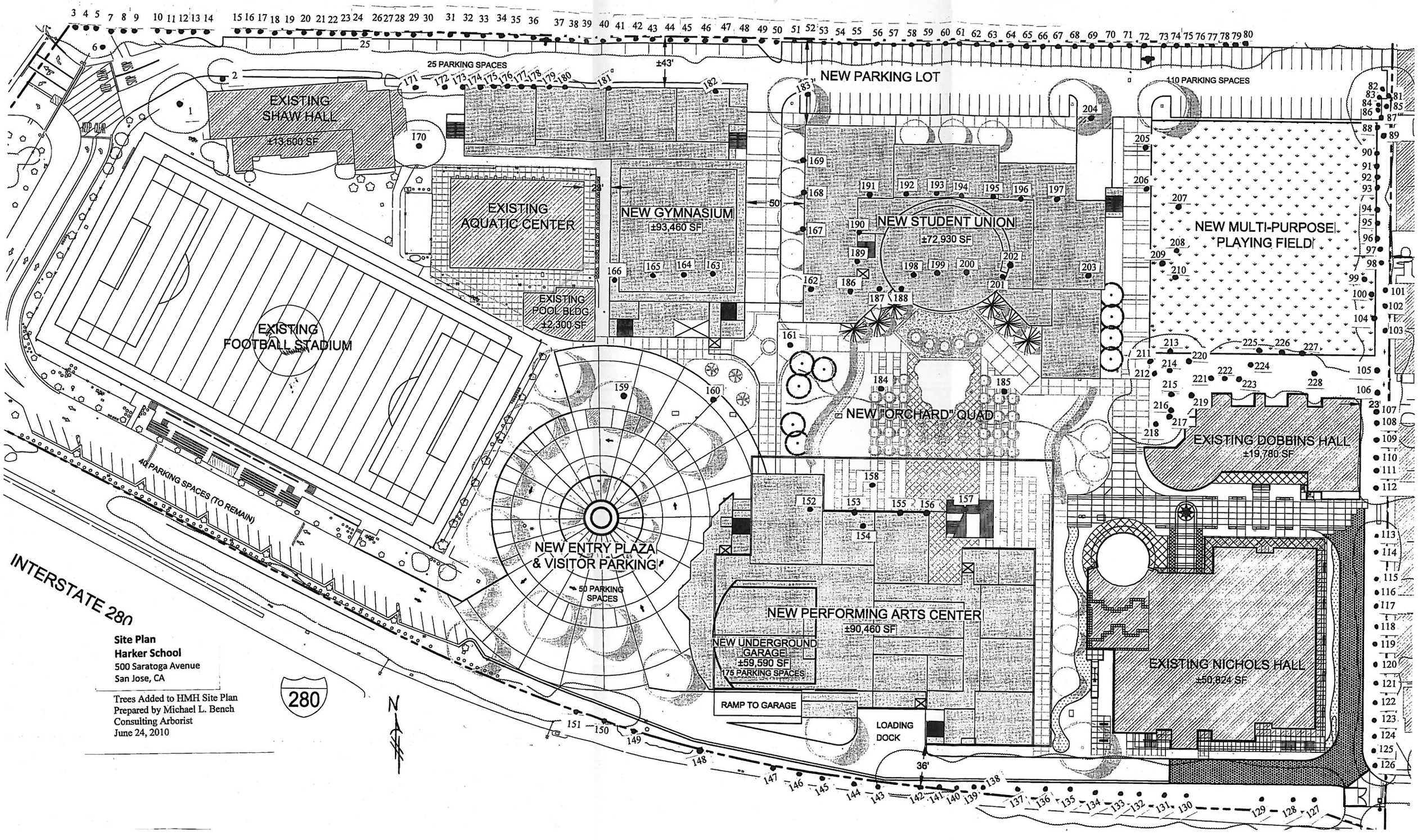
7. Neither all nor any part of the contents of this report, nor copy thereof, shall be used for any purpose by anyone but the client to whom this report is addressed, without the prior written consent of the appraiser/consultant; nor shall it be conveyed by anyone, including the client, to the public through advertizing, public relations, news, sales, or other media, without the written consent and approval of the author; particularly as to value considerations, identity of the appraiser/consultant to any professional society or institute or to any designation conferred upon by the appraiser/consultant as stated in his/her qualifications.

8. This report and the values expressed herein represent the opinion of the appraiser/consultant. Further, the appraiser/consultant's fee is in no way contingent upon the reporting of a specified value nor upon any finding or recommendation reported.

9. Sketches, diagrams, graphs, photos, etc., in this report are intended as visual aides and are not done necessarily to scale and should not be construed as engineering information or specifications.

10. This report has been made in conformity with generally acceptable appraisal/evaluation/diagnostic reporting methods and produres and is consistent with practices recommended by the International Society of Arboriculture and the American Society of Consulting Arborists.

11. The appraiser/consultant takes no responsibility for any defects in any tree's structure. No tree described in this report/evaluation has been climbed, unless othewise stated, and, as such, structural defects that could only have been discovered by climbing are not reported. Likewise, a root collar inspection, consisting of excavation of soil around the tree for the purpose of uncovering major root defects/weaknesses, has not been performed, unless otherwise stated.



Site Plan
Harker School
500 Saratoga Avenue
San Jose, CA

Trees Added to HMH Site Plan
Prepared by Michael L. Bench
Consulting Arborist
June 24, 2010

State of California The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI #

PRIMARY RECORD

Trinomial

NRHP Status Code NA

Other Listings _____
Review Code _____ Reviewer _____ Date

Page 1 **of** 27 ***Resource Name or #:** (Assigned by recorder) 480-500 Saratoga Ave, San Jose

P1. Other Identifier:

***P2. Location: Not for Publication** X **Unrestricted**

***a. County** Santa Clara **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** San Jose West **Date** 1980 **T** __; **R** __; __ **3 of** __ **3 of Sec** __; _____ **B.M.**

c. Address 480-500 Saratoga Ave City San Jose Zip 95129

d. UTM: (Give more than one for large and/or linear resources) Zone 10, 590958 mE/ 4130693 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN 303-25-056

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The subject property is a portion of the Harker Academy's 15.9 acre site and is a remnant of the past semi-agricultural residential properties that were spaced apart along Saratoga Avenue from the 1920's-1950's. The integrity of the property is severely diminished by the dominating developments adjacent to the former single-family residence. To the west is the main campus of Harker Elementary and High School, to the east a three story multi-family residential building, and to the north, Saratoga Avenue has been widened to remove the original landscaping of the front yard.

The site consists of two single-story, wood -framed buildings which together comprise a mid-sized single-family residence fronting Saratoga Avenue and a rear out building containing both a garage and attached secondary residential/storage space. The front structure is constructed on an irregular floor plan, sheathed in stucco and distinguished by a flat roof with a projecting flat roofed front porch designed in a regional interpretation of Prairie

(Continued on page 3)

***P3b. Resource Attributes:** (List attributes and codes) HP 2 Single family detached house/ HP 15 Educational Bldg.

P4. Resources Present: X Building Structure Object Site District Element of District Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #) View S Front Façade, 10/25/2010

***P6. Date Constructed/Age and Source:** X Historic Prehistoric Both
Constructed: 1922 Assessor Records

***P7. Owner and Address:**
Harker School Foundation
500 Saratoga Ave.,San Jose 95050

***P8. Recorded by:** (Name, affiliation, and address)
Bonnie Bamburg
Urban Programmers
10710 Ridgeview Avenue
San Jose CA 95127

***P9. Date Recorded:** 10/25/2010

***P10. Survey Type:** (Describe) Intensive

***P11. Report Citation**: (Cite survey report and other sources, or enter "none.") None

***Attachments:** NONE Location Map Continuation Sheet X Building, Structure, and Object Record
Archaeological Record District Record Linear Feature Record Milling Station Record Rock Art Record
Artifact Record X Photograph Record Other (List):

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 6Z

Page 2 **of** 27 ***Resource Name or #** (Assigned by recorder) 480-500 Saratoga Ave. San Jose

B1. **Historic Name**: Wiesendanger Home

B2. **Common Name**: Harker School Building

B3. **Original Use**: residence **B4. Present Use:** vacant

***B5. Architectural Style:** Vernacular Prairie Style

***B6. Construction History:** (Construction date, alterations, and date of alterations)

Constructed c.1922 remodeling c. 1977

B7. Moved? X **No** **Yes** **Unknown** **Date:** _____ **Original Location:**

***B8. Related Features:**

none

B9a. Architect: Unknown b. Builder: Unknown

***B10. Significance: Theme** architecture **Area** San Jose

Period of Significance **Property Type** house **Applicable Criteria** NA (Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The property is not significant to the history or architectural heritage of San Jose because it is not associated with individuals or events of significance. Further the architecture is not an important example of the Prairie Style design and it has been altered with contemporary materials. The property and building are associated with the James Wiesendanger family who had the buildings constructed 1922, and commercial uses, but none of the associations were individually significant in the history of San Jose. The property totaled 23.68 points on the San Jose Historic Evaluation Tally- rating in the category of non-significant.

Historical Development

Prehistoric Period

The first known inhabitants of the Santa Clara Valley were the Tamien tribe, a group of four distinct triblets that occupied different parts of the valley and were part of the Coastal Ohlone language group. Their settlements were established in areas where game, fish, acorns and vegetation (food) and fresh water were available, often along the Guadalupe River and Coyote Creek (Laffey 1992:1).

The Ohlone were decimated in the late 1700's as Spain, attempting to thwart the expansion of Russia and

(Sketch Map with north arrow required.)

See sheet # 18

B11. Additional Resource Attributes: (List attributes and codes) HP 15 Educational Building, HP2 single family house

***B12. References:** City & County public documents,

B13. Remarks:

***B14. Evaluator:** Bonnie Bamburg

***Date of Evaluation:** 11/15/2010

(This space reserved for official comments.)

P3.Description cont

Style architecture. The rear building is constructed on a simple rectangular floor plan also with a similar-designed flat roof. The lot is pie shaped with the largest area along the roadway and narrowing in an easterly direction to the rear. The lot is wedged between the campus of Harker Academy to the south and southeast and a new high-density apartment/condominium development to the north and northeast.

The house itself is constructed on an irregular-shaped rectangular floor plan in a very truncated "L" design with the longest side running parallel to Saratoga Avenue and the shorter rear side projecting eastward into the lot. The residence's most distinctive architectural feature is the front porch with its 4 square-posts supporting a flat roof that mimics the general roof design that characterize both buildings which is of a flat roof with a second flat portion projecting from the eave line. This porch extends to the north forming a *port cochere* over a driveway that continues to the area between the front residence and the back garage building. The dominance of this front porch extending over the drive further emphasizes the horizontal massing of the site which is very characteristic of Prairie Style architecture.

This dominant front porch is the most important design element which characterizes the house's main façade facing west. The porch/*port cochere* projects significantly from the house and comprises about 60% of the frontage along Saratoga Avenue. It is raised 3 concrete steps above the ground. The wooden supports are somewhat distinctive in their design which consists of a thick flat squared wooden base with flat, stacked boards forming a capital that is topped by a short and much smaller mini-column above. These forms are very characteristic of many of the local vernacular Prairie houses found throughout the Santa Clara Valley. The porch is further ornamented by a wide, cross-hatched wooden screen placed along the porch's front wall. Fenestration consists of single and tripartite rectangular shaped horizontally-oriented windows with wooden surrounds. Thin tongue and groove wooden slats sheathe the ceiling of the porch roof. The most interesting aspect of the roof occurs where the porch roof intersects with the main house roof. The flat roof of the house has a similar flat roof piece that juts out perpendicularly and then a second flat roof which forms the cover of the porch parallels the main roof. Each one of these roof forms have the same basic design which is flat with a centered boxed flat section above. The final detail of the front façade is the front door which is a simple, tall single-paneled door with a decorative metallic "sunburst" screen door covering. In addition, small horizontal-shaped metal vents further appear along the raised box section of the roof on all facades.

The south-facing façade is defined by twin rectangular double-hung windows on the western side of the main residence and then a rear enclosed glass porch with 3 double-hung , tall rectangular-shaped windows that are set back in a slight dog-leg. The same flat roof design with its projecting flat eave characterizes all elevations. Two concrete steps lead down from the porch to the ground at this the first of two rear entries.

The rear or east-facing elevation is characterized by a single, small double-hung rectangular-shaped window then paired double hung windows and a second rear door with 4 concrete steps leading down to the ground. Here too an ornamental screen door defines this main rear entry. A final single rectangular window is located north of this door.

The north-facing elevation exhibits the aforementioned large *port cochere* that projects out from the residence. Behind this are more of the characteristic rectangular window forms that define the other facades.

The rear, detached outbuilding is set behind the residence and consists of a single-story stucco- sheathed structure that is constructed on a simple rectangular floor plan with the same flat roof with flat form projecting from the eave line. The middle part of the building contains a single door with two small widows on either side while the south side exhibits the remnant garage space. A second space of old wooden garage doors that have been sealed as part of the converted residential area defines the north side. A badly damaged brick chimney punctuates the north facing elevation of the outbuilding with another door entry immediately to the west. The flat roof is topped by three metal chimney vents with conical caps. A shed roof juts from the rear of the structure.

The parcel itself is defined by a new wooden fence separating the site from the "La Terraza" 3 story apartment/condominium complex next door. A metal fence runs along Saratoga Ave while a cyclone fence separates the site from the rest of the Harker Academy, a private school, to the south. Two big pepper trees shade the lot along with one smaller tree (that appears to be dead) at the rear.

The buildings are in very deteriorating (poor) condition with the front residence being the better maintained. The building was altered for commercial use, prior to being acquired by the school in 2000, and used as a pre-school. Currently it appears to be used by the school as a security station.

The main building is a very modest example of vernacular adaptation of Prairie Style architecture which was prominent in the Bay Area from approximately 1910 to 1935. This house was once a farmhouse when this section of the Santa Clara Valley was primarily orchards. The attribute that is of most interest is the vernacular Prairie Style architecture represented by the prominent porch structure; however it is not carried out as a total design style throughout the building. Within San Jose the Prairie Style is found in many locations with fine examples found in the Rose Garden and Willow Glen neighborhoods. Of the seven aspects of integrity ascribed by the National Register, the property has lost the integrity of feeling and association to the agricultural setting. The other aspects of design, workmanship, and materials are diminished, location is the only aspect not diminished.

B 10: Significance Continued:

England in California, colonized the area enforcing subjugation and introducing European disease as Spain continued exploring and settling the coast for commercial expansion.

The Spanish Period (1777-1822)

Exploration of Alta California brought the Spanish to the San Francisco Bay Area. The initial discovery of the Santa Clara Valley was by Sergeant Jose Ortega of the Portola Expedition in 1769, who chronicled the abundance of timber, rich soil and a native population that could become a work force. It took less than eight years for Mission Santa Clara to be established and a few months longer for the first civil settlement in California, El Pueblo de San Jose de Guadalupe, to be established along the east bank of the Guadalupe River. The river became the boundary between the Roman Catholic Mission and the civil settlement. Although both were expected to provide food and goods to the Presidios of Monterey and San Francisco, their methods were very different. The Mission required the native population as a work force, while the Pueblo was settled by volunteers who were provided limited provisions and operated under a form of civil/military regulations.

In November 1777, Lt. Jose Joaquin Moraga, representing the King of Spain, and 14 families, a total of 66 people, left the Presidio San Francisco to create the first civil settlement in California in the fertile valley of the Guadalupe River. Moraga had the map drawn providing each family with a lot for a house and allocating "suertes" farming plots which could be used but not sold, and surrounding the Pueblo, common lands for grazing.

The settlement was originally located on the Guadalupe River in north San Jose (Taylor Street), but the annual flooding caused the settlers to petition for relocation to the south where they would be on higher ground. The request was granted, allowing the town to relocate about 1791. The new location was at the cross roads from Monterey and Mission Santa Clara with the port of Alviso about one mile north. The town was laid out with the center a plaza and market place where the Road from Monterey entered (Market Street). Creating the town required a system of ditches (acequia) be constructed that would circulate fresh water throughout the town and farm lands. Eventually these were fed throughout the years by constructing a dam on the river. Residential lots and settlement patterns followed the alignment of the acequia.

The route of travel between San Francisco (Yerba Buena) and Monterey essentially follows the El Camino Real (Monterey Road through the south of the county) to Santa Clara Street; The Alameda to Santa Clara. Along this section, willow trees were planted by the Padres to shade travelers. Other modern roads also follow the early trails; Trimble Road connected the Mission Santa Clara with its corn fields (milpas) and to Mission San Jose (established in 1789); Highway 880 (#17) connected the Missions of Santa Clara and Santa Cruz, an old trail that was improved with the labor of Mission Indians.

During the Spanish period, farming produced beans, corn, wheat, hemp, flax, seasonal vegetables and fruit. The basic industry of the area revolved around the crops, milling and hemp/flax thread, candles and soap- the necessities. A poor quality wine and brandy were made from small vineyards and orchard fruit. As the cattle herds grew, hides (leather) and tallow (fat and rendering) became important in the local economy. Surplus food and goods made by the Pueblo were sent to the Presidios or traded with the sailing ships through the ports of Alviso, Monterey, Yerba Buena, and Santa Cruz.

Mexican Period (1822-1846)

Change was brought about by the 1810, civil war in Mexico which relaxed the regulations and destroyed the economy within the Pueblo. With reduced oversight from the Spanish military and reduced Spanish trade, the opportunity for trade with foreign ships through previously guarded ports provided different provisions - tea and coffee as well as manufactured goods. Exposure to different trade and governance systems came from the sailors who decided to jump ship and stay in California.

In 1822 Mexican governmental control replaced Spain's. The two most important and long term changes were the secularizing of Mission lands and, in 1824, the granting of large land holdings (ranchos) to any person who settled an unoccupied tract of land. Within Santa Clara Valley there were 38 land grants issued between 1833 and 1845, 15 of which were within the lands formerly held by the Pueblo (Laffey 1992:2). The ranchos were operated much as small towns, self sufficient in growing food and providing labor for the rancho's fields and industries, which were increasingly related to cattle (hides and tallow). While religion was part of the Rancho life, education was lacking.

Another change was allowing foreigners to settle in California. The first such settler was Antonio Sunol, born in Spain, who arrived on a French ship. An educated man, he opened the first general store and saloon in the Pueblo. He also planted a vineyard and it appears he was the first European to make wine in

Santa Clara Valley selling it as early as 1823 (Arbuckle 1984:175). Soon his education qualified him for postmaster, banker and attorney, and in 1841, he became the Alcade (Mayor). Others followed and in 1841, the first Americans arrived by overland routes. In 1835, approximately 700 residents lived in the Pueblo; 40 were foreign, mostly English or Americans. By 1845, the population had grown to 900; almost 200 were Americans. The Americans were interested in business and transforming the Pueblo with American style commerce. By 1846, when the Americans occupied the State, their numbers were sufficient to take control.

It was during this period in 1841, that the 13,330 acre Quito Rancho was granted to Juan Noriega and his father-in-law, Juan Zenon Fernandez. The Rancho included what is today, Campbell, Saratoga, west San San Jose and Cupertino. It appears the land was used for grazing horses and cattle.

The Early American Period (1846-1869)

This turbulent period was marked by change; the influx of American settlers to the Mexican community; the dramatic change from the established governing systems of Spain, then Mexico to the English/American legal system; and an agrarian economy to the beginning of industry in the local economy. Land ownership was particularly difficult since the Mexican Government had granted large holdings with little documentation of boundaries; the two cultures often disagreed on how to adjudicate differences.

To settle at least some of the issues relating to land ownership, a survey was conducted in 1847 of the Pueblo from Market Street to Eighth Street and Julian south to Reed Street. Those who claimed ownership were given legal title; unclaimed land sold for $50 a city block (Laffey 1992:5). Other surveys followed, some more accurate than others. In 1850, Surveyor Thomas White extended the city limits to Coyote Creek in the east and beyond the Guadalupe River on the west. Surveys were only part of the problem. Americans believed the open lands gained by the Treaty of Hidalgo were public and available. To determine legal title under the American system required the US government to establish the California Lands Commission in 1851; but that process proved lengthy and expensive, with the consequence that land was often forfeited. Within the Pueblo, the area between Market Plaza and the Guadalupe was contested for many years delaying development in this area while ownership was determined.

The gold rush of 1848-49 brought a sudden influx of primarily Americans to California. People needed food and services that were not immediately available. The businessmen of San Jose quickly developed hotels, saloons, theaters, and stores ready to sell whatever the miners needed. So prominent was the City that it was selected the first State Capitol in 1850 and although it lasted only two years, this provided incentive for even more urban development.

Outside the city proper, farms, orchards and vineyards started to fill the Valley. However, the stock of vines and trees did not significantly improve until 1851-53 when Antoine Delmas and then Louis Pellier imported European vines and scions that could be grafted to the hardy mission grape stock. They were followed by Etienne Thee and Charles Le Franc, who by 1857, had formed the Almaden Vineyards.

The College of Notre Dame was founded in 1851 growing from a small wood building to occupy a large campus of classic brick buildings on W. Santa Clara St. between San Pedro and Santa Teresa. The school educated young girls, elementary school through college. A few years later Minns Evening Normal School was established in San Francisco in 1857, after which it moved to San Jose, becoming San Jose Normal School now San Jose State University.

Infrastructure continued to develop to support the population growth. Natural gas was piped to buildings

and street lights in San Jose and Santa Clara in 1861. Five years later, San Jose Water Company incorporated to provide piped water to residents followed closely by the City installing the first sewers. Transportation, using horse drawn carriages, was established between Santa Clara, San Jose and Saratoga-Los Gatos, to be replaced by Samuel Bishop's Street Car line in 1868. This line extended from Santa Clara eventually ending at the Alum Rock Reserve (park) in the east hills.

The educated population attracted printers and newspapers to the area. Politically motivated, the *State Journal* in December 1850, and the *Daily Argus* in 1851, were short lived; however, San Jose would never again be without locally printed newspapers (Arbuckle 1984:397).

A subtle change was occurring in agriculture with a switch from grazing lands to planted grain fields, primarily wheat, filling the valley floor. The economy was changing from cattle-based to wheat and seasonal fresh fruit. Fruit orchards planted by the Mission supplied apples and pears to the miners showing the profit potential that could be made by raising fruit. By the end of 1850, San Jose was home to several professional orchardists and nurserymen including Louis Pellier, who opened City Nursery on the northeast corner of San Pedro and Chaboya Alley in 1850. Just 10 years later, 106,000 fruit trees thrived in the county and 156,000 grape vines; orchards were planted in all directions extending from the City (Arbuckle 1984:155).

This early period ends with the coming of the railroad. The first line was between San Francisco and San Jose opening in 1864, and in 1869, the Central Pacific line started from San Jose to Niles. The transcontinental railroad that connected Santa Clara Valley to the eastern states allowed access for the local agriculture and goods to be sold into the world's markets.

Horticultural Expansion 1870-1918

Grape growing found an instant market in the late 1870s, and into the 1880s because wine was in high demand and fruit that could not be dried, remained a seasonal commodity. "By the end of the 1880's Santa Clara County had 15,000 acres of vine and 478 viticulturists. producing 2,500,000 gallons of wine a year" (Arbuckle 1984:176). Orchards of many varieties of fruit spread in all directions spawning small towns with services and conveniences for the rural families. Berryessa in the east, The Willows in the west, Saratoga and Los Gatos, were all connected by fruit orchards. The most popular fruit was the small French prune imported by Louis and Pierre Pellier, known as the "la Petite Prune d'Agen" a fruit that would lead the agricultural industry in Santa Clara Valley. A fruit in high demand all over the world the prune grew to be a $43,000,000 a-year- industry in California (Arbuckle, 1984:163). Throughout the Horticultural Era and into 1970, when the industry was ending, the prune was grown in ratios of approximately three to one of the next species, apricots (Arbuckle,1984:163). Drying fruit was a relatively natural and low cost process, but it was subject to weather conditions and not suitable for all types of fruit. The abundance of the orchards demanded a new process to preserve the fruit for sale.

Food processing started in France in the 1850's. However, locally it was Dr. James Dawson who invented the process in his home laboratory in 1871. Companies formed to manufacture all types of equipment to support the joint industries; orchard sprayers, food processing machinery, and tractors all were made in San Jose. With superb growing conditions and land for vast orchards, the canning industry grew quickly in San Jose, as did support industries of box, basket, and can factories. Mergers of the smaller or specialized companies led to some of the largest corporations, such as FMC, that started as Bean Pump and Spray Company merging with Anderson –Barngrover, Hull and Cunningham. During the same period, vineyards were also bountiful and Paul Masson, Pierre Mirassou and William Wehner were all producing wines from

grapes grown on the hillsides around the Valley. Food processors, canners and dryers separated to form their own support organizations.

As the economy grew so did urban development, expanding from First Street to Second and, two years after the Chinatown fire of 1887, a new City Hall was constructed in the Plaza, and in 1893, a new Post Office on Market Street. During the 1880's three and four-story bank buildings were constructed on all four corners of Santa Clara and First streets. During this time, business moved south from Santa Clara Street, spurred on by T.S. Montgomery who developed several large city blocks.
As the City expanded so did the infrastructure. By 1881, electricity, was provided by several private companies operating from different locations around the City. In the same year J.J. Owen, owner of the San Jose Mercury was instrumental in having a light tower constructed at the corner of Market and Santa Clara streets. Electric arc lamps that had replaced the gas lamps were replaced in 1912, with incandescent lights on the downtown streets.

Automobiles were first seen in the Valley in the 1890's, with the State's first auto manufacturing, garage and gas station established in San Jose by the turn of the century. The first "garage" was opened by Clarence Letcher in 1900 followed by his first gas station in 1902. The first motor bus line in the state began service from San Jose to Mt. Hamilton in 1910. It was then possible to take the bus to the San Jose Country Club established in 1899, on Alum Rock Avenue.

The first regularly scheduled radio station was started in San Jose in 1909, when Dr. Charles Harold broadcast from his offices at the corner of First and San Fernando streets. In addition to the first commercial broadcast, Harold is credited with opening a college to train radio engineers where he qualified over 1200 students by 1922. He is also credited with more than 50 inventions during his career. Development continued throughout the City. Most of the vacant lots were filled with houses or small commercial buildings during the 1880's. The Hensley property was divided in 1886, as was College Park off The Alameda followed by the subdivision of General Naglee's estate in 1902 and Hanchett Park in 1907. During this period, the City annexed the Gardiner District and the City of East San Jose in 1911, and a year later an unusual annexation was the 100 foot wide strip of land along N. First Street leading to Alviso. Streets that began in the center of the city, extended to connect the rural corners of the Valley. Although they changed names outside the core, the convenience of a connected valley was perfect for the automobile and truck traffic that took hold during this era.

Inter-War Period 1918-1945
Three projects that started in the 1920's and completed by 1939, were particularly important in the development of San Jose. The first was the connection of Bayshore Highway from N. First Street to San Francisco; the second was the formation of the Santa Clara Valley Water Conservation District to alleviate the falling level of ground water; and the third was the selection and development of Moffett Field as a military base, for which San Jose campaigned heavily.

After several years of attempting to block the effects of the Volstead Act in Santa Clara Valley, the winemakers were faced on February 20, 1920 with following the provision of the Eighteenth Amendment

to the U.S. Constitution "prohibiting the sale and manufacture of intoxicating liquors until the conclusion of the present war and thereafter until the termination of demobilization, the date of which shall be determined and proclaimed by the President of the United States. The words "beer, wine, or other intoxicating malt or vinous liquors" in the War Prohibition Act shall be hereafter construed to mean any such beverages which contain one-half of 1 per centum or more of alcohol by volume" (Volstead Act; Title one, 1919). Winemaking was an important part of the local economy in the Santa Clara Valley where 8,000 acres were cultivated with wine grapes. Northern California more known as the wine area was more heavily invested (Sullivan1982:128). Not until 1933 were the effects of the Volstead Act - 1920-1933 - and local laws repealed. Several local wineries had stocked wine and were quick to tool up their old equipment and begin shipping wine made and stored during the dry years. Cribari, Almaden, Paul Masson and others shipped less than 145,000 gallons. The first new winery operation after repeal was constructed in 1937, by Peter Mirassou who held 100 acres in Evergreen. The winery with 130,000 gallon capacity shipped bulk dry wine and champagne, that was considered of better quality than most (Sullivan 1982:144). Peter and his sons Edmund and Norbert continued to improve the quality of local wine and promote the industry. At the conclusion of WWII, California and the Santa Clara Valley were experiencing a wine shortage and more acreage was planted to meet the need. Along with this came a campaign to teach the wine buying public about the quality of Santa Clara Valley and other premium wines. The industry was moving away from sweet wine, cheap white wine, and to the better wines produced locally.

At the same time the vintners were facing a loss of business, the orchards were expanding to supply the growing need for fruit to satisfy the demand for processed, canned and dried fruit. Associations of growers, canners and dryers finally gained stability developing into huge organizations that would distribute Santa Clara Valley's produce throughout the world. World War I was ending when the California Fruit Packers Association (Calpak) was formed, uniting several successful independent companies under one name. In San Jose construction began in 1918 to construct plants along the railroads, often taking over buildings left empty by prohibition. F.W. Wool, Baron-Gray, Richmond-Chase, Calpak – Del Monte, Tri-Valley Growers and Packers, Sunsweet, and Hunt Bros. constructed plants throughout the Valley, in San Jose there were concentrations in the Taylor-Jackson area, The Alameda, along S. 3rd-9th Sts, and in Willow Glen. The food processors were followed by American Can, Continental Can and other secondary manufacturers of containers and machinery. In 1925, there were 6,959 farms, between 1927 and 1930 prune acreage increased to 65,077 acres; apricots to 17,891; pear to 7,308 cherry to 1,906 and plum to 1,560 acres (Arbuckle 1985:163). La petite prune d'Agen, propagated by Louis Pelllier was the fruit that lead the county in percentage of the world consumption and was reported to have been a $43,000,000 a year industry. The food processing industry became the economic engine that encouraged growth in population, housing, social organizations, wealth, and all aspects of the City. However international events leading to WWII had a dramatic effect in the Valley when the Third Reich, at Hitler's direction ceased purchasing dried fruit from California. The resulting glut of fruit in 1933-34 forced several ranches into bankruptcy and others to replant prunes with alternative species. The subject property was one of those that were forced into bankruptcy and foreclosure by Bank of America.

Population continued to increase and the residential development to expand into the orchard areas or infill such as the Vendome Hotel site on N. First Street. Annexation continued to extend the City

boundaries; Palm Haven in 1922, and the Stockton and White districts in 1924. Willow Glen incorporated in 1927 and annexed to San Jose in 1936. Further outside the City, the east hills were subdivided for homes and the first airport was constructed at 1919 Alum Rock Road. The first municipal airport was established as the Garden City Airport in 1934 and moved to Tully Road in1939 by Cecil and Robert Reid who renamed it Reid Hillview Airport (Laffey 1992:9).

Part of the population and job growth was from those who had served in the military and came to attend college in the Valley using the G.I. Bill to help pay expenses. At Stanford University, Dr. Frederick Terman, a gifted professor had an exceptional class and was already seeing some of his students venture into what would become the next economic wave; electronics, and high technology. Students David Packard and Bill Hewlett invented test equipment in 1939, and obtained government contracts to continue their work during the war years. In 1945, they were well positioned to lead those who formed or worked for companies that were the foundation of Silicon Valley - Varian Sylvania, Philco-Ford, GE and Lockheed.

Industrialization and Urbanization 1945-1991

During WWII social changes occurred. Women who became part of the war-effort work force were then less content to stay at home. Able to work outside the home or to volunteer these women made it very desirable to have two cars in each family. This was not lost on the home builders who included a two car garage with most homes after 1945. With more automobiles available, commercial centers were no longer tied to the bus or street car line; thus they spread out along all the major roads. At the same time, changes in building safety codes required additional exiting and other modifications to second floor spaces primarily in the downtown. Without the guarantee of higher rents, many owners did not correct the deficiencies so the upper story spaces became vacant.

After WWII, the population of San Jose rose dramatically. City leaders launched campaigns to attract non-agricultural industries and house building led construction in the Valley. The post-war community of 95,000 in 1950 became the urban hub of 500,000 by 1975, while the area of the City grew from 17 square miles to 120 square miles as land annexed for housing tracts, commercial centers and industrial complexes replaced orchards.

All roads seemed to lead out of the historic downtown. Valley Fair at Stevens Creek and Winchester boulevards, offered a new shopping experience - a mall with free parking and a variety of stores, (I Magnin, Joseph Magnin, Macys, and the Emporium, stores previously only in San Francisco). In 1957, the new City Hall constructed with modern manufactured materials, signaling the progressive City, was located at N. First and Mission Streets, far north of the downtown. Hotels in the downtown, once the heart of the social set, became subsidized housing for older, often destitute people. Even the San Jose Mercury and San Jose Evening News, San Jose's only daily newspapers moved from W. Santa Clara Street to a new facility on Ridder Park Drive out of the downtown. Soon the downtown became isolated as shops either went out of business or moved to outlying centers and there was little to attract people to come into the City's core. During the 1950's and early 1960's federal funds were available for urban renewal to demolish obsolete or blighted buildings and San Jose's leaders, believing that a cleared parcel

of land was more attractive to new development, received many awards for this work. Asphalt soon covered the vacant lots where three and four story buildings had once stood, almost 30% of the downtown was paved.

The train ran between San Jose and San Francisco exactly has it had since 1909, and the Southern Pacific sponsored bus line dropped the SP and became the Greyhound Line, moving to a larger bus terminal on Notre Dame Avenue. Light industrial development appeared just outside the core where the opportunity for less expensive land allowed service, repair, warehouse and distribution of services related to the remaining businesses.

Outside of the City, General Electric Company opened a new facility at Curtner and Monterey Road in 1948, IBM on Cottle Road in 1953, and Ac'cent on Monterey Road in 1946. Lockheed was also renting space and looking for a place to construct a facility (eventually in Mt. View). Major reconstruction of the schools in San Jose began in the late 1950's when, with the intent to protect children, the State made bond funds available to local school districts if their schools were evaluated by structural engineers and found to be seismically inadequate. Many schools were determined to be structurally unsafe and were demolished, replaced with new buildings or new facilities which were deemed to be more economical to maintain and located in areas where the population was growing. A few years later, hospitals found the same state mandates and were either rebuilt or extensively remodeled.

By the end of the 1970's Park Center Plaza, a new library and the Center for the Performing Arts were constructed on the west side of the downtown. In the center, next to St. James Park the Scottish Rite Temple on N. 3rd became the San Jose Athletic Club and the old Post Office (formerly library) became the San Jose Museum of Art. Other than reusing some historic buildings, there was little new development in the core area.

Surrounding the growing city, agricultural use remained predominate, with most of the land outside the City borders in Santa Clara County. Villages developed on transit corridors, generally about five miles from the downtown providing the sense of a district or community - a town center, with a school and often a post office. Replacing the orchards with residential tracts accelerated in the decades of the 1950's and 1960's as large acreages were annexed to San Jose. The new housing was constructed in suburban style tracts, all with a forward facing double or triple garage to showcase the family cars.
As the City embraced the new, ever expanding high technology, the price of industrial waste was beginning to be understood. Still, the general tenure through the 1980's was one of optimism and progress.

Historical Context within the Inter-War Period, relative to the subject property:

During the Inter-War Period 1918-1945 , fruit ranches, continued to be planted on land that had previously been used for grazing . Throughout the Santa Clara Valley, orchards produced the fruit that became the resource to an expanding fruit processing industry, an industry that would see the Santa Clara Valley producing 25% of the world's prunes by the 1930's (Laffy, G.A.: 1992). Through the Inter-War

Period 1918-1945, agriculture remained the most important industry of the Valley with some ranches continuing into the era that would show great disparity between agriculture and the rising value of technology after WWII, when residential and industrial development expanded into the agricultural lands leading to the Era of Industrialization and Urbanization 1945-1991. Thus the origins are within the context of the "Inter-War Period 1918-1945", and extend into the Industrialization and "Urbanization Period 1945-1991", a time when many immigrant families in the Santa Clara Valley found that agriculture was the key to their new life. Of the many families who followed this pattern, some encountered disaster during the Great Depression and the loss of European prune markets at the beginning of WWII. It appears the fruit trees on the subject property were apricots and cherries and not prunes, although all ranchers suffered during the Depression.

480 Saratoga Avenue:

The buildings on the subject property were developed in the 1920'sduring the Inter-War Era 1919-1945, in San Jose. During this period the City of San Jose was experiencing both population growth and the end of the domination of the fruit processing industry. Agriculture turned toward green houses, cold storage and ice manufactures to maintain fresh produce, leading into the development of frozen strawberries and other produce. As the automobile gained acceptance road-side fruit stands were common in the Santa Clara Valley.[1] The themes of architecture and agriculture were primary in the evaluation of the subject property.

During the Spanish period the land was likely used for grazing, however there is no indication that structures were constructed on this particular parcel. When control moved to Mexican rule in 1822, the property was petitioned and became the 13,330 acre Rancho Quito, granted by Governor Juan Alverado to Jose Noriega and his father-in-law, Jose Zenon Fernandez, in 1841. Noriega, who had been the Alcade (Mayor) for San Jose in 1839, sold his interest to Jose Alviso in 1844. Fernandez, a teacher in San Jose from 1836-1840, left his section to his children and went on to acquire and sell several other grants. With secession in 1848, the land grant was patented to Alviso and the heirs of Jose Noriega and Jose Zenon Fernandez. Typical of many land grants, by the time ownership was determined, sections had been occupied by farmers who thought it public land. Settlement of these claims often took years.

The property was purchased by Francis Smith, orchardist, prior to 1900. During the time that it was owned by Smith, there were no recorded improvements on the subject parcel. The subject parcel was part of lots 11 and 12 of the Subdivision of the Francis Smith Tract in the Quito Rancho, recorded June 20, 1896 in Book "I" of Maps, page 81. The subject parcel was part of a subdivision surveyed and recorded on May 3, 1922 by Charles Harrmann of Harrmann Bros. Surveyors and Civil Engineers. On May 16, 1922, the subject parcel was part of a 10.24 acre plot sold without improvements to J.E. and Matilda J. Wiesendanger.[2] The Wiesendanger family had lived on Campbell Avenue in 1910, when the U.S. Census

[1] Laffey, G.A, Historic Themes for the City of San Jose
[2] Deed J.E. and Matilda I Wiesendanger

listed James Edwin as working on a fruit ranch. In the 1920 U.S. Census the family is listed as living on the subject property, but may not have had recorded ownership. When the subject property was purchased, the family consisted of James E. and D. Matilda and children, Delphi 23, Alicia 20, Mable18, and William 16. After five years, the family moved to Saratoga[3] and the 10 acre parcel containing the existing house, garage and out buildings, was sold to A.E. and Lillian Rae,[4] The Rae's continued working the orchards and living on the property until 1953. During this period there is no information that the Rae's operated a road-side fruit stand, and there is no existing shed or evidence that they had a fruit stand before Saratoga Avenue was widened from two lanes, one in each direction, to the existing alignment. The property was sold to James W. Wayne, an individual acting as a trustee for a family trust on, August 5, 1953. During the City of San Jose's extensive expansion era in the 1950's, the parcel was annexed as part of Boynton No.12, on June 26, 1958. With commercial development extended along Saratoga Avenue and west from Stevens Creek Blvd, the James and Linda Wayne Family Partnership converted the residential building to commercial use and subdivided the 10.24 acre parcel, selling the subject commercial parcel APN 303-25-004 to Hans Paul and Maury Hager February 27, 1989. By that time the building had been zoned C-1 and for many years had been used commercially as shown on permits filed with the City of San Jose on June 3, 1977 to repair water and termite damage that indicate the commercial use was already established.[5] The permit included removal of stucco and repair of studs and electric work on the North, West and South sides. Additional permits have been issued for repairs and code compliance that further removed historic materials and added contemporary ones. Another subdivision of the parcel created the adjacent parcel where the La Terrazo Apartment building was developed and established the subject parcel APN 303-25-056. The Harker School Foundation purchased the property from Hans and Maury Hager on November 02, 2000.[6] Since that time the buildings have been remodeled and used for educational purposes.

EVALUATION OF SIGNIFICANCE

The property was evaluated using the criteria of the City of San Jose Historic Preservation Ordinance; the California Register of Historic Resources, and the National Register of Historic Places. The property is evaluated within the historical context of the later years of the Inter-War Era 1919-1945 when the existing buildings were constructed,c.1922.

Summary: Evaluated as a unit, the property does not retain integrity of the primary period of significance 1922-1958, when the parcel was part of a 10.24 acre fruit ranch, and there was a front set-back and agricultural out-building associated with the house. If one considers the house as an individual resource, the architecture and associations do not achieve significance under any of the criteria established by the

[3] Voter Registration, Santa Clara County 1930-1942

[4] Deed J.E. and Matilda I. Weisendanger to A. M. and Lillian Rae; May 16, 1922 Recorded May 18, 1922 Book 554 of Deeds, page 137

[5] City of San Jose Building Permit #03477, June 3, 1977

[6] Deed: Hans P & Maury Hager to Harker School Foundation, Doc. # 15443690

City of San Jose, the California Register of Historic Resources or the National Register of Historic Places.

San Jose Historic Landmark

The San Jose Historic Preservation Ordinance #17927, as amended, contains the criteria that were used to evaluate the property and building. The criteria are as follows.

Historical, Architectural, Cultural, Aesthetic or Engineering Interest or Value of an Historical Nature is defined as, "historical, architectural, cultural, aesthetic, or engineering interest or value of an historical nature" shall mean a quality that derives from, is based upon, or related to any of the following factors:

1. Identification or association with persons, eras or events that have contributed to local, regional, state or national history, heritage or culture in a distinctive, significant or important way;

2. Identification as, or association with, a distinctive, significant or important work or vestige:

a. Of an architectural style, design or method of construction;
b. Of a master architect, builder, artist or craftsman;
c. Of high artistic merit;
d. The totality of which comprises a distinctive, significant or important work or vestige whose component parts may lack the same attributes;
e. That has yielded or is substantially likely to yield information of value about history, architecture, engineering, culture or aesthetics, or that provides for existing and future generations an example of the physical surroundings in which past generations lived or worked; or
f. That the construction materials or engineering methods used in the proposed landmark are unusual or significant or uniquely effective.

San Jose Historic Landmarks Commission's Evaluation for Significance establishes the following levels of significance:

33 and above Evaluate for City Landmark
32-0 Non-significant

Evaluation of Significance under San Jose Landmark Criteria:

Criteria #1. Identification or association with persons, eras or events that have contributed to local, regional, state or national history, heritage or culture in a distinctive, significant or important way;

The subject property is associated with the Inter-war Era and small fruit ranch operations. However, the association is typical of many such properties in Santa Clara County during the second and third quarter of the past century. The families associated with the property were not found to have individually contributed to San Jose's history, heritage or culture in a distinctive,

significant or important way.

Criteria #2. Identification as, or association with, a distinctive, significant or important work or vestige:

Criteria #2 (a) Of an architectural style, design or method of construction;

The buildings are not significant architecture or of unusual, artistic or high quality vernacular design or construction. Much finer examples of the Prairie Style architecture exist in San Jose.

Criteria #2 (b) Of a master architect, builder, artist or craftsman;

The buildings were not found to be the work of a master architect, builder or artesian.

Criteria #2 (c) Of high artistic merit

The buildings are not of high artistic merit.

Criteria # 2 (d). The totality of which comprises a distinctive, significant or important work or vestige whose component parts may lack the same attributes

The property is typical of many former ranch parcels in the west San Jose area of Santa Clara County. It is composed of one former house and remodeled garage. The current setting and remodeled buildings do not provide a sense of how a fruit ranch would have operated.

Criteria #2 (e) That has yielded or is substantially likely to yield information of value about history, architecture, engineering, culture or aesthetics, or that provides for existing and future generations an example of the physical surroundings in which past generations lived or worked

The site is adjacent to Saratoga Avenue, a major city street that has been widened taking several feet of the subject property, and Interstate highway 280. The previous excavation and development surrounding this parcel give it a very low probability for containing important prehistoric material.

Criteria #2 (f) That the construction materials or engineering methods used in the proposed landmark are unusual or significant or uniquely effective.

The buildings are common wood frame with stucco covering and are not examples of significant or uniquely effective materials or methods of construction.

The property and buildings was rated at 23.86 points, within the category that is considered non-

significant. The Tally sheet is attached to this document

California Register of Historic Resources- Eligibility

The criteria for listing historical resources in the California Register are consistent with those developed by the National Park Service for listing resources in the National Register of Historic Places, but have been modified for state use in order to include a range of historical resources which better reflect the history of California. An historical resource must be significant at the local, state or national level under one or more of the following four criteria;

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
2. It is associated with the lives of persons important to local, California, or national history;
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or is likely to yield, information important to the prehistory or history of the local area, California, or the nations.

In addition, the resource must retain enough of its historic character or appearance to be recognizable as a historic property, and to convey the reason for its significance.
Architectural and historic integrity are determined by the presence of seven attributes, location, design, setting, materials, workmanship, feeling and association which together form the ability of a property to convey its significance (National Register Bulletin – How to Apply the National Register Criteria for Evaluation; page 44-47). The California Register of Historic Resources defines the threshold for integrity if the property meets some of the aspects. The site retains the aspect of location, all other aspects are diminished by the changes that have occurred to the setting and remodeling of the buildings. Therefore the aspects of design, materials, workmanship setting and feeling are not represented in the property . Because the property meets the threshold of retaining some of the elements of integrity, the site was evaluated under the criteria the California Register for Historic Resources.

California Register of Historic Resources Evaluation:

It is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.

The property is associated with the J.B. and Matilda J. Wiesendanger Family that was part of, although a very small and not a significant contributor to, the agricultural economy of the Santa Clara Valley during the 1920's. Like many others it appears they sold fruit to brokers and at local outlets.

It is associated with the lives of persons important to local, California, or national history;

There is no evidence that persons who lived in the house were involved in significant historical developments in San Jose, California or the nation.

It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values;

The house (primary building on the property) is a modest vernacular version of the Prairie Style.

Although the style was not extremely popular in San Jose there are several fine examples in other areas of the City that retain their settings and exhibit artistic architecture. This building does not possess high artistic values.

It has yielded, or is likely to yield, information important to the prehistory or history of the local area, California, or the nations.

The site has a very low probability to yield information important to the prehistory or history due to extensive development and construction in close proximity that has not produced important materials.

The property does not meet the criteria of the California Register of Historic Resources.

National Register of Historic Places

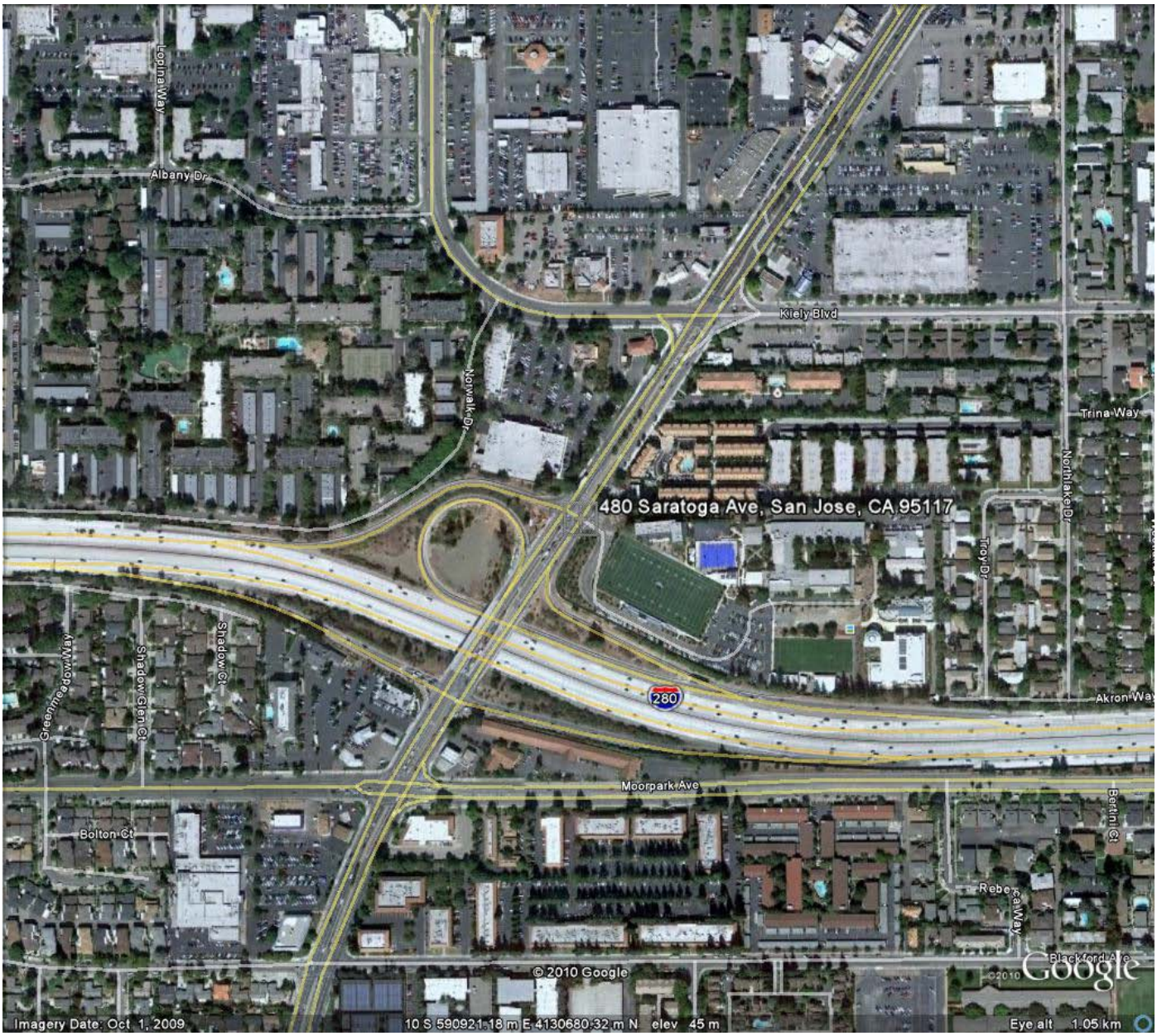
The criteria and standards of the National Register of Historic Places are similar to those of the California Register of Historic Resources, however they are more demanding requiring that a property posses most if not all aspects of integrity. The subject property does not meet that standard. Property that is not eligible for listing in the California Register is not eligible for listing in the National Register of Historic Places.

PROPOSED ACTION AND CEQA STATUS

The property has been proposed for inclusion in a master plan developed for the Harker Academy. PDC 10-917 describes a Planned Development Zoning for a private school Master Plan to demolish existing buildings and approve 316,400 gross square feet of new construction on a 15.9 gross acre site.

The Master Plan proposes to demolish the existing buildings as part of the expanded educational campus. The Planned Development Zoning is subject to the requirements of the California Environmental Quality Act (CEQA). CEQA defines a historic resource to be one that is eligible for listing in the California Register of Historic Resources, the National Register of Historic Places or certain California Historic Landmarks. Property that is not eligible for listing in either register is not considered a significant historic resource under CEQA. The alteration or removal of non-significant buildings does not require mitigation to achieve a level of less than significant impact.

Sketch Map- location of the subject parperty.



Source: Google Earth Pro

B 12: Sources Consulted:

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Photographs: All photographs were taken on November 12, 2010 :

Photograph # 1 Front (north) façade

Photograph #2 Former house, west façade

Photograph # 3 Former house, east façade

Photograph # 4 Rear (south) façade

Photograph #5 Secondary building, apartment & garage (east side)

Photograph # 6 Secondary building (south side)

Photograph # 7 Secondary building,(north side) Two story buildings are apartments on the adjacent parcel.

HISTORIC EVALUATION SHEET

HISTORIC RESOURCE NAME:
HISTORIC RESOURCE ADDRESS: 480 Saratoga Ave

A. VISUAL QUALIFICATIONS

1	EXTERIOR The site composition is undistinguished	E	VG	G	FP
2	STYLE Vernacular with Prairie style elements	E	VG	G	FP
3	DESIGNER unknown	E	VG	G	FP
4	CONSTRUCTION common materials- wood frame	E	VG	G	FP
5	SUPPORTIVE ELEMENTS Pepper and redwood trees	E	VG	G	FP

B. HISTORY/ASSOCIATION

6	PERSON/ORGANIZATION none of significance	E	VG	G	FP
7	EVENT none of significance	E	VG	G	FP
8	PATTERNS agricultural subdivision/ change in use to commercial	E	VG	G	FP
9	AGE c. 1922	E	VG	G	FP

C. ENVIRONMENTAL/CONTEXT

10	CONTINUITY not in an area of importance	E	VG	G	FP
11	SETTING not compatible with the transitioning style of the area	E	VG	G	FP
12	FAMILIARITY familiar to motorists on Saratoga Ave	E	VG	G	FP

D. INTEGRITY

13	CONDITION exhibits surface wear and wood deterioration	E	VG	G	FP
14	EXTERIOR ALTERATIONS alterations do not change overall character	E	VG	G	FP
15	STRUCTURAL REMOVALS unknown	E	VG	G	FP
16	SITE appears to be the original site	E	VG	G	FP

E. REVERSIBILITY

17	EXTERIOR structure is changed to accommodate commercial use	E	VG	G	FP

F. ADDITIONAL CONSIDERATIONS/BONUS POINTS

18	INTERIOR VISUAL	E	VG	G	FP
19	INTERIOR HISTORY	E	VG	G	FP
20	INTERIOR ALTERATIONS	E	VG	G	FP
21	INTERIOR REVERSIBILITY	E	VG	G	FP
22	NATIONAL OR CALIFORNIA REGISTER	E	VG	G	FP

REVIEWED BY: Bonnie Bamburg DATE:10/22/2010

EVALUATION TALLY SHEET
(PART 1)

HISTORIC RESOURCE ADDRESS: 480 Saratoga Ave

			E	VG	G	FP	
A		VISUAL QUALITY/DESIGN					
	1	EXTERIOR	16	12	6	0	0
	2	STYLE	10	8	4	0	4
	3	DESIGNER	6	4	2	0	0
	4	CONSTRUCTION	10	8	4	0	0
	5	SUPPORTIVE ELEMENTS	8	6	3	0	3
					Subtotal:		7
B.		HISTORY/ASSOCIATION					
	6	PERSON/ORGANIZATION	20	15	7	0	0
	7	EVENT	20	15	7	0	0
	8	PATTERNS	12	9	5	0	5
	9	AGE	8	6	3	0	3
					Subtotal:		8
C.		ENVIRONMENTAL/ CONTEXT					
	10	CONTINUITY	8	6	3	0	0
	11	SETTING	6	4	2	0	0
	12	FAMILIARITY	10	8	4	0	8
					SUBTOTAL:		8

A & C SUBTOTAL:	15
B SUBTOTAL:	8
PRELIMINARY TOTAL: (sum of A. B. & C.)	23

EVALUATION TALLY SHEET
(PART II)

HISTORIC RESOURCE ADDRESS: 480 Saratoga Ave

		E	VG	G	FP					
D.	INTEGRITY									
	13 CONDITION		0.03	0.05	0.1	23	X	0.05	=	1.15
		SUBTOTAL A,B&C								
	14 EXTERIOR ALTERATIONS		0.05	0.1	0.2	15	X	0.05	=	0.75
		SUBTOTAL A&C								
			0.03	0.05	0.1	8	X	0.03	=	0.24
		FROM B								
	15 STRUCTURAL REMOVALS		0.2	0.3	0.4	15	X	0	=	0
		SUBTOTAL: A & C								
			0.1	0.2	0.4	8	X	0	=	0
		FROM B								
	16 SITE		0.1	0.2	0.4	8	X	0	=	0
		FROM B								
		INTEGRITY DEDUCTIONS SUBTOTAL								2.14
		ADJUSTED SUBTOTAL: (Preliminary Total minus Integrity Deductions)				23	-	2.14		20.86
		VALUE								
E	REVERSIBILITY	E	VG	G	FP					
	17 EXTERIOR	3	3	2	2					3
				Total:		3				
F.	ADDITIONAL CONSIDERATIONS BONUS POINTS									
	18 INTERIOR HISTORY ASSOCIATION	3	3	1	0	0				
	19 INTERIOR VISUAL QUALITY	3	3	1	0	0				
	20 INTERIOR ALTERATIONS	4	4	3	1	0				
	21 INTERIOR REVERSIBILITY	4	4	2	0	0				
	22 NATIONAL OR CALIFORNIA REGISTER	20	15	10	0	0				
		BONUS POINTS SUBTOTAL:								0
		ADJUSTED TOTAL:								23.86

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NOISE ASSESSMENT STUDY FOR THE HARKER SENIOR HIGH SCHOOL SARATOGA AVENUE, SAN JOSE

Prepared for
The Harker School
San Jose, CA

Prepared by
Jeffrey K. Pack

August 18, 2010
Project No. 42-021

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LIST OF TABLES AND FIGURES

EXECUTIVE SUMMARY

This report presents the results of a noise assessment study for the Master Plan for the Harker Senior High School remodel at 500 Saratoga Avenue in San Jose, as shown on the Site Plan, Ref. (a). The noise exposures and noise levels presented herein were evaluated against the standards of the City of San Jose Noise Element, Ref. (b), the City of San Jose Zoning Ordinance, Ref. (c) and the American National Standards Institute (ANSI) S12.60 standards for classroom interiors, Ref. (d). This study analyzes the noise impacts from Interstate 280 traffic sources to the Performing Arts building, the Student Union building and the Classroom Wing behind the planned Gymnasium as these structures have not yet been built. In addition, this study analyzes potential noise impacts from the Gymnasium and Multi-Purpose Field to the adjacent residential receptors to the north and east. Building shell plans are not available at the time of this study. Thus, precise noise levels at the interiors of the buildings from exterior sources and noise emission levels from the interiors to the residences cannot be calculated. The results of the analysis reveal that noise excesses may occur in the Performing Arts building from I-280 traffic and noise from the Gymnasium may be excessive at the La Terraza Apartments, assuming standard building construction. Noise from the multi-purpose field will exceed the limits of the Zoning Ordinance but will be within the limits of the Noise Element at the La Terraza Apartments and at the Troy Drive duplex residences adjacent to the east.

Mitigation measures will be required for compliance with the City of San Jose Zoning Ordinance standards. Mitigation measures may also be required for the Performing Arts building for compliance with the ANSI standards.

I. Background Information on Acoustics

Noise is defined as unwanted sound. Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dB) with 0 dB corresponding roughly to the threshold of hearing. Environmental noise is measured and reported using the "A-weighting" network, notated as "dBA". A-weighting filters out very low and very high frequencies similar to the frequency response of the human ear. All sound levels used in this report are A-weighted unless otherwise noted. Table I, below, shows the typical human response and noise sources for A-weighted noise levels.

TABLE I

The A-Weighted Decibel Scale, Human Response, and Common Noise Sources

Noise Level, dBA	Human Response	Noise Source
120-150+	Painfully Loud	Sonic Boom (140 dBA)
100-120	Physical Discomfort	Discotheque (115 dBA) Motorcycle at 20 ft. (110 dBA) Power Mower (100 dBA)
70-100	Annoying	Diesel Pump at 100 ft. (95 dBA) Freight Train at 50 ft. (90 dBA) Food Blender (90 dBA) Jet Plane at 1000 ft. (85 dBA) Freeway at 50 ft. (80 dBA)
50-70	Intrusive	Average Traffic at 100 ft. (70 dBA) Vacuum Cleaner (70 dBA) Typewriter (65 dBA)
0-50	Quiet	Normal Conversation (50 dBA) Refrigerator (45 dBA) Whispering (35 dBA) Leaves Rustling (10 dBA) Threshold of Hearing (0 dBA)

Although the A-weighted noise level may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from distant sources that create a relatively steady background noise from which no particular source is identifiable. To describe the time-varying character of environmental noise, the statistical noise descriptors, L_1, L_{10}, L_{50} and L_{90} are commonly used. They are the A-weighted noise levels exceeded during 1%, 10%, 50% and 90% of a stated time period. The continuous equivalent-energy level (L_{eq}) is that level of a steady state noise which has the same sound energy as a time varying noise. It is often considered the average noise level and is used to calculate the DNL and CNEL described below.

In determining the daily level of environmental noise, it is important to account for the difference in response of people to daytime and nighttime noises. During the nighttime, exterior background noises are generally lower than the daytime levels. However, most household noise also decreases at night and exterior noise becomes very noticeable. Further, most people sleep at night and are very sensitive to noise intrusion. To account for human sensitivity to nighttime noise levels, the Day-Night Level (DNL) noise descriptor was developed. The DNL is also called the L_{dn}. Either is acceptable, however, DNL is more popular worldwide. The DNL divides the 24-hour day into the daytime period of 7:00 a.m. to 10:00 p.m. and the nighttime period of 10:00 p.m. to 7:00 a.m. The nighttime noise levels are penalized by 10 dB to account for the greater sensitivity to noise at night. The Community Noise Equivalent Level (CNEL) is another 24-hour average which includes both an evening (7:00 p.m. - 10:00 p.m.) and a nighttime penalty. The proper notations for the Day-Night Level and the Community Noise Equivalent Level are dB DNL and dB CNEL, respectively, as they can only be calculated using A-weighted decibels. It is, therefore, considered redundant to notate dBA DNL or dBA CNEL.

The effects of noise on people can be listed in three general categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning, relaxing;
- physiological effects such as startling, hearing loss.

The levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants, airports, etc., can experience noise in the last category. Unfortunately, there is, as yet, no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily due to the wide variation in individual thresholds of annoyance and differing individual past experiences with noise.

Thus, an important way to determine a person's subjective reaction to a new noise is to compare it to the existing environment to which one has adapted, i.e., the "ambient". In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by the hearers.

With regard to increases in A-weighted noise level, knowledge of the following relationships will be helpful in understanding this report.

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a just-perceptible difference.
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected.
- A 10 dB change is subjectively heard as approximately a doubling in loudness, and would almost certainly cause an adverse change in community response.

The adding or subtracting of sound levels is not simply arithmetic. The sound levels, in decibels, must be converted to Bels, the anti-logarithms of which are then calculated. The manipulation is then performed (arithmetic addition or subtraction), the logarithm of the sum or difference is calculated, the final number is then multiplied by 10 to convert Bels to decibels. The formula for adding decibels is as follows:

$$\text{Sum} = 10\log(10^{SL/10} + 10^{SL/10})$$ where, SL is the Sound Level in decibels.

For example, 60 dB + 60 dB = 63 dB, and 60 dB + 50 dB = 60 dB. Two sound sources of the same level are barely noisier than just one of the sources by itself. When one source is 10 dB higher than the other, the less noisy source does not add to the noisier source.

II. Acoustical Setting

A. Noise Standards

The noise exposures at the new Quad were evaluated against the standards of the City of San Jose Noise Element, which limits noise at exterior noise sensitive spaces to 60 decibels (dB) DNL from transportation related noise sources.

The City of San Jose does not have noise standards applicable to the interiors of school buildings from off site noise sources, such as freeway traffic. Therefore, noise impacts to the project (classroom interiors) were evaluated against the standards of the American National Standards Institute S12.60, which specifies a limit of 35 dBA for background noise. ANSI does not specify limits for theater interiors. Because of the noise sensitivity of the theater, we recommend a background noise limit of 25 dBA, which is common for noise critical spaces. Higher noise level design criteria for the Theater may result in audible traffic noise events, such as loud trucks or motorcycles or emergency vehicle sirens, and may be disruptive during quiet musical passages or soliloquies.

The project-generated noise exposures created by gymnasium and multi-purpose field activities were evaluated against the standards of the City of San Jose Noise Element, which utilizes the Day-Night Level (DNL) noise descriptor and specifies a limit of 55 decibels (dB) DNL for residential land uses impacted by non-transportation related sources such as school related activities.

The project-generated short-term maximum noise levels created by gymnasium activities and multi-purpose field activities were also evaluated against the standards of the City of San Jose Zoning Ordinance, which limits instantaneous noise from these sources to 55 dBA. Note that the Zoning Ordinance limits are rather stringent for the area due to the background sound levels. The Zoning Ordinance, as enforced by the City, may provide adjustments to the limit to account for existing background noise, time of occurrence, duration of the source or the environment in general. Therefore, a subjective evaluation of excessive sources should be made by the City to determine if a given noise source would be objectionable and cause undue annoyance to the neighboring receptors.

B. Site, Traffic and Project Description

The proposed project site is located at the existing Harker School at 500 Saratoga Avenue at Interstate 280 in San Jose. The site is relatively flat and at-grade with Saratoga Avenue and approximately at-grade with I-280 near the easterly end of the site, however, I-280 descends as it crosses under Saratoga Avenue at the west end of the site. Surrounding land uses include I-280 adjacent to the south, Saratoga Avenue adjacent to the west, the La Terraza two-story apartment complex adjacent to the north and two-story duplex (over/under) units adjacent to the east along Troy Drive. There is a 13 ft. high noise control barrier along the full length of the I-280 property line contiguous with the site. Standard wood fencing is along the north and east property lines.

The noise environment (from off-site sources) at the site is created primarily by traffic sources in I-280 with a minor influence from traffic sources on Saratoga Avenue along the westerly boundary. Saratoga Avenue traffic does not impact the school site as the school uses closest to Saratoga Avenue are the football field and Shaw Hall, both of which are setback significantly from the roadway. I-280 generates significant levels of traffic noise and carries an Average Daily Traffic (ADT) volume of 204,000 vehicles. For future year 2028, the I-280 traffic volume is estimated to increase to 212,242 vehicles ADT. This future increase in traffic volume yields a negligible increase in the traffic noise levels.

The present phase of the Master Plan includes the construction of a Entry Plaza and Visitor Parking area, a Performing Arts building with a Theater, a new Quad, a Student Union building which will house the Library, a Multi-Purpose Field, a Gymnasium and a new classroom wing. The enrollment of the school is not expected to change from the existing enrollment. A portion of the Master Plan has already been completed and is considered existing uses, which include the football stadium, Dobbins Hall (classrooms), Nichols Hall (science building), Aquatic Center, Shaw Hall and parking.

School starts at 7:45 a.m. with staff arriving at 7:00 a.m. Most students leave at 5:00 p.m. with some leaving as early as 3:45 p.m. One hundred staff and 130 student vehicles enter the campus each day. An additional 350 (approx.) parent vehicles arrive in the morning to drop students off and pick them up between 5:00 - 5:30 p.m. Approximately 100 staff vehicles and 50-100 parent vehicles utilize the northern driveway during drop-off and pick-up, as reported by Harker School, Ref. (e).

III. Noise Impacts to the Project

Table II on the following page provides the results of the analysis of noise impacts to the project from traffic sources on I-280. Traffic noise from Saratoga Avenue does not impact the project buildings or exterior areas. The future traffic volume for I-280 is expected to increase slightly over the next twenty years resulting in a less than 1 decibel increase in the traffic noise levels. Thus, the noise exposures and noise levels shown below represent the noise environment for both existing and future traffic conditions.

Shown in the Table are the most impacted receptor locations for each building or area, the exterior DNL (24-hour average), the noise exposures excesses (as applicable), the exterior L_{eq} (hourly average), the interior L_{eq} and the interior noise level excesses. The analysis includes the effect of the I-280 soundwall. Thus, the upper floor elevations at the Performing Arts Building are not shielded. However, due to the increased setback of the Student Union building, Gymnasium and Classroom Wing, the upper floors of these buildings realize some level of noise shielding.

TABLE II						
Noise Impacts to the Harker School						
Receptor	Dist. To I-280 C_L	Exterior DNL	Noise Exposure Excess	Exterior L_{eq}	Interior L_{eq}	Noise Level Excess
Performing Arts Bldg.	168					
Theater Upper Floor		74	Na	71	41	16
Other Rms Upper Floor		74	Na	71	41	6
Theater First Floor		65	Na	62	32	7
Other Rms First Floor		65	Na	62	32	None
Gymnasium	468					
Second Fl.		62	Na	59	29	None
First Fl.		60	Na	57	27	None
Student Union	380					
Fourth Fl.		57	Na	54	24	None
Third Fl.		57	Na	54	24	None
Second Fl.		57	Na	54	24	None
First Fl.		56	Na	53	23	None
Classroom Wing	578					
Third Fl.		60	Na	57	24	None
Second Fl.		60	Na	57	24	None
First Fl.		59	Na	56	23	None
Quad	430	52-57	None	na	Na	Na

As shown in Table II, the exterior noise exposures at the Quad area will be within the limits of the City of San Jose Noise Element standards. The interior noise levels in the classrooms and student union will be within the limits of the ANSI standards.

Interior noise levels excess will occur in the Performing Arts Building. Mitigation measures will be required for upper floor classrooms of the building and in the Theater for compliance with the standards of ANSI S12.60. More stringent mitigation measures are recommended for the Theater of the Performing Arts Building to preclude potential performance disruption. These additional measures recommended herein will be optional.

The interior noise levels in the noise sensitive classroom spaces were determined by a 30 dB downward adjustment applied to the exterior noise levels at the most impacted planned building setback from the roadway to account for the attenuation provided by a commercial building shell. This adjustment value assumes that the building shells are constructed using standard construction design and materials with ¾" dual-pane thermal insulating windows that are in a closed position at all times.

Noise Measurement Methodology

To determine the existing noise environment at the site, continuous recordings of the sound levels were made at three locations. Location 1 was 123 ft. from the centerline of I-280 (13 ft. from the soundwall) and at a 14 ft. elevation where there was an unshielded view to the freeway surface. This location was near the planned location of the Performing Arts building. Location 2 was along the north property line near the northeasterly corner of the new classroom wing. Location 3 was at the northeast corner of the site near the planned practice field. The measurement locations are shown on the following satellite photo.


Meas. Loc. 2
Meas. Loc.
Meas. Loc. 1
395 ft
© 2010 Google
© 2010 Europa Technologies
37°19'03.43" N 121°58'17.38" W elev 148 ft

The measurements were made for a continuous 24-hour period on June 9-10, 2010 using Larson-Davis 812 Precision Integrating Sound Level Meters. The meter yields, by direct readout, a series of the sound levels versus time, which include the L_1, L_{10}, L_{50} and L_{90}, i.e., those levels of noise exceeded 1%, 10%, 50% and 90% of the time. Also measured were the minimum and maximum levels, and the continuous equivalent-energy levels (L_{eq}), which are used to calculate the DNL. The results of the sound measurements are shown in Appendix C.

As shown in the tables, the L_{eq}'s at measurement Location 1, ranged from 70.1 to 74.4 dBA during the daytime and from 62.4 to 74.5 dBA at night. The noise levels at this locations were due primarily to traffic on I-280.

The L_{eq}'s at measurement Location 2, ranged from 47.7 to 61.2 dBA during the daytime and from 42.8 to 55.1 dBA at night. Since school was out of session during the measurement period, the noise levels at this location were due primarily to activities associated with the La Terraza Apartments. Noise from I-280 was heard as part of the background noise environment along with minor amounts of noise from Saratoga Avenue traffic.

The L_{eq}'s at measurement Location 3, ranged from 52.9 to 65.0 dBA during the daytime and from 46.9 to 57.7 dBA at night. Like Location 2, the noise levels at this location were due mostly to activities at the La Terraza Apartments and the adjacent apartments to the north, with minor noise influence from activity at Harker School and traffic on I-280.

To evaluate the on-site noise exposures against the City of San Jose standards, the DNL's for the survey locations were calculated from the measured noise levels as a decibel average of the L_{eq} values for the daily time periods. A nighttime weighting factor was applied to account for the increased human sensitivity to noise during these hours. The mathematical formula used to calculate the DNL is shown in Appendix B. The results of the calculations are shown in Appendix C.

The noise exposure calculated for measurement Location 1, 145 ft. from the centerline of I-280 with a view of the road, was 76 dB DNL. A short-term (1 hr.) measurement was also made at the first floor elevation contemporaneously with the unshielded noise measurements. The first floor hourly L_{eq} was 9 dB lower than the unshielded hourly L_{eq}. The first floor data were used to calibrate the standard noise barrier calculations. Thus, the noise exposure at the first floor elevation behind the barrier was calculated to be 67 dB DNL.

At measurement Location 2 along the north property line, the noise exposure was calculated to be 58 dB DNL.

At measurement Location 3 at the northeast corner of the Harker School site, the noise exposure was calculated to be 61 dB DNL.

IV. Project-Generated Noise Impacts

As the project, as it relates to acoustics, consists mainly of adding facilities to the school, there is no anticipated significant increase in enrollment. Thus, the project-generated noise exposures and noise levels for the existing uses at the school, such as the football field, parking lots and related traffic, existing school buildings and their mechanical equipment and the Aquatic Center, are expected to be similar to the existing scenario. There has been no indication that any of these sources are unacceptable.

Project-generated noise, therefore, is limited to construction noise, activities in the Gymnasium and on the practice field, and mechanical equipment associated with the new buildings. Since the mechanical designs for the new buildings have not been developed, noise analyses of the future equipment cannot be made. Project-generated noise impacts from the Theater, classrooms and Student Union are expected to be insignificant as noise generating sources associated with these buildings will be indoors and, typically, will not be loud enough to transmit to the outside.

A. Gymnasium

The possible noise leakage paths for the Gymnasium would be through the doors and windows. The building shell with the windows and doors closed will provide approximately 30 dB of noise reduction. However, with the windows and/or doors open, the building shell is likely to provide only 10 dB of noise reduction.

The noise levels created by activity within the Gymnasium is dependent upon the particular activity, number of people in attendance, type of sound reinforcement systems involved and other factors. The maximum sound level from people cheering or shouting or if live music is being played could be up to 100 dBA. The hourly average sound level inside a gymnasium during a basketball game, dance or other very active event, is approximately 80 dBA L_{eq}. The noise exposures were estimated using a potential worst-case scenario consisting of hourly average gymnasium noise levels for six hours with one of the hours extending into the nighttime period (after 10:00 p.m.).

Table III, below, provides typical gymnasium sound levels during very intense activities such as a basketball game or dance, the noise levels and the noise exposures at the property line and at the setback of the La Terraza apartments with the gymnasium windows open and closed, and the noise level and noise exposure excesses in terms of both the Zoning Ordinance (55 dBA L_{max}) and the Noise Element (55 dB DNL).

TABLE III				
Gymnasium Noise Levels and Noise Exposures				
Source Level in Gym.	Noise Level @ Prop. Line	Noise Excess	Noise Level @ La Terraza Setback	Noise Excess
100 dBA Max.	81 dBA windows open	26 dB	76 dBA windows open	21 dB
100 dBA Max.	61 dBA windows closed	6 dB	56 dBA windows closed	1 dB
80 dBA L_{eq}	61 dBA windows open	Na	56 dBA windows open	Na
80 dBA L_{eq}	41 dBA windows closed	Na	36 dBA windows closed	Na
80 dB DNL	61 dB DNL windows open	6 dB	56 dB DNL windows open	1 dB
80 dB DNL	41 dB DNL windows closed	None	36 dB DNL windows closed	None

As shown above, the noise levels at the property line could be up to 26 dB in excess of the City of San Jose Zoning Ordinance and up to 6 dB in excess of the City of San Jose Noise Element is windows are left open during loud events.

Noise from the Gymnasium has a potential for noise exceedance. Mitigation measures are recommended. The recommended measures are described in Section IV, below.

B. Practice Field Noise

The practice field will be used only for soccer and football practice. Therefore, the primary noise sources associated with practice of these two sports, typically, coach/teacher whistles, shouts, the crash/crunch of football pads and helmets, and the thud of striking the blocking sled.

Soccer practice noise is generally less intensive than football practice noise. Acoustical studies of soccer noise at St. Francis High School in Watsonville, Ref. (f), and at the Campbell Community Center, Ref. (g), revealed that the primary sources of noise during soccer playing are coaches/referee whistles and shouts of players.

The St. Francis High School soccer fields generated sound levels of 57 dBA L_{eq} at 180 ft. from the center of the field and included referee whistles and shouts. Referee whistles generated maximum noise levels of 61-63 dBA at 180 ft. from the center of the field. The Campbell Community Center soccer game generated noise levels of 43-55 dBA at 190 ft. from the center of the field. Referee whistles were 58-60 dBA. Shouts and cheers were 52-60 dBA.

High school football playing noise levels were measured at Serra High School in San Mateo, Ref. (h). Coach's whistles were measured to be up to 77 dBA at 40 ft. Players and coach's shouts were measured to be 70-73 dBA at 90 ft. Hits were measured to be 65-66 dBA at 90 ft. Hitting the blocking sled was measured to be 57 dBA at 25 ft.

Table IV on the following page provides the maximum, hourly average and DNL noise levels and noise exposures at the property lines and building setbacks to the east (Troy Drive) and to the north (La Terraza Apartments). Also included are the noise excesses. The noise exposures shown for soccer practice include the use of the field for P.E. classes, which may result in the field being used from 8:00 a.m. to 6:00. We are assuming that the noise levels from P.E. classes would be similar to soccer practice noise. Football practice noise would be limited to three hours in the afternoon.

TABLE IV								
Practice Field Noise Levels and Noise Exposures								
Source	Troy Dr. Prop. Line	Noise Excess	Troy Dr. Setback	Noise Excess	La Terraza Prop. Line	Noise Excess	La Terraza Setback	Noise Excess
Dist. =	120'		170'		165'		235'	
Soccer								
Whistles	62-67 dBA	12 dB	58-63 dBA	8 dB	59-64 dBA	9 dB	56-61 dBA	6 dB
Shouts	56-64	9 dB	52-60 dBA	5 dB	53-61 dBA	6 dB	50-58 dBA	3 dB
Playing	49 dBA Leq	Na	45 dBA Leq	Na	46 dBA Leq	Na	43 dBA Leq	Na
DNL	45 dB	None	41 dB	None	42 dB	None	39 dB	None
Football								
Whistles	62-67 dBA	12 dB	58-63 dBA	8 dB	59-64 dBA	9 dB	56-61 dBA	6 dB
Shouts	67-70 dBA	15 dB	63-66 dBA	11 dB	64-67 dBA	12 dB	61-64 dBA	9 dB
Hits	62-63 dBA	8 dB	58-59 dBA	4 dB	59-60 dBA	5 dB	56-57 dBA	2 dB
Blocking Sled	56 dBA	1 dB	52 dBA	None	53 dBA	None	50 dBA	None
Playing	52 dBA Leq	Na	48 dBA Leq	Na	49 dBA Leq	Na	46 dBA Leq	Na
DNL	43 dB	None	39 dB	None	40 dB	None	37 dB	None

C. Mechanical Equipment Noise Impacts

Mechanical equipment associated with the new school buildings has not been specified. Therefore, an acoustical analysis of the potential noise impacts from said equipment could not be performed. Roof-mounted or ground-mounted equipment that is near the residential areas to the east and north and that is not properly screened may produce excessive noise at the residences.

D. Construction Phase Impacts

Short-term construction impacts may be created during construction of the project. Construction equipment generates noise levels in the range of 78 to 98 dBA at a 20 ft. distance from the source and has the potential for disturbing the nearby residences when equipment is operating.

At the most impacted Troy Drive residences, the construction noise maximum sound levels could be up to 87 dBA depending on the level of work performed near the east property line.

At the most impacted La Terraza Apartment residences, the construction noise maximum sound levels could be up to 62 to 82 dBA depending on the level of work performed near the north property line.

Since construction is carried out in several reasonably discrete phases, each has its own mix of equipment and consequently, its own noise characteristics. Generally, the site preparation requires the use of heavy equipment such as bulldozers, backhoes, scrapers, and cement and diesel trucks. Certain days when construction occurs close to the east or north property lines the noise exposure will exceed 55 dB DNL. Residences within 200 ft. of a work area that utilizes diesel equipment for more than one full day will immit noise exposures in excess of 55 dB DNL. Although construction noise may generate significant noise impacts to the nearby residents, it is a temporary impact. Measures to minimize the noise impacts are described in Section IV, below.

V. Mitigation Measures

A. Performing Arts Building/Theater

To achieve compliance with the 35 dBA L_{eq} standard of ANSI S12.60 for classrooms and the Theater, the following mitigation measures are recommended:

- Maintain closed all windows and doors on the south, west and east sides of the Performing Arts Buildings during classes and performances.
- Install windows rated minimum Sound Transmission Class (STC) 32 at first floor elevations. Install windows rated minimum STC 42 at upper floor elevations.

Optional additional noise mitigation for the Theater

To achieve compliance with the 25 dBA L_{eq} limit recommended for the interior of the Theater, the following mitigation measures are recommended:

- Design the Theater building shell so there are no windows higher than 12 ft. above the ground level.
- Maintain closed all windows and doors at the first floor elevations of the Theater during classes and performances.
- At first (ground) floor elevations, install windows rated minimum Sound Transmission Class (STC) 44 at the south, west and east elevations. At the north elevation, install windows rated minimum STC 36.

B. Gymnasium Noise

To achieve compliance with the 55 dB DNL standard of the City of San Jose Noise Element and the 55 dBA maximum noise standard of the Zoning Code at the residential property lines near the Gymnasium, the following mitigation measures are recommended:

- Maintain closed all windows and doors on the north, west and east sides of the gymnasium during noise generating activity periods inside the gymnasium. Noise generating activities include, but are not limited to, athletic games and practice, social events with music and P.E. classes.

- Install windows rated minimum Sound Transmission Class (STC) 32. The window assemblies shall contain at least one pane of 3/16" glass.

C. Practice Field Noise

Noise from the practice field is not expected to exceed the limits of the 55 dB DNL standard of the City of San Jose Noise Element. However, due to the very short-term maximum noise level due to whistles and shouts, achieving compliance with the 55 dBA maximum noise standard of the Zoning Code at the residential building setbacks, extraordinarily high noise control barriers would be required along the north and east sides of the practice field or along the north and east property lines. The noise barriers would need to be 19 ft. to 23 ft. high to shield the second floor elevations of the adjacent residences. These measures are likely not feasible. Even limiting the location of coach's or teacher's whistles to the southwesterly quadrant of the field and not allow players or coaches to shout would still require noise barriers up to 17 ft. high.

Note that the existing short-term sound levels in the vicinity of the practice field (with school not in session) are slightly lower than the expected sound levels from practice field activity. The existing sound levels are due to vehicular traffic in the La Terraza Apartment parking lot and landscaping operations at the apartments.

Although the practice field noise levels are not too much higher than the existing noise levels and the fact that there are many schools with play fields close to residences, the duration of the use of the field on a daily basis may be disruptive to certain residents.

The minimum noise barrier heights that would provide any level of noise reduction for second floor elevations are 13 ft. high along the Troy Drive property line and 14 ft. high along the La Terraza Apartment property line. The resulting noise levels would then be up to 58 dBA at the Troy Drive residences and 56 dBA at the La Terraza Apartments.

To shield first floor elevations, the noise barriers could be as low as 6 ft. high. However, typical 8 ft. high barriers commonly used between residential and non-residential land uses would result in noise levels of 56 dBA and 55 dBA at the Troy Drive and La Terraza Apartments, respectively.

- Should the City of San Jose determine that noise barriers will be required, contact our office for the precise placement and heights of the barriers as heights may change with lateral distance from the practice field.

D. <u>Mechanical Equipment Noise</u>

- Perform a detailed analysis of the school mechanical equipment systems to ensure compliance with the City standards under cumulative (traffic + afterschool activities + mechanical equipment, etc.) conditions. The analysis shall be performed by a qualified acoustician.

E. Construction Noise Reduction

Reduction of the construction phase noise at the site can be accomplished by using quiet or "new technology" equipment. The greatest potential for noise abatement of current equipment should be the quieting of exhaust noises by use of improved mufflers. It is recommended that all internal combustion engines used at the project site be equipped with a type of muffler recommended by the vehicle manufacturer. In addition, all equipment should be in good mechanical condition so as to minimize noise created by faulty or poorly maintained engine, drive-train and other components. Construction noise can also be mitigated by the following:

- If noise control barriers are required along the north and east property lines near the practice field, construct the barriers before significant noise generating demolition or construction activity commences.

- Demolition of buildings should occur in phases with the walls of the building closest to existing residences being removed last as the walls can act as noise barriers.

- Scheduling noisy operations for the daytime hours of 7:00 a.m. to 5:00 p.m. Monday through Friday.

- All diesel powered equipment should be located more than 200 ft. from any residence if the equipment is to operate for more than several hours per day.

- Dirt berming and stockpiling materials whenever possible can also help reduce noise to sensitive receptor locations.

As noise reduction benefit can also be achieved by appropriate selection of equipment utilized for various operations, subject to equipment availability and cost considerations, the following recommendations for minimizing impacts on the surrounding area are offered:

Earth Removal: Use scrapers as much as possible for earth removal, rather than the noisier loaders and hauling trucks.

Backfilling: Use a backhoe for backfilling, as it is less costly and quieter than either dozers or loaders.

Ground Preparation: Use a motor grader rather than a bulldozer for final grading.

Building Construction: Powers saws should be shielded or enclosed where practical to decrease noise emissions. Nail guns should be used where possible as they are less noisy than manual hammering.

VI. Conclusions

In conclusion, noise impacts to the Theater may occur, depending upon the ultimate architectural details of the building and the school's desire for quiet during classes or performances. The Gymnasium and Practice Field have potential for generating excessive noise. Mitigation measures for the Gymnasium and Practice Field are provided in Section IV of this report.

The study findings for existing conditions are based on field measurements and other data and are correct to the best of our knowledge. Future noise projections are based on information provided by Harker School. Significant deviations in the predicted school enrollment, site planning, future changes in school activity levels, noise regulations or other future changes beyond our control may produce long-range noise results different from our estimates.

Report Prepared By:

Jeffrey K. Pack
President

APPENDIX A

References

(a) Site Plan + First Floor Plan, Harker School, April 31, 2010

(b) San Jose 2020 General Plan, Focus on the Future, City of San Jose, Department of City Planning and Building, August 16, 1994

(c) City of San Jose Municipal Code, Title 20, The Zoning Ordinance, Part 7, Performance Standards, Section 20.30.700 B2

(d) American National Standards Institute 12.60-2002, "American National Standard Acoustical Performance Criteria, Design Requirements, and Guidelines for Schools". http://asastore.aip.org/

(e) Information on Existing and Future School Enrollment and Operations Provided by the Harker School, by email to Edward L. Pack Associates, Inc., June 9, 2010

(f) "Noise Assessment Study For the Planned St. Francis Youth Center Soccer Fields, College Road, Watsonville", by Edward L. Pack Associates, Inc., Project No. 27-092, November 6, 1995

(g) Acoustical Analysis of Soccer and Football Noise, Campbell Community Center, by Edward L. Pack Associates, Inc., Project No. 33-110, November 4, 2001

(h) "Noise Assessment Study for the Planned Football Field Remodel, Serra High School, San Mateo", by Edward L. Pack Associates, Inc., Project No. 34-096, November 11, 2002

APPENDIX B

Noise Standards and Terminology

1. Noise Standards

A. City of San Jose "Noise Element" Standards

The noise section of the San Jose 2020 General Plan, Focus on the Future, adopted August 16, 1994 identifies an exterior limit of 60 dB Day-Night Level (DNL) at outdoor living or recreation areas of residential developments. This standard applies at the property line of residential areas impacted by transportation related noise sources. For off-site noise sources, such as commercial and industrial operations, an exterior limit of 55 dB DNL for residential areas is specified. A long-term goal of 55 dB DNL from transportation sources anticipates future reductions in transportation noise due to improvements in design, such as quieter engines and improved muffler systems. The Noise Element also contains wording that some development site is the Downtown Core Area, near San Jose International Airport, along rail lines and along major thoroughfares may not be able to meet the noise standards in the time frame of the General Plan.

At interior living spaces of residences, the standards establishes an interior limit of 45 dB DNL for noise exposures due to exterior sources.

The Performance Standards of Title 20 of the San Jose Municipal Code, Zoning Ordinance limit maximum noise levels at the following receiving land uses:

Residential	55 dBA L_{max}
Commercial	60 dBA L_{max}
Industrial	70 dBA L_{max}

2. Terminology

A. Statistical Noise Levels

Due to the fluctuating character of urban traffic noise, statistical procedures are needed to provide an adequate description of the environment. A series of statistical descriptors have been developed which represent the noise levels exceeded a given percentage of the time. These descriptors are obtained by direct readout of the Community Noise Analyzer. Some of the statistical levels used to describe community noise are defined as follows:

L_1 - A noise level exceeded for 1% of the time.

L_{10} - A noise level exceeded for 10% of the time, considered to be an "intrusive" level.

L_{50} - The noise level exceeded 50% of the time representing an "average" sound level.

L_{90} - The noise level exceeded 90 % of the time, designated as a "background" noise level.

L_{eq} - The continuous equivalent-energy level is that level of a steady-state noise having the same sound energy as a given time-varying noise. The L_{eq} represents the decibel level of the time-averaged value of sound energy or sound pressure squared and is used to calculate the DNL and CNEL.

B. Day-Night Level (DNL)

Noise levels utilized in the standards are described in terms of the Day-Night Level (DNL). The DNL rating is determined by the cumulative noise exposures occurring over a 24-hour day in terms of A-Weighted sound energy. The 24-hour day is divided into two subperiods for the DNL index, i.e., the daytime period from 7:00 a.m. to 10:00 p.m., and the nighttime period from 10:00 p.m. to 7:00 a.m. A 10 dB weighting factor is applied (added) to the noise levels occurring during the nighttime period to account for the greater sensitivity of people to noise during these hours. The DNL is calculated from the measured L_{eq} in accordance with the following mathematical formula:

$$DNL = [(L_d+10\log_{10}15) \,\&\, (L_n+10+10\log_{10}9)] - 10\log_{10}24$$

Where:

L_d = L_{eq} for the daytime (7:00 a.m. to 10:00 p.m.)

L_n = L_{eq} for the nighttime (10:00 p.m. to 7:00 a.m.)

24 - indicates the 24-hour period

& - denotes decibel addition.

C. A-Weighted Sound Level

The decibel measure of the sound level utilizing the "A" weighted network of a sound level meter is referred to as "dBA". The "A" weighting is the accepted standard weighting system used when noise is measured and recorded for the purpose of determining total noise levels and conducting statistical analyses of the environment so that the output correlates well with the response of the human ear.

APPENDIX C

Noise Measurement Data and Calculation Tables

DNL CALCULATIONS

CLIENT: THE HARKER SCHOOL
FILE: 42-021
PROJECT: HARKER SCHOOL REMODEL
DATE: 6/9-10/2010
SOURCE: INTERSTATE 280, AMBIENT CONDITIONS

LOCATION 1	Interstate 280			
Dist. To Source	145 ft.			
TIME	Leq	10^Leq/10		
7:00 AM	74.4	27542287.0		
8:00 AM	73.1	20417379.4		
9:00 AM	73.9	24547089.2		
10:00 AM	71.2	13182567.4		
11:00 AM	71.6	14454397.7		
12:00 PM	71.5	14125375.4		
1:00 PM	71.6	14454397.7		
2:00 PM	71.2	13182567.4		
3:00 PM	71.3	13489628.8		
4:00 PM	71.6	14454397.7		
5:00 PM	70.1	10232929.9		
6:00 PM	73.1	20417379.4		
7:00 PM	72.7	18620871.4		
8:00 PM	72.2	16595869.1		
9:00 PM	71.8	15135612.5	SUM=	250852750
10:00 PM	70.7	11748975.5	Ld=	72.2
11:00 PM	68.4	6918309.7		
12:00 AM	65.9	3890451.4		
1:00 AM	63.7	2344228.8		
2:00 AM	62.4	1737800.8		
3:00 AM	62.5	1778279.4		
4:00 AM	65.4	3467368.5		
5:00 AM	71.4	13803842.6		
6:00 AM	74.5	28183829.3	SUM=	73873086
		1.0	Ld=	69.1
		1.0		
	Daytime Level=	84.0		
	Nighttime Level=	88.6		
	DNL=	**76**		
	24-Hour Leq=	71.3		

LOCATION 2	North Prop. Line @ Gym. Existing Ambient			
TIME	Leq	10^Leq/10		
7:00 AM	59.7	933254.3		
8:00 AM	61.2	1318256.7		
9:00 AM	59.9	977237.2		
10:00 AM	56.3	426579.5		
11:00 AM	55.7	371535.2		
12:00 PM	60.6	1148153.6		
1:00 PM	54.9	309029.5		
2:00 PM	54.1	257039.6		
3:00 PM	54.4	275422.9		
4:00 PM	51.1	128825.0		
5:00 PM	50.4	109647.8		
6:00 PM	51.0	125892.5		
7:00 PM	52.6	181970.1		
8:00 PM	50.3	107151.9		
9:00 PM	47.7	58884.4	SUM=	6728880
10:00 PM	46.6	45708.8	Ld=	56.5
11:00 PM	43.9	24547.1		
12:00 AM	43.4	21877.6		
1:00 AM	43.6	22908.7		
2:00 AM	43.0	19952.6		
3:00 AM	42.8	19054.6		
4:00 AM	53.3	213796.2		
5:00 AM	55.1	323593.7		
6:00 AM	53.2	208929.6	SUM=	900369
		1.0	Ld=	50.0
	Daytime Level=	68.3		
	Nighttime Level=	69.5		
	DNL=	**58**		
	24-Hour Leq=	55.0		

DNL CALCULATIONS

CLIENT: HARKER ACADEMY
FILE: 42-021
PROJECT: HARKER ACADEMY REMODEL
DATE: 6/9-10/2010
SOURCE: INTERSTATE 280, AMBIENT CONDITIONS

LOCATION 3	Northwest Corner Existing Ambient			
TIME	Leq	10^Leq/10		
7:00 AM	59.6	912010.8		
8:00 AM	61.0	1258925.4		
9:00 AM	65.0	3162277.7		
10:00 AM	52.9	194984.5		
11:00 AM	59.7	933254.3		
12:00 PM	60.6	1148153.6		
1:00 PM	62.4	1737800.8		
2:00 PM	63.1	2041737.9		
3:00 PM	62.8	1905460.7		
4:00 PM	56.2	416869.4		
5:00 PM	54.8	301995.2		
6:00 PM	56.4	436515.8		
7:00 PM	56.8	478630.1		
8:00 PM	54.8	301995.2		
9:00 PM	53.1	204173.8	SUM=	15434785
10:00 PM	50.8	120226.4	Ld=	60.1
11:00 PM	48.9	77624.7		
12:00 AM	48.4	69183.1		
1:00 AM	48.0	63095.7		
2:00 AM	47.0	50118.7		
3:00 AM	46.9	48977.9		
4:00 AM	53.3	213796.2		
5:00 AM	55.3	338844.2		
6:00 AM	57.7	588843.7	SUM=	1570711
			Ld=	52.4
	Daytime Level=	71.9		
	Nighttime Level=	71.9		
	DNL=	**61**		
	24-Hour Leq=	58.5		

FEHR PEERS

MEMORANDUM

Date: February 25, 2011

To: Mike Bassoni, The Harker School

Copy To: Ray Hashimoto, HMH, Inc.

From: Jane Bierstedt

Subject: ***The Harker School Master Plan Transportation Analysis***

SJ10-1193

This memorandum presents the results of the focused transportation analysis conducted for The Harker School Master Plan, a senior high school facility located at 500 Saratoga Avenue in San Jose, California. An aerial showing the school's location is included as Figure 1. The existing site plan is shown on Figure 2. The Master Plan envisions existing facilities being removed (including classroom and administrative buildings and sports facilities such locker rooms and gymnasium) and new facilities being constructed (including approximately 300,000 square feet (sf) of buildings - classrooms, gymnasium, student union building, and performing arts center and a new turf soccer field). The Master Plan will allow a net addition of up to 108,240 square feet of building area but no increase in enrollment. A new entry plaza and visitor parking area will also be created. The conceptual site plan showing the potential new facilities is presented on Figure 3.

The transportation analysis was conducted to evaluative traffic issues identified by City staff and for use in the master plan's California Environmental Quality Act (CEQA) clearance document.

SCOPE OF TRANSPORTATION ANALYSIS

The transportation analysis contains:

- A description of current on-site vehicular circulation and student pick-up and drop-off activities
- A description of the proposed site plan modifications and the associated transportation characteristics
- A review of traffic operations on Saratoga Avenue in the vicinity of the school including:
    1. Left-turn demand (and turn pocket storage length) into the site from southbound Saratoga Avenue
    2. Left-turn demand onto the northbound and southbound I-280 on-ramps
    3. Conflicts between the left-turn movement onto the southbound I-280 on-ramp and northbound school traffic through the intersections of Saratoga Avenue/Moorpark Avenue and Saratoga Avenue/I-280 southbound on-ramp
    4. Conflicts on northbound Saratoga Avenue between school traffic entering the site and traffic turning right from the I-280 northbound off-ramp

5. Back-ups onto I-280

6. Signal operations and progression on Saratoga Avenue

- Discussion of other traffic issues:

1. Traffic operations of the Saratoga Avenue/Harker School driveway intersection

2. Americans with Disability Act (ADA) compliance on the northeast corner of the driveway's intersection with Saratoga Avenue

The City has also requested a pedestrian access and circulation plan that shows how onsite pedestrian paths will be linked to the public sidewalk on Saratoga Avenue. HMH, Inc. will prepare the pedestrian circulation plan. The conceptual ADA accessible paths of travel are shown on the Master Plan site plan on Figure 3.

EXISITNG ON-SITE CONDITIONS

An aerial showing the school's location is included on Figure 1 and the existing site plan is shown on Figure 2. The school has one driveway located on Saratoga Avenue across from the northbound I-280 on-ramp. The internal circulation system is shaped like a sideways "Y" with one circulation road along the northern border and the other along the southern border of the site with the school facilities in the middle. The two internal roadways meet approximately 50 feet east of the main entry on Saratoga Avenue and no other internal connections are provided. School personnel manually direct traffic at the on-site intersection during peak hours so that traffic does not extend onto Saratoga Avenue.

The school has approximately 325 parking spaces plus 10 ADA spaces. The school currently has 690 students of which 140 are allowed to park onsite. The other students are dropped-off and picked-up at the school or use the intercampus shuttle bus. Current student drop-off and pick-up activities were observed and are described below.

Existing Student Pick-Up and Drop-Off Activities

Fehr & Peers observed student drop-off and pick-up activities and on-site circulation patterns in February 2011. Student drop-off activities were observed during the peak activity period from 7:30 am to 8:10 am. (School starts at 8:00 am.) Students were dropped-off along the curb areas shown on Figures 3 and 4. Vehicles use several routes to circulate through the parking lot after dropping off the students to return to the Saratoga Avenue. Queues of up to 16 vehicles were observed. However, typical queue lengths were between 5 and 12 vehicles. Between 7:45 am and 8:00 am school personnel were present to direct traffic and expedite drop-off activities.

Student pick-up activities were observed from 4:15 pm to 5:10 pm (the peak activity period). Many students have afterschool activities and some parents were in the parking lot waiting to pick-up their children (estimated to be approximately 20 vehicles at the beginning of the observation period). Queues of vehicles waiting at the curb ranged from three to eight vehicles. Some vehicles parked in the lot as opposed to waiting at the curb (a total of approximately 15 to 20 during the observation period). The shuttle bus arrived at 5:00 pm and left at approximately 5:10 pm.

Existing Shuttle Bus Operations

The Harker School provides an intercampus shuttle service to assist parents in dropping-off and picking-up their children, especially if they have two or more students on separate campuses. A parent may drop-off their child at any campus in the morning and as long as they are within the approved shuttle schedule, the student will be transported to the appropriate campus in time for class. The shuttle bus operates in the afternoon to facilitate parent pick-up and the sports programs. The intercampus shuttle schedule is attached.

SITE DESCRIPTION AND PROPOSED MODIFICATIONS

The Master Plan includes removing existing facilities and adding new facilities including classrooms, gymnasium, student union building, and performing arts center and a new turf soccer field. The parking areas along the north side of the site will be reconfigured and the surface parking lots near the school building entrance will be replaced with a new entry plaza providing visitor parking. In addition, underground parking will be provided creating a total of approximately 400 parking spaces, or a net increase of about 75 spaces.

Proposed On-site Vehicle Circulation and Student Pick-Up and Drop-Off Activities

The Master Plan's on-site vehicle circulation system is very similar to the existing system with the exception of the new circular entry plaza with visitor parking and the new parking garage. (See Figure 5.) While the plaza adds a unique design feature, it could create some driver confusion. The vehicular circulation areas and direction of travel should be made clear and not obfuscated through intricate pavement patterns. Plus it is unlikely that drivers exiting the garage will circulate through the plaza. Therefore the southern outside ring should accommodate two-way traffic while the inside ring would accommodate one-way traffic. The amount of curb space dedicated to student pick-up and drop-off appears to only accommodate six vehicles. It is recommended that a minimum of nine vehicles be accommodated. It is also recommended that the entry plaza be reviewed carefully regarding vehicular and pedestrian access and circulation, garage driveway and loading dock design, and drop-off/pick-up activities during the design phase. A "Keep Clear" pavement legend or similar marking may be needed to ensure that vehicles do not block the garage driveway.

SARATOGA AVENUE FIELD OBSERVATIONS AND DATA COLLECTION

Fehr & Peers conducted field observations of the traffic operations on Saratoga Avenue in the vicinity of The Harker School and the adjacent I-280 interchange during the morning peak period and the evening peak period on Wednesday, November 17, 2010 and again on February 9, 2011. The purpose of these observations was to identify the extent Harker School traffic contributed to congestion and queuing. Observations included:

- Left-turn demand into the school site from southbound Saratoga Avenue
- Left-turn demand onto the northbound and southbound I-280 on-ramps
- Conflicts between the left-turn movement onto the southbound I-280 on-ramp and northbound school traffic through the intersections of Saratoga Avenue/Moorpark Avenue and Saratoga Avenue/I-280 southbound on-ramp
- Conflicts on northbound Saratoga Avenue between school traffic entering the site and traffic turning right from the I-280 northbound off-ramp

- Back-ups onto I-280
- Signal operations and progression on Saratoga Avenue

Field Observations

The results of the field observations are discussed below:

Southbound Left Turns into the School Driveway

Vehicles traveling southbound on Saratoga Avenue and turning left into the school driveway backed-out of the left-turn pocket into the adjacent travel lane a few times during the morning and evening peak periods. (The adjacent lane is a left-turn lane for the southbound I-280 on-ramp. It is congested and the vehicles backing out of the pocket did not affect its operations.) Traffic counts and queue length surveys were conducted to measure the number of occurrences and to determine the length of the maximum (85th percentile) queue. The results are described in the next subsection. A few vehicles were observed in the left-turn pocket that were headed for the southbound I-280 on-ramp. These vehicles essentially blocked the lane until the signal changed for the southbound through movement and then they continued through the intersection. It is recommended that pavement legends be added to indicate the "destinations" of the lanes to minimize these occurrences.

Left Turns onto I-280 Northbound On-Ramp

The I-280 northbound on-ramp is controlled by ramp meters. Traffic traveling northbound on Saratoga Avenue and turning left plus southbound Saratoga Avenue turning right onto the on-ramp were observed to often fill up the on-ramp causing left-turning traffic to extend across the southbound through lanes during the morning peak period. The queuing is caused by the combined northbound left-turn and southbound right-turn vehicle demand exceeding the on-ramp capacity and is not associated with the school driveway's operations.

Left Turns onto I-280 Southbound On-Ramp

No conflicts were observed between the left-turn movement onto the southbound I-280 on-ramp and northbound school traffic through the intersections of Saratoga Avenue/Moorpark Avenue and Saratoga Avenue/I-280 southbound on-ramp.

Left Turns onto I-280 Southbound On-Ramp and Northbound School Traffic

Queues on northbound Saratoga Avenue at the intersection of the school's driveway extended just past the northbound off-ramp but not to the southbound I-280 on-ramp nor to Moorpark Avenue during both the AM and PM peak hours. Queues that did occur were moving queues in the outside lane. Northbound vehicles would move over to the center lane where there was plenty of capacity to bypass the queue of vehicles turning right into the school site.

Northbound Saratoga Entering School Traffic and Traffic Turning Right from the I-280 Northbound Off-Ramp

There was some congestion on northbound Saratoga Avenue between the school driveway and the I-280 northbound off-ramp. The congestion is partly due to vehicles turning right to enter the school site driving slowly due to the tight curb radii and placement of the on-site circulation roadway. (Vehicles essentially make a U-turn.) Counts were conducted to measure the traffic volume on the northbound I-280 off-ramp turning right onto northbound Saratoga Avenue and to observe the queue lengths.

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Back-ups on I-280

Back-ups occur on I-280 in the vicinity of Saratoga Avenue. Back-ups were observed on northbound I-280 during the PM peak period. Queues extended on the northbound I-280 off-ramp from both northbound and southbound Saratoga Avenue onto northbound I-280 as the vehicles demand exceeds the ramp's storage capacity.

Traffic Signal Timings and Progression

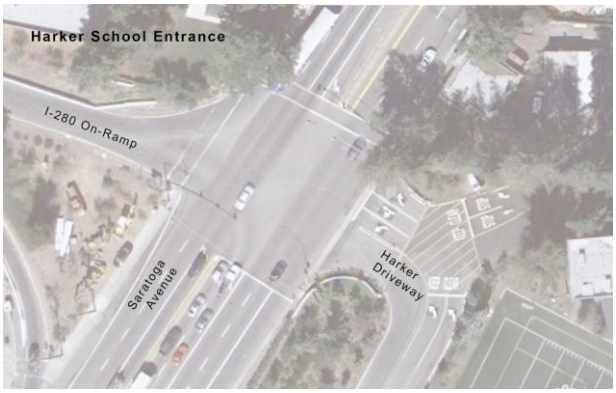
During the observations it was determined the traffic signal timings and progression could be improved. It is very likely that traffic volumes have changed since the timings and offsets were set.

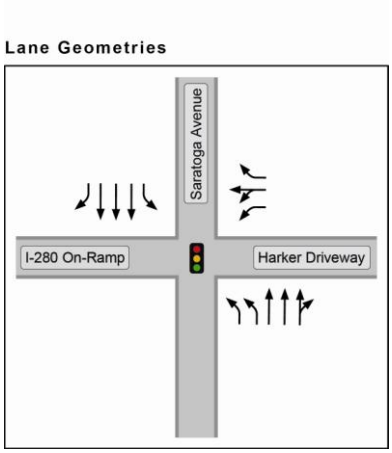
Data Collection

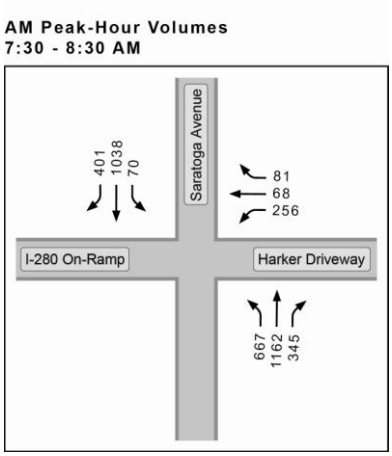
Turning movement counts were conducted at the signalized intersection of Saratoga Avenue and the school driveway during the AM and PM peak periods (7:00 am to 9:00 am and 4:00 pm to 6:00 pm). Traffic volumes on the northbound I-280 off-ramp to northbound Saratoga Avenue were also counted during the same time periods. Queues of vehicles turning left into the school site were measured and queues on the off-ramp were estimated during the traffic counts.

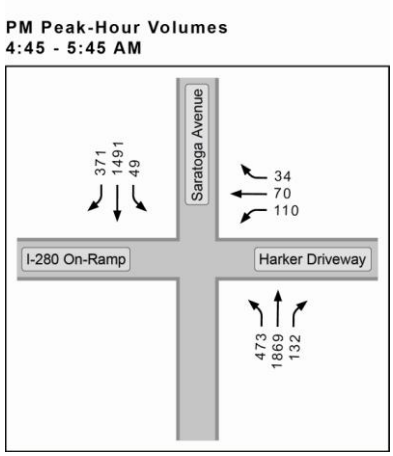
Intersection Counts

The intersection lane configuration and AM and PM peak hour traffic volumes are illustrated below:









School Trip Generation

School vehicle trip generation was obtained from the counts. The school generates 820 AM peak hour trips (415 in and 405 out) and 395 PM peak hour trips (181 in and 214 out). Based on the existing student population of 690 students, the school currently generates 1.19 AM peak hour trips per student (0.60 trip in and 0.59 trips out) and 0.57 PM peak hour trips per student (0.26 in and 0.31 trips out). The results are similar to trip generation surveys conducted in 1997 and 1998 which averaged to 1.17 AM peak hour trips per student and 0.66 PM peak hour trips per student.

Queue Lengths

The queue length survey results are attached. The southbound left-turn pocket storage length is 100 feet with a 50-foot taper. The queue of vehicles turning left into the school site extended out of the left-turn pocket three times during the morning peak two-hour period and twice during the evening period. Twice during the evening period vehicles headed toward the I-280 southbound on-ramp erroneously got into The Harker School left-turn pocket and blocked the movement. Additional field visits were conducted to observe the left-turn queues. The maximum observed queue was eleven (11) vehicles during the AM peak hour. A left-turn pocket storage area of 275 feet (assumed 25 feet per vehicle) would accommodate this queue. The left-turn pocket can be extended to a maximum of 300 feet and still maintain the left-turn pocket to northbound Kiely Boulevard. However, landscaping would need to be removed.

TRAFFIC OPERATIONS AT DRIVEWAY INTERSECTION

Level of service calculations were conducted to evaluate operations of the intersection of the school driveway and Saratoga Avenue and to determine the required pocket length for the left-turn pocket into the site. Level of service is a qualitative description of intersection operations ranging from LOS A (good operations with little or no delay) to LOS F (stop and go conditions with excessive delays). LOS definitions for signalized intersections are attached.

Existing Operations

Using the city-approved Traffix software, existing peak hour volumes, lane configuration, and field measured signal cycle lengths, the intersection is calculated as operating at LOS C (28 seconds of delay per vehicle) during the AM peak hour and LOS B (20 seconds of delay per vehicle) during the PM peak hour.

Traffix evaluates intersection operations in isolation and is appropriate for intersections that are not affected by traffic queues extending from adjacent intersections. Therefore, it does not reflect actual intersection operations at the subject intersection. The intersection was also evaluated using Synchro, a software package that takes into account the interaction of closely-spaced intersections. Using Synchro, the intersection is calculated as operating at LOS D (36 seconds) during the AM peak hour and LOS C (24 seconds) during the PM peak hour.

The 85th percentile queue in the southbound left-turn lane based on the Synchro output is 135 feet. The 85th percentile peak hour queue is used to determine the length of left-turn pocket storage areas. The left-turn pocket storage area could be extended to 150 feet to accommodate this queue. However, this would require removal of some of the landscaping in the median. Plus since the adjacent lane is congested, queues in that lane would block vehicles from entering it. So the operational improvements would be minimal.

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Operations with the Master Plan

The Master Plan is expected to affect the amount of traffic generated by the school. It will reduce the amount of traffic on typical days; by providing more on-site parking, more students will be allowed to drive themselves to school as opposed to having their parents drive them. This will replace two-way trips with one-way trips thus reducing the amount of outbound traffic during the AM peak hour and the amount of inbound traffic during the PM peak hour. The AM peak hour outbound trips are projected to be reduced by 65 vehicles. (Based on the proposed addition of 75 spaces, and assuming that 85 percent of them would be used by students in that one-hour period.) The PM peak hour inbound trips are estimated to be reduced by 30 trips based on the ratio of PM peak hour trips to AM peak hour trips. The intersection operations were re-evaluated with these trip reductions as presented in Table 1.

Additional school traffic reductions could result from traffic management strategies such as increased shuttle bus service, carpool matching, additional remote student drop-off and pick-up locations, and staggered start times. Fehr & Peers tested intersection operations with school traffic reduced by 5 percent to determine delay reductions. The results are presented in Table 1.

TABLE 1:
SARATOGA AVENUE/HARKER SCHOOL DRIVEWAY OPERATIONS

Scenario	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
Existing	35.8	D	24.5	C
Master Plan	28.4	C	21.4	C
With 5% School Traffic Reduction	25.1	C	18.9	B

Source: Fehr & Peers, 2011

The per vehicle average delay at the intersection is projected to be reduced with the Master Plan by approximately 3 to 7 seconds.

PEDESTRIAN ACCESS AT THE SCHOOL DRIVEWAY

Fehr & Peers identified Americans with Disabilities Act (ADA) issues on the northeast corner of Saratoga Avenue and the school driveway including the asphalt path width and pedestrian push button location. The results of our review are presented on Figures 6a, 6b, and 6c. We are including two curb ramp options, Caltrans Case G and Caltrans Case C. We prefer Case C as shown in Option B.

RECOMMENDATIONS

Our recommendations are summarized below:

1. Consider lengthening the storage area of the southbound left-turn pocket on Saratoga Avenue at the school driveway to 150 feet and consider the trade-off between the landscaping removal and minimal traffic operational improvement
2. Add pavement legends for “Harker” and “I-280 S” to the southbound left-turn lane and adjacent lane (on Saratoga Avenue at the school driveway)

3. Conduct a traffic engineering review of the new entry plaza and visitor parking area during the site design stage to ensure adequate vehicular circulation, pedestrian access and circulation, parking garage and loading dock designs, and to ensure that student drop-off and pick-up activities are accommodated
4. Provide room for nine vehicles in the student drop-off and pick-up area (unless future field studies indicate that another number is more appropriate)
5. Add a "Keep Clear" pavement legend or similar marking to ensure that vehicles do not block the garage driveway
6. Modify the northeast corner of the Saratoga Venue/Harker School driveway intersection and adjacent areas to improve pedestrian access and provide ADA accommodations per Figure 6a or 6b

CONCLUSIONS

The Master Plan will not result in traffic increases as it will not provide for increased enrollment nor will the added facilities generate traffic during the peak hours. The Master Plan is expected to decrease school-generated traffic by providing more student parking and therefore replacing some two-way trips with one-way trips.

The site plan was reviewed and there are some recommendations regarding the new entry plaza and visitor parking area including conducting a detailed traffic engineering review during the site design stage. The parking garage layout, its driveway, and the loading dock should be included in the review.

To improve operations at the intersection of Saratoga Avenue and the school driveway it is recommended that pavement legends "Harker" and "I-280 S" be added to the southbound left-turn lane and adjacent lane on Saratoga Avenue. It is also recommended that lengthening the southbound left-turn pocket to 150 feet be considered. This would entail assessing the trade-off between removing some of the landscaping in the median with the minimal traffic operational improvement since the traffic in the adjacent lane blocks vehicles from reaching the pocket.

The northeast corner of the Saratoga Venue/Harker School driveway intersection can be improved to meet ADA accommodations.

ATTACHMENTS

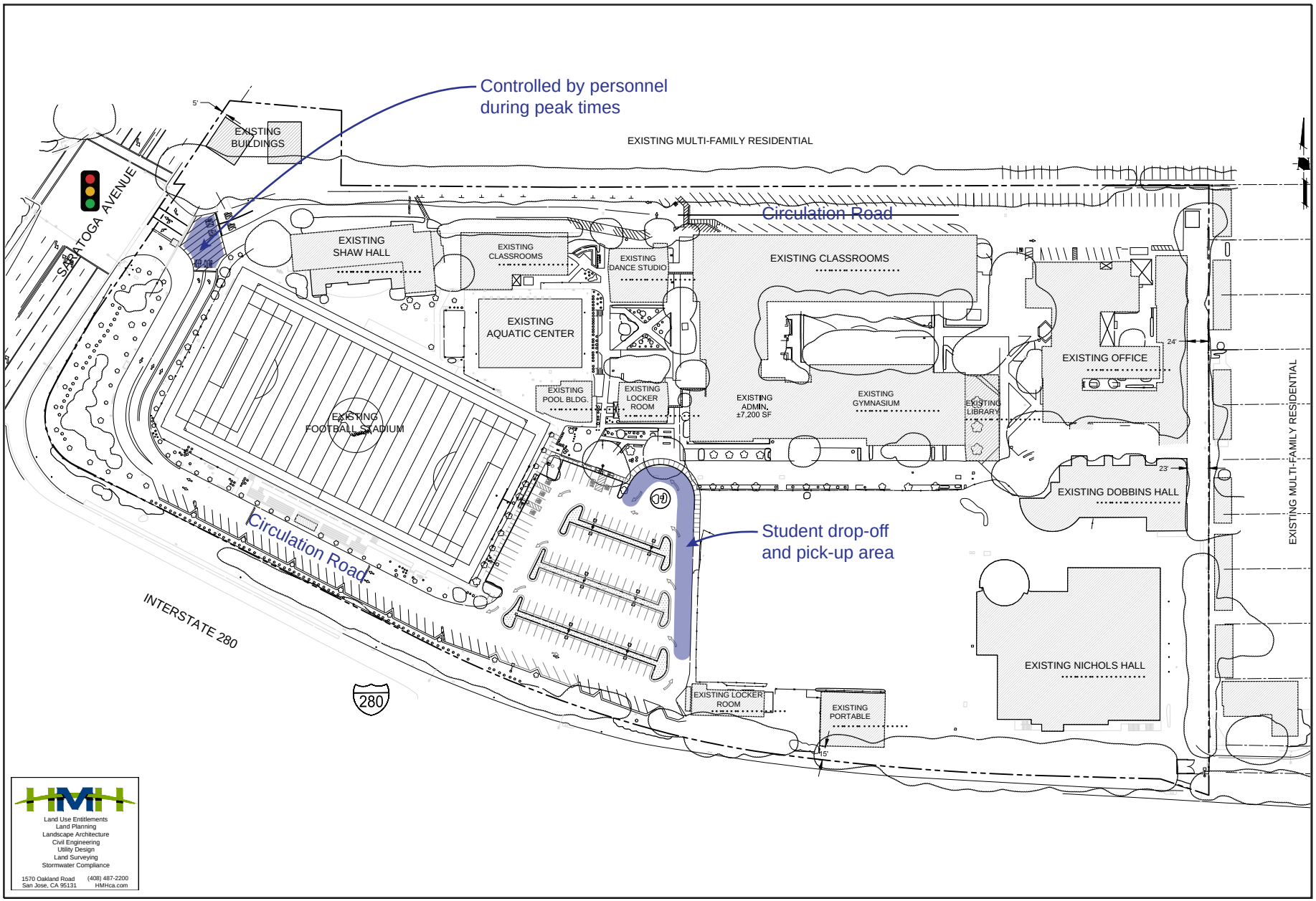
FIGURES

FEHR & PEERS

Aerial Showing School Location and Site Layout

February 2011
SJ10-1193

Figure 1



Land Use Entitlements
Land Planning
Landscape Architecture
Civil Engineering
Utility Design
Land Surveying
Stormwater Compliance

1570 Oakland Road
San Jose, CA 95131
(408) 487-2200
HMHca.com

Harker School

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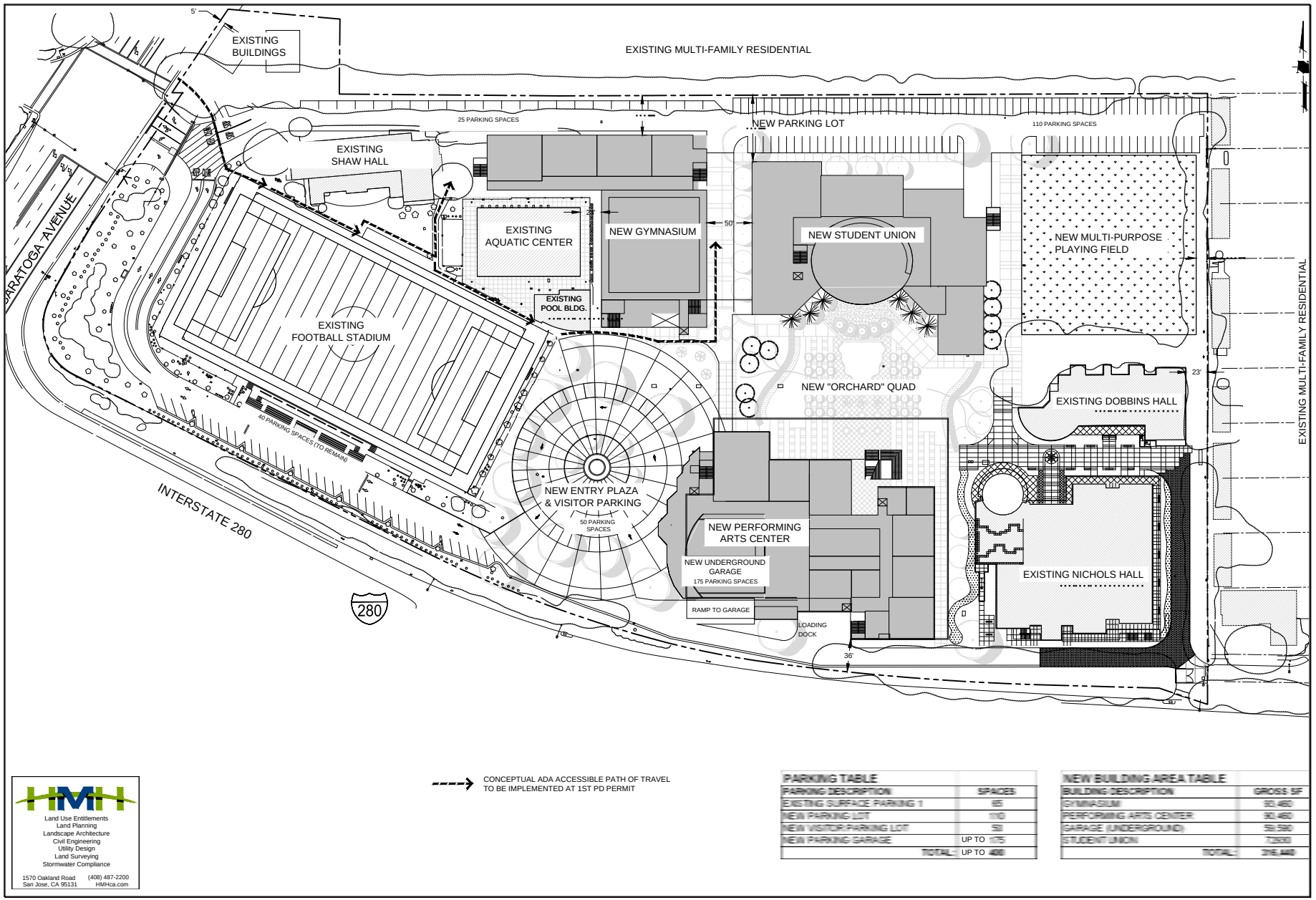
SJ10-1193

Existing Site Plan

Figure 2



HMH
Land Use Entitlements
Land Planning
Landscape Architecture
Civil Engineering
Utility Design
Land Surveying
Stormwater Compliance
1570 Oakland Road San Jose, CA 95131
(408) 487-2200 HMHca.com

CONCEPTUAL ADA ACCESSIBLE PATH OF TRAVEL TO BE IMPLEMENTED AT 1ST PD PERMIT

PARKING TABLE	
PARKING DESCRIPTION	SPACES
EXISTING SURFACE PARKING 1	65
NEW PARKING LOT	110
NEW VISITOR PARKING LOT	50
NEW PARKING GARAGE	UP TO 175
TOTAL:	UP TO 400

NEW BUILDING AREA TABLE	
BUILDING DESCRIPTION	GROSS SF
GYMNASIUM	90,460
PERFORMING ARTS CENTER	90,460
GARAGE (UNDERGROUND)	59,590
STUDENT UNION	72500
TOTAL:	316,440

Harker School

FEHR PEERS

February 2011
SJ10-1193

Master Plan Conceptual Site Plan

Figure 3

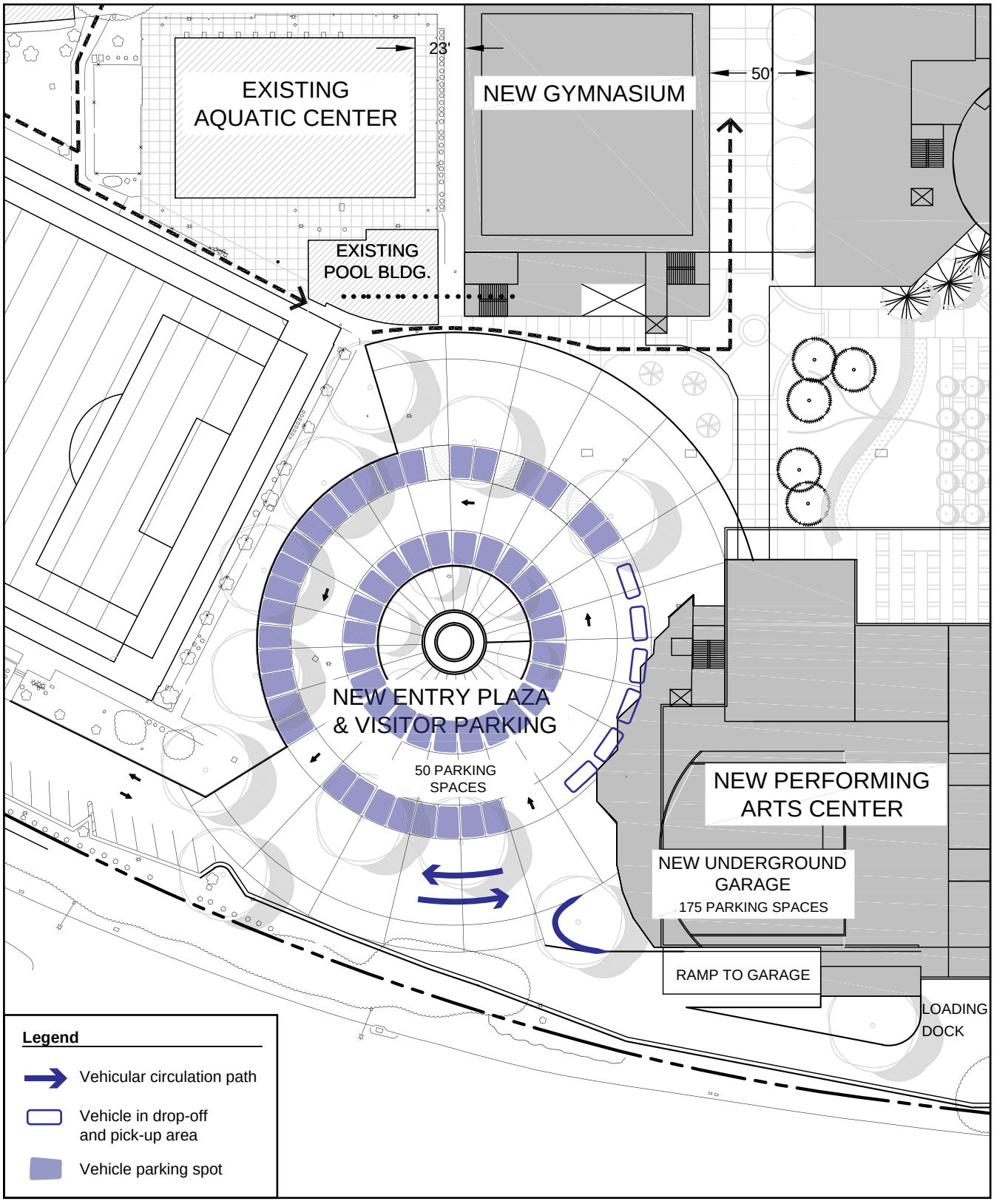
Harker School

FEHR & PEERS

Existing Student Drop-Off and Pick-Up Activities

February 2011
SJ10-1193

Figure 4



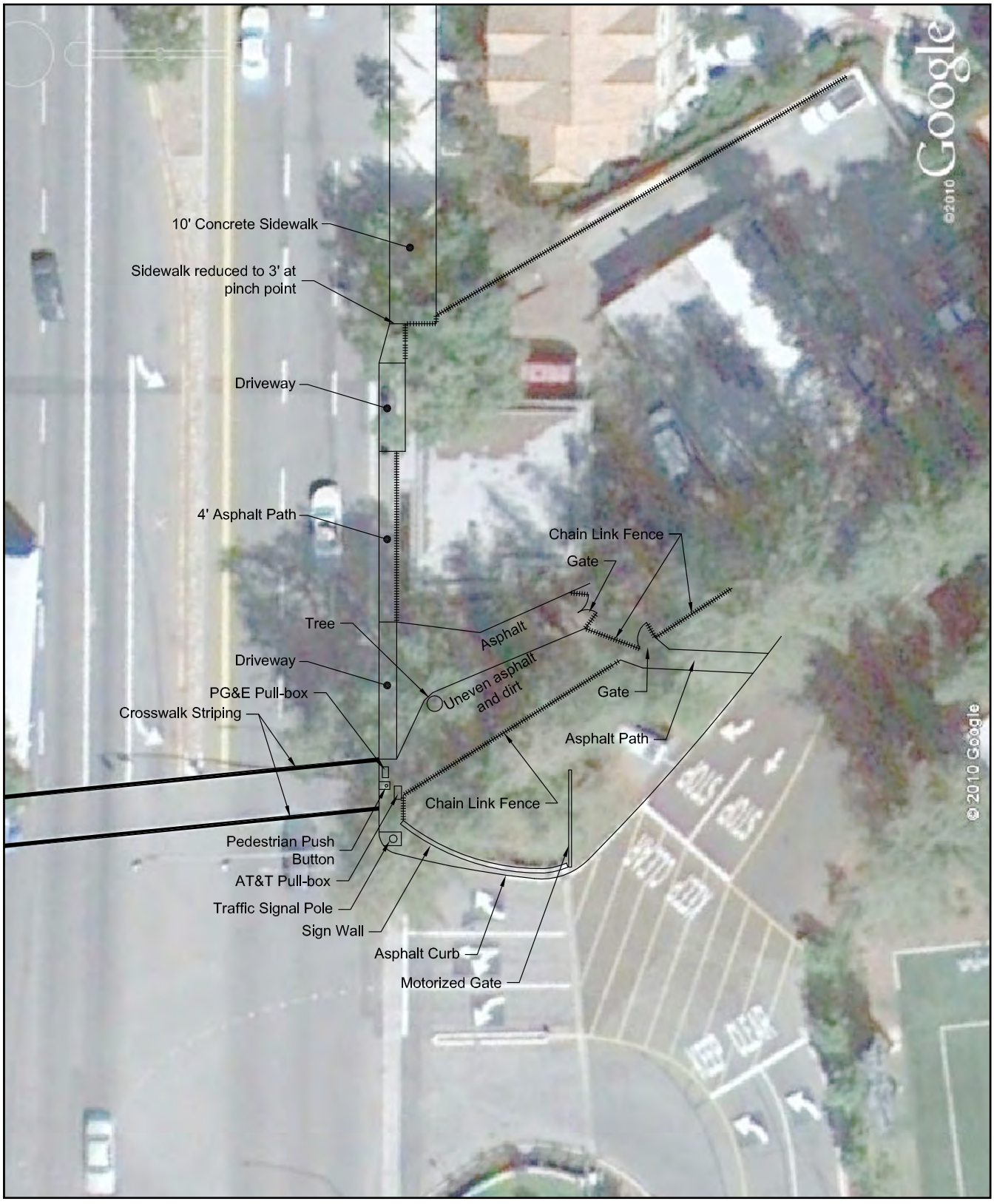
Harker School

FEHR & PEERS

February 2011
SJ10-1193

Proposed Student Drop-Off and Pick-Up Activities

Figure 5



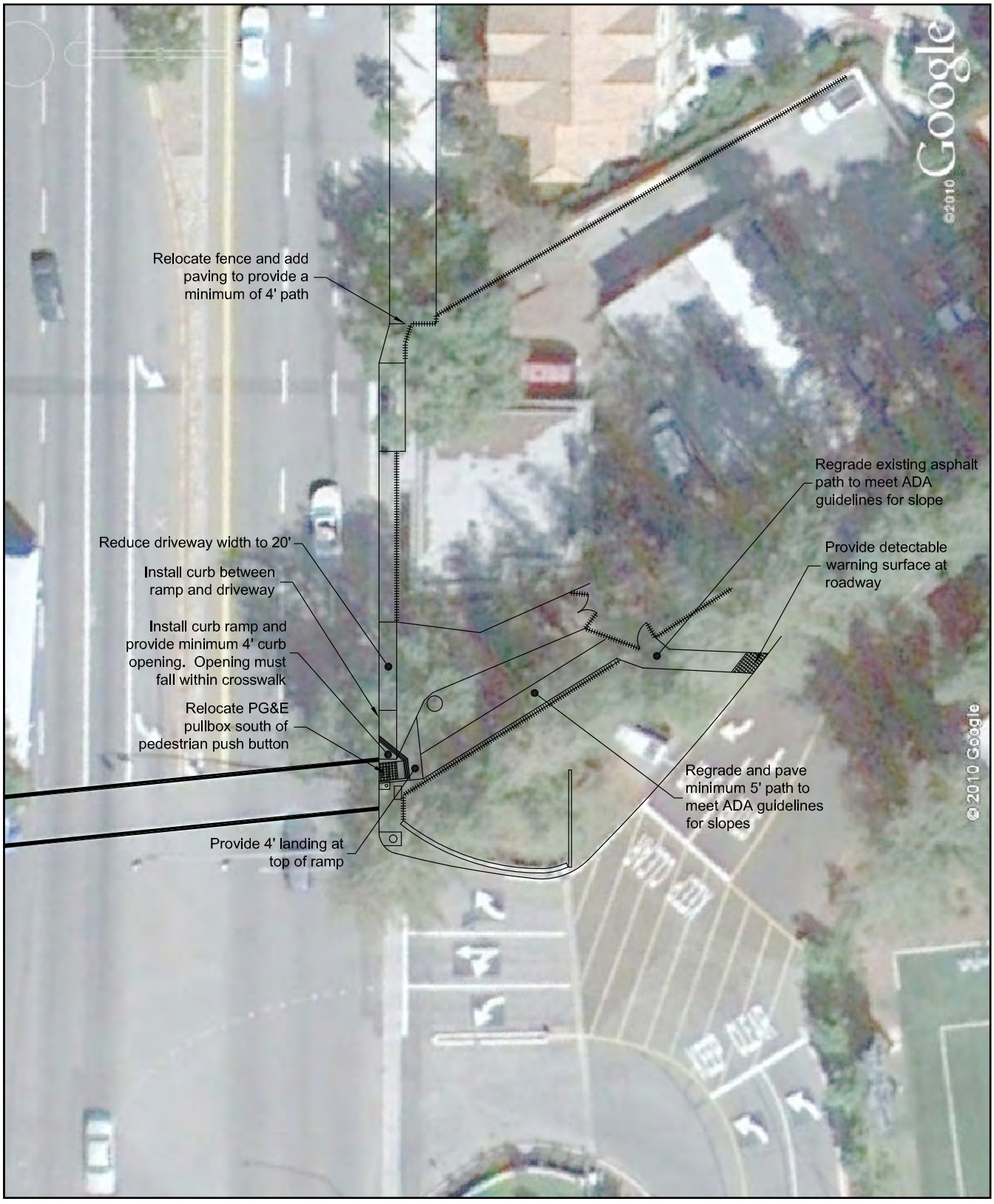
Harker School

FEHR PEERS

February 2011
SJ10-1193

Pedestrian Access at School Driveway
Existing Conditions

Figure 6a



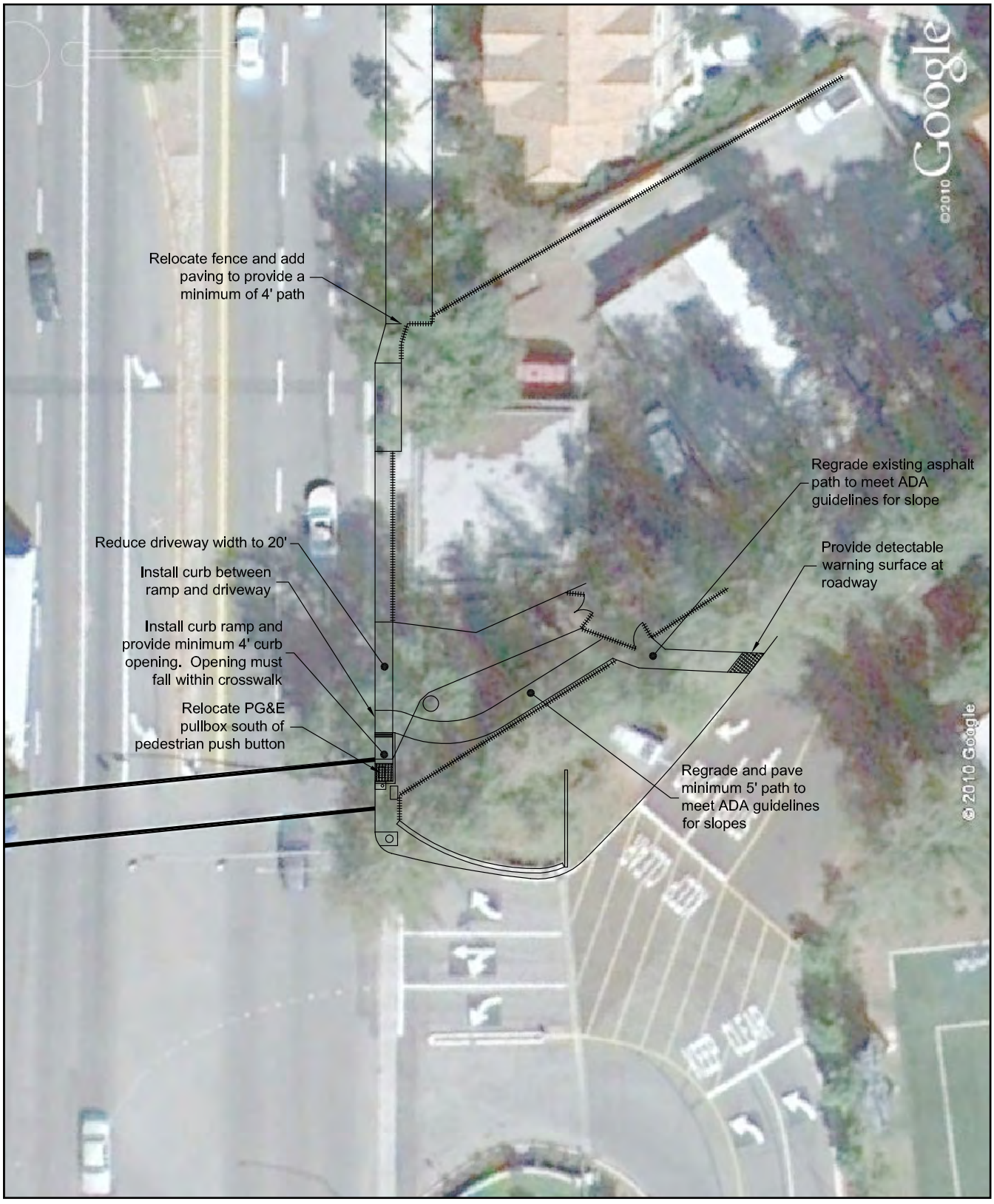
Harker School

FEHR & PEERS

February 2011
SJ10-1193

Pedestrian Access at School Driveway
Option A

Figure 6b



Harker School

FEHR & PEERS

February 2011
SJ10-1193

Pedestrian Access at School Driveway
Option B

Figure 6c

SHUTTLE BUS SCHEDULE

The Harker School Intercampus Shuttle
Daily Schedule, 2010-2011 School Year

(For internal use only)

Morning (a.m.) Shuttle Schedule (Daily)

7:20 a.m. depart Saratoga ..... 7:30 a.m. arrive at Blackford

7:35 a.m. depart Blackford ..... 7:45 a.m. arrive at Saratoga

7:50 a.m. depart Saratoga ..... 8:05 a.m. arrive at Bucknall

End of (a.m.) morning shuttle

Sports Shuttle (Tuesday, Wednesday, Friday)

Tuesday: 2:55 p.m. departs Saratoga to Blackford and Bucknall

Wednesday: 3:15 p.m. departs Saratoga to Blackford and Bucknall

Friday: 2:55 p.m. departs Saratoga to Blackford and Bucknall

(May be amended in advance for special daily schedules)

Afternoon (p.m.) Shuttle Schedule (Daily)

3:50 p.m. depart Saratoga ..... 4:00 p.m. arrive at Blackford

4:10 p.m. depart Blackford ..... 4:20 p.m. arrive at Bucknall

4:40 p.m. depart Bucknall ..... 4:50 p.m. arrive at Blackford

4:55 p.m. depart Blackford ..... 5:05 p.m. arrive at Saratoga

5:10 p.m. depart Saratoga ..... 5:20 p.m. arrive at Blackford

5:25 p.m. depart Blackford ..... 5:35 p.m. arrive at Bucknall

5:40 p.m. depart Bucknall ..... 5:55 p.m. arrive at Blackford

6:00 p.m. depart Blackford ..... 6:10 p.m. arrive at Saratoga

End of afternoon (p.m.) shuttle

The 3:50 and 5:10 shuttles from STG are designed to transport juniors parking at BLD to their vehicles. If need be, students with late practices/rehearsals at STG may utilize the 6:10 p.m. arrival there as an additional opportunity to be transported to BLD at 6:15 p.m. This will be pre-arranged through the Office of Student Affairs and communicated to the Director of Transportation.

Valid as of 5/13/2010 1:58 PM

TRAFFIC COUNTS AND QUEUE SURVEYS

Traffic Data Service
Campbell, CA
(408) 377-2988
tdsbay@cs.com

File Name : 1AM FINAL
Site Code : 00000001
Start Date : 1/12/2011
Page No : 1

Groups Printed- Vehicles

	SARATOGA AVE Southbound					HARKER SCHOOL DRIVEWAY Westbound					SARATOGA AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	74	111	4	0	189	0	0	1	0	1	27	171	140	0	338	0	0	0	0	0	528
07:15 AM	106	194	8	0	308	3	11	35	0	49	128	167	206	0	501	0	0	0	0	0	858
07:30 AM	113	223	29	0	365	23	16	123	0	162	173	189	179	0	541	0	0	0	0	0	1068
07:45 AM	93	264	28	0	385	32	33	80	0	145	155	238	132	0	525	0	0	0	0	0	1055
Total	386	792	69	0	1247	58	60	239	0	357	483	765	657	0	1905	0	0	0	0	0	3509
08:00 AM	95	249	9	0	353	26	17	50	0	93	12	343	166	0	521	0	0	0	0	0	967
08:15 AM	100	302	4	0	406	0	2	3	0	5	5	392	190	0	587	0	0	0	0	0	998
08:30 AM	122	280	3	0	405	1	0	6	0	7	9	455	143	0	607	0	0	0	0	0	1019
08:45 AM	82	235	3	0	320	0	0	2	0	2	13	453	136	0	602	0	0	0	0	0	924
Total	399	1066	19	0	1484	27	19	61	0	107	39	1643	635	0	2317	0	0	0	0	0	3908
Grand Total	785	1858	88	0	2731	85	79	300	0	464	522	2408	1292	0	4222	0	0	0	0	0	7417
Apprch %	28.7	68	3.2	0		18.3	17	64.7	0		12.4	57	30.6	0		0	0	0	0		
Total %	10.6	25.1	1.2	0	36.8	1.1	1.1	4	0	6.3	7	32.5	17.4	0	56.9	0	0	0	0	0	

	SARATOGA AVE Southbound					HARKER SCHOOL DRIVEWAY Westbound					SARATOGA AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	113	223	29	0	365	23	16	123	0	162	173	189	179	0	541	0	0	0	0	0	1068
07:45 AM	93	264	28	0	385	32	33	80	0	145	155	238	132	0	525	0	0	0	0	0	1055
08:00 AM	95	249	9	0	353	26	17	50	0	93	12	343	166	0	521	0	0	0	0	0	967
08:15 AM	100	302	4	0	406	0	2	3	0	5	5	392	190	0	587	0	0	0	0	0	998
Total Volume	401	1038	70	0	1509	81	68	256	0	405	345	1162	667	0	2174	0	0	0	0	0	4088
% App. Total	26.6	68.8	4.6	0		20	16.8	63.2	0		15.9	53.4	30.7	0		0	0	0	0		
PHF	.887	.859	.603	.000	.929	.633	.515	.520	.000	.625	.499	.741	.878	.000	.926	.000	.000	.000	.000	.000	.957

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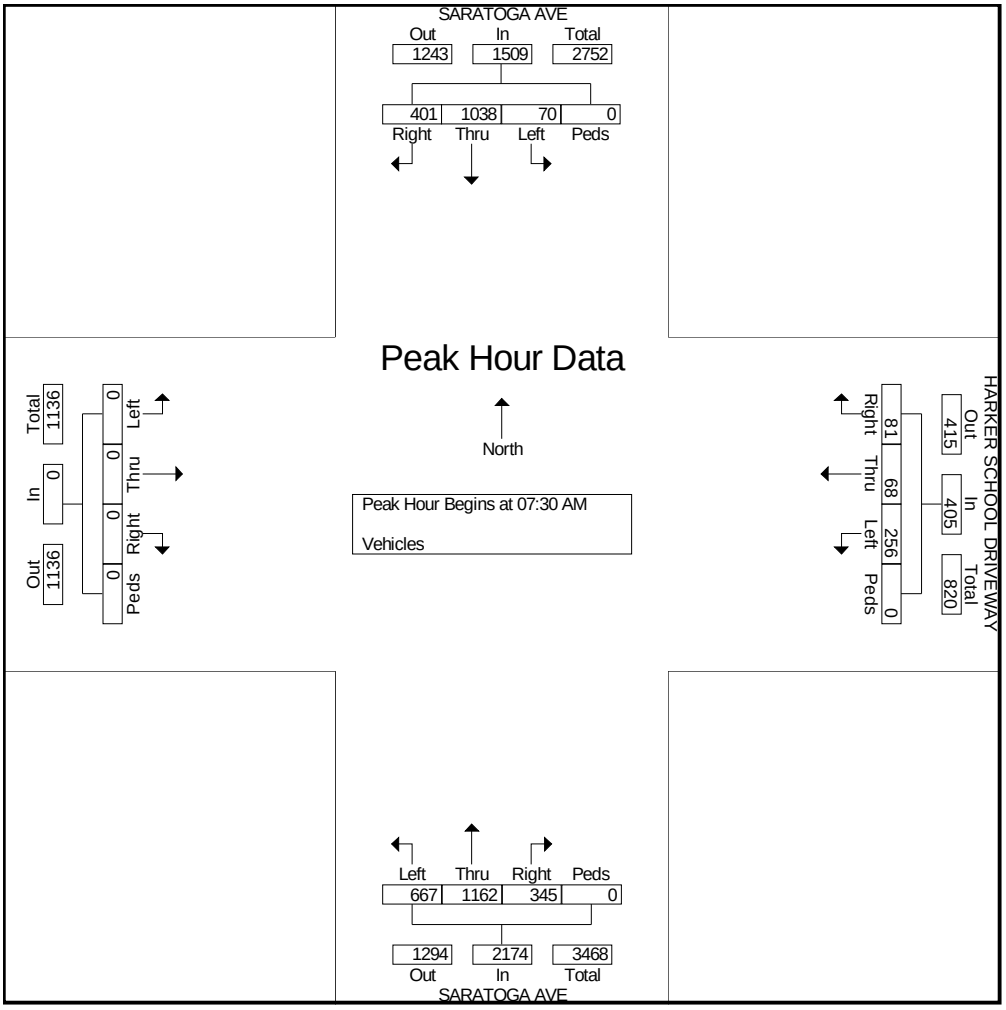

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File Name : 1PM FINAL
Site Code : 00000001
Start Date : 1/12/2011
Page No : 1

Groups Printed- Vehicles

	SARATOGA AVE Southbound					HARKER SCHOOL DRIVEWAY Westbound					SARATOGA AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	55	310	6	0	371	4	11	23	0	38	36	425	82	0	543	0	0	0	0	0	952
04:15 PM	90	365	10	0	465	6	12	21	0	39	22	493	100	0	615	0	0	0	0	0	1119
04:30 PM	91	331	6	0	428	1	10	27	0	38	20	459	76	0	555	0	0	0	0	0	1021
04:45 PM	102	385	12	0	499	8	12	15	0	35	34	461	105	0	600	0	0	0	0	0	1134
Total	338	1391	34	0	1763	19	45	86	0	150	112	1838	363	0	2313	0	0	0	0	0	4226
05:00 PM	88	414	11	0	513	7	20	32	0	59	37	451	131	0	619	0	0	0	0	0	1191
05:15 PM	82	350	9	0	441	12	24	40	0	76	32	464	80	0	576	0	0	0	0	0	1093
05:30 PM	99	342	17	0	458	7	14	23	0	44	29	493	157	0	679	0	0	0	0	0	1181
05:45 PM	59	302	27	0	388	3	10	31	0	44	39	481	111	0	631	0	0	0	0	0	1063
Total	328	1408	64	0	1800	29	68	126	0	223	137	1889	479	0	2505	0	0	0	0	0	4528
Grand Total	666	2799	98	0	3563	48	113	212	0	373	249	3727	842	0	4818	0	0	0	0	0	8754
Apprch %	18.7	78.6	2.8	0		12.9	30.3	56.8	0		5.2	77.4	17.5	0		0	0	0	0		
Total %	7.6	32	1.1	0	40.7	0.5	1.3	2.4	0	4.3	2.8	42.6	9.6	0	55	0	0	0	0	0	

	SARATOGA AVE Southbound					HARKER SCHOOL DRIVEWAY Westbound					SARATOGA AVE Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	102	385	12	0	499	8	12	15	0	35	34	461	105	0	600	0	0	0	0	0	1134
05:00 PM	88	414	11	0	513	7	20	32	0	59	37	451	131	0	619	0	0	0	0	0	1191
05:15 PM	82	350	9	0	441	12	24	40	0	76	32	464	80	0	576	0	0	0	0	0	1093
05:30 PM	99	342	17	0	458	7	14	23	0	44	29	493	157	0	679	0	0	0	0	0	1181
Total Volume	371	1491	49	0	1911	34	70	110	0	214	132	1869	473	0	2474	0	0	0	0	0	4599
% App. Total	19.4	78	2.6	0		15.9	32.7	51.4	0		5.3	75.5	19.1	0		0	0	0	0		
PHF	.909	.900	.721	.000	.931	.708	.729	.688	.000	.704	.892	.948	.753	.000	.911	.000	.000	.000	.000	.000	.965

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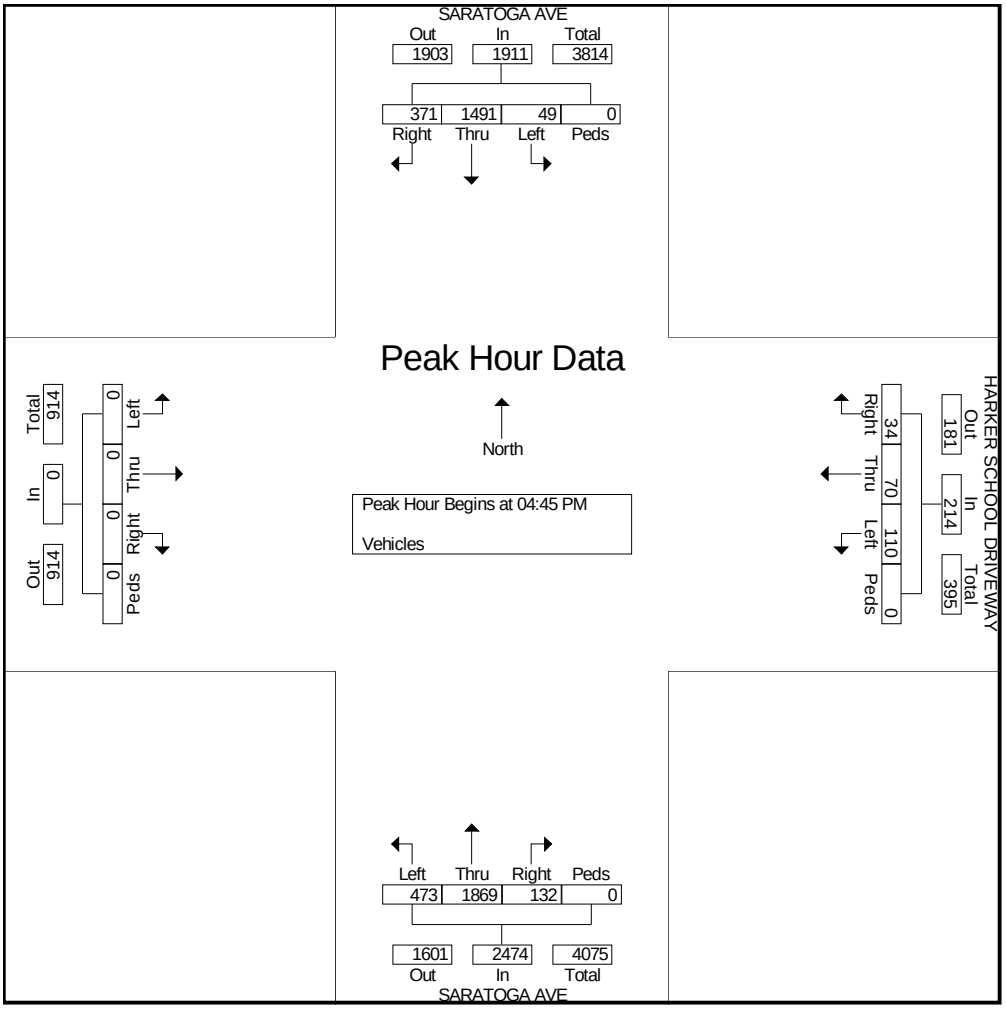

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Groups Printed- Vehicles

	Southbound					NB I-280 RAMP to NB SARATOGA AVE Westbound					Northbound					NB I-280 RAMP to SB SARATOGA AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	116	0	0	0	116	0	0	0	0	0	115	0	0	0	115	231
07:15 AM	0	0	0	0	0	119	0	0	0	119	0	0	0	0	0	111	0	0	0	111	230
07:30 AM	0	0	0	0	0	111	0	0	0	111	0	0	0	0	0	89	0	0	0	89	200
07:45 AM	0	0	0	0	0	146	0	0	0	146	0	0	0	0	0	123	0	0	0	123	269
Total	0	0	0	0	0	492	0	0	0	492	0	0	0	0	0	438	0	0	0	438	930
08:00 AM	0	0	0	0	0	100	0	0	0	100	0	0	0	0	0	120	0	0	0	120	220
08:15 AM	0	0	0	0	0	117	0	0	0	117	0	0	0	0	0	146	0	0	0	146	263
08:30 AM	0	0	0	0	0	145	0	0	0	145	0	0	0	0	0	120	0	0	0	120	265
08:45 AM	0	0	0	0	0	156	0	0	0	156	0	0	0	0	0	105	0	0	0	105	261
Total	0	0	0	0	0	518	0	0	0	518	0	0	0	0	0	491	0	0	0	491	1009
Grand Total	0	0	0	0	0	1010	0	0	0	1010	0	0	0	0	0	929	0	0	0	929	1939
Apprch %	0	0	0	0		100	0	0	0		0	0	0	0		100	0	0	0		
Total %	0	0	0	0	0	52.1	0	0	0	52.1	0	0	0	0	0	47.9	0	0	0	47.9	

	Southbound					NB I-280 RAMP to NB SARATOGA AVE Westbound					Northbound					NB I-280 RAMP to SB SARATOGA AVE Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	146	0	0	0	146	0	0	0	0	0	123	0	0	0	123	269
08:00 AM	0	0	0	0	0	100	0	0	0	100	0	0	0	0	0	120	0	0	0	120	220
08:15 AM	0	0	0	0	0	117	0	0	0	117	0	0	0	0	0	146	0	0	0	146	263
08:30 AM	0	0	0	0	0	145	0	0	0	145	0	0	0	0	0	120	0	0	0	120	265
Total Volume	0	0	0	0	0	508	0	0	0	508	0	0	0	0	0	509	0	0	0	509	1017
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.000	.000	.000	.000	.870	.000	.000	.000	.870	.000	.000	.000	.000	.000	.872	.000	.000	.000	.872	.945

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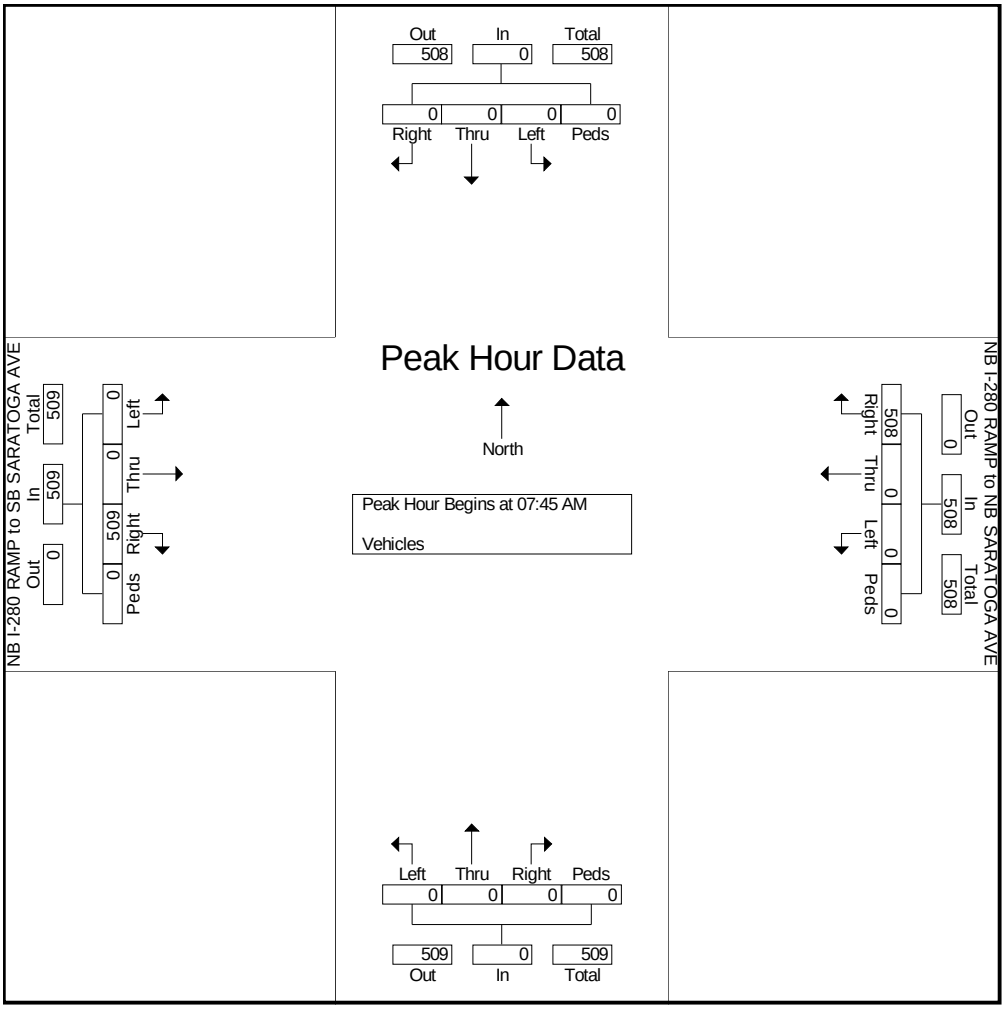

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File Name : 2PM FINAL
Site Code : 00000002
Start Date : 1/12/2011
Page No : 1

Groups Printed- Vehicles

	Southbound					NB I-280 RAMP TO NB SARATOGA AV Westbound					Northbound					NB I-280 RAMP TO SB SARATOGA AV Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	0	0	0	0	0	193	0	0	0	193	0	0	0	0	0	171	0	0	0	171	364
04:15 PM	0	0	0	0	0	205	0	0	0	205	0	0	0	0	0	252	0	0	0	252	457
04:30 PM	0	0	0	0	0	206	0	0	0	206	0	0	0	0	0	225	0	0	0	225	431
04:45 PM	0	0	0	0	0	197	0	0	0	197	0	0	0	0	0	346	0	0	0	346	543
Total	0	0	0	0	0	801	0	0	0	801	0	0	0	0	0	994	0	0	0	994	1795
05:00 PM	0	0	0	0	0	209	0	0	0	209	0	0	0	0	0	283	0	0	0	283	492
05:15 PM	0	0	0	0	0	243	0	0	0	243	0	0	0	0	0	277	0	0	0	277	520
05:30 PM	0	0	0	0	0	259	0	0	0	259	0	0	0	0	0	242	0	0	0	242	501
05:45 PM	0	0	0	0	0	219	0	0	0	219	0	0	0	0	0	243	0	0	0	243	462
Total	0	0	0	0	0	930	0	0	0	930	0	0	0	0	0	1045	0	0	0	1045	1975
Grand Total	0	0	0	0	0	1731	0	0	0	1731	0	0	0	0	0	2039	0	0	0	2039	3770
Apprch %	0	0	0	0		100	0	0	0		0	0	0	0		100	0	0	0		
Total %	0	0	0	0	0	45.9	0	0	0	45.9	0	0	0	0	0	54.1	0	0	0	54.1	

	Southbound					NB I-280 RAMP TO NB SARATOGA AV Westbound					Northbound					NB I-280 RAMP TO SB SARATOGA AV Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	197	0	0	0	197	0	0	0	0	0	346	0	0	0	346	543
05:00 PM	0	0	0	0	0	209	0	0	0	209	0	0	0	0	0	283	0	0	0	283	492
05:15 PM	0	0	0	0	0	243	0	0	0	243	0	0	0	0	0	277	0	0	0	277	520
05:30 PM	0	0	0	0	0	259	0	0	0	259	0	0	0	0	0	242	0	0	0	242	501
Total Volume	0	0	0	0	0	908	0	0	0	908	0	0	0	0	0	1148	0	0	0	1148	2056
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		100	0	0	0		
PHF	.000	.000	.000	.000	.000	.876	.000	.000	.000	.876	.000	.000	.000	.000	.000	.829	.000	.000	.000	.829	.947

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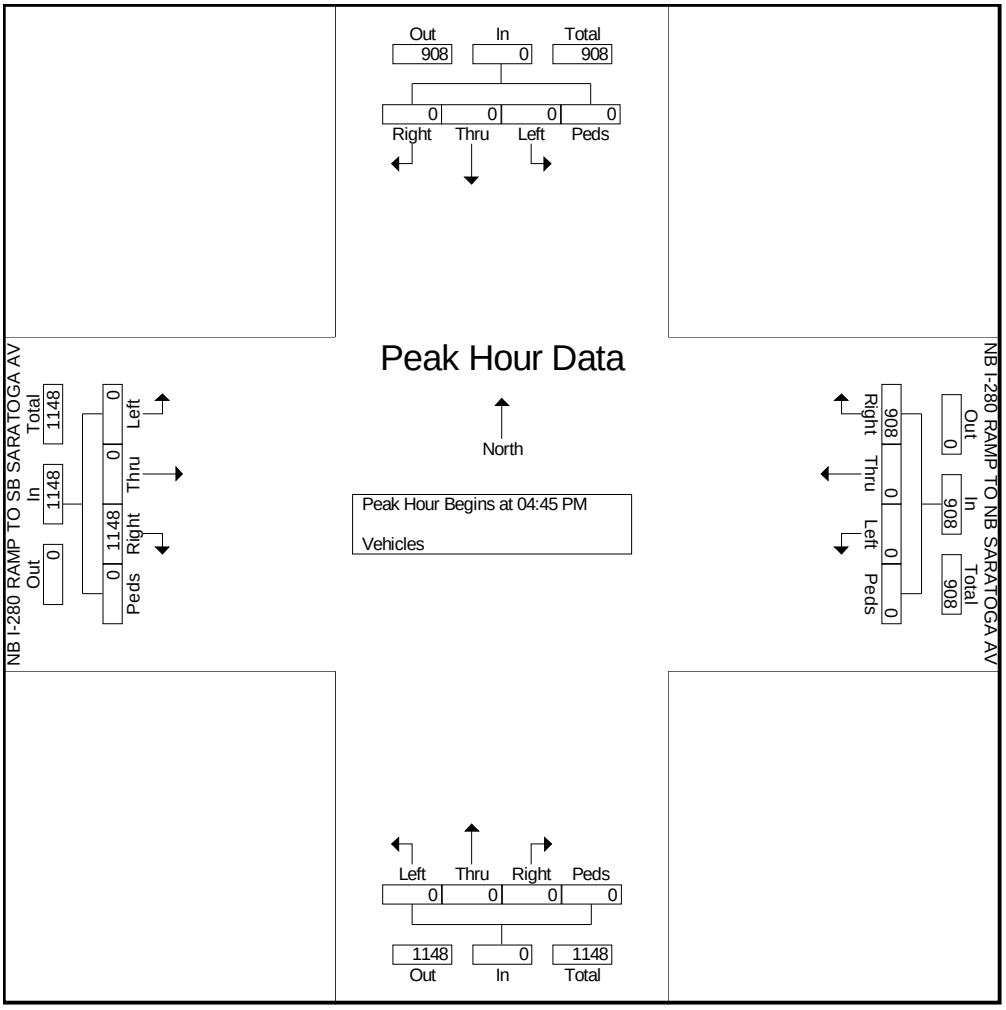
Start Date : 1/12/2011
Page No : 2



SARATOGA AVE - HARKER SCHOOL DRIVEWAY
January 12, 2011

AM

I-280 NB RAMP	
OVERFLOW TIME	CLEAR TIME
7:45	7:49
7:54	7:57

PM

I-280 NB RAMP	
OVERFLOW TIME	CLEAR TIME
4:06	4:08
4:17	4:23
4:38	4:40
4:44	4:44
4:55	4:56
5:00	5:04
5:08	5:08
5:15	5:25
5:26	5:31
5:31	5:41
5:45	5:50
5:53	-

AM

SARATOGA AVE SBL QUEUE COUNTS	
TIME	# IN QUEUE
7:01	1
7:04	1
7:07	1
7:12	1
7:15	2
7:23	2
7:26	4
7:29	4
7:31	3
7:34	4
7:37	5
7:40	6
7:42	7+
7:45	7+
7:47	4
7:50	4
7:53	6
7:55	4
7:58	2
8:01	1
8:04	7+
8:11	1
8:21	2
8:24	1
8:27	1
8:29	1
8:40	1
8:43	1
8:45	1
8:48	1
8:51	1
8:56	1

PM

SARATOGA AVE SBL QUEUE COUNTS	
TIME	# IN QUEUE
4:03	1
4:06	1
4:11	3
4:13	1
4:16	3
4:19	2
4:24	1
4:27	1
4:35	2
4:38	2
4:40	2
4:46	2
4:48	3
4:51	1
4:54	2
4:56	2
4:59	1
5:02	3
5:04	1
5:07	2
5:09	2
5:12	1
5:15	2
5:20	2
5:23	2
5:26	4
5:31	2
5:33	3
5:36	5
5:39	1
5:41	3
5:44	4
5:47	4
5:49	3
5:52	7+
5:55	7+
5:58	6

INTERSECTION LEVEL OF SERVICE DEFINITIONS AND CALCULATIONS

TABLE 1
SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	≤ 10.0
B+	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 12.0
B		12.1 to 18.0
B-		18.1 to 20.0
C+	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 23.0
C		23.1 to 32.0
C-		32.1 to 35.0
D+	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 39.0
D		39.1 to 51.0
D-		51.1 to 55.0
E+	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	55.1 to 60.0
E		60.1 to 75.0
E-		75.1 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Traffic Level of Service Analysis Guidelines*, VTA Congestion Management Program, March 2009; *Highway Capacity Manual*, Transportation Research Board, 2000.

SIMTRAFFIC LEVEL OF SERVICE REPORT
Including Upstream Delays

Project: *The Harker School Master Plan Transp Analysis* ***HCM:*** *2000*
Scenario: *Existing AM* ***PHF:*** *0.96*
TOD: *07:30AM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *1*

Intersection: *1: NB 280 On-Ramp & Saratoga Ave.* ***Type:*** *Signalized*

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	695	470	68	0	43.9	D	--
	T	1210	990	82	0	17.7	B	--
	R	359	270	75	0	14.2	B	--
	Subtotal	**2265**	**1730**	**76**	**--**	**24.3**	**C**	**--**
SB	L	73	65	89	0	110.0	F	--
	T	1081	1080	100	0	50.7	D	--
	R	418	377	90	0	9.7	A	--
	Subtotal	**1572**	**1522**	**97**	**--**	**43.1**	**D**	**--**
WB	L	267	251	94	0	77.5	E	--
	T	71	56	79	0	31.4	C	--
	R	84	88	105	0	22.1	C	--
	Subtotal	**422**	**395**	**94**	**--**	**58.6**	**E**	**--**
	Total	**4258**	**3647**	**86**	**--**	**35.8**	**D**	**--**

SIMTRAFFIC LEVEL OF SERVICE REPORT
Including Upstream Delays

Project: *The Harker School Master Plan Transp Analysis* ***HCM:*** *2000*
Scenario: *Existing PM* ***PHF:*** *0.96*
TOD: *04:45PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *1*

Intersection: *1: NB 280 On-Ramp & Saratoga Ave.* ***Type:*** *Signalized*

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	493	420	85	0	50.5	D	--
	T	1947	1831	94	0	22.4	C	--
	R	138	141	102	0	19.3	B	--
	Subtotal	**2577**	**2392**	**93**	**--**	**27.2**	**C**	**--**
SB	L	51	37	73	0	66.3	E	--
	T	1553	1492	96	0	20.1	C	--
	R	386	354	92	0	9.0	A	--
	Subtotal	**1991**	**1883**	**95**	**--**	**18.9**	**B**	**--**
WB	L	115	109	95	0	47.9	D	--
	T	73	75	103	0	44.5	D	--
	R	35	30	86	0	35.3	D	--
	Subtotal	**223**	**214**	**96**	**--**	**44.9**	**D**	**--**
	Total	**4791**	**4489**	**94**	**--**	**24.5**	**C**	**--**

SIMTRAFFIC LEVEL OF SERVICE REPORT
Including Upstream Delays

Project: *The Harker School Master Plan Transp Analysis* ***HCM:*** *2000*
Scenario: *Existing with Master Plan* ***PHF:*** *0.96*
TOD: *07:30AM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *1*

Intersection: *1: NB 280 On-Ramp & Saratoga Ave.* ***Type:*** *Signalized*

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	695	479	69	0	35.4	D	--
	T	1210	965	80	0	14.0	B	--
	R	359	279	78	0	11.4	B	--
	Subtotal	**2265**	**1723**	**76**	**--**	**19.5**	**B**	**--**
SB	L	73	71	97	0	83.2	F	--
	T	1081	1085	100	0	41.8	D	--
	R	418	387	93	0	11.6	B	--
	Subtotal	**1572**	**1543**	**98**	**--**	**36.1**	**D**	**--**
WB	L	224	218	97	0	44.4	D	--
	T	59	67	114	0	37.7	D	--
	R	71	67	94	0	16.5	B	--
	Subtotal	**354**	**352**	**99**	**--**	**37.8**	**D**	**--**
	Total	**4191**	**3618**	**86**	**--**	**28.4**	**C**	**--**

SIMTRAFFIC LEVEL OF SERVICE REPORT
Including Upstream Delays

Project: *The Harker School Master Plan Transp Analysis* ***HCM:*** *2000*
Scenario: *Existing with Master Plan* ***PHF:*** *0.96*
TOD: *04:45PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *1*

Intersection: *1: NB 280 On-Ramp & Saratoga Ave.* ***Type:*** *Signalized*

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	493	396	80	0	46.0	D	--
	T	1947	1797	92	0	20.6	C	--
	R	138	113	82	0	19.0	B	--
	Subtotal	**2577**	**2306**	**89**	**--**	**24.9**	**C**	**--**
SB	L	51	36	71	0	59.2	E	--
	T	1553	1489	96	0	15.9	B	--
	R	386	358	93	0	8.0	A	--
	Subtotal	**1991**	**1883**	**95**	**--**	**15.2**	**B**	**--**
WB	L	99	108	109	0	38.9	D	--
	T	63	75	121	0	41.0	D	--
	R	30	26	87	0	34.4	C	--
	Subtotal	**192**	**209**	**109**	**--**	**39.1**	**D**	**--**
	Total	**4759**	**4398**	**92**	**--**	**21.4**	**C**	**--**

SIMTRAFFIC LEVEL OF SERVICE REPORT
Including Upstream Delays

Project: *The Harker School Master Plan Transp Analysis* ***HCM:*** *2000*
Scenario: *Existing with Master Plan (5% Red)* ***PHF:*** *0.96*
TOD: *07:30AM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *1*

Intersection: *1: NB 280 On-Ramp & Saratoga Ave.* ***Type:*** *Signalized*

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	695	446	64	0	38.6	D	--
	T	1210	957	79	0	15.4	B	--
	R	342	261	76	0	11.8	B	--
	Subtotal	**2247**	**1664**	**74**	**--**	**21.1**	**C**	**--**
SB	L	70	64	91	0	74.5	E	--
	T	1081	1068	99	0	31.3	C	--
	R	418	452	108	0	9.3	A	--
	Subtotal	**1569**	**1584**	**101**	**--**	**26.8**	**C**	**--**
WB	L	213	219	103	0	43.5	D	--
	T	56	55	98	0	41.5	D	--
	R	68	90	132	0	16.3	B	--
	Subtotal	**336**	**364**	**108**	**--**	**36.5**	**D**	**--**
	Total	**4152**	**3612**	**87**	**--**	**25.1**	**C**	**--**

SIMTRAFFIC LEVEL OF SERVICE REPORT
Including Upstream Delays

Project: *The Harker School Master Plan Transp Analysis* ***HCM:*** *2000*
Scenario: *Existing with Master Plan (5% Red)* ***PHF:*** *0.96*
TOD: *04:45PM* ***Analysis Period:*** *Hourly* ***# of Runs:*** *1*

Intersection: *1: NB 280 On-Ramp & Saratoga Ave.* ***Type:*** *Signalized*

Approach	Movement	Demand Volume	Volume Served			Delay/Veh (sec)		
			Avg	%	Std Dev	Avg	LOS	Std Dev
NB	L	493	439	89	0	40.1	D	--
	T	1947	1855	95	0	13.8	B	--
	R	130	137	105	0	13.9	B	--
	Subtotal	**2570**	**2431**	**95**	**--**	**18.6**	**B**	**--**
SB	L	49	43	88	0	55.8	E	--
	T	1553	1442	93	0	17.6	B	--
	R	386	358	93	0	10.1	B	--
	Subtotal	**1989**	**1843**	**93**	**--**	**17.0**	**B**	**--**
WB	L	94	93	99	0	45.2	D	--
	T	59	60	102	0	45.9	D	--
	R	29	29	100	0	29.1	C	--
	Subtotal	**182**	**182**	**100**	**--**	**42.9**	**D**	**--**
	Total	**4741**	**4456**	**94**	**--**	**18.9**	**B**	**--**