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APPENDIX F

HYDROLOGY AND WATER QUALITY

**THE SAN JOSE FLEA MARKET
MIXED USE DEVELOPMENT**

**FLOODING AND DRAINAGE
EVALUATION**

PREPARED FOR
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September 2005

THE SAN JOSE FLEA MARKET MIXED USE DEVELOPMENT FLOODING AND DRAINAGE EVALUATION

INTRODUCTION

The objective of this study is to describe the existing flood and drainage conditions at the proposed San Jose Flea Market mixed use development project, the potential project constraints, and the potential impacts of the proposed project. The project area includes Upper Penitencia Creek and is adjacent to Coyote Creek. Portions of the project are subject to flooding from Upper Penitencia Creek.

PROJECT DESCRIPTION

The proposed San Jose Flea Market Mixed Use Development is a planned development zoning application for approximately 120 acres located in San Jose, California. The project is proposed on the site of the San Jose Flea Market, which is located on both sides of Berryessa Road, east of Coyote Creek, and north of Mabury Road. The planned development would include the development of a total of 1,500,000 square feet of business uses, and up to 2855 residential units. The proposed project would also include 32.5 acres of public park/open space and 3.0 acre public school site.

EXISTING SETTING

The Upper Penitencia Creek watershed is located in the northeast part of Santa Clara County, California, near the southern end of San Francisco Bay. The watershed lies in and adjacent to the eastern part of the city of San Jose and extends northward into the city of Milpitas. The total watershed area is about 24 square miles, or 15,300 acres.

Upper Penitencia Creek is a tributary of Coyote Creek. Coyote Creek originates in the mountains of the Diablo Range northeast of Morgan Hill. After leaving the mountains, it flows northwesterly along the floor of the Santa Clara Valley to San Francisco Bay, a distance of about 30 miles. Upper Penitencia Creek joins it about 10 miles from the bay. Coyote Creek's drainage area, above the point where it enters the bay, is 229 square miles.

The Diablo Range borders the east side of the Santa Clara Valley. The boundary between the mountains and the alluvial plain that forms the valley floor is quite sharply defined. Flows coming out of the mountains must cross this alluvial plain to reach Coyote Creek. At Upper Penitencia Creek the distance from the - mountains to Coyote Creek is about three and a half miles.

Elevations in the Upper Penitencia Creek watershed range from nearly 3,000 feet above mean sea level in the upper watershed, to 280 feet at Dorel Drive near the base of the mountains, to 80 feet at the junction of Upper Penitencia and Coyote Creeks. The upper watershed, upstream of Dorel Drive, occupies about 21 square miles and includes Upper Penitencia Creek and its principal tributary, Arroyo Aguague. The topography is rugged and vigorously youthful.

Canyons are deep and narrow, with little or no flat land along their bottoms. Slopes are steep and landslides are numerous.

The bedrock in the hills consists primarily of sandstones, shales, conglomerates, and limestones. Soils are the residual soils toned from these rocks and include the moderately well- drained clay barns of the Altamont-Azule association and the well-drained barns of the Los Gatos-Gaviota-Vallecitos association.

Vegetative cover includes grassland and brushland on the upper parts of the hills and woodland in the steep valleys. The land use is primarily range and recreation. There is little urban development in the upper watershed.

The area below Dorel Drive contrasts sharply with the upper watershed. The creek emerges from the hills at the top of an alluvial fan that merges with other fans to form the plains that border San Francisco Bay. The soils in the lower watershed can be divided into three groups, based primarily on their position on the fan.

On the upper part of the fan one will find Yolo loam and Garretson gravelly loam. The latter is restricted to stream benches along the channel. These soils are well drained and have slopes up to 5 percent. On the lower edges of the fan are Cropley clay and Yolo silty loam, well-drained soils with slopes up to 2 percent. Farther down, in a north-south band along the east side of Coyote Creek, are the Campbell silty clay and silty clay loam. These are somewhat poorly drained soils with slopes of 0 to 2 percent, found on valley bottom areas and alluvial plains.

Most of the lower watershed was once in agricultural uses, particularly orchards, truck drops and cut flowers. This has given way almost entirely to urban uses. Undeveloped land is now limited to a few scattered parcels still used for agriculture, and the corridor along portions of Upper Penitencia Creek.

The climate is one of mild, dry summers and cool, wet winters. Temperature extremes range from about 20 to 100 degrees Fahrenheit. Average winter lows are in the middle 30's, while the summer highs average in the 80's. Average annual rainfall ranges from 14 inches in the lower watershed to 18 inches in the mountains. Ninety percent of the rainfall occurs from November through March.

Flow in Upper Penitencia Creek is classified as intermittent, which means that the creek is normally dry or nearly dry during the summer months. Low flows are partially regulated by Cherry Flat Reservoir, a 500-acre-foot reservoir located about 5 miles upstream of Dorel Drive.

The Santa Clara Valley Water District (SCVWD) operates a number of percolation ponds to recharge the local ground water. Three ponds are located adjacent to the creek downstream of Noble Avenue, and another is between Interstate 680 and King Road. The SCVWD diverts from the creek and imports water through a pipeline to supply the ponds. The SCVWD also releases water into the creek, to be infiltrated into the streambed. This imported water augments the natural flow in the creek between Noble Avenue and King Road. Farther downstream the creek is usually dry during the summer.

For the most part, the vegetation along the creek has been preserved as development has occurred. Upstream of Dorel Drive there has been little development along the creek. Through the urbanized area, the creek supports an extensive stand of trees and other riparian vegetation along both banks, interrupted in only a few places. The creek is one of the few remaining riparian corridors connecting the mountains of the Diablo Range with Coyote Creek.

The creek is in public ownership for much of its length. In the upper watershed it flows for about three miles through the City of San Jose Alum Rock Park. The reach between Dorel Drive and King Road is commonly known as Penitencia Creek Park. It combines lands owned by the County of Santa Clara, the City of San Jose, the SCVWD, and various school districts. The portion owned by the SCVWD was acquired for a flood control right-of-way. The water district also has a flood control easement on the reach downstream of King Road.

FLOOD HISTORY

Perhaps the largest flood of the century on Penitencia Creek occurred in 1911. No stream gauge data exists for that flood and a recurrence interval has therefore never been assigned to it. Estimates of dollar damages are also unavailable. The flood was described in a local newspaper on March 7, 1911:

“Penitencia Creek had evidently overflowed its banks for its entire length between the mouth of Alum Rock Canyon and the Coyote Creek. At Capitol Avenue...water stood three feet...

“Two bridges in the canyon were carried away, a railroad bridge below the tunnel which went out sometime Sunday night and a railroad bridge...was torn loose yesterday.’

More recent floods have occurred in 1955, 1958, 1962, 1963, 1973, 1980, 1982, 1983, 1986, 1995, and 1998. The largest recorded flood occurred in 1958 and had a peak flow of 2,100 cubic feet per second (cfs). This flow approximates a 13-year event. The 1982 flood is the only one of these for which damage estimates are available. The SCVWD reports that it caused between \$1 and \$2 million in damages. This flood was approximately a 10-year event.

According to the U.S. Army Corps of Engineers’ (Corps) 1995 reconnaissance report, 4,300 buildings are located in the flood-prone area including portions of the cities of San Jose and Milpitas. In the event of a 1 percent or 100-year flood, almost half of the buildings would have water entering the first floor and damages would exceed \$121 million.

Upper Penitencia Creek is a well-defined, entrenched channel where it leaves the mountainous area near Dorel Avenue. Between Dorel Avenue and Piedmont Road its capacity is estimated to be approximately 1,000 cfs. From Piedmont Road through the culvert at Penitencia Creek Road the capacity is estimated to be close to 2,000 cfs. As the creek continues down the alluvial fan and across the urbanized valley floor, its capacity decreases to about 500 cfs near King Road.

FLOOD CONDITIONS

Upper Penitencia Creek was studied in detail for the Flood Insurance Study for the City of San Jose, revised August 17, 1998. The majority of the project site is located within Special Flood Hazard Areas (SFHA) designated by the Federal Emergency Management Agency (FEMA) and shown on the effective Flood Insurance Rate Maps (FIRMs) for the City of San Jose (Community No. 060349, Panels 0014E and 0019E, Revised December 16, 1998). The effective FIRMs show water ponded (Zone AH) to an elevation of 79 feet (NGVD 29) on the north side of Berryessa Road and to an elevation of 81 feet on the south side of Berryessa Road.

Based on the original hydrology and hydraulic information from the flood study analysis, the estimated flood elevations on the project site were based on potential worst case conditions and do not represent the current conditions on the site. The ponded elevation of 81 feet south of Upper Penitencia Creek was based on the maximum water surface elevation in the channel upstream of the existing access road bridge and assumes no flood water could return to the

channel downstream of the access road due to buildings and obstructions adjacent to the channel. The analysis also assumes that no flood water would flow into Coyote Creek along the southwest side of the property although the water level would be three to four feet above the channel bank. In addition, there is an access ramp from the flea market site into the Coyote Creek channel which would allow flow off the site into Coyote Creek.

Based on the existing channel capacity and flows in the channel at the UPRR upstream of the project site, the existing 100-year flood condition on the site south of the creek would contain approximately 1000 cfs in the Upper Penitencia Creek channel, and approximately 400 cfs would flow through the project site from near the railroad toward Coyote Creek as shallow sheetflow. The maximum depths on the site would be near one foot. The extent of the 100-year flooding on the site would depend on the location of the overflow from the creek downstream of the UPRR. There is an existing soundwall along the railroad right of way which may contain flood flows within the channel downstream to Berryessa Road upstream of the existing access road bridge.

The portion of the project site north of Berryessa Road is subject to shallow 100-year flooding from Upper Penitencia Creek upstream of the UPRR. Approximately, 480 cfs was estimated to flow over the UPRR north of Berryessa Road and enter the northern portion of the project site from the existing development area to the east. Approximately half of the northern portion of the site is shown as a shallow ponding area on the flood insurance rate maps with an estimated water surface elevation of 79 feet. Based on the existing elevations on the northern portion of the site, the maximum depths would be three to four feet along the back of Coyote Creek to the southwest, decreasing to less than one foot deep at the eastern property line. The estimated ponding elevation on the site and the limited portion of the site included in the flood plain may have been due to concrete traffic barriers on the site and along Coyote Creek. Based on the effective flood insurance study, the water surface elevation within Coyote Creek are below the existing top of bank elevations within the project site.

FLOOD PROTECTION PROJECT

The U.S. Army Corps of Engineers (Corps), in conjunction with the Santa Clara Valley Water District (SCVWD) is working to develop a flood management plan for Upper Penitencia Creek.

A previous plan for Upper Penitencia Creek was prepared by the SCVWD, assisted by the US Soil Conservation Service in 1988. The proposed project for the lower portion of Upper Penitencia Creek, starting just upstream of King Road and ending at the confluence with Coyote Creek was to divert high flows into a 2,500 foot long underground bypass channel that would outfall directly to Coyote Creek upstream of its confluence with Upper Penitencia Creek. The bypass project was designed to provide flood protection from a 100-year flood event (1 percent flood). The proposed project was not constructed.

The Corps is continuing to evaluate alternatives that would provide cost-effective flood protection in an environmentally sensitive nature. The Corps is currently preparing a feasibility study and environmental impact statement that is scheduled for completion by summer 2006. Over the past year, San Jose and the SCVWD staff have been meeting with local, state and

federal agencies, as well as other interested stakeholders, and have developed recommendations for future actions in the Upper Penitencia project area.

The currently preferred alternative is a widened channel alternative. The staff preferred alternative has not been adopted by the SCVWD Board of Directors and the Corps is expected to report on their final recommendation of a project plan in 2005.

Under the 100-year channel and floodplain alternative, the present earth channel alignment from King Road to Coyote Creek in Reach 1 would be widened, along with floodwalls to control a peak flow for a 100-year flood event of 4,800 cfs. The project would require a 200-foot wide corridor on the south side of Berryessa Road.

EXISTING DRAINAGE CONDITIONS

The project area is served by underground storm drain systems which discharge to both Coyote Creek and Upper Penitencia Creek. The existing land use on the site includes extensive buildings, pavement and parking lots. The existing site is estimated to be more than 95 percent pavement which drains to the stream channels.

POTENTIAL PROJECT IMPACTS

The proposed Flea Market Mixed Use Development update would increase the density of development in portions of the project area. This may have effects on both flooding and drainage conditions. The increased density of development may affect flooding by reducing the area available for flood flows to flow over land through the area as sheetflow. The project would also replace the existing storm drain facilities on the site and modify existing drainage patterns. These potential effects are described below.

Flooding

The evaluation of increased development density on flooding in the project area is complicated by the fact that the effective FEMA flood plain maps are inaccurate due to changes in the existing conditions on the project site since the last map revision for Upper Penitencia Creek in 1988. It appears that the parking area north of Berryessa Road has been expanded, and concrete traffic barriers on the site have been relocated. In the area south of Berryessa Road there have also been changes to traffic barriers, walls and buildings. However, the overall flood conditions on the site with overflows from Upper Penitencia Creek have not changed. There would continue to be shallow flooding on the site with flows from east to west toward Coyote Creek.

North of Berryessa Road, the proposed land use plan includes large blocks of residential and industrial/commercial development. FEMA requirements and City of San Jose development policies require that all building elevations must be above the 100-year flood elevation and therefore would block shallow flood flows across the project site. However, there are several east-west streets, open space areas, and potential surface parking areas which would be available for flood flows. It is anticipated that the project would be required to proceed with a FEMA letter of map revision to define the area and depth of flooding with the proposed project. Based

on the available public streets and potential open space, the shallow flooding would approximately one foot deep in the streets. The project area would remain in the flood plain until the completion of a flood protection project for Upper Penitencia Creek. Design of the project to allow for sheetflow through the site is common in flood plain areas in the City of San Jose. The potential changes to the site flooding conditions would be a less than significant impact.

South of Upper Penitencia Creek, conditions would be similar to the portion of the site north of Berryessa Road. The 100-year sheetflow would flow from east to west parallel to the creek in the open space adjacent to the existing creek channel and in parallel streets. The extent and depth of flow may depend on the property interface at the UPRR. If the soundwall remains or is replaced, the majority of the flow would be near the creek channel. If the soundwall is removed, the sheetflow may extend to more of the parallel streets. In addition, the construction of the new access roads and bridges across the creek may affect the amount of flow in the channel versus the sheetflow on the site. Preliminary hydraulic analysis suggests that larger bridges over the existing channel could contain the existing creek flow within the existing channel. As with the northern portion of the site, the project would require a FEMA letter of map revision to define the new flood plain areas and flood elevations. The project area may remain in the flood plain until the completion of a flood protection project for Upper Penitencia Creek. The potential changes to the site flooding conditions would be a less than significant impact.

The proposed project is generally consistent with the proposed Corp flood protection project with a widened channel for Upper Penitencia Creek. The project includes a minimum 100-foot setback from the existing channel. This may allow for the construction of the preferred project alternative through the area, which is currently described as a 200-foot right of way. For most of the length of the Berryessa Road frontage, the first project facility is a public road approximately 200-feet from Berryessa Road. However, there is a portion of the reach near the UPRR where the on-site road is less than 200 feet from Berryessa Road. The potential conflict between the two projects has not been resolved and may require modification of one or both projects to accommodate the future flood protection project.

Drainage

The proposed project would redevelop the entire project site with the exception of the Coyote Creek and Upper Penitencia Creek riparian areas. The site is approximately 95 percent pavement and buildings for the existing condition. The site drains to Coyote Creek and Upper Penitencia Creek through existing storm drain systems. The proposed project would increase the open space and riparian areas, and therefore, would reduce the potential runoff compared to existing conditions. The existing storm drain systems would be replaced to conform to the new land plan. The existing outfalls to the stream channels may be modified or replaced. Because the proposed project would reduce the estimated runoff from the site, the project would not increase drainage or flood flows in the stream channels. Therefore, the project would have no significant change in the site runoff or stream flows.

Because the project would remove and replace the existing pavement areas on the site, the project would be required to conform to the current stormwater quality requirements in the City

of San Jose. The project would be required to include best management practices to reduce potential pollutants in the runoff from the site. This may include site design, source control and treatment best management practices.

REFERENCES

Federal Emergency Management Agency, Flood Insurance Study, City of San Jose, California, August 17, 1998.

Santa Clara Valley Water District, Upper Penitencia Creek Watershed Project, August 1988.

Santa Clara Valley Water District, Upper Penitencia Creek Flood Protection Project Summary, 2001.

US Department of Agriculture, Soil Conservation Service, Upper Penitencia Creek FPM Calculations, January 1985.

Stormwater Management

New construction in San Jose is subject to the conditions of the City's NPDES Permit, which was reissued by the Regional Water Quality Control Board in February 2001, with a revision of Provision C.3 (New and Redevelopment Performance Standards) approved in October 2001. Provision C.3 was amended to enhance performance standards for new development and redevelopment projects. Under the amended Provision C.3, the City must now 1) require that certain sizes of new and redevelopment projects include storm water treatment measures; 2) ensure that the treatment measures be designed to treat an optimal volume or flow of storm water runoff from the project site; and 3) ensure that storm water treatment measures are properly installed, operated and maintained.

Stormwater Quality

The City has an adopted policy that implements Provision C.3 of the NPDES Permit, requiring new development projects to include specific measures for improving the water quality of urban runoff to the maximum extent feasible. Under the Policy, development of the subject property will be required to include, in addition to standard construction stormwater Best Management Practices, post-construction stormwater treatment measures designed in conformance with the Policy's volume or flow hydraulic design criteria. Site-specific analysis of each of the various planning areas is required in order to determine the most appropriate type of treatment facility selected for the planning areas.

Selection of actual treatment facilities will depend on the amount of impervious surface area proposed, the grading required, and the amount of open space available (including private landscaping, public parks and riparian setback areas) for each planning area. Although final details and calculations for any proposed on-site stormwater treatment facilities will be required at the PD Permit stage of the entitlement process, preliminary designs should be provided with the submittal of the PD Zoning application, and stormwater quality (and hydromodification) issues must be specifically addressed in the CEQA document prepared for environmental clearance. Preliminary designs for stormwater treatment facilities will be included with the preparation of conceptual grading and drainage plans.

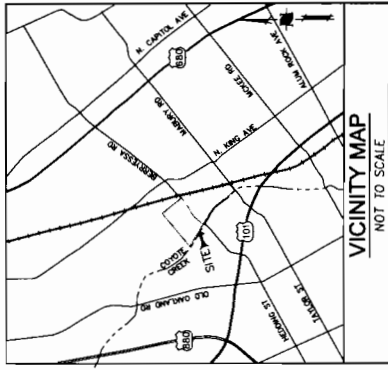
Hydrologic Issues

Provision C.3 also requires new and redevelopment projects to conform to specific hydromodification plan (HMP) requirements developed by the local stormwater program to reduce the volume of runoff from development sites.

The City of San Jose has an adopted policy (Council Policy 8-14 - Post-Construction Hydromodification Management) that establishes an implementation framework for incorporating measures into the City's

development review and approval process to control hydromodification impacts from new and redevelopment projects. The policy, which is consistent with the Hydromodification Plan Final Report prepared by the local stormwater program for Santa Clara Valley (SCVURPPP) and adopted by the City, requires applicable projects to include Hydromodification Control Measures (HCMs) designed to reduce erosion and siltation impacts to local receiving waters by restricting the discharge of runoff. Typical examples of HCMs would include on-site detention facilities.

Based on a preliminary comparison of the proposed Land Use Plan's total impervious surface area and the relatively high percentage of impervious surface coverage in the existing site condition, it does not appear that hydromodification will be an issue for the project. The proposed project would likely meet the exemption criteria contained in the policy, and would not be subject to the policy's requirements for providing HCMs.

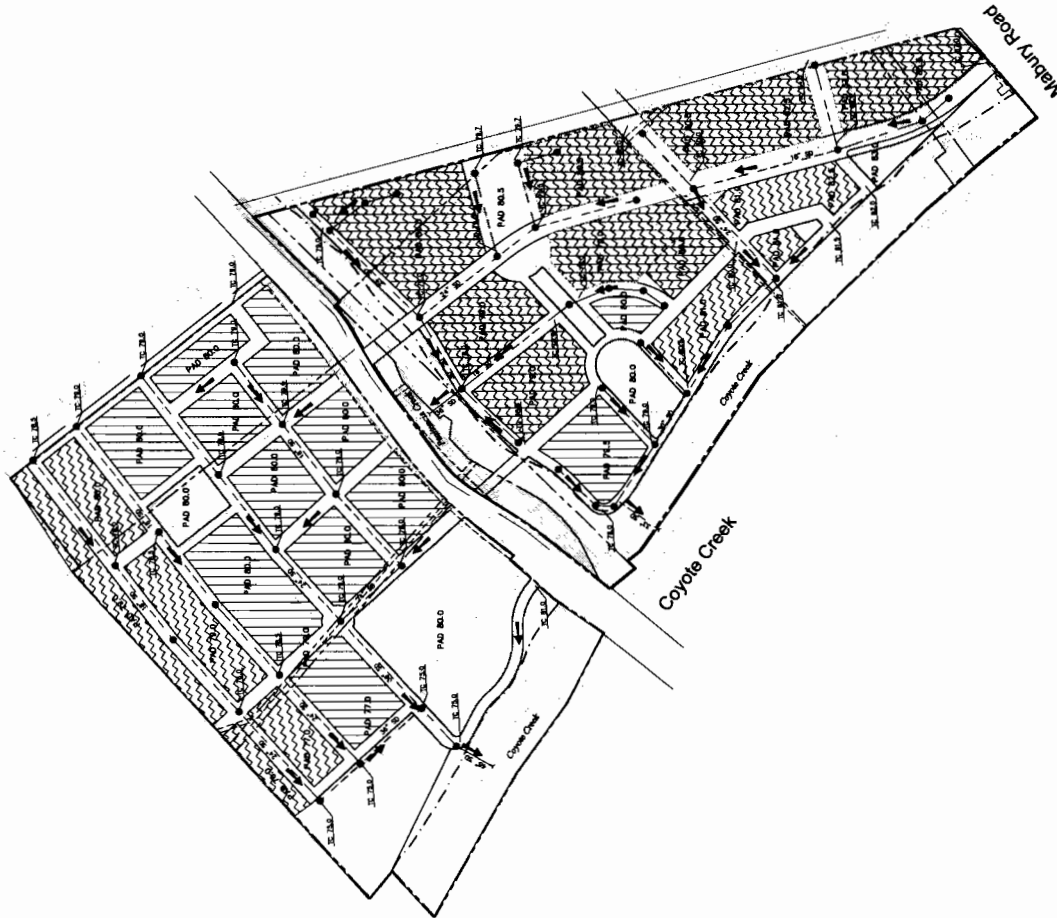
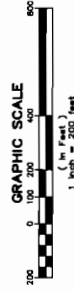
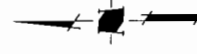


LEGEND

- POTENTIAL AREAS FOR INCORPORATING MECHANICAL AND HYDRODYNAMIC SEPARATORS, MEDIA FILTERS, ETC.-SEE DETAILS, SHEET S-4
- POTENTIAL AREAS FOR INCORPORATING SITE DESIGN MEASURES SUCH AS TREES, ROOTS, PERVIOUS PAVING-SEE DETAILS, SHEET S-5
- POTENTIAL AREAS FOR INCORPORATING LANDSCAPE-BASED TREATMENT CONTROL LOCATIONS
- PROJECT BOUNDARY
- EXISTING LOT LINES
- STORM DRAIN (PROPOSED)
- STORM DRAIN INLET
- STORM DRAIN MANHOLE
- FLAT GATE INLET OR AREA DRAIN
- DIRECTION OF SURFACE DRAINAGE
- OVERLAND RELEASE

NOTES

Conceptual grading, drainage, and PAD elevations may be modified.



The Flea Market, Inc.
1590 Berryessa Avenue
San Jose, CA 95133

DATE	BY	REVISIONS
12.23.08		PRELIMINARY
1.14.09		REVISED
1.20.09		REVISED WITH NEW SITE PLAN
3.10.09		REVISED WITH ADDITIONAL INFORMATION

HMH
ENGINEERS

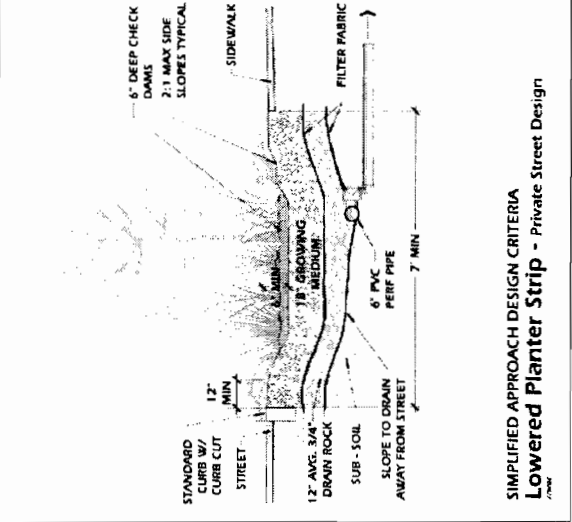
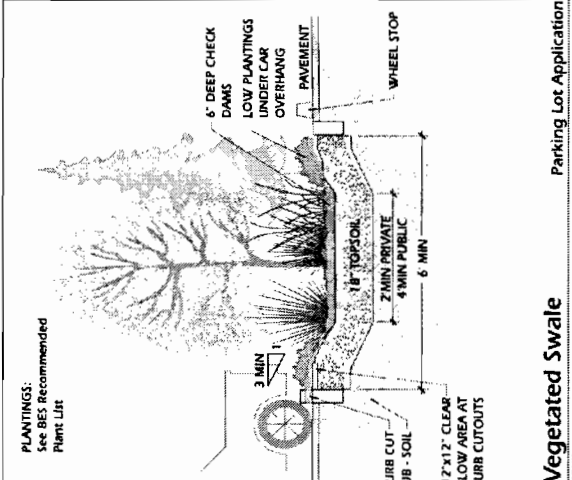
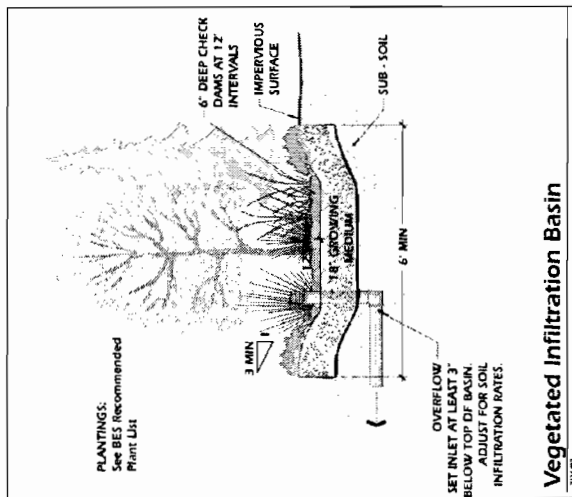
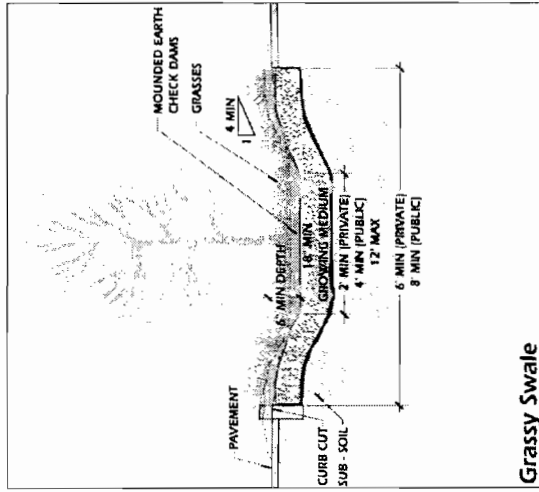
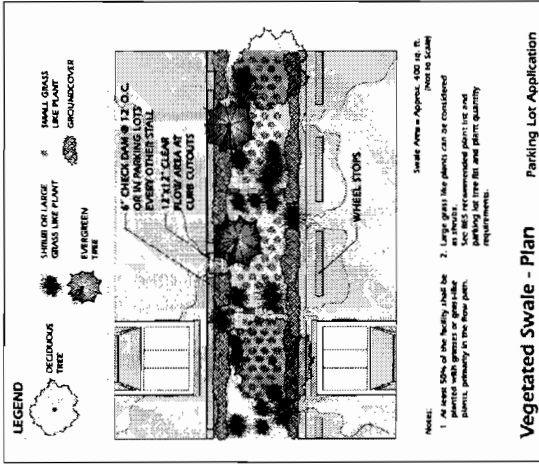
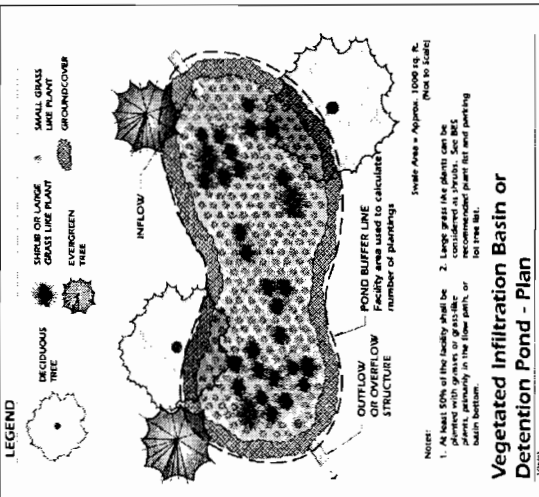
San Jose
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Gilroy
(408) 848-0888
www.hmh-engineers.com

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2005 Sand Street, Suite 301
Berkeley, CA 94709
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Fax: (510) 864-4844

CALTHORPE ASSOCIATES
1555 CALIFORNIA STREET, SUITE 200
SAN JOSE, CA 95128
Tel: (415) 499-9900
Fax: (415) 499-9901

General Development Plan - Exhibit 'C'
PDC03-108
Conceptual Storm Water Control Plan

Sheet
S-1
OF 11 SHEETS
JOB NUMBER
0908.14



DATE	12.23.08
Scale:	AS SHOWN
Designed:	MC
Drawn:	US
Field Eng'g:	DRP
Check:	DRP
FILE	

HMM ENGINEERS

Blair J. Heston
Blair J. Heston, Inc.
Blair J. Heston, Inc.
Blair J. Heston, Inc.

The SOKRANALIS COMPANY, LLC

CAUTHORPEX SUBSTITUTES

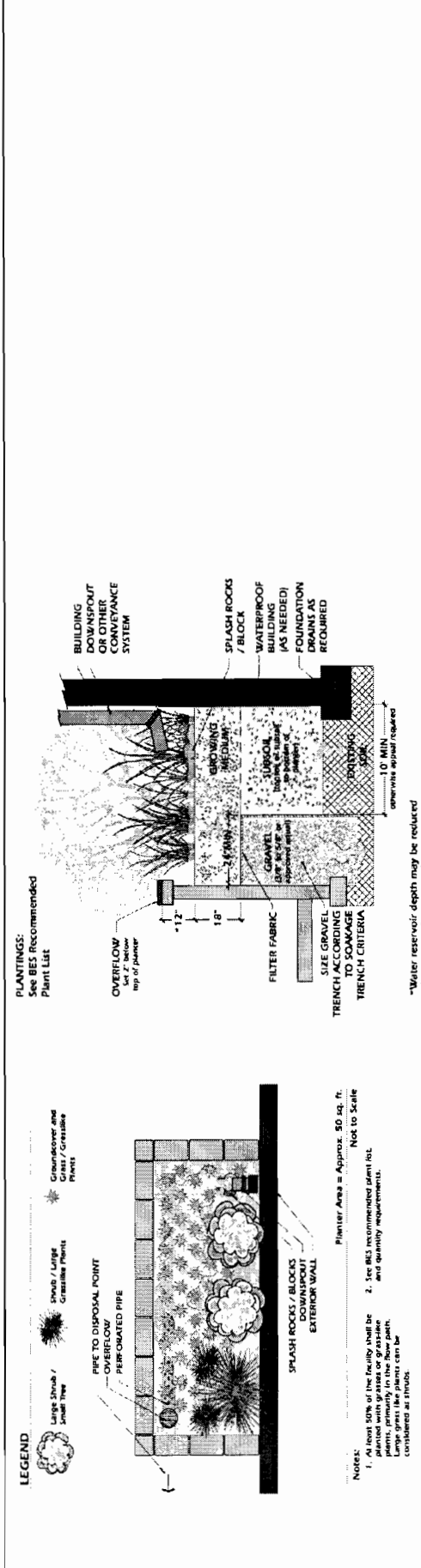
2092 Bush Street, Suite 201
Berkeley, CA 94704
Tel: (415) 841-4800
Fax: (415) 841-4800

General Development Plan - Exhibit 'C'
PC003-108

Landscaping-Based Treatment Controls

Sheet S-2
Job Number 0908.14

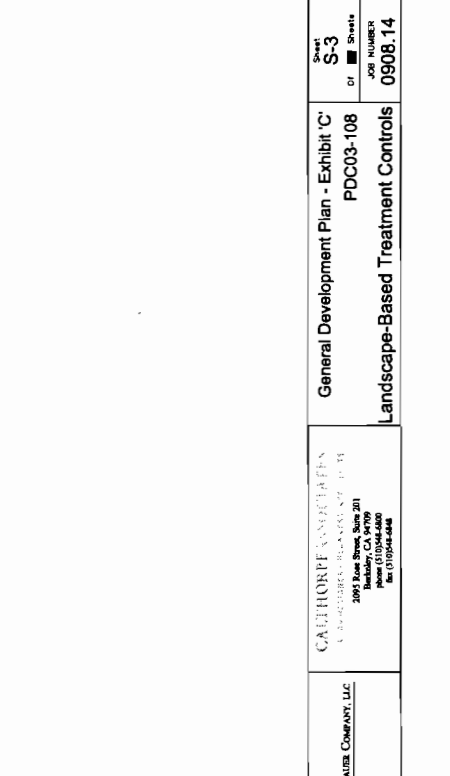
The Flea Market, Inc.
1590 Berryessa Avenue
San Jose, CA 95133



PLANTINGS:
See BES Recommended Plant List

*Water reservoir depth may be reduced if planter surface area is increased.

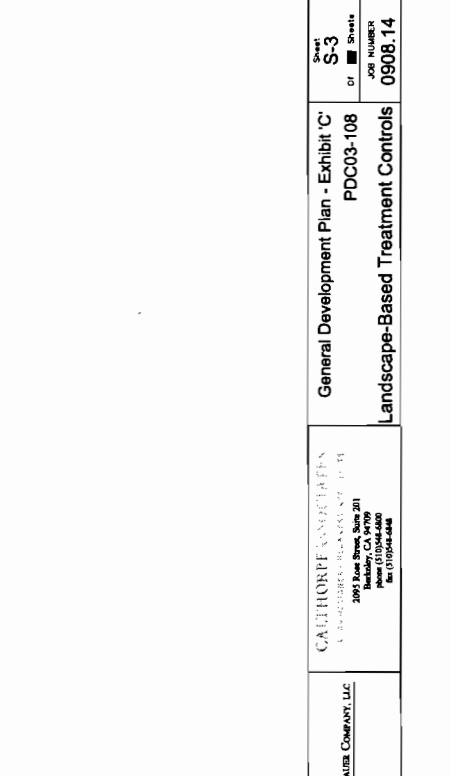
Infiltration Planter



PLANTINGS:
See BES Recommended Plant List

*Water reservoir depth may be reduced if planter surface area is increased.

Flow-Through Planter - Plan



PLANTINGS:
See BES Recommended Plant List

*Water reservoir depth may be reduced if planter surface area is increased.

Flow-Through Planter Box

DATE	SCALE	BY	CHKD
12.13.03	MC		
Drawn:	VP		
Checked:	VP		
Proj. Engr.:	DRP		
File:			

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HMH
ENGINEERS

The Flea Market, Inc.
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San Jose, CA 95133

General Development Plan - Exhibit 'C'
PDC03-108
Landscape-Based Treatment Controls

CAUTIONER AND OTHERS
LANDSCAPE ARCHITECTS
2097 Rose Street, Suite 201
Berkeley, CA 94709
Tel: (916)544-4444

The Scheduling Company, LLC

Sheet S-3 of 11
JOB NUMBER 0908.14