APPENDIX I

Hydrology and Water Quality Report

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HOLLYWOOD CENTER
HYDROLOGY AND WATER QUALITY REPORT
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1. INTRODUCTION

1.1. PROJECT DESCRIPTION

MCAF Vine LLC, 1750 North Vine LLC, 1749 North Vine Street LLC, 1770 Ivar LLC, 1733 North Argyle LLC, and 1720 North Vine LLC (collectively, the Applicant) proposes a new mixed-use development (Project) on an approximately 4.46-acre (194,495 square feet) site (Project Site) in the Hollywood Community Plan Area of the City of Los Angeles (City). The Project Site is bounded by Yucca Street on the north, Ivar Avenue on the west, Argyle Avenue on the east, and Hollywood Boulevard on the south, and is bifurcated by Vine Street. The portion of the Project located between Ivar Avenue and Vine Street is identified as the "West Site," and the portion located between Vine Street and Argyle Avenue is identified as the "East Site." The Project Site includes 10 individual parcels, and is currently occupied by a building leased by American Musical and Dramatic Academy (AMDA) and surface parking lot on the West Site, and the Capitol Records Building and Gogerty Building occupied by Capitol Records (the Capitol Records Complex) and a surface parking lot that serves the Capitol Records Complex and general public parking on the East Site.

The Capitol Records Complex would be preserved, although portions of its supporting parking area, along with some existing parking not adjacent to the Capitol Records Complex, would be reconfigured and relocated to the East Site five-floor subterranean and grade-level parking garage. The remaining surface parking uses on the Project Site would be removed in order to develop a mix of land uses, including residential uses (market-rate and senior affordable housing units), commercial uses, parking, and associated landscape and open space amenities. Four new buildings are proposed, including a 35-story building on the West Site (West Building), a 46-story building on the East Site (East Building), and two 11-story senior housing buildings (West Senior Building and East Senior Building) set aside for extremely-low and very-low income households (one senior housing building on each site). The Project would develop approximately 1,287,150 square feet of developed floor area, including 1,005 residential housing units (872 market-rate units and 133 senior affordable housing units) totaling approximately 1,256,974 square feet of residential floor area, approximately 30,176 square feet of commercial floor area (retail and restaurant uses), approximately 160,707 square feet of open space and amenities, approximately 1,521 vehicle parking spaces, and approximately 551 bicycle parking spaces. The Project would have a floor-area ratio (FAR) of 6.975:1 which includes the existing 114,303 square-foot Capitol Records Complex (consisting of the 92,664 square-foot Capitol Records Building and 21,639 square-foot Gogerty Building). The total buildable area for the Project Site would be 1,401,453 square feet.

Under a proposed Hotel Option associated with the East Site, the Project would replace 104 residential units within East Building levels 3 through 12 with a 220-room hotel, with no change to building heights and massing. The number of affordable residential units within the East Senior Building would be reduced by 17 units and the height of the building would be reduced from 11 stories to 9 stories. Overall, under the Hotel Option there would be approximately 1,272,741 square feet of developed floor area, including 884 residential housing units (768 market-rate units and 116 senior affordable housing units) totaling approximately 1,112,287 square feet of residential floor area, a 220-room hotel with

approximately 130,278 square feet of floor area, approximately 30,176 square feet of other commercial floor area, approximately 147,366 square feet of open space and amenities, 1,521 vehicle parking spaces, and 554 bicycle parking spaces. The Hotel Option would have a FAR of 6.903:1 which includes the existing Capitol Records Complex, for a total buildable area for the Project Site would be 1,387,044 square feet.

Assuming the two sites are built one after another, construction of the Project would be completed over an approximately six-year period. Activities would be phased, beginning on the West Site as early as 2021 and on the East Site in approximately 2024. Construction timing could vary for both sites and could potentially overlap on the West and East Sites, and the EIR will analyze the most conservative construction schedule. Project construction would require grading and excavation activities down to a maximum depth of 82 feet below existing grade for building foundations and five levels of subterranean parking. The Project would export approximately 542,300 cubic yards of soil and generate approximately 1,616 cubic yards of demolition debris (asphalt, interior and exterior building demolition, and general demolition debris). No import of soil is proposed.

1.2. SCOPE OF WORK

This report provides a description of the existing surface water hydrology, surface water quality, groundwater level, and groundwater quality at the Project Site. In addition, the report includes an analysis of the Project's potential impacts related to surface water hydrology, surface water quality, groundwater level, and groundwater quality.

2. ENVIRONMENTAL SETTING

2.1. SURFACE WATER HYDROLOGY

2.1.1. REGIONAL

The Project Site is located within the Ballona Creek Watershed (Watershed) in the Los Angeles Basin. The Watershed encompasses an area of approximately 130 square miles extending from the Santa Monica Mountains and the Ventura-Los Angeles County line on the north, to the Harbor Freeway (110) on the east, and to the Baldwin Hills on the south. Ballona Creek is a 9-mile-long flood protection channel that drains the Watershed to the Pacific Ocean. The major tributaries to Ballona Creek include Centinela Creek, Sepulveda Canyon Channel, Benedict Canyon Channel, and numerous storm drains. Refer to Figure 9 for the Ballona Creek Watershed Map.

2.1.2. LOCAL

Underground storm drain facilities in the Project vicinity (see Figure 2) consist of the following:

- **Yucca Street:** There is an existing 27-inch reinforced concrete pipe (RCP) between Vine Street and Argyle Avenue which flows towards the southwest.

- **Vine Street:** There is an existing 24-inch RCP which flows towards the south.

- **Argyle Avenue:** There is an existing 12-inch vitrified clay pipe (VCP) in the Alley which flows east to Argyle Avenue and then discharges to the gutter via an outlet chamber located approximately 90 feet south of the Alley.

- **Ivar Avenue:** There is an existing 69-inch RCP which flows towards the south.

The underground pipes and catch basins noted above are owned and maintained by the City of Los Angeles. The stormwater runoff from the Project Site is discharged into off-site storm drainage catch basins and underground storm drainage pipes which convey stormwater through various underground pipe networks into the Ballona Creek. Ballona Creek flows generally southwest, ultimately discharging into the Pacific Ocean at the Santa Monica Bay. Ballona Creek is designed to discharge to Santa Monica Bay approximately 71,400 cubic feet per second from a 50-year frequency storm event.[1]

2.1.3. PROJECT SITE

Based on the project survey by KPFF dated December 20, 2017 (see Figure 1) and site observations, it is determined that under the existing conditions the Project Site is divided into six drainage areas, which are described below and shown in Figure 3. For the purposes of this hydrologic analysis, the 4.46-acre Project Site is slightly expanded to 4.50 acres in order to include the portion of the Alley to the south of the Project Site (Area B4 in figure 1) which would be merged into the Project Site upon Project buildout. While no physical changes would occur to this ally, it is accounted for in its own drainage area under existing conditions in order to provide an accurate comparison between the pre- and post-Project conditions. The Alley consists entirely of impervious surfaces. These drainage areas are determined by the drainage patterns and flow paths of stormwater that are tributary to a common point or area. The Site generally consists of impervious surface parking, buildings, and impervious pavement for pedestrian and vehicular circulation.

- **West Site**

    - Area A1 consists of the one-story AMDA building and surface parking lot located at the corner of Yucca Street and Ivar Avenue. There are several catch basins in the parking lot into which the storm water generally conveys before discharging to either Yucca Street or Ivar Avenue via curb drains. The building's roof drainage collects internally and discharges to Vine Street via a curb drain.

    - Area A2 consists of a surface parking lot located between Ivar Avenue and Vine Street which sheet flows southeast to the gutter on Vine Street.

[1] http://www.ladpw.org/wmd/watershed/bc/; accessed October 1, 2018.

- **East Site**

    - Area B1 consists of a surface parking lot on Vine Street which sheet flows southwest to the gutter on Vine Street.

    - Area B2 consists of a surface parking lot on Argyle Avenue which sheet flows southeast to a catch basin before daylighting to the Alley to the south.

    - Area B3 consists of the Capitol Records Complex and surrounding surface parking lot. The surface parking lot sheet flows southwest to a catch basin which is anticipated to discharge to Vine Street. The Capitol Records Complex roof drainage collects internally and discharges to Yucca Street and Vine Street via curb drains.

    - Area B4 consists of a portion of the Alley to the south of the site which will be merged into the proposed Project Site. The merged portion of the alley sheet flows into an existing catch basin that is located on the west side of the alley. The remainder of the alley that will remain public right-of-way also sheet flows towards the same catch basin. A small portion of eastern part of the alley sheet flows into the gutter in Argyle Avenue.

Figure 5 shows all the input parameters used for analyzing the existing Site. Table 1 summarizes the existing volumetric flow rate generated by a 50-year storm event (Q_{50}).

Table 1- Existing Drainage Stormwater Runoff Calculations

Drainage Area	Area (Acres)	Percent Imperviousness (%)	Q_{50} (cfs) (volumetric flow rate measured in cubic feet per second)
West Site			
A1	0.17	100%	0.53
A2	1.64	100%	5.27
East Site			
B1	0.78	100%	2.50
B2	0.57	90.9%	1.82
B3	1.31	94.5%	4.20
B4	0.03	100%	0.10
TOTAL	**4.50**	**97.2%**	**14.42**

2.2. SURFACE WATER QUALITY

2.2.1. REGIONAL

As stated above, the Project Site lies within the Ballona Creek Watershed. Constituents of concern listed for Ballona Creek under California's Clean Water Act Section 303(d) List include Cadmium (sediment), Chlordane (Tissue & Sediment), Coliform Bacteria, Copper (Dissolved), Cyanide, DDT, Lead, PAHs, PCBs, Selenium, Sediment Toxicity, Shellfish Harvesting Advisory, Silver, Toxicity, Trash, Viruses (Enteric), and Zinc. No TMDL data have been recorded by EPA for this waterbody.[2]

2.2.2. LOCAL

In general, urban stormwater runoff occurs following precipitation events, with the volume of runoff flowing into the drainage system depending on the intensity and duration of the rain event. Contaminants that may be found in stormwater from developed areas include sediments, trash, bacteria, metals, nutrients, organics and pesticides. The source of contaminants includes surface areas where precipitation falls, as well as the air through which it falls. Contaminants on surfaces such as roads, maintenance areas, parking lots, and buildings, which are usually contained in dry weather conditions, may be carried by rainfall runoff into drainage systems. The City of Los Angeles typically installs catch basins with screens to capture debris before entering the storm drain system. In addition, the City conducts routine street cleaning operations, as well as periodic cleaning and maintenance of catch basins, to reduce stormwater pollution within the City.

2.2.3. PROJECT SITE

Based on the project survey by KPFF dated December 20, 2017 (see Figure 1), site observations, and the fact that the existing site was developed prior to the enforcement of storm water quality Best Management Practices (BMP) design, implementation and maintenance, it appears the Project Site currently does not implement BMPs and has no means of treatment for stormwater runoff.

2.3. GROUNDWATER HYDROLOGY

2.3.1. REGIONAL

Groundwater use for domestic water supply is a major beneficial use of groundwater basins in Los Angeles County. The City of Los Angeles overlies the Los Angeles Coastal Plain Groundwater Basin (Basin). The Basin comprises the Hollywood, Santa Monica, Central, and West Coast Subbasins. Groundwater flow in the Basin is generally south-southwesterly and may be restricted by natural geological features. Replenishment of groundwater basins occurs mainly by percolation of precipitation throughout the region via permeable surfaces, spreading grounds, and groundwater migration from adjacent basins, as well as injection

[2]https://iaspub.epa.gov/waters10/attains_waterbody.control?p_au_id=CAR4051300019980918142302&p_list_id=CAR4051300019980918142302&p_cycle=2012; accessed October 1, 2018.

wells designed to pump freshwater along specific seawater barriers to prevent the intrusion of salt water.

2.3.2. LOCAL

Within the Basin, the Project Site specifically overlies the Hollywood Subbasin (Subbasin), which underlies the northeastern portion of the Basin. The Subbasin is bounded on the north by the Santa Monica Mountains and the Hollywood fault, on the east by the Elysian Hills, on the west by the Inglewood fault zone, and on the south by the La Brea high, formed by an anticline that brings impermeable rocks close to the surface.[3]

Groundwater in the Subbasin is replenished by percolation of precipitation and stream flow from the Santa Monica Mountains to the north. Urbanization in this area has decreased the amount of pervious surface area allowing direct percolation. Therefore, natural recharge is somewhat limited. The natural safe yield of the Subbasin is estimated to be approximately 3,000 acre-feet per year (AFY).

The primary producer from the Subbasin is the city of Beverly Hills, which currently owns and operates 4 groundwater production wells in the Subbasin. These wells have a combined capacity of 2,083 gallons per minute (gpm) and are treated by a reverse osmosis desalter.[4] Groundwater flow within the Subbasin generally flows east to west.

The Project Site is located in the eastern portion of the Subbasin.

2.3.3. PROJECT SITE

The existing Project Site is improved with existing buildings and paved surfaces, and therefore does not contribute to groundwater recharge. The below discussion is based upon a review of relevant previous investigations and on-site explorations conducted as part of the Preliminary Geotechnical Investigation for EIR by Feffer Geological Consulting dated July 22, 2019.

Soil borings were drilled to a maximum depth of 135.5 feet below the ground surface during Feffer's field investigation and groundwater was encountered at varying depths between 49.2 feet and 98.3 feet below ground surface. Historically, highest groundwater in this area of Los Angeles is estimated to be between 80 and 100 feet below the ground surface (Department of Conservation, 1998).[5]

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3 http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/4-11.02.pdf; accessed September 6, 2018.

4 http://www.water.ca.gov/urbanwatermanagement/2010uwmps/Beverly%20Hills,%20City%20of/Beverly%20Hills%202010%20UWMP_August%202011.pdf; accessed September 6, 2018.

5 Preliminary Geotechnical report titled "Geotechnical Investigation for EIR", by Feffer Geological Consulting, dated July 22 2019.

2.4. GROUNDWATER QUALITY

2.4.1. REGIONAL

As stated above, the City of Los Angeles overlies the Los Angeles Coastal Plain Groundwater Basin (Basin), which falls under the jurisdiction of the Los Angeles Regional Water Quality Control Board (LARWQCB). According to LARWQCB's Basin Plan, objectives applying to all ground waters of the region include bacteria, chemical constituents and radioactivity, mineral quality, nitrogen (nitrate, nitrite), and taste and odor.[6]

2.4.2. LOCAL

As stated above, the Project Site specifically overlies the Hollywood Subbasin. Based upon LARWQCB's Basin Plan, constituents of concern listed for the Hollywood Subbasin include boron, chloride, sulfate, Total Dissolved Solids (TDS), and nitrate.[7]

2.4.3. PROJECT SITE

Though it is possible for surface water borne contaminants to percolate into groundwater and affect groundwater quality, as the Project Site is 97.5% impervious in the existing condition, no appreciable infiltration of potential contaminants described above is expected to occur. Additionally, compliance with all existing hazardous waste regulations further reduce this potential.

Other types of risk such as underground storage tanks (UST) have a greater potential to impact groundwater. Based on a review of relevant previous investigations and on-site explorations conducted as part of the Phase I Environmental Site Assessment (ESA) dated July 30, 2018 by Citadel Environmental Services, Inc. (Citadel) four USTs were installed in 1944 at 6334 Yucca Street, which was historically a gasoline service station, and abandoned by removal under Los Angeles Fire Department oversight in 1971. The subject property is not listed on the California Facility Inventory Database Underground Storage Tank (CA FID UST) database. Furthermore, Citadel found that a part of the Site was once occupied by a dry-cleaner and that other several dry-cleaning facilities were once present in the Site Vicinity. Based on the historical nature of operation of the Site, Citadel recommended additional testing and subsurface impact evaluation to be performed as a part of a Phase II ESA.

As outlined in the Phase II ESA dated December 19, 2018 by Citadel, twelve borings were drilled on the Site and vapor probes were installed in each boring. No groundwater was

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6 Los Angeles Regional Water Quality Control Board, Basin Plan, March 2013, http://www.waterboards.ca.gov/losangeles/water_issues/programs/basin_plan/electronics_documents/Final%20Chapter%203%20Text.pdf accessed February 1, 2018.

7 Ibid.

encountered in any of the borings. The boring logs can be found in Appendix D of the Phase II ESA.

Citadel found detections of carbon tetrachloride, PCE, toluene and xylenes in borings B1, B2, B3, B5 and B8 located in close proximity to the historical gasoline station. Furthermore, detections of xylenes in boring B9 and B10 were observed. Citadel reported that all the detections were below the screening levels for future commercial structures. The full laboratory results can be found in Appendix F of the Phase II ESA.

If excavation activities are performed at the Site, Citadel recommends that a soil management plan (SMP) should be prepared to establish policy and requirements for the management and disposal of soil that may be generated during excavation activities at the Site. The purpose of the SMP is to describe specific soil controls required for complying with local, state and federal overseeing agencies; prevent unacceptable exposure to contaminated soil and groundwater, and prevent the improper disposal of contaminated soil.

3. PROPOSED IMPACT ANALYSIS

3.1. CONSTRUCTION

3.1.1. SURFACE WATER HYDROLOGY

Construction activities for the Project would include demolition of the one-story AMDA building and hardscape, excavating down to a maximum depth of 82 feet bgs to build up the underground structure, building up the structures, and constructing hardscape and landscape around the structures. It is anticipated that up to approximately 542,300 cubic yards of soil would be graded, most of which would be exported to construct the Project. These activities have the potential to temporarily alter existing drainage patterns and flows on the Project Site by exposing the underlying soils, modifying flow direction, and making the Project Site temporarily more permeable. Also, exposed and stockpiled soils could be subject to erosion and conveyance into nearby storm drains during storm events. In addition, construction activities such as earth moving, maintenance/operation of construction equipment, and handling/storage/disposal of materials could contribute to pollutant loading in stormwater runoff.

As the construction site would be greater than one acre, the Project would be required to obtain coverage under the National Pollutant Discharge Elimination System (NPDES) General Construction stormwater permit. In accordance with the requirements of this permit, the Project would implement a Stormwater Pollution Prevention Plan (SWPPP) that specifies BMPs and erosion control measures to be used during construction to manage runoff flows and prevent pollution. BMPs would be designed to reduce runoff and pollutant levels in runoff during construction. The NPDES and SWPPP measures are designed to (and would) contain and treat, as necessary, stormwater or construction watering for dust reduction on the Project Site so runoff does not impact off-site drainage facilities or

receiving waters. Construction activities would be temporary, and flow directions and runoff volumes during construction would be controlled.

In addition, the Project would be required to comply with all applicable City grading permit regulations that require necessary measures, plans, and inspections to reduce sedimentation and erosion. Thus, through compliance with all NPDES General Construction Permit requirements, including preparation of a SWPPP, implementation of BMPs, and compliance with applicable City grading regulations, the Project would not substantially alter the Project Site drainage patterns in a manner that would result in substantial erosion, siltation, or flooding on- or off-site. Similarly, adherence to standard compliance measurements in construction activities would avoid flooding, substantially increasing or decreasing the amount of surface water flow from the Project Site into a water body, or a permanent, adverse change to the movement of surface water.

3.1.2. SURFACE WATER QUALITY

Construction activities such as earth moving, maintenance/operation of construction equipment, potential dewatering, and handling/storage/disposal of materials could contribute to pollutant loading in stormwater runoff. However, as previously discussed, the Project would be required to obtain coverage under the NPDES General Construction Permit (order No. 2009-0009-SWQ). In accordance with the requirements of the permit, the Project Applicants would prepare and implement a site-specific SWPPP adhering to the California Stormwater Quality Association (CASQA) BMP Handbook. The SWPPP would specify BMPs to be used during construction. BMPs would include, but would not necessarily be limited to: erosion control, sediment control, non-stormwater management, and materials management BMPs. Refer to Exhibit 1 for typical SWPPP BMPs implemented during the construction of development projects.

Based on the Geotechnical report from Feffer dated July 22, 2019, there were four borings drilled on the site ranging from 65 to 135.5 feet in depth and a water monitor well was installed in boring #3 at a depth of 65 feet. Per the boring log, the monitor well in boring 3 found the groundwater to be at 59 feet bgs on 10/30/2018 and 51 feet bgs on 11/01/2018. The maximum estimated excavation is 82 feet bgs from the highest existing elevation on the site. Since the existing surface drops by over 20 feet across the site, the excavation depth will vary. At boring 3 where the monitoring well was installed the excavation depth will be closer to 65 feet bgs. Since the proposed lowest underground level is deeper than the measured groundwater, dewatering is expected to be required during construction. Dewatering operations are practices that discharge non-stormwater, such as groundwater, that must be removed from a work location and discharged into the storm drain system to proceed with construction. Discharges from dewatering operations can contain high levels of fine sediments, which, if not properly treated, could lead to exceedance of the NPDES requirements. When groundwater is encountered during construction, temporary pumps and filtration would be utilized in compliance with the NPDES permit. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations. If dewatering is required, the treatment and disposal of the dewatered water would occur in accordance with the requirements of

LARWQCB's Waste Discharge Requirements for Discharges of Groundwater from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties.

With the implementation of site-specific BMPs included as part of the required Erosion Plan, the Project would reduce or eliminate the discharge of potential pollutants from the stormwater runoff. In addition, the Project Applicant would be required to comply with City grading permit regulations, which require implementation of necessary measures, plans (including a wet weather erosion control plan if construction occurs during the rainy season), and inspection to reduce sedimentation and erosion. Therefore, with compliance with NPDES requirements and City grading regulations, construction of the Project would not result in discharge that would cause: (1) pollution which would alter the quality of the water of the State (i.e. Ballona Creek) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the water of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes. Furthermore, construction of the Project would not result in discharges that would cause regulatory standards to be violated in Ballona Creek.

3.1.3. GROUNDWATER HYDROLOGY

As stated above, construction activities for the Project would include demolition of the one-story AMDA building and hardscape, excavating down to a maximum depth of 82 feet bgs to build up the underground structure, building up the structures, and constructing hardscape and landscape around the structures. Dewatering operations may be required temporarily in order to construct the footings and the underground structure. If groundwater is encountered during construction, temporary pumps and filtration would be utilized in compliance with all applicable regulations and requirements, including with all relevant NPDES requirements related to construction and discharges from dewatering operations. Therefore, the Project would not substantially deplete groundwater supplies in a manner that would result in a net deficit in aquifer volume or lowering of the local groundwater table.

3.1.4. GROUNDWATER QUALITY

As discussed above, the Project would include excavations to a maximum depth of approximately 82 feet below ground surface. The Project would also result in a net export of existing soil material. Although not anticipated at the Project Site, any contaminated soils found would be captured within that volume of excavated material, removed from the Project Site, and remediated at an approved disposal facility in accordance with regulatory requirements.

During on-site grading and building construction, hazardous materials, such as fuels, paints, solvents, and concrete additives, could be used and would therefore require proper management and, in some cases, disposal. The management of any resultant hazardous wastes could increase the opportunity for hazardous materials releases into groundwater.

Compliance with all applicable federal, state, and local requirements concerning the handling, storage and disposal of hazardous waste, would reduce the potential for the construction of the Project to release contaminants into groundwater that could affect existing contaminants, expand the area or increase the level of groundwater contamination, or cause a violation of regulatory water quality standards at an existing production well. Therefore, the Project would not result in any substantial increase in groundwater contamination through hazardous materials releases and impacts on groundwater quality would be less than significant.

3.2. OPERATION

3.2.1. SURFACE WATER HYDROLOGY

The Project will meet the requirements of the City's Low Impact Development (LID) standards.[8] Under section 3.1.3. of the LID Manual, post-construction stormwater runoff from a new development must be infiltrated, evapotranspirated, captured and used, and/or treated through high efficiency BMPs onsite for at least the volume of water produced by the greater of the 85th percentile storm or the 0.75 inch storm event. The LID Manual prioritized the selection of BMPs used to comply with stormwater mitigation requirement. The order of priority is:

1. Infiltration Systems
2. Stormwater Capture and Use
3. High Efficient Biofiltration/Bioretention Systems
4. Combination of Any of the Above

Feasibility screening delineated in the LID manual is applied to determine which BMP will best suit the Project. Based on the screening criteria, infiltration is not considered feasible at the Project Site. Based on Feffer's Geological Consulting geotechnical report, the encountered depth of groundwater and the depth to bedrock there is likely insufficient capacity for infiltration into the subsurface and inadequate separation between the bottom of foundations and the groundwater. Specifically, LID guidelines require that infiltration systems maintain at least ten feet of clearance to the groundwater, property line, and any building structure. As stated above, the groundwater was encountered during Feffer's soil boring analysis at varying depths of 49.2 to 98.3 feet below the ground surface and the historic high groundwater level is approximately 80 and 100 feet below the ground surface. Thus, due to the Project's planned maximum excavation depth of 82 feet below the ground surface, infiltration is not considered feasible. Therefore the Project will land in priority tier 2 – capture and use. The Project would implement capture and use systems to collect and store the first flush of stormwater runoff to satisfy LID requirements and use it for irrigation. Based on the proposed landscape area and irrigation demands, a

[8] The Development Best Management Practices Handbook, Part B Planning Activities, 5th edition was adopted by the City of Los Angeles, Board of Public Works on May 9, 2016 to reflect Low Impact Development (LID) requirements.

capture and reuse system is feasible for the Site. The capture and use system will be designed to comply with the latest City of LA LID standards.

The Project will nominally increase the percentage of impervious area compared to existing conditions on the Project Site. The Project Site currently consists of existing buildings and paved parking lots with little pervious surface. The Project will develop buildings surrounded by hardscape and landscape. The proposed Project will be approximately 87.3% impervious after construction. Based on site investigation, under the existing condition it appears that stormwater discharges from the Project Site without treatment or on-site detention. The Project would improve this condition by complying with the LID standards for capturing the first flush of stormwater rather than it being disposed directly to the public storm drain system.

Under the proposed conditions illustrated in Figure 4, the Project Site would consist of three drainage areas that would drain via building roof drains, surface flow, and subterranean drainage to the proposed BMPs.

- **West Site**
    - Area A1 consists of the entire West Site. The West Site have subterranean parking spanning property line to property line and is therefore considered one drainage area. The general drainage on the podiums would enter various catch basins and area drains to be designed and located by the Architect, Landscape and Plumbing Engineer during the design phase. The captured stormwater will be routed via building conveyance pipes designed by the Plumbing Engineer, and the water will be connected to the LID system.
- **East Site**
    - Area B1 consists of the proposed building footprint on the East Site, including the alley merger. The East Site have subterranean parking spanning property line to property line and is therefore considered one drainage area. The general drainage on the podiums would enter various catch basins and area drains to be designed and located by the Architect, Landscape and Plumbing Engineer during the design phase. The captured stormwater will be routed via building conveyance pipes designed by the Plumbing Engineer, and the water will be connected to the LID system
    - Area B2 consists of the portion of the Capitol Records Complex which will be preserved. The general drainage pattern will remain.

Proposed runoff was analyzed for a 50-year storm event. Refer to Figure 6 for the parameters used for analyzing the proposed site drainage using HydroCalc and Figure 8 for the LA County Hydrology Data Map. Table 2 shows the proposed volumetric flow rates generated by a 50-year storm event.

Table 2 - Proposed Drainage Stormwater Runoff Calculations			
Drainage Area	Area (acres)	Percent Imperviousness (%)	Q_{50} (cfs) (volumetric flow rate measured in cubic feet per second)
West Site			
A1	1.81	83.0%	5.77
East Site			
B1	1.62	88.1%	5.17
B2	1.07	93.3%	3.43
TOTAL	**4.50**	**87.3%**	**14.37**

Table 3 shows the proposed 50-year frequency design storm event peak flow rate within the Project Site. A comparison of the pre- and post-Project peak flow rates indicates a 0.3% decrease in stormwater runoff.

Table 3 – Proposed Drainage Stormwater Runoff Calculations Summary		
Pre-Project Q_{50} (cfs)	**Post-Project Q_{50} (cfs)**	**Incremental Decrease from Existing to Proposed Condition**
14.42	14.37	0.3%

Compliance with the LID requirements for the Project Site would ensure stormwater treatment with post-construction BMPs that are required to control pollutants associated with storm events up to the 85th percentile storm event, per the City's Stormwater Program. It follows that, the Project BMPs would control stormwater runoff and result in a minor decrease in runoff. In order to meet the LID requirements, it is estimated that a total of 9,684 cubic feet of stormwater will need to be mitigated throughout the Project Site; 4,986 cubic feet at the West Site and 4,698 cubic feet at the East Site (see Figure 7). The East Site mitigated area does not include Area B2, which consists of the Capitol Records Complex as this area will remain preserved and will be separated into a separate lot. To achieve this design capture volume, the Applicant would likely install a capture and use system on each site. The detention tank would temporarily store the captured stormwater until the stored volume is entirely used through the irrigation systems. Typical capture and use systems are illustrated in Exhibit 2.

In addition, as described above, as part of the SUSMP for the Project to manage post-construction stormwater runoff, the Project would include the installation of building roof drain downspouts, area drains, and planter drains throughout the Project Site to collect roof and site runoff and direct stormwater away from buildings through a series of storm drain pipes. This on-site stormwater conveyance system would serve to prevent on-site flooding and nuisance water on the Project Site.

Consequently, the Project would not cause flooding during the 50-year developed storm event, would not create runoff which would exceed the capacity of existing or planned drainage systems, would not substantially reduce or increase the amount of surface water in a water body, or result in a permanent adverse change to the movement of surface water.

Earthquake-induced flooding can result from the failure of dams or other water-retaining structures resulting from earthquakes. According to the City of Los Angeles General Plan Safety Element, Exhibit G: Inundation & Tsunami Hazard Areas (Refer to Figure 11), the Project Site is located in a potential dam inundation area. Dam safety regulations are the primary means of reducing damage or injury due to inundation occurring from dam failure. The California Division of Safety of Dams regulates the siting, design, construction, and periodic review of all dams in the State. In addition, the Los Angeles Department of Water and Power (LADWP) operates the dams in the Project Site area and mitigates the potential for over flow and seiche hazard through control of water levels and dam wall height. These measures include seismic retrofits and other related dam improvements completed under the requirements of the 1972 State Dam Safety Act. The City's Local Hazard Mitigation Plan,[9] which was adopted in July 2011, provides a list of existing programs, proposed activities and specific projects that may assist the City of Los Angeles in reducing risk and preventing loss of life and property damage from natural and human-caused hazards, including dam failure. The Hazard Mitigation Plan evaluation of dam failure vulnerability classifies dam failure as a moderate risk rating. Therefore, considering the above information and risk reduction projects, the risk of flooding from inundation by a seiche or dam failure is considered low.

Additionally, the Project Site is not located within a Special Flood Hazard Area (100-year floodplain) or Moderate Flood Hazard Area (500-year floodplain) identified by the Federal Emergency Management Agency (FEMA) and published in the Flood Insurance Rate Maps (FIRM).[10] The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 500-year floodplain are labeled Zone C or Zone X (unshaded). As shown on Figure 10, the Project Site is located within Zone X (unshaded) and is therefore located outside of the 100- and 500-year floodplain.[11]

---

9 City of Los Angeles Emergency Management Department, *Local Hazard Mitigation Plan,* dated July 1, 2011.

10 FIRMs depict the 100-year floodplain as Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30. FIRMs depict the 500-year floodplain as Zone B or Zone X (shaded).

11 Based on FIRM Number 06037C1605F, effective on 09/26/2008.

3.2.2. SURFACE WATER QUALITY

The Project would not increase concentrations of the items listed as constituents of concern for the Ballona Creek Watershed.

As discussed above, the Project would implement capture and use system as a BMP for managing stormwater runoff in accordance with current LID requirements. Since it appears there are currently no existing onsite BMPs, stormwater run-off during post-Project conditions would result in improved surface water quality.

Due to the incorporation of the required LID BMP(s), operation of the Project would not result in discharges that would cause: (1) pollution which would alter the quality of the waters of the State (i.e., Ballona Creek) to a degree which unreasonably affects beneficial uses of the waters; (2) contamination of the quality of the waters of the State by waste to a degree which creates a hazard to the public health through poisoning or through the spread of diseases; or (3) nuisance that would be injurious to health; affect an entire community or neighborhood, or any considerable number of persons; and occurs during or as a result of the treatment or disposal of wastes.

As is typical of most urban existing uses and proposed developments, stormwater runoff from the Project Site has the potential to introduce pollutants into the stormwater system. Anticipated and potential pollutants generated by the Project are sediment, nutrients, pesticides, metals, pathogens, and oil and grease. Release of such pollutants would be minimized by implementation of LID BMPs.

Furthermore, operation of the Project would not result in discharges that would cause regulatory standards to be violated. The existing Project Site is 97.5% impervious and consists of existing building and paved surface lots. The Project will decrease the percentage of impervious surface to 87.3%. As stated above, it appears that the existing conditions on the Project Site discharge without any means of treatment. However, the Project would include the installation of LID BMPs, which would mitigate at minimum the first flush or the equivalent of the greater between the 85th percentile storm and first 0.75-inch of rainfall for any storm event. The Project BMPs will control stormwater runoff with no increase in runoff resulting from the Project.

3.2.3. GROUNDWATER HYDROLOGY

Regarding groundwater recharge, the entire Project Site is virtually impervious in the existing condition, and there is minimal groundwater recharge potential. The Project will develop hardscape and structures that cover virtually the entire Project Site with impervious surfaces, and therefore the groundwater recharge potential will remain minimal. As stated above, the stormwater which bypasses the BMP systems would discharge to an approved discharge point in the public right-of-way and not result in infiltration of a large amount of rainfall that would affect groundwater hydrology, including the direction of groundwater flow. Therefore, the Project's potential impact on groundwater recharge is less than significant.

As discussed above, Project development would require excavations with a maximum depth of approximately 82 feet below grade. As described in the geotechnical report by Feffer Geological Consulting, the groundwater was encountered at varying depths between 49.2 and 98.3 feet below the ground surface. Furthermore the historic high groundwater level in the vicinity of the Project Site was on the order of 80-100 feet below grade. If groundwater is encountered during construction, temporary pumps and filtration would be utilized in compliance with the NPDES permit. The temporary system would comply with all relevant NPDES requirements related to construction and discharges from dewatering operations. Furthermore, there are no existing wells or spreading grounds within one mile of the Project Site and the Project would not include new injection or supply wells.

3.2.4. GROUNDWATER QUALITY

The Project does not include the installation or operation of water wells, or any extraction or recharge system that is in the vicinity of the coast, an area of known groundwater contamination or seawater intrusion, a municipal supply well or spreading ground facility.

Operational activities which could affect groundwater quality include spills of hazardous materials and leaking underground storage tanks. No underground storage tanks are currently operated or will be operated by the Project. In addition, while the Project would introduce more density and land uses to the Project Site which would slightly increase the use of potentially hazardous materials as described above, the Project would comply with all applicable existing regulations regarding the handling and potentially required cleanup of hazardous materials. Therefore, the Project would not affect or expand any potential areas of contamination, increase the level of contamination, or cause regulatory water quality standards at an existing production well to be violated, as defined in the California Code of Regulations, Title 22, Division 4, Chapter 15 and the Safe Drinking Water Act.

Additionally, the Project would include the installation of capture and use system as a means of treatment and disposal of the volume of water produced by the greater of the 85th percentile storm or the 0.75-inch storm event, which would allow for treatment of the on-site stormwater prior to using it for irrigation.

4. CONCLUSION

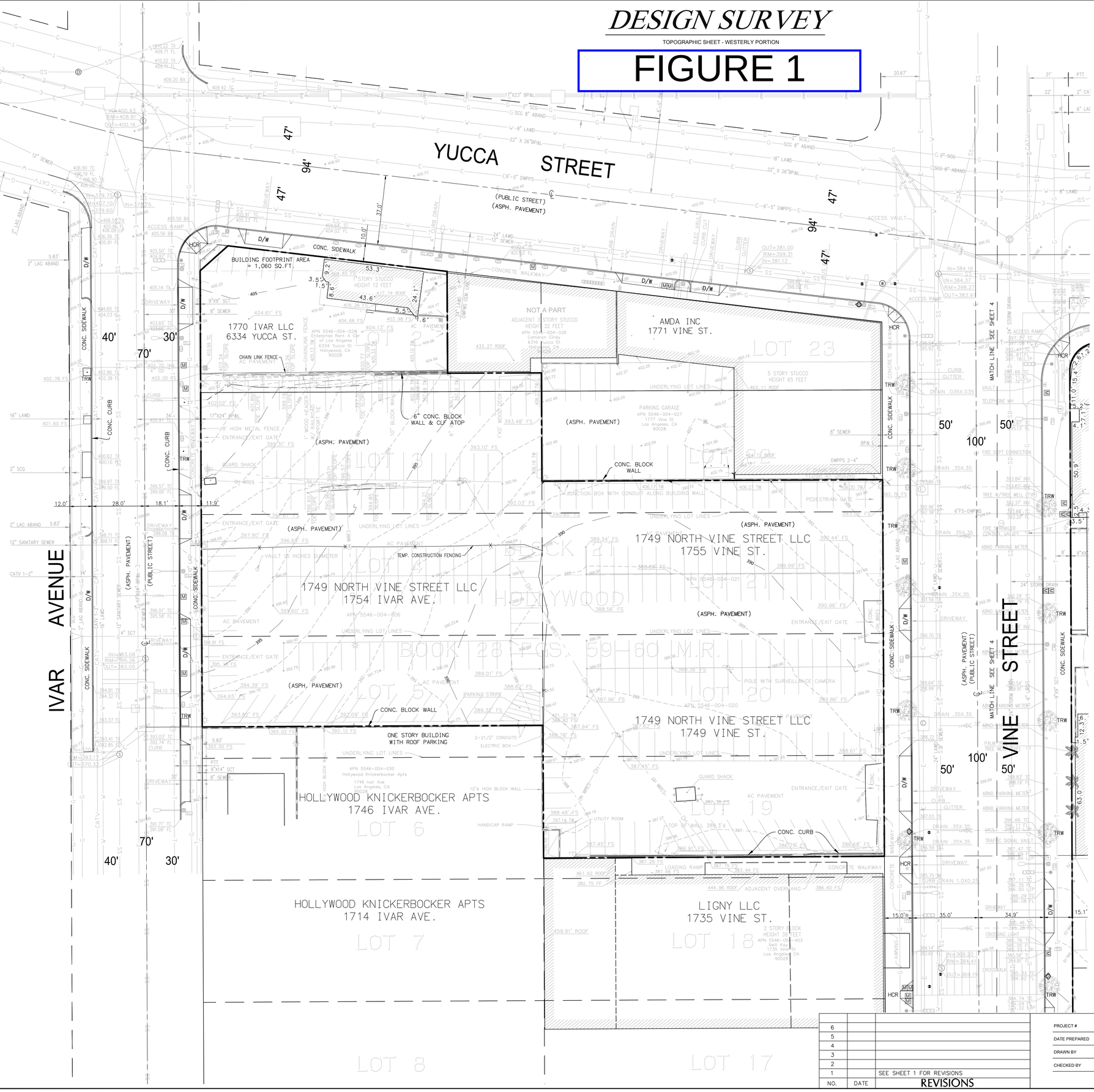
In conclusion, the Project will improve the site's hydrologic function. The Project design will include implementation of a capture and use system that would comply with the City's LID requirements. Whereas stormwater from the Project Site currently sheet flows without treatment into an underground storm drain network that ultimately discharges to the Santa Monica Bay, implementation of the Project would capture and use stormwater on-site, reducing the amount of water discharged from the site.

APPENDICES

DESIGN SURVEY

TOPOGRAPHIC SHEET - WESTERLY PORTION

FIGURE 1



N

0 10' 20'

SCALE: 1"=20'

ABBREVIATIONS

ASPH	ASPHALT
AC	ASPHALT CONCRETE
AD	AREA DRAIN
BW	BACK OF WALK
CONC.	CONCRETE
CBW	CONCRETE BLOCK WALL
CD	CURB DRAIN
DI	DROP INLET
DG	DRAIN GRATE
D/W	DRIVEWAY APRON
ELEV	ELEVATION
ELEC.	ELECTRICAL
EV	ELECTRICAL VAULT
FF	FINISHED FLOOR
FL	FLOW LINE
FS	FINISH SURFACE (HARDSCAPE)
GV	GAS VALVE
HCR	HANDICAP RAMP
INV	INVERT OF PIPE
LA	LANDSCAPE AREA
LIP	LIP OF GUTTER
MH	MANHOLE
NTS	NOT TO SCALE
SCO	SEWER CLEANOUT
SDMH	STORM DRAIN MANHOLE
SS	SANITARY SEWER
SSMH	SANITARY SEWER MANHOLE
SCT	SOUTHERN CALIFORNIA TELEPHONE
SL	STREET LIGHT
TC	TOP OF CURB
TRW	TREE WELL
TS	TRAFFIC SIGNAL
VLT	VAULT
WVLT	WATER VAULT
WV	WATER VALVE
N'LY	NORTHERLY
S'LY	SOUTHERLY
E'LY	EASTERLY
W'LY	WESTERLY
NE'LY	NORTHEASTERLY
NW'LY	NORTHWESTERLY
SE'LY	SOUTHEASTERLY
SW'LY	SOUTHWESTERLY
℄	CENTERLINE

LEGEND

- AREA LIGHT
- BOLLARD
- DRAIN
- ELECTRICAL MANHOLE
- FIRE HYDRANT
- FIRE DEPARTMENT CONNECTION
- GAS VALVE
- GAS METER
- PARKING METER
- STREET LIGHT
- STREET LIGHT PULL BOX
- SEWER MANHOLE
- SEWER CLEAN OUT
- SIGN
- STORM DRAIN MANHOLE
- TELEPHONE MANHOLE
- TRAFFIC SIGNAL POLE
- TRAFFIC SIGNAL PULLBOX
- TREE
- TREE PALM
- UTILITY POLE
- WATER VALVE
- WATER METER
- WATER MANHOLE
- OVERHEAD LINE
- CONCRETE CURB
- WALL
- CHAIN LINK FENCE
- WROUGHT IRON FENCE

NO.	DATE	REVISIONS
6		
5		
4		
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2		
1		SEE SHEET 1 FOR REVISIONS

PROJECT #	1700060
DATE PREPARED	12/20/2017
DRAWN BY	DA
CHECKED BY	CJ

HOLLYWOOD CENTER

PREPARED FOR:

MAYER BROWN LLP
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F: 213.266.5294
www.kpff.com

DESIGN SURVEY

TOPOGRAPHIC SHEET - EASTERLY PORTION

YUCCA STREET
(PUBLIC STREET)
(ASPH. PAVEMENT)

VINE STREET
(PUBLIC STREET)
(ASPH. PAVEMENT)

ARGYLE AVENUE
(PUBLIC STREET)
(ASPH. PAVEMENT)

ALLEY

1750 NORTH VINE LLC LESSOR
6272 YUCCA ST.

1750 NORTH VINE LLC LESSOR
1750 VINE ST.

1750 NORTH VINE LLC LESSOR
6272 YUCCA ST.

6230 YUCCA URBAN HOUSING LLC
6230 YUCCA ST.

1733 NORTH ARGYLE LLC
1733 ARGYLE AVE.

1720 NORTH VINE LLC
1720 VINE ST.

NED PAN INC.
6233 HOLLYWOOD BLVD.

CITIZEN LA HOLLYWOOD PROPERTIES
1718 VINE ST.

BUILDING FOOTPRINT AREA
= 24,616 SQ.FT.

8" CONC. BLOCK WALL & IRON FENCE ATOP

8" CONC. WALL & LATTICE FENCE ATOP

UNMEASURED PEDESTRIAN DOOR AT BASEMENT LEVEL

ADJACENT BUILDING OVERHANG LINE

ADJACENT BUILDING LINE

CONC. CURB & GUTTER

FOUNTAIN

CONC. SIDEWALK

MATCH LINE SEE SHEET 3

SCALE: 1"=20'

NO.	DATE	REVISIONS
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PROJECT #	1700060
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HOLLYWOOD CENTER

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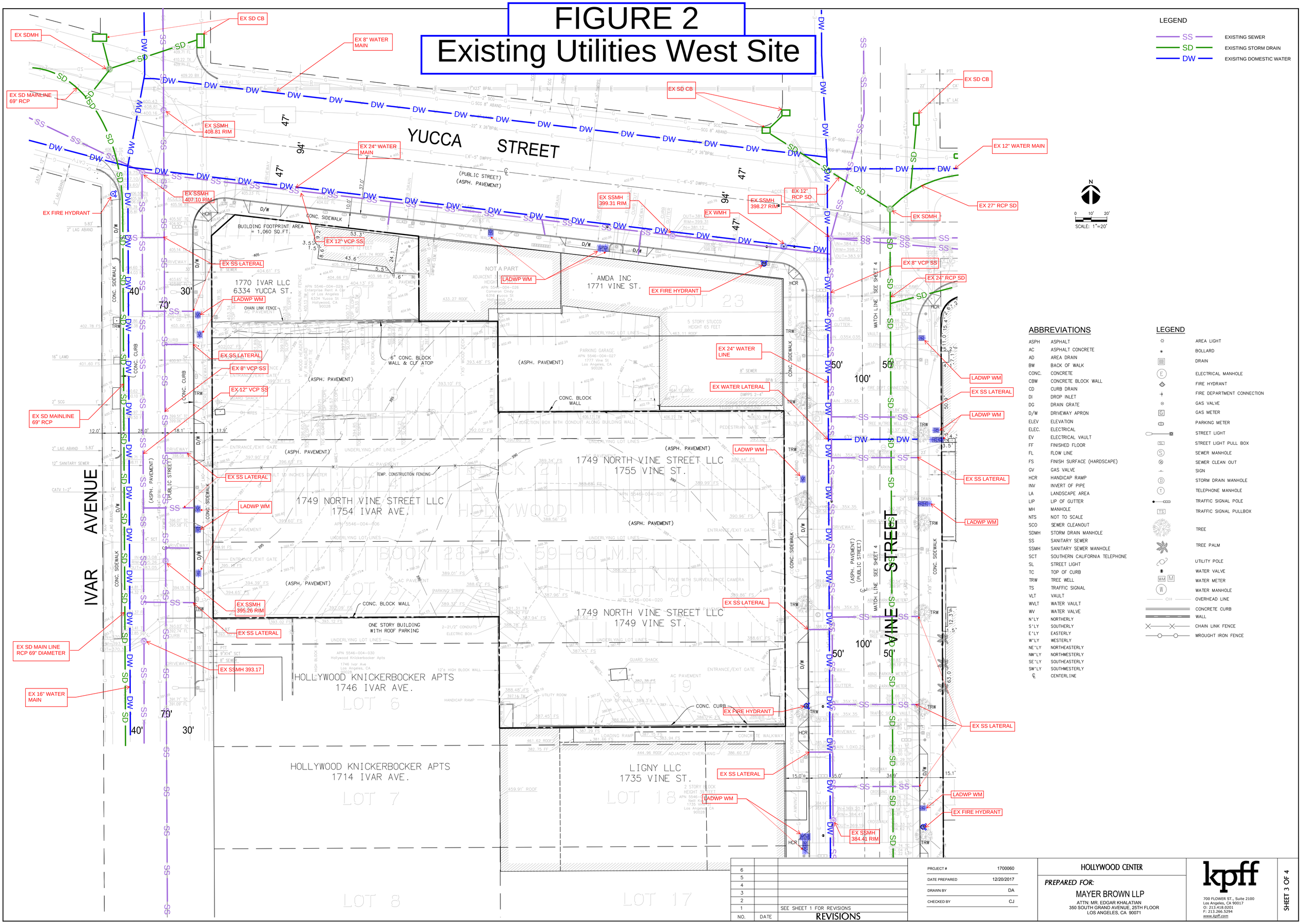
FIGURE 2
Existing Utilities West Site



LEGEND

SS	EXISTING SEWER
SD	EXISTING STORM DRAIN
DW	EXISITNG DOMESTIC WATER

N

0 10' 20'

SCALE: 1"=20'

ABBREVIATIONS

ASPH	ASPHALT
AC	ASPHALT CONCRETE
AD	AREA DRAIN
BW	BACK OF WALK
CONC.	CONCRETE
CBW	CONCRETE BLOCK WALL
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DI	DROP INLET
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D/W	DRIVEWAY APRON
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SW'LY	SOUTHWESTERLY
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LEGEND

- AREA LIGHT
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- DRAIN
- ELECTRICAL MANHOLE
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- WATER METER
- WATER MANHOLE
- OVERHEAD LINE
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- WALL
- CHAIN LINK FENCE
- WROUGHT IRON FENCE

NO.	DATE	REVISIONS
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1		SEE SHEET 1 FOR REVISIONS

PROJECT #	1700060
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CHECKED BY	CJ

HOLLYWOOD CENTER

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www.kpff.com

FIGURE 2
Existing Utilities East Site

YUCCA STREET
(PUBLIC STREET)
(ASPH. PAVEMENT)
VINE STREET
(PUBLIC STREET)
(ASPH. PAVEMENT)
ARGYLE AVENUE
(PUBLIC STREET)
(ASPH. PAVEMENT)
ALLEY

1750 NORTH VINE LLC LESSOR
6272 YUCCA ST.
1750 VINE ST.
6230 YUCCA URBAN HOUSING LLC
6230 YUCCA ST.
1733 NORTH ARGYLE LLC
1733 ARGYLE AVE.
1720 NORTH VINE LLC
1720 VINE ST.
NED PAN INC.
6233 HOLLYWOOD BLVD.
CITIZEN LA HOLLYWOOD PROPERTIES
1718 VINE ST.

EX SSMH 398.27 RIM
EX WMH
EX SDMH
EX 27" RCP SD
EX SS LINE
EX 12" WATER MAIN
EX 8" VCP SS
EX SSMH 411.47 RIM
EX 12" VCP SS
EX SSMH 405.11 RIM
EX 12" VCP SS
EX SSMH 411.46 RIM
EX 8" WATER LINE
EX 8" SS
EX 24" RCP SD
EX SS LATERAL
EX SD LINE
EX SS LATERAL
EX FIRE HYDRANT
EX SD LINE
EX CB
EX FIRE HYDRANT
EX SS LATERAL
EX 24" WATER LINE
EX LADWP WM
EX SS LATERAL
EX LADWP WM
EX LADWP WM
EX SS LATERAL
EX LADWP WM
EX CB
EX SS LATERAL
EX CB
EX CB
EX SS LATERAL
EX SS LATERAL
EX CB
EX FIRE HYDRANT
EX LADWP WM
EX SS LATERAL
EX LADWP WM
EX FIRE HYDRANT
EX SSMH 384.41 RIM
EX SS LATERAL
EX SS LATERAL
EX LADWP WM
EX SS LATERAL
EX FIRE HYDRANT
EX CB
EX 12" SD
EX SDMH
EX 24" RCP SD
EX LADWP WM
EX 12" SD
EX LADWP WM
EX SSMH 408.47 RIM
EX 8" VCP SS
EX 8" VCP SS
EX SSMH 384.77 RIM

ADJACENT BUILDING OVERHANG LINE
ADJACENT BUILDING LINE
CONC. CURB & GUTTER
FOUNTAIN
8" CONC. BLOCK WALL & IRON FENCE ATOP
8" CONC. WALL & LATTICE FENCE ATOP
BUILDING FOOTPRINT AREA = 24,616 SQ.FT.
UNMEASURED PEDESTRIAN DOOR AT BASEMENT LEVEL
GATE
CONC. SIDEWALK
BIKE RACK

LEGEND
SS EXISTING SEWER
SD EXISTING STORM DRAIN
DW EXISITNG DOMESTIC WATER

N
0 10' 20'
SCALE: 1"=20'

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1		SEE SHEET 1 FOR REVISIONS

PROJECT #	1700060
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CHECKED BY	CJ

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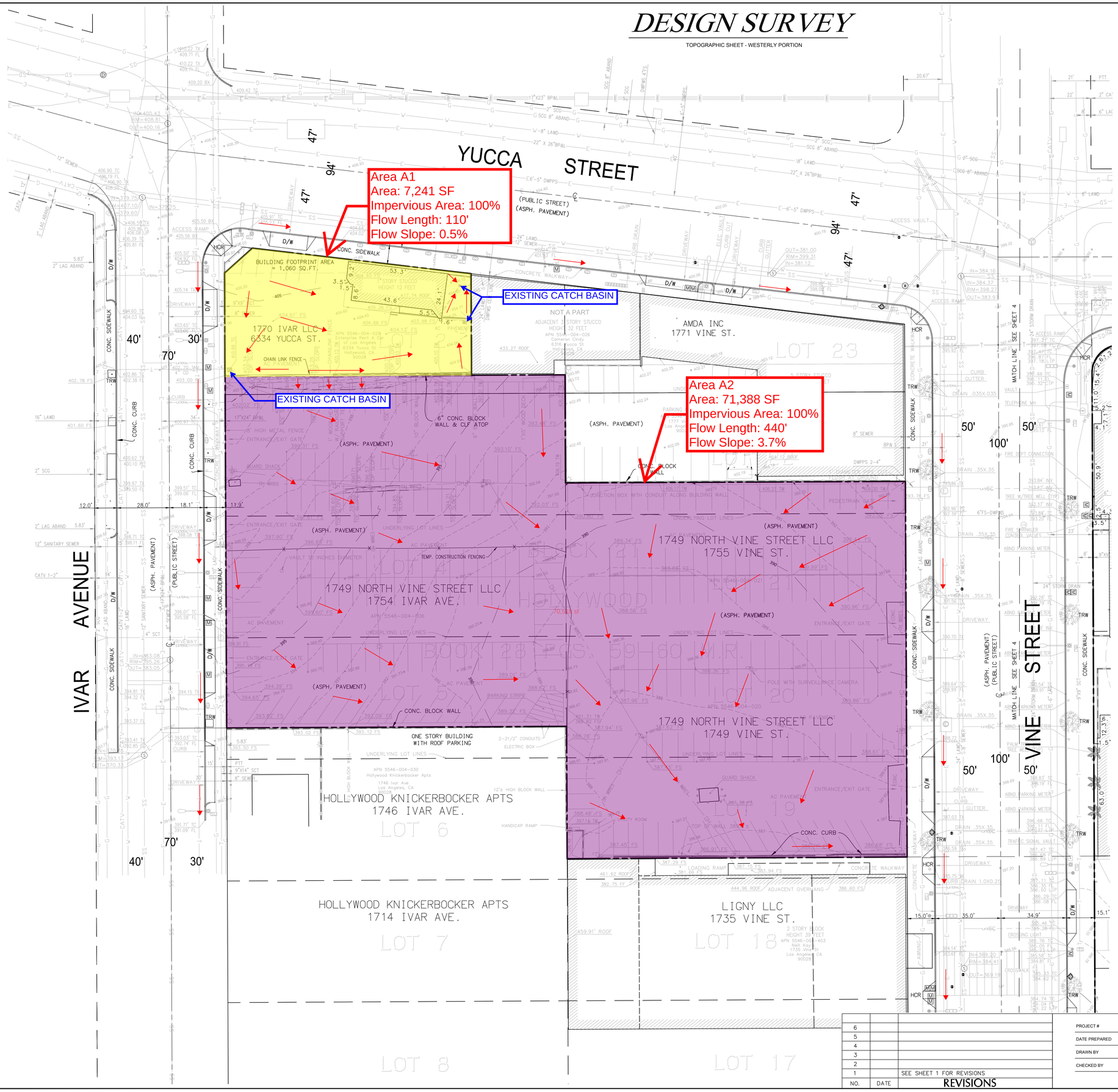
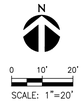
FIGURE 3

Existing Site Drainage: West Site





LEGEND

→ EXISTING FLOW PATTERN

FLOW LENGTH:
THE LENGTH FROM FURTHEST POINT TO THE LOWEST POINT IN THE DRAINAGE AREA.

FLOW SLOPE:
THE STEEPNESS (%) FROM THE HIGHEST POINT TO THE LOWEST POINT OF THE DRAINAGE AREA.

NO.	DATE	REVISIONS
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DESIGN SURVEY

TOPOGRAPHIC SHEET - EASTERN PORTION

FIGURE 3

Existing Site Drainage: East Site

YUCCA STREET
(PUBLIC STREET)
(ASPH. PAVEMENT)

Area B3
Area: 57,059 SF
Impervious Area: 94.5%
Flow Length: 250'
Flow Slope: 5.8%

EXISTING CATCH BASIN

EXISTING CATCH BASIN

EXISTING CATCH BASIN

EXISTING CATCH BASIN

EXISTING CATCH BASIN

HIGH POINT

Area B2
Area: 24,897 SF
Impervious Area: 90.9%
Flow Length: 192'
Flow Slope: 6.5%

Area B4 - Proposed
Alley Merger
Area: 1,267 SF
Impervious Area: 100%
Flow Length: 25'
Flow Slope: 8%

Area B1
Area: 33,910 SF
Impervious Area: 100%
Flow Length: 262'
Flow Slope: 4%

1750 NORTH VINE LLC LESSOR
6272 YUCCA ST.

1750 NORTH VINE LLC LESSOR
1750 VINE ST.

6230 YUCCA URBAN HOUSING LLC
LOT 15
6230 YUCCA ST.

1733 NORTH ARGYLE LLC
1733 ARGYLE AVE.

1720 NORTH VINE LLC
1720 VINE ST.

NED PAN INC.
6233 HOLLYWOOD BL

ALLEY

CITIZEN LA HOLLYWOOD PROPERTIES
1718 VINE ST.

VINE STREET

ARGYLE AVENUE (PUBLIC STREET)

LEGEND

→ EXISTING FLOW PATTERN

FLOW LENGTH:
THE LENGTH FROM FURTHEST POINT TO THE LOWEST POINT IN THE DRAINAGE AREA.

FLOW SLOPE:
THE STEEPNESS (%) FROM THE HIGHEST POINT TO THE LOWEST POINT OF THE DRAINAGE AREA.

N
0 10' 20'
SCALE: 1"=20'

NO.	DATE	REVISIONS
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PROJECT #	1700060
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HOLLYWOOD CENTER

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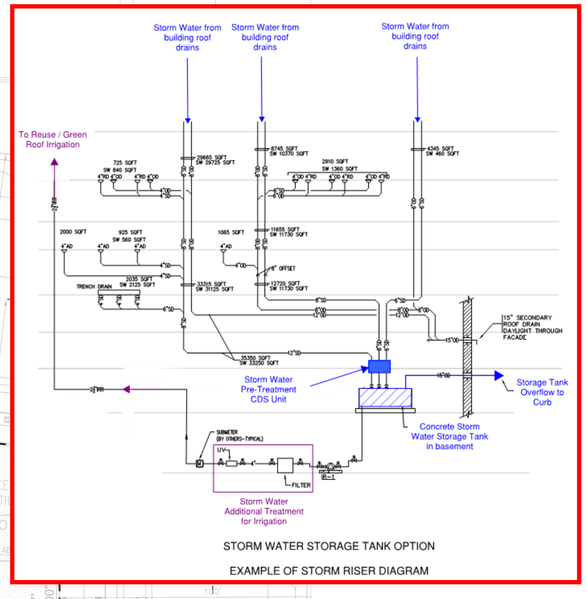
FIGURE 4

Proposed Site Drainage: West Site

Area A1
Area: 78,629 SF
Impervious Area: 83.0 %
LID Volume: 4,986 cubic feet.
Capture and Use tank location to be determined during design phase.

TYPICAL CAPTURE AND USE LID SYSTEM.



STORM WATER STORAGE TANK OPTION

EXAMPLE OF STORM RISER DIAGRAM

EXTENT OF SUBTERRANEAN PARKING

N

0 10' 20'

SCALE: 1"=20'

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CONSULTANTS

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REVISIONS

DATE		ISSUED FOR
XX/XX/XX	1	DESCRIPTION

SCALE 1" = 20'

KEY MAP

PROJECT DESCRIPTION
HOLLYWOOD CENTER

DRAWING TITLE

SHEET NUMBER (EXHIBIT NUMBER)

Area B2
Area: 46,752 SF
Impervious Area: 93.3%

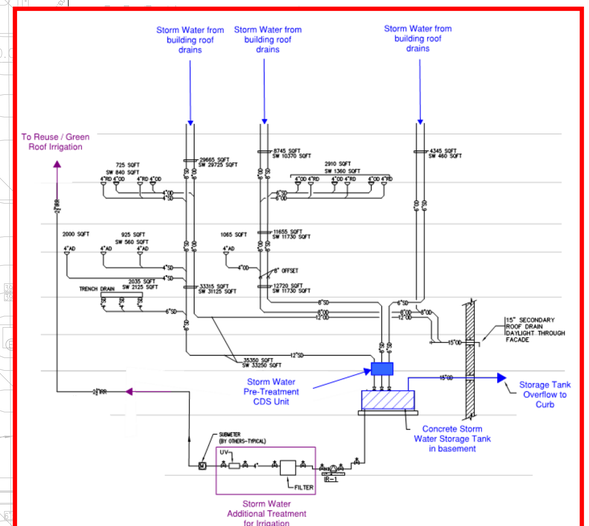
Area B1
Area: 70,381 SF (INCLUDING ALLEY MERGER)
Impervious Area: 88.1%
LID Volume: 4,698 cubic feet.
Capture and Use tank location to be determined during design phase

EXISTING CAPITOL RECORDS COMPLEX TO REMAIN

PROPOSED ALLEY MERGER - 1,267 SF

EXTENT OF SUBTERRANEAN PARKING

TYPICAL CAPTURE AND USE LID SYSTEM.



STORM WATER STORAGE TANK OPTION

EXAMPLE OF STORM RISER DIAGRAM

N
0 10' 20'
SCALE: 1"=20'

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STAMP

REVISIONS

DATE		ISSUED FOR
XX/XX/XX	1	DESCRIPTION

SCALE 1" = 20'

KEY MAP

PROJECT DESCRIPTION
HOLLYWOOD CENTER

DRAWING TITLE

SHEET NUMBER (EXHIBIT NUMBER)

FIGURE 5
Existing Flow Analysis

Peak Flow Hydrologic Analysis

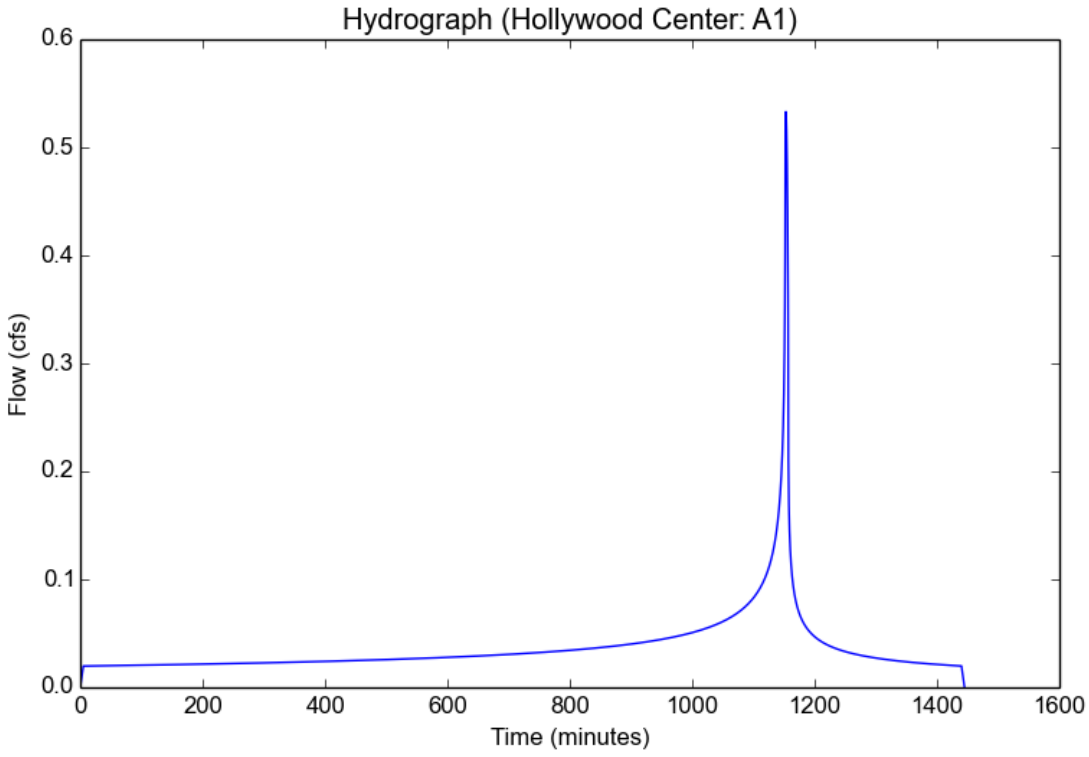
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 5_Peak Flow Exis
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	A1
Area (ac)	0.166
Flow Path Length (ft)	110.0
Flow Path Slope (vft/hft)	0.005
50-yr Rainfall Depth (in)	5.98
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.533
Burned Peak Flow Rate (cfs)	0.533
24-Hr Clear Runoff Volume (ac-ft)	0.0738
24-Hr Clear Runoff Volume (cu-ft)	3216.2842



Peak Flow Hydrologic Analysis

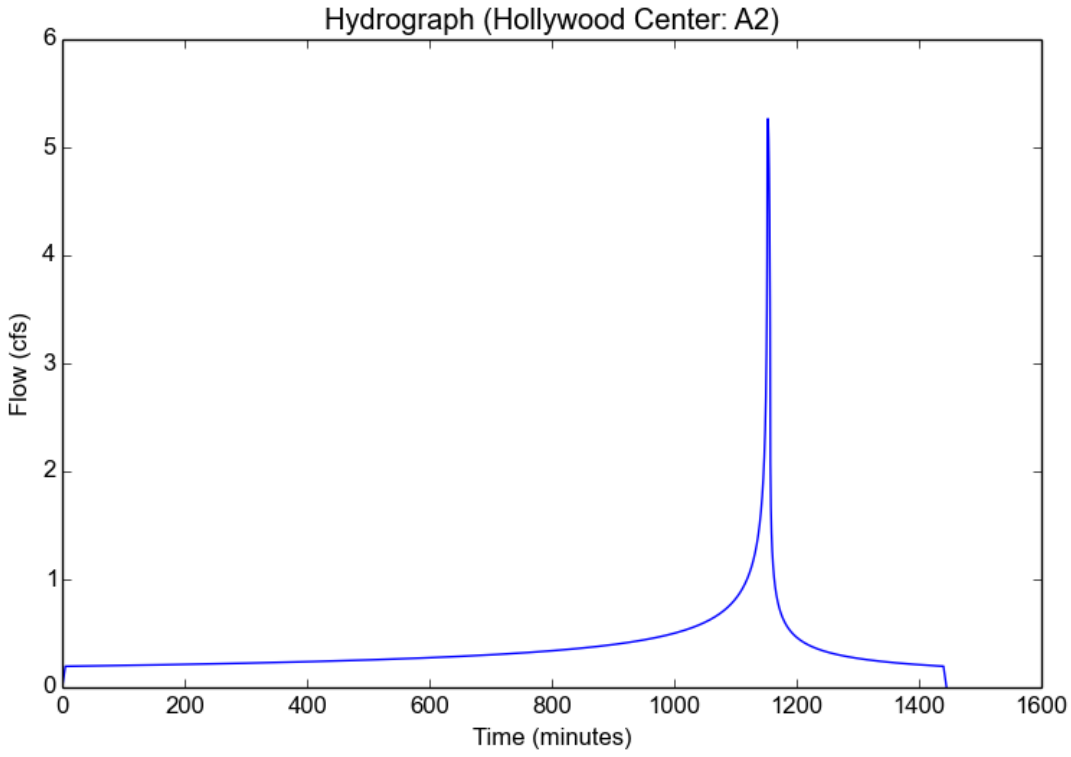
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 5_Peak Flow Exis
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	A2
Area (ac)	1.64
Flow Path Length (ft)	440.0
Flow Path Slope (vft/hft)	0.037
50-yr Rainfall Depth (in)	5.98
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.2661
Burned Peak Flow Rate (cfs)	5.2661
24-Hr Clear Runoff Volume (ac-ft)	0.7295
24-Hr Clear Runoff Volume (cu-ft)	31775.338



Peak Flow Hydrologic Analysis

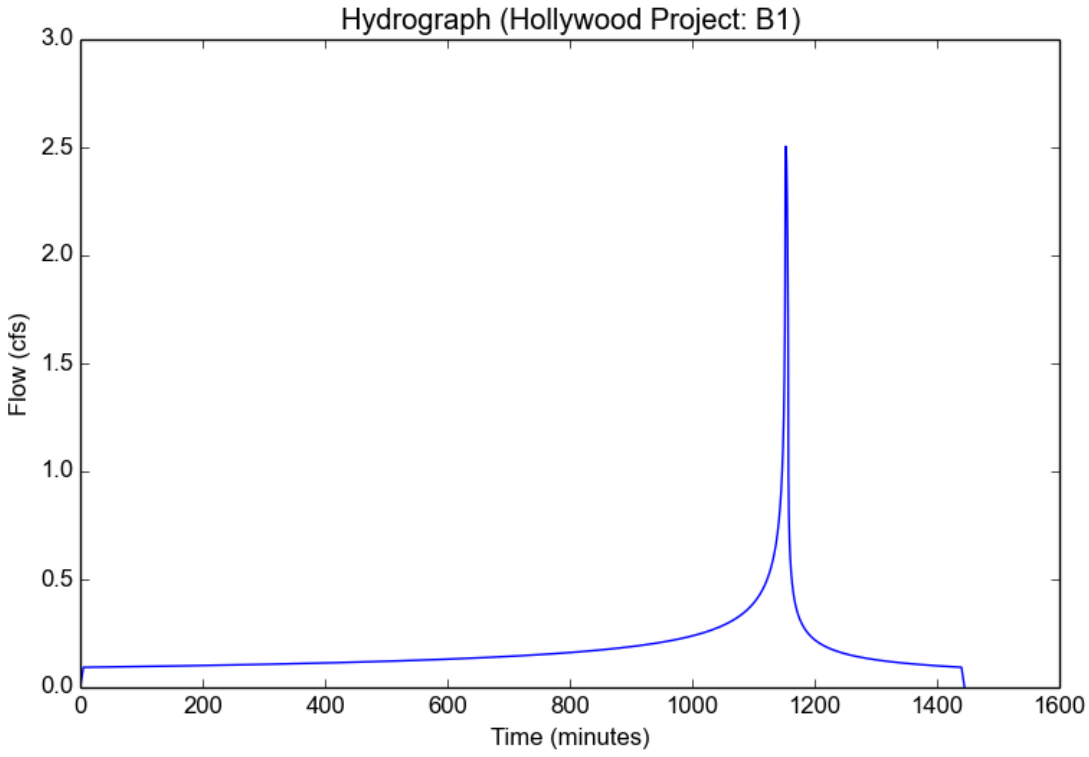
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Peak Flow Existing Site/A
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Project
Subarea ID	B1
Area (ac)	0.78
Flow Path Length (ft)	262.0
Flow Path Slope (vft/hft)	0.04
50-yr Rainfall Depth (in)	5.98
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	2.5046
Burned Peak Flow Rate (cfs)	2.5046
24-Hr Clear Runoff Volume (ac-ft)	0.3469
24-Hr Clear Runoff Volume (cu-ft)	15112.6607



Peak Flow Hydrologic Analysis

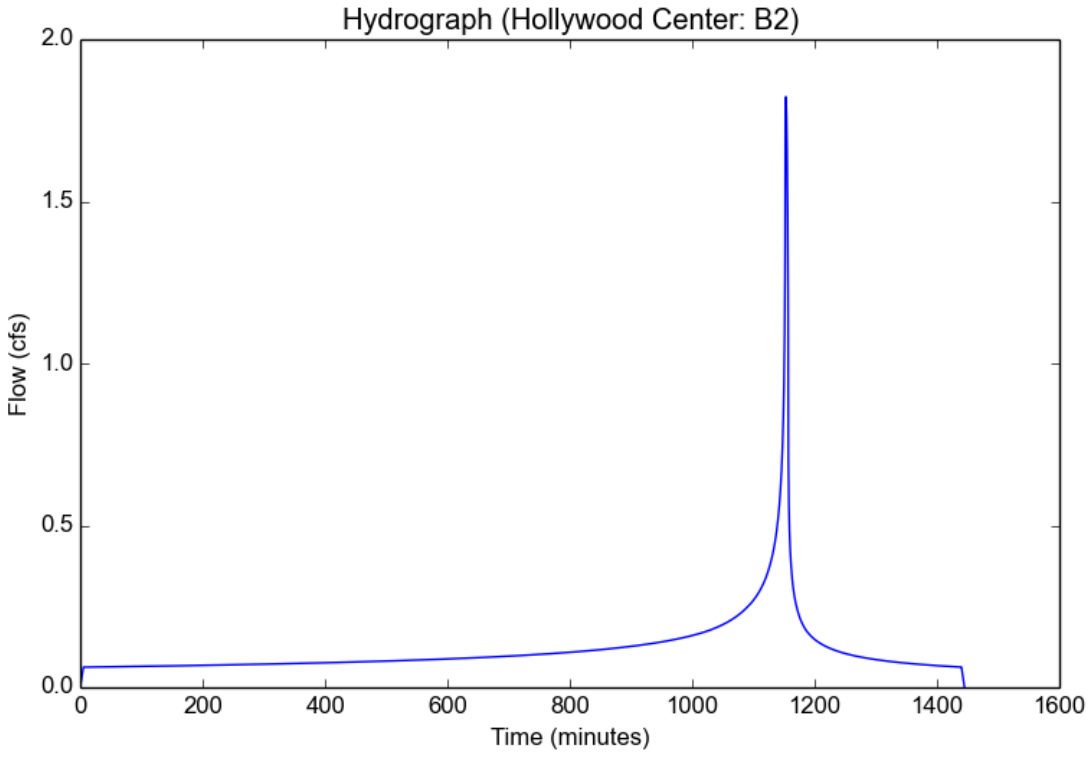
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Hollywood Center - B2.p
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	B2
Area (ac)	0.57
Flow Path Length (ft)	192.0
Flow Path Slope (vft/hft)	0.065
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.909
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.8964
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	1.8229
Burned Peak Flow Rate (cfs)	1.8229
24-Hr Clear Runoff Volume (ac-ft)	0.236
24-Hr Clear Runoff Volume (cu-ft)	10280.2875



Peak Flow Hydrologic Analysis

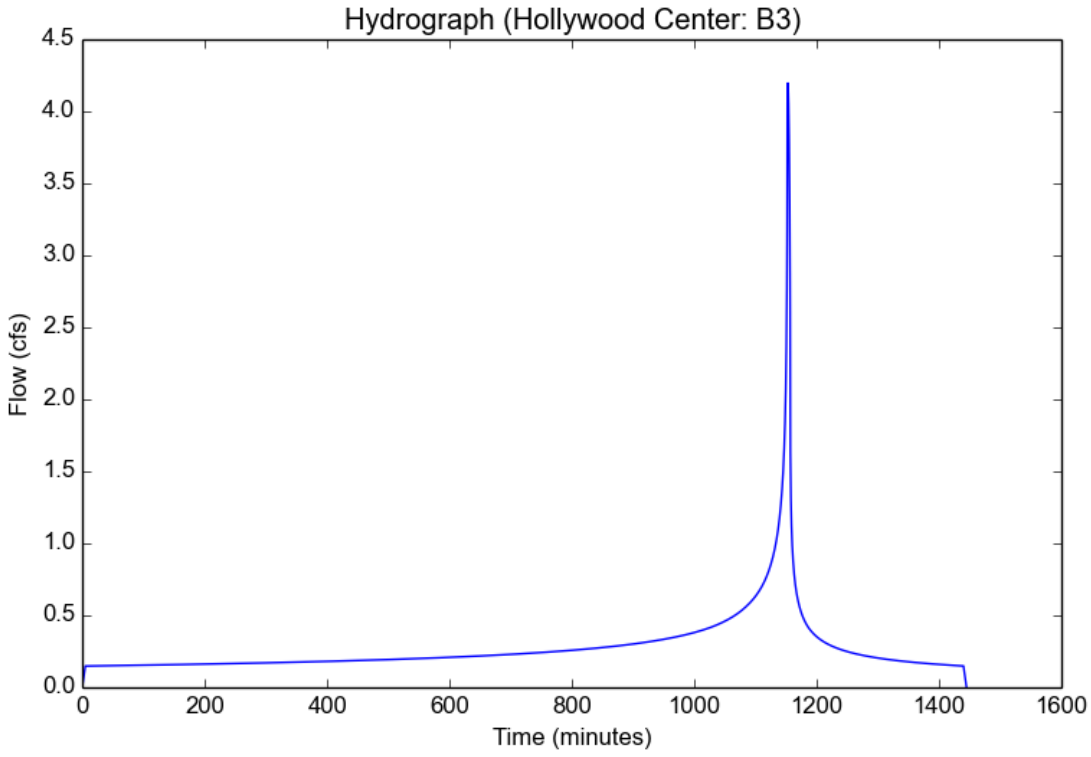
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 5_Peak Flow Exis
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	B3
Area (ac)	1.31
Flow Path Length (ft)	250.0
Flow Path Slope (vft/hft)	0.058
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.945
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.8978
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	4.1962
Burned Peak Flow Rate (cfs)	4.1962
24-Hr Clear Runoff Volume (ac-ft)	0.5583
24-Hr Clear Runoff Volume (cu-ft)	24320.8695



Peak Flow Hydrologic Analysis

File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 5_Peak Flow Exis
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	B4
Area (ac)	0.03
Flow Path Length (ft)	25.0
Flow Path Slope (vft/hft)	0.08
50-yr Rainfall Depth (in)	5.98
Percent Impervious	1.0
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.9
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	0.0963
Burned Peak Flow Rate (cfs)	0.0963
24-Hr Clear Runoff Volume (ac-ft)	0.0133
24-Hr Clear Runoff Volume (cu-ft)	581.2562

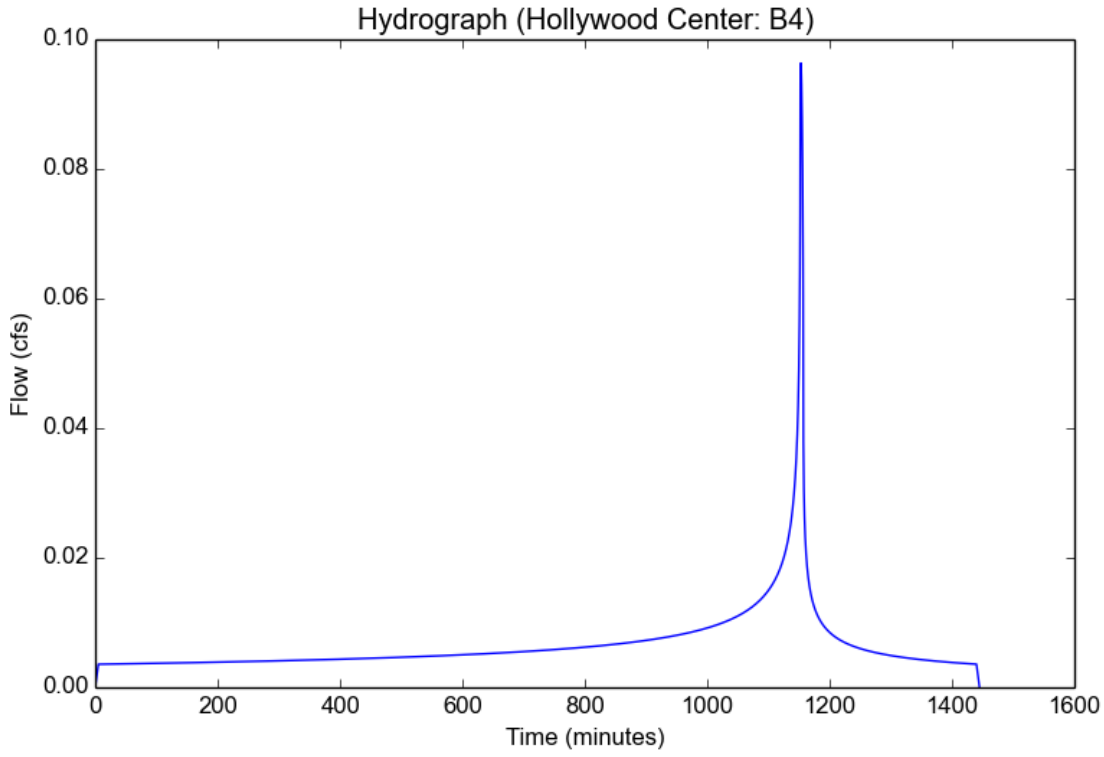


FIGURE 6
Proposed Flow Analysis

Peak Flow Hydrologic Analysis

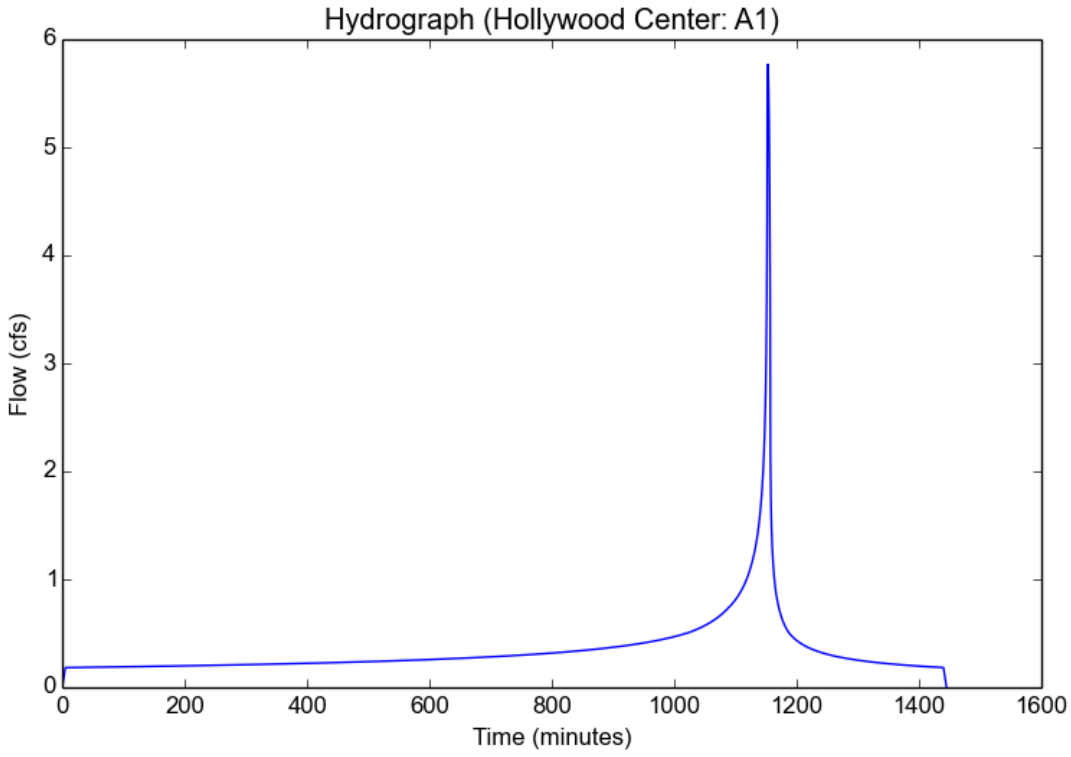
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 6_Peak Flow Prop
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	A1
Area (ac)	1.81
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	5.98
Percent Impervious	0.83
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.8932
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.7681
Burned Peak Flow Rate (cfs)	5.7681
24-Hr Clear Runoff Volume (ac-ft)	0.7011
24-Hr Clear Runoff Volume (cu-ft)	30539.4612



Peak Flow Hydrologic Analysis

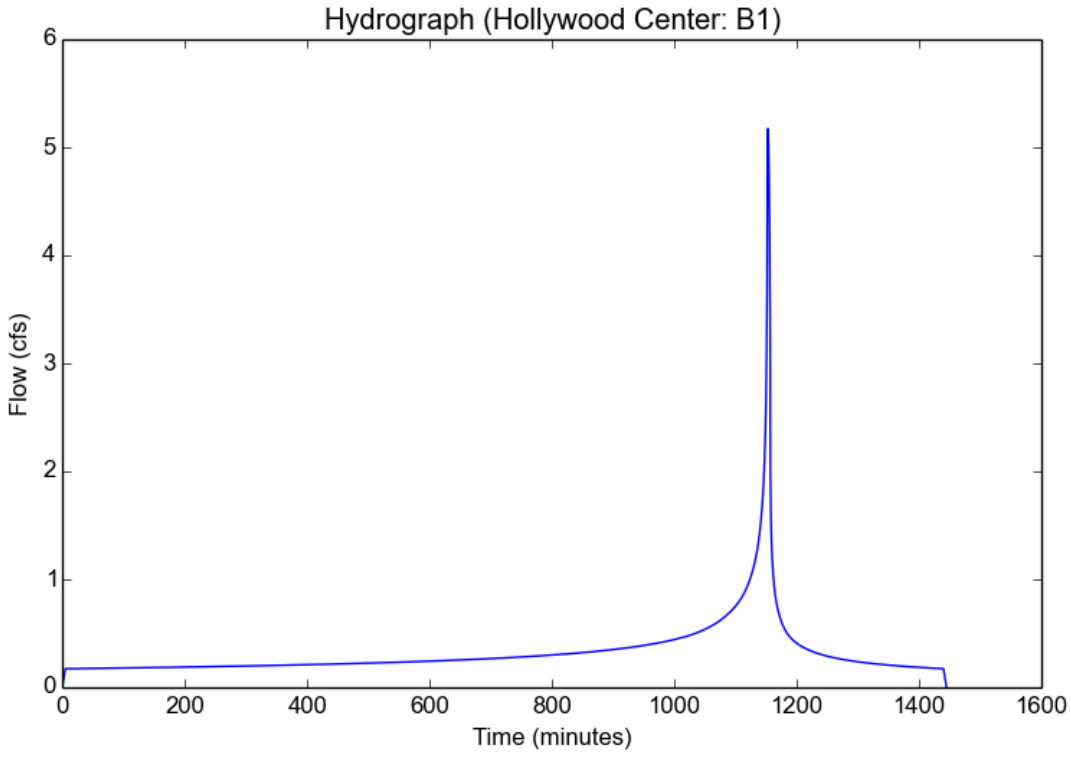
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 6_Peak Flow Prop
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	B1
Area (ac)	1.62
Flow Path Length (ft)	200.0
Flow Path Slope (vft/hft)	0.02
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.881
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.8952
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	5.1744
Burned Peak Flow Rate (cfs)	5.1744
24-Hr Clear Runoff Volume (ac-ft)	0.6554
24-Hr Clear Runoff Volume (cu-ft)	28549.9132



Peak Flow Hydrologic Analysis

File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 6_Peak Flow Prop
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	B2
Area (ac)	1.07
Flow Path Length (ft)	250.0
Flow Path Slope (vft/hft)	0.058
50-yr Rainfall Depth (in)	5.98
Percent Impervious	0.933
Soil Type	6
Design Storm Frequency	50-yr
Fire Factor	0
LID	False

Output Results

Modeled (50-yr) Rainfall Depth (in)	5.98
Peak Intensity (in/hr)	3.5678
Undeveloped Runoff Coefficient (Cu)	0.86
Developed Runoff Coefficient (Cd)	0.8973
Time of Concentration (min)	5.0
Clear Peak Flow Rate (cfs)	3.4256
Burned Peak Flow Rate (cfs)	3.4256
24-Hr Clear Runoff Volume (ac-ft)	0.4517
24-Hr Clear Runoff Volume (cu-ft)	19676.1197

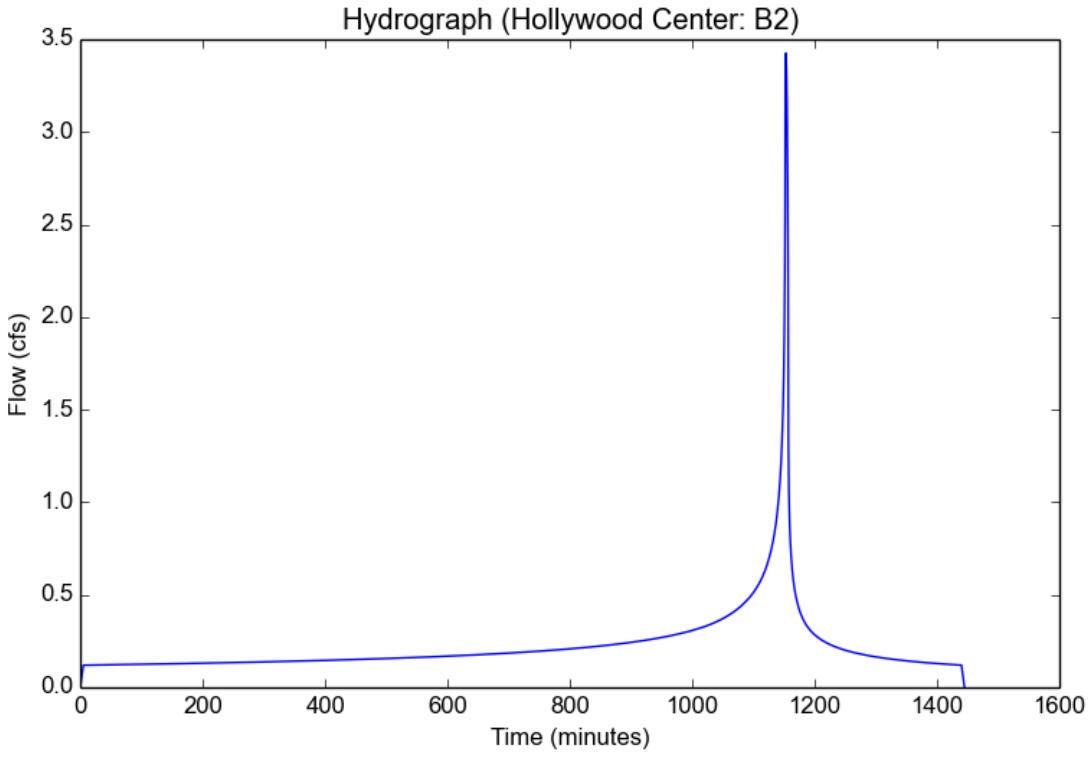


FIGURE 7
Estimated LID Volume

Peak Flow Hydrologic Analysis

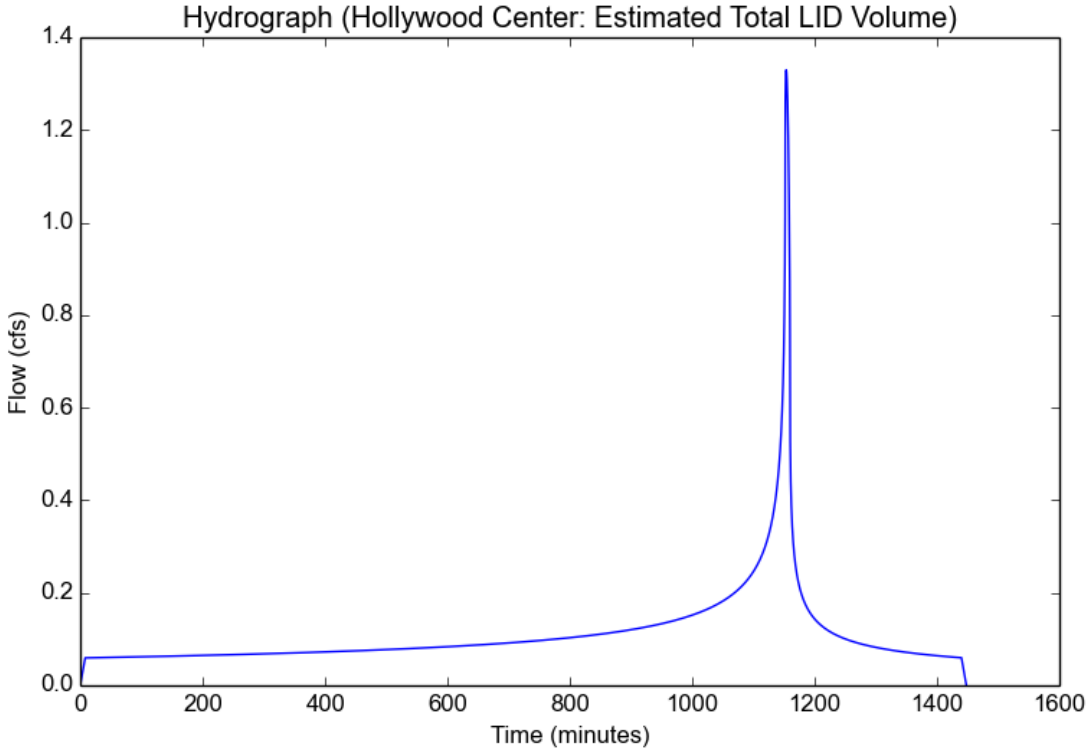
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 7_Estimated LID V
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	Estimated Total LID Volume
Area (ac)	3.43
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.854
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.4784
Undeveloped Runoff Coefficient (Cu)	0.2862
Developed Runoff Coefficient (Cd)	0.8104
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	1.3297
Burned Peak Flow Rate (cfs)	1.3297
24-Hr Clear Runoff Volume (ac-ft)	0.2223
24-Hr Clear Runoff Volume (cu-ft)	9683.6562



Peak Flow Hydrologic Analysis

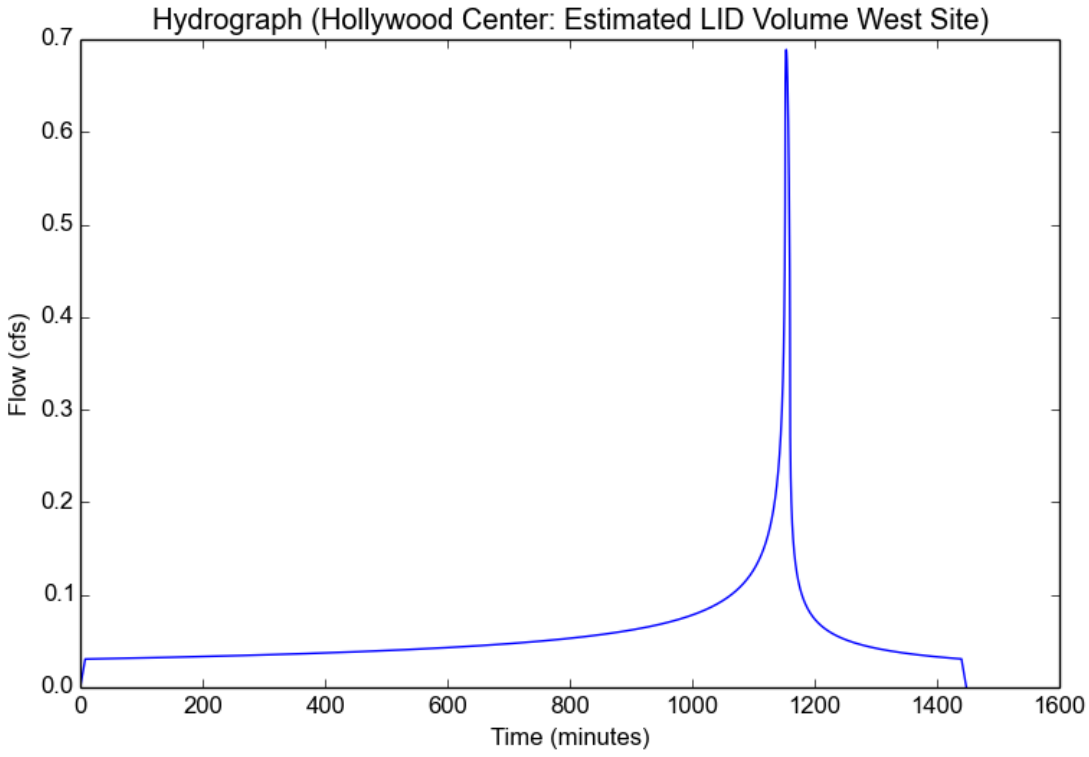
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Figure 7_Estimated LID V
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	Estimated LID Volume West Site
Area (ac)	1.81
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.83
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.4784
Undeveloped Runoff Coefficient (Cu)	0.2862
Developed Runoff Coefficient (Cd)	0.7957
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.6889
Burned Peak Flow Rate (cfs)	0.6889
24-Hr Clear Runoff Volume (ac-ft)	0.1145
24-Hr Clear Runoff Volume (cu-ft)	4986.0282



Peak Flow Hydrologic Analysis

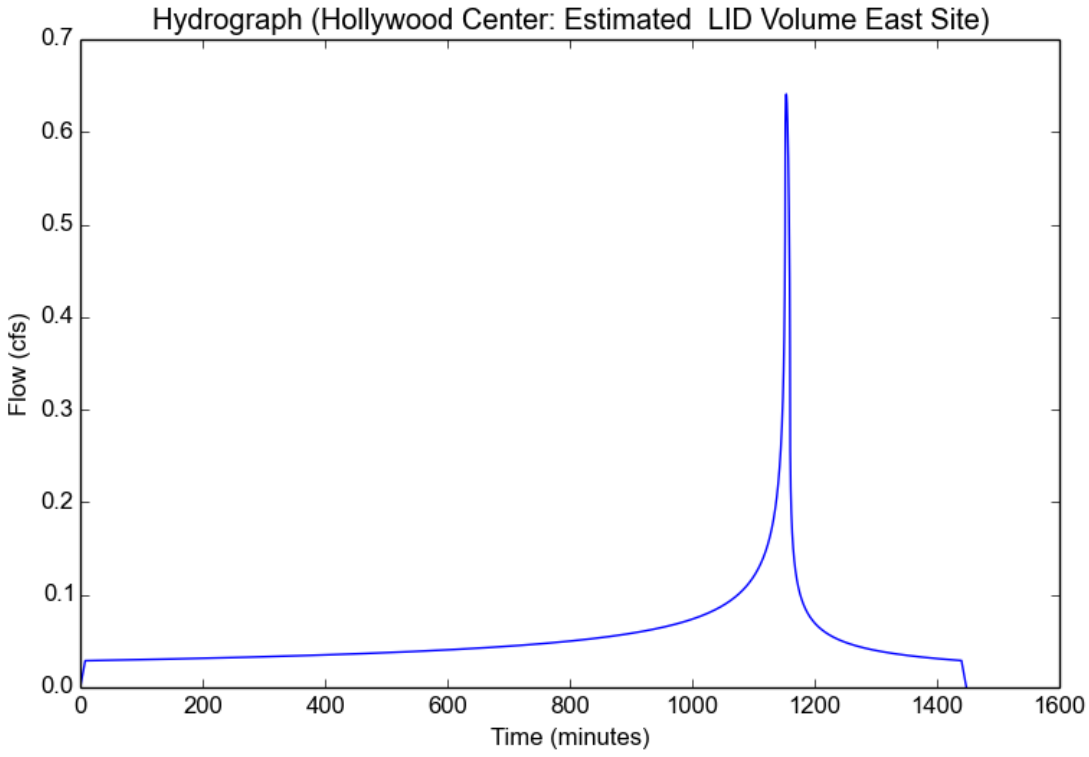
File location: P:/2017/1700059 Hollywood Center/ENGR/EIR/Technical Reports/Water Resource Technical Report/Attachments/Hollywood Center - Estin
Version: HydroCalc 1.0.2

Input Parameters

Project Name	Hollywood Center
Subarea ID	Estimated LID Volume East Site
Area (ac)	1.62
Flow Path Length (ft)	100.0
Flow Path Slope (vft/hft)	0.02
85th Percentile Rainfall Depth (in)	1.0
Percent Impervious	0.881
Soil Type	6
Design Storm Frequency	85th percentile storm
Fire Factor	0
LID	True

Output Results

Modeled (85th percentile storm) Rainfall Depth (in)	1.0
Peak Intensity (in/hr)	0.4784
Undeveloped Runoff Coefficient (Cu)	0.2862
Developed Runoff Coefficient (Cd)	0.827
Time of Concentration (min)	8.0
Clear Peak Flow Rate (cfs)	0.6409
Burned Peak Flow Rate (cfs)	0.6409
24-Hr Clear Runoff Volume (ac-ft)	0.1079
24-Hr Clear Runoff Volume (cu-ft)	4698.4844



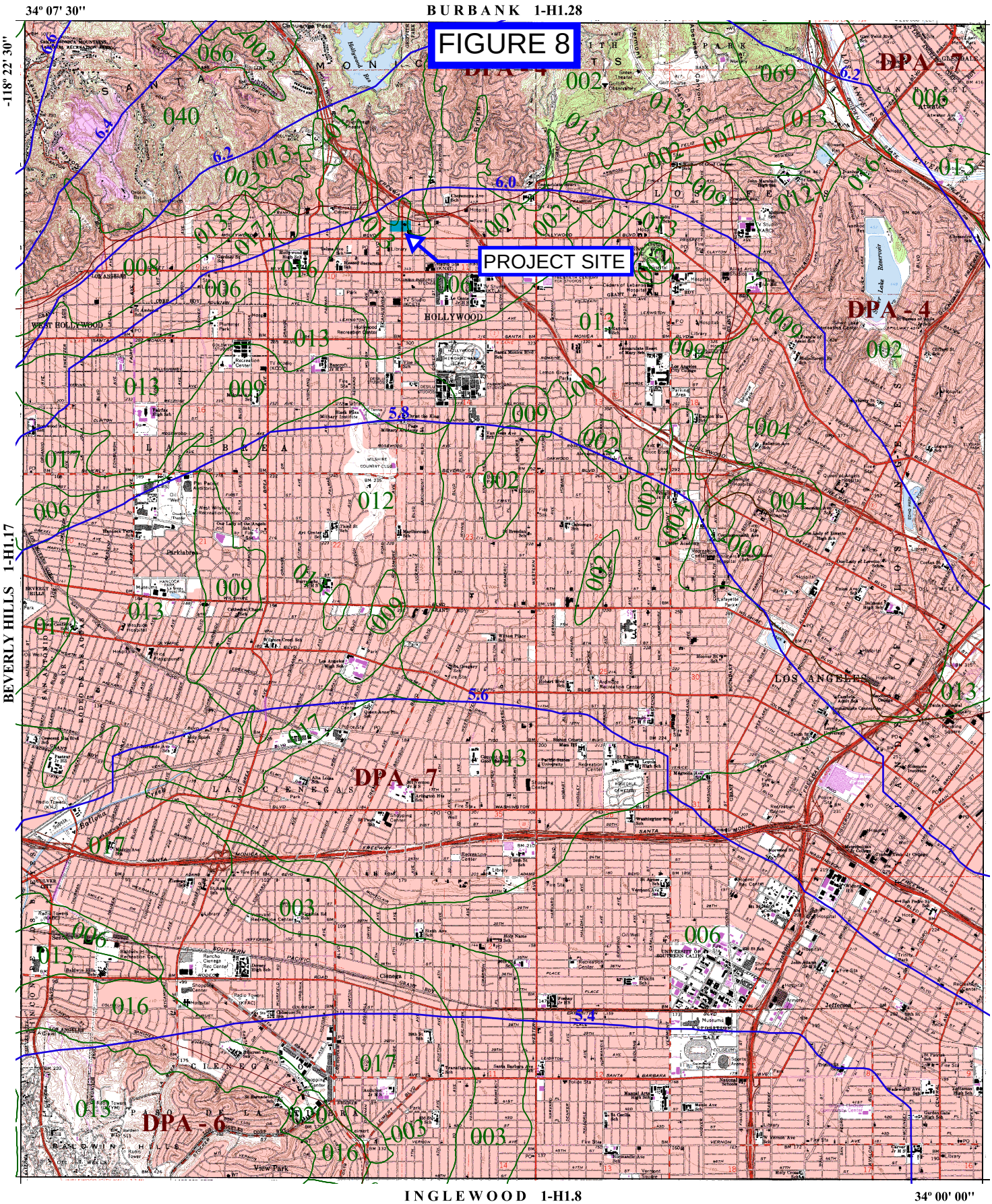


FIGURE 8
PROJECT SITE
34° 07' 30"
BURBANK 1-H1.28
-118° 22' 30"
BEVERLY HILLS 1-H1.17
LOS ANGELES 1-H1.19
-118° 15' 00"
INGLEWOOD 1-H1.8
34° 00' 00"
DPA - 4
DPA - 7
DPA - 6
HOLLYWOOD
WEST HOLLYWOOD
LOS ANGELES
BEVERLY HILLS
LA BREA
LAS CIENEGAS
CIENEGA
PALMS
BALDWIN HILLS
SANTA MONICA MTNS.
016
7.2
DPA - 6
N
S
E
W
SOIL CLASSIFICATION AREA
INCHES OF RAINFALL
DEBRIS POTENTIAL AREA
1 0 1 2 Miles
25-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.878
10-YEAR 24-HOUR ISOHYET REDUCTION FACTOR: 0.714
HOLLYWOOD
50-YEAR 24-HOUR ISOHYET
1-H1.18
LOS ANGELES COUNTY
PUBLIC WORKS
Public Service That Works

BALLONA CREEK WATERSHED
Unincorporated County Areas

FIGURE 9

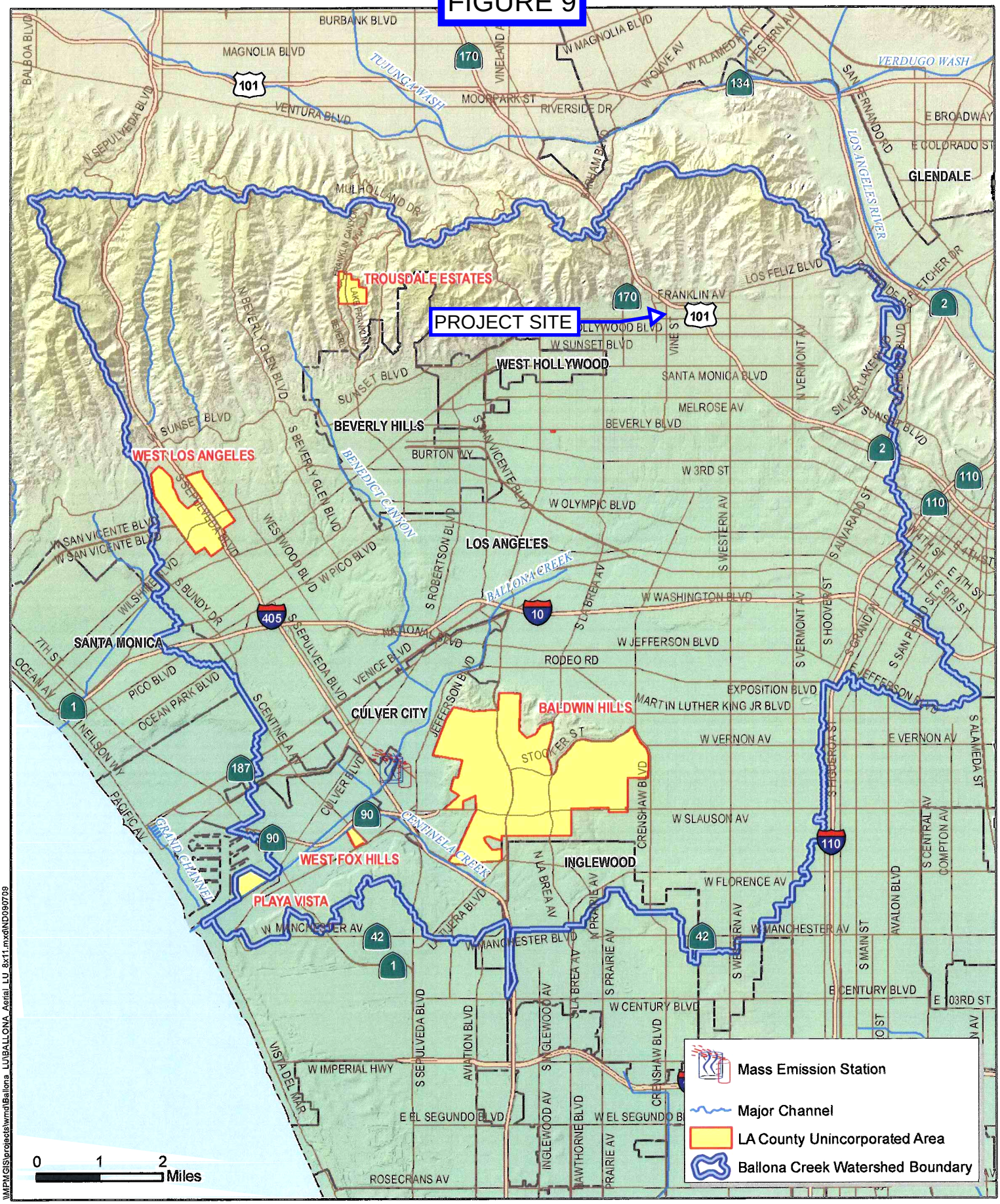


FIGURE 10

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0 North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit its website at http://www.ngs.noaa.gov/.

Base map information shown on this FIRM was derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1994 or later and from National Geospatial Intelligence Agency imagery produced at a scale of 1:4,000 from photography dated 2003 or later.

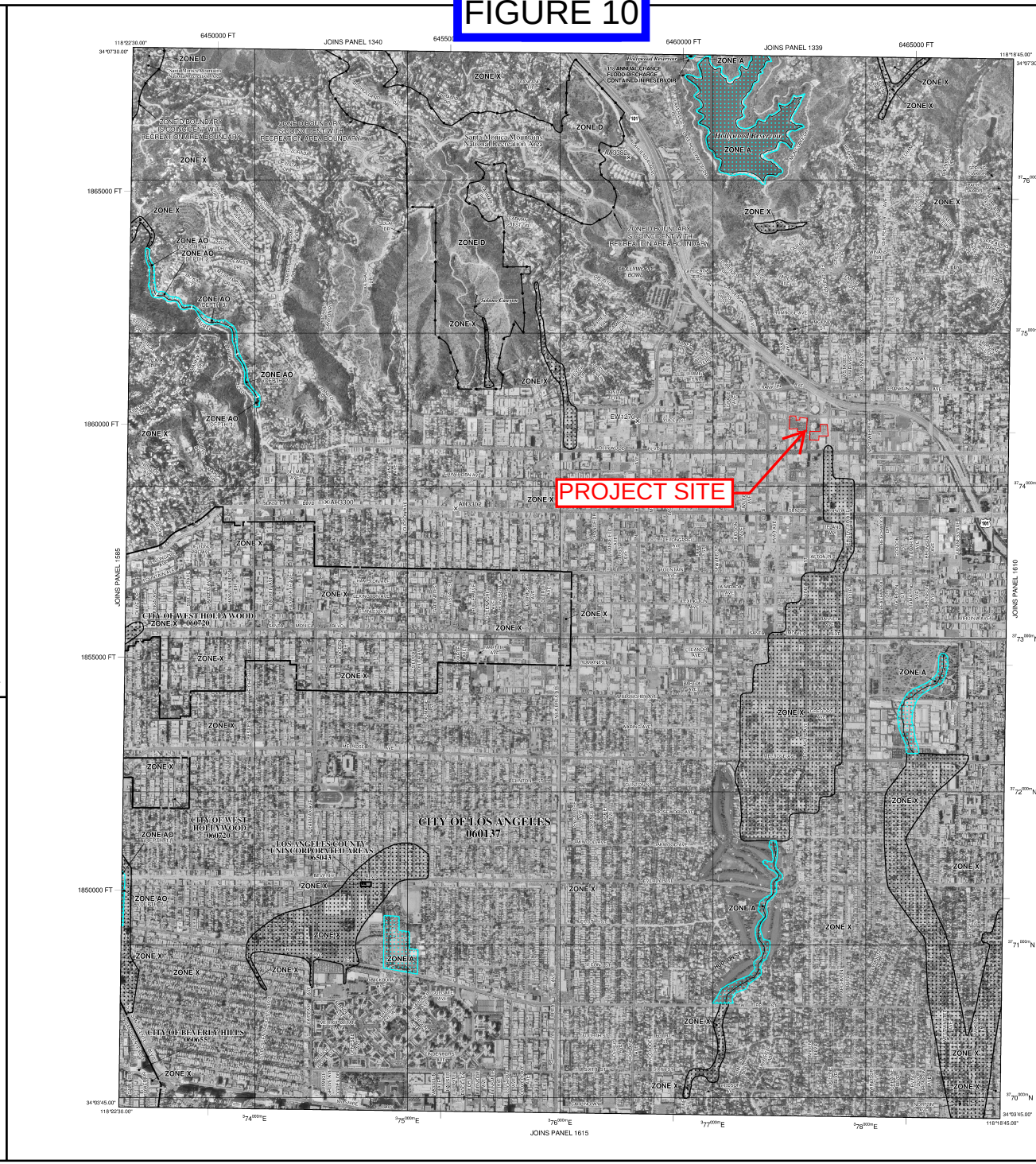
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, *a Flood Insurance Study report,* and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

- A — A — Cross section line
- 23 — 23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
- 4275000mN — 1000-meter Universal Transverse Mercator grid values, zone 11
- 6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, V zone (FIPSZONE 0405), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
September 26, 2008
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1605F

FIRM
FLOOD INSURANCE RATE MAP
LOS ANGELES COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 1605 OF 2350
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

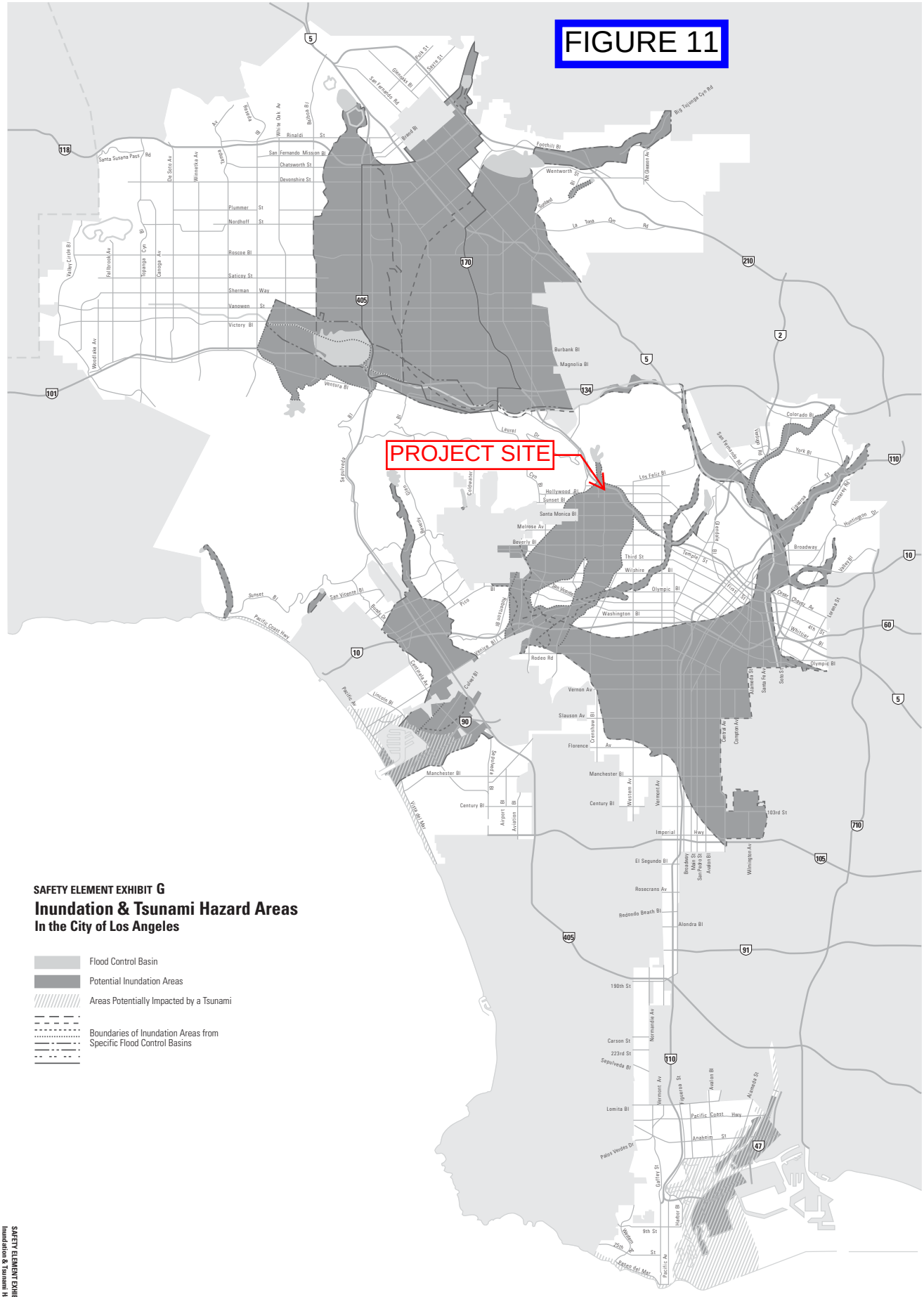
COMMUNITY	NUMBER	PANEL	SUFFIX
LOS ANGELES COUNTY	065043	1605	F
BEVERLY HILLS, CITY OF	060655	1605	F
LOS ANGELES, CITY OF	060137	1605	F
WEST HOLLYWOOD, CITY OF	060720	1605	F

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06037C1605F
EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

FIGURE 11



SAFETY ELEMENT EXHIBIT G

Inundation & Tsunami Hazard Areas
In the City of Los Angeles

- Flood Control Basin
- Potential Inundation Areas
- Areas Potentially Impacted by a Tsunami
- Boundaries of Inundation Areas from Specific Flood Control Basins

SAFETY ELEMENT EXHIBIT G
Inundation & Tsunami Hazard Areas

Sources: Environmental Impact Report, Framework Element, Los Angeles City General Plan, May 1995; Technical Appendix to the Safety Element of the Los Angeles County General Plan Hazard Reduction in Los Angeles County, Volume 2, Plate 6, "Flood and Inundation Hazards" January 1990; California Environmental Quality Act of 1970 (CEQA), Public Resources Code Section 21000 *et. seq.* with guidelines as amended, 1992; California Government Code Title 7 chapter 3, article 5 section 65302(g), as amended 1993.

Prepared by the General Plan Framework Section • City of Los Angeles Planning Department • Citywide Graphics • March, 1994 • Council File No. 89-2104

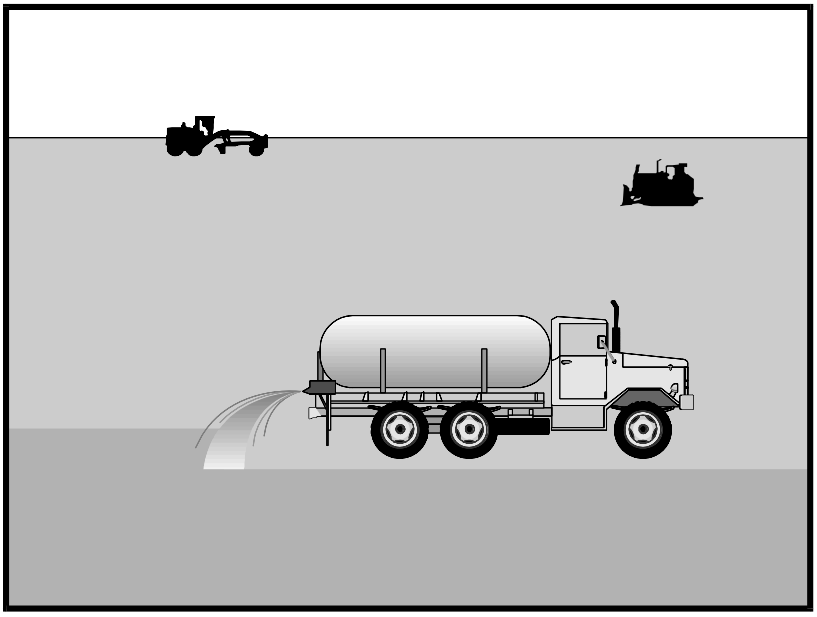
N

1 1/2 0 1 2 3 4 5 KILOMETERS

1 1/2 1/4 0 1 2 3 4 MILES

Soil Binders

EC-5



Categories

EC	Erosion Control	☑
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	☒
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-3 Hydraulic Mulch

EC-4 Hydroseeding

EC-6 Straw Mulch

EC-7 Geotextiles and Mats

EC-8 Wood Mulching

Description and Purpose

Soil binding consists of application and maintenance of a soil stabilizer to exposed soil surfaces. Soil binders are materials applied to the soil surface to temporarily prevent water and wind induced erosion of exposed soils on construction sites.

Suitable Applications

Soil binders are typically applied to disturbed areas requiring temporary protection. Because soil binders, when used as a stand-alone practice, can often be incorporated into the soil, they are a good alternative to mulches in areas where grading activities will soon resume. Soil binders are commonly used in the following areas:

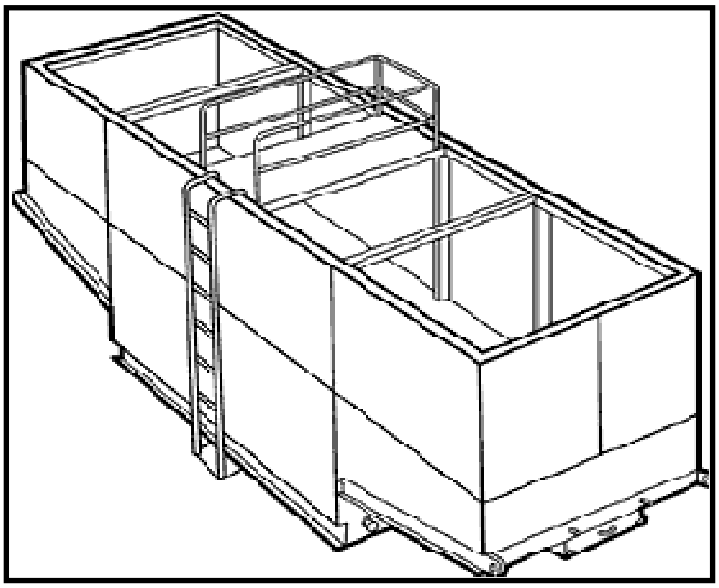
- Rough graded soils that will be inactive for a short period of time
- Soil stockpiles
- Temporary haul roads prior to placement of crushed rock
- Compacted soil road base
- Construction staging, materials storage, and layout areas

Limitations

- Soil binders are temporary in nature and may need reapplication.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Dewatering Operations NS-2



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

SE-5: Fiber Roll

SE-6: Gravel Bag Berm

Description and Purpose

Dewatering operations are practices that manage the discharge of pollutants when non-stormwater and accumulated precipitation (stormwater) must be removed from a work location to proceed with construction work or to provide vector control.

The General Permit incorporates Numeric Effluent Limits (NEL) and Numeric Action Levels (NAL) for turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Discharges from dewatering operations can contain high levels of fine sediment that, if not properly treated, could lead to exceedences of the General Permit requirements.

Suitable Applications

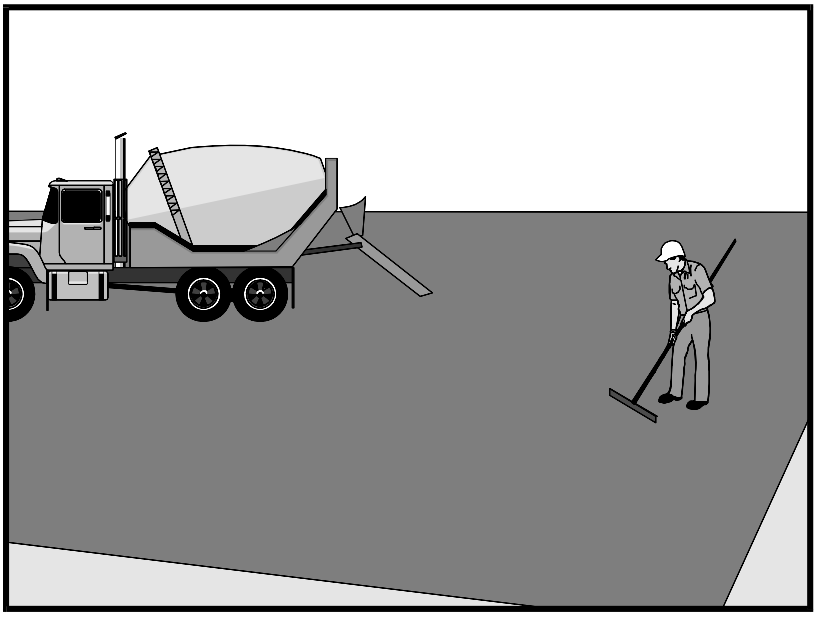
These practices are implemented for discharges of non-stormwater from construction sites. Non-stormwaters include, but are not limited to, groundwater, water from cofferdams, water diversions, and waters used during construction activities that must be removed from a work area to facilitate construction.

Practices identified in this section are also appropriate for implementation when managing the removal of accumulated precipitation (stormwater) from depressed areas at a construction site.

Stormwater mixed with non-stormwater should be managed as non-stormwater.

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Paving and Grinding Operations NS-3



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	☒

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

The General Permit incorporates Numeric Effluent Limits (NEL) and Numeric Action Levels (NAL) for pH and turbidity (see Section 2 of this handbook to determine your project's risk level and if you are subject to these requirements).

Many types of construction materials associated with paving and grinding operations, including mortar, concrete, and cement and their associated wastes have basic chemical properties that can raise pH levels outside of the permitted range. Additional care should be taken when managing these materials to prevent them from coming into contact with stormwater flows, which could lead to exceedances of the General Permit requirements.

Suitable Applications

These procedures are implemented where paving, surfacing, resurfacing, or sawcutting, may pollute stormwater runoff or discharge to the storm drain system or watercourses.

Limitations

- Paving opportunities may be limited during wet weather.
- Discharges of freshly paved surfaces may raise pH to environmentally harmful levels and trigger permit violations.

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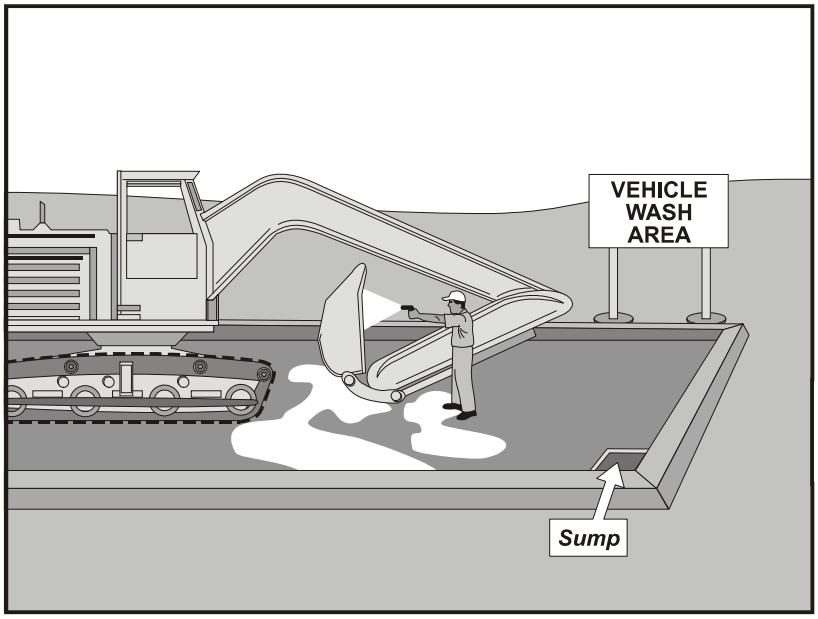
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Vehicle and Equipment Cleaning NS-8



Categories

EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☑
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	☑
Trash	
Metals	
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Vehicle and equipment cleaning procedures and practices eliminate or reduce the discharge of pollutants to stormwater from vehicle and equipment cleaning operations. Procedures and practices include but are not limited to: using offsite facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water; and training employees and subcontractors in proper cleaning procedures.

Suitable Applications

These procedures are suitable on all construction sites where vehicle and equipment cleaning is performed.

Limitations

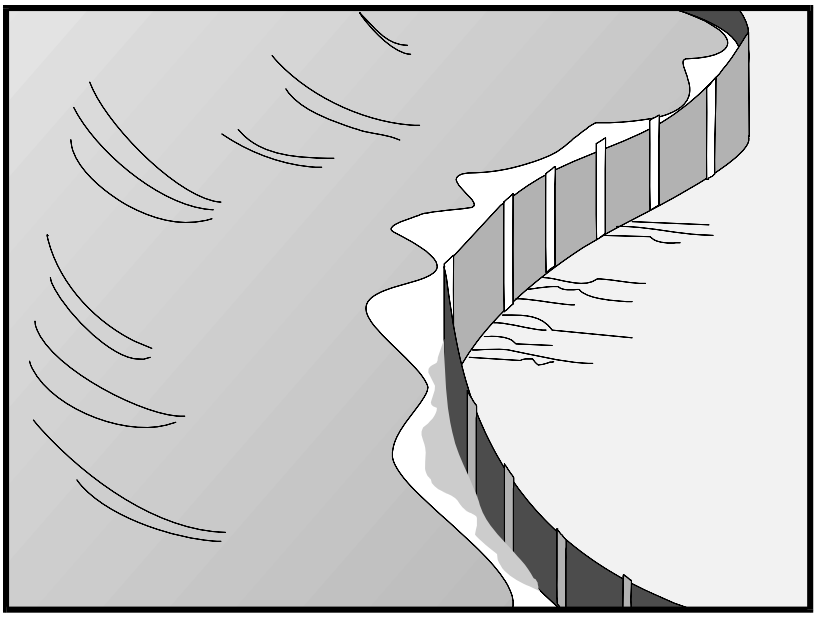
Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades. Sending vehicles/equipment offsite should be done in conjunction with TC-1, Stabilized Construction Entrance/Exit.

Implementation

Other options to washing equipment onsite include contracting with either an offsite or mobile commercial washing business. These businesses may be better equipped to handle and dispose of the wash waters properly. Performing this work offsite can also be economical by eliminating the need for a separate washing operation onsite.

If washing operations are to take place onsite, then:

Silt Fence SE-1



Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-10 Storm Drain Inlet Protection

SE-14 Biofilter Bags

Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (SE-10). Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

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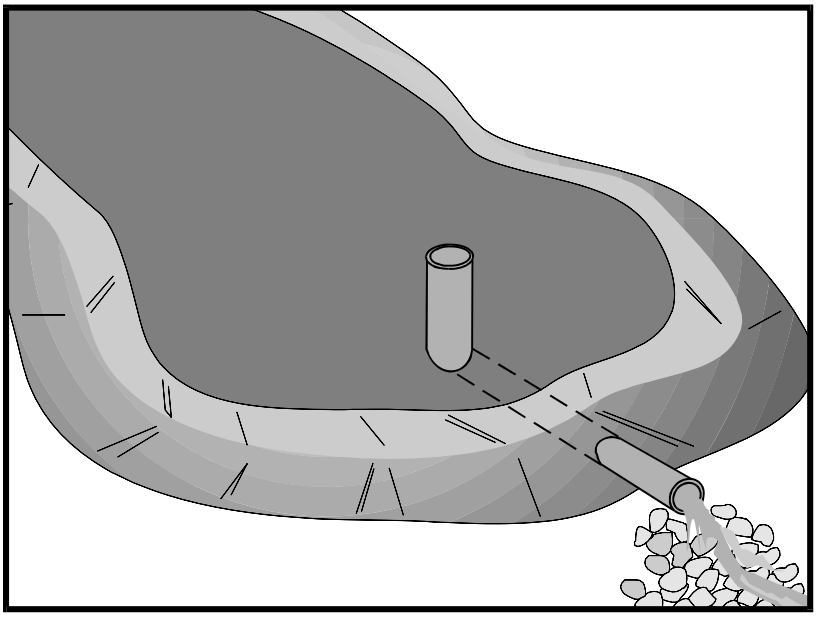
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Sediment Basin SE-2



Description and Purpose

A sediment basin is a temporary basin formed by excavation or by constructing an embankment so that sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out before the runoff is discharged.

Sediment basin design guidance presented in this fact sheet is intended to provide options, methods, and techniques to optimize temporary sediment basin performance and basin sediment removal. Basin design guidance provided in this fact sheet is not intended to guarantee basin effluent compliance with numeric discharge limits (numeric action levels or numeric effluent limits for turbidity). Compliance with discharge limits requires a thoughtful approach to comprehensive BMP planning, implementation, and maintenance. Therefore, optimally designed and maintained sediment basins should be used in conjunction with a comprehensive system of BMPs that includes:

- Diverting runoff from undisturbed areas away from the basin
- Erosion control practices to minimize disturbed areas on-site
  and to provide temporary stabilization and interim sediment controls (e.g., stockpile perimeter control, check dams, perimeter controls around individual lots) to reduce the basin's influent sediment concentration.

At some sites, sediment basin design enhancements may be required to adequately remove sediment. Traditional

Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

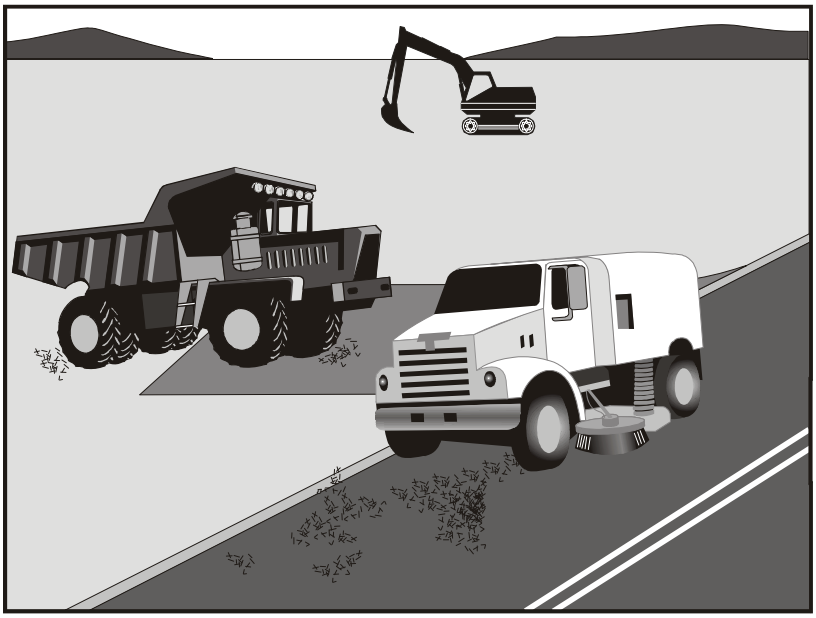
Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-3 Sediment Trap (for smaller areas)

Street Sweeping and Vacuuming SE-7



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	☑
Organics	

Potential Alternatives

None

Description and Purpose

Street sweeping and vacuuming includes use of self-propelled and walk-behind equipment to remove sediment from streets and roadways, and to clean paved surfaces in preparation for final paving. Sweeping and vacuuming prevents sediment from the project site from entering storm drains or receiving waters.

Suitable Applications

Sweeping and vacuuming are suitable anywhere sediment is tracked from the project site onto public or private paved streets and roads, typically at points of egress. Sweeping and vacuuming are also applicable during preparation of paved surfaces for final paving.

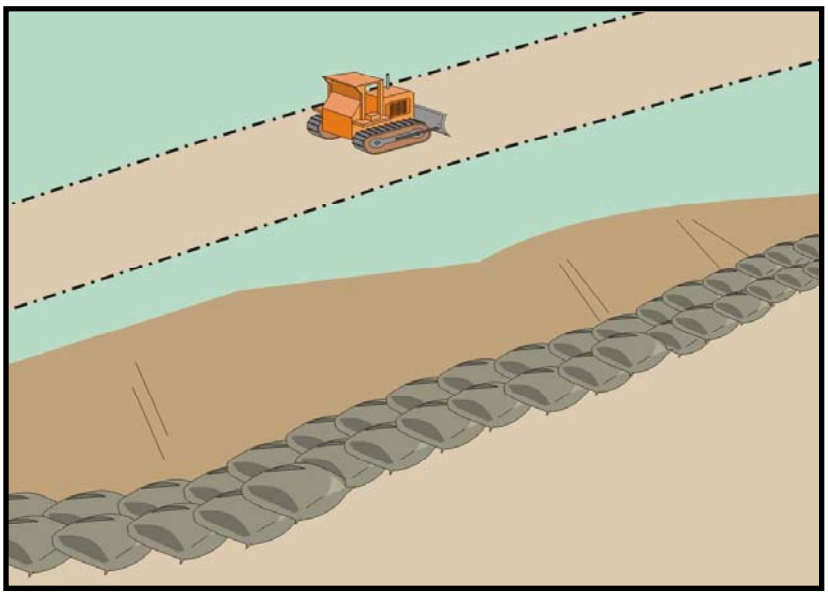
Limitations

Sweeping and vacuuming may not be effective when sediment is wet or when tracked soil is caked (caked soil may need to be scraped loose).

Implementation

- Controlling the number of points where vehicles can leave the site will allow sweeping and vacuuming efforts to be focused, and perhaps save money.
- Inspect potential sediment tracking locations daily.
- Visible sediment tracking should be swept or vacuumed on a daily basis.
- Do not use kick brooms or sweeper attachments. These tend to spread the dirt rather than remove it.

Sandbag Barrier SE-8



Categories		
EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Description and Purpose

A sandbag barrier is a series of sand-filled bags placed on a level contour to intercept or to divert sheet flows. Sandbag barriers placed on a level contour pond sheet flow runoff, allowing sediment to settle out.

Suitable Applications

Sandbag barriers may be suitable:

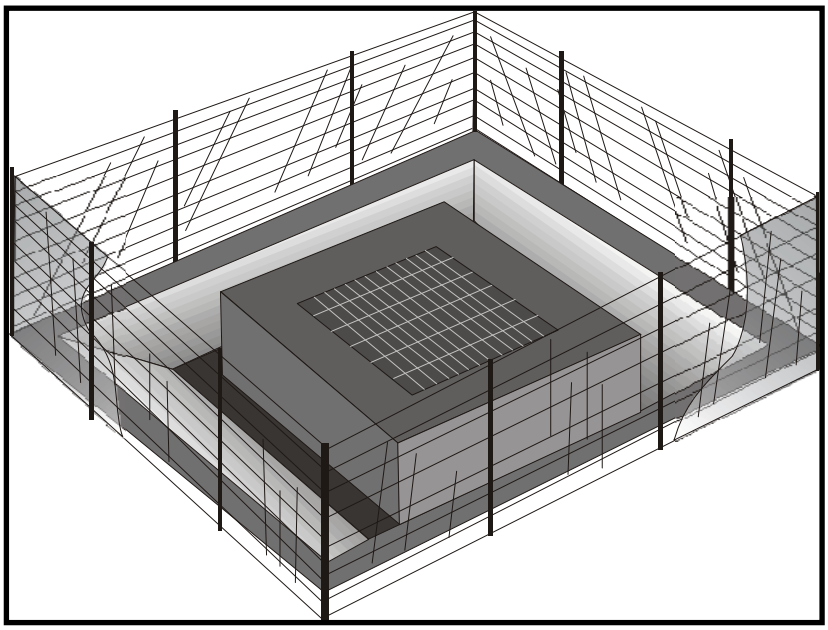
- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes.
  - As sediment traps at culvert/pipe outlets.
  - Below other small cleared areas.
  - Along the perimeter of a site.
  - Down slope of exposed soil areas.
  - Around temporary stockpiles and spoil areas.
  - Parallel to a roadway to keep sediment off paved areas.
  - Along streams and channels.
- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives
SE-1 Silt Fence
SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-14 Biofilter Bags

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Storm Drain Inlet Protection SE-10



Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☒
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence
SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-8 Sandbag Barrier
SE-14 Biofilter Bags

Description and Purpose

Storm drain inlet protection consists of a sediment filter or an impounding area in, around or upstream of a storm drain, drop inlet, or curb inlet. Storm drain inlet protection measures temporarily pond runoff before it enters the storm drain, allowing sediment to settle. Some filter configurations also remove sediment by filtering, but usually the ponding action results in the greatest sediment reduction. Temporary geotextile storm drain inserts attach underneath storm drain grates to capture and filter storm water.

Suitable Applications

Every storm drain inlet receiving runoff from unstabilized or otherwise active work areas should be protected. Inlet protection should be used in conjunction with other erosion and sediment controls to prevent sediment-laden stormwater and non-stormwater discharges from entering the storm drain system.

Limitations

- Drainage area should not exceed 1 acre.
- In general straw bales should not be used as inlet protection.
- Requires an adequate area for water to pond without encroaching into portions of the roadway subject to traffic.

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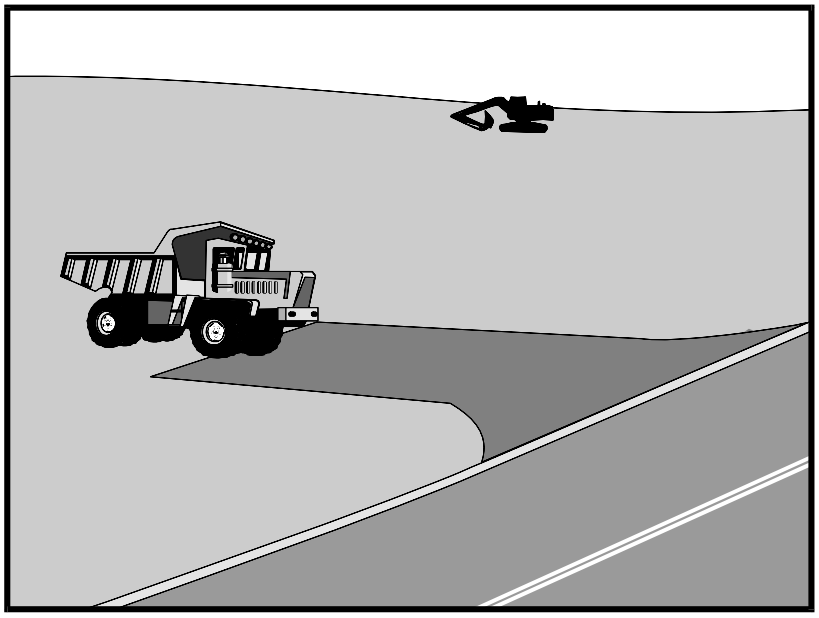
CALIFORNIA STORMWATER QUALITY ASSOCIATION

Stabilized Construction Entrance/Exit TC-1



Categories		
EC	Erosion Control	☒
SE	Sediment Control	☒
TC	Tracking Control	☑
WE	Wind Erosion Control	
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WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Objective**
☒ **Secondary Objective**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

None

Description and Purpose

A stabilized construction access is defined by a point of entrance/exit to a construction site that is stabilized to reduce the tracking of mud and dirt onto public roads by construction vehicles.

Suitable Applications

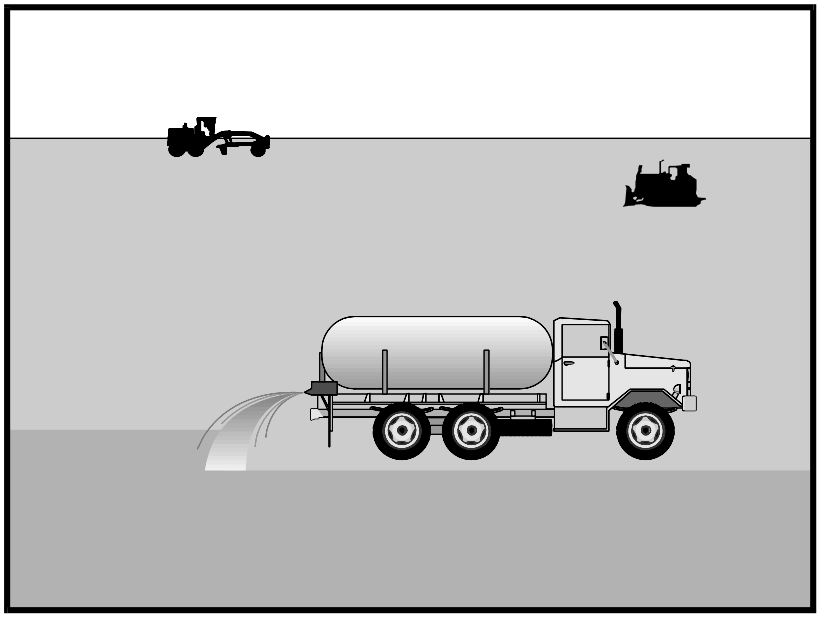
Use at construction sites:

- Where dirt or mud can be tracked onto public roads.
- Adjacent to water bodies.
- Where poor soils are encountered.
- Where dust is a problem during dry weather conditions.

Limitations

- Entrances and exits require periodic top dressing with additional stones.
- This BMP should be used in conjunction with street sweeping on adjacent public right of way.
- Entrances and exits should be constructed on level ground only.
- Stabilized construction entrances are rather expensive to construct and when a wash rack is included, a sediment trap of some kind must also be provided to collect wash water

Wind Erosion Control WE-1



Categories		
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SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	☑
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

EC-5 Soil Binders

Description and Purpose

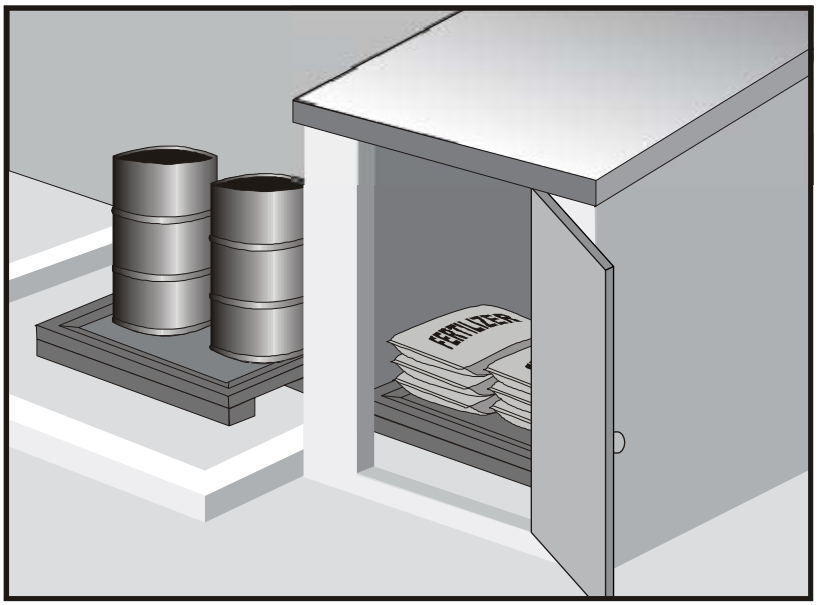
Wind erosion or dust control consists of applying water or other chemical dust suppressants as necessary to prevent or alleviate dust nuisance generated by construction activities. Covering small stockpiles or areas is an alternative to applying water or other dust palliatives.

California's Mediterranean climate, with a short "wet" season and a typically long, hot "dry" season, allows the soils to thoroughly dry out. During the dry season, construction activities are at their peak, and disturbed and exposed areas are increasingly subject to wind erosion, sediment tracking and dust generated by construction equipment. Site conditions and climate can make dust control more of an erosion problem than water based erosion. Additionally, many local agencies, including Air Quality Management Districts, require dust control and/or dust control permits in order to comply with local nuisance laws, opacity laws (visibility impairment) and the requirements of the Clean Air Act. Wind erosion control is required to be implemented at all construction sites greater than 1 acre by the General Permit.

Suitable Applications

Most BMPs that provide protection against water-based erosion will also protect against wind-based erosion and dust control requirements required by other agencies will generally meet wind erosion control requirements for water quality protection. Wind erosion control BMPs are suitable during the following construction activities:

Material Delivery and Storage WM-1



Categories		
EC	Erosion Control	
SE	Sediment Control	
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Prevent, reduce, or eliminate the discharge of pollutants from material delivery and storage to the stormwater system or watercourses by minimizing the storage of hazardous materials onsite, storing materials in watertight containers and/or a completely enclosed designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

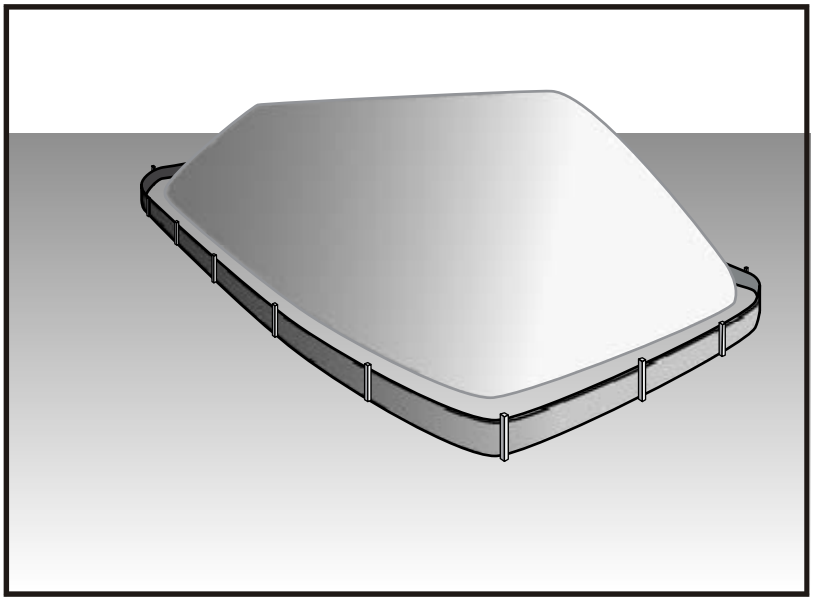
This best management practice covers only material delivery and storage. For other information on materials, see WM-2, Material Use, or WM-4, Spill Prevention and Control. For information on wastes, see the waste management BMPs in this section.

Suitable Applications

These procedures are suitable for use at all construction sites with delivery and storage of the following materials:

- Soil stabilizers and binders
- Pesticides and herbicides
- Fertilizers
- Detergents
- Plaster
- Petroleum products such as fuel, oil, and grease

Stockpile Management WM-3



Categories		
EC	Erosion Control	
SE	Sediment Control	☒
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	☒
WM	Waste Management and Materials Pollution Control	☑

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents	
Sediment	☑
Nutrients	☑
Trash	☑
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Potential Alternatives

None

Description and Purpose

Stockpile management procedures and practices are designed to reduce or eliminate air and stormwater pollution from stockpiles of soil, soil amendments, sand, paving materials such as portland cement concrete (PCC) rubble, asphalt concrete (AC), asphalt concrete rubble, aggregate base, aggregate sub base or pre-mixed aggregate, asphalt minder (so called "cold mix" asphalt), and pressure treated wood.

Suitable Applications

Implement in all projects that stockpile soil and other loose materials.

Limitations

- Plastic sheeting as a stockpile protection is temporary and hard to manage in windy conditions. Where plastic is used, consider use of plastic tarps with nylon reinforcement which may be more durable than standard sheeting.
- Plastic sheeting can increase runoff volume due to lack of infiltration and potentially cause perimeter control failure.
- Plastic sheeting breaks down faster in sunlight.
- The use of Plastic materials and photodegradable plastics should be avoided.

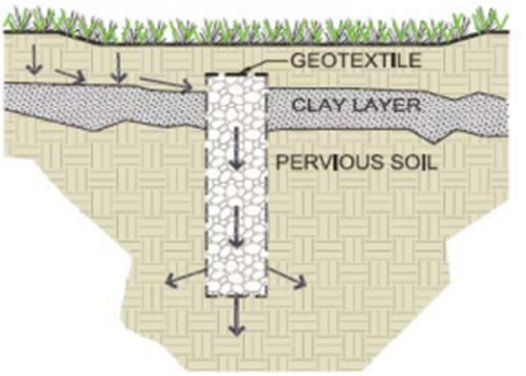
Implementation

Protection of stockpiles is a year-round requirement. To properly manage stockpiles:

EXHIBIT 2
TYPICAL LID BMPs

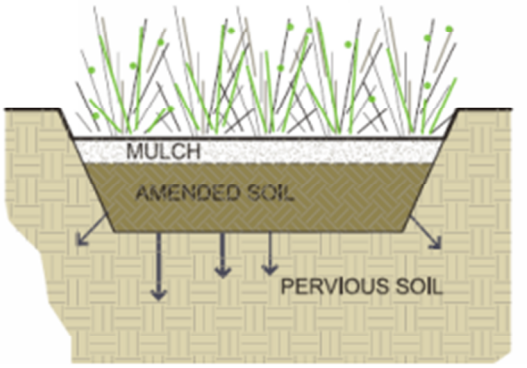
Dry Wells

A dry well is defined as an excavated, bored, drilled, or driven shaft or hole whose depth is greater than its width. Drywells are similar to infiltration trenches in their design and function, as they are designed to temporarily store and infiltrate runoff, primarily from rooftops or other impervious areas with low pollutant loading. A dry well may be either a drilled borehole filled with aggregate or a prefabricated storage chamber or pipe segment.



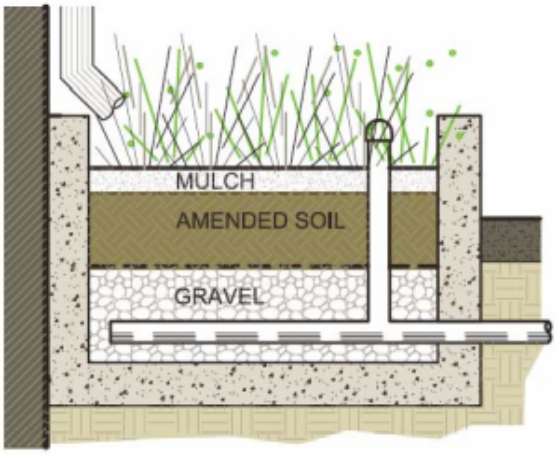
Bioretention

Bioretention stormwater treatment facilities are landscaped shallow depressions that capture and filter stormwater runoff. These facilities function as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. The facilities normally consist of a ponding area, mulch layer, planting soils, plantings, and, optionally, a subsurface gravel reservoir layer.



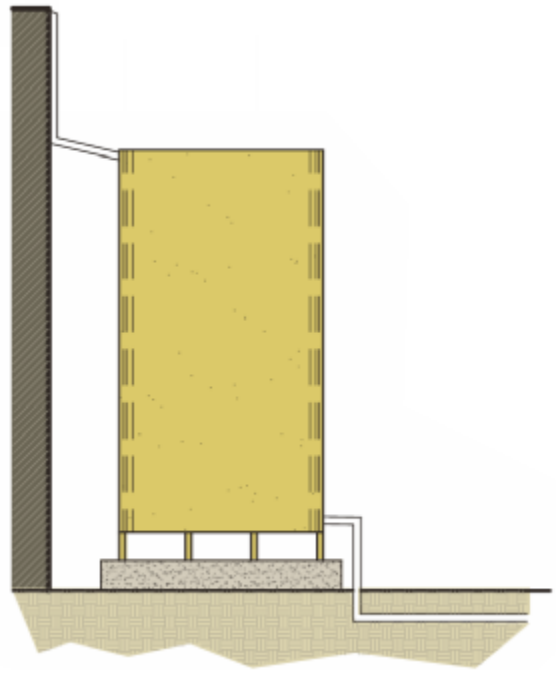
Planter Boxes

Planter boxes are bioretention treatment control measures that are completely contained within an impermeable structure with an underdrain (they do not infiltrate). They are similar to bioretention facilities with underdrains except they are situated at or above ground and are bound by impermeable walls. Planter boxes may be placed adjacent to or near buildings, other structures, or sidewalks.



4.5 CAPTURE AND USE BMPS

Capture and Use refers to a specific type of BMP that operates by capturing stormwater runoff and holding it for efficient use at a later time. On a commercial or industrial scale, capture and use BMPs are typically synonomous with cisterns, which can be implemented both above and below ground. Cisterns are sized to store a specified volume of water with no surface discharge until this volume is exceeded. The primary use of captured runoff is for subsurface drip irrigation purposes. The temporary storage of roof runoff reduces the runoff volume from a property and may reduce the peak runoff velocity for small, frequently occurring storms. In addition, by reducing the amount of stormwater runoff that flows overland into a stormwater conveyance system, less pollutants are transported through the conveyance system into local streams and the ocean. The onsite use of the harvested water for non-potable domestic purposes conserves City-supplied potable water and, where directed to unpaved surfaces, can recharge groundwater in local aquifers.



Cistern Example