Appendix G.1
Storm Water Hydrology Study
STORM WATER HYDROLOGY STUDY FOR

MIXED USE PROJECT
AT
BOYLE HEIGHTS

April 15, 2011

PREPARED FOR

GIBSON, DUNN & CRUTCHER LLP

PREPARED BY

STANTEC CONSULTING SERVICES, INC.
290 Conejo Ridge Avenue
Thousand Oaks, CA  91361
(805) 230-1266
STORM WATER HYDROLOGY STUDY

The following report is an analysis of the existing and proposed stormwater drainage infrastructure of a proposed Mixed Use project in Boyle Heights, a community within the City of Los Angeles, California. The project consists of the redevelopment of an existing 70-acre rental apartment project known as Wyvernwood Garden Apartments. The intent of this report is to explore the existing storm drain infrastructure within the existing development, determine its capacity to accept future development, present proposed storm drain systems necessary to serve the new mixed use project, and determine the capacity of the new systems to serve the proposed redeveloped community.

1) EXISTING CONDITIONS

a) Boundary Information

The project site is approximately 68.8 acres. The site is generally bounded by Eighth Avenue to the north, Olympic Boulevard to the south, Grande Vista Avenue and Dacotah Streets to the east and Soto Street to the west. The proposed project site is a portion of an 80.9 acre drainage area which includes 73.6 acres of residential and 7.3 acres of commercial, office, and a school property most of which drains directly to the subject property. A portion, about 2.9 acres on the north side of the site, drains to Eighth Street and a portion, about 2.0 acres on the southeast corner of the site, drains to Olympic Boulevard. The remaining 76 acres of drainage areas drain to interior streets within the Wyvernwood site.

The Wyvernwood site is the lower south portion of an approximately 1,000-acre regional drainage area that is bordered by the I-10 Freeway on the north, the I-10/I-5 Freeway connector on the west, Grande Vista Avenue on the east, and Olympic Boulevard on the south.

The Los Angeles River is located to the west and south of the site and flows southeasterly. The Los Angeles River is the downstream receiving body of water for the Wyvernwood site.

The terrain of the regional drainage area slopes downward from northwest to southeast toward the Los Angeles River. Most storm drains in the regional drainage area drain south toward the river. However, some storm drains flow west toward the Los Angeles River or east toward regional relief storm drains.

The project site is served by two distinct storm drain networks. The first is a major public storm drain owned by the City of Los Angeles that traverses the site from west to east. The storm drain enters at the northwest corner of the site at the intersection of Glenn Avenue and Eighth Avenue and leaves the site at the east boundary at Grande Vista Avenue. The drain continues southeasterly and eventually reaches the Los Angeles River. The drain is concrete pipe from 75” to 84” in diameter and was constructed in 1925. Its tributary area extends offsite north of I-5 Freeway almost to the I-10 Freeway.

The second storm drain network is a major County of Los Angeles storm drain located immediately adjacent to the east edge of the site in Grande Vista Avenue. The drain is a concrete box 11’ wide x 6.5’ high and was constructed in 1969. The County drain was constructed to provide additional capacity because
capacity greater than the City drain was required. It flows south in Grande Vista Avenue to the Los Angeles River. This County storm drain crosses the City storm drain described above. While the two storm drains cross, they do not connect. They both discharge to the Los Angeles River at different points.

The site consists of two separate drainage areas. The first drainage area connects to the City of Los Angeles storm drain that traverses the site. The existing onsite public streets drain to public storm drain inlets at 4 low points; Glenn Avenue and Camulos Place, Glenn Avenue and Hostetter Street, Glenn Avenue and Camulos Street, and Rosalind Place near Lydia Drive. The tributary areas associated with these inlets comprise an area of 34.2 acres within the project boundary as well as 7.3 acres beyond the project boundary. (Refer to Table 1, subareas 1 through 4 and Existing Hydrology exhibit).

The second drainage area within the project site flows to the County drainage system and includes the central open space area in Wyvernwood known as the Mall. The Mall does not have an underground storm drain but is surface drained by a grassy swale. This open space area is comprised of 34.5 acres. (Refer to Table 1, subarea 5) and Existing Hydrology exhibit.

Two additional small portions of the site drain to 8th Street and Olympic Boulevards. These streets are served by other City of Los Angeles inlets and storm drains that drain to the Los Angeles River.

b) 100-Year Floodplain.

The Wyvernwood site is located on Flood Insurance Rate Map No. 06037CIND2A on the index map for the southern portion of Los Angeles County. The Wyvernwood area is located on Panel 1639F, with the notation “Panel Not Printed – No Special Flood Hazard Area”, indicating it is not within the 100-year flood plain.

c) Hydrological Conditions of the Project Site:

i) Rainfall Zone

The Los Angeles County Public Works Department Hydrology Manual shows the project area to be in rainfall zone K.

ii) Soil Type

The Los Angeles County Public Works Department Hydrology Manual shows the soil type for the site is Type 013 (Ramona Loam). This soil type is a well drained sandy loam with moderately slow permeability and a slow to rapid runoff depending on slope.

iii) Topography

The site is designated as Hillside Area by the City of Los Angeles. The highest point on the site is elevation 280’ at the northwest corner near Eighth Avenue and Soto Street. The lowest point on the site is elevation 231’ at the westernmost corner of the site near Grande Vista Avenue and
Lydia Drive. The two points are 3,500 feet apart and the average slope of the site is 1.5%.

iv) Existing Surface Imperviousness

The existing land use per the Los Angeles County Public Works Department Hydrology Manual of the Wyvernwood property is 1123-Low Rise Apartment, Condominiums and Townhouses. According to the County’s Manual, this category assumes that site conditions will be 86% impervious. This factor is considered to be conservative or a “worst case” condition and represents the maximum imperviousness for this type of development as allowed by city code.

The site is approximately 68.8 acres. As currently constructed, the existing Wyvernwood apartment project contains approximately 37 acres of impervious surfaces, including approximately 14 acres of buildings, 10.5 acres of public streets and sidewalks, and 12.5 acres of parking and pavement. The existing site is actually approximately 54% impervious.

v) Runoff Rates and Calculation of Rainfall Runoff

The rainfall Runoff Rate is needed to size storm drainage systems or determine surface runoff quantities. The Runoff Coefficient is the percentage of rainfall that runs off instead of soaking into the ground. In southern California, the maximum rainfall runoff occurs on the last days of multi-day storms when the ground has already been saturated by days of rain. After days of rain even an open field will be muddy with puddles of standing water. Additional rain will runoff rather than be absorbed.

In order to better understand the drainage aspects of the site, the following section calculates there scenarios for the peak runoff rates for the property as if: (1) the property is vacant, (2) the property is developed per the County’s standard model, and (3) as the property is actually currently developed.

The rainfall Runoff Rate is calculated using the formula:

\[ Q = C \times I \times A \]

\[ \text{Runoff Rate} = (\text{Runoff Coefficient}) \times (\text{Rainfall Intensity}) \times (\text{Drainage Area}) \]

Where:

- \( Q \) = the Runoff Rate
- \( C \) = the Runoff Coefficient
- \( I \) = the Rainfall Intensity
- \( A \) = the Drainage Area.

The Runoff Coefficient is a factor of the soil type, the “Time of Concentration (Tc) and the Rainfall Intensity.” As stated above, the Wyvernwood soil type is Type 013 (Ramona Loam).

Time of concentration for the Wyvernwood site, as calculated using the County of Los Angeles Hydrology Method, is 23 minutes. In other words, a
rainfall event must last for at least 23 minutes for storm water runoff to reach its peak flow. Rainfall Intensity decreases as Time of Concentration increases; corresponding to short, hard rain bursts versus long, steady rainfall.

The maximum rainfall intensity in Rainfall Zone K for a 23 minute storm with a 2% chance of occurring in any given year (50-year storm) is 2.118 inches per hour.

The Runoff Coefficient also increases as rainfall intensity increases because rain is falling faster than it can be absorbed into the ground.

1. **Vacant Property Scenario**
   
   If the rainfall intensity is 2.118 inches per hour on soil Type 013, then the runoff coefficient for undeveloped areas, Cu, will be .842 (84.2%).

   Therefore, if the Wyvernwood site was an undeveloped vacant parcel the Runoff Rate would be:

   \[
   Q \text{ (undeveloped)} = Cu \times I \times A \\
   = (0.842) \times (2.118) \times (68.8) = 122.7 \text{ cfs}
   \]

   Where: \( Cu \) = undeveloped runoff coefficient

2. **County Standard Model Scenario**

   The Runoff Coefficient for developed areas, Cd, is a factor of the undeveloped runoff coefficient and the imperviousness of the developed site. Imperviousness (IMP) is the ratio of impervious surfaces such as roadways and roofs to the site area. The standard county impervious value (IMP) for multi-family housing areas is 86%, which assumes the site is developed to the maximum density allowed by code. The Los Angeles County hydrology method uses a maximum runoff value of 90% from impervious surfaces to allow for wetting and surface storage; in other words not all the rain that falls on an impervious surface will run off, some will stick and wet the surface or puddle.

   \[
   Cd = (0.9 \times \text{IMP}) + [(1.0 - \text{IMP}) \times Cu] \\
   = (0.9 \times 0.86) + [(1.0 - 0.86) \times 0.842] = 0.89
   \]

   Where: \( Cd \) = developed runoff coefficient

   IMP = percentage impervious

   Cu = undeveloped runoff coefficient.

   Therefore, the Runoff Rate for the standard model developed site is:

   \[
   Q(\text{developed}) = Cd \times I \times A \\
   = (0.89) \times (2.118) \times (68.8) = 130.0 \text{ cfs}.
   \]
(3) Existing Site Conditions Scenario

The actual existing Wyvernwood density of development is far less than the maximum allowed by code; therefore the actual existing imperviousness is far less than the county standard. The actual existing imperviousness, IMP, of the site is 54%. However, this has little impact on the Runoff Rate because the formula always assumes the maximum impact will be during a multi-day storm when the ground is saturated and runoff is high. Using the actual level of imperviousness, the actual developed runoff coefficient Cd is:

\[
Cd = (0.9 \times IMP) + (1.0 – IMP) \times Cu
\]

\[
= (0.9 \times 0.54) + [(1.0 – 0.54) \times 0.842] = 0.87
\]

Therefore, the Runoff Rate for the actual existing site is:

\[
Q(\text{actual}) = (0.87) \times (2.118) \times (68.8) = 126.8 \text{ cfs.}
\]

The Runoff Rate for the County standard model is only slightly higher than the Runoff Rate for the actual existing site. The actual existing runoff rate is 98% of the standard County value. The standard County model Runoff Rate is 6% higher than the rate for a corresponding vacant lot while the actual existing Runoff Rate is 3% higher than the corresponding vacant lot.

vi) Drainage Patterns.

The Wyvernwood site consists of 7 different drainage subareas. The total drainage area includes areas which do not belong to the Wyvernwood property, but which drain into public streets within the Wyvernwood site. The Wyvernwood site is 68.8 acres, the non-Wyvernwood properties are 10.1 acres and the total is 80.9 acres.

Most of the areas drain to catch basins onsite and directly to storm drains. However, one small area drains to the gutter in Olympic Boulevard and another to the gutter in 8th Street.

The runoff from each separate area is determined using the method demonstrated above and summarized below:
### Table 1: Existing Hydrology

<table>
<thead>
<tr>
<th>Subarea No.</th>
<th>Acreage</th>
<th>Imperviousness (%)</th>
<th>Time of Concentration ($T_c$)</th>
<th>Runoff Coefficient</th>
<th>Absorption Rate</th>
<th>Drainage Subarea Types</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.2</td>
<td>86</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Drains to interior street, City SD</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>7.3</td>
<td>86</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Off-site area, drains to interior street, City SD</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10.6</td>
<td>86</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Drains to interior street, City SD</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7.4</td>
<td>86</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Drains to interior street, City SD</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>34.5</td>
<td>86</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Central mall, drains to County SD</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2.0</td>
<td>86</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Fronts Olympic Blvd, drains to Olympic.</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>2.9</td>
<td>86</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Drains to 8th Street, Includes non-Wyvernwood property.</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>80.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Areas 1, 2, 3, and 4 on the west and south portions of the site drain to streets and storm drains which are connected to the 84” diameter City storm drain in the middle of the site. These areas total approximately 41.5 acres.

Area 5 in the central and east portions of the site drain to the Mall and eventually to the 11’ wide x 6.5’ high County storm drain in Grande Vista Avenue. This area is approximately 34.5 acres.

Area 6 on the south side of the site drains to Olympic Boulevard. This area is approximately 2.0 acres.

Area 7 on the north side of the site drains to 8th Street. This area is approximately 2.9 acres.
vii) Quantity of surface water runoff for 50-year event

Table 2a: Existing Runoff

<table>
<thead>
<tr>
<th>Subarea No.</th>
<th>Runoff Coefficient</th>
<th>Intensity (inches/hour)</th>
<th>Area (acres)</th>
<th>Flow Rate (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.89</td>
<td>2.118</td>
<td>16.2</td>
<td>30.5</td>
</tr>
<tr>
<td>2</td>
<td>.89</td>
<td>2.118</td>
<td>7.3</td>
<td>13.8</td>
</tr>
<tr>
<td>3</td>
<td>.89</td>
<td>2.118</td>
<td>10.6</td>
<td>20.0</td>
</tr>
<tr>
<td>4</td>
<td>.89</td>
<td>2.118</td>
<td>7.4</td>
<td>13.9</td>
</tr>
<tr>
<td>5</td>
<td>.89</td>
<td>2.118</td>
<td>34.5</td>
<td>65.0</td>
</tr>
<tr>
<td>6</td>
<td>.89</td>
<td>2.118</td>
<td>2.0</td>
<td>3.8</td>
</tr>
<tr>
<td>7</td>
<td>.89</td>
<td>2.118</td>
<td>2.9</td>
<td>5.5</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>80.9</td>
<td>152.5</td>
</tr>
</tbody>
</table>

- 1 Discharges to City Storm Drain
- 2 Discharges to County Storm Drain
- 3 Discharges to Olympic Boulevard gutters, then eventually to off-site city storm drain.
- 4 Discharges to 8th Street gutters, then eventually to off-site city storm drain.
- 5 Offsite area, drains to on-site

Table 2b: Existing Runoff Distribution

<table>
<thead>
<tr>
<th>Discharge to</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>City Storm Drain</td>
<td>78.2 cfs</td>
</tr>
<tr>
<td>County Storm Drain</td>
<td>65.0 cfs</td>
</tr>
<tr>
<td>Olympic Blvd.</td>
<td>3.8 cfs</td>
</tr>
<tr>
<td>8th Street</td>
<td>5.5 cfs</td>
</tr>
<tr>
<td>Total</td>
<td>152.5 cfs</td>
</tr>
</tbody>
</table>

d) Existing Public Drainage Facilities

i) Age of the onsite storm drain system

The City of Los Angeles storm drain line was constructed in 1925. Additional catch basins and laterals were constructed as part of the Wyvernwood project in 1939.

The County of Los Angeles storm drain system in Grande Vista Avenue was constructed in 1969.

ii) Size and Capacity

The main City of Los Angeles storm drain is a 75” to 84” diameter concrete pipe. The capacity of the 84” diameter storm drain is 410 cubic feet per second (cfs).
The County of Los Angeles storm drain is located along Grande Vista Avenue and is an 11’x 6.5’ box channel. The capacity of the box channel is 588 cfs.

The Los Angeles County Department of Public Works has indicated that a maximum of 2.9 cfs per acre may be directed to the County storm drain from this project. Currently 34.5 acres drains to that County storm drain which allows a maximum discharge of 100 cfs into that system.

iii) Layout of the existing storm drain system.

The existing City storm drain mainline traverses the site from west to east. All on-site storm drain laterals are connected to the City storm drain.

Area 5, known as the Mall is served by a surface swale that conveys stormwater runoff to the east side of the site and drains into an inlet that connects to the County system in Grande Vista.

iv) Existing system deficiencies.

The existing City of Los Angeles and Los Angeles County storm drain systems accommodate the existing drainage run off from the project site. No system deficiencies or incidents of flooding have been noted.
2) PROPOSED CONDITIONS

a) Net change in amount of impervious surface.

The proposed land use per the Los Angeles County Public Works Department Hydrology Manual is “1125” - High Rise Apartment, Condominiums. According to the County’s Manual this category has 90% imperviousness. The proposed 68.8 acre development will have approximately 10 acres of “open space”, of which approximately 3 acres will be impervious surfaces sports courts, roofs, walks and terraces. The proposed development will have approximately 90% imperviousness, consistent with the County standard.

b) Peak discharge during the proposed 50-year event

Using the County Public Works Department Hydrology Manual rates, the proposed development will increase imperviousness 4.7%, from 86% to 90%. The Time of Concentration (Tc) and Rainfall Intensity will not change. The Runoff Coefficient increases 1%, from 0.89 to 0.90. The new Runoff Rate for the entire site will be 152.60 cfs. (Runoff rate = C x I x A), an insignificant increase of 0.1 cfs or 0.07%.

The Runoff by subarea is summarized below:

Table 3: Proposed Hydrology

<table>
<thead>
<tr>
<th>Subarea No</th>
<th>Acreage</th>
<th>Imperviousness (%)</th>
<th>Time of Concentration (Tc)</th>
<th>Runoff Coefficient</th>
<th>Absorption Rate</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>16.2</td>
<td>90</td>
<td>23</td>
<td>.90</td>
<td>10%</td>
<td>Drains to City SD</td>
</tr>
<tr>
<td>2</td>
<td>7.3</td>
<td>86</td>
<td>23</td>
<td>.90</td>
<td>10%</td>
<td>Off-site, unchanged, drains to City</td>
</tr>
<tr>
<td>3</td>
<td>10.6</td>
<td>90</td>
<td>23</td>
<td>.90</td>
<td>10%</td>
<td>Drains to City SD</td>
</tr>
<tr>
<td>4</td>
<td>7.4</td>
<td>90</td>
<td>23</td>
<td>.90</td>
<td>10%</td>
<td>Drains to City SD</td>
</tr>
<tr>
<td>5</td>
<td>34.5</td>
<td>90</td>
<td>23</td>
<td>.89</td>
<td>11%</td>
<td>Drains to County SD</td>
</tr>
<tr>
<td>6</td>
<td>2.0</td>
<td>90</td>
<td>23</td>
<td>.90</td>
<td>10%</td>
<td>Drains to County SD</td>
</tr>
<tr>
<td>7</td>
<td>2.9</td>
<td>90</td>
<td>23</td>
<td>.90</td>
<td>10%</td>
<td>Drains to County SD</td>
</tr>
<tr>
<td>Total</td>
<td>80.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4: Proposed runoff

<table>
<thead>
<tr>
<th>Subarea No.</th>
<th>Runoff Coefficient</th>
<th>Intensity (inches/hour)</th>
<th>Area (acres)</th>
<th>Flow Rate (cfs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.90</td>
<td>2.118</td>
<td>16.2</td>
<td>30.88</td>
</tr>
<tr>
<td>2</td>
<td>.90</td>
<td>2.118</td>
<td>7.3</td>
<td>13.92</td>
</tr>
<tr>
<td>3</td>
<td>.90</td>
<td>2.118</td>
<td>10.6</td>
<td>20.21</td>
</tr>
<tr>
<td>4</td>
<td>.89</td>
<td>2.118</td>
<td>7.4</td>
<td>13.95</td>
</tr>
<tr>
<td>5</td>
<td>.88</td>
<td>2.118</td>
<td>34.5</td>
<td>64.3</td>
</tr>
<tr>
<td>6</td>
<td>.90</td>
<td>2.118</td>
<td>2.0</td>
<td>3.81</td>
</tr>
<tr>
<td>7</td>
<td>.90</td>
<td>2.118</td>
<td>2.9</td>
<td>5.53</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>80.9</td>
<td>152.60</td>
</tr>
</tbody>
</table>

The overall runoff from the site will not be significantly increased. The proposed development will collect all site storm water in catch basins. The areas that currently drain to the Olympic and 8th Street gutters will be connected directly to the storm drains, with no water in the gutter, as shown below:

Table 5: Discharge Changes Resulting From Project

<table>
<thead>
<tr>
<th>Discharge</th>
<th>Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharge to City Storm Drain</td>
<td>78.96 cfs</td>
<td>0.76 cfs</td>
</tr>
<tr>
<td>Discharge to County Storm Drain</td>
<td>73.64 cfs</td>
<td>8.64 cfs</td>
</tr>
<tr>
<td>Discharge to Olympic Blvd.</td>
<td>0 cfs</td>
<td>-3.8 cfs</td>
</tr>
<tr>
<td>Discharge to 8th Street.</td>
<td>0 cfs</td>
<td>-5.5 cfs</td>
</tr>
<tr>
<td>Total peak surface water runoff</td>
<td>152.6 cfs</td>
<td>0.1 cfs</td>
</tr>
</tbody>
</table>

c) Proposed Improvements.

The existing 84” diameter City storm drain will be protected in place or relocated as required to conform to the proposed street alignments. Relocated portions of the pipe will be replaced with pipe of equal size. The existing storm drain will remain in service at all times to convey flows from off-site areas.

Preliminary calculations indicate that the project’s discharge to the 84” diameter City storm drain will increase from 78.2 cfs to 78.95 cfs, representing a change of less than 1%. The acreage currently draining to the City storm drain is 41.5 acres and will not be increased. In fact, this area will be reduced at final design to assure that there is no net flow increase to the existing City storm drain.

Discharge to the County storm drain in Grande Vista Avenue will be increased from 65.0 cfs to 73.64 cfs because of the elimination of discharge to Olympic Boulevard and 8th Street. Per Los Angeles County criteria for this storm drain,
the total allowable discharge to the County storm drain from the site is 100 cfs.
The proposed project will be well under this limit.

All existing on-site drainage facilities except the 84” diameter City storm drain will be removed and reconstructed to match the project’s revised street alignments.

The eastern portion of the project will be developed first. In the existing condition, 36.5 acres in this area currently drains to the County storm drain at Olympic Boulevard. In the proposed condition, a minimum of 36.5 acres will be directed to the County storm drain.

The western portion of the project will be developed in subsequent phases. In the existing condition, 41.5 acres in this area currently drains to the City storm drain. In the proposed condition, a maximum of 41.5 acres will be directed to the City storm drain.

The project will include storm water quality measures that may include infiltration devices. These devices could further reduce runoff leaving the site. This analysis, however, does not incorporate such measures in its calculations. As designed, the project already conforms to the drainage requirements set forth by both the City and the County agencies. Any further reduction in flow due to infiltration devices will serve to augment and improve runoff conditions, but are not required to successfully implement the project’s drainage system. The project’s surface water quality measures are identified and discussed in a separate “Surface Water Quality Study”.

d) On-site Conveyance.

Proposed storm drains will range from 24” to 54” in diameter. Proposed drains will be located within the project’s new street alignments or within easements established in the project site.

e) Off-site impacts.

The existing 84” diameter City storm drain will be protected in place or relocated as required. The existing storm drain will remain in service at all times to convey flow from upstream off-site areas.

As indicated in Table 5, the project will slightly alter local offsite drainage patterns as a result of on-site areas draining to the County’s storm drain versus the City’s storm drain. However, the ratio of drainage areas connected to each storm drain system will remain the same. Also, both storm drains eventually connect to the Los Angeles River in close proximity to each other, resulting in no significant impacts by diverting drainage patterns. The amount of surface water reaching the downstream body of water, the Los Angeles River, remains the same.

All on-site water will be collected on-site in catch basins. Water leaving the site to surrounding streets and gutters will be eliminated.

Discharge to the County storm drain is 65% of the allowable discharge.

Surface water run-off from the site will not be significantly increased and downstream off-site areas will not be adversely impacted by the project’s marginal increased run-off.

f) Erosion or Sedimentation.

The proposed development will be fully developed and landscaped in accordance with acceptable standards. The site will conform to current storm
water quality runoff treatment requirements. We do not anticipate any erosion or sedimentation mitigation problems.

The project site will be 100% covered in pavement, buildings, and landscaping. Landscape areas will be graded and planted to prevent erosion. Stormwater from roads and buildings will flow to streets, driveways, storm drains, or other drainage devices that are not subject to erosion.
3) PROJECT IMPACTS

This project will have a less than significant impact because it:

- Will not cause flooding during 50-year storm that harms people or property. Stormwater will be directed to storm drains which have adequate or excess capacity.

- Will not substantially reduce or increase the amount of surface waters to a downstream water body. Flow to the Los Angeles River will increase an insignificant 0.07%, well within the limits established by Los Angeles County.

- Will not result in a permanent or adverse change to the movement of surface waters sufficient to produce a substantial change in the current direction of water flow. All storm water will be directed to existing storm drains which discharge to the Los Angeles River. The volume of storm water directed to the City of Los Angeles storm drain will not increase. A small amount of water, 9.3 cfs, which now drains to the surrounding street gutters before reaching a storm drain will be intercepted before leaving the site and connected directly to the County storm drain. The overall drainage pattern will not change.
STORM WATER HYDROLOGY STUDY – REFERENCES


