CITY OF SAN DIEGO
WATER QUALITY STUDY

Prepared by: San Diego Land Surveying and Engineering, INC.
9665 Chesapeake Drive, Suite 445, San Diego, Ca. 92123
Michael L. Smith, Project Engineer, RCE 35471

Date: March 17, 2016

PROJECT SITE LOCATION: **City PTS No. 461154**
The project is located at 2340 CALLE DEL ORO, San Diego, Ca.
Assessor's Parcel Number 346-120-08

EXISTING PROJECT SITE DESCRIPTION:
The existing site is occupied by a single family home. The site drains to the south to Calle Del Oro. Calle Del Oro drains to the west. The storm runoff from the site sheet flows to the public right-of-way and is not treated.

The impervious area of the existing site is 3872 square feet or 19.8% of the site.
See Exhibit A at the back of this report.

PROPOSED PROJECT DESCRIPTION:
The disturbed area for this project is 0.3673 acres. The existing single family home is to be removed. Earth work will consist of minor grading and compaction of the area underneath the proposed structure. One new home, pool, pool cabana, landscaping, hardscape, one car garage and a 2 two car garage are proposed. Installation of landscaping will require minor grading on site. Off site work will be limited to the closing of the existing driveway and the construction of a new driveway. A private storm drain system will collect the storm runoff and direct it to a water polisher located in the front driveway. This device will discharge to a cleanout located behind the property line and connect to two sidewalk underdrains to the public gutter.

The impervious area of the proposed site is 10,658 square feet or 54.4% of the site.
See Exhibit B at the back of this report

Required Permanent Best Management Practices for Standard Development Projects

Source Control (SC) BMP Requirements:

SC-1: Prevent illicit discharges into the MS4
An illicit discharge is any discharge to the MS4 that is not composed entirely of storm water except discharges pursuant to a National Pollutant Discharge Elimination System permit and discharges resulting from firefighting activities. Projects must effectively eliminate discharges of non-storm water into the MS4. This may involve a suite of housekeeping BMPs which could include effective irrigation, dispersion of non-storm water discharges into landscaping for infiltration, and controlling wash water from vehicle washing.

DISCUSSION:

The proposed irrigation and landscape design is done by a registered professional and will be submitted to the City of San Diego to comply with Municipal Code. It shall include flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Any vehicle maintenance conducted by the home owner will follow good housekeeping practices such as not allowing contaminated water to run into the public street. This is accomplished by the utilization of a temporary flow diverter to a landscaped area.

SC-2: Identify the storm drain system using stenciling or signage

Storm drain signs and stencils are visible source controls typically placed adjacent to the inlets. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Stenciling shall be provided for all storm water conveyance system inlets and catch basins within the project area. Inlet stenciling may include concrete stamping, concrete painting, placards, or other methods approved by the local municipality. In addition to storm drain stenciling, projects are encouraged to post signs and prohibitive language (with graphical icons) which prohibit illegal dumping at trailheads, parks, building entrances and public access points along channels and creeks within the project area.

Language associated with the stamping (e.g., "No Dumping-Drains to Ocean") must be satisfactory to the City Engineer. Stamping may also be required in Spanish.

DISCUSSION:

There is no existing storm drain system. The proposed project storm drain system will be on private property and not accessible by the general public. It will consist of roof drains, small landscape inlets and 6" brass grates in the patio. The 4" or 6" PVC pipes onsite will discharge to a water polisher. The water polisher structure will be stamped with the words "no dumping – drains to the ocean". It will be the responsibility of the home owner to prevent pollutants from entering the storm drain system.

SC-3: Protect outdoor material storage areas from rainfall, run-on, runoff, and wind dispersal

Materials with the potential to pollute storm water runoff shall be stored in a manner that prevents contact with rainfall and storm water runoff. Contaminated runoff shall be managed for treatment incorporate the following structural or pollutant control BMPs for outdoor material storage areas, as applicable and feasible:

Materials with the potential to contaminate storm water shall be:

- Placed in an enclosure such as, but not limited to, a cabinet, or similar structure, or under a roof or awning that prevents contact with rainfall runoff or spillage to the storm water conveyance system; or
- Protected by secondary containment structures such as berms, dikes, or curbs.
- The storage areas shall be paved and sufficiently impervious to contain leaks and spills, where necessary.

(continued below)

- The storage area shall be sloped towards a sump or another equivalent measure that is effective to contain spills.
- Runoff from downspouts/roofs shall be directed away from storage areas.
- The storage area shall have a roof or awning that extends beyond the storage area to minimize collection of storm water within the secondary containment area. A manufactured storage shed may be used for small containers.

DISCUSSION:

This project is the construction of a single family home. There are no outdoor material storage areas included in the design.

SC-4: Protect materials stored in outdoor work areas from rainfall, run-on, runoff, and wind dispersal
Outdoor work areas have an elevated potential for pollutant loading and spills. All development projects shall include the following structural or pollutant control BMPs for any outdoor work areas with potential for pollutant generation, as applicable and feasible:

• Create an impermeable surface such as concrete or asphalt, or a prefabricated metal drip pan, depending on the size needed to protect the materials.
• Cover the area with a roof or other acceptable cover.
• Berm the perimeter of the area to prevent water from adjacent areas from flowing on to the surface of the work area.
• Directly connect runoff to sanitary sewer or other specialized containment system(s), as needed and where feasible. This allows the more highly concentrated pollutants from these areas to receive special treatment that removes particular constituents. Approval for this connection must be obtained from the appropriate sanitary sewer agency.
• Locate the work area away from storm drains or catch basins.

DISCUSSION:

This project is the construction of a single family home. There are no materials stored in outdoor work area included in the design.

SC-5: Protect trash storage areas from rainfall, run-on, runoff, and wind dispersal
Storm water runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. All development projects shall include the following structural or pollutant control BMPs, as applicable:

• Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This can include berming or grading the waste handling area to prevent run-on of storm water.
• Ensure trash container areas are screened or walled to prevent offsite transport of trash.
• Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
• Locate storm drains away from immediate vicinity of the trash storage area and vice versa.
• Post signs on all dumpsters informing users that hazardous material are not to be disposed.

DISCUSSION:

This is a single family home; the trash storage area will be limited to the City approved trash containers that will be stored in the garage.

SC-6: Use any additional BMPs determined to be necessary by the Copermittee to minimize pollutant generation at each project site

Appendix E.1 provides guidance on permanent controls and operational BMPs that are applicable at a project site based on potential sources of runoff pollutants at the project site. The project shall implement all applicable and feasible source control BMPs listed in Appendix E.1. In addition to the source control BMPs in Appendix E.1, additional source control requirements apply for the following project types within the City jurisdiction. Guidance for implementing these additional source control requirements are presented in Appendix E.

• **SC-6A: Large Trash Generating Facilities**: Includes but are not limited to restaurants, supermarkets, "big box" retail stores serving food, and pet stores. Refer to Appendix E.20

• **SC-6B: Animal Facilities**: Includes but are not limited to animal shelters, dog daycare centers, veterinary clinics, groomers, pet care stores, and breeding, boarding, and training facilities. Refer to Appendix E.21

• **SC-6C: Plant Nurseries and Garden Centers**: Includes but are not limited to commercial facilities that grow, distribute, sell, or store plants and plant material. Refer to Appendix E.22

• **SC-6D: Automotive-related Uses**: include but are not limited to facilities that perform maintenance or repair of vehicles, vehicle washing facilities, and retail gasoline outlets. Refer to Appendix E.23

DISCUSSION:

This is a single family home, this is not a large trash generation facility, animal facility, plant nursery or for automotive related uses.

Site Design (SD) BMP Requirements:

How to comply: Projects shall comply with this requirement by using all of the site design BMPs listed in this section that are applicable and practicable to their project type and site conditions. Applicability of a given site design BMP shall be determined based on project type, soil conditions, presence of natural features (e.g. streams), and presence of site features (e.g. parking areas). Explanation shall be provided by the applicant when a certain site design BMP is considered to be not applicable or not practicable/feasible. Site plans shall show site design BMPs and provide adequate details necessary for effective implementation of site design BMPs. The "Site Design BMP Checklist for All Development Projects" located in Appendix I-5 shall be used to document compliance with site design BMP requirements.

SD-1: Maintain natural drainage pathways and hydrologic features

Maintain or restore natural storage reservoirs and drainage corridors (including topographic depressions, areas of permeable soils, natural swales, and ephemeral and intermittent streams)

Buffer zones for natural water bodies (where buffer zones are technically infeasible, require project applicant to include other buffers such as trees, access restrictions, etc.)

During the site assessment, natural drainages must be identified along with their connection to creeks and/or streams, if any. Natural drainages offer a benefit to storm water management as the soils and habitat already function as a natural filtering/infiltrating swale. When determining the development footprint of the site, altering natural drainages should be avoided. By providing a development envelope set back from natural drainages, the drainage can retain some water quality benefits to the watershed. In some situations, site constraints, regulations, economics, or other factors may not allow avoidance of drainages and sensitive areas. Projects proposing to dredge or fill materials in Waters of the U.S. must obtain Clean Water Act Section 401 Water Quality Certification. Projects proposing to dredge or fill waters of the State must obtain waste discharge requirements. Both the 401 Certification and the Waste Discharge Requirements are administered by the San Diego Water Board. The project applicant shall consult the local jurisdiction for other specific requirements.

Projects can incorporate SD-1 into a project by implementing the following planning and design phase techniques as applicable and practicable:

• Evaluate surface drainage and topography in considering selection of Site Design BMPs that will be most beneficial for a given project site. Where feasible, maintain topographic depressions for infiltration.
• Optimize the site layout and reduce the need for grading. Where possible, conform the site layout along natural landforms, avoid grading and disturbance of vegetation and soils, and replicate the site's natural drainage patterns. Integrating existing drainage patterns into the site plan will help maintain the site's predevelopment hydrologic function.
• Preserve existing drainage paths and depressions, where feasible and applicable, to help
• Structural BMPs cannot be located in buffer zones if a State and/or Federal resource agency (e.g. SDRWQCB, California Department of Fish and Wildlife; U.S. Army Corps of Engineers, etc.) prohibits maintenance or activity in the area.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The existing surface drainage and topography are maintained. The design of the new house conforms to the existing contours and graded pad.

SD-2: Conserve natural areas, soils and vegetation

• Conserve natural areas within the project footprint including existing trees, other vegetation, and soils

To enhance a site's ability to support source control and reduce runoff, the conservation and restoration of natural areas must be considered in the site design process. By conserving or restoring the natural drainage features, natural processes are able to intercept storm water, thereby reducing the amount of runoff. The upper soil layers of a natural area contain organic material, soil biota, vegetation, and a configuration favorable for storing and slowly conveying storm water and establishing or restoring vegetation to stabilize the site after construction. The canopy of existing native trees and shrubs also provide a water conservation benefit by intercepting rain water before it hits the ground. By minimizing disturbances in these areas, natural processes are able to intercept storm water, providing a water quality benefit. By keeping the development concentrated to the least environmentally sensitive areas of the site and set back from natural areas, storm water runoff is reduced, water quality can be improved, environmental impacts can be decreased, and many of the site's most attractive native landscape features can be retained. In some situations, site constraints, regulations, economics, and/or other factors may not allow avoidance of all sensitive areas on a project site. Project applicant shall consult the local municipality for jurisdictional specific requirements for mitigation of removal of sensitive areas.

Projects can incorporate SD-2 by implementing the following planning and design phase techniques as applicable and practicable:

• Identify areas most suitable for development and areas that should be left undisturbed. Additionally, reduced disturbance can be accomplished by increasing building density and increasing height, if possible.
• Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
• Avoid areas with thick, undisturbed vegetation. Soils in these areas have a much higher capacity to store and infiltrate runoff than disturbed soils, and reestablishment of a mature vegetative community can take decades. Vegetative cover can also provide additional volume storage of rainfall by retaining water on the surfaces of leaves, branches, and trunks of trees during and after storm events.
• Preserve trees, especially native trees and shrubs, and identify locations for planting additional native or drought tolerant trees and large shrubs.
• In areas of disturbance, topsoil should be removed before construction and replaced after the project is completed. When handled carefully, such an approach limits the disturbance to native soils and reduces the need for additional (purchased) topsoil during later phases.
• Avoid sensitive areas, such as wetlands, biological open space areas, biological mitigation sites, streams, floodplains, or particular vegetation communities, such as coastal sage scrub and intact forest. Also, avoid areas

that are habitat for sensitive plants and animals, particularly those, State or federally listed as endangered, threatened or rare. Development in these areas is often restricted by federal, state and local laws.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. There is minimal natural area or vegetation remaining on the site due to the construction of the existing house. Much of the existing vegetation will be preserved.

SD-3: Minimize impervious area

• Construct streets, sidewalks or parking lots aisles to the minimum widths necessary, provided public safety is not compromised

• Minimize the impervious footprint of the project

One of the principal causes of environmental impacts by development is the creation of impervious surfaces. Imperviousness links urban land development to degradation of aquatic ecosystems in two ways:

• First, the combination of paved surfaces and piped runoff efficiently collects urban pollutants and transports them, in suspended or dissolved form, to surface waters. These pollutants may originate as airborne dust, be washed from the atmosphere during rains, or may be generated by automobiles and outdoor work activities.

• Second, increased peak flows and runoff durations typically cause erosion of stream banks and beds, transport of fine sediments, and disruption of aquatic habitat. Measures taken to control stream erosion, such as hardening banks with riprap or concrete, may permanently eliminate habitat. Impervious cover can be minimized through identification of the smallest possible land area that can be practically impacted or disturbed during site development. Reducing impervious surfaces retains the permeability of the project site, allowing natural processes to filter and reduce sources of pollution.

Projects can incorporate SD-3 by implementing the following planning and design phase techniques as applicable and practicable:

• Decrease building footprint through (the design of compact and taller structures when allowed by local zoning and design standards and provided public safety is not compromised.
• Construct walkways, trails, patios, overflow parking lots, alleys and other low-traffic areas with permeable surfaces.
• Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and alternative transportation (e.g. pedestrians, bikes) are not compromised.
• Consider the implementation of shared parking lots and driveways where possible.
• Landscaped area in the center of a cul-de-sac can reduce impervious area depending on configuration. Design of a landscaped cul-de-sac must be coordinated with fire department personnel to accommodate turning radii and other operational needs.
• Design smaller parking lots with fewer stalls, smaller stalls, more efficient lanes.
• Design indoor or underground parking.
• Minimize the use of impervious surfaces in the landscape design.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The proposed project will increase the impervious area by 34.6% or 6,786 square feet, compared to the existing development. A water polisher will be installed to mitigate the increase in impervious area.

SD-4: Minimize soil compaction

• Minimize soil compaction in landscaped areas

The upper soil layers contain organic material, soil biota, and a configuration favorable for storing and slowly conveying storm water down gradient. By protecting native soils and vegetation in appropriate areas during the clearing and grading phase of development the site can retain some of its existing beneficial hydrologic function. Soil compaction resulting from the movement of heavy construction equipment can reduce soil infiltration rates. It is important to recognize that areas adjacent to and under building foundations, roads and manufactured slopes must be compacted with minimum soil density requirements in compliance with local building and grading ordinances.

Projects can incorporate SD-4 by implementing the following planning and design phase techniques as applicable and practicable:

• Avoid disturbance in planned green space and proposed landscaped areas where feasible. These areas that are planned for retaining their beneficial hydrological function should be protected during the grading/construction phase so that vehicles and construction equipment do not intrude and inadvertently compact the area.
• In areas planned for landscaping where compaction could not be avoided, re-till the soil surface to allow for better infiltration capacity. Soil amendments are recommended and may be necessary to increase permeability and organic content. Soil stability, density requirements, and other geotechnical considerations associated with soil compaction must be reviewed by a qualified landscape architect or licensed geotechnical, civil or other professional engineer.

DISCUSSION:

The proposed irrigation and landscape design is done by a registered professional and will be submitted to the City of San Diego to comply with Municipal Code. It shall include flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Soil will be compacted to maximize the infiltration of storm water.

SD-5: Disperse impervious areas

Disconnect impervious surfaces through disturbed pervious areas

Design and construct landscaped or other pervious areas to effectively receive and infiltrate, retain and/or treat runoff from impervious areas prior to discharging to the MS4

Impervious area dispersion (dispersion) refers to the practice of essentially disconnecting impervious areas from directly draining to the storm drain system by routing runoff from impervious areas such as rooftops, walkways, and driveways onto the surface of adjacent pervious areas. The intent is to slow runoff discharges, and reduce volumes while achieving incidental treatment. Volume reduction from dispersion is dependent on the infiltration characteristics of the pervious area and the amount of impervious area draining to the pervious area. Treatment is achieved through filtration, shallow sedimentation, sorption, infiltration, evapotranspiration, biochemical processes and plant uptake.

The effects of imperviousness can be mitigated by disconnecting impervious areas from the drainage system and by encouraging detention and retention of runoff near the point where it is generated. Detention and retention of runoff reduces peak flows and volumes and allows pollutants to settle out or adhere to soils before they can be transported downstream. Disconnection practices may be applied in almost any location, but impervious surfaces must discharge into a suitable receiving area for the practices to be effective. Information gathered during the site assessment will help determine appropriate receiving areas.

Project designs should direct runoff from impervious areas to adjacent landscaping areas that have higher potential for infiltration and surface water storage. This will limit the amount of runoff generated, and therefore the size of the mitigation BMPs downstream. The design, including consideration of slopes and soils, must reflect a reasonable expectation that runoff will soak into the soil and produce no runoff of the DCV. On hillside sites,

drainage from upper areas may be collected in conventional catch basins and piped to landscaped areas that have higher potential for infiltration. Or use low retaining walls to create terraces that can accommodate BMPs. Projects can incorporate SD-5 by implementing the following planning and design phase techniques as applicable and practicable:

• Implement design criteria and considerations listed in impervious area dispersion fact sheet (SD-5) presented in Appendix E.
• Drain rooftops into adjacent landscape areas.
• Drain impervious parking lots, sidewalks, walkways, trails, and patios into adjacent landscape areas.
• Reduce or eliminate curb and gutters from roadway sections, thus allowing roadway runoff to drain to adjacent pervious areas.
• Replace curbs and gutters with roadside vegetated swales and direct runoff from the paved street or parking areas to adjacent LID facilities. Such an approach for alternative design can reduce the overall capital cost of the site development while improving the storm water quantity and quality issues and the site's aesthetics.
• Plan site layout and grading to allow for runoff from impervious surfaces to be directed into distributed permeable areas such as turf, landscaped or permeable recreational areas, medians, parking islands, planter boxes, etc.
• Detain and retain runoff throughout the site. On flatter sites, landscaped areas can be interspersed among the buildings and pavement areas. On hillside sites, drainage from upper areas may be collected in conventional catch basins and conveyed to landscaped areas in lower areas of the site.
• Pervious area that receives run on from impervious surfaces shall have a minimum width of 10 feet and a maximum slope of 5%.

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The proposed project will increase the impervious area by 34.6% or 6,786 square feet, compared to the existing development. A water polisher will be installed to mitigate the increase in impervious area.

SD-6: Collect runoff

• Use small collection strategies located at, or as close to as possible to the sources (i.e. the point where storm water initially meets the ground) to minimize the transport of runoff and pollutants to the MS4 and receiving waters

• Use permeable material for projects with low traffic areas and appropriate soil conditions

Distributed control of storm water runoff from the site can be accomplished by applying small collection techniques (e.g. green roofs), or integrated management practices, on small sub-catchments or on residential lots. Small collection techniques foster opportunities to maintain the natural hydrology provide a much greater range of control practices. Integration of storm water management into landscape design and natural features of the site, reduce site development and long-term maintenance costs, and provide redundancy if one technique fails. On flatter sites, it typically works best to intersperse landscaped areas and integrate small scale retention practices among the buildings and paving.

Permeable pavements contain small voids that allow water to pass through to a gravel base. They come in a variety of forms; they may be a modular paving system (concrete pavers, grass-pave, or gravel-pave) or poured in place pavement (porous concrete, permeable asphalt). Project applicants should identify locations where permeable pavements could be substituted for impervious concrete or asphalt paving. The O&M of the site must ensure that permeable pavements will not be sealed in the future. In areas where infiltration is not appropriate, permeable paving systems can be fitted with an under drain to allow filtration, storage, and evaporation, prior to drainage into the storm drain system.

Projects can incorporate SD-6 by implementing the following planning and design phase techniques as applicable and practicable:

• Implementing distributed small collection techniques to collect and retain runoff
• Installing permeable pavements (see SD-6B in Appendix E)

DISCUSSION:

This project is the construction of a single family home on a previously developed home site. The small proposed site does not support bio-retentions or infiltration trenches. Mechanical means will be used to treat the storm water before discharging it to the public street.

SD-7: Landscape with native or drought tolerant species

All development projects are required to select a landscape design and plant palette that minimizes required resources (irrigation, fertilizers and pesticides) and pollutants generated from landscape areas. Native plants require less fertilizers and pesticides because they are already adapted to the rainfall patterns and soils conditions. Plants should be selected to be drought tolerant and not require watering after establishment (2 to 3 years). Watering should only be required during prolonged dry periods after plants are established. Final selection of plant material needs to be made by a landscape architect experienced with LID techniques. Microclimates vary significantly throughout the region and consulting local municipal resources will help to select plant material suitable for a specific geographic location.

Projects can incorporate SD-7 by landscaping with native and drought tolerant species. Recommended plant list is included in Appendix E (Fact Sheet PL).

DISCUSSION:

This project will be landscaped with native and drought tolerant species.

SD-8: Harvest and use precipitation

Harvest and use BMPs capture and stores storm water runoff for later use. Harvest and use can be applied at smaller scales (Standard Projects) using rain barrels or at larger scales (PDPs) using cisterns. This harvest and use technique has been successful in reducing runoff discharged to the storm drain system conserving potable water and recharging groundwater.

Rain barrels are above ground storage vessels that capture runoff from roof downspouts during rain events and detain that runoff for later reuse for irrigating landscaped areas. 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 storm water runoff that flows overland into a storm water conveyance system (storm drain inlets and drain pipes), less pollutants are transported through the conveyance system into local creeks and the ocean. The reuse of the detained water for irrigation purposes leads to the conservation of potable water and the recharge of groundwater. SD-8 fact sheet in Appendix E provides additional detail for designing Harvest and Use BMPs. Projects can incorporate SD-8 by installing rain barrels or cisterns, as applicable.

DISCUSSION:

This project will not include harvesting of storm water. The site is to compact to efficiently use rail barrels for storm capture and use as irrigation water.

MICHAEL L. SMITH, RCE 35471

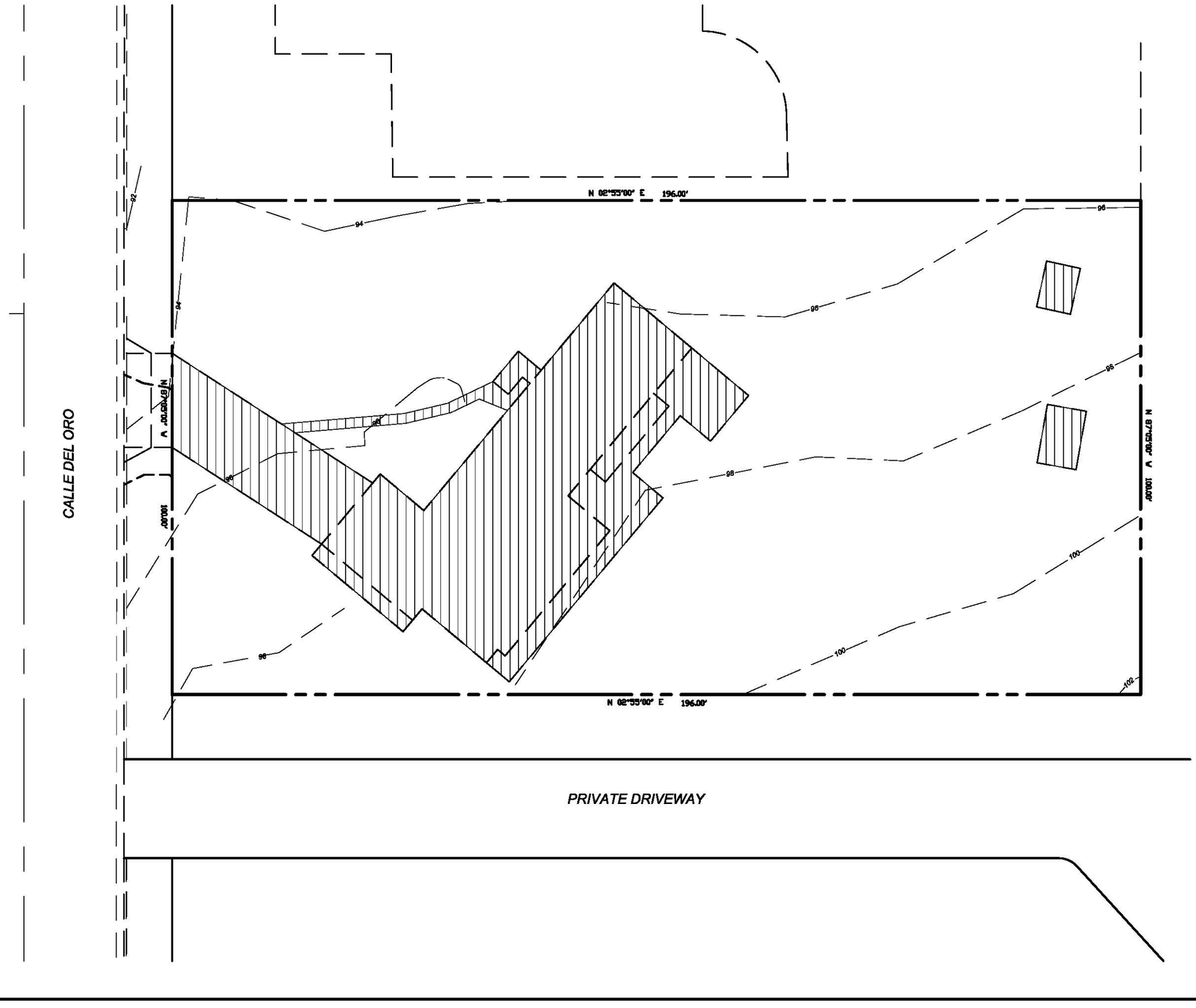

EXHIBIT A

IMPERVIOUS AREAS MAP
EXISTING CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 19,600 SF. OR 0.4500 AC.

IMPERVIOUS AREA
AREA = 3,872 SF. OR 0.0889 AC.
19.8% OF SITE

LANDSCAPE AREA
AREA = 15,728 SF. OR 0.3611 AC.
80.2% OF SITE

IMPERVIOUS AREA

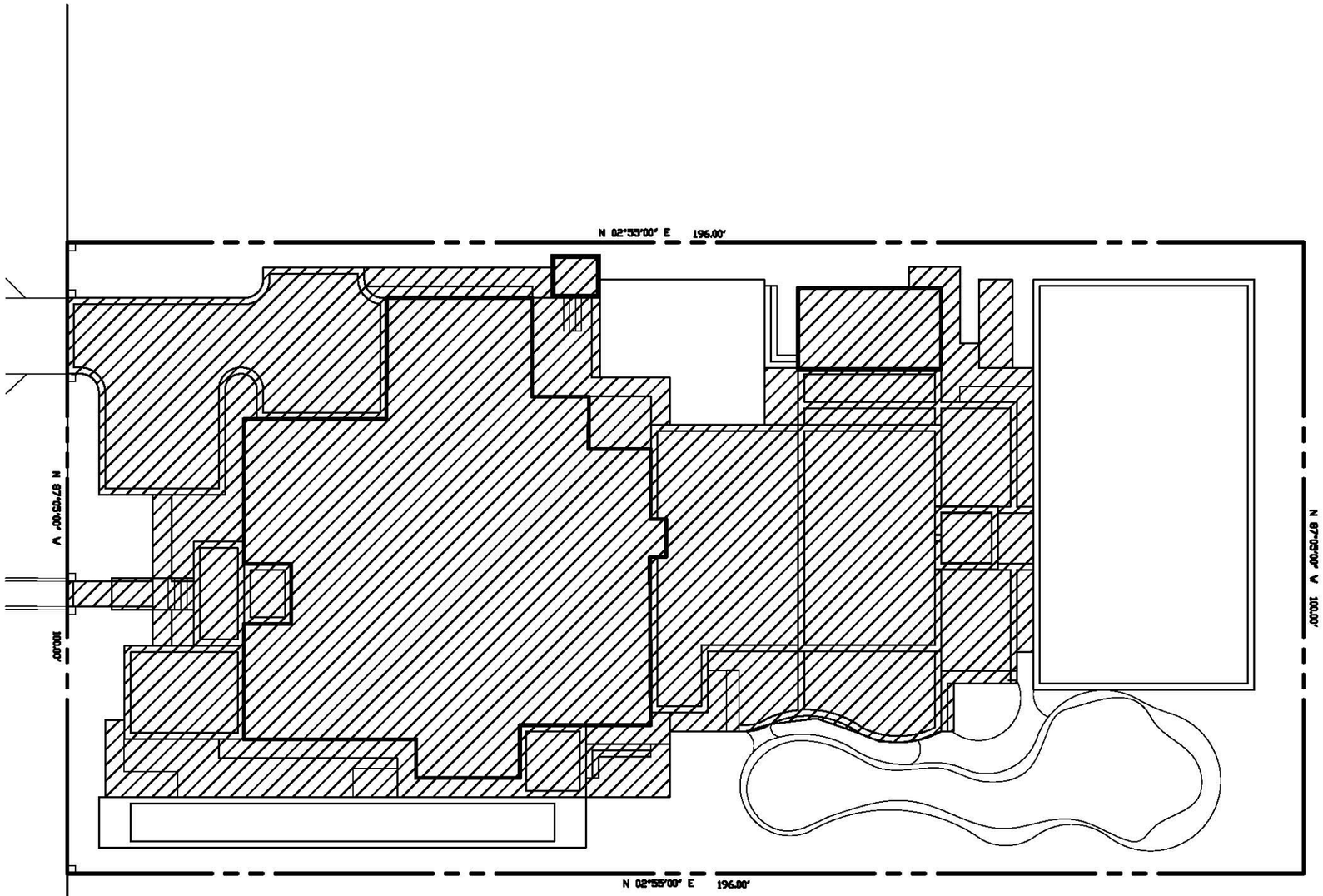

EXHIBIT B

IMPERVIOUS AREAS MAP
PROPOSED CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 19,600 SF. OR 0.4500 AC.

DISTURBED AREA
AREA = 16,000 SF. OR 0.3673 AC.

IMPERVIOUS AREA
AREA = 10,658 SF. OR 0.2447 AC.
54.4% OF SITE

LANDSCAPE AREA
AREA = 8,942 SF. OR 0.2053 AC.
45.6% OF SITE

IMPERVIOUS AREA

The City of San Diego	**PRIORITY DEVELOPMENT PROJECT (PDP) STORM WATER QUALITY MANAGEMENT PLAN (SWQMP) FOR**

2340 Calle Del Oro, San Diego, Ca. 92037
PTS No. 461154

ENGINEER OF WORK:

MICHAEL L. SMITH, RCE 35471

PREPARED FOR:
Robbie Robbins
2340 Calle Del Oro
San Diego, Ca. 92037

PREPARED BY:

San Diego Land Surveying and Engineering, Inc.
9665 Chesapeake Drive, Suite 445
San Diego, Ca. 92123
858-565-8362

DATE: 09/05/2016

Approved by: City of San Diego Date

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TABLE OF CONTENTS

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ACRONYMS

APN	Assessor's Parcel Number
ASBS	Area of Special Biological Significance
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CGP	Construction General Permit
DCV	Design Capture Volume
DMA	Drainage Management Areas
ESA	Environmentally Sensitive Area
GLU	Geomorphic Landscape Unit
GW	Ground Water
HMP	Hydromodification Management Plan
HSG	Hydrologic Soil Group
HU	Harvest and Use
INF	Infiltration
LID	Low Impact Development
LUP	Linear Underground/Overhead Projects
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PDP	Priority Development Project
PE	Professional Engineer
POC	Pollutant of Concern
SC	Source Control
SD	Site Design
SDRWQCB	San Diego Regional Water Quality Control Board
SIC	Standard Industrial Classification
SWPPP	Stormwater Pollutant Protection Plan
SWQMP	Storm Water Quality Management Plan
TMDL	Total Maximum Daily Load
WMAA	Watershed Management Area Analysis
WPCP	Water Pollution Control Program
WQIP	Water Quality Improvement Plan

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CERTIFICATION PAGE

Project Name:
Permit Application Number:

I hereby declare that I am the Engineer in Responsible Charge of design of storm water BMPs for this project, and that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with the requirements of the Storm Water Standards, which is based on the requirements of SDRWQCB Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 (MS4 Permit).

I have read and understand that the City Engineer has adopted minimum requirements for managing urban runoff, including storm water, from land development activities, as described in the Storm Water Standards. I certify that this PDP SWQMP has been completed to the best of my ability and accurately reflects the project being proposed and the applicable source control and site design BMPs proposed to minimize the potentially negative impacts of this project's land development activities on water quality. I understand and acknowledge that the plan check review of this PDP SWQMP by the City Engineer is confined to a review and does not relieve me, as the Engineer in Responsible Charge of design of storm water BMPs for this project, of my responsibilities for project design.

C-35471 EXPIRES 09/30/2017

Engineer of Work's Signature, PE Number & Expiration Date

MICHAEL L. SMITH

Print Name

SAN DIEGO LAND SURVEYING AND ENGINEERING, INC

Company

09/05/2016

Date

Engineer's Stamp

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SUBMITTAL RECORD

Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plan check comments is included. When applicable, insert response to plan check comments.

Submittal Number	Date	Project Status	Changes
1		☒ Preliminary Design/Planning/CEQA ☐ Final Design	Initial Submittal
2	07/07/16	☐ Preliminary Design/Planning/CEQA ☒ Final Design	REVISED SUBMITTAL
3		☐ Preliminary Design/Planning/CEQA ☐ Final Design	
4		☐ Preliminary Design/Planning/CEQA ☐ Final Design	

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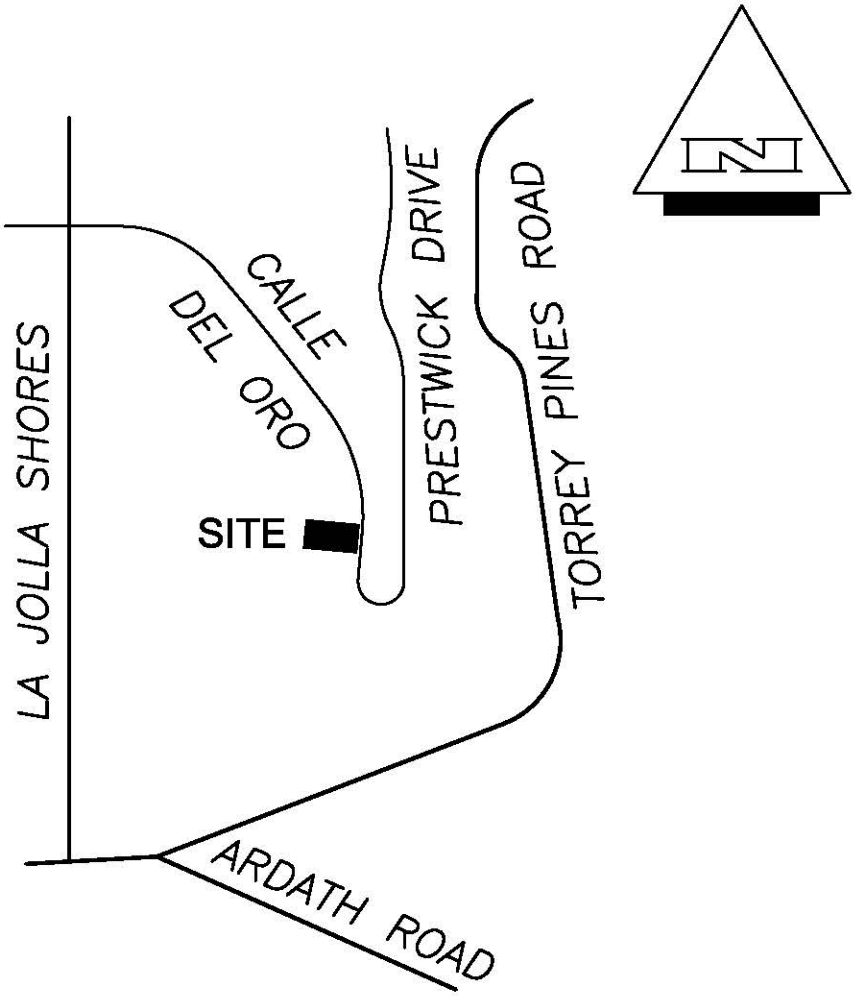
PROJECT NAME: 2340 CALLE DEL ORO
PTS: 461154



VICINITY MAP

NO SCALE

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STORM WATER REQUIREMENTS APPLICABILITY CHECKLIST

Complete and attach DS-560 Form included in Appendix A.1

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THE CITY OF SAN DIEGO
City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000

Storm Water Requirements Applicability Checklist

FORM
DS-560
FEBRUARY 2016

Project Address: 2340 CALLE DEL ORO	Project Number *(for City Use Only):*

SECTION 1. Construction Storm Water BMP Requirements:

All construction sites are required to implement construction BMPs in accordance with the performance standards in the Storm Water Standards Manual. Some sites are additionally required to obtain coverage under the State Construction General Permit (CGP)[1] , which is administered by the State Water Resources Control Board.

For all project complete PART A: If project is required to submit a SWPPP or WPCP, continue to PART B.

PART A: Determine Construction Phase Storm Water Requirements.

1. Is the project subject to California's statewide General NPDES permit for Storm Water Discharges Associated with Construction Activities, also known as the State Construction General Permit (CGP)? (Typically projects with land disturbance greater than or equal to 1 acre.)

   ☐ Yes; SWPPP required, skip questions 2-4 ☒ No; next question

2. Does the project propose construction or demolition activity, including but not limited to, clearing, grading, grubbing, excavation, or any other activity that results in ground disturbance and contact with storm water runoff?

   ☒ Yes; WPCP required, skip 3-4 ☐ No; next question

3. Does the project propose routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility? (Projects such as pipeline/utility replacement)

   ☐ Yes; WPCP required, skip 4 ☐ No; next question

4. Does the project only include the following Permit types listed below?
   - Electrical Permit, Fire Alarm Permit, Fire Sprinkler Permit, Plumbing Permit, Sign Permit, Mechanical Permit, Spa Permit.
   - Individual Right of Way Permits that exclusively include only ONE of the following activities: water service, sewer lateral, or utility service.
   - Right of Way Permits with a project footprint less than 150 linear feet that exclusively include only ONE of the following activities: curb ramp, sidewalk and driveway apron replacement, pot holing, curb and gutter replacement, and retaining wall encroachments.

   ☐ Yes; no document required

Check one of the boxes to the right, and continue to PART B:

☐ If you checked "Yes" for question 1, **a SWPPP is REQUIRED. Continue to PART B**

☐ If you checked "No" for question 1, and checked "Yes" for question 2 or 3, **a WPCP is REQUIRED.** If the project proposes less than 5,000 square feet of ground disturbance AND has less than a 5-foot elevation change over the entire project area, a Minor WPCP may be required instead. **Continue to PART B.**

☐ If you checked "No" for all questions 1-3, and checked "Yes" for question 4 PART B **does not apply and no document is required. Continue to Section 2.**

1. More information on the City's construction BMP requirements as well as CGP requirements can be found at: www.sandiego.gov/stormwater/regulations/index.shtml

PART B: Determine Construction Site Priorit

This prioritization must be completed within this form, noted on the plans, and included in the SWPPP or WPCP. The city reserves the right to adjust the priority of projects both before and after construction. Construction projects are assigned an inspection frequency based on if the project has a "high threat to water quality." The City has aligned the local definition of "high threat to water quality" to the risk determination approach of the State Construction General Permit (CGP). The CGP determines risk level based on project specific sediment risk and receiving water risk. Additional inspection is required for projects within the Areas of Special Biological Significance (ASBS) watershed. **NOTE:** The construction priority does **NOT** change construction BMP requirements that apply to projects; rather, it determines the frequency of inspections that will be conducted by city staff.

Complete PART B and continued to Section 2

1. ☒ **ASBS**

a. Projects located in the ASBS watershed.

2. ☐ **High Priority**

a. Projects 1 acre or more determined to be Risk Level 2 or Risk Level 3 per the Construction General Permit and not located in the ASBS watershed.

b. Projects 1 acre or more determined to be LUP Type 2 or LUP Type 3 per the Construction General Permit and not located in the ASBS watershed.

3. ☐ **Medium Priority**

a. Projects 1 acre or more but not subject to an ASBS or high priority designation.

b. Projects determined to be Risk Level 1 or LUP Type 1 per the Construction General Permit and not located in the ASBS watershed.

4. **Low Priority**

a. Projects requiring a Water Pollution Control Plan but not subject to ASBS, high, or medium priority designation.

SECTION 2. Permanent Storm Water BMP Requirements.

Additional information for determining the requirements is found in the Storm Water Standards Manual.

PART C: Determine if Not Subject to Permanent Storm Water Requirements.

Projects that are considered maintenance, or otherwise not categorized as "new development projects" or "redevelopment projects" according to the Storm Water Standards Manual are not subject to Permanent Storm Water BMPs.

If "yes" is checked for any number in Part C, proceed to Part F and check "Not Subject to Permanent Storm Water BMP Requirements".

If "no" is checked for all of the numbers in Part C continue to Part D.

1.	Does the project only include interior remodels and/or is the project entirely within an existing enclosed structure and does not have the potential to contact storm water?	☐ Yes	☒ No
2.	Does the project only include the construction of overhead or underground utilities without creating new impervious surfaces?	☐ Yes	☒ No
3.	Does the project fall under routine maintenance? Examples include, but are not limited to: roof or exterior structure surface replacement, resurfacing or reconfiguring surface parking lots or existing roadways without expanding the impervious footprint, and routine replacement of damaged pavement (grinding, overlay, and pothole repair).	☐ Yes	☒ No

PART D: PDP Exempt Requirements.

PDP Exempt projects are required to implement site design and source control BMPs.

If "yes" was checked for any questions in Part D, continue to Part F and check the box labeled "PDP Exempt."

If "no" was checked for all questions in Part D, continue to Part E.

1. Does the project ONLY include new or retrofit sidewalks, bicycle lanes, or trails that:
   - Are designed and constructed to direct storm water runoff to adjacent vegetated areas, or other non-erodible permeable areas? Or;
   - Are designed and constructed to be hydraulically disconnected from paved streets and roads? Or;
   - Are designed and constructed with permeable pavements or surfaces in accordance with the Green Streets guidance in the City's Storm Water Standards manual?

   ❑ Yes; PDP exempt requirements apply ☒ No; next question

2. Does the project ONLY include retrofitting or redeveloping existing paved alleys, streets or roads designed and constructed in accordance with the Green Streets guidance in the City's Storm Water Standards Manual?

   ❑ Yes; PDP exempt requirements apply ☒ No; project not exempt. PDP requirements apply

PART E: Determine if Project is a Priority Development Project (PDP).
Projects that match one of the definitions below are subject to additional requirements including preparation of a Storm Water Quality Management Plan (SWQMP).

If "yes" is checked for any number in PART E, continue to PART F.

If "no" is checked for every number in PART E, continue to PART F and check the box labeled "Standard Development Project".

1.	**New Development that creates 10,000 square feet or more of impervious surfaces collectively over the project site.** This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	X Yes ☒ No
2.	**Redevelopment project that creates and/or replaces 5,000 square feet or more of impervious surfaces on an existing site of 10,000 square feet or more of impervious surfaces**. This includes commercial, industrial, residential, mixed-use, and public development projects on public or private land.	❑ Yes ☒ No
3.	**New development or redevelopment of a restaurant.** Facilities that sell prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC 5812), and where the land development creates and/or replace 5,000 square feet or more of impervious surface.	❑ Yes ☒ No
4.	**New development or redevelopment on a hillside.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site) and where the development will grade on any natural slope that is twenty-five percent or greater.	❑ Yes ☒ No
5.	**New development or redevelopment of a parking lot that creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).**	❑ Yes ☒ No
6.	**New development or redevelopment of streets, roads, highways, freeways, and driveways.** The project creates and/or replaces 5,000 square feet or more of impervious surface (collectively over the project site).	❑ Yes ☒ No

7. **New development or redevelopment discharging directly to an Environmentally Sensitive Area.** The project creates and/or replaces 2,500 square feet of impervious surface (collectively over project site), and discharges directly to an Environmentally Sensitive Area (ESA). "Discharging directly to" includes flow that is conveyed overland a distance of 200 feet or less from the project to the ESA, or conveyed in a pipe or open channel any distance as an isolated flow from the project to the ESA (i.e. not commingled with flows from adjacent lands). ❑ Yes ☒ No

8. **New development or redevelopment projects of a retail gasoline outlet (RGO) that create and/or replaces 5,000 square feet of impervious surface.** The development project meets the following criteria: (a) 5,000 square feet or more or (b) has a projected Average Daily Traffic (ADT) of 100 or more vehicles per day. ❑ Yes ☒ No

9. **New development or redevelopment projects of an automotive repair shops that creates and/or replaces 5,000 square feet or more of impervious surfaces.** Development projects categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539. ❑ Yes ☒ No

10. **Other Pollutant Generating Project.** The project is not covered in the categories above, results in the disturbance of one or more acres of land and is expected to generate pollutants post construction, such as fertilizers and pesticides. This does not include projects creating less than 5,000 sf of impervious surface and where added landscaping does not require regular use of pesticides and fertilizers, such as slope stabilization using native plants. Calculation of the square footage of impervious surface need not include linear pathways that are for infrequent vehicle use, such as emergency maintenance access or bicycle pedestrian use, if they are built with pervious surfaces of if they sheet flow to surrounding pervious surfaces. ❑ Yes ☒ No

PART F: Select the appropriate category based on the outcomes of PART C through PART E.

1. The project is **NOT SUBJECT TO STORM WATER REQUIREMENTS**. ❑
2. The project is a **STANDARD DEVELOPMENT PROJECT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. X
3. The project is **PDP EXEMPT**. Site design and source control BMP requirements apply. See the Storm Water Standards Manual for guidance. ❑
4. The project is a **PRIORITY DEVELOPMENT PROJECT**. Site design, source control, and structural pollutant control BMP requirements apply. See the Storm Water Standards Manual for guidance on determining if project requires a hydromodification plan management ❑

Name of Owner or Agent *(Please Print):* Michael L. Smith Title: Project Engineer

Signature: Date: June 07, 2016

Applicability of Permanent, Post-Construction Storm Water BMP Requirements		**Form I-1**
Project Identification		
Project Name: 2340 CALLE DEO ORO		
Permit Application Number: 461154		Date: JUNE 02, 2016
Determination of Requirements		
The purpose of this form is to identify permanent, post-construction requirements that apply to the project. This form serves as a short summary of applicable requirements, in some cases referencing separate forms that will serve as the backup for the determination of requirements. Answer each step below, starting with Step 1 and progressing through each step until reaching "Stop". Refer to Part 1 of Storm Water Standards sections and/or separate forms referenced in each step below.		
Step	Answer	Progression
Step 1: Is the project a "development project"? See Section 1.3 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	X Yes	Go to Step 2.
	☐ No	Stop. Permanent BMP requirements do not apply. No SWQMP will be required. Provide discussion below.
Discussion / justification if the project is not a "development project" (e.g., the project includes only interior remodels within an existing building):		
Step 2: Is the project a Standard Project, Priority Development Project (PDP), or exception to PDP definitions? To answer this item, see Section 1.4 of the BMP Design Manual (Part 1 of Storm Water Standards) in its entirety for guidance, AND complete Storm Water Requirements Applicability Checklist.	☐ Standard Project	Stop. Standard Project requirements apply.
	X PDP	PDP requirements apply, including PDP SWQMP. Go to Step 3.
	☐ PDP Exempt	Stop. Standard Project requirements apply. Provide discussion and list any additional requirements below.
Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		

Form I-1 Page 2		
Step	Answer	Progression
Step 3. Is the project subject to earlier PDP requirements due to a prior lawful approval? See Section 1.10 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Consult the City Engineer to determine requirements. Provide discussion and identify requirements below. Go to Step 4.
	X No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements (<u>not required if prior lawful approval does not apply</u>):		
Step 4. Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	X Yes	PDP structural BMPs required for pollutant control (Chapter 5) and hydromodification control (Chapter 6). Go to Step 5.
	☐ No	Stop. PDP structural BMPs required for pollutant control (Chapter 5) only. Provide brief discussion of exemption to hydromodification control below.
Discussion / justification if hydromodification control requirements do <u>not</u> apply:		
Step 5. Does protection of critical coarse sediment yield areas apply? See Section 6.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☐ Yes	Management measures required for protection of critical coarse sediment yield areas (Chapter 6.2). Stop.
	X No	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.
Discussion / justification if protection of critical coarse sediment yield areas does <u>not</u> apply: No offsite storm water or onsite un-improved area apply to this project.		

Site Information Checklist For PDPs	Form I-3B
Project Summary Information	
Project Name	2340 CALLE DEL ORO
Project Address	2340 CALLE DEL ORE
Assessor's Parcel Number(s) (APN(s))	346-120-08
Permit Application Number	461154
Project Watershed	Select One: ☐ San Dieguito River X Penasquitos ☐ Mission Bay ☐ San Diego River ☐ San Diego Bay ☐ Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	SCRIPPS 906.30
Project Area (total area of Assessor's Parcel(s) associated with the project or total area of the right-of-way)	~~0.4500~~ Acres (19,600 Square Feet)
Area to be disturbed by the project (Project Footprint)	0.3673 Acres (16,000 Square Feet)
Project Proposed Impervious Area (subset of Project Footprint)	0.2447 Acres (10,658 Square Feet)
Project Proposed Pervious Area (subset of Project Footprint)	0.2053 Acres (8,942 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Project Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition.	34.6% increase in impervious area

Form I-3B Page 2 of 11
Description of Existing Site Condition and Drainage Patterns
Current Status of the Site (select all that apply): ☒ Existing development ☐ Previously graded but not built out ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information:
Existing Land Cover Includes (select all that apply): ☒ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☒ Impervious Areas Description / Additional Information: The site is developed with a single family home, driveway, hardscape and landscaping.
Underlying Soil belongs to Hydrologic Soil Group (select all that apply): ☒ NRCS Type A ☐ NRCS Type B ☐ NRCS Type C ☐ NRCS Type D
Approximate Depth to Groundwater (GW): ☐ GW Depth < 5 feet ☐ 5 feet < GW Depth < 10 feet ☐ 10 feet < GW Depth < 20 feet ☒ GW Depth > 20 feet
Existing Natural Hydrologic Features (select all that apply): ☐ Watercourses ☐ Seeps ☐ Springs ☐ Wetlands ☒ None Description / Additional Information:

Form I-3B Page 3 of 11
Description of Existing Site Topography and Drainage:
How is storm water runoff conveyed from the site? At a minimum, this description should answer: 1. Whether existing drainage conveyance is natural or urban; 2. If runoff from offsite is conveyed through the site? If yes, quantification of all offsite drainage areas, design flows, and locations where offsite flows enter the project site and summarize how such flows are conveyed through the site; 3. Provide details regarding existing project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, and natural and constructed channels; 4. Identify all discharge locations from the existing project along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide summary of the pre-project drainage areas and design flows to each of the existing runoff discharge locations.
Description / Additional Information:
THE EXISTING DRAINAGE CONVEYANCE IS URBAN. NO OR MINOR OFFSITE STORM WATER RUNS ONTO THE SITE. THE EXISTING SITE DRAINAGE CONSISTS OF ROOF DRAINS AND SHEET FLOW OF STORM WATER TO THE NORTH AND WEST TO CALLE DEL ORO A PUBLIC STREET. PROPOSED SITE STORM DRAIN WATER WILL SURFACE FLOW AND BE PIPED VIA ROOF DRAINS TO INFILTRATION BASINS. THESE BASIN WILL DISCHARGE VIA SIDEWALK UNDERDRAINS TO THE PUBLIC STREET.

Form I-3B Page 4 of 11
Description of Proposed Site Development and Drainage Patterns
Project Description / Proposed Land Use and/or Activities: Construct a single family home, driveway, hardscape and landscaping.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): Impervious features are the house roof, walkways, patio areas and sheds.
List/describe proposed pervious features of the project (e.g., landscape areas): Pervious features are the infiltration basins, landscaped areas and brick paver driveway.
Does the project include grading and changes to site topography? x Yes ☐ No Description / Additional Information: Minor grading to create a building pad and direct drainage to the proposed infiltration basins.

Form I-3B Page 5 of 11

Does the project include changes to site drainage (e.g., installation of new storm water conveyance systems)?

☐ Yes

x No

If yes, provide details regarding the proposed project site drainage conveyance network, including storm drains, concrete channels, swales, detention facilities, storm water treatment facilities, natural and constructed channels, and the method for conveying offsite flows through or around the proposed project site. Identify all discharge locations from the proposed project site along with a summary of the conveyance system size and capacity for each of the discharge locations. Provide a summary of pre and post-project drainage areas and design flows to each of the runoff discharge locations. Reference the drainage study for detailed calculations.

Description / Additional Information:

The existing drainage pattern flows to the public right-of-way. The proposed discharge point for the site is the public right-of-way.

Form I-3B Page 6 of 11

Identify whether any of the following features, activities, and/or pollutant source areas will be present (select all that apply):

☐ On-site storm drain inlets
☐ Interior floor drains and elevator shaft sump pumps
☐ Interior parking garages
☐ Need for future indoor & structural pest control
❹ Landscape/Outdoor Pesticide Use
❹ Pools, spas, ponds, decorative fountains, and other water features
☐ Food service
☐ Refuse areas
☐ Industrial processes
☐ Outdoor storage of equipment or materials
☐ Vehicle and Equipment Cleaning
☐ Vehicle/Equipment Repair and Maintenance
☐ Fuel Dispensing Areas
☐ Loading Docks
❹ Fire Sprinkler Test Water
❹ Miscellaneous Drain or Wash Water
❹ Plazas, sidewalks, and parking lots
☐ Large Trash Generating Facilities
☐ Animal Facilities
☐ Plant Nurseries and Garden Centers
☐ Automotive-related Uses

Description / Additional Information:

Form I-3B Page 7 of 11
Identification and Narrative of Receiving Water
Narrative describing flow path from discharge location(s), through urban storm conveyance system, to receiving creeks, rivers, and lagoons and ultimate discharge location to Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable) The project discharges to the gutter of Calle Del Oro. From this point it flows down Calle Del Oro to the Pacific Ocean
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations. Industrial service supply Contact water recreation Non-contact water recreation Navigation Commercial and sport fishing Biological habitats Wildlife habitats Rare threatened or endangered species Aquaculture Marine habitat Migration of aquatic organisms Spawning reproduction and early development Shellfish Harvesting
Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations. La Jolla Special Biological Significance Area
Provide distance from project outfall location to impaired or sensitive receiving waters. 0.25 miles
Summarize information regarding the proximity of the permanent, post-construction storm water BMPs to the City's Multi-Habitat Planning Area and environmentally sensitive lands The private onsite BMPs are small and size and scope (1.0 cfs of runoff) and located 0.25 miles from the sensitive waters. Minimal impact is anticipated.

Form I-3B Page 8 of 11		
Identification of Receiving Water Pollutants of Concern		
List any 303(d) impaired water bodies within the path of storm water from the project site to the Pacific Ocean (or bay, lagoon, lake or reservoir, as applicable), identify the pollutant(s)/stressor(s) causing impairment, and identify any TMDLs and/or Highest Priority Pollutants from the WQIP for the impaired water bodies:		
303(d) Impaired Water Body	Pollutant(s)/Stressor(s)	TMDLs/ WQIP Highest Priority Pollutant
none		

Identification of Project Site Pollutants*			
*Identification of project site pollutants is only required if flow-thru treatment BMPs are implemented onsite in lieu of retention or biofiltration BMPs (note the project must also participate in an alternative compliance program unless prior lawful approval to meet earlier PDP requirements is demonstrated) Identify pollutants anticipated from the project site based on all proposed use(s) of the site (see BMP Design Manual (Part 1 of Storm Water Standards) Appendix B.6):			
Pollutant	Not Applicable to the Project Site	Anticipated from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment		X	
Nutrients		X	
Heavy Metals	X		
Organic Compounds	X		
Trash & Debris		X	
Oxygen Demanding Substances		X	
Oil & Grease		X	
Bacteria & Viruses		X	X
Pesticides		X	

Form I-3B Page 9 of 11

Hydromodification Management Requirements

Do hydromodification management requirements apply (see Section 1.6 of the BMP Design Manual)?

☐ Yes, hydromodification management flow control structural BMPs required.

☐ No, the project will discharge runoff directly to existing underground storm drains discharging directly to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

⦸ No, the project will discharge runoff directly to conveyance channels whose bed and bank are concrete-lined all the way from the point of discharge to water storage reservoirs, lakes, enclosed embayments, or the Pacific Ocean.

☐ No, the project will discharge runoff directly to an area identified as appropriate for an exemption by the WMAA for the watershed in which the project resides.

Description / Additional Information (to be provided if a 'No' answer has been selected above):

Critical Coarse Sediment Yield Areas*

*This Section only required if hydromodification management requirements apply

Based on Section 6.2 and Appendix H does CCSYA exist on the project footprint or in the upstream area draining through the project footprint?

☐ Yes

⦸ No

Discussion / Additional Information:

Form I-3B Page 10 of 11
Flow Control for Post-Project Runoff* *This Section only required if hydromodification management requirements apply
List and describe point(s) of compliance (POCs) for flow control for hydromodification management (see Section 6.3.1). For each POC, provide a POC identification name or number correlating to the project's HMP Exhibit and a receiving channel identification name or number correlating to the project's HMP Exhibit. 1) NORTH PROPERTY LINE SIDEWALK UNDER-DRAIN 2) SOUTH PROPERTY LINE SIDEWALK UNDER-DRAIN
Has a geomorphic assessment been performed for the receiving channel(s)? ⦸ No, the low flow threshold is 0.1Q2 (default low flow threshold) ☐ Yes, the result is the low flow threshold is 0.1Q2 ☐ Yes, the result is the low flow threshold is 0.3Q2 ☐ Yes, the result is the low flow threshold is 0.5Q2 If a geomorphic assessment has been performed, provide title, date, and preparer:
Discussion / Additional Information: (optional)

Form I-3B Page 11 of 11
Other Site Requirements and Constraints
When applicable, list other site requirements or constraints that will influence storm water management design, such as zoning requirements including setbacks and open space, or local codes governing minimum street width, sidewalk construction, allowable pavement types, and drainage requirements. NONE
Optional Additional Information or Continuation of Previous Sections As Needed
This space provided for additional information or continuation of information from previous sections as needed.

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Source Control BMP Checklist for All Development Projects	Form I-4

Source Control BMPs

All development projects must implement source control BMPs SC-1 through SC-6 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of the Storm Water Standards) for information to implement source control BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the source control BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project has no outdoor materials storage areas). Discussion / justification may be provided.

Source Control Requirement	Applied?		
SC-1 Prevention of Illicit Discharges into the MS4	X Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☐ Yes	X No	☐ N/A
Discussion / justification if SC-2 not implemented: No storm drain structures.			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	x No	☐ N/A
Discussion / justification if SC-3 not implemented: None			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	x No	☐ N/A
Discussion / justification if SC-4 not implemented: None			
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	x Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented: City trach containers.			

Form I-4 Page 2 of 2			
Source Control Requirement	Applied?		
SC-6 Additional BMPs Based on Potential Sources of Runoff Pollutants (must answer for each source listed below)			
On-site storm drain inlets	☐ Yes	☐ No	x N/A
Interior floor drains and elevator shaft sump pumps	☐ Yes	☐ No	x N/A
Interior parking garages	☐ Yes	☐ No	x N/A
Need for future indoor & structural pest control	☐ Yes	☐ No	x N/A
Landscape/Outdoor Pesticide Use	x Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	x Yes	☐ No	☐ N/A
Food service	☐ Yes	☐ No	x N/A
Refuse areas	x Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	x N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	x N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	x N/A
Fuel Dispensing Areas	☐ Yes	☐ No	x N/A
Loading Docks	☐ Yes	☐ No	x N/A
Fire Sprinkler Test Water	x Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☐ Yes	x No	☐ N/A
Plazas, sidewalks, and parking lots	x Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	x No	☐ N/A
SC-6B: Animal Facilities	☐ Yes	x No	☐ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	x No	☐ N/A
SC-6D: Automotive-related Uses	☐ Yes	x No	☐ N/A
Discussion / justification if SC-6 not implemented. Clearly identify which sources of runoff pollutants are discussed. Justification must be provided for <u>all</u> "No" answers shown above.			

Site Design BMP Checklist for All Development Projects	Form I-5

Site Design BMPs

All development projects must implement site design BMPs SD-1 through SD-8 where applicable and feasible. See Chapter 4 and Appendix E of the BMP Design Manual (Part 1 of Storm Water Standards) for information to implement site design BMPs shown in this checklist.

Answer each category below pursuant to the following.

- "Yes" means the project will implement the site design BMP as described in Chapter 4 and/or Appendix E of the BMP Design Manual. Discussion / justification is not required.
- "No" means the BMP is applicable to the project but it is not feasible to implement. Discussion / justification must be provided.
- "N/A" means the BMP is not applicable at the project site because the project does not include the feature that is addressed by the BMP (e.g., the project site has no existing natural areas to conserve). Discussion / justification may be provided.

A site map with implemented site design BMPs must be included at the end of this checklist.

Site Design Requirement	Applied?		
SD-1 Maintain Natural Drainage Pathways and Hydrologic Features	☐ Yes	X No	☐ N/A
Discussion / justification if SD-1 not implemented: The site will be re-graded to accommodate the new house foot print. Surface treatment will change and infiltration basins will be added. The discharge point for this site will not be changed.			
1-1 Are existing natural drainage pathways and hydrologic features mapped on the site map?	X Yes	☐ No	
1-2 Are trees implemented? If yes, are they shown on the site map?	☐ Yes	X No	
1-3 Implemented trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☐ Yes	X No	
1-4 Is tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☐ Yes	X No	
SD-2 Have natural areas, soils and vegetation been conserved?	☐ Yes	☐ No	☒ N/A
Discussion / justification if SD-2 not implemented: Street trees and on site trees will be included in the site design but not the runoff calculations.			

Site Design Requirement	Applied?		
SD-3 Minimize Impervious Area	x Yes	☐ No	☐ N/A
Discussion / justification if SD-3 not implemented:			
SD-4 Minimize Soil Compaction	x Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented: In landscaped areas and the bio-filtration basins			
SD-5 Impervious Area Dispersion	x Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented: Impervious areas are directed to the bio-filtration bsins.			
5-1 Is the pervious area receiving runon from impervious area identified on the site map?	x Yes	☐ No	
5-2 Does the pervious area satisfy the design criteria in SD-5 Fact Sheet in Appendix E (e.g. maximum slope, minimum length, etc.)	x Yes	☐ No	
5-3 Is impervious area dispersion credit volume calculated using Appendix B.2.1.1 and SD-5 Fact Sheet in Appendix E?	x Yes	☐ No	

Form I-5 Page 3 of 4			
Site Design Requirement	Applied?		
SD-6 Runoff Collection	x Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented: This project will not use green roof technology as it does not fit in with the overall design of the project. Therefore no roof credit is applied.			
6a-1 Are green roofs implemented in accordance with design criteria in SD-6A Fact Sheet? If yes, are they shown on the site map?	☐ Yes	x No	
6a-2 Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E?	☐ Yes	x No	
6b-1 Are permeable pavements implemented in accordance with design criteria in SD-6B Fact Sheet? If yes, are they shown on the site map?	x Yes	☐ No	
6b-2 Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E?	x Yes	☐ No	
SD-7 Landscaping with Native or Drought Tolerant Species	x Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:			
SD-8 Harvesting and Using Precipitation	☐ Yes	x No	☐ N/A
Discussion / justification if SD-8 not implemented: Bio-filtration basins will be used to reduce storm runoff, therefore harvesting and re-use of storm water will not be used.			
8-1 Are rain barrels implemented in accordance with design criteria in SD-8 Fact Sheet? If yes, are they shown on the site map?	☐ Yes	x No	
8-2 Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E?	☐ Yes	x No	

Form I-5 Page 4 of 4
Insert Site Map with all site design BMPs identified:

BMP A	AREA(SF)	SURFACE
DMA A1	3555	LANDSCAPED
DMA A2	638	CONCRETE
DMA A3	295	ROOF
DMA A4	796	CONCRETE
DMA A5	1650	ROOF
DMA A6	1250	BRICK
DMA A7	175	LANDSCAPED
DMA A8	276	LANDSCAPED
TOTAL	8636	

BMP B	AREA(SF)	SURFACE
DMA B1	4160	LANDSCAPED
DMA B2	344	CONCRETE
DMA B3	1297	CONCRETE
DMA B4	241	BRICK
DMA B5	2044	ROOF
DMA B6	1607	LANDSCAPED
DMA B7	218	BRICK
DMA B8	353	CONCRETE
TOTAL	10264	

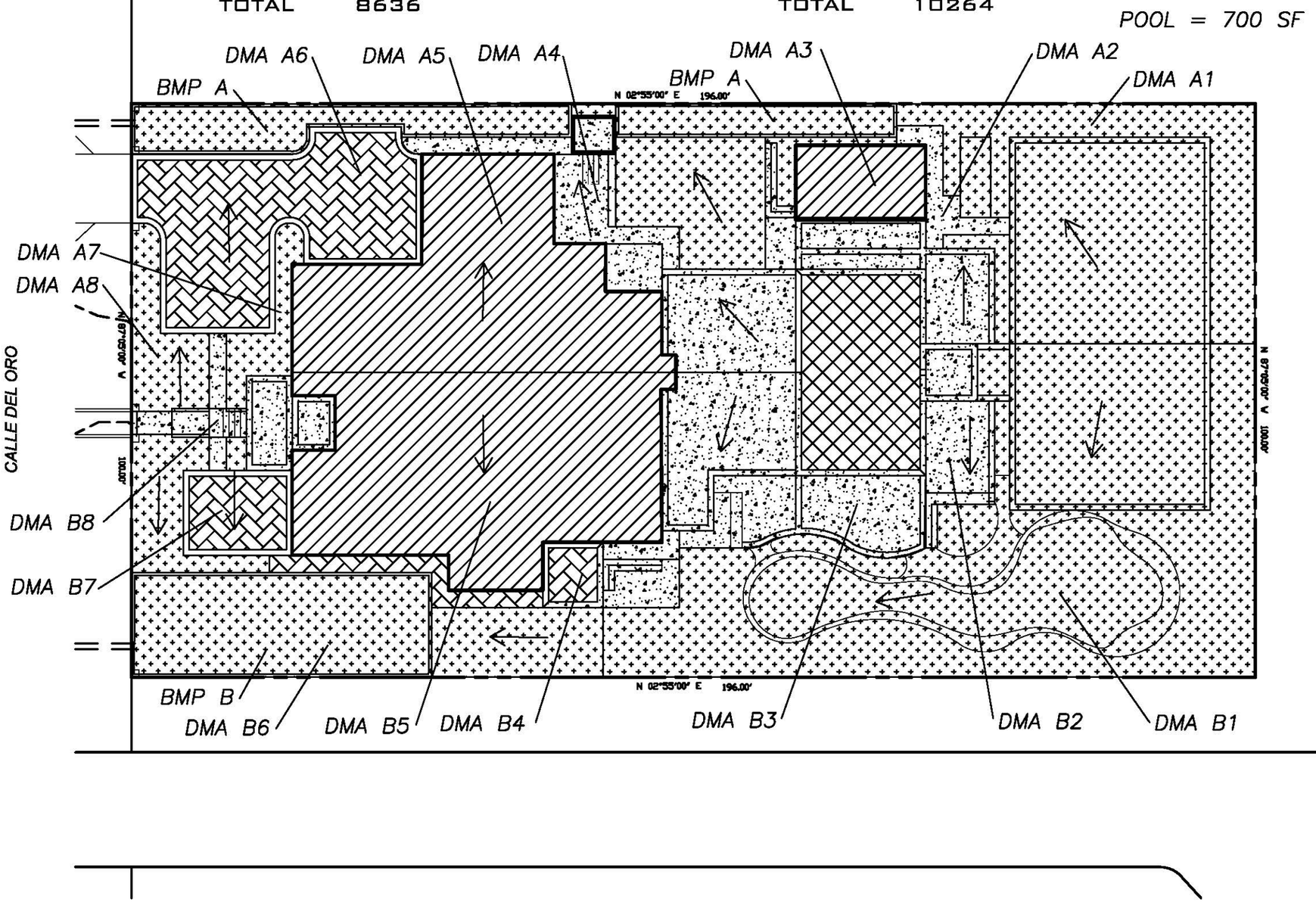

EXHIBIT B

SITE DESIGN BMPS

IMPERVIOUS AREAS MAP PROPOSED CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 19,600 SF. OR 0.4500 AC.

DISTURBED AREA
AREA = 16,000 SF. OR 0.3673 AC.

IMPERVIOUS AREA
AREA = 10,658 SF. OR 0.2447 AC.
54.4% OF SITE

LANDSCAPE AREA
AREA = 8,942 SF. OR 0.2053 AC.
45.6% OF SITE

LANDSCAPED AREA
AREA = 9,773 SF.

BRICK PAVERS PER.
AREA = 1,347 SF.

CONCRETE SIDEWALK
AREA = 3,321 SF.

ROOF
AREA = 3,989 SF.

POOL
AREA = 700 SF.

IMPERVIOUS AREA

Summary of PDP Structural BMPs	Form I-6

PDP Structural BMPs

All PDPs must implement structural BMPs for storm water pollutant control (see Chapter 5 of the BMP Design Manual, Part 1 of Storm Water Standards). Selection of PDP structural BMPs for storm water pollutant control must be based on the selection process described in Chapter 5. PDPs subject to hydromodification management requirements must also implement structural BMPs for flow control for hydromodification management (see Chapter 6 of the BMP Design Manual). Both storm water pollutant control and flow control for hydromodification management can be achieved within the same structural BMP(s).

PDP structural BMPs must be verified by the City at the completion of construction. This includes requiring the project owner or project owner's representative to certify construction of the structural BMPs (complete Form DS-563). PDP structural BMPs must be maintained into perpetuity (see Chapter 7 of the BMP Design Manual).

Use this form to provide narrative description of the general strategy for structural BMP implementation at the project site in the box below. Then complete the PDP structural BMP summary information sheet (page 3 of this form) for each structural BMP within the project (copy the BMP summary information page as many times as needed to provide summary information for each individual structural BMP).

Describe the general strategy for structural BMP implementation at the site. This information must describe how the steps for selecting and designing storm water pollutant control BMPs presented in Section 5.1 of the BMP Design Manual were followed, and the results (type of BMPs selected). For projects requiring hydromodification flow control BMPs, indicate whether pollutant control and flow control BMPs are integrated or separate.

Bio-filtration basins will control and treat runoff.

(Continue on page 2 as necessary.)

Form I-6 Page 2 of X
(Page reserved for continuation of description of general strategy for structural BMP implementation at the site)
(Continued from page 1)

Form I-6 Page 3 of X (Copy as many as needed)	
Structural BMP Summary Information	
Structural BMP ID No.	
Construction Plan Sheet No.	
Type of structural BMP: ○ Retention by harvest and use (HU-1) ○ Retention by infiltration basin (INF-1) ○ Retention by bioretention (INF-2) ○ Retention by permeable pavement (INF-3) ○ Partial retention by biofiltration with partial retention (PR-1) ⊗ Biofiltration (BF-1) ○ Flow-thru treatment control with prior lawful approval to meet earlier PDP requirements (provide (BMP type/description in discussion section below) ○ Flow-thru treatment control included as pre-treatment/forebay for an onsite retention or biofiltration BMP (provide BMP type/description and indicate which onsite retention or biofiltration BMP it serves in discussion section below) ○ Flow-thru treatment control with alternative compliance (provide BMP type/description in ○ Detention pond or vault for hydromodification management ○ Other (describe in discussion section below)	
Purpose: ⊗ Pollutant control only ○ Hydromodification control only ○ Combined pollutant control and hydromodification control ○ Pre-treatment/forebay for another structural BMP ○ Other (describe in discussion section below)	
Who will certify construction of this BMP? Provide name and contact information for the party responsible to sign BMP verification form DS-563	Project engineer: Michael L. Smith, RCE 35471
Who will be the final owner of this BMP?	Property owner
Who will maintain this BMP into perpetuity?	Property owner
What is the funding mechanism for maintenance?	Property owner

Form I-6 Page 4 of X (Copy as many as needed)
Structural BMP ID No. BMP A
Construction Plan Sheet No. BMP PLAN
Discussion (as needed): BIO-FILTRATION BASIN

Form I-6 Page 4 of X (Copy as many as needed)
Structural BMP ID No. BMP B
Construction Plan Sheet No. BMP PLAN
Discussion (as needed): BIO-FILTRATION BASIN

THE CITY OF SAN DIEGO City of San Diego **Development Services** 1222 First Ave., MD-302 San Diego, CA 92101 (619) 446-5000	**Permanent BMP Construction** **Self Certification Form**	FORM DS-563 January 2016

Date Prepared:	Project No.:
Project Applicant:	Phone:
Project Address:	
Project Engineer:	Phone:

The purpose of this form is to verify that the site improvements for the project, identified above, have been constructed in conformance with the approved Storm Water Quality Management Plan (SWQMP) documents and drawings.

This form must be completed by the engineer and submitted prior to final inspection of the construction permit. Completion and submittal of this form is required for all new development and redevelopment projects in order to comply with the City's Storm Water ordinances and NDPES Permit Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100. Final inspection for occupancy and/or release of grading or public improvement bonds may be delayed if this form is not submitted and approved by the City of San Diego.

CERTIFICATION:

As the professional in responsible charge for the design of the above project, I certify that I have inspected all constructed Low Impact Development (LID) site design, source control and structural BMP's required per the approved SWQMP and Construction Permit No. _____; and that said BMP's have been constructed in compliance with the approved plans and all applicable specifications, permits, ordinances and Order No. R9-2013-0001 as amended by R9-2015-0001 and R9-2015-0100 of the San Diego Regional Water Quality Control Board.

I understand that this BMP certification statement does not constitute an operation and maintenance verification.

Signature: _____

Date of Signature: _____

Printed Name: _____

Title: _____

Phone No. _____

Engineer's Stamp

DS-563 (01-16)

BMP A	AREA(SF)	SURFACE
DMA A1	3555	LANDSCAPED
DMA A2	638	CONCRETE
DMA A3	295	ROOF
DMA A4	796	CONCRETE
DMA A5	1650	ROOF
DMA A6	1250	BRICK
DMA A7	175	LANDSCAPED
DMA A8	276	LANDSCAPED
TOTAL	8636	

BMP B	AREA(SF)	SURFACE
DMA B1	4160	LANDSCAPED
DMA B2	344	CONCRETE
DMA B3	1297	CONCRETE
DMA B4	241	BRICK
DMA B5	2044	ROOF
DMA B6	1607	LANDSCAPED
DMA B7	218	BRICK
DMA B8	353	CONCRETE
TOTAL	10264	

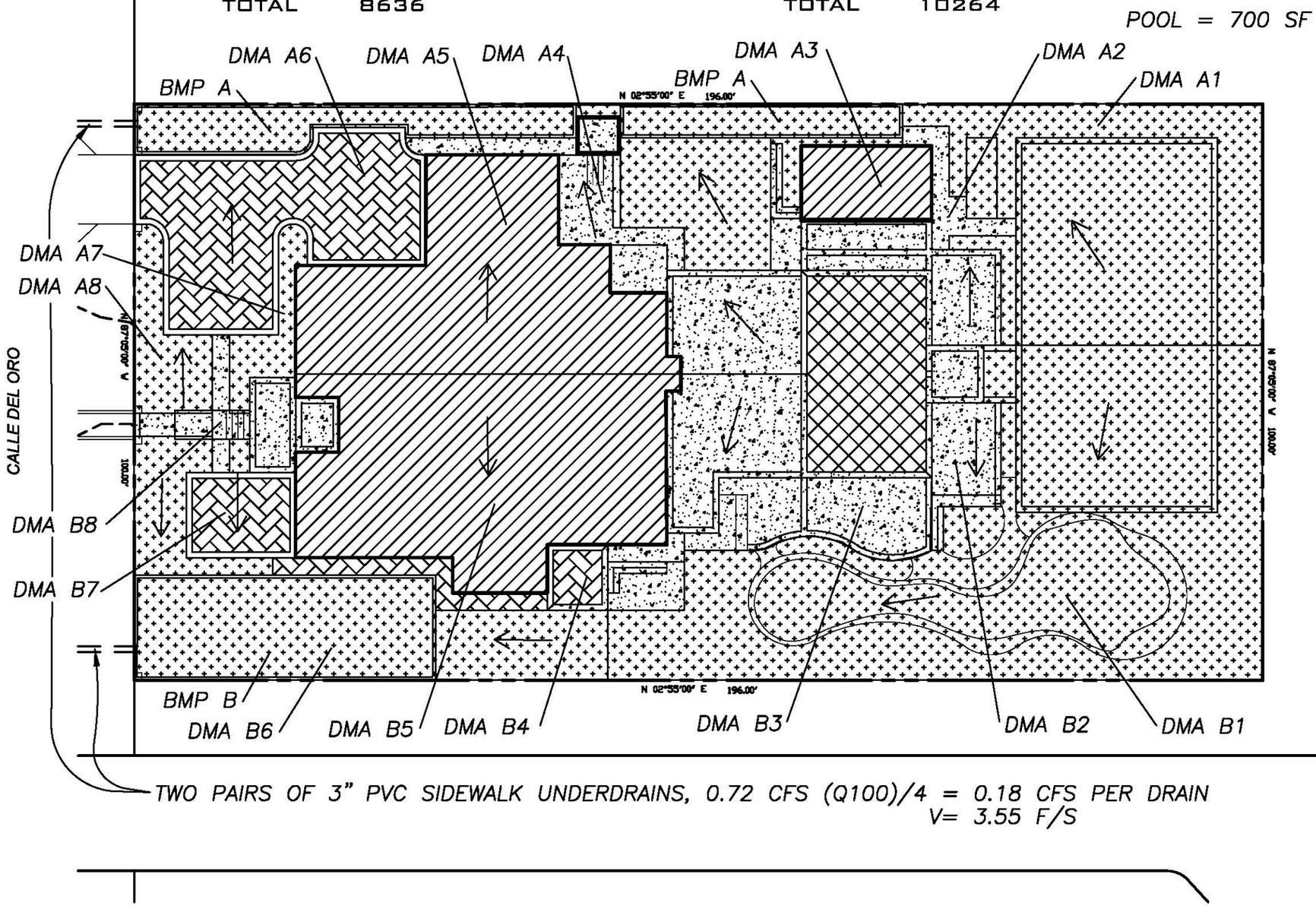

EXHIBIT B

SITE DESIGN BMPS

IMPERVIOUS AREAS MAP PROPOSED CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 19,600 SF. OR 0.4500 AC.

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45.6% OF SITE

LANDSCAPED AREA
AREA = 9,773 SF.

BRICK PAVERS PER.
AREA = 1,347 SF.

CONCRETE SIDEWALK
AREA = 3,321 SF.

ROOF
AREA = 3,989 SF.

POOL
AREA = 700 SF.

IMPERVIOUS AREA

Worksheet B.1-1. DCV

Category	#	Description	Value	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	BMP A	unitless
	1	Basin Drains to the Following BMP Type	INFILT.	unitless
	2	85th Percentile 24-hr Storm Depth	.5	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	3379	sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)	1250	sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)		sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)		sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)		sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	4007	sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)		sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	NO	yes/no
	11	Impervious Surfaces Directed to Dispersion Area per SD-B (Ci=0.90)		sq-ft
	12	Semi-Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.30)		sq-ft
	13	Engineered Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.10)		sq-ft
	14	Natural Type A Soil Serving as Dispersion Area per SD-B (Ci=0.10)		sq-ft
	15	Natural Type B Soil Serving as Dispersion Area per SD-B (Ci=0.14)		sq-ft
	16	Natural Type C Soil Serving as Dispersion Area per SD-B (Ci=0.23)		sq-ft
	17	Natural Type D Soil Serving as Dispersion Area per SD-B (Ci=0.30)		sq-ft
	18	Number of Tree Wells Proposed per SD-A	0	#
	19	Average Mature Tree Canopy Diameter	0	ft
	20	Number of Rain Barrels Proposed per SD-E	0	#
	21	Average Rain Barrel Size	0	gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	8636	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	.58	unitless
	24	Initial Composite Runoff Factor for Dispersed & Dispersion Areas		unitless
	25	Total Impervious Area Dispersed to Pervious Surface		sq-ft
	26	Total Pervious Dispersion Area		sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area		ratio
	28	Adjustment Factor for Dispersed & Dispersion Areas		ratio
	29	Final Adjusted Tributary Runoff Factor	.5	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	8636	sq-ft
	31	Initial Design Capture Volume	180	cubic-feet
	32	Volume Reduction per Tree Well	0	cubic-feet
	33	Total Tree Well Volume Reduction	0	cubic-feet
	34	Total Rain Barrel Volume Reduction	0	cubic-feet
Result	35	Design Capture Volume Tributary to BMP	180	cubic-feet

4119 SF

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes. Applicants must provide inputs for yellow shaded cells and calculate appropriate values for unshaded cells. Notes corresponding with each line item are provided on the following page. An automated version of this worksheet is available for download at the County of San Diego Department of Public Works website.

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner.

C. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking.

D. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance.

E. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Worksheet B.1-1. DCV

Category	#	Description	Value	Units
Standard Drainage Basin Inputs	0	Drainage Basin ID or Name	BMP B	unitless
	1	Basin Drains to the Following BMP Type	INFILT.	unitless
	2	85th Percentile 24-hr Storm Depth	.5	inches
	3	Impervious Surfaces Not Directed to Dispersion Area (C=0.90)	4038	sq-ft
	4	Semi-Pervious Surfaces Not Serving as Dispersion Area (C=0.30)	459	sq-ft
	5	Engineered Pervious Surfaces Not Serving as Dispersion Area (C=0.10)		sq-ft
	6	Natural Type A Soil Not Serving as Dispersion Area (C=0.10)		sq-ft
	7	Natural Type B Soil Not Serving as Dispersion Area (C=0.14)		sq-ft
	8	Natural Type C Soil Not Serving as Dispersion Area (C=0.23)	5767	sq-ft
	9	Natural Type D Soil Not Serving as Dispersion Area (C=0.30)		sq-ft
Dispersion, Tree Well, & Rain Barrel Inputs (Optional)	10	Does Tributary Incorporate Dispersion, Tree Wells, and/or Rain Barrels?	NO	yes/no
	11	Impervious Surfaces Directed to Dispersion Area per SD-B (Ci=0.90)		sq-ft
	12	Semi-Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.30)		sq-ft
	13	Engineered Pervious Surfaces Serving as Dispersion Area per SD-B (Ci=0.10)		sq-ft
	14	Natural Type A Soil Serving as Dispersion Area per SD-B (Ci=0.10)		sq-ft
	15	Natural Type B Soil Serving as Dispersion Area per SD-B (Ci=0.14)		sq-ft
	16	Natural Type C Soil Serving as Dispersion Area per SD-B (Ci=0.23)		sq-ft
	17	Natural Type D Soil Serving as Dispersion Area per SD-B (Ci=0.30)		sq-ft
	18	Number of Tree Wells Proposed per SD-A		#
	19	Average Mature Tree Canopy Diameter		ft
	20	Number of Rain Barrels Proposed per SD-E		#
	21	Average Rain Barrel Size		gal
Final Adjusted Runoff Factor Calculations	22	Total Area Tributary to BMP	10264	sq-ft
	23	Composite Runoff Factor for Standard Drainage Areas	.50	unitless
	24	Initial Composite Runoff Factor for Dispersed & Dispersion Areas		unitless
	25	Total Impervious Area Dispersed to Pervious Surface		sq-ft
	26	Total Pervious Dispersion Area		sq-ft
	27	Dispersed Impervious Area / Pervious Dispersion Area		ratio
	28	Adjustment Factor for Dispersed & Dispersion Areas		ratio
	29	Final Adjusted Tributary Runoff Factor	.5	unitless
Volume Reduction Calculations	30	Final Effective Tributary Area	10264	sq-ft
	31	Initial Design Capture Volume	214	cubic-feet
	32	Volume Reduction per Tree Well		cubic-feet
	33	Total Tree Well Volume Reduction		cubic-feet
	34	Total Rain Barrel Volume Reduction		cubic-feet
Result	35	Design Capture Volume Tributary to BMP	214	cubic-feet

884 SF

Worksheet B.1-1 General Notes:

A. Applicants may use this worksheet to calculate design capture volumes. Applicants must provide inputs for yellow shaded cells and calculate appropriate values for unshaded cells. Notes corresponding with each line item are provided on the following page. An automated version of this worksheet is available for download at the County of San Diego Department of Public Works website.

B. Impervious surfaces include roofs, concrete, asphalt, or pervious pavements with an impervious liner.

C. Semi-pervious surfaces include decomposed granite, cobbles, crushed aggregate, or compacted soils such as unpaved parking.

D. Engineered pervious surfaces include pervious pavements providing full retention of the 85th percentile rainfall depth, or areas with soils that have been amended and mulched per Section 86.709 of the Landscape Ordinance.

E. Dispersion areas are pervious or semi-pervious surfaces that receive runoff from impervious surfaces (C=0.90) and reduce stormwater runoff as outlined in Fact Sheet SD-B.

Worksheet B.3-1. Harvest and Use Feasibility Screening

Harvest and Use Feasibility Screening	Worksksheet B.3-1
1. Is there a demand for harvested water (check all that apply) at the project site that is reliably present during the wet season? ☒ Toilet and urinal flushing ☒ Landscape irrigation ☐ Other:_____	
2. If there is a demand; estimate the anticipated average wet season demand over a period of 36 hours. Guidance for planning level demand calculations for toilet/urinal flushing and landscape irrigation is provided in Section B.3.2. [Provide a summary of calculations here] 9.3 x 5 = 46.5 1470 x 0.2053 = 302	
3. Calculate the DCV using worksheet B-2.1. [Provide a results here] 394 CF	TOTAL 348.5

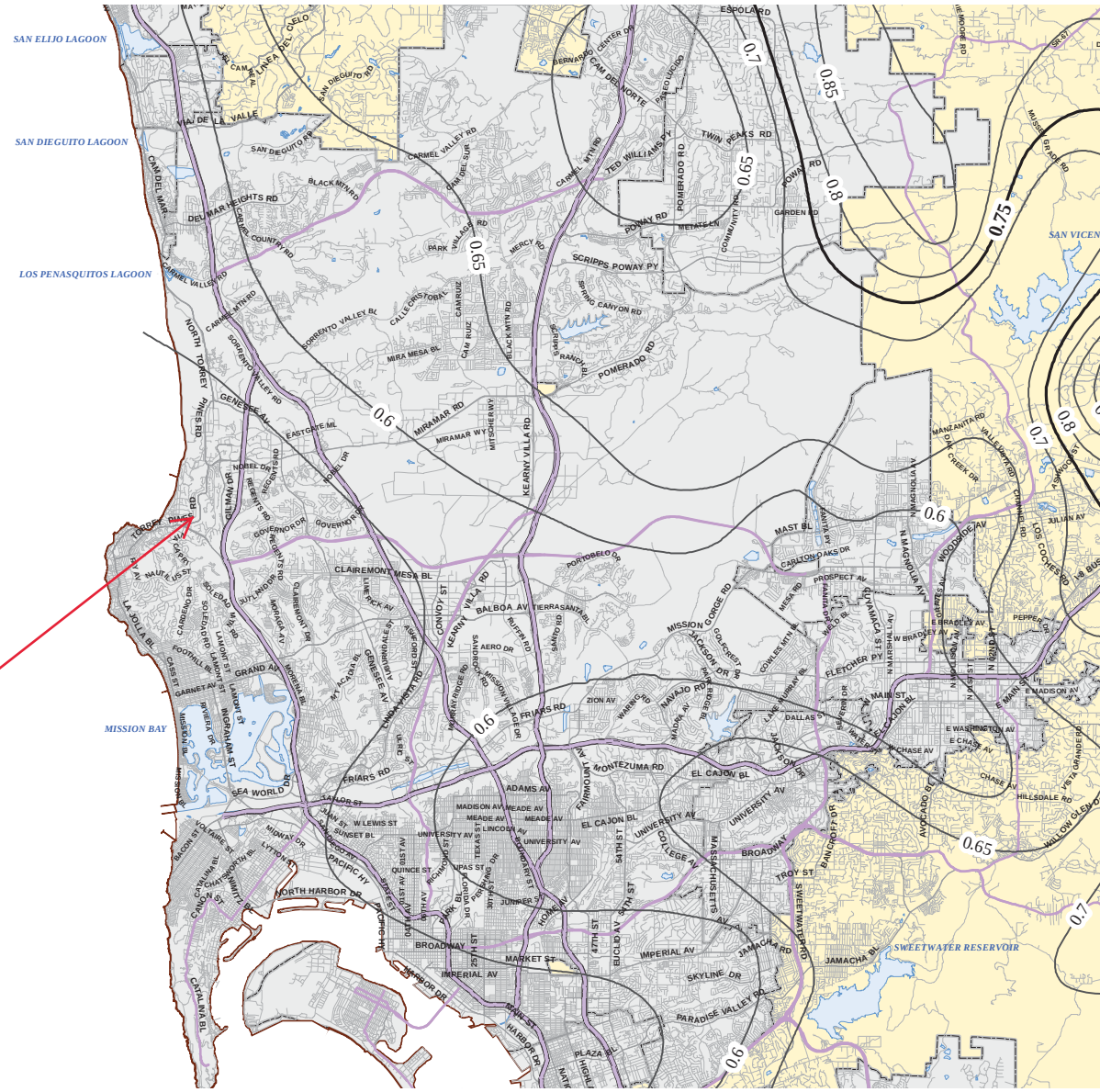
3a. Is the 36-hour demand greater than or equal to the DCV?	3b. Is the 36-hour demand greater than 0.25DCV but less than the full DCV?	3c. Is the 36-hour demand less than 0.25DCV?
Yes / (No) ⇨ ⇩	Yes / No ⇨ ⇩	Yes ⇩
Harvest and use appears to be feasible. Conduct more detailed evaluation and sizing calculations to confirm that DCV can be used at an adequate rate to meet drawdown criteria.	Harvest and use may be feasible. Conduct more detailed evaluation and sizing calculations to determine feasibility. Harvest and use may only be able to be used for a portion of the site, or (optionally) the storage may need to be upsized to meet long term capture targets while draining in longer than 36 hours.	Harvest and use is considered to be infeasible.

San Diego County
85th Percentile Isopluvials

- 85th Percentile Rainfall in Inches
- Freeway
- Highway
- Major Road
- Street
- Municipal Boundary
- Water Body

Note:
The 85th percentile is a 24-hour rainfall total. It represents a value such that 85% of the observed 24-hour rainfall totals will be less than that value.

SITE



Worksheet C.4-1: Categorization of Infiltration Feasibility Condition

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1	
Part 1 - Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without any undesirable consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than 0.5 inches per hour? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X
Provide basis: SITE INFILTRATION @ BETWEEN 0.025"/H TO 0.05"/H.			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
2	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.		X
Provide basis: SEE SOILS REPORT			
Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Worksheet C.4-1 Page 2 of 4			
Criteria	Screening Question	Yes	No
3	Can infiltration greater than 0.5 inches per hour be allowed without increasing risk of groundwater contamination (shallow water table, storm water pollutants or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
4	Can infiltration greater than 0.5 inches per hour be allowed without causing potential water balance issues such as change of seasonality of ephemeral streams or increased discharge of contaminated groundwater to surface waters? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 1 Result*	If all answers to rows 1 - 4 are "Yes" a full infiltration design is potentially feasible. The feasibility screening category is Full Infiltration If any answer from row 1-4 is "No", infiltration may be possible to some extent but would not generally be feasible or desirable to achieve a "full infiltration" design. Proceed to Part 2		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings.

Worksheet C.4-1 Page 3 of 4			
Part 2 – Partial Infiltration vs. No Infiltration Feasibility Screening Criteria Would infiltration of water in any appreciable amount be physically feasible without any negative consequences that cannot be reasonably mitigated?			
Criteria	Screening Question	Yes	No
5	Do soil and geologic conditions allow for infiltration in any appreciable rate or volume? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
6	Can Infiltration in any appreciable quantity be allowed without increasing risk of geotechnical hazards (slope stability, groundwater mounding, utilities, or other factors) that cannot be mitigated to an acceptable level? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2.	X	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			

Worksheet C.4-1 Page 4 of 4			
Criteria	Screening Question	Yes	No
7	Can Infiltration in any appreciable quantity be allowed without posing significant risk for groundwater related concerns (shallow water table, storm water pollutants or other factors)? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
8	Can infiltration be allowed without violating downstream water rights? The response to this Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.3.	X	
Provide basis: Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability and why it was not feasible to mitigate low infiltration rates.			
Part 2 Result*	If all answers from row 1-4 are yes then partial infiltration design is potentially feasible. The feasibility screening category is Partial Infiltration. If any answer from row 5-8 is no, then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category is No Infiltration.		

*To be completed using gathered site information and best professional judgment considering the definition of MEP in the MS4 Permit. Additional testing and/or studies may be required by City Engineer to substantiate findings

BMP A	AREA(SF)	SURFACE
DMA A1	3555	LANDSCAPED
DMA A2	638	CONCRETE
DMA A3	295	ROOF
DMA A4	796	CONCRETE
DMA A5	1650	ROOF
DMA A6	1250	BRICK
DMA A7	175	LANDSCAPED
DMA A8	276	LANDSCAPED
TOTAL	8636	

BMP B	AREA(SF)	SURFACE
DMA B1	4160	LANDSCAPED
DMA B2	344	CONCRETE
DMA B3	1297	CONCRETE
DMA B4	241	BRICK
DMA B5	2044	ROOF
DMA B6	1607	LANDSCAPED
DMA B7	218	BRICK
DMA B8	353	CONCRETE
TOTAL	10264	

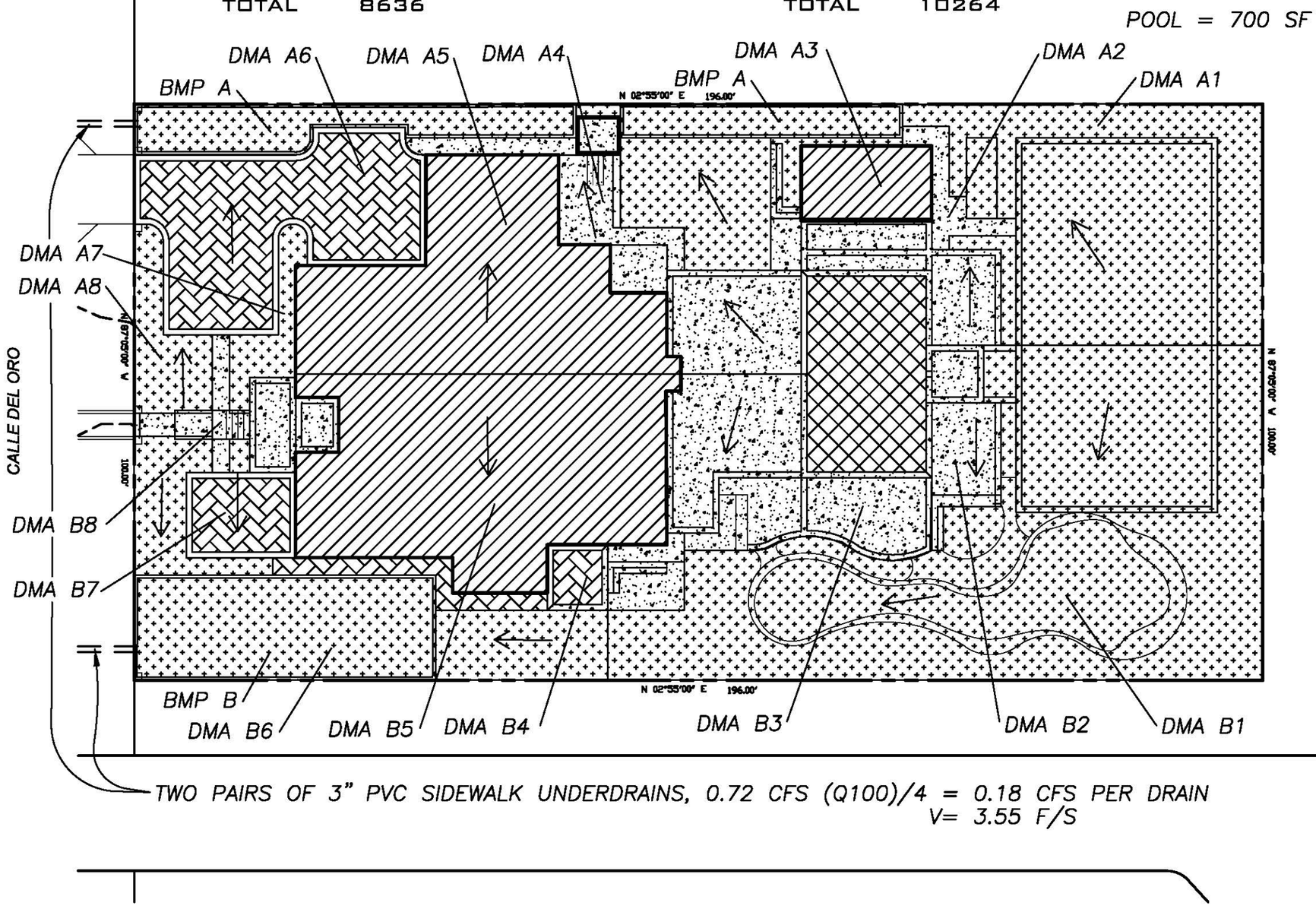


EXHIBIT B

SITE DESIGN BMPS

IMPERVIOUS AREAS MAP PROPOSED CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 19,600 SF. OR 0.4500 AC.

DISTURBED AREA
AREA = 16,000 SF. OR 0.3673 AC.

IMPERVIOUS AREA
AREA = 10,658 SF. OR 0.2447 AC.
54.4% OF SITE

LANDSCAPE AREA
AREA = 8,942 SF. OR 0.2053 AC.
45.6% OF SITE

LANDSCAPED AREA
AREA = 9,773 SF.

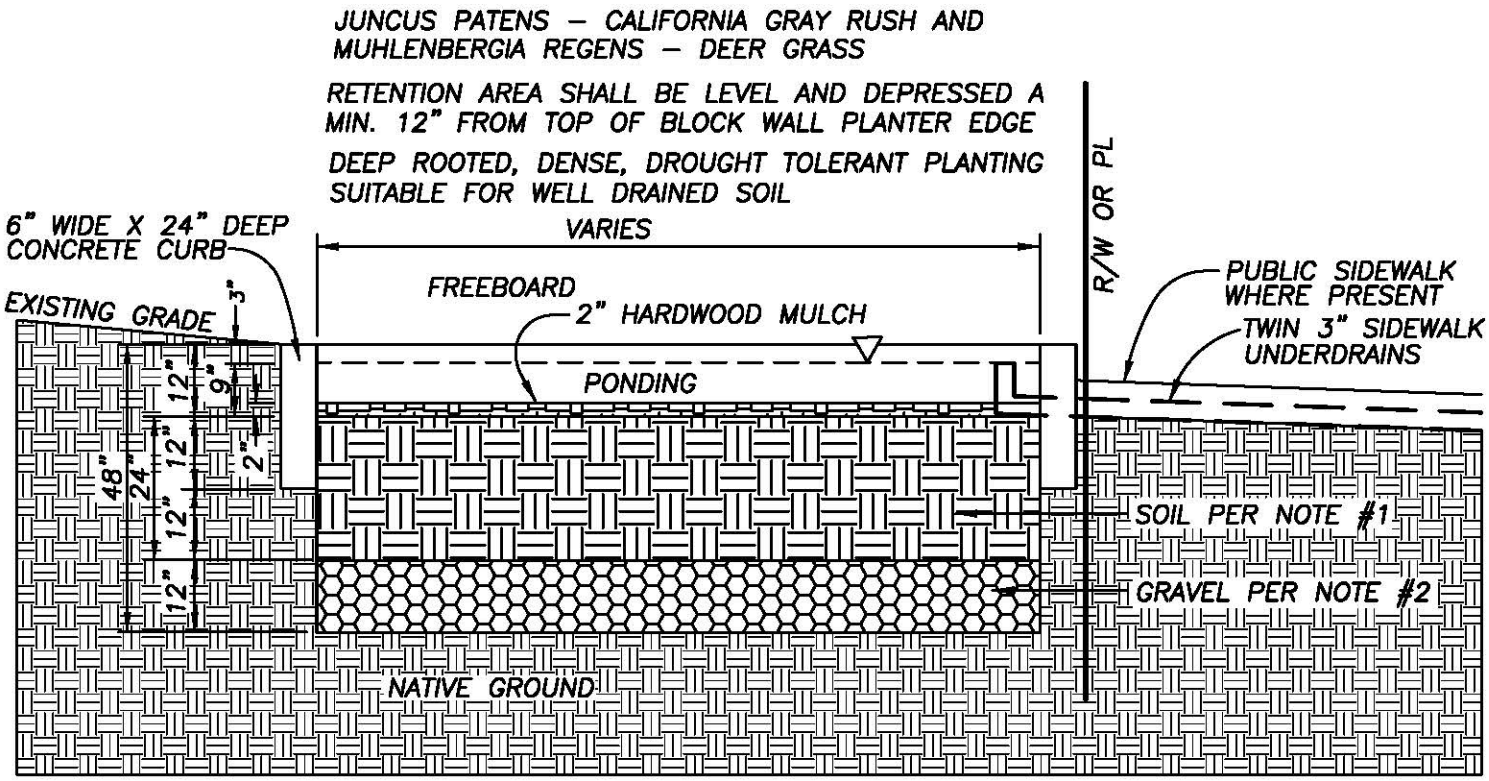
BRICK PAVERS PER.
AREA = 1,347 SF.

CONCRETE SIDEWALK
AREA = 3,321 SF.

ROOF
AREA = 3,989 SF.

POOL
AREA = 700 SF.

IMPERVIOUS AREA



NOTES:

1. BIORETENTION "ENGINEERED SOIL" LAYER SHALL BE MINIMUM 24" DEEP "SANDY LOAM" SOIL MIX WITH NO MORE THAN 10% CLAY CONTENT, THE MIX SHALL CONTAIN 80–88% SAND, 3–5% COMPOST OR HARDWOOD MULCH. COMPACT TO 80%

2. GRAVEL BASE SHALL BE 3/4 CRUSHED ROCK LAYER WITH A MINIMUM OF 12" DEEP. MAY BE DEEPENED TO INCREASE THE INFILTRATION AND STORAGE ABILITY OF THE BASIN. COMPACT TO 90%

3. THE EFFECTIVE AREA OF THE BASIN SHALL BE LEVEL AND SHALL BE SIZED BASED ON THE HYDRO–MODIFICATION CALCULATION OR 4% OF THE IMPERVIOUS SURFACE AREA OR ROOF AREA.

BIO–RETENTION BASIN – DETAIL "A"

NO SCALE

DRAINAGE STUDY

FOR

2340 CALLE DEL ORO
APN: 346-120-08
DATE: JUNE 14, 2016

OWNER:
Robbie Robbins
2340 Calle Del Oro
San Diego, Ca 92037

PREPARED BY:
SAN DIEGO LAND SURVEYING AND ENGINEERING INC.
9665 CHESAPEAKE DRIVE, SUITE 445
SAN DIEGO, CA. 92123

CITY OF SAN DIEGO
PTS NO. 461154

TABLE OF CONTENTS

APPENDICES

EXHIBITS

PROJECT DESCRIPTION:

EXISTING PROJECT SITE DESCRIPTION:
The site is 0.4500 acres in size and is occupied by a single family home. The site is padded with the existing grade sloping to the southwest. The grade drops about 8’ across the site. The existing impervious area for this project is 0.0889 acres or 19.8% of the site. The majority of the site drains to the south and west, to Calle Deo Oro. No offsite storm water drains onto the site. Storm water on Calle Del Oro runs to the west. See the vicinity map in Appendix A and the Site Plan in Exhibit A, for more details about the location of the project. There are no existing concrete channels, detention facilities or storm water treatment facilities other than the limited existing landscaping.

PROPOSED PROJECT DESCRIPTION:
The proposed project will consist of a single family home with two enclosed garages. The disturbed area for this project is 0.4500 acres. The proposed impervious area for this project is 0.2054 acres or 45.6% of the site. This is an increase of 25.8% over the existing condition. For more details on this, see the Site Plan in Exhibit B. The majority of the site and surrounding area will continue to drain to Calle Del Oro. Earth work will consist of grading and compaction of the area underneath the proposed structure. On site drainage will consist of roof drains, landscape and bio-retention basins/planters. The bio-retention basins will discharge to the public street. The increase in discharge will not disrupt this downstream facility. The site work will include minimal street improvements, limited hardscape, landscaping and irrigation.

STANDARDS AND METHODS

PURPOSE OF CALCULATIONS:

Compare the “pre” and “post” construction storm drain runoff quantities. Determine the adequacy of any storm drain inlets, pipes or flow through planters.

HYDROLOGIC MODEL AND METHODS USED:

This report uses the “Rational Method” as demonstrated in the County of San Diego Storm Drain Manual.

Q = CIA

WATER QUALITY DESIGN STORM:

The design storm for private storm water flow, drain inlets and pipes shall be the 50 year storm. The design storm for public storm water flow, drain inlets and pipes shall be the 100 year storm. The design storm for treatment will be the first 85% storm.

ANALYSIS AND CONCLUSIONS

PRE-DEVELOPMENT RUNOFF VOLUMES AND PEAK FLOWS:

Runoff factor “C” for Residential, 2.2 DU/A or less, soil group “A” from table 3-1 “Runoff Coefficients for Urban Areas” from the above manual and attached in Appendix “B” is 0.34. See Exhibit “A” for plan view of the drainage area.

Time of concentration equals Initial time of concentration (Ti) and concentrated flow time over the rest of the lot (Tc). Initial time of concentration for 2.2 DU/A or less, 3% grade from table 3-2 “Maximum overland flow length” from the above manual and attached in Appendix “C” is 8.1 minutes for the first 100 feet. Assume 3 f/s for the remaining 120 feet = 0.67 min. for a total of 8.8 minutes

Intensity-duration-frequency curves from the chart in Appendix “D”. Determine rainfall intensity “I”. For 8.8 min., 50 year storm, the rainfall intensity = **3.34.**

Intensity-duration-frequency curves from the chart in Appendix “D”. Determine rainfall intensity “I”. For 8.8 min., 100 year storm, the rainfall intensity = **3.73.**

The majority of the site drains to the street by inlets and pipe or sheet flow over the curb gutter and sidewalk.

Zone Existing Area E1 = 0.4500 acres
Q50 = CIA = .34 x 3.34 x 0.4500 = 0.51 CFS
Q100 = CIA = .34 x 3.73 x 0.4500 = 0.57 CFS

This area drains to Calle Del Oro.

POST-PROJECT RUNOFF VOLUMES AND PEAK FLOWS:

Runoff factor "C" for Residential, 2.2 DU/A or less, soil group "A" from table 3-1 "Runoff Coefficients for Urban Areas" from the above manual and attached in Appendix "B" is 0.34. See Exhibit "A" for plan view of the drainage area.

To account for the increase in impervious area of the proposed project, the runoff factor will be increase by 25.8% or 0.43.

Time of concentration equals Initial time of concentration (Ti) and concentrated flow time over the rest of the lot (Tc). Initial time of concentration for 2.2 DU/A or less, 3% grade from table 3-2 "Maximum overland flow length" from the above manual and attached in Appendix "C" is 8.1 minutes for the first 100 feet. Assume 3 f/s for the remaining 120 feet = 0.67 min. for a total of 8.8 minutes

Intensity-duration-frequency curves from the chart in Appendix "D". Determine rainfall intensity "I". For 8.8 min., 50 year storm, the rainfall intensity = **3.34.**

Intensity-duration-frequency curves from the chart in Appendix "D". Determine rainfall intensity "I". For 8.8 min., 100 year storm, the rainfall intensity = **3.73.**

Zone Proposed Area P1 = 0.4500 acres
Q50 = CIA = .43 x 3.34 x 0.4500 = 0.65 CFS
Q100 = CIA = .43 x 3.73 x 0.4500 = 0.72 CFS

Increase in runoff (50 year) is 0.65 – 0.51 = 0.14 CFS
Increase in runoff (100 year) is 0.72 – 0.57 = 0.15 CFS

CONCLUSION:

The increase in impervious area of the proposed project compared to the existing site has created an increase in runoff of 0.15 CFS (100 year). The proposed bio-retention basin/planters will act as a retention basin as well as a treatment basin and offset this increase in runoff. There is no possible damage to the downstream drainage infrastructure as the storm runoff travels in the curb and gutter of Calle Del Oro.

CERTIFICATION STATEMENT:

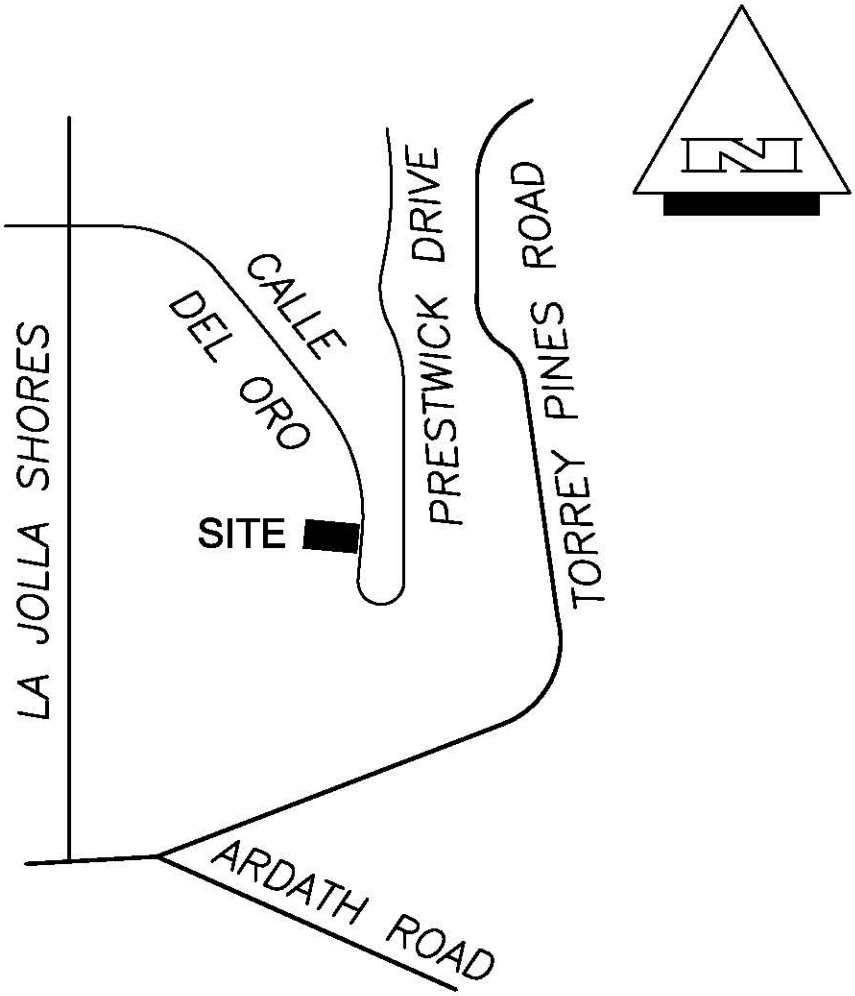
This Hydrology Report has been prepared under the direction of the following registered civil engineer. The registered civil engineer (Engineer) attests to the technical information contained herein and the engineering data upon which the following design, recommendations, conclusions and decisions are based. The selection, sizing, and design of storm water treatment and other control measures in this report meet the requirements of the Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

ENGINEER OF WORK:

_____ DATE: 06-14-2016

MICHAEL LEE SMITH, RCE 35471
MY REGISTRATION EXPIRES ON
9/30/2017

PROJECT NAME: 2340 CALLE DEL ORO
PTS: 461154



VICINITY MAP

NO SCALE

APPENDIX B

COUNTY OF SAN DIEGO STORM DRAIN MANUAL
TABLE 3-1, RUNOFF COEFFICIENTS FOR URBAN AREA

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

APPENDIX C

COUNTY OF SAN DIEGO STORM DRAIN MANUAL TABLE 3-2, MAXIMUM OVERLAND FLOW LENGTH AND INITIAL TIME OF CONCENTRATION (Ti)

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

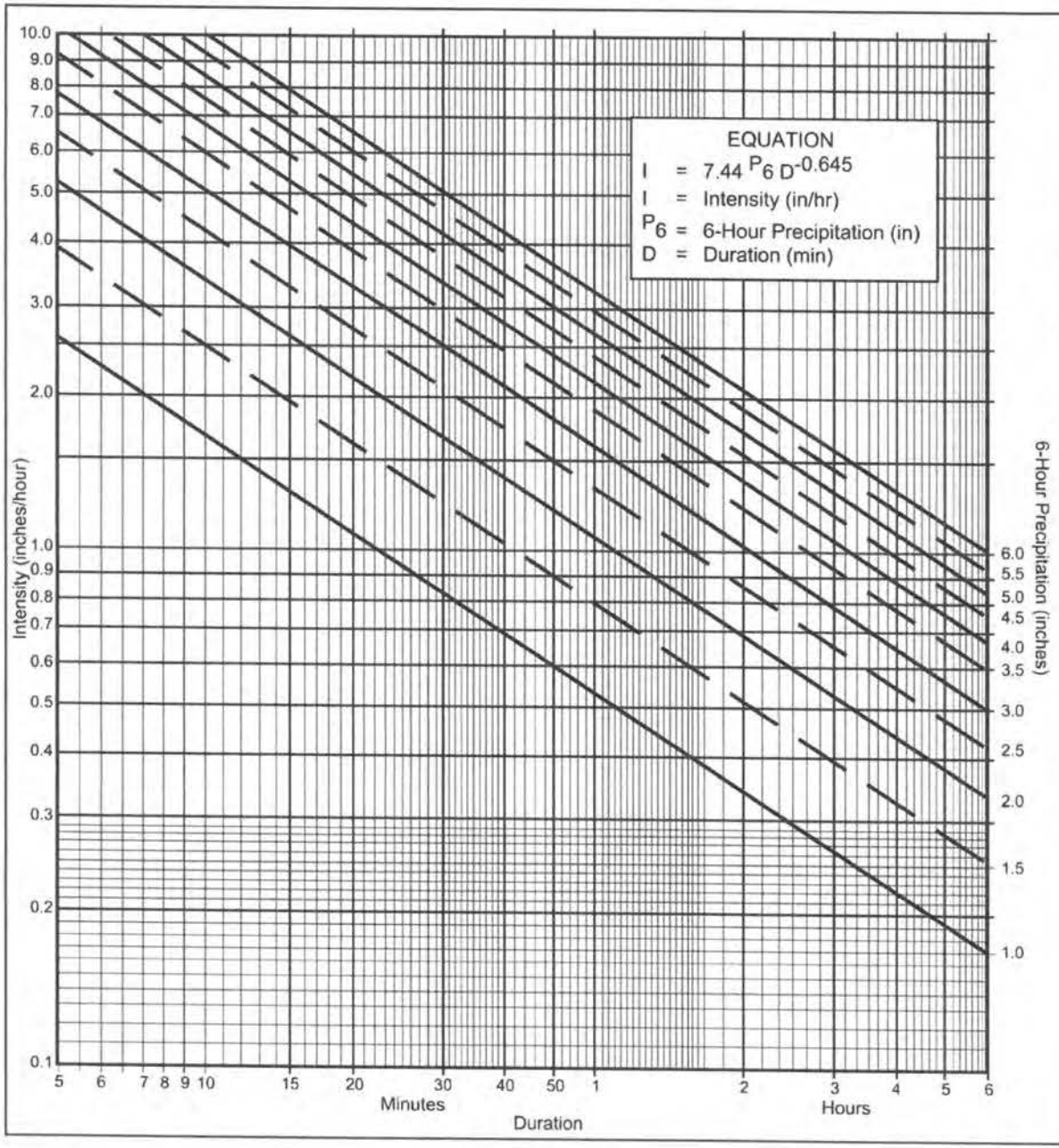
MAXIMUM OVERLAND FLOW LENGTH (L_M) & INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description

APPENDIX D

COUNTY OF SAN DIEGO STORM DRAIN MANUAL
FIGURE 3-2, INTENSITY DURATION DESIGN CHART



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 50 year

(b) P_6 = 1.8 in., P_{24} = 3.4, $\frac{P_6}{P_{24}}$ = 53 %(2)

(c) Adjusted P_6(2) = 1.8 in.

(d) t_x = 8.8 min.

(e) I = 3.34 in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6 / Duration	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

1.5 1.8 2.0
7 3.18 3.82 4.24
8.8 3.34
10 2.53 3.03 3.37

FIGURE 3-1

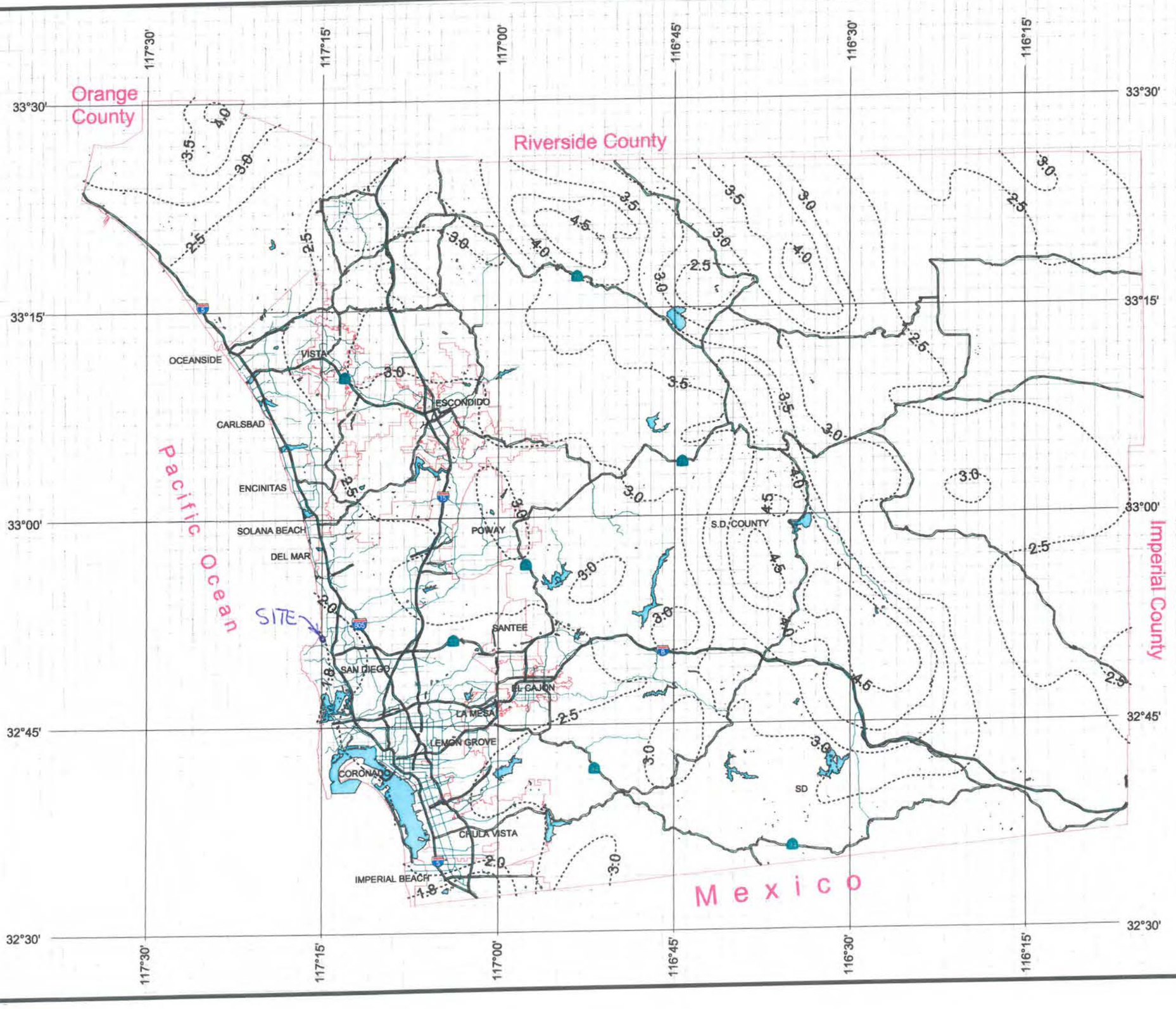
County of San Diego Hydrology Manual

Rainfall Isopluvials

50 Year Rainfall Event - 6 Hours

Isopluvial (inches)

1.8



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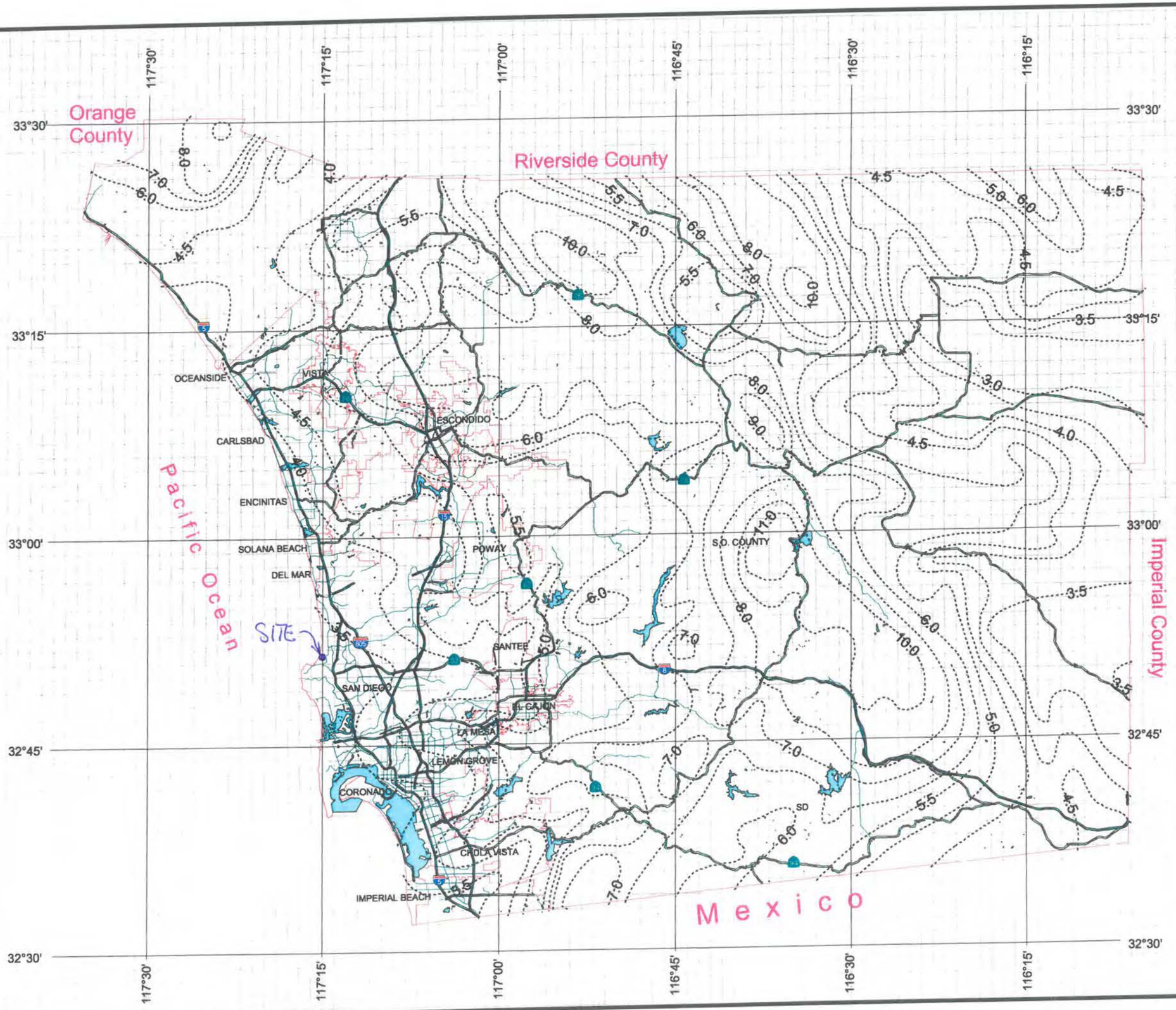
County of San Diego Hydrology Manual

Rainfall Isopluvials

50 Year Rainfall Event - 24 Hours

Isopluvial (inches)

3.4



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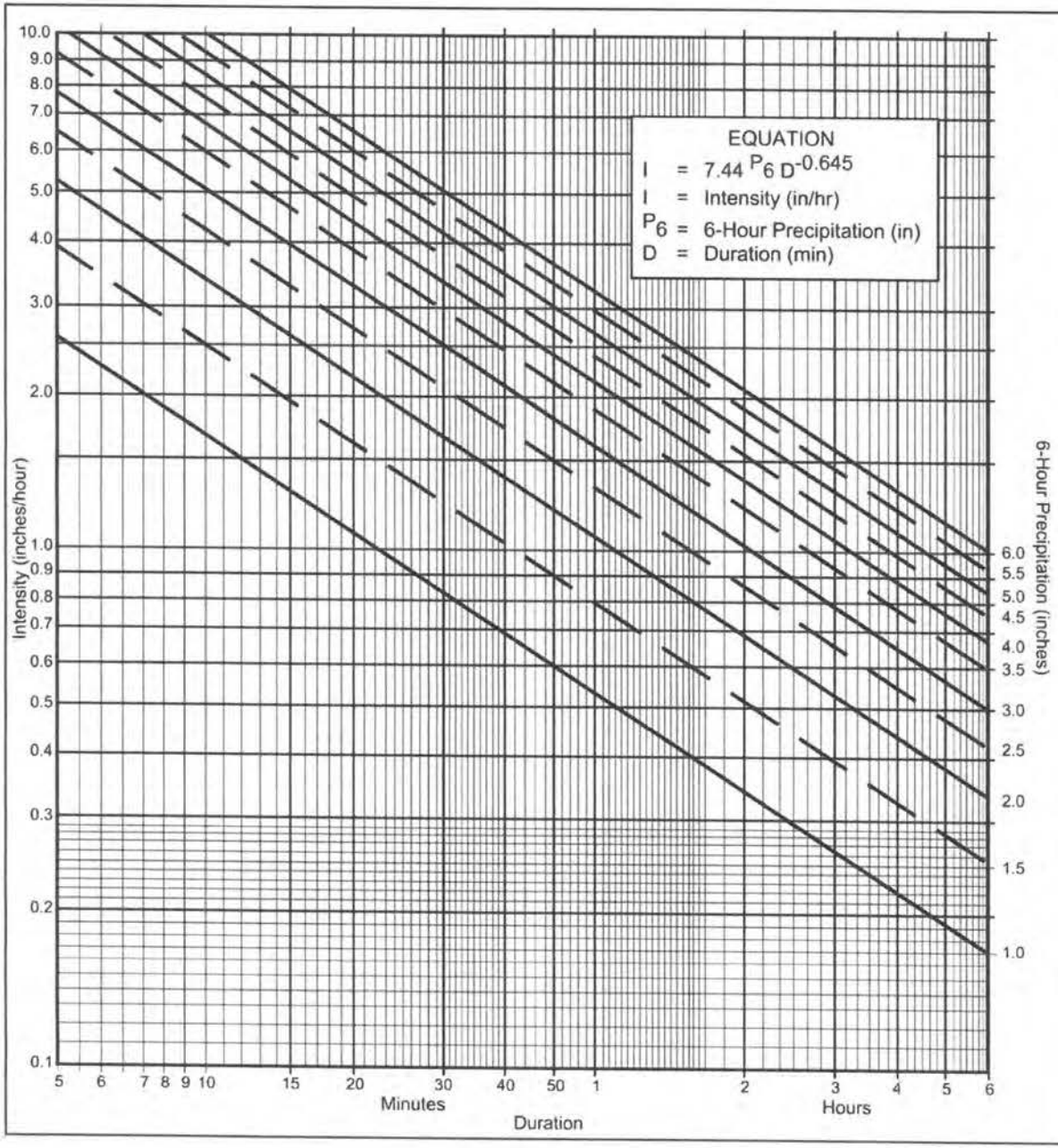

Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 2.0 in., P_{24} = 3.9, $\frac{P_6}{P_{24}}$ = 51 %(2)

(c) Adjusted P_6(2) = 2.0 in.

(d) t_x = 8.8 min.

(e) I = 3.73 in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

2.0

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'

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County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

3.9

Orange County

Riverside County

Imperial County

Mexico

Pacific Ocean

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
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SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
SD
CHULA VISTA
IMPERIAL BEACH

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works Geographic Information Services

SanGIS
We Have San Diego Covered!

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EXHIBIT A AND B

EXISTING DRAINAGE CONDITIONS
PROPOSED DRAINAGE CONDITIONS

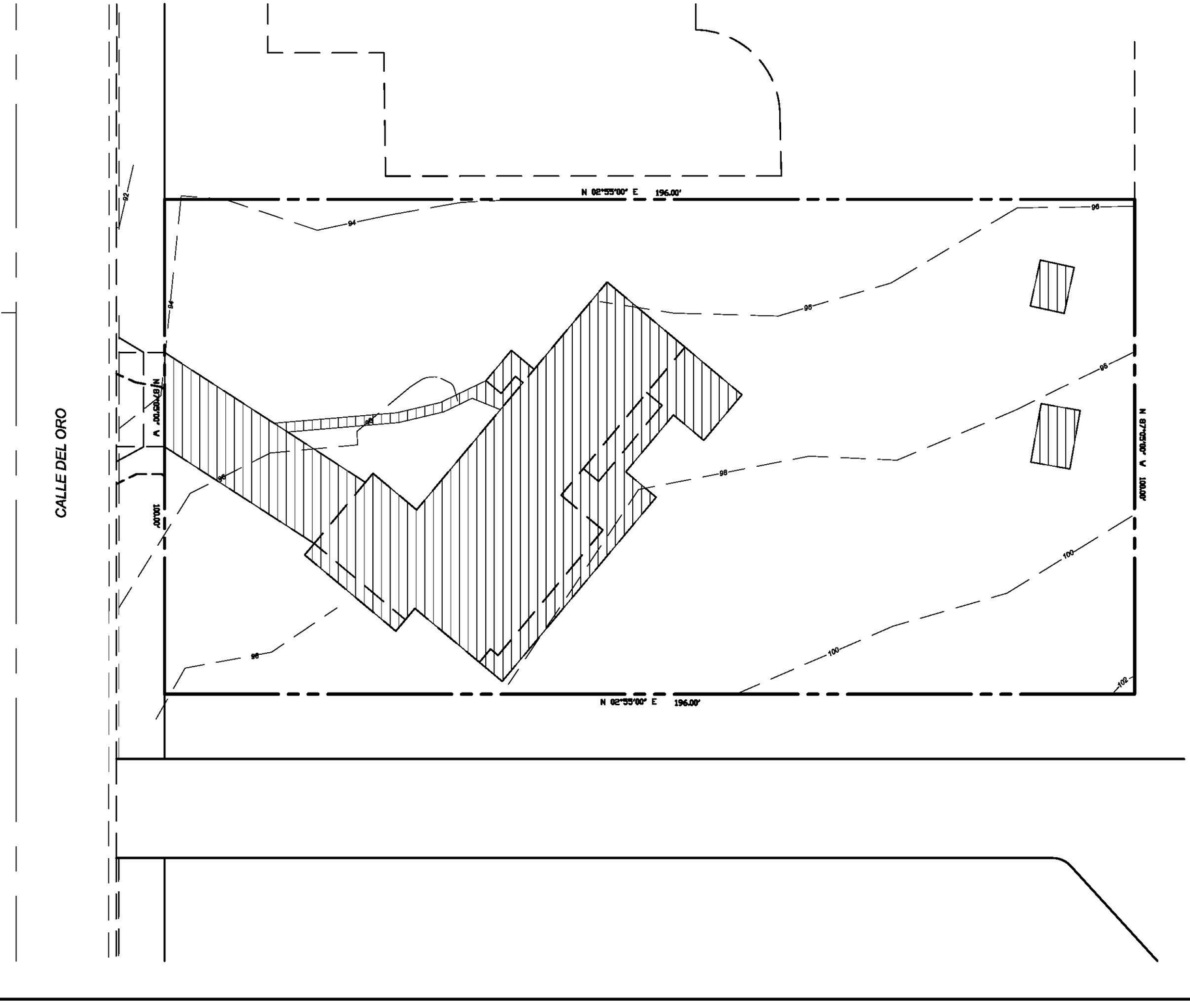

EXHIBIT A

IMPERVIOUS AREAS MAP
EXISTING CONDITIONS

SCALE 1" = 20'

PROJECT AREA
AREA = 19,600 SF. OR 0.4500 AC.

IMPERVIOUS AREA
AREA = 3,872 SF. OR 0.0889 AC.
19.8% OF SITE

LANDSCAPE AREA
AREA = 15,728 SF. OR 0.3611 AC.
80.2% OF SITE

IMPERVIOUS AREA

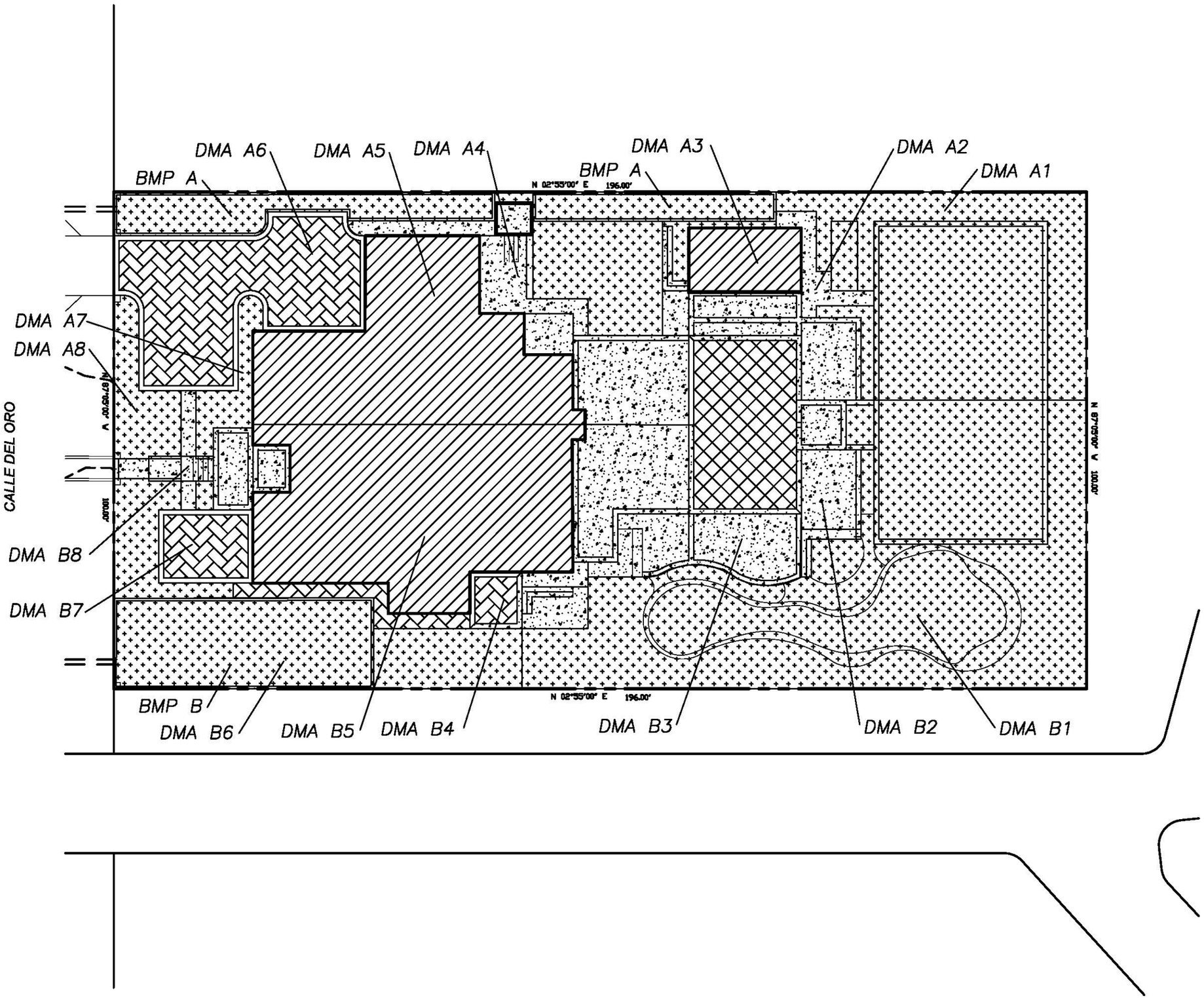

EXHIBIT B

IMPERVIOUS AREAS MAP
PROPOSED CONDITIONS

N

SCALE 1" = 20'

PROJECT AREA
AREA = 19,600 SF. OR 0.4500 AC.

DISTURBED AREA
AREA = 16,000 SF. OR 0.3673 AC.

IMPERVIOUS AREA
AREA = 10,658 SF. OR 0.2447 AC.
54.4% OF SITE

LANDSCAPE AREA
AREA = 8,942 SF. OR 0.2053 AC.
45.6% OF SITE

LANDSCAPED AREA
AREA = 9,773 SF.

BRICK PAVERS PER.
AREA = 1,347 SF.

CONCRETE SIDEWALK
AREA = 3,321 SF.

ROOF
AREA = 3,989 SF.

POOL
AREA = 700 SF.

IMPERVIOUS AREA