Morena Apartment Homes
CONDITIONAL LETTER OF MAP REVISION - FILL (CLOMR-F)

FEMA, City of San Diego
June 6, 2017

FIRM # 06073C1614G

Prepared For:

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APPENDICES

1. INTRODUCTION

This Conditional Letter of Map Revision based on Fill (CLOMR-F) has been prepared in order to certify that the proposed development within the Morena Apartment Homes project in the City of San Diego, California is above the Zone AO indicated flood depth as indicated on the NFIP map. The lots are included in the development of the Morena Apartment Homes project at the intersection of Morena and West Morena Boulevard. For a full legal description of the property, refer to the ALTA in Appendix 1.

The application herein is to remove a portion of Parcel 1 and a portion of Parcel 2 out of the 100-year floodplain by proving that the proposed grading for the project site is above the depths indicated in Zone AO as shown in the FIRM Panel No. 06073C1614G, effective date May 16, 2012. The FIRM panel indicates an average Zone AO flood depth of approximately one foot within the property. The Zone AO floodplain within the property represents areas of shallow flooding from Tecolote Creek located to the south of the project.

2. SUMMARY OF METHODOLOGY

The following summary explains the methodology used to show that the portion of the lots would not be inundated by the base flood.

2.1 Existing Condition of the Lots

The site is currently developed as a mobile-home park consisting of drive pads, internal roads, grassed areas, trees and a few one-story support structures. The site is known as the Coastal Trailer Villa. The Project is bounded by a commercial storage lot to the northwest, Tonopah Avenue to the northeast, Frankfort Street to the southeast, and Morena Boulevard and West Morena Boulevard to the southwest. Landscaping and trees were observed along the northern, eastern, and western portions of the site and adjacent to the site buildings and in the parking areas. Refer to Exhibit A for the existing condition floodplain exhibit.

2.2 Proposed Condition of the Lots

The proposed Morena Apartment Homes project will be an urban, infill development within the Mission Bay neighborhood of the City of San Diego. The development will include demolition of the existing buildings, streets and drive pads, mass grading the entire site, fill placement within the property to ensure that the future buildings will be sufficiently elevated above the floodplain, and construction of final surface and building improvements for the project. The Project includes nine multi-unit residential structures, a club house, pool area and all the associated utilities, hardscaping, and landscaping.

The characteristics of the Zone AO area determines the appropriate methodology to be used to develop the BFE for the property. Because the property is partially inundated by the special flood hazard area and the floodwater flow is not contained within a street section, the base flood elevation is determined by averaging the inundated portion of the lot elevation and adding the depth of flooding indicated on the FIRM panel. For this application, the base flood elevation was determined by averaging the elevations along the edge of the floodplain and along the property boundary (NGVD29). Refer to Exhibit B for the calculations. Note that there is a conversion of -2.09 from NAVD88 to NGVD29 datum. The elevations listed on the exhibits show elevations per the NGVD29 datum.

Refer to the proposed grading plans in Appendix 2. According to the proposed grading plan, a significant portion of the property will be raised above the 100-year floodplain elevation. The purpose of this application is to remove the special flood hazard area from the portion of the lot that will be filled above the flooding depth, so that the proposed buildings are not within a special flood hazard area. Refer to Exhibit B for a graphical representation of the proposed area and buildings with respect to the floodplain. The proposed grading includes placement of fill to raise the lower areas of the site. Refer to Exhibit C for the metes and bounds description of the portion of the lot to be removed from the special flood hazard area (elevations above the base flood elevation).

All proposed development with a Special Flood Hazard Area is subject to the City of San Diego's Municipal Code (Chapter 14) requirements and all other applicable requirements and regulations of FEMA. The City's Code states that new construction or substantial improvement of any structure in FIRM Zone AO shall have the lowest floor, including basement, elevated above the highest adjacent grade at least 2 feet higher than the depth number specified on the FIRM. Upon completion of the development, the elevation of the lowest floor, including basement, shall be certified by a registered professional engineer or surveyor to be properly elevated. The lowest finished floor elevation currently proposed for this project is 18.9, which complies with the City's two-foot minimum freeboard requirement.

3. ESA COMPLIANCE

Appendix 3 contains the required ESA Compliance documentation to support the determination for the proposed project. Because the existing condition of the site is developed land, the proposed fill is not expected to result in a take of any federally-listed species and therefore, the project is in compliance with the ESA.

4. CONCLUSIONS

The proposed mass graded condition for the site indicates that the portion of the lot, as described on Exhibit C, is higher than the Zone AO special flood hazard area for the special flood hazard area associated with Tecolote Creek. Therefore, this report supports a recommendation that the portion of property identified be removed from the 100-year floodplain limits. A LOMR-F will be processed with FEMA after mass grading is complete to document the as-built condition after construction of the project.

APPENDIX 1

FEMA Forms, Package MT-1

MT-1 Form 1

Property Information

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

PROPERTY INFORMATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.63 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form may be completed by the property owner, property owner's agent, licensed land surveyor, or registered professional engineer to support a request for a Letter of Map Amendment (LOMA), Conditional Letter of Map Amendment (CLOMA), Letter of Map Revision Based on Fill (LOMR-F), or Conditional Letter of Map Revision Based on Fill (CLOMR-F) for existing or proposed, single or multiple lots/structures. In order to process your request, all information on this form must be completed ***in its entirety***, unless stated as optional. **Incomplete submissions will result in processing delays.** Please check the item below that describes your request:

☐ LOMA	A letter from DHS-FEMA stating that an existing structure or parcel of land that has not been elevated by fill (natural grade) would not be inundated by the base flood.
☐ CLOMA	A letter from DHS-FEMA stating that a proposed structure that is not to be elevated by fill (natural grade) would not be inundated by the base flood if built as proposed.
☐ LOMR-F	A letter from DHS-FEMA stating that an **existing** structure or parcel of land that has been **elevated by fill** would not be inundated by the base flood.
■ CLOMR-F	A letter from DHS-FEMA stating that a parcel of land or **proposed** structure that will be **elevated by fill** would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

Fill is defined as material from any source (including the subject property) placed that raises the ground to or above the Base Flood Elevation (BFE). The common construction practice of removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered the placement of fill if the practice does not alter the existing (natural grade) elevation, which is at or above the BFE. **Fill that is placed before the date of the first National Flood Insurance Program (NFIP) map showing the area in a Special Flood Hazard Area (SFHA) is considered natural grade.**

Has fill been placed on your property to raise ground that was previously below the BFE? ☐ Yes ■ No If yes, when was fill placed? / month/year

Will fill be placed on your property to raise ground that is below the BFE? ■ Yes* ☐ No If yes, when will fill be placed? 10 / 18 month/year

* If yes, Endangered Species Act (ESA) compliance must be documented to FEMA prior to issuance of the CLOMR-F determination (please refer page 4 to the MT-1 instructions).

1. Street Address of the Property (if request is for multiple structures or units, please attach additional sheet referencing each address and enter street names below):

   1577 & 1623 Morena Boulevard, San Diego, CA, 92110

2. Legal description of Property (Lot, Block, Subdivision or abbreviated description from the Deed):

   A portion of Corella Tract, being a subdivision of a part of Pueblo Lot #256. See full legal description.

3. Are you requesting that a flood zone determination be completed for (check one):

   ☐ Structures on the property? What are the dates of construction? _____ (MM/YYYY)
   ☒ A portion of land within the bounds of the property? (A certified metes and bounds description and map of the area to be removed, certified by a licensed land surveyor or registered professional engineer, are **required**. For the preferred format of metes and bounds descriptions, please refer to the MT-1 Form 1 Instructions.)
   ☐ The entire legally recorded property?

4. Is this request for a (check one):

   ☐ Single structure
   ☐ Single lot
   ☐ Multiple structures (How many structures are involved in your request? List the number: _____)
   ☒ Multiple lots (How many lots are involved in your request? List the number: 2_____)

In addition to this form (MT-1 Form 1), please complete the checklist below. **ALL** requests must include one copy of the following:

- ■ Copy of the effective FIRM panel on which the structure and/or property location has been accurately plotted (property inadvertently located in the NFIP regulatory floodway will require Section B of MT-1 Form 3)
- ☐ Copy of the Subdivision Plat Map for the property **(with recordation data and stamp of the Recorder's Office)**

OR

- ■ Copy of the Property Deed **(with recordation data and stamp of the Recorder's Office)**, ***accompanied by*** a tax assessor's map or other certified map showing the surveyed location of the property relative to local streets and watercourses. The map should include at least one street intersection that is shown on the FIRM panel.
- ■ Form 2 – Elevation Form. If the request is to remove the structure, and an Elevation Certificate has already been completed for this property, it may be submitted in lieu of Form 2. If the request is to remove the entire legally recorded property, or a portion thereof, the lowest lot elevation must be provided on Form 2.
- ■ Please include a map scale and North arrow on all maps submitted.

For LOMR-Fs and CLOMR-Fs, the following must be submitted in addition to the items listed above:

- ■ Form 3 – Community Acknowledgment Form

For CLOMR-Fs, the following must be submitted in addition to the items listed above:

- ■ Documented ESA compliance, which may include a copy of an Incidental Take Permit, an Incidental Take Statement, a "not likely to adversely affect" determination from the National Marine Fisheries Service (NMFS) or the U.S. Fish and Wildlife Service (USFWS), or an official letter from NMFS or USFWS concurring that the project has "No Effect" on proposed or listed species or designated critical habitat. Please refer to the MT-1 instructions for additional information.

Please do *not* submit original documents. Please retain a copy of all submitted documents for your records.

DHS-FEMA encourages the submission of all required data in a digital format (e.g. scanned documents and images on Compact Disc [CD]). Digital submissions help to further DHS-FEMA's Digital Vision and also may facilitate the processing of your request.

Incomplete submissions will result in processing delays. For additional information regarding this form, including where to obtain the supporting documents listed above, please refer to the MT-1 Form Instructions located at http://www.fema.gov/plan/prevent/fhm/dl_mt-1.shtm.

Processing Fee (see instructions for appropriate mailing address; or visit http://www.fema.gov/fhm/frm_fees.shtm **for** the most current fee schedule)

Revised fee schedules are published periodically, but no more than once annually, as noted in the **Federal Register**. Please note: single/multiple lot(s)/structure(s) LOMAs are fee exempt. The current review and processing fees are listed below:

Check the fee that applies to your request:

- ☐ $325 (single lot/structure LOMR-F following a CLOMR-F)
- ☐ $425 (single lot/structure LOMR-F)
- ☐ $500 (single lot/structure CLOMA or CLOMR-F)
- ☐ $700 (multiple lot/structure LOMR-F following a CLOMR-F, or multiple lot/structure CLOMA)
- ■ $800 (multiple lot/structure LOMR-F or CLOMR-F)

Please submit the Payment Information Form for remittance of applicable fees. Please make your check or money order payable to:
National Flood Insurance Program.

All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Applicant's Name (required): Chelisa Pack

Company (if applicable): Project Design Consultants

Mailing Address (required): 701 B Street, Suite 800, San Diego, CA 92101

Daytime Telephone No. (required): (619) 881-2575

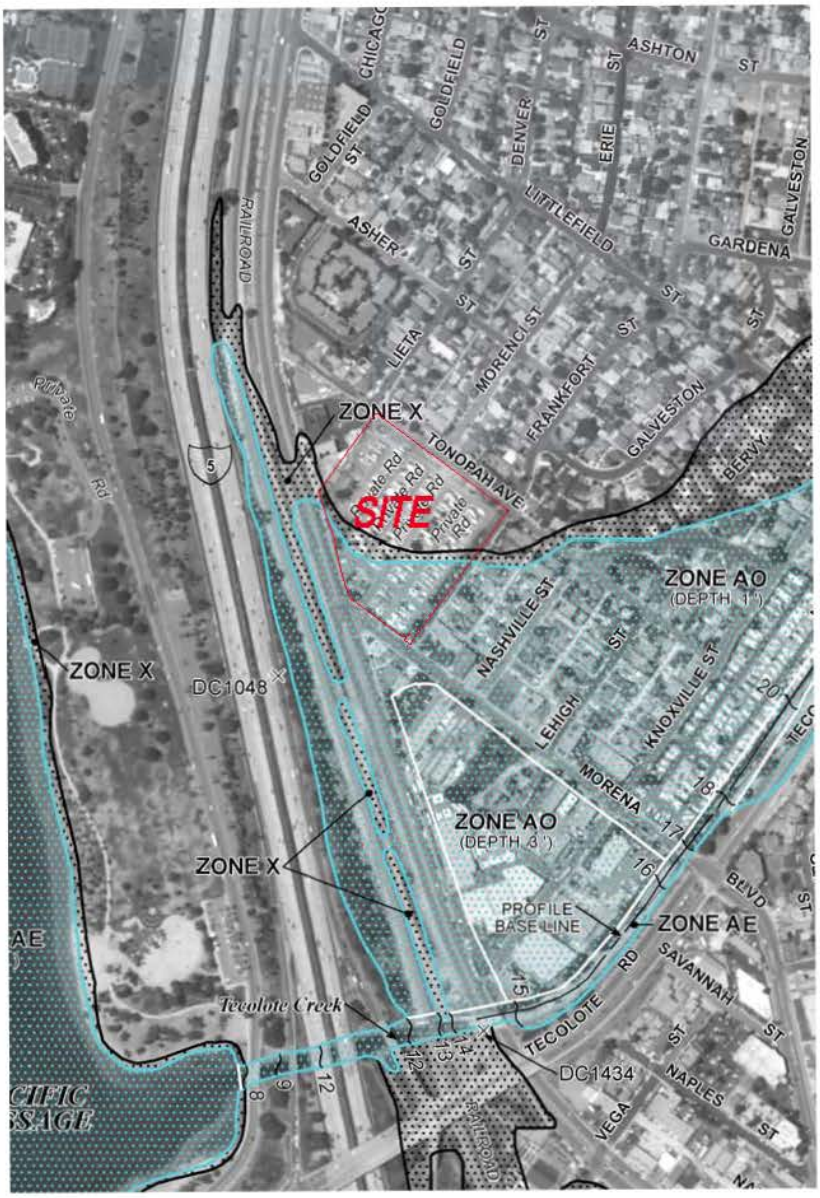
E-Mail Address (optional): ■ By checking here you may receive correspondence electronically at the email address provided): chelisap@projectdesign.com

Fax No. (optional):

Date (required) 6/6/17

Signature of Applicant (required)

Annotated FIRM Panel



MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1614G

FIRM

FLOOD INSURANCE RATE MAP

SAN DIEGO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 1614 OF 2375

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SAN DIEGO, CITY OF	060295	1614	G

ANNOTATED FIRM

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

MAP NUMBER
06073C1614G

MAP REVISED
MAY 16, 2012

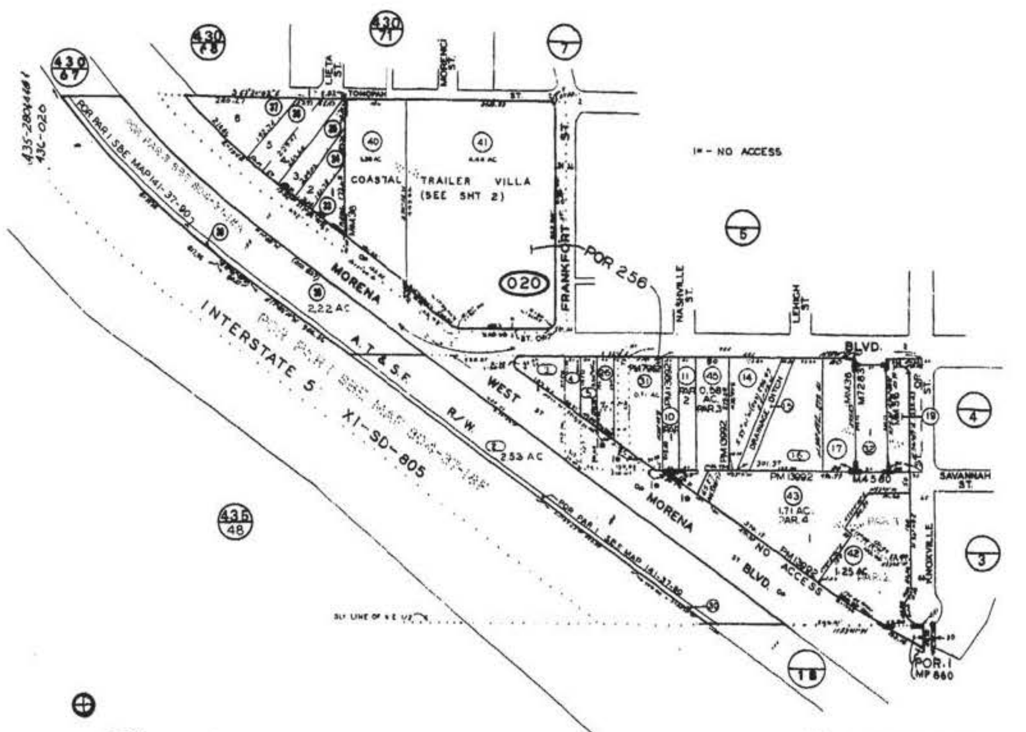
Federal Emergency Management Agency

Copy of APN Map & ALTA

08

436-02
SHT 1 OF 2

1" = 300'



CHANGES				
BLK	OLD	NEW	YR	CUT
	[illegible]	33-37	75	[illegible]
	[illegible]	38-41		
	[illegible]	42	81	1289
	23	[illegible]	[illegible]	[illegible]
	23	[illegible]	84	8718
	26 & 11	[illegible]	86	5780
	23	43 [illegible]	86	1587
	[illegible]	45	86	2481

SAN DIEGO COUNTY
ASSESSOR'S MAP
BOOK 436 PAGE 02
SHT 1 OF 2

THIS MAP WAS PREPARED FOR ASSESSMENT PURPOSES ONLY. NO LIABILITY IS ASSUMED FOR THE ACCURACY OF THE DATA SHOWN. ASSESSOR'S PARCELS MAY NOT COMPLY WITH LOCAL SUBDIVISION OR BUILDING ORDINANCES

MAPPED FOR ASSESSMENT PURPOSES ONLY

MAP 7283 - SID'S SUB
MAP 4580 - DEAN INDUSTRIAL TRACT
MAP 4016 - LAUDYS L SUBDIVISION
MM 36(CC 84864) - PUEBLO LANDS
ROS 837, 6355, 11063, 14163

08

436-02
SHT 2

NO SCALE

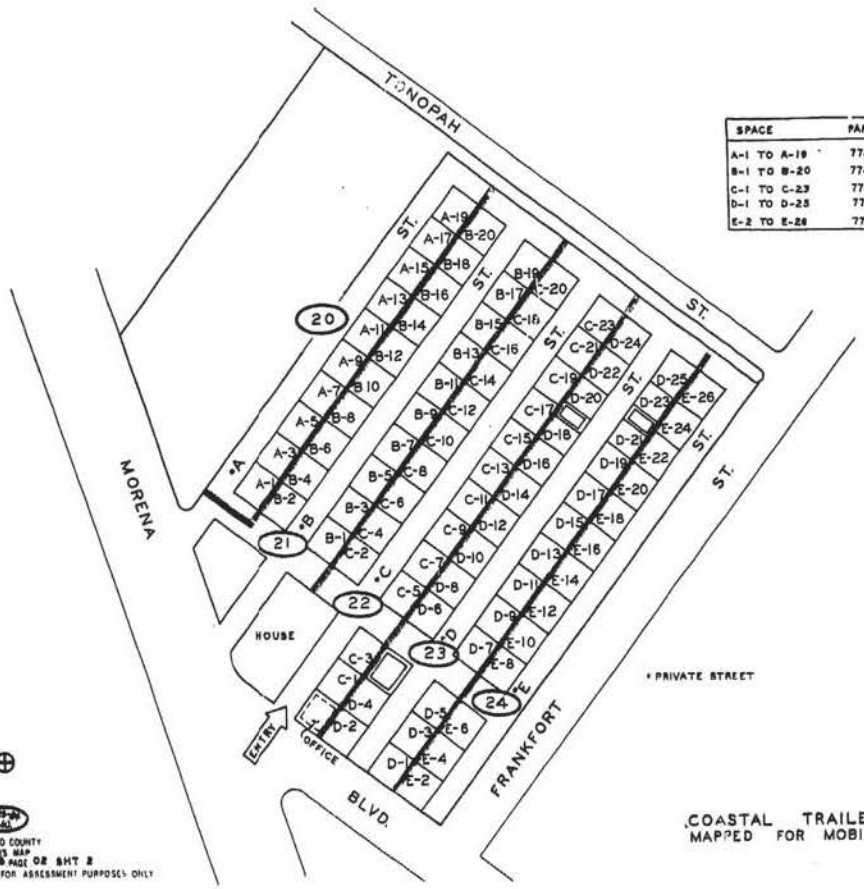
SPACE	PARCEL NUMBER
A-1 TO A-19	774-360-20-01 TO 19
B-1 TO B-20	774-360-21-01 TO 20
C-1 TO C-23	774-360-22-01 TO 23
D-1 TO D-25	774-360-23-01 TO 25
E-2 TO E-26	774-360-24-02 TO 26

5-25-84 A.W.

CHANGES

BLK	OLD	NEW	YR	CUT

436-030, 520



* PRIVATE STREET

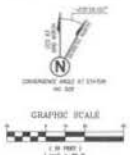
COASTAL TRAILER VILLA
MAPPED FOR MOBILE HOME ASSESSMENT ONLY

SAN DIEGO COUNTY
ASSESSORS MAP
BOOK 436 PAGE 02 SHT 2
MAPPED FOR ASSESSMENT PURPOSES ONLY

A.L.T.A./A.C.S.M. LAND TITLE SURVEY

1623 MORENA BLVD PROPERTY, SAN DIEGO, CA

VICINITY MAP
NO SCALE



LEGAL DESCRIPTION

REAL PROPERTY IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

PARCEL 1
APN NO. 438-020-40

ALL THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH WAS MAP WAS FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 19, 1921, AND IS KNOWN AS MISCELLANEOUS MAP NO. 36 DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWESTERLY CORNER OF THE CORELLA TRACT, ACCORDING TO MAP THEREOF NO. 1171 FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY; THENCE NORTH 72°25' WEST ALONG THE NORTHERLY LINE OF SAID PUEBLO LOT 256, A DISTANCE OF 299.74 FEET TO THE TRUE POINT OF BEGINNING; THENCE SOUTH 39°07' WEST 485.50 FEET TO THE NORTHEASTERLY LINE OF MORENA BOULEVARD AS SAID MORENA BOULEVARD IS LOCATED AND ESTABLISHED AS OF THE DATE OF THIS INSTRUMENT; THENCE NORTH 17°20' WEST ALONG SAID NORTHEASTERLY LINE 183.50 FEET; THENCE NORTH 39°11' EAST 394.80 FEET TO THE NORTHERLY LINE OF SAID PUEBLO LOT 256; THENCE SOUTH 72°49' EAST ALONG SAID NORTHERLY LINE 108.00 FEET TO THE POLE POINT OF BEGINNING, EXCEPTING FROM THE ABOVE DESCRIBED PROPERTY THAT PORTION THEREOF LYING BETWEEN THE LOCATION AND RELOCATIONS OF A LINE DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHEASTERLY LINE OF SAID ABOVE DESCRIBED PROPERTY DISTANT THEREON NORTH 39°08'58" EAST – RECORD NORTH 39°11' EAST – 44.03 FEET FROM THE MOST SOUTHERLY CORNER OF SAID PROPERTY; THENCE NORTH 17°09'54" WEST 191.35 FEET TO A POINT ON THE NORTHWESTERLY LINE OF SAID ABOVE DESCRIBED PROPERTY DISTANT THEREON NORTH 39°10'58" EAST – RECORD NORTH 39°11' EAST – 45.38 FEET FROM THE NORTHWESTERLY CORNER OF SAID PROPERTY.

PARCEL 2
APN NO. 438-020-41

THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH SAID MAP WAS FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAID SAN DIEGO COUNTY, NOVEMBER 19, 1921 AND IS KNOWN AS MISCELLANEOUS MAP NO. 36 DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHWESTERLY LINE OF CORELLA TRACT, LOT SHOWN ON MAP THEREOF NO. 1171, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY WITH THE NORTHEASTERLY LINE OF SAID PUEBLO LOT 256; THENCE NORTHERLY ALONG SAID NORTHEASTERLY LINE, 396.39 FEET TO THE MOST EASTERLY CORNER OF THE LAND DESCRIBED IN DEED TO AUGUSTUS T. FOUSHEE AND WIFE, RECORDED NOVEMBER 5, 1941 AS DOCUMENT NO. 89886 IN BOOK 1266, PAGE 245 OF OFFICIAL RECORDS; THENCE SOUTH 39°08'58" WEST ALONG THE SOUTHEASTERLY LINE OF SAID LAND, 191.35 FEET TO THE MOST NORTHERLY CORNER OF THE LAND DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED JANUARY 5, 1956 AS DOCUMENT NO. 1277 IN BOOK 6826, PAGE 580 OF OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY LINE OF LAST MENTIONED LAND AS FOLLOWS:

SOUTH 17°54'40" EAST, 99.39 FEET; THENCE SOUTH 17°09'54" EAST, 89.87 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY AND HAVING A RADIUS OF 50.00 FEET; THENCE SOUTHEASTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 35°27'06" A DISTANCE OF 30.93 FEET TO A POINT OF TANGENCY IN A LINE DRAWN PARALLEL WITH AND 7.00 FEET NORTHEASTERLY, AT RIGHT ANGLE FROM THE NORTHEASTERLY LINE OF MORENA BOULEVARD, AS SAID NORTHEASTERLY LINE WAS LOCATED ON JULY 27, 1925; THENCE SOUTH 72°17'00" EAST ALONG SAID PARALLEL LINE, 150 FEET MORE OR LESS TO A POINT DISTANT THEREON NORTH 72°17'00" EAST 20.00 FEET FROM THE NORTHWESTERLY LINE OF TRANSPORT STREET AS SAID NORTHWESTERLY LINE IS DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED APRIL 11, 1951 AS DOCUMENT NO. 46478 IN BOOK 4195, PAGE 185 OF OFFICIAL RECORDS; THENCE NORTHEASTERLY AT RIGHT ANGLES TO LAST MENTIONED COURSE, 20.00 FEET TO SAID NORTHWESTERLY LINE OF TRANSPORT STREET; THENCE CONTINUE NORTHEASTERLY ALONG SAID CURVE, THROUGH AN ANGLE OF 90°00'00" TO A POINT OF TANGENCY IN THE NORTHWESTERLY LINE OF SAID TRANSPORT STREET; THENCE SOUTH 39°47'00" WEST ALONG SAID NORTHWESTERLY LINE 25.00 FEET TO A POINT IN THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD; THENCE LEAVING SAID BOUNDARY LINE AND RUNNING SOUTH 53°13'00" EAST ALONG THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD 24.66 FEET TO THE MOST WESTERLY CORNER OF ABOVE MENTIONED CORELLA TRACT; THENCE NORTH 39°47'00" EAST ALONG THE NORTHWESTERLY LINE OF SAID CORELLA TRACT 500.00 FEET TO THE POINT OF BEGINNING.

EASEMENTS/ENCUMBRANCES

8 AN EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED APRIL 10, 1998 AS INSTRUMENT NO. 1998-0177204 OF OFFICIAL RECORDS.

IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY

THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.

⑪ AN EASEMENT FOR THE CONSTRUCTION, OPERATION, MAINTENANCE AND REPAIR OF AN OUTFALL SEWER LINE AND INCIDENTAL PURPOSES, RECORDED OCTOBER 8, 1945 IN BOOK 1931, PAGE 409 OF OFFICIAL RECORDS.

IN FAVOR OF: THE UNITED STATES OF AMERICA
AFFECTS: PARCEL 2

⑫ AN EASEMENT FOR A PUBLIC STREET AND INCIDENTAL PURPOSES, RECORDED APRIL 11, 1951 IN BOOK 4195, PAGE 442 OF OFFICIAL RECORDS.

IN FAVOR OF: THE CITY OF SAN DIEGO
AFFECTS: PARCEL 2

⑭ AN EASEMENT FOR EITHER OR BOTH POLE LINES, UNDERGROUND CONDUITS AND INCIDENTAL PURPOSES, RECORDED APRIL 12, 1951 IN BOOK 4201, PAGE 256 OF OFFICIAL RECORDS.

IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY
AFFECTS: PARCEL 2

⑮ AN EASEMENT FOR A PUBLIC STREET AND INCIDENTAL PURPOSES, RECORDED FEBRUARY 23, 1956 IN BOOK 6560, PAGE 115 OF OFFICIAL RECORDS.

IN FAVOR OF: THE CITY OF SAN DIEGO
AFFECTS: PARCEL 2

16 AN EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED APRIL 10, 1998 AS INSTRUMENT NO. 1998-0177206 OF OFFICIAL RECORDS.

IN FAVOR OF: SAN DIEGO GAS AND ELECTRIC COMPANY

THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.

NOTES

1. THIS SURVEY IS BASED ON PRELIMINARY REPORT NO. 14002-1562924 (SC) ISSUED BY FIRST AMERICAN TITLE COMPANY DATED AUGUST 10, 2015. THOSE LIENS, EFFECTS, FACTS, RIGHTS, AND MATTERS APPEARING IN SAID REPORT NO. NCS-747614-SD (SC) ITEMS NO. 1-6, 12, 13, 15, 16, 17 AND 19-22 HAVE NOT BEEN SHOWN HEREON.
2. TOTAL AREA WITHIN ALTA SURVEY BOUNDARY: PARCELS 1 & 2 = 9,907 ACRES NET
   FRANCHISE STREET = 0.245 ACRES
   TOTAL = 0.253 ACRES GROSS
3. TAX ASSESSOR PARCEL NO. 438-020-40 & 41.
4. FIELD SURVEY FOR THIS SITE WAS PERFORMED DURING MAY AND NOVEMBER, 2003 AND SITE WALK WAS UPDATED MAY 2014 AND AUGUST 2015 BY PROJECT DESIGN CONSULTANTS.
5. PRIVATE LANDSCAPE IRRIGATION & DRAINAGE SYSTEMS ARE NOT SHOWN HEREON. (UNLESS INDICATED OTHERWISE)
6. AS DETERMINED BY GRAPHIC PLOTTING ONLY, A PORTION OF SAID SITE IS IN ZONE X AND A PORTION OF THIS SITE IS IN ZONE AO OF THE CLOSE INSURANCE RATE MAP, COMMUNITY PANEL NO. 06073C0261H & 0737C0261H MAY 16, 2012 AND IS WITHIN THE 100 YEAR FLOOD ZONE.
7. TOPOGRAPHY SHOWN ON THIS SURVEY IS BASED UPON AN AERIAL SURVEY BY PROJECT DESIGN CONSULTANTS, ON MAY, 2003.
8. UNDERGROUND UTILITIES SHOWN ARE FROM VISUALLY OBSERVABLE SURFACE ITEMS IN THE FIELD.
9. ZONING: BOTH PARCELS HAVE ZONE: ZONING: THE FIRST SIX OF PROPERTIES FRONTING MORENA IS ZONED CC-4-2, THE REAR PORTION IS ZONED RS-1-7. SETBACKS ARE MARKED AND SITE SPECIFIC AND THEREFOR HAVE NOT BEEN PLOTTED HEREON.

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS A.L.T.A. IS THE CALIFORNIA COORDINATE SYSTEM OF 1983, ZONE 6, 1991.35 EPOCH GRID BEARING BETWEEN U.T.S. STATION NO. 808 AND U.T.S. STATION NO. 805 PER RECORD OF SURVEY NO. 13482.

I.E., SOUTH 90°54'21" EAST.

DISTANCES SHOWN HEREON ARE GRID DISTANCES. TO OBTAIN GROUND LEVEL DISTANCES MULTIPLY DISTANCES BY 1.0 (GRIDSCA. (LISTED) BEARINGS FROM REFERENCE MAPS/DEEDS MAY OR MAY NOT BE IN TERMS OF SAID SYSTEM.

BENCH MARK

CITY OF SAN DIEGO BRASS DISC AT THE S.E. CURB RETURN OF TOPSPIN AND PROMPORT.

ELEVATION = 20.870' M.S.L. DATUM (N.G.V.D. '27)

CURRENT VESTED OWNER

APN NO. 438-020-40:

BRUCE BARLOW AND PAMELA ANN BARLOW, TRUSTEES OF THE BARLOW REVOCABLE TRUST DATED JULY 19, 1993, AS TO AN UNDIVIDED 50.00% INTEREST, AND DONALD J. METCALFE, TRUSTEE OF THAT CERTAIN REVOCABLE TRUST OF DONALD J. METCALFE AND SHIRIN M. METCALFE DATED AUGUST 1, 1983, AS TO AN UNDIVIDED 49.238 INTEREST, AS TO PARCEL 1.

APN NO. 438-020-41:

DONALD J. METCALFE, TRUSTEE OF THAT CERTAIN REVOCABLE TRUST OF DONALD J. METCALFE AND SHIRIN M. METCALFE DATED AUGUST 1, 1983, AS TO AN UNDIVIDED 50.00% INTEREST, LAURENCE E. MOORE, INC., A CALIFORNIA CORPORATION AS TO AN UNDIVIDED 0.238 INTEREST, BRUCE BARLOW AND PAMELA ANN BARLOW, TRUSTEES OF THE BARLOW REVOCABLE TRUST DATED JULY 19, 1993, AS TO AN UNDIVIDED 49.762% INTEREST, AS TO PARCEL 2 AND DONALD J. METCALFE, TRUSTEE OF THAT CERTAIN REVOCABLE TRUST OF DONALD J. METCALFE AND SHIRIN M. METCALFE DATED SEPTEMBER 28, 1983, AS TO AN UNDIVIDED 0.238 INTEREST, PAUL H. ROSENTHAL, AS TRUSTEE UNDER THE PAUL H. ROSENTHAL IV TRUST AGREEMENT DATED OCTOBER 11, 2002, AS TO AN UNDIVIDED 10.000 INTEREST, PALMER HUGHES, AS AND PRISCILLA H. HUGHES, AS TRUSTEES UNDER THE HUGHES FAMILY AGREEMENT TRUST DATED JULY 10, 2002, AS TO AN UNDIVIDED 49.762 INTEREST, AS TO PARCEL 2.

SURVEYOR'S STATEMENT

TO: TP HEALTH II, LLC AND FIRST AMERICAN TITLE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2011 MINIMUM COMBINED DETAIL REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 6(a), 8, 9, 13(c), AND 14 OF TABLE A THEREOF. THE FIELD WORK WAS COMPLETED IN AUGUST, 2015.

DATE OF PLAT OR MAP: 09-01-2015

NOTE: SECTION 8770.6 OF THE PROFESSIONAL LAND SURVEYORS ACT IN THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA STATES THAT THE USE OF THE WORD "CERTIFY" OR "CERTIFICATION" HEREON ONLY CONSTITUTES AN EXPRESSION OF PROFESSIONAL OPINION REGARDING THOSE FACTS OR FINDINGS WHICH ARE THE SUBJECT OF THE CERTIFICATION, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EITHER EXPRESSED OR IMPLIED.

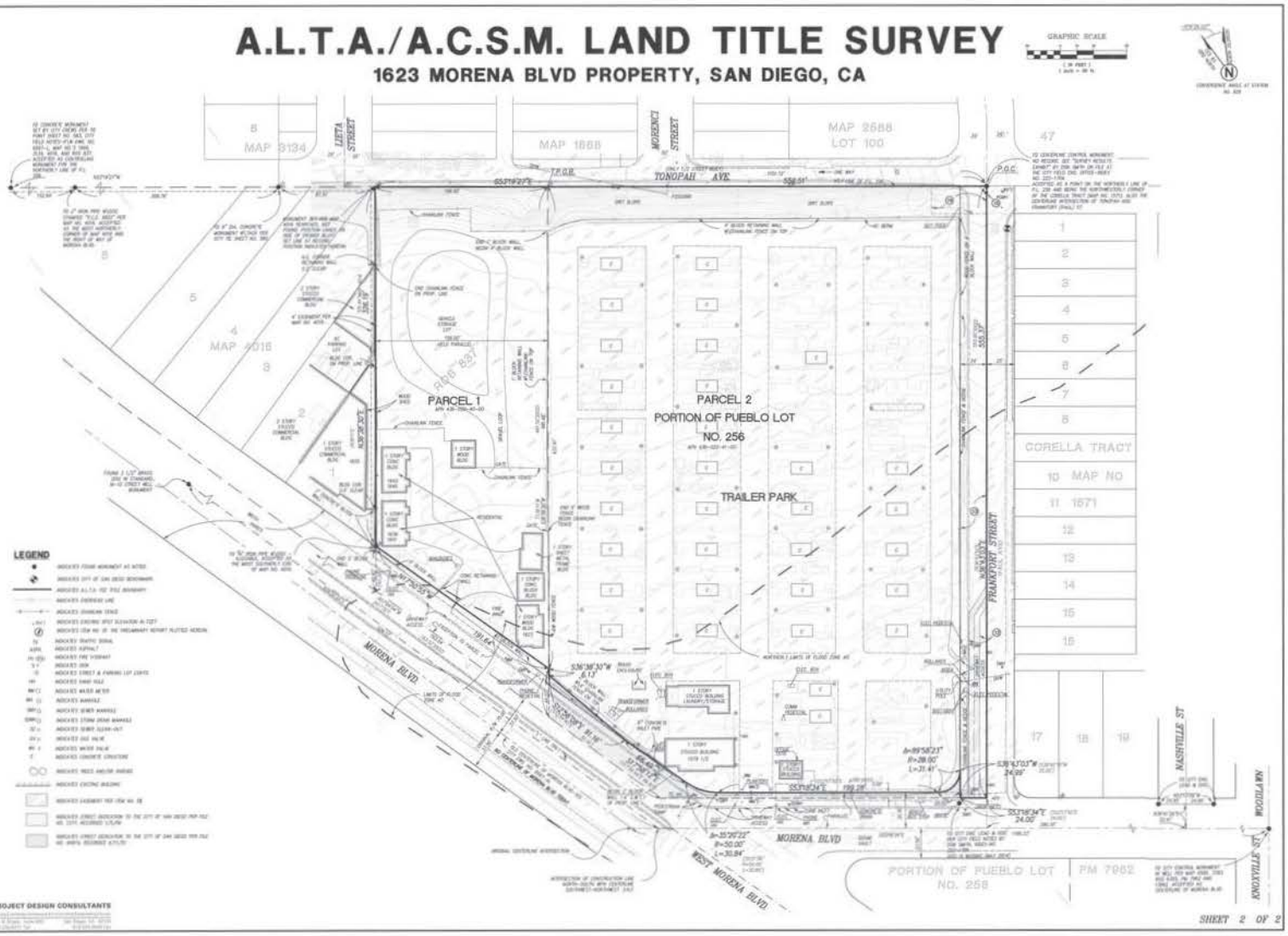
GARY L. HUS, L.S. 7894 — 09-01-2015 — DATE

PROJECT DESIGN CONSULTANTS

SHEET 1 OF 2

A.L.T.A./A.C.S.M. LAND TITLE SURVEY

1623 MORENA BLVD PROPERTY, SAN DIEGO, CA



PROJECT DESIGN CONSULTANTS

SHEET 2 OF 2

Copy of Property Deeds

RECORDING REQUESTED BY 135

AND WHEN RECORDED MAIL TO

Name Donald J Metzler, trustee
Street Address 6302 Elmhurst Dr.
City & State San Diego, Ca. 92120

83-361656
RECORDED IN OFFICIAL RECORDS OF SAN DIEGO COUNTY, CA
1383 OCT -7 PM 12:04
VERA L. [illegible]
COUNTY RECORDER

PF 5
MC 1
UF 10
TYPD 6

SPACE ABOVE THIS LINE FOR RECORDER'S USE

GRANT DEED

(CODE DEED)

No consideration paid for transfer of property
DOCUMENTARY TRANSFER TAX $ -0-
COMPUTED ON FULL VALUE OF PROPERTY CONVEYED.
OR COMPUTED ON FULL VALUE LESS LIENS AND ENCUMBRANCES REMAINING AT TIME OF SALE.
Donald J. Metzler
Signature of Declarant or Agent determining tax. Firm Name

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

Assessor's parcel No. 436-020-40-00
436-020-41-00

Donald J Metzler and Diane W. Metzler, husband and wife do hereby

GRANT to Donald J Metzler, trustee of that certain revocable trust of Donald J Metzler & Diane W Metzler dated 8/1/83 as to an undivided 18% interest.

the real property in the City of San Diego, County of San Diego, State of California, described as

Parcel I: That portion of Pueblo Lot 256 of the Pueblo Lands of San Diego, in the City of San Diego, County of San Diego, State of California, according to Map thereof made by James Pascoe in 1870 as more completely described in the attached legal description and made a part hereof.

Parcel II: That portion of Pueblo Lot 256 of the Pueblo Lands of San Diego, in the City of San Diego, County of San Diego, State of California, according to Map thereof made by James Pascoe in 1870 as more completely described in the attached legal description and made a part hereof.

Dated: 10/7/83

Donald J. Metzler
Diane W. Metzler

State of California,
County of San Diego } ss

On October 7, 1983, before me, the undersigned, a Notary Public in and for said State, personally appeared Donald J Metzler and Diane W Metzler

known to me to be the persons whose name s are subscribed to the within instrument and acknowledged that they executed the same.

WITNESS my hand and official seal.

OFFICIAL SEAL
LOUISE F. WILLIAMS
NOTARY PUBLIC - CALIFORNIA
SAN DIEGO COUNTY
My Comm. Expires Jan. 23, 1984

(Seal) Louise F. Williams
Notary Public in and for said State

MAIL TAX
STATEMENTS TO Donald J Metzler, trustee 7906 Raytheon Road, San Diego, Ca. 92111
NAME ADDRESS ZIP

83-361656

DEED—Code—Wolcotts Form 772— Rev 2-70

8 pt. type or larger

AAR-813544 MARCH 19

136

PARCEL I
DESCRIPTION:

That portion of Pueblo Lot 256 of the Pueblo Lands of San Diego, in the City of San Diego, County of San Diego, State of California, according to Map thereof made by James Pascoe in 1870, a copy of which Map was filed in the office of the County Recorder of San Diego County, November 14, 1921 and is known as Miscellaneous Map No. 36, described as follows:

Beginning at the intersection of the Northwesterly line of Corella Tract, as same is shown on Map thereof No. 1571, filed in the office of the County Recorder of San Diego County, with the Northeasterly line of said Pueblo Lot 256; thence Northwesterly along said Northeasterly line, 396.39 feet to the most Easterly corner of the land described in deed to Augustus F. Fougeron and wife, recorded November 5, 1941 as Document No. 68486 in Book 1266, page 245 of Official Records; thence South 36°39'58" West (record South 36°11' West) along the Southeasterly line of said land, 443.56 feet, more or less, to the most Northerly corner of the land described in deed to the City of San Diego, recorded January 5, 1956 as Document No. 1277 in Book 5926, page 590 of Official Records; thence along the boundary line of last mentioned land as follows:

South 12°54'40" East, 91.16 feet; thence South 17°56'44" East, 66.87 feet to the beginning of a tangent curve concave Northeasterly and having a radius of 50.00 feet; thence Southeasterly along said curve, through a central angle of 35°21'06" a distance of 30.85 feet to a point of tangency in a line drawn parallel with and 5.00 feet Northeasterly, at right angles from the Northeasterly line of Morena Boulevard, as said Northeasterly line was located on date of deed to the City of San Diego above referred to; thence South 53°17'50" East along said parallel line, 199 feet, more or less, to a point distant thereon North 53°17'50" West, 20.00 feet from the Northwesterly line of Frankfort Street, as said Northwesterly line is described in deed to the City of San Diego, recorded April 11, 1951 as Document No. 45874 in Book 4049, page 442 of Official Records; said point being the beginning of a tangent curve concave Northerly, having a radius of 20.00 feet; thence Easterly, along said curve, 31.42 feet, through an angle of 90°00' to a point of tangency in the Northwesterly line of said Frankfort Street; thence South 36°42'10" West, along said Northwesterly line, 25 feet to a point in the Northeasterly line of said Morena Boulevard; thence leaving said boundary line and running South 53°17'50" East, along the Northeasterly line of said Morena Boulevard, 24.00 feet to the most Westerly corner of above mentioned Corella Tract; thence North 36°42'10" East, along the Northwesterly line of said Corella Tract, 555.90 feet to the point of beginning.

83-361656

WITNESS my hand and official seal.

OFFICIAL SEAL
LOUISE F. WILLIAMS
NOTARY PUBLIC - CALIFORNIA
SAN DIEGO COUNTY
My Comm. Expires Jan. 23, 1984

(Seal) Louise F. Williams
Notary Public in and for said State

MAIL TAX
STATEMENTS TO Donald J Metzler, trustee (NAME) 7906 Raytheon Road, San Diego, Ca. 92111 (ADDRESS) (ZIP)

8 pt. type or larger

DEED—Code—WOLCOTTS Form 772— Rev 8-70

PARCEL II DESCRIPTION:

THE LAND REFERRED TO IN THIS POLICY IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF SAN DIEGO, AND IS DESCRIBED AS FOLLOWS:

ALL THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH SAID MAP WAS FILED IN THE OFFICE OF COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 14, 1921 AND IS KNOWN AS MISCELLANEOUS MAP 36 DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWESTERLY CORNER OF THE CORELLA TRACT, ACCORDING TO MAP THEREOF NO. 1571 FILED IN THE OFFICE OF COUNTY RECORDER OF SAN DIEGO COUNTY, THENCE NORTH 53°25' WEST ALONG THE NORTHERLY LINE OF SAID PUEBLO LOT 256, A DISTANCE OF 396.39 FEET TO THE TRUE POINT OF BEGINNING; THENCE SOUTH 36°11' WEST 481.50 FEET TO THE NORTHEASTERLY LINE OF MORENA BOULEVARD AS SAID MORENA BOULEVARD IS LOCATED AND ESTABLISHED AS OF THE DATE OF THIS INSTRUMENT; THENCE NORTH 17°32' WEST ALONG SAID NORTHEASTERLY LINE 193.52 FEET; THENCE NORTH 36°11' EAST 366.98 FEET TO THE NORTHERLY LINE OF SAID PUEBLO LOT 256; THENCE SOUTH 53°49' EAST ALONG SAID NORTHERLY LINE 156.00 FEET TO THE TRUE POINT OF BEGINNING. EXCEPTING FROM THE ABOVE DESCRIBED PROPERTY THAT PORTION THEREOF LYING WESTERLY OF THE LOCATION AND PROLONGATIONS OF A LINE DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHEASTERLY LINE OF SAID ABOVE DESCRIBED PROPERTY DISTANT THEREON NORTH 36°39'58" EAST -RECORD NORTH 36°11' EAST- 44.07 FEET FROM THE MOST SOUTHERLY CORNER OF SAID PROPERTY; THENCE NORTH 17°56'44" WEST 191.35 FEET TO A POINT ON THE NORTHWESTERLY LINE OF SAID ABOVE DESCRIBED PROPERTY DISTANT THEREON NORTH 36°39'58" EAST -RECORD NORTH 36°11' EAST- 40.39 FEET FROM THE NORTHWESTERLY CORNER OF SAID PROPERTY.

83-
361656

they executed the same.

WITNESS my hand and official seal.

OFFICIAL SEAL
LOUISE F. WILLIAMS
NOTARY PUBLIC - CALIFORNIA
SAN DIEGO COUNTY
My Comm. Expires Jan. 23, 1984

(Seal) Louise F. Williams
Notary Public in and for said State.

MAIL TAX
STATEMENTS TO Donald J Metzler, trustee 7906 Raytheon Road, San Diego, Ca. 92111
NAME ADDRESS ZIP

DEED—CORP—WOLCOTTS FORM 772— REV 2-70

8 pt. type or larger

Order No.
Escrow No.
Loan No.
RECORDING REQUESTED BY
AND MAIL TO:
WHEN RECORDED MAIL TO:

PAMELA ANN BARLOW
5341 MARLBOROUGH DR.
SAN DIEGO, CA 92116

DOC # 1992-0030430
21-JAN-1992 10:48 AM

1863

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
ANNETTE EVANS, COUNTY RECORDER

RF:	5.00	FEES:	30.50
AF:	5.00		OC
MF:	1.00		
UF:	10.00		
CF:	9.50		

SPACE ABOVE THIS LINE FOR RECORDER'S USE

MAIL TAX STATEMENTS TO:

PAMELA ANN BARLOW
5341 MARLBOROUGH DR.
SAN DIEGO, CA 92116

DOCUMENTARY TRANSFER TAX $ -0-
Computed on the consideration or value of property conveyed, OR
Computed on the consideration or value less liens or encumbrances remaining at time of sale.
James C. Russell, Attorney at Law
Signature of Declarant or Agent determining tax - Firm Name

A.P.N. 436-020-41

GRANT DEED

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Dorothy B. Pickering, a widow; Dorothy Brown Pickering and Paul P. Pickering, III, Trustees under Declaration of Trust dated March 3, 1960, who acquired title to a portion of subject property as Dorothy Brown Pickering and Paul P. Pickering, III, Trustees, and sometimes referred to as Dorothy Brown (*) hereby GRANT(S) to
Dorothy Brown Pickering and Paul P. Pickering, III, Trustees of The Pickering Trust #016598-00-04 as to an undivided 31.2% interest; LAWRENCE T. MOORE, INC., A California Corporation as to an undivided 9.5% interest; and to Pamela Ann Barlow, Successor (**) the real property in the City of SAN DIEGO State of California, described as County of SAN DIEGO
Property address 1579 Morena Boulevard, San Diego, CA. Legal description consisting of one page attached hereto as Exhibit "A" and incorporated herein by reference.

(*) Pickering and Paul P. Pickering, III, Trustees of The PICKERING TRUST #016598-00-04; LAWRENCE T. MOORE, INC., A California Corporation, formerly known as LAWRENCE T. MOORE, M.D., A Professional Corporation, A California Corporation, which was formerly known as CHERYL CO., A California Corporation; and Pamela Ann Barlow, Successor Trustee of The Moore Inter Vivos Trust dated March 13, 1985, sometimes referred to as Lawrence T. Moore, M.D., as Trustee under Declaration of Trust dated March 13, 1985, and sometimes referred to as Lawrence T. Moore, M.D., as Trustee under Declaration of Trust dated March 14, 1985.

(**) Trustee of The Moore Inter Vivos Trust dated March 13, 1985, Second Restatement August 26, 1991, as to an undivided 41.3% interest; in and to

CORRECTION DEED

Dated 1-17-92

Dorothy B. Pickering
Dorothy B. Pickering

Dorothy Brown Pickering, Trustee
Dorothy Brown Pickering, Trustee

Pamela Ann Barlow, Pres & Sec'y
Pamela Ann Barlow, President and Secretary, LAWRENCE T. MOORE, INC., A California Corporation

Pamela Ann Barlow, Successor Trustee
Pamela Ann Barlow, Successor Trustee

Paul P. Pickering, III, Trustee

STATE OF CALIFORNIA)
COUNTY OF San Diego) ss.
On Jan. 17, 1992 before me,
Laura E. Martinez
personally appeared Pamela Ann Barlow

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s) or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.
Signature Laura E. Martinez

LAURA E. MARTINEZ

(This area for official notarial seal)

OFFICIAL RECORDS, ANNETTE J. EVANS, SAN DIEGO RECORDER/COUNTY CLERK

2

ACKNOWLEDGEMENT - CORPORATION

STATE OF CALIFORNIA
COUNTY OF } SS

1864

On Jan. 17, 1992 before me,
the undersigned Notary Public, personally appeared
Pamela Ann Barlow
(personally known to me) (proved to me on the basis of satisfactory evidence) to be the _____ President, and
_____
(personally known to me) (proved to me on the basis of satisfactory evidence to be the _____
Secretary of the corporation that executed the within instrument, to be the person who executed the within instrument on behalf of the corporation therein named and acknowledged to me that such corporation executed the same, pursuant to its laws or a resolution of its Board of Directors

Signature Laura E. Martinez

SAV 102 (10 87)

SEAL

LAURA E. MARTINEZ
[illegible] 1992

TT-1101 REV 11/87 Individual Acknowledgment

STATE OF CALIFORNIA
COUNTY OF San Diego } SS.

On this 17th day of January in the year 1992
before me, the undersigned, a Notary Public in and for said County and State,
personally appeared Dorothy B. Vickrey And
Paul E. Vickrey
~~personally known to me~~ or proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to this instrument, and acknowledged that ~~he/she or~~ they) executed it.

Signature _____
Notary Public in and for said County and State

FOR NOTARY SEAL OR STAMP

OFFICIAL SEAL
C. P. DeHART
NOTARY PUBLIC-CALIFORNIA
PRINCIPAL OFFICE IN
SAN DIEGO COUNTY
My Commission Exp Aug 10, 1994

OFFICIAL RECORDS, ANNETTE J. EVANS, SAN DIEGO RECORDER/COUNTY CLERK

2

1865

EXHIBIT "A"

LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN IS SITUATED IN THE STATE OF CALIFORNIA, COUNTY OF SAN DIEGO, AND IS DESCRIBED AS FOLLOWS:

THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH MAP WAS FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 14, 1921 AND IS KNOWN AS MISCELLANEOUS MAP NO. 36, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHWESTERLY LINE OF CORELLA TRACT, AS SAME IS SHOWN ON MAP THEREOF NO. 1571, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, WITH THE NORTHEASTERLY LINE OF SAID PUEBLO LOT 256; THENCE NORTHWESTERLY ALONG SAID NORTHEASTERLY LINE, 396.39 FEET TO THE MOST EASTERLY CORNER OF THE LAND DESCRIBED IN DEED TO AUGUSTUS F. FOUGERON AND WIFE, RECORDED NOVEMBER 5, 1941 AS DOCUMENT NO. 68886 IN BOOK 1266, PAGE 245 OF OFFICIAL RECORDS; THENCE SOUTH 36°39'58" WEST (RECORD SOUTH 36°11' WEST) ALONG THE SOUTHEASTERLY LINE OF SAID LAND, 443.56 FEET, MORE OR LESS TO THE MOST NORTHERLY CORNER OF THE LAND DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED JANUARY 5, 1956 AS FILE NO. 1277 IN BOOK 5926, PAGE 590 OF OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY LINE OF LAST MENTIONED LAND AS FOLLOWS:

SOUTH 12°54'40" EAST, 91.16 FEET; THENCE SOUTH 17°56'44" EAST, 66.87 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY AND HAVING A RADIUS OF 50.00 FEET; THENCE SOUTHEASTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 35°21'06" A DISTANCE OF 30.85 FEET TO A POINT OF TANGENCY IN A LINE DRAWN PARALLEL WITH AND 5.00 FEET NORTHEASTERLY, AT RIGHT ANGLES FROM THE NORTHEASTERLY LINE OF MORENA BOULEVARD, AS SAID NORTHEASTERLY LINE WAS LOCATED ON DATE OF DEED TO THE CITY OF SAN DIEGO ABOVE REFERRED TO; THENCE SOUTH 53°17'50" EAST ALONG SAID PARALLEL LINE, 199 FEET, MORE OR LESS, TO A POINT DISTANT THEREON NORTH 53°17'50" WEST, 20.00 FEET FROM THE NORTHWESTERLY LINE OF FRANKFORT STREET, AS SAID NORTHWESTERLY LINE IS DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED APRIL 11, 1951 AS FILE NO. 45874 IN BOOK 4049, PAGE 442 OF OFFICIAL RECORDS; SAID POINT BEING THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHERLY, HAVING A RADIUS OF 20.00 FEET; THENCE EASTERLY, ALONG SAID CURVE, 31.42 FEET, THROUGH AN ANGLE OF 90°00' TO A POINT OF TANGENCY IN THE NORTHWESTERLY LINE OF SAID FRANKFORT STREET; THENCE SOUTH 36°42'10" WEST, ALONG SAID NORTHWESTERLY LINE, 25 FEET TO A POINT IN THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD; THENCE LEAVING SAID BOUNDARY LINE AND RUNNING SOUTH 53°17'50" EAST, ALONG THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD, 24.00 FEET TO THE MOST WESTERLY CORNER OF ABOVE MENTIONED CORELLA TRACT; THENCE NORTH 36°42'10" EAST, ALONG THE NORTHWESTERLY LINE OF SAID CORELLA TRACT, 555.90 FEET TO THE POINT OF BEGINNING.

2

2146 DOC # 1992-0833370
29-DEC-1992 12:23 PM

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
ANNETTE EVANS, COUNTY RECORDER
RF: 4.00 FEES: 8.00
AF: 3.00 OC
MF: 1.00

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:

Klayman and Fairley
2320 Fifth Avenue, Suite 200
San Diego, CA 92101

MAIL TAX STATEMENTS TO:

Pamela Ann Barlow
5341 Marlborough Drive
San Diego, CA 92116-2038

DOCUMENTARY TRANSFER TAX $ -0-

___ Computed on the consideration value of property conveyed; OR
___ Computed on the consideration or value less liens or encumbrances remaining at time of sale.

Klayman and Fairley

QUITCLAIM DEED APN 436-020-40

THIS IS A PARENT TO CHILD TRANSFER UNDER REV. & TAX. CODE §63.1.

FOR NO CONSIDERATION, receipt of which is hereby acknowledged,

Pamela Ann Barlow, Trustee of the Moore Inter Vivos Trust,

does hereby GRANT to

Bruce Barlow and Pamela Ann Barlow, Trustees of the Barlow Revocable Trust dated July 17, 1992,

the real property in the County of San Diego, State of California, described as

All that portion of Pueblo Lot 256 of the Pueblo Lands of San Diego, in the City of San Diego County of San Diego, State of California, according to Map thereof made by James Pascoe in 1870, a copy of which said Map was filed in the Office of the County Recorder of San Diego County, November 14, 1921, and is known as Miscellaneous Map 36, described as follows:

Commencing at the Northwesterly corner of the Corella Tract, according to Map thereof No. 1571 filed in the Office of the County Recorder of San Diego County, thence North 53°25' West along the Northerly lien of said Pueblo Lot 256, a distance of 396.39 feet to the True Point of Beginning; thence South 36°11' West 481.50 feet to the Northeasterly line of Morena Boulevard as said Morena Boulevard is located and established as of the date of this instrument; thence North 17°32' West along said Northeasterly line 193.52 feet; thence North 36°11' East 366.98 feet to the Northerly line of said Pueblo Lot 256; thence South 53°49' East along said Northerly line 156.00 feet to the True Point of Beginning. Excepting from the above described property that portion thereof lying Westerly of the location and prolongations of a line described as follows:

Beginning at a point on the Southeasterly line of said above described property distant thereon North 36°39'58" East - record North 36°11' East - 44.07 feet from the most Southerly corner of said property; thence North 17°55'44" West 191.35 feet to a point on the Northwesterly line of said above described property distant thereon North 36°39'58" East - record North 36°11' East 40.39 feet from the Northwesterly corner of said property.

Dated: December 8, 1992

Pamela Ann Barlow
PAMELA ANN BARLOW, Trustee

OFFICIAL RECORDS, ANNETTE J. EVANS, SAN DIEGO RECORDER/COUNTY CLERK

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

On December 8 1992, before me, Dixie L Lokensgard, a Notary Public in and for said State, personally appeared Pamela Ann Barlow, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Dixie L Lokensgard
NOTARY PUBLIC

OFFICIAL SEAL
DIXIE L LOKENSGARD
Notary Public-California
SAN DIEGO COUNTY
My Commission Expires
March 25, 1996

DOC # 1992-0833371
29-DEC-1992 12:23 PM

2148

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
ANNETTE EVANS, COUNTY RECORDER

RF:	4.00	FEES:	8.00
AF:	3.00	OC	
MF:	1.00		

RECORDING REQUESTED BY AND
WHEN RECORDED MAIL TO:

Klayman and Fairley
2320 Fifth Avenue, Suite 200
San Diego, CA 92101

MAIL TAX STATEMENTS TO:

Pamela Ann Barlow
5341 Marlborough Drive
San Diego, CA 92116-2038

DOCUMENTARY TRANSFER TAX $ -0-

___ Computed on the consideration value of property conveyed; OR
___ Computed on the consideration or value less liens or encumbrances remaining at time of sale.

Klayman and Fairley

QUITCLAIM DEED APN 436-020-41

FOR NO CONSIDERATION, receipt of which is hereby acknowledged,

Pamela Ann Barlow, Trustee of the Moore Inter Vivos Trust,

does hereby GRANT to

Bruce Barlow and Pamela Ann Barlow, Trustees of the Barlow Revocable Trust dated July 17, 1992,

the real property in the County of San Diego, State of California, described as

That portion of Pueblo Lot 256 of the Pueblo Lands of San Diego, in the City of San Diego County of San Diego, State of California, according to Map thereof made by James Pascoe in 1870, a copy of which Map was filed in the Office of the County Recorder of San Diego County, November 14, 1921, and is known as Miscellaneous Map 36, described as follows:

Beginning at the intersection of the Northwesterly line of Corella Tract, as same is shown on Map thereof No. 1571 filed in the Office of the County Recorder of San Diego County, with the Northeasterly line of said Pueblo Lot 256; thence Northwesterly along said Northeasterly line, 396.39 feet to the most Easterly corner of the land described in deed to Augustus F. Fougeron and wife, recorded November 5, 1941, as Document No. 68886 in Book 1266, Page 245 of Official Records; thence South 36°39'58" West (record South 36°11' West) along the Southeasterly line of said land, 443.56 feet, more or less to the most Northerly corner of the land described in deed to the City of San Diego, recorded January 5 1956, as File No. 1277 in Book 5926, Page 590 of Official Records; thence along the boundary line of last mentioned land as follows:

South 12°56'40" East, 91.16 feet; thence South 17°56'44" East, 66.87 feet to the beginning of a tangent curve concave Northeasterly and having a radius of 50.00 feet; thence Southeasterly along said curve, through a central angle of 35°21'06" a distance of 30.85 feet to a point of tangency in a line drawn parallel with and 5.00 feet Northeasterly, at right angles from the Northeasterly line of Morena Boulevard, as said Northeasterly line was located on date of deed to the City of San Diego above referred to; thence South 53°17'50" East along said parallel line, 199 feet, more or less, to a point distant thereon North 53°17'50" West, 20.00 feet from the Northwesterly line of Frankfort Street, as said Northwesterly line is described in deed to the City of San Diego, recorded April 11, 1951, as File No. 45874 in Book 4049, Page 442 of Official Records; said point being

OFFICIAL RECORDS, ANNETTE J. EVANS, SAN DIEGO RECORDER/COUNTY CLERK

the beginning of a tangent curve concave Northerly, having a radius of 20.00 feet; thence Easterly, along said curve, 31.42 feet, through an angle of 90°00' to a point of tangency in the Northwesterly line of said Frankfort Street; thence South 36°42'10" West, along said Northwesterly line, 25 feet to a point in the Northeasterly line of said Morena Boulevard; thence leaving said boundary line and running South 53°17'50" East, along the Northeasterly line of said Morena Boulevard, 24.00 feet to the most Westerly corner of above mentioned Corella tract; thence North 36°42'10" East, along the Northwesterly line of said Corella tract, 555.90 feet to the point of beginning.

This is a parent to child transfer under Rev. & Tax. Code §63.1.

Dated: December 8, 1992

Pamela Ann Barlow
PAMELA ANN BARLOW, Trustee

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

On December 8, 1992, before me, Dixie L. Lokensgard, a Notary Public in and for said State, personally appeared Pamela Ann Barlow, personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Dixie L Lokensgard
NOTARY PUBLIC

OFFICIAL SEAL
DIXIE L. LOKENSGARD
Notary Public-California
SAN DIEGO COUNTY
My Commission Expires
March 25, 1995

CHICAGO TITLE COMPANY

RECORDING REQUESTED BY

AND WHEN RECORDED MAIL THIS DEED AND, UNLESS OTHERWISE SHOWN BELOW, MAIL TAX STATEMENTS TO:

Name DONALD J. METZLER, TRUSTEE
Street Address 7906 RAYTHEON RD
City State Zip SAN DIEGO, CA 92111

436-020-40

ORDER NO 973988-05
ESCROW NO. 93904-K

83

DOC # 1995-0182190
01-MAY-1995 08:00 AM

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
GREGORY SMITH, COUNTY RECORDER

RF:	6.00	FEES:	249.35
AF:	3.00		OC
MF:	1.00		
UF:	10.00		
TAX:	229.35		

RECORDERS USE ONLY

GRANT DEED

TAX PARCEL NO

The undersigned declares that the documentary transfer tax is $ 229.35 and is
XX computed on the full value of the interest of the property conveyed, or is
___ computed on the full value less the value of liens or encumbrances remaining thereon at the time of sale.
The land, tenements or realty is located in
___ unincorporated area XX city of SAN DIEGO and
FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,
DOROTHY BROWN PICKERING AND PAUL P. PICKERING III, TRUSTEES OF THE PICKERING TRUST NO. 016598-00-04

hereby GRANT(S) to
DONALD J. METZLER, TRUSTEE OF THAT CERTAIN REVOCABLE TRUST OF DONALD J. METZLER AND DIANE W. METZLER DATED AUGUST 1, 1983

the following described real property in the City of SAN DIEGO
County of SAN DIEGO, State of California:
ALL THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH SAID MAP WAS FILED IN HE OFFICE OF COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 14, 1921, MORE PARTICULARLY DESCRIBED IN THE ATTACHED LEGAL DESCRIPTION MARKED EXHIBIT "A".

Dated NOVEMBER 7, 1994

Dorothy Brown Pickering Trustee
DOROTHY BROWN PICKERING, TRUSTEE

PAUL P. PICKERING, III, TRUSTEE

STATE OF CALIFORNIA,)
COUNTY OF San Diego)
On December 28, 1994 before me, C. P. DeHart
(insert name/title of the officer), personally appeared

DOROTHY BROWN PICKERING, TRUSTEE
and PAUL P. PICKERING, III, TRUSTEE

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted executed the instrument.
WITNESS my hand and official seal.

C. P. DE HART
COMM. #1034557
NOTARY PUBLIC-CALIFORNIA
SAN DIEGO COUNTY
My Commission Expires
AUGUST 10, 1998

Signature _____ (Notary Seal)

MAIL TAX STATEMENTS TO PARTY SHOWN BELOW: IF NO PARTY SO SHOWN, MAIL AS DIRECTED ABOVE.
DONALD J. METZLER, TRUSTEE, 7906 RAYTHEON RD SAN DIEGO, CA 92111
Name Street Address City & State

CSCI 252

EXHIBIT A

84

AN UNDIVIDED 31.2 PERCENT INTEREST IN AND TO:

ALL THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH SAID MAP WAS FILED IN THE OFFICE OF COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 14, 1921 AND IS KNOWN AS MISCELLANEOUS MAP 36 DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWESTERLY CORNER OF THE CORELLA TRACT, ACCORDING TO MAP THEREOF NO. 1571 FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, THENCE NORTH 53° 25' WEST ALONG THE NORTHERLY LINE OF SAID PUEBLO LOT 256, A DISTANCE OF 396.39 FEET TO THE TRUE POINT OF BEGINNING; THENCE SOUTH 36° 11' WEST 481.50 FEET TO THE NORTHEASTERLY LINE OF MORENA BOULEVARD AS SAID MORENA BOULEVARD IS LOCATED AND ESTABLISHED AS OF THE DATE OF THIS INSTRUMENT; THENCE NORTH 17° 32' WEST ALONG SAID NORTHEASTERLY LINE 193.52 FEET; THENCE NORTH 36° 11' EAST 366.98 FEET TO THE NORTHERLY LINE OF SAID PUEBLO LOT 256; THENCE SOUTH 53° 49' EAST ALONG SAID NORTHERLY LINE 156.00 FEET TO THE TRUE POINT OF BEGINNING. EXCEPTING FROM THE ABOVE DESCRIBED PROPERTY THAT PORTION THEREOF LYING WESTERLY OF THE LOCATION AND PROLONGATIONS OF A LINE DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHEASTERLY LINE OF SAID ABOVE DESCRIBED PROPERTY DISTANT THEREON NORTH 36° 39' 58" EAST -RECORD NORTH 36° 11' EAST - 44.07 FEET FROM THE MOST SOUTHERLY CORNER OF SAID PROPERTY; THENCE NORTH 17° 56' 44" WEST 191.35 FEET TO A POINT ON THE NORTHWESTERLY LINE OF SAID ABOVE DESCRIBED PROPERTY DISTANT THEREON NORTH 36° 39' 58" EAST -RECORD NORTH 36° 11' EAST- 40.39 FEET FROM THE NORTHWESTERLY CORNER OF SAID PROPERTY.

RECORDING REQUESTED BY

3671

DOC # 2001-0084782

Feb 14, 2001 10:02 AM

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
GREGORY J. SMITH, COUNTY RECORDER
FEES: 68.20
OC: OC

2001-0084782

AND WHEN RECORDED MAIL THIS DEED AND, UNLESS OTHERWISE SHOWN BELOW, MAIL TAX STATEMENTS TO:

Name
Street Address DONALD J. METZLER
City 7906 Raytheon Road
State San Diego, CA 92111
Zip

#6
2
UF
TT

ORDER NO.
ESCROW NO.

GRANT DEED

TAX PARCEL NO. 436-020-41

The undersigned declares that the documentary transfer tax is 68.20 and is

X computed on the full value of the interest of the property conveyed, or is

____ computed on the full value less the value of liens or encumbrances remaining thereon at the time of sale.

The land, tenements or realty is located in

____ unincorporated area X city SAN DIEGO and

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

PAUL P. PICKERING, III SUCCESSOR TRUSTEE OF THE PICKERING TRUST NO. 016598-00-04

hereby GRANT(S) to

DONALD J. METZLER, TRUSTEE OF THAT CERTAIN REVOCABLE TRUST OF DONALD J. METZLER DATED SEPTEMBER 28, 1998

The following described real property in the City of SAN DIEGO
County of SAN DIEGO , State of California:

AS TO AN UNDIVIDED 2% INTEREST IN AND TO THE FOLLOWING DESCRIBED PROPERTY:

THAT PORTION OF PUEBLO LOT 266 OF THE PUEBLO LANDS OF SAN DIEGO, MORE PARTICULARLY DESCRIBED IN THE ATTACHED LEGAL DESCRIPTION MARKED EXHIBIT "A'

Dated 2/9/01

Paul P. Pickering III by SCC Trustee

PAUL P. PICKERING, III, SUCCESSOR TRUSTEE

STATE OF CALIFORNIA,)
COUNTY OF San Diego)

On February 9, 2001, before me,

C.P. DeHart

(insert name/title of the officer), personally appeared

Paul P. Pickering III

personally known to me (~~or proved to me on the basis of satisfactory evidence~~) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted executed the instrument.

WITNESS my hand and official seal.

C.P. DE HART
COMM. #1190149
NOTARY PUBLIC-CALIFORNIA
SAN DIEGO COUNTY
My Commission Expires
AUGUST 10, 2002

Signature _____ (Notary Seal)

MAIL TAX STATEMENTS TO PARTY SHOWN BELOW: IF NO PARTY SO SHOWN, MAIL AS DIRECTED ABOVE.

La Cumbre Mgm Co, Inc. 100 N. Hope Ave Suite 1, Santa Barbara, CA 93110

Name Street Address City & State

DESCRIPTION:

That portion of Pueblo Lot 256 of the Pueblo Lands of San Diego, in the City of San Diego, County of San Diego, State of California, according to Map thereof made by James Pascoe in 1870, a copy of which Map was filed in the office of the County Recorder of San Diego County, November 14, 1921 and is known as Miscellaneous Map No. 36, described as follows:

Beginning at the intersection of the Northwesterly line of Corella Tract, as same is shown on Map thereof No. 1571, filed in the office of the County Recorder of San Diego County, with the Northeasterly line of said Pueblo Lot 256; thence Northwesterly along said Northeasterly line, 396.39 feet to the most Easterly corner of the land described in deed to Augustus F. Fougeron and wife, recorded November 5, 1941 as Document No. 68886 in Book 1266, page 245 of Official Records; thence South 36°39'58" West (record South 36°11' West) along the Southeasterly line of said land, 443.56 feet, more or less, to the most Northerly corner of the land described in deed to the City of San Diego, recorded January 5, 1956 as Document No. 1277 in Book 5926, page 590 of Official Records; thence along the boundary line of last mentioned land as follows:

South 12°54'40" East, 91.16 feet; thence South 17°56'44" East, 66.87 feet to the beginning of a tangent curve concave Northeasterly and having a radius of 50.00 feet; thence Southeasterly along said curve, through a central angle of 35°21'06" a distance of 30.85 feet to a point of tangency in a line drawn parallel with and 5.00 feet Northeasterly, at right angles from the Northeasterly line of Morena Boulevard, as said Northeasterly line was located on date of deed to the City of San Diego above referred to; thence South 53°17'50" East along said parallel line, 199 feet, more or less, to a point distant thereon North 53°17'50" West, 20.00 feet from the Northwesterly line of Frankfort Street, as said Northwesterly line is described in deed to the City of San Diego, recorded April 11, 1951 as Document No. 45874 in Book 4049, page 442 of Official Records; said point being the beginning of a tangent curve concave Northerly, having a radius of 20.00 feet; thence Easterly, along said curve, 31.42 feet, through an angle of 90°00' to a point of tangency in the Northwesterly line of said Frankfort Street; thence South 36°42'10" West, along said Northwesterly line, 25 feet to a point in the Northeasterly line of said Morena Boulevard; thence leaving said boundary line and running South 53°17'50" East, along the Northeasterly line of said Morena Boulevard, 24.00 feet to the most Westerly corner of above mentioned Corella Tract; thence North 36°42'10" East, along the Northwesterly line of said Corella Tract, 555.90 feet to the point of beginning.

EXHIBIT "A"

RECORDING REQUESTED BY:

STEPHEN L. NEWNHAM, ESQ.

AND WHEN RECORDED MAIL THIS DEED AND, UNLESS OTHERWISE SHOWN BELOW, MAIL TAX STATEMENTS TO

MR PAUL PICKERING III
PO BOX 90907
SAN DIEGO CA 92169

11734

DOC # 2003-0379320

APR 04, 2003 11:09 AM

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
GREGORY J. SMITH, COUNTY RECORDER
FEES: 11.00
OC: OC

2003-0379320

FOR RECORDER'S USE ONLY

APN: 436-020-41

Quitclaim Deed

The undersigned declares that the documentary transfer tax is $0--less than $1.00 consideration and is
[ ] computed on the full value of the interest or property conveyed, or is
[ ] computed on the full value less the value of liens or encumbrances remaining thereon at the time of sale. The land, tenements or realty is located in the City of San Diego

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

PAUL P. PICKERING, III SUCCESSOR TRUSTEE OF THE PICKERING TRUST NO. 016598-00-04, AS TO AN UNDIVIDED 19.46% INTEREST

do hereby remise, release and forever quitclaim to

PAUL P. PICKERING, III, AS TRUSTEE UNDER THE PAUL P. PICKERING, III TRUST AGREEMENT TRUST DATED OCTOBER 11, 2002

the following described real property situated in the City and County of San Diego, State of California:

THAT PORTION OF PUEBLO LOT 266 OF THE PUEBLO LANDS OF SAN DIEGO, MORE PARTICULARLY DESCRIBED IN THE ATTACHED LEGAL DESCRIPTION MARKED EXHIBIT "A"

Dated: March 27 2003

PAUL P. PICKERING, III, Successor Trustee

STATE OF CALIFORNIA)
) ss
COUNTY OF SAN DIEGO)

On March 27, 2003, before me, Kathleen M. Johnson, a Notary Public, personally appeared PAUL P. PICKERING, III, personally known to me or (proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature

KATHLEEN M. JOHNSON
COMM. #1294638
NOTARY PUBLIC • CALIFORNIA
SAN DIEGO COUNTY
Commission Expires Feb. 19, 2005

11735

EXHIBIT "A"

DESCRIPTION:

THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH MAP WAS FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 14, 1921 AND IS KNOWN AS MISCELLANEOUS MAP NO. 36, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHWESTERLY LINE OF COROLLA TRACT, AS SAME IS SHOWN ON MAP THEREOF NO. 1571, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, WITH THE NORTHEASTERLY LINE OF SAID PUEBLO LOT 256; THENCE NORTHWESTERLY ALONG SAID NORTHEASTERLY LINE, 396.39 FEET TO THE MOST EASTERLY CORNER OF THE LAND DESCRIBED IN DEED TO AUGUSTUS F. FOUGERON AND WIFE, RECORDED NOVEMBER 5, 1941 AS DOCUMENT NO. 68886 IN BOOK 1266, PAGE 245 OF OFFICIAL RECORDS; THENCE SOUTH 36°39' 58" WEST (RECORD SOUTH 36°11' WEST) ALONG THE SOUTHEASTERLY LINE OF SAID LAND, 443.56 FEET, MORE OR LESS, TO THE MOST NORTHERLY CORNER OF THE LAND DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED JANUARY 5, 1956 AS DOCUMENT NO. 1277 IN BOOK 5926, PAGE 590 OF OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY LINE OF LAST MENTIONED LAND AS FOLLOWS:

SOUTH 12°54'40" EAST, 91.16 FEET; THENCE SOUTH 17°56'44" EAST, 66.87 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY AND HAVING A RADIUS OF 50.00 FEET; THENCE SOUTHEASTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 35°21'06" A DISTANCE OF 30.85 FEET TO A POINT OF TANGENCY IN A LINE DRAWN PARALLEL WITH AND 5.00 FEET NORTHEASTERLY, AT RIGHT ANGLES FROM THE NORTHEASTERLY LINE OF MORENA BOULEVARD, AS SAID NORTHEASTERLY LINE WAS LOCATED ON DATE OF DEED TO THE CITY OF SAN DIEGO ABOVE REFERENCED TO; THENCE SOUTH 53°17'50" EAST ALONG SAID PARALLEL LINE, 199 FEET, MORE OR LESS TO A POINT DISTANT THEREON NORTH 53°17'50" WEST, 20.00 FEET FROM THE NORTHWESTERLY LINE OF FRANKFORT STREET, AS SAID NORTHWESTERLY LINE IS DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED APRIL 11, 1951 AS DOCUMENT NO. 45874 IN BOOK 4049, PAGE 442 OF OFFICIAL RECORDS; SAID POINT BEING THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHERLY, HAVING A RADIUS OF 20.00 FEET; THENCE EASTERLY, ALONG SAID CURVE, 31.42 FEET; THROUGH AN ANGLE OF 90°00' TO A POINT OF TANGENCY IN THE NORTHWESTERLY LINE OF SAID FRANKFORT STREET; THENCE SOUTH 36°42'10" WEST, ALONG SAID NORTHWESTERLY LINE, 25 FEET TO A POINT IN THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD; THENCE LEAVING SAID BOUNDARY LINE AND RUNNING SOUTH 53°17'50" EAST, ALONG MOST WESTERLY CORNER OF ABOVE MENTIONED COROLLA TRACT; THENCE NORTH 36 42'10" EAST, ALONG THE NORTHWESTERLY LINE OF SAID COROLLA TRACT 555.90 FEET TO THE POINT OF BEGINNING.

RECORDING REQUESTED BY:

STEPHEN L. NEWNHAM, ESQ.

AND WHEN RECORDED MAIL THIS DEED AND, UNLESS OTHERWISE SHOWN BELOW, MAIL TAX STATEMENTS TO

MRS PRISCILLA HUGHES
4315 HUGGINS STREET
SAN DIEGO CA 92122

11738

DOC # 2003-0379322

APR 04, 2003 11:09 AM

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
GREGORY J. SMITH, COUNTY RECORDER
FEES: 11.00
DC: DC

2003-0379322

RECORDER'S USE ONLY

APN: 436-020-41

Quitclaim Deed

The undersigned declares that the documentary transfer tax is $0–less than $1.00 consideration and is
[ ] computed on the full value of the interest or property conveyed, or is
[ ] computed on the full value less the value of liens or encumbrances remaining thereon at the time of sale. The land, tenements or realty is located in the City of San Diego

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

PAUL P. PICKERING, III SUCCESSOR TRUSTEE OF THE PICKERING TRUST NO. 016598-00-04, AS TO AN UNDIVIDED 4.87% INTEREST

do hereby remise, release and forever quitclaim to

PALMER HUGHES, III AND PRISCILLA P. HUGHES, AS TRUSTEE UNDER THE HUGHES FAMILY AGREEMENT TRUST DATED JULY 19, 2000

the following described real property situated in the City and County of San Diego, State of California:

THAT PORTION OF PUEBLO LOT 266 OF THE PUEBLO LANDS OF SAN DIEGO, MORE PARTICULARLY DESCRIBED IN THE ATTACHED LEGAL DESCRIPTION MARKED EXHIBIT "A"

Dated: March 27 2003

PAUL P. PICKERING, III, Successor Trustee

STATE OF CALIFORNIA)
) ss
COUNTY OF SAN DIEGO)

On March 27, 2003, before me, Kathleen M. Johnson, a Notary Public, personally appeared PAUL P. PICKERING, III, personally known to me or (proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

WITNESS my hand and official seal.

Signature

KATHLEEN M. JOHNSON
COMM. #1294638
NOTARY PUBLIC • CALIFORNIA
SAN DIEGO COUNTY
Commission Expires Feb. 19, 2006

11739

EXHIBIT "A"

DESCRIPTION:

THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH MAP WAS FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 14, 1921 AND IS KNOWN AS MISCELLANEOUS MAP NO. 36, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHWESTERLY LINE OF COROLLA TRACT, AS SAME IS SHOWN ON MAP THEREOF NO. 1571, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, WITH THE NORTHEASTERLY LINE OF SAID PUEBLO LOT 256; THENCE NORTHWESTERLY ALONG SAID NORTHEASTERLY LINE, 396.39 FEET TO THE MOST EASTERLY CORNER OF THE LAND DESCRIBED IN DEED TO AUGUSTUS F. FOUGERON AND WIFE, RECORDED NOVEMBER 5, 1941 AS DOCUMENT NO. 68886 IN BOOK 1266, PAGE 245 OF OFFICIAL RECORDS; THENCE SOUTH 36°39' 58" WEST (RECORD SOUTH 36°11' WEST) ALONG THE SOUTHEASTERLY LINE OF SAID LAND, 443.56 FEET, MORE OR LESS, TO THE MOST NORTHERLY CORNER OF THE LAND DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED JANUARY 5, 1956 AS DOCUMENT NO. 1277 IN BOOK 5926, PAGE 590 OF OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY LINE OF LAST MENTIONED LAND AS FOLLOWS:

SOUTH 12°54'40" EAST, 91.16 FEET; THENCE SOUTH 17°56'44" EAST, 66.87 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY AND HAVING A RADIUS OF 50.00 FEET; THENCE SOUTHEASTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 35°21'06" A DISTANCE OF 30.85 FEET TO A POINT OF TANGENCY IN A LINE DRAWN PARALLEL WITH AND 5.00 FEET NORTHEASTERLY, AT RIGHT ANGLES FROM THE NORTHEASTERLY LINE OF MORENA BOULEVARD, AS SAID NORTHEASTERLY LINE WAS LOCATED ON DATE OF DEED TO THE CITY OF SAN DIEGO ABOVE REFERENCED TO; THENCE SOUTH 53°17'50" EAST ALONG SAID PARALLEL LINE, 199 FEET, MORE OR LESS TO A POINT DISTANT THEREON NORTH 53°17'50" WEST, 20.00 FEET FROM THE NORTHWESTERLY LINE OF FRANKFORT STREET, AS SAID NORTHWESTERLY LINE IS DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED APRIL 11, 1951 AS DOCUMENT NO. 45874 IN BOOK 4049, PAGE 442 OF OFFICIAL RECORDS; SAID POINT BEING THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHERLY, HAVING A RADIUS OF 20.00 FEET; THENCE EASTERLY, ALONG SAID CURVE, 31.42 FEET; THROUGH AN ANGLE OF 90°00' TO A POINT OF TANGENCY IN THE NORTHWESTERLY LINE OF SAID FRANKFORT STREET; THENCE SOUTH 36°42'10" WEST, ALONG SAID NORTHWESTERLY LINE, 25 FEET TO A POINT IN THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD; THENCE LEAVING SAID BOUNDARY LINE AND RUNNING SOUTH 53°17'50" EAST, ALONG MOST WESTERLY CORNER OF ABOVE MENTIONED COROLLA TRACT; THENCE NORTH 36 42'10" EAST, ALONG THE NORTHWESTERLY LINE OF SAID COROLLA TRACT 555.90 FEET TO THE POINT OF BEGINNING.

DOC # 2008-0521546

OCT 03, 2008 8:00 AM
OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
GREGORY J. SMITH, COUNTY RECORDER
FEES: 22.00
OC: OC TAX: N.D.
PAGES: 2

RECORDING REQUESTED BY:
Fidelity National Title Company
Escrow No. 781408-PM
Title Order No. 725117155 — DJ

When Recorded Mail Document and Tax Statement To:
Donald J. Metzler, Trustee
7906 Raytheon Road
San Diego, CA 92111

F6P 2P UF ND
1037 FT

APN: 4360204.1

SPACE ABOVE THIS LINE FOR RECORDER'S USE

GRANT DEED

The undersigned grantor(s) declare(s) Section 11932 R & T Code
Documentary transfer tax is NSDT of public Record
[X] computed on full value of property conveyed, or
[ ] computed on full value less value of liens or encumbrances remaining at time of sale,
[ ] Unincorporated Area City of San Diego

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, Brown Pickering Clark Trust Dated December 1, 1999, as to an undivided 4.87%

hereby GRANT(S) to Donald J. Metzler, Trustee of that certain Revocable Trust of Donald J. Metzler dated September 28, 1998, as to an undivided 4.87% interest

the following described real property in the City of San Diego
County of San Diego, State of California:
SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

DATED: ~~August 28, 2008~~ September 24th, 2008

Brown Pickering Clark Trust Dated December 1, 1999

By: _____
Brown Pickering Clark, Trustee

State of ~~California~~ Arizona)
County of Pima)

On Sept. 24th, 2008 before me, Olga L. Ortiz, Notary Public (here insert name and title of the officer), personally appeared Brown Pickering Clark

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of ~~California~~ Arizona that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____ (Seal)

OLGA L. ORTIZ
NOTARY PUBLIC – ARIZONA
PIMA COUNTY
My Commission Expires
August 19, 2011

MAIL TAX STATEMENTS AS DIRECTED ABOVE

2

1038

LEGAL DESCRIPTION

EXHIBIT "A"

THAT PORTION OF PUEBLO LOT 256 OF THE PUEBLO LANDS OF SAN DIEGO, IN THE CITY OF SAN DIEGO, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF MADE BY JAMES PASCOE IN 1870, A COPY OF WHICH MAP WAS FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 14, 1921 AND IS KNOWN AS MISCELLANEOUS MAP NO. 36, DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTHWESTERLY LINE OF CORELLA TRACT, AS SAME IS SHOWN ON MAP THEREOF NO. 1571, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, WITH THE NORTHEASTERLY LINE OF SAID PUEBLO LOT 256; THENCE NORTHWESTERLY ALONG SAID NORTHEASTERLY LINE, 396.39 FEET TO THE MOST EASTERLY CORNER OF THE LAND DESCRIBED IN DEED TO AUGUSTUS F. FOUGERON AND WIFE, RECORDED NOVEMBER 5, 1941 AS DOCUMENT NO. 63886 IN BOOK 1266, PAGE 245 OF OFFICIAL RECORDS; THENCE SOUTH 36° 39' 58" WEST (RECORD SOUTH 36° 11' WEST) ALONG THE SOUTHEASTERLY LINE OF SAID LAND, 443.56 FEET, MORE OR LESS, TO THE MOST NORTHERLY CORNER OF THE LAND DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED JANUARY 5, 1956 AS DOCUMENT NO. 1277 IN BOOK 5926, PAGE 590 OF OFFICIAL RECORDS; THENCE ALONG THE BOUNDARY LINE OF LAST MENTIONED LAND A FOLLOWS:

SOUTH 12° 54' 40" EAST, 91.16 FEET; THENCE SOUTH 17° 56' 44" EAST, 66.87 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHEASTERLY AND HAVING A RADIUS OF 50.00 FEET; THENCE SOUTHEASTERLY ALONG SAID CURVE, THROUGH A CENTRAL ANGLE OF 35° 21' 06" A DISTANCE OF 30.85 FEET TO A POINT OF TANGENCY IN A LINE DRAWN PARALLEL WITH AND 5.00 FEET NORTHEASTERLY AT RIGHT ANGLES FROM THE NORTHEASTERLY LINE OF MORENA BOULEVARD, AS SAID NORTHEASTERLY LINE WAS LOCATED ON DATE OF DEED TO THE CITY OF SAN DIEGO ABOVE REFERRED TO; THENCE SOUTH 53° 17' 50" EAST ALONG SAID PARALLEL LINE, 199 FEET, MORE OR LESS, TO A POINT DISTANT THEREON NORTH 53° 17' 50" WEST, 20.00 FEET FROM THE NORTHWESTERLY LINE OF FRANKFORT STREET, AS SAID NORTHWESTERLY LINE IS DESCRIBED IN DEED TO THE CITY OF SAN DIEGO, RECORDED APRIL 11, 1951 AS DOCUMENT NO. 45874 IN BOOK 4049, PAGE 442 OF OFFICIAL RECORDS; SAID, POINT BEING THE BEGINNING OF A TANGENT CURVE CONCAVE NORTHERLY, HAVING A RADIUS OF 20.00 FEET; THENCE EASTERLY, ALONG SAID CURVE, 31.42 FEET, THROUGH AN ANGLE OF 90° 00' TO A POINT OF TANGENCY IN THE NORTHWESTERLY LINE OF SAID FRANKFORT STREET; THENCE SOUTH 36° 42' 10" WEST, ALONG SAID NORTHWESTERLY LINE, 25 FEET TO A POINT IN THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD; THENCE LEAVING SAID BOUNDARY LINE AND RUNNING SOUTH 53° 17' 50" EAST, ALONG THE NORTHEASTERLY LINE OF SAID MORENA BOULEVARD, 24.00 FEET TO THE MOST WESTERLY CORNER OF ABOVE MENTIONED CORELLA TRACT; THENCE NORTH 36° 42' 10" EAST, ALONG THE NORTHWESTERLY LINE OF SAID CORELLA TRACT, 555.90 FEET TO THE POINT OF BEGINNING.

APN: 436-020-41

MT-1 Form 2

Elevation Form

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

ELEVATION FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.25 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). **NOTE: Do not send your completed form to this address.**

This form must be completed for requests and must be completed and signed by a registered professional engineer or licensed land surveyor. **A DHS - FEMA National Flood Insurance Program (NFIP) Elevation Certificate may be submitted in lieu of this form for single structure requests.**

For requests to remove a structure on natural grade OR on engineered fill from the Special Flood Hazard Area (SFHA), submit the lowest adjacent grade (the lowest ground touching the structure), ***including an attached deck or garage***. For requests to remove an entire parcel of land from the SFHA, provide the lowest lot elevation; or, if the request involves an area described by metes and bounds, provide the lowest elevation within the metes and bounds description. All measurements are to be rounded to nearest tenth of a foot. In order to process your request, all information on this form must be completed ***in its entirety***. **Incomplete submissions will result in processing delays.**

1. NFIP Community Number: 060295 Property Name or Address: Morena Apartment Homes

2. Are the elevations listed below based on ☐ ***existing*** or ■ ***proposed*** conditions? (Check one)

3. For the existing or proposed structures listed below, what are the types of construction? (check all that apply)
   ☐ crawl space ■ slab on grade ☐ basement/enclosure ☐ other (explain)

4. Has DHS - FEMA identified this area as subject to land subsidence or uplift? (see instructions) ☐ Yes ■ No
   If yes, what is the date of the current re-leveling? / (month/year)

5. What is the elevation datum? ■ NGVD 29 ☐ NAVD 88 ☐ Other (explain)
   If any of the elevations listed below were computed using a datum different than the datum used for the effective Flood Insurance Rate Map (FIRM) (e.g., NGVD 29 or NAVD 88), what was the conversion factor? +2.09
   Local Elevation +/- ft. = FIRM Datum

6. Please provide the Latitude and Longitude of the most upstream edge of the ***structure*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ☐ NAD83 ☐ NAD27 Lat. . Long. .
   Please provide the Latitude and Longitude of the most upstream edge of the ***property*** (in decimal degrees to the nearest fifth decimal place):
   Indicate Datum: ☐ WGS84 ■ NAD83 ☐ NAD27 Lat. 32 . 77598 Long. 117 . 20498

Address	Lot Number	Block Number	Lowest Lot Elevation*	Lowest Adjacent Grade To Structure	Base Flood Elevation	BFE Source
1623 Morena Blvd	Parcel 1	N/A	17.0	N/A	16.0	FIRM 06073C1614G (ZONE AO)
1577 Morena Blvd	Parcel 2	N/A	17.0	N/A	16.0	FIRM 06073C1614G (ZONE AO)

This certification is to be signed and sealed by a licensed land surveyor, registered professional engineer, or architect authorized by law to certify elevation information. All documents submitted in support of this request are correct to the best of my knowledge. I understand that any false statement may be punishable by fine or imprisonment under Title 18 of the United States Code, Section 1001.

Certifier's Name: DEBBY REECE	License No.: C56148	Expiration Date: 12/31/2018
Company Name: PROJECT DESIGN CONSULTANTS	Telephone No.: 619-235-6471	
Email: debby@projectdesign.com	Fax No. 619-235-0349	
Signature: Debby Reece	Date: 6/6/17	

Seal (optional)

* For requests involving a portion of property, include the lowest ground elevation within the metes and bounds description.
Please note: If the Lowest Adjacent Grade to Structure is the only elevation provided, a determination will be issued for the structure only.

Questions concerning the VERTCON process may be mailed to _NGS

Latitude: 32 46 33.42

Longitude: 117 12 22.40

NGVD 29 height:

Datum shift(NAVD 88 minus NGVD 29): 0.638 meter

MT-1 Form 3

Community Acknowledgment

DEPARTMENT OF HOMELAND SECURITY - FEDERAL EMERGENCY MANAGEMENT AGENCY

COMMUNITY ACKNOWLEDGMENT FORM

O.M.B. NO. 1660-0015
Expires February 28, 2014

PAPERWORK BURDEN DISCLOSURE NOTICE

Public reporting burden for this data collection is estimated to average 1.38 hours per response. The burden estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the needed data, and completing and submitting the form. This collection is required to obtain or retain benefits. You are not required to respond to this collection of information unless a valid OMB control number is displayed on this form. Send comments regarding the accuracy of the burden estimate and any suggestions for reducing this burden to: Information Collections Management, Department of Homeland Security, Federal Emergency Management Agency, 1800 South Bell Street, Arlington, VA 20598-3005, Paperwork Reduction Project (1660-0015). NOTE: Do not send your completed form to this address.

This form must be completed for requests involving the existing or proposed placement of fill (complete Section A) ***OR*** to provide acknowledgment of this request to remove a property from the SFHA which was previously located within the regulatory floodway (complete Section B).

This form must be completed and signed by the official responsible for floodplain management in the community. **The six digit NFIP community number and the subject property address must appear in the spaces provided below. Incomplete submissions will result in processing delays.** Please refer to the MT-1 instructions for additional information about this form.

Community Number: 060295 Property Name or Address: Morena Apartment Homes

A. REQUESTS INVOLVING THE PLACEMENT OF FILL

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this Letter of Map Revision Based on Fill (LOMR-F) or Conditional LOMR-F request. Based upon the community's review, we find the completed or proposed project meets or is designed to meet all of the community floodplain management requirements, including the requirement that no fill be placed in the regulatory floodway, and that all necessary Federal, State, and local permits have been, or in the case of a Conditional LOMR-F, will be obtained. For Conditional LOMR-F requests, the applicant has or will document Endangered Species Act (ESA) compliance to FEMA prior to issuance of the Conditional LOMR-F determination. For LOMR-F requests, I acknowledge that compliance with Sections 9 and 10 of the ESA has been achieved independently of FEMA's process. Section 9 of the ESA prohibits anyone from "taking" or harming an endangered species. If an action might harm an endangered species, a permit is required from U.S. Fish and Wildlife Service or National Marine Fisheries Service under Section 10 of the ESA. For actions authorized, funded, or being carried out by Federal or State agencies, documentation from the agency showing its compliance with Section 7(a)(2) of the ESA will be submitted. In addition, we have determined that the land and any existing or proposed structures to be removed from the SFHA are or will be reasonably safe from flooding as defined in 44CFR 65.2(c), and that we have available upon request by DHS-FEMA, all analyses and documentation used to make this determination. For LOMR-F requests, we understand that this request is being forwarded to DHS-FEMA for a possible map revision.

Community Comments:

Community Official's Name and Title: (*Please Print or Type*) Jamal Batta		Telephone No.: 619-533-7482
Community Name: CITY OF SAN DIEGO	Community Official's Signature: (required)	Date: 6-14-17

B. PROPERTY LOCATED WITHIN THE REGULATORY FLOODWAY

As the community official responsible for floodplain management, I hereby acknowledge that we have received and reviewed this request for a LOMA. We understand that this request is being forwarded to DHS-FEMA to determine if this property has been inadvertently included in the regulatory floodway. We acknowledge that no fill on this property has been or will be placed within the designated regulatory floodway. We find that the completed or proposed project meets or is designed to meet all of the community floodplain management requirements.

Community Comments:

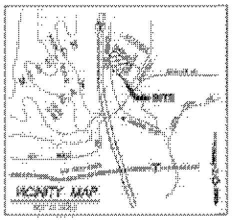
Community Official's Name and Title: (*Please Print or Type*)		Telephone No.:
Community Name:	Community Official's Signature (required): N/A	Date:

APPENDIX 2

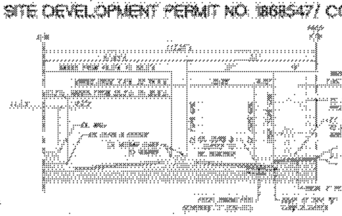
Proposed TM for Morena Apartment Homes

MORENA APARTMENT HOMES

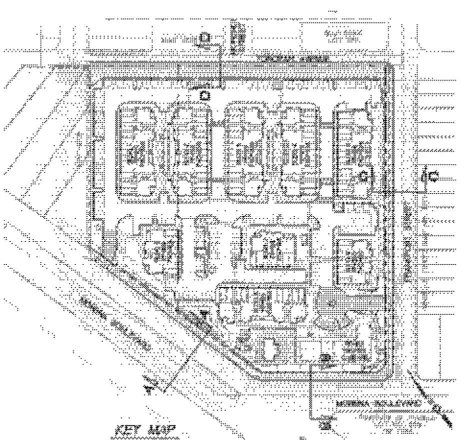
REZONE NO. 1868548/VESTING TENTATIVE MAP NO. 1868551/PLANNED DEVELOPMENT PERMIT NO. 1868549
SITE DEVELOPMENT PERMIT NO. 1868547/ COMMUNITY PLAN AMENDMENT NO. 1868552



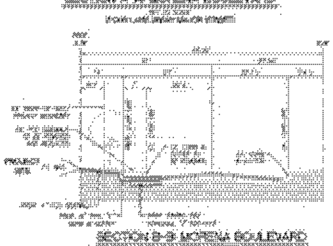
SECTION C-C: TONOPAH AVENUE



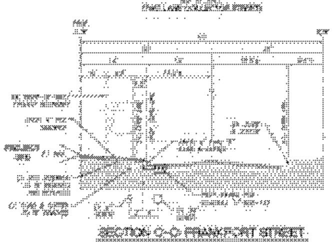
SECTION A-A: MORENA BOULEVARD



KEY MAP



SECTION B-B: MORENA BOULEVARD



SECTION D-D: FRANKFORT STREET

GENERAL NOTES

EXISTING AND PROPOSED USES

LEGAL DESCRIPTION

GRADING TABULATIONS

SHEET INDEX

BENCHMARK

BASIS OF BEARING

SOURCE OF TOPOGRAPHY

REFERENCE DRAWINGS

LEGEND

UTILITY TABLE

OWNER

APPLICANT

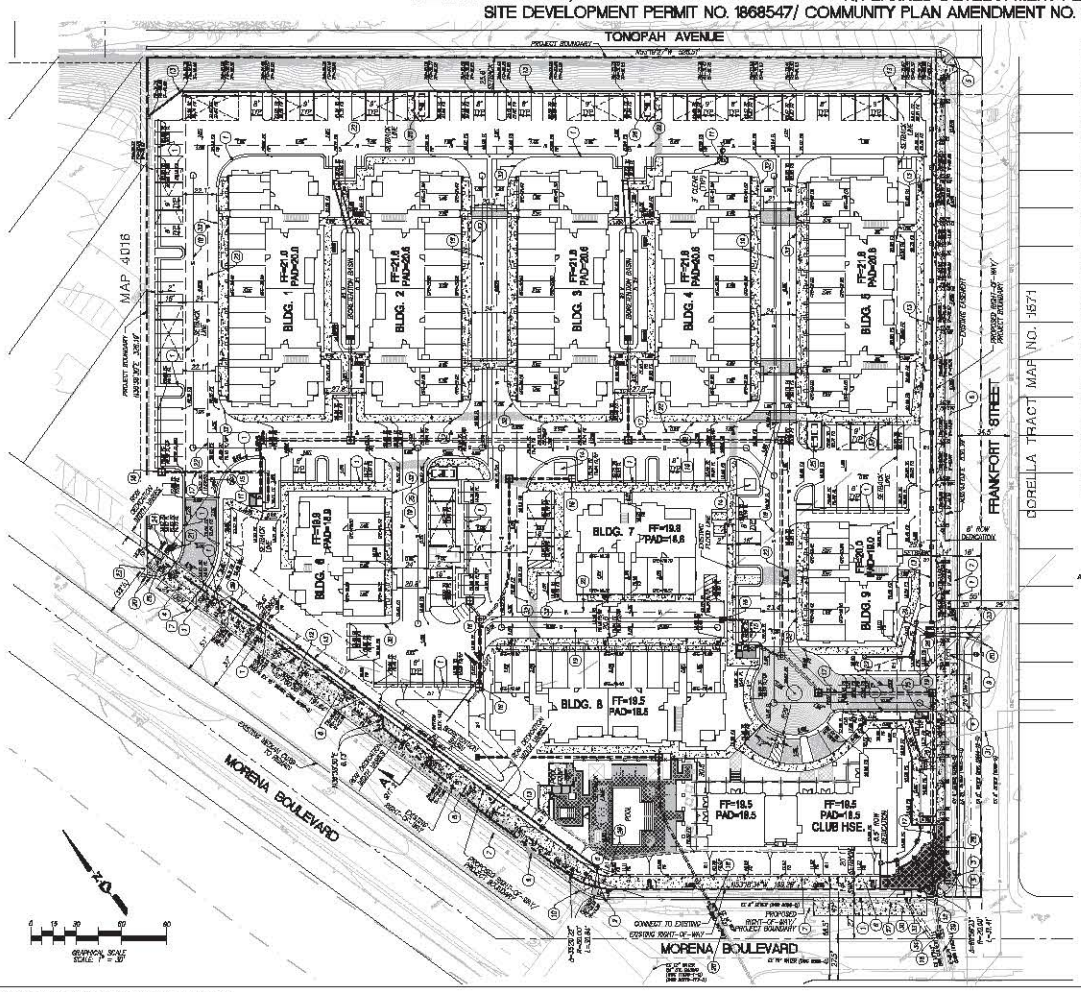
GEOTECHNICAL

ENGINEER OF WORK

PROJECT DESIGN CONSULTANTS

MORENA APARTMENT HOMES

REZONE NO. 1868548/VESTING TENTATIVE MAP NO. 1868551/PLANNED DEVELOPMENT PERMIT NO. 1868549
SITE DEVELOPMENT PERMIT NO. 1868547/ COMMUNITY PLAN AMENDMENT NO. 1868552



KEY NOTES:

1. PROPOSED TYPE "B" CURB & GUTTER PER SDG-101
2. PROPOSED 30' RADIUS CURB RETURN
3. PROPOSED 35' RADIUS CURB RETURN
4. PROPOSED 34' DRIVEWAY PER SDG-158
5. PROPOSED TYPE A CURB RAMP PER SDG-133
6. PROPOSED PCC SIDEWALK PER SDG-105
7. EXISTING TYPE "D" CURB & GUTTER TO BE REMOVED
8. EXISTING SEMPRE TRANSFORMER TO BE RELOCATED
9. EXISTING FIRE HYDRANT TO BE RELOCATED
10. EXISTING TRAFFIC SIGNAL POLE TO BE RELOCATED
11. PROPOSED FIRE HYDRANT ASSEMBLY
12. EXISTING STREET TREE TO BE REMOVED (TYPICAL)
13. PROPOSED RETAINING WALL
14. PROPOSED ELECTRIC TRANSFORMER LOCATION
15. PROPOSED MODULAR WETLAND UNIT (PRIVATE)
16. PROPOSED STORM DRAIN INLET (PRIVATE)
17. PROPOSED STORM DRAIN (PRIVATE) - SIZE VARIES FROM 18" TO 24" RCP
18. PROPOSED TYPE A-4 STORM DRAIN CLEANOUT PER G-09 (PUBLIC)
19. PROPOSED 6" SEWER LATERAL (PRIVATE)
20. PROPOSED WATER SERVICE METER (PUBLIC)
21. PROPOSED DOMESTIC/FIRE BACKFLOW (PRIVATE)
22. PROPOSED 8" DOMESTIC/FIRE WATER MAIN (PRIVATE)
23. PROPOSED 2" IRRIGATION SERVICE (PUBLIC)
24. PROPOSED IRRIGATION 2" REDUCED PRESSURE DETECTOR ASSEMBLY (PRIVATE)
25. PROPOSED TRASH ENCLOSURE
26. SIGHT DISTANCE LINE, SEE SIGHT DISTANCE NOTE RIGHT
27. EXISTING BUS STOP/ BENCH TO BE RELOCATED
28. EXISTING 18" STORM DRAIN PER DWG 3475-D TO REMAIN
29. EXISTING 12"SAN" RCP CULVERT PER DWG 10563-L TO REMAIN
30. PROPOSED BUS STOP PAD 12' X 20' PER SDG-102
31. EXISTING OVERHEAD ELECTRIC LINE (304 LF) TO BE UNDERGROUNDED
32. PROPOSED 6" CURB PER SDG-160
33. PROPOSED TYPE B INLET PER SDG-116 (PUBLIC)
34. PROPOSED 15" X 42" RCP CULVERT (PUBLIC)

WATER AND SEWER NOTES:

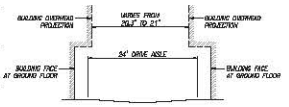
1. ALL PROPOSED WATER AND SEWER FACILITIES WITHIN THE PUBLIC ROW OR PUBLIC EASEMENT (PUBLIC AND PRIVATE) MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED WITHIN THE CITY OF SAN DIEGO'S CURRENT WATER AND SEWER FACILITY DESIGN GUIDELINES, REGULATIONS, STANDARDS, AND PRACTICES PERTAINING THERETO.
2. ALL PROPOSED PRIVATELY MAINTAINED WATER AND SEWER FACILITIES LOCATED WITHIN A SINGLE LOT OR PRIVATE EASEMENT MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED WITHIN THE CURRENT CALIFORNIA PLUMBING CODE.
3. ALL WATER SERVICES TO THE SITE (EXCEPTING SINGLE FAMILY DOMESTIC SERVICE LINES, AND SINGLE FAMILY DOMESTIC/FIRE COMBINED SERVICE LINES WHERE THE RESIDENTIAL FIRE SPRINKLER SYSTEM UTILIZES PASSIVE PURGE DESIGN) MUST PASS THROUGH A PRIVATE ABOVE GROUND BACK FLOW PREVENTION DEVICE (BFPD). BFPD'S ARE TO BE LOCATED ABOVE GROUND, ON PRIVATE PROPERTY, IN LINE WITH THE SERVICE, AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY.

NOTES:

1. FILL PLACED IN THE SFHA FOR THE PURPOSE OF CREATING A BUILDING PAD MUST BE COMPACTED TO 95% OF THE MAXIMUM DENSITY OBTAINABLE WITH THE STANDARD PROCTOR TEST FILL METHOD ISSUED BY THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM STANDARD D-698). GRANULAR FILL SLOPES MUST HAVE ADEQUATE PROTECTION FOR A MINIMUM FLOOD WATER VELOCITY OF FIVE FEET PER SECOND.
2. AN EMRA WILL BE REQUIRED FOR ALL PRIVATE STORM DRAINS, LANDSCAPING AND IRRIGATION WITHIN THE PUBLIC RIGHT-OF-WAY.
3. THIS PROJECT WILL IMPLEMENT GREEN STREET ELEMENTS (GSE) THAT SHALL THAT CAN BE REFERENCED WITH THE SWQMP.
4. IF A 3" DM CAMPEN FACTOR IS REQUIRED FOR THIS PROJECT, THE OWNER/PERMITTEE SHALL CONSTRUCT A NEW METER ABOVE GROUND WITHIN THE PUBLIC ROW, OR AN ACCEPTABLE 5' WIDE PUBLIC WATER EASEMENT, IN A MANNER SATISFACTORY TO THE PUBLIC UTILITIES DIRECTOR AND THE CITY ENGINEER.

SIGHT DISTANCE NOTE:

NO OBSTRUCTION (INCLUDING SOLID WALLS IN THE VISIBILITY AREA SHALL EXCEED 3 FEET IN MASSIVE PLANT MATERIAL, OTHER THAN TREES, WITHIN THE PUBLIC RIGHT-OF-WAY THAT IS LOCATED WITHIN THE VISIBILITY AREA. SHALL NOT EXCEED 36 INCHES IN HEIGHT, MEASURED FROM THE TOP OF THE ADJACENT CURB.



DRIVE AISLE SECTION
NOT TO SCALE

SITE AND GRADING PLAN
SCALE: 1"=30'

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey

PREPARED BY:
NAME: PROJECT DESIGN CONSULTANTS
ADDRESS: 701 'B' STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101
PHONE #: (619) 235-6471

PROJECT ADDRESS:
SAN DIEGO, CALIFORNIA

PROJECT NAME:
MORENA APARTMENT HOMES

STREET TITLE:
SITE AND GRADING PLAN

REVISION 14:
REVISION 13:
REVISION 12:
REVISION 11:
REVISION 10:
REVISION 09:
REVISION 08:
REVISION 07:
REVISION 06:
REVISION 05:
REVISION 04:
REVISION 02:
REVISION 01: 05/08/2017
ORIGINAL DATE: 12/05/2016

SHEET 4 OF 58
DEP #

P:\4187\Engr\DWG_Plans\Tentative Map\4187_TM_04.dwg 5/5/2017 8:33 AM

APPENDIX 3

Documented ESA Compliance Determination

RECON

An Employee-Owned Company

May 22, 2017

Mr. Ed McCoy
Fairfield Realty, LLC
5510 Morehouse Drive, Suite 200
San Diego, CA 92121

Reference: Federal Emergency Management Agency Letter for Morena Apartment Homes: Required Background Information for Issuance of CLOMR-F (RECON Number 8456)

Dear Mr. McCoy:

This letter provides the background information needed by Federal Emergency Management Agency (FEMA) to make a "no take" determination as part of the CLOMR-F for the Morena Apartment Homes project. The southern portion of the project site is located within FEMA Zone AO, which is designated as being within the 100-year floodplain and having average flood depths of one foot. The portion of the 100-year flood zone within the project site is associated with Tecolote Creek. The project applicant is proposing to fill a portion of the current FEMA delineated 100-year floodplain for Tecolote Creek. Information contained in this letter demonstrates how the Morena Apartment Homes project would not affect any listed species covered under the federal Endangered Species Act.

The 6.2-acre project site is located in the city of San Diego, to the east of Interstate 5 and just northwest of Morena Boulevard, west of West Morena Boulevard, southwest of Tonopah Avenue, and northwest of Frankfort Street (Figures 1 and 2). The project site includes Assessor's Parcel Numbers 436-020-40 and 436-020-41.

Biological Resource Evaluation Methods

RECON Environmental, Inc. biologists conducted a general biological survey on the project site on November 22, 2016. The biological resource survey identified three land cover types on the site: disturbed land, ornamental plantings, and urban/developed land (Figure 3). No native habitat types occur on the site.

Federal listed species with the potential to occur on-site were evaluated based on habitat present on the project site. The information provided on habitat was used to make determinations on the likelihood of any federal listed species to be directly or indirectly affected by the project. A search of the California Natural Diversity Database was conducted to find known observations of federal listed species either on the project site or in its vicinity (Attachment 1). The potential for these listed species to occur on the project site was then further evaluated using the information on habitat preferences and ecological conditions preferred by each species.

No federal listed species were observed or are expected to occur on the project site due to the lack of any suitable native habitats and level of development that has occurred to the site and surrounding lands. No direct or indirect impacts to federal listed species are anticipated from the project. There is no critical habitat for any federal listed species designated on the project site.

Effects on Federal Listed Species

Federal listed plant and wildlife species with the potential for occurrence on the Morena Apartment Homes project site were evaluated for presence/absence and for any anticipated direct or indirect impacts on these species. The project site lacks suitable habitat for any of the listed species with the potential for occurrence on-site. Therefore, no direct or indirect impacts to any federal listed species are anticipated from the project.

Sincerely,

Gerry Scheid
Senior Biologist

GAS:jg

cc: Chelisa Pack, Project Design Consultants

Project Location

RECON

M:\JOBS5\8456\common_gis\fig1.mxd 12/6/2016 sab

FIGURE 1
Regional Location

Image Source: NearMaps (flown July 2016)

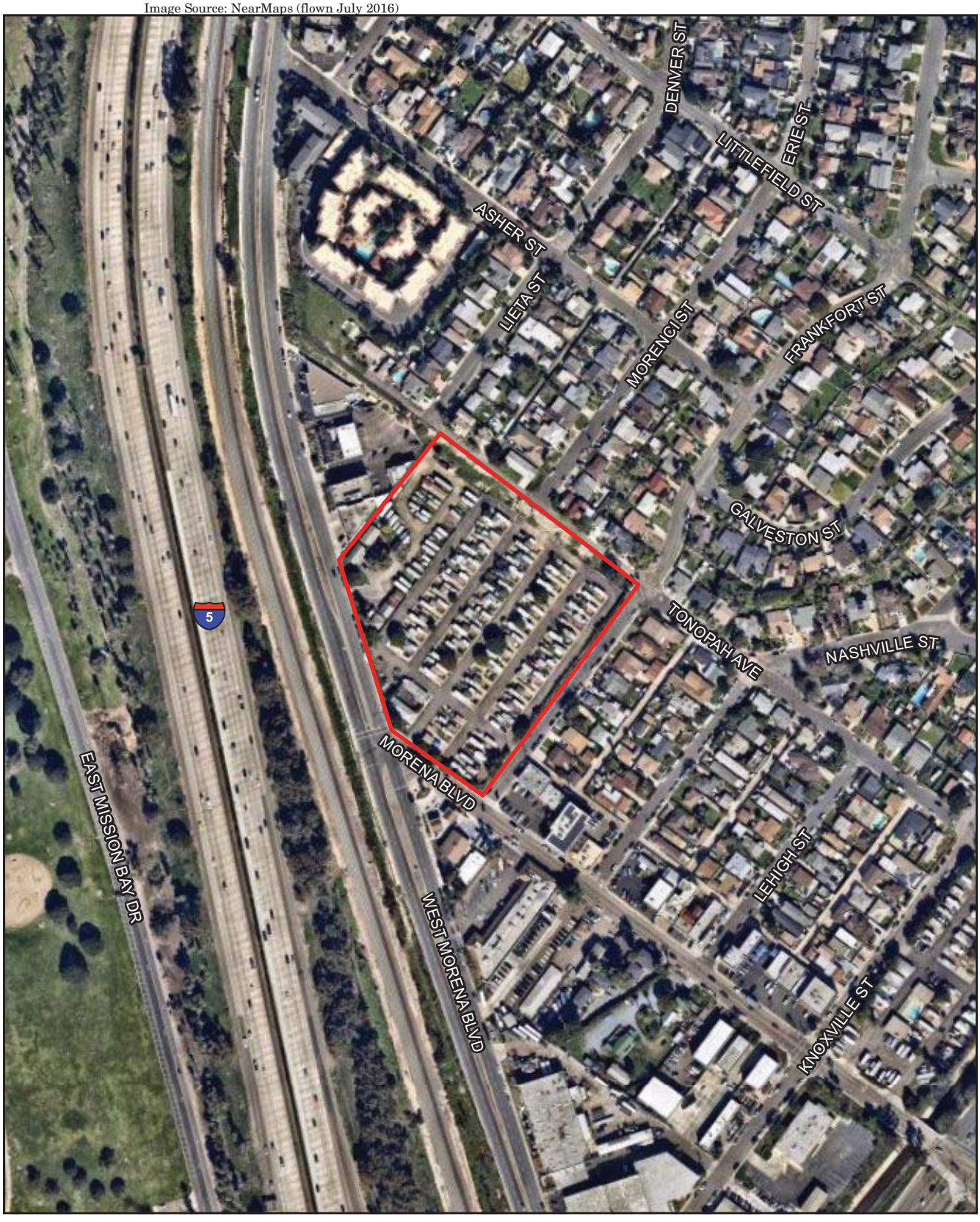


FIGURE 2

Project Location on Aerial Photograph

RECON

M:\JOBS5\8456\common_gis\fig2_air.mxd 5/19/2017 sab

Image Source: Nearmaps (flown Jan 2017)

Project Boundary

Vegetation Communities and Land Cover Types

- Ornamental Plantings
- Disturbed Land
- Urban/Developed

0 Feet 100

RECON

M:\JOBS5\8456\common_gis\fig3_esa.mxd 5/19/2017 sab

FIGURE 3
Existing Vegetation Communities and Land Cover Types

ATTACHMENT 1

Attachment 1 Federal Listed Species with the Potential for Occurrence on the Morena Apartment Homes Project Site			
Species' *Scientific Name* Common Name	State/Federal Status	Habitat/Preference/Requirements/ Blooming Period	Basis for Determination of Occurrence Potential
PLANT SPECIES			
APIACEAE **CARROT FAMILY**			
Eryngium aristulatum var. *parishii* San Diego button-celery	FE	Biennial/perennial herb; vernal pools, mesic areas of coastal sage scrub and grasslands, blooms April–June; elevation less than 2,000 feet. Known from San Diego and Riverside counties. Additional populations occur in Baja California, Mexico.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
ASTERACEAE **SUNFLOWER FAMILY**			
Ambrosia pumila San Diego ambrosia	FE	Perennial herb (rhizomatous); chaparral, coastal sage scrub, valley and foothill grasslands, creek beds, vernal pools, often in disturbed areas; blooms May–September; elevation less than 1,400 feet. Many occurrences extirpated in San Diego County.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
LAMIACEAE **MINT FAMILY**			
Acanthomintha ilicifolia San Diego thornmint	FT	Annual herb; chaparral, coastal sage scrub, and grasslands; friable or broken clay soils; blooms April–June; elevation less than 3,200 feet.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
Monardella viminea [=*Monardella linoides* ssp. *viminea*] willowy monardella	FE	Perennial herb; closed-cone coniferous forest, chaparral, coastal sage scrub, riparian scrub, riparian woodlands, sandy seasonal dry washes; blooms June–August; elevation 160–740 feet. San Diego County endemic.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
Pogogyne abramsii San Diego mesa mint	FE	Annual herb; vernal pools; blooms April–July; elevation 300–700 feet. San Diego County endemic.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
Pogogyne nudiuscula Otay mesa mint	FE	Annual herb; vernal pools; blooms May–July; elevation 300–820 feet. In California, known from approximately 10 occurrences in Otay Mesa in San Diego County. Additional populations occur in Baja California, Mexico.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.

Attachment 1 Federal Listed Species with the Potential for Occurrence on the Morena Apartment Homes Project Site			
Species' *Scientific Name* Common Name	State/Federal Status	Habitat/Preference/Requirements/ Blooming Period	Basis for Determination of Occurrence Potential
POLEMONIACEAE PHLOX FAMILY			
Navarretia fossalis spreading navarretia [=prostrate navarretia]	FT	Annual herb; vernal pools, marshes and swamps, chenopod scrub; blooms April–June; elevation 100–4,300 feet.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
POLYGONACEAE BUCKWHEAT FAMILY			
Chorizanthe orcuttiana Orcutt's spineflower	FE	Annual herb; maritime chaparral, closed-cone coniferous forest, coastal sage scrub; sandy openings; blooms March–May; elevation less than 400 feet. San Diego County endemic. Known from fewer than 20 occurrences.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
POACEAE GRASS FAMILY			
Orcuttia californica California Orcutt grass	FE	Annual herb; vernal pools; blooms April–August; elevation 50–2,200 feet.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
WILDLIFE SPECIES			
INVERTEBRATES			
BRANCHINECTIDAE FAIRY SHRIMP			
San Diego fairy shrimp *Branchinecta sandiegonensis*	FE	Vernal pools.	This species has a low potential for occurrence on the site due to the lack of appropriate vernal pool habitat. The site is developed.
BIRDS			
RALLIDAE RAILS, GALLINULES, & COOTS			
Light-footed Ridgway's rail *Rallus obsoletus* [=*longirostris*] *levipes*	FE	Salt marshes supporting *Spartina foliosa*. Localized resident.	This species has a low potential for occurrence on the site due to the lack of appropriate salt marsh habitat. The site is developed.

Attachment 1 Federal Listed Species with the Potential for Occurrence on the Morena Apartment Homes Project Site			
Species' *Scientific Name* Common Name	State/Federal Status	Habitat/Preference/Requirements/ Blooming Period	Basis for Determination of Occurrence Potential
LARIDAE **GULLS, TERNS, & SKIMMERS**			
California least tern (nesting colony) *Sternula antillarum browni*	FE	Bays, estuaries, lagoons, shoreline. Resident. Localized breeding.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
VIREONIDAE **VIREOS**			
Least Bell's vireo (nesting) *Vireo bellii pusillus*	FE	Willow riparian woodlands. Summer resident.	This species has a low potential for occurrence on the site due to the lack of appropriate habitat. The site is developed.
FEDERAL CANDIDATES AND LISTED PLANTS FE = Federally listed endangered FT = Federally listed threatened			

APPENDIX 4

Exhibits

BFE METHODOLOGY (NGVD29):

APPROACH PER FEMA'S METHODOLOGY FOR PARTIAL INUNDATION WITH SIGNIFICANT GRADE CHANGE ACROSS THE PROPERTY

BFE=AVERAGE INUNDATED GRADE ELEVATION + 1

AVERAGE EXISTING GROUND ELEV OF 18 SPOT ELEVATIONS = 15.0 NGVD29

BFE = 16.0 NGVD29

NOTE:

TOPOGRAPHY SOURCE

LEGEND:

EG XX.X

PREPARED BY:

PROJECT DESIGN CONSULTANTS

CITY OF SAN DIEGO

MORENA APARTMENT HOMES

EXISTING CONDITIONS FEMA FLOOD MAP
CONDITIONAL LETTER OF MAP REVISION
EXHIBIT A

TOPOGRAPHY SOURCE

LEGEND

PROJECT DESIGN CONSULTANTS

CITY OF SAN DIEGO

MORENA APARTMENT HOMES

PROPOSED CONDITIONS FEMA FLOOD MAP
CONDITIONAL LETTER OF MAP REVISION
EXHIBIT B

EXHIBIT 'C'

Land Description for

FEMA CLOMR FLOODPLAIN REVISIONS

That portion of Pueblo Lot 256 of The Pueblo Lands of San Diego, in the City of San Diego, County of San Diego, State of California, according to Map thereof made by James Pascoe in 1870, a copy of which said Map was filed in the office of the County Recorder of San Diego County, November 14, 1921 and is known as Miscellaneous Map 36 described as follows:

Beginning at the Northwesterly corner of the Corella Tract, according to Map thereof No. 1571 filed in the office of County Recorder of San Diego County May 14, 1913, said point being the centerline intersection of Tonopah Avenue and Frankfort Street (formerly Paul Ave) as shown on said Map 1571; thence along the centerline of said Frankfort Street, South 36°43'03" West 185.19 feet; thence leaving said centerline, North 48°31'51" West 16.06 feet; thence North 69°58'54" West 14.62 feet; thence South 48°00'03" West 13.52 feet; thence South 37°19'08" West 82.26 feet; thence South 36°46'52" West 20.50 feet; thence South 41°14'51" West 35.45 feet; thence South 36°53'42" West 26.65 feet; thence South 58°23'00" West 5.92 feet; thence South 39°48'44" West 23.12 feet; to the beginning of a tangent curve concave Northerly having a radius of 6.00 feet; thence Southwesterly and Westerly along the arc of said curve through a central angle of 77°06'05" a distance of 8.07 feet; thence North 63°05'11" West 12.65 feet; thence North 67°41'36" West 14.68 feet; thence North 80°53'00" West 5.67 feet; thence South 42°35'56" West 23.24 feet; thence South 41°29'26" East 21.06 feet; thence South 36°43'25" West 8.16 feet; thence South 24°05'27" East 5.95 feet; thence South 15°26'47" West 9.97 feet; thence South 35°51'36" West 69.69 feet; thence North 88°36'51" West 6.29 feet; thence North 52°44'43" West 136.16 feet; thence North 57°57'13" West 58.48 feet; thence North 17°37'52" West 81.66 feet; thence North 72°22'08" East 4.92 feet; to the beginning of a tangent curve concave Northwesterly having a radius of 8.00 feet; thence Northeasterly and Northerly along the arc of said curve through a central angle of 67°27'23" a distance of 9.42 feet; thence North 03°04'47" West 34.03 feet; thence North 36°02'57" East 19.62 feet; to the beginning of a tangent curve concave Westerly having a radius of 8.00 feet; thence Northeasterly, Northerly and Northwesterly along the arc of said curve through a central angle of 89°20'09" a distance of 12.47 feet; thence North 53°17'12" West 44.77 feet; thence North 81°51'52" West 14.61 feet; to the beginning of a non-tangent curve concave Easterly having a radius of 836.88 feet a radial line to said point bears South 73°28'43" West; thence Westerly along the arc of said curve through a central angle of 02°13'15" a distance of 32.44 feet; thence North 18°04'04" West 59.29 feet; thence North 09°06'12" West 31.84 feet; thence North 43°34'55" East 27.62 feet; thence North 32°42'46" East 12.44 feet; thence North 08°12'57" East 7.23 feet; thence North 33°43'56" West 34.02 feet; thence North 57°44'07" West 23.43 feet to a point on the Easterly boundary line of Luadys L Subdivision according to Map thereof No. 4016 filed in the office of the County recorder November 19, 1958; thence along

said Easterly boundary, North 36°38'30" East 293.67 feet to a point on the Northerly line of said Pueblo Lot 256; thence along said Northerly line, South 53°19'27" East 552.51 feet to the **Point of Beginning**.

Said parcel contains 5.529 acres, more or less.

This land description was prepared by me or under my direction in conformance with the California Professional Land Surveyors' Act.

6-05-2017

DAVID W. AMBLER
LS 7322

DRAFT

EXHIBIT 'C'

FEMA CLOMR FLOODPLAIN REVISIONS

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS PLAT IS THE CALIFORNIA COORDINATE SYSTEM OF 1983, ZONE 6, 1991.35 EPOCH GRID BEARING BETWEEN G.P.S. STATION NO. 928 AND G.P.S. STATION NO. 929 PER RECORD OF SURVEY NO. 14492.

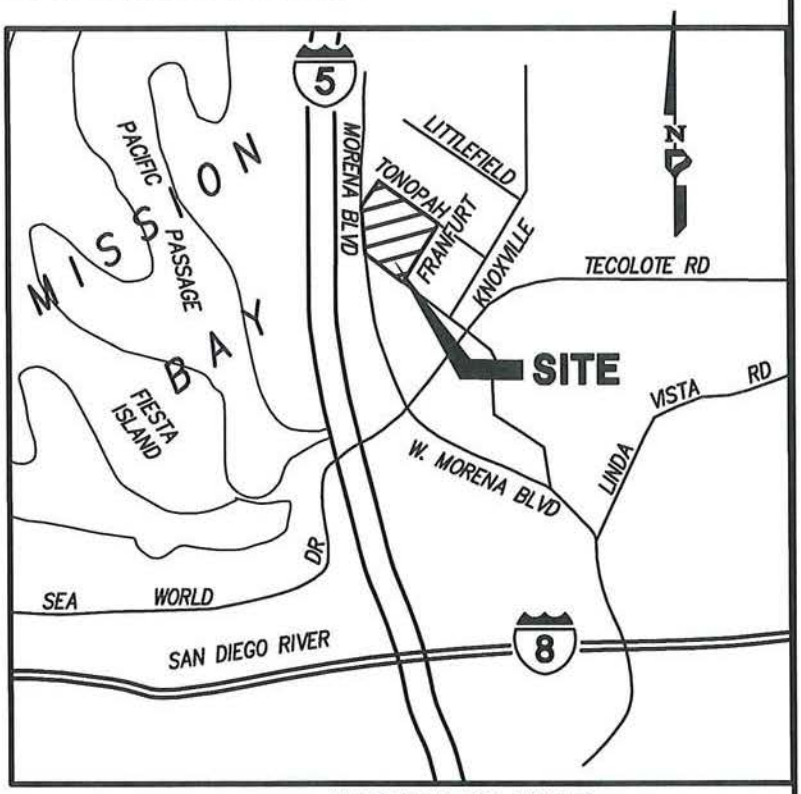
I.E., SOUTH 60°54'21" EAST

DISTANCES SHOWN HEREON ARE GRID DISTANCES. TO OBTAIN GROUND LEVEL DISTANCES MULTIPLY DISTANCES BY 1/1.0000029. QUOTED BEARINGS FROM REFENCE MAPS/DEEDS MAY OR MAY NOT BE IN TERMS OF SAID SYSTEM.

BENCH MARK

CITY OF SAN DIEGO BRASS DISC AT THE S.E. CURB RETURN OF TONOPAH AND FRANKFURT.

ELEVATION : 29.315' M.S.L. DATUM (N.G.V.D. 29)



VICINITY MAP

NO SCALE

LEGEND

	*INDICATES PORTION OF PROPERTY TO BE REMOVED FROM THE SPECIAL FLOOD HAZARD AREA (SFHA) AREA: 5.529 ACRES*
— - - - —	*INDICATES PROJECT BOUNDARY*
P.O.B.	*INDICATES POINT OF COMMENCEMENT*
●	*INDICATES FOUND MONUMENT AS NOTED ON PLAN*

David W. Ambler 6-05-2017

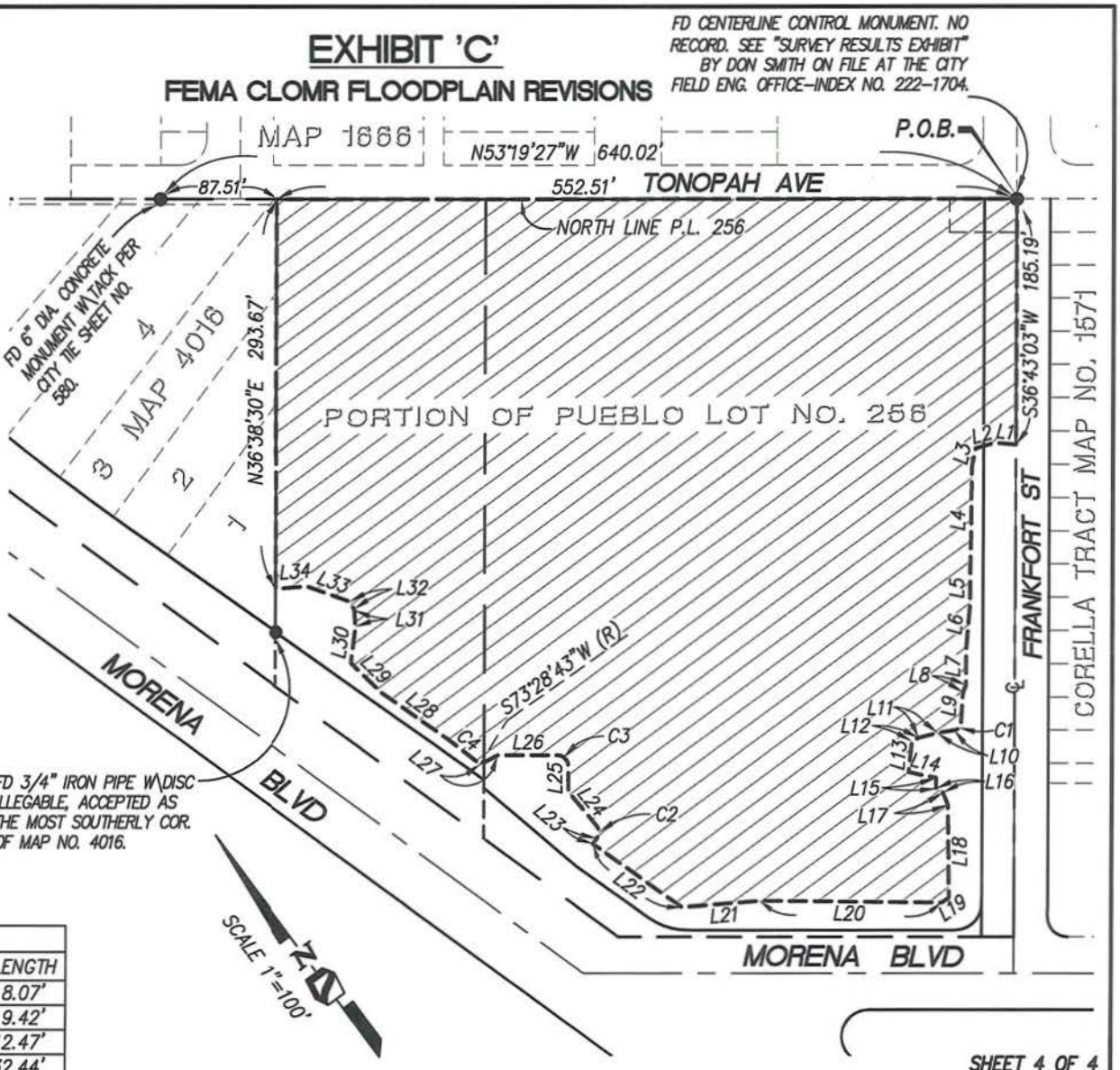
DAVID W. AMBLER, L.S. NO. 7322 DATE

LICENSED LAND SURVEYOR
DAVID W. AMBLER
NO. 7322
Exp. 12/31/2017
STATE OF CALIFORNIA

DRAFT

EXHIBIT 'C'

FEMA CLOMR FLOODPLAIN REVISIONS



LINE TABLE		
NO.	BEARING	LENGTH
L1	N48°31'51"W	16.06'
L2	N69°58'54"W	14.62'
L3	S48°00'03"W	13.52'
L4	S37°19'08"W	82.26'
L5	S36°46'52"W	20.50'
L6	S41°14'51"W	35.45'
L7	S36°53'42"W	26.65'
L8	S58°23'00"W	5.92'
L9	S39°48'44"W	23.12'
L10	N63°05'11"W	12.65'
L11	N67°41'36"W	14.68'
L12	N80°53'00"W	5.67'
L13	S42°35'56"W	23.24'
L14	S41°29'26"E	21.06'
L15	S36°43'25"W	8.16'
L16	S24°05'27"E	5.95'
L17	S15°26'47"W	9.97'
L18	S35°51'36"W	69.69'
L19	N88°36'51"W	6.29'
L20	N52°44'43"W	136.16'
L21	N57°57'13"W	58.48'
L22	N17°37'52"W	81.66'
L23	N72°22'08"E	4.92'
L24	N03°04'47"W	34.03'
L25	N36°02'57"E	19.62'
L26	N53°17'12"W	44.77'
L27	N81°51'52"W	14.61'
L28	N18°04'04"W	59.29'
L29	N09°06'12"W	31.84'
L30	N43°34'55"E	27.62'
L31	N32°42'46"E	12.44'
L32	N08°12'57"E	7.23'
L33	N33°43'56"W	34.02'
L34	N57°44'07"W	23.43'

ARC TABLE			
NO.	DELTA	RADIUS	LENGTH
C1	Δ=77°06'05"	6.00'	8.07'
C2	Δ=67°27'23"	8.00'	9.42'
C3	Δ=89°20'09"	8.00'	12.47'
C4	Δ=02°13'15"	836.88'	32.44'

Project Name: Morena Apartment Homes

CITY OF SAN DIEGO

PRIORITY DEVELOPMENT PROJECT (PDP)
STORM WATER QUALITY MANAGEMENT PLAN (SWQMP)
FOR
Morena Apartment Homes
SDP/VTM/PDP PTS #526167

ENGINEER OF WORK:

Debby Reece, PE
RCE 56148, REGISTRATION EXPIRES 12/31/18

PREPARED FOR:

Fairfield Realty III, LLC
5510 Morehouse Drive, Suite 200
San Diego, CA 92121
858.626.8263

PREPARED BY:

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey

701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
619.234.0349 Fax

DATE OF SWQMP:
January 17, 2017

Job No. 4197.00

Approved by: City of San Diego Date

Project Name: Morena Apartment Homes

TABLE OF CONTENTS

Project Name: Morena Apartment Homes

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

Project Name: Morena Apartment Homes

CERTIFICATION PAGE

Project Name: Morena Apartment Homes
Permit Application Number: PTS 526167

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.

_____
Debby Reece, PE, RCE 56148, Registration Expires 12/31/18

Debby Reece
Print Name

Project Design Consultants
Company

_____
Date

Project Name: Morena Apartment Homes

SUBMITTAL RECORD

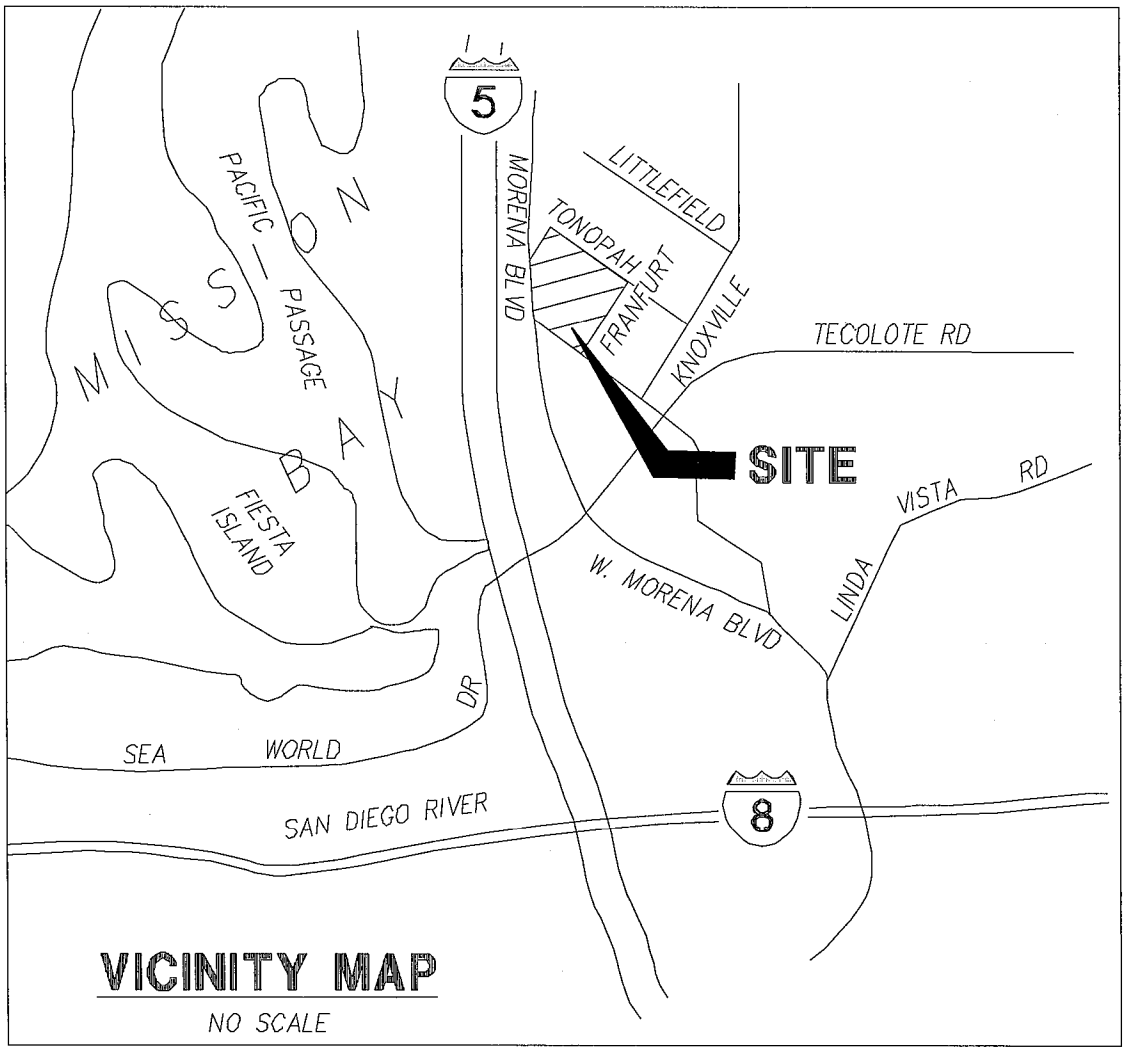
Use this Table to keep a record of submittals of this PDP SWQMP. Each time the PDP SWQMP is re-submitted, provide the date and status of the project. In last column indicate changes that have been made or indicate if response to plancheck comments is included. When applicable, insert response to plancheck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

Submittal Number	Date	Project Status	Summary of Changes
1	12/5/2016	☒ Preliminary Design / Planning / CEQA ☐ Final Design	Initial Submittal
2	5/8/2017	☒ Preliminary Design / Planning / CEQA ☐ Final Design	2nd Submittal
3	7/21/2017	☒ Preliminary Design / Planning / CEQA ☐ Final Design	3rd Submittal
4	11/16/2017	☒ Preliminary Design / Planning / CEQA ☐ Final Design	4th Submittal
5	1/17/2018	☒ Preliminary Design / Planning / CEQA ☐ Final Design	5th Submittal

Project Name: Morena Apartment Homes

PROJECT VICINITY MAP

Project Name: Morena Apartment Homes
Permit Application Number: 526167



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
OCTOBER 2016

Project Address: 1577-79 MORENA BLVD.

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 projects 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 resulting 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 below, 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 Priority

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.

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 and check the box labeled "Priority Development Project".

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. ☑ 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 PERMANENT 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. ☐
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 ☑

CAMERON BELL — Name of Owner or Agent *(Please Print)*

CIVIL ENGINEER — Title

Signature

May 8, 2017 — Date

Applicability of Permanent, Post-Construction Storm Water BMP Requirements (Storm Water Intake Form for all Development Permit Applications)	Form I-1

Project Identification

Project Name: Morena Apartment Homes	
Permit Application Number: **526167**	Date: 1/17/18

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.	☒ 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.
	☒ 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.

Project Name: Morena Apartment Homes

Form I-1		
[Step 2 Continued from Page 1] Discussion / justification, and additional requirements for exceptions to PDP definitions, if applicable:		
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.
	☒No	BMP Design Manual PDP requirements apply. Go to Step 4.
Discussion / justification of prior lawful approval, and identify requirements (*not required if prior lawful approval does not apply*):		
Step 4: Do hydromodification control requirements apply? See Section 1.6 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☐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: The project discharges into a hardline storm drain leading to Tecolote Creek, a fully concrete lined channel. Tecolote Creek then outfalls into Mission Bay at a point that is not located within a nature preserve.		
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.
	☒N/A	Management measures not required for protection of critical coarse sediment yield areas. Provide brief discussion below. Stop.

Project Name: Morena Apartment Homes

Discussion / justification if protection of critical coarse sediment yield areas does not apply: The project is hydromodification exempt and therefore the protection of critical coarse sediment yield areas does not apply.	
Site Information Checklist For PDPs	**Form I-3B**
Project Summary Information	
Project Name	Morena Apartment Homes
Project Address	1577-79 Morena Boulevard
Assessor's Parcel Number(s) (APN(s))	436-020-40 and 41
Permit Application Number	526167
Project Watershed	Select One: ☐San Dieguito ☐Penasquitos ☒Mission Bay ☐San Diego River ☐San Diego Bay ☐Tijuana River
Hydrologic subarea name with Numeric Identifier up to two decimal places (9XX.XX)	Tecolote Creek-Frontal Mission Bay (906.50)
Parcel Area (total area of Assessor's Parcel(s) associated with the project)	6.21 Acres (270,638 Square Feet) (including 0.306 ac of Frankfort St.)
Area to be Disturbed by the Project (Project Area)	5.73 Acres (270,638 Square Feet)
Project Proposed Impervious Area (subset of Project Area)	4.28 Acres (195,715 Square Feet)
Project Proposed Pervious Area (subset of Project Area)	1.45 Acres (74,923 Square Feet)
Note: Proposed Impervious Area + Proposed Pervious Area = Area to be Disturbed by the Project. This may be less than the Parcel Area.	
The proposed increase or decrease in impervious area in the proposed condition as compared to the pre-project condition	-16 % (approx.. 1 ac. Pre project perviousness)

Project Name: Morena Apartment Homes

Form I-3B
Description of Existing Site Condition
Current Status of the Site (select all that apply): ☒ Existing development ☐ Previously graded but not built out ☐ Demolition completed without new construction ☐ Agricultural or other non-impervious use ☐ Vacant, undeveloped/natural Description / Additional Information: Presently the site is developed as a trailer/RV park with a few small support structures (eg. laundry).
Existing Land Cover Includes (select all that apply): ☒ Vegetative Cover ☐ Non-Vegetated Pervious Areas ☒ Impervious Areas Description / Additional Information: The existing impervious cover consists of asphalt paving and concrete drive pads. The existing vegetative cover consists of square grassed areas and a few trees spread throughout the park.
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:

Project Name: Morena Apartment Homes

Form I-3B
Description of Existing Site Drainage Patterns
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. Onsite runoff is divided into two major areas, northwest and south east, which both sheet flow along the streets to the southwest. The northwest area is roughly split into three areas that enter the gutter through separate curb outlets along Morena Boulevard and into a curb inlet along Morena Boulevard. The southeast area enters a separate curb inlet at the corner of Morena and Frankfort St. See the attached drainage report for additional details including discharge points and peak flow rates.

Project Name: Morena Apartment Homes

Form I-3B
Description of Proposed Site Development
Project Description / Proposed Land Use and/or Activities: The proposed project will entail the construction of 150 multi-family apartment units within 9 multi-story buildings, as well as a club house and pool area.
List/describe proposed impervious features of the project (e.g., buildings, roadways, parking lots, courtyards, athletic courts, other impervious features): The impervious features of the project will consist of apartment buildings, drive aisles, parking lots and patios.
List/describe proposed pervious features of the project (e.g., landscape areas): The pervious features of the project included landscape areas.
Does the project include grading and changes to site topography? ☒ Yes ☐ No Description / Additional Information: The site is presently sloped gradually along its extent and experiences a drop of about ten feet. It will undergo cut and fill in to bring the finished floor elevations above the floodplain and will likely require some import of dirt.

Project Name: Morena Apartment Homes

Form I-3B
Description of Proposed Site Drainage Patterns

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

☒ Yes

☐ 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.

Describe proposed site drainage patterns:

The proposed site drainage conveyance network will consist of curb and ribbon gutters, an area drain system and an underground stormdrain system. Three biofiltration basins and three Modular Wetland units will be employed to provide treatment requirements. Storm water will reach these treatment BMPs through the storm drain and area drain system. In some cases the roof downspouts may sheet flow into the biofiltration basins. A storm drain system will carry the outflow from the BMPs to one of the two discharge points. These discharge points will remain the same as in the existing condition as will the split of the areas between each, generally with minor changes due to grading or storm drain constraints. See the attached drainage report for additional details including discharge points and peak flow rates.

Project Name: Morena Apartment Homes

Form I-3B

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
- ☒ Landscape/Outdoor Pesticide Use
- ☒ 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
- ☐ Fire Sprinkler Test Water
- ☐ Miscellaneous Drain or Wash Water
- ☐ Plazas, sidewalks, and parking lots
- ☐ Large Trash Generating Facilities
- ☐ Animal Facilities
- ☐ Plant Nurseries and Garden Centers
- ☐ Automotive-related Uses

Description / Additional Information:

Project Name: Morena Apartment Homes

Form I-3B
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) From the discharge point at the curb inlets along Morena, the storm drain system leads north west into a collector along West Morena, where it then travels southwest approximately 1500 feet until it enters Tecolote Creek channel. From the point of entry into Tecolote channel it will travel another few hundred feet or so where it discharges into Mission Bay at the Enchanted Cove near Fiesta Island.
Provide a summary of all beneficial uses of receiving waters downstream of the project discharge locations. ➢ Industrial Services Supply: Includes use of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well re-pressurization ➢ Contact Recreation: Includes use of water for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and SCUBA diving, surfing, white water activities, fishing, or use of natural hot springs. ➢ Non-Contact Recreation: Includes use of water for recreation involving proximity to water, but not normally involving body contact with water where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, camping, boating, tide pool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities. ➢ Commercial and Sport Fishing: Includes the uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes. ➢ Estuarine Habitat: Includes uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds). ➢ Wildlife Habitat: Includes uses of water that support terrestrial ecosystems including but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife, (e. g. , mammals, birds, reptiles, amphibians, invertebrates), or wildlife and food sources. ➢ Rare, Threatened, or Endangered Species: Includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered. ➢ Marine Habitat: Includes uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds) ➢ Shellfish Harvesting: Includes uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial, sport purposes

Project Name: Morena Apartment Homes

Identify all ASBS (areas of special biological significance) receiving waters downstream of the project discharge locations.

There are no ASBS receiving waters downstream of the projects.

Provide distance from project outfall location to impaired or sensitive receiving waters.

The outfall is located in Tecolote Creek which is an impaired receiving water, as is the area in Mission Bay at the mouth of Tecolote Creek.

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 project does not include any disturbance to MHPA lands. The only environmentally sensitive lands affected by the project are the FEMA floodplain areas, which will be raised to remove the proposed structures from the special flood hazard area.

Form I-3B

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
Tecolote Creek	Cadmium, Copper, Indicator Bacteria, Lead, Nitrogen, Phosphorus, Selenium, Toxicity, Turbidity, Zinc	
Mission Bay	Eutrophic, Lead	

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	Expected from the Project Site	Also a Receiving Water Pollutant of Concern
Sediment			
Nutrients			

Project Name: Morena Apartment Homes

Heavy Metals			
Organic Compounds			
Trash & Debris			
Oxygen Demanding Substances			
Oil & Grease			
Bacteria & Viruses			
Pesticides			

Form I-3B

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):

The project discharges into a storm drain system that leads into Tecolote Creek channel. This channel has both its bed and banks lined at the point of entry until it discharges into Mission Bay. Refer to Attachment 2 for additional documentation.

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, No critical coarse sediment yield areas to be protected based on WMAA maps

Discussion / Additional Information:

Form I-3B

Flow Control for Post-Project Runoff*

***This Section only required if hydromodification management requirements apply**

Project Name: Morena Apartment Homes

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.

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)

Project Name: Morena Apartment Homes

Form I-3B
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.
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. The shallow invert elevations of the discharge points place vertical constraints on the placement of BMP outlets. The site will undergo fill in order to elevate it out of the floodplain making some portions of the site impossible to treat due to grading constraints, and depth to storm drain connections. Therefore these have been regarded as De Minimis areas. While the De Minimis areas are larger than technically allowed individually, together they account for less than 2% of the site and will be accommodated by the green streets elements implemented for the public improvements on the street frontage.

Project Name: Morena Apartment Homes

Source Control BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects)	Form I-4		
Project Identification			
Project Name: Morena Blvd Apartment Homes			
Permit Application Number: **526167**			
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 Model BMP Design Manual 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 Model 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	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-1 not implemented:			
SC-2 Storm Drain Stenciling or Signage	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-2 not implemented: Private trench drain will be stenciled as required.			
SC-3 Protect Outdoor Materials Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☒ N/A
Discussion / justification if SC-3 not implemented: No outdoor material storage areas planned.			
SC-4 Protect Materials Stored in Outdoor Work Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☐ Yes	☐ No	☒ N/A
Discussion / justification if SC-4 not implemented: No outdoor work areas planned.			

Project Name: Morena Apartment Homes

Form I-4			
Source Control Requirement	**Applied?**		
SC-5 Protect Trash Storage Areas from Rainfall, Run-On, Runoff, and Wind Dispersal	☒ Yes	☐ No	☐ N/A
Discussion / justification if SC-5 not implemented:			
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	☐ N/A
Interior floor drains and elevator shaft sump pumps	☒ Yes	☐ No	☐ N/A
Interior parking garages	☒ Yes	☐ No	☐ N/A
Need for future indoor & structural pest control	☒ Yes	☐ No	☐ N/A
Landscape/Outdoor Pesticide Use	☒ Yes	☐ No	☐ N/A
Pools, spas, ponds, decorative fountains, and other water features	☒ Yes	☐ No	☐ N/A
Food service	☒ Yes	☐ No	☐ N/A
Refuse Areas	☒ Yes	☐ No	☐ N/A
Industrial processes	☐ Yes	☐ No	☒ N/A
Outdoor storage of equipment or materials	☐ Yes	☐ No	☒ N/A
Vehicle/Equipment Repair and Maintenance	☐ Yes	☐ No	☒ N/A
Fuel Dispensing Areas	☐ Yes	☐ No	☒ N/A
Loading Docks	☐ Yes	☐ No	☒ N/A
Fire Sprinkler Test Water	☒ Yes	☐ No	☐ N/A
Miscellaneous Drain or Wash Water	☒ Yes	☐ No	☐ N/A
Plazas, sidewalks, and parking lots	☒ Yes	☐ No	☐ N/A
SC-6A: Large Trash Generating Facilities	☐ Yes	☐ No	☒ N/A
SC-6B: Animal Facilities	☐ Yes	☐ No	☒ N/A
SC-6C: Plant Nurseries and Garden Centers	☐ Yes	☐ No	☒ N/A
SC-6D: Automotive-related Uses	☐ Yes	☐ 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.			

Project Name: Morena Apartment Homes

Site Design BMP Checklist for All Development Projects (Standard Projects and Priority Development Projects)	Form I-5

Project Identification

Project Name: Morena Apartment Homes

Permit Application Number: **526167**

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	☐ No	☒ N/A
Discussion / justification if SD-1 not implemented: No natural drainage pathways or hydrologic features are present in the existing conditions. Street trees have been added to form self-retaining areas where small pieces of project runoff along the property line cannot be routed into a BMP because of grading constraints.				
1-1	Are existing natural drainage pathways and hydrologic features mapped on the site map?	☐Yes	☐ No	☒ N/A
1-2	Are street trees implemented? If yes, are they shown on the site map?	☒Yes	☐ No	☐ N/A
1-3	Implemented street trees meet the design criteria in SD-1 Fact Sheet (e.g. soil volume, maximum credit, etc.)?	☒Yes	☐ No	☐ N/A
1-4	Is street tree credit volume calculated using Appendix B.2.2.1 and SD-1 Fact Sheet in Appendix E?	☒Yes	☐ No	☐ N/A
SD-2 Have natural areas, soils and vegetation been conserved?		☐Yes	☒ No	☐ N/A
Discussion / justification if SD-2 not implemented: The site has to undergo significant fill to raise out of the floodplain, thus vegetation cannot be conserved.				
SD-3 Minimize Impervious Area		☒Yes	☐ No	☐ N/A

Project Name: Morena Apartment Homes

Discussion / justification if SD-3 not implemented:				
SD-4 Minimize Soil Compaction		☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-4 not implemented:				
SD-5 Impervious Area Dispersion		☒ Yes	☐ No	☐ N/A
Discussion / justification if SD-5 not implemented:				
Form I-5				
Site Design Requirement		**Applied?**		
SD-6 Runoff Collection		☒Yes	☐ No	☐ N/A
Discussion / justification if SD-6 not implemented:				
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	☐ No	☒ N/A
6a-2	Is green roof credit volume calculated using Appendix B.2.1.2 and SD-6A Fact Sheet in Appendix E?	☐Yes	☐ No	☒ N/A
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?	☐Yes	☐ No	☒ N/A
6b-2	Is permeable pavement credit volume calculated using Appendix B.2.1.3 and SD-6B Fact Sheet in Appendix E?	☐Yes	☐ No	☒ N/A
SD-7 Landscaping with Native or Drought Tolerant Species		☒Yes	☐ No	☐ N/A
Discussion / justification if SD-7 not implemented:				
SD-8 Harvesting and Using Precipitation		☐ Yes	☒ No	☐ N/A
Discussion / justification if SD-8 not implemented: The Harvest & Reuse Feasibility Worksheet determined that this was not feasible.				
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	☒ No	☐ N/A
8-2	Is rain barrel credit volume calculated using Appendix B.2.2.2 and SD-8 Fact Sheet in Appendix E?	☐ Yes	☒ No	☐ N/A
Insert Site Map with all site design BMPs identified:				
Refer to Attachment 1A for site design BMPs.				

Project Name: Morena Apartment Homes

Summary of PDP Structural BMPs	Form I-6 (PDPs)
Project Identification	
Project Name: Morena Apartment Homes	
Permit Application Number: **526167**	
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).	

Project Name: Morena Apartment Homes

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.

Based on a recommendation of partial-infiltration by the geotechnical engineer, biofiltration basins with partial retention were implemented where possible for treatment and retention purposes. The siting and selection performed was based on spatial and grading constraints with the intent to spread them out across the site in order to limit the opportunity for runoff to collect pollutants and provide adequate fall to the discharge points. Runoff from the site will be treated with a combination of three (3) biofiltration basins and three (3) Modular Wetlands units. Where the site plan provided landscaping with sufficient area for biofiltration basins, they have been sited accordingly. To make up for volume retention deficit dispersion areas will be implemented throughout the site.

Generally these basins are located toward the upstream portion of the site where fall to the discharge points is available for underdrains to extend out at an allowable slope, as these discharge points are very shallow. For this reason Modular Wetland units have been implemented toward the downstream portion of the site where the difference between the BMP inlets and outlets was more constrained in order to provide the proper slope for the discharge pipes. This lack of fall in combination with grade changes due to the fill requiring steep driveways make it a challenge to capture and treat all areas. A number of means were used to capture as much run off as possible on these driveways to keep the total of the de-minimis areas within the allowable limits. There are landscaped areas along the perimeter of the site identified as self-mitigating areas. Runoff from these areas will drain offsite.

In the case of the driveway along Morena Boulevard, a pump to get the water back up to the closet Modular Wetland has been placed at the bottom of the driveway to capture gutter runoff. The driveway has been sloped to ensure no more than 250 SF of area bypasses. It is anticipated that further refinement of this BMP approach will be proposed with final engineering.

The driveway along Frankfort Street is similarly tilted the with the prevailing slope of the street, in this case to the southwest. A Modular wetland has been placed as far down gradient as possible to still allow drainage into the storm drain. The fine grading of the driveway and the curb inlet and approach, will ensure that no greater than 250 ft.^{2} will bypass. In total, these de-minimis areas make up less than 2% of the drainage area and this calculation has been provided in Attachment 1e.

During final engineering, it is anticipated that the required parkway and street widening adjacent to the project will be permitted with a separate public improvement plan. Due to the shallow existing storm drain and the significant amount of upstream runoff, it is proposed that the street widening project be addressed as a PDP exempt project by using Green Streets Guidance. Street Trees will be incorporated as the Green Street feature. Refer to Attachment 1E for a copy of Form J-1 for the PDP exemption justification of the street widening.

Project Name: Morena Apartment Homes

Form I-6
Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**
Structural BMP ID No. 1
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) ☒ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ 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 discussion section below) ☐ 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 forms if required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Project Design Consultants 619-235-6471
Who will be the final owner of this BMP?	Fairfield Realty III, LLC
Who will maintain this BMP into perpetuity?	Fairfield Realty III, LLC
What is the funding mechanism for maintenance?	Revenue from the property

Project Name: Morena Apartment Homes

Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No. 2	
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) ☒ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ 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 discussion section below) ☐ 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 forms if required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Project Design Consultants 619-235-6471
Who will be the final owner of this BMP?	Fairfield Realty III, LLC
Who will maintain this BMP into perpetuity?	Fairfield Realty III, LLC
What is the funding mechanism for maintenance?	Revenue from the property

Project Name: Morena Apartment Homes

Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No. 3	
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) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ 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 discussion section below) ☐ 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 forms if required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Project Design Consultants 619-235-6471
Who will be the final owner of this BMP?	Fairfield Realty III, LLC
Who will maintain this BMP into perpetuity?	Fairfield Realty III, LLC
What is the funding mechanism for maintenance?	Revenue from the property

Project Name: Morena Apartment Homes

Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No. 4	
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) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ 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 discussion section below) ☐ 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 forms if required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Project Design Consultants 619-235-6471
Who will be the final owner of this BMP?	Fairfield Realty III, LLC
Who will maintain this BMP into perpetuity?	Fairfield Realty III, LLC
What is the funding mechanism for maintenance?	Revenue from the property

Project Name: Morena Apartment Homes

Structural BMP Summary Information **(Copy this page as needed to provide information for each individual proposed structural BMP)**	
Structural BMP ID No. 5	
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) ☐ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ 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 discussion section below) ☐ 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 forms if required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Project Design Consultants 619-235-6471
Who will be the final owner of this BMP?	Fairfield Realty III, LLC
Who will maintain this BMP into perpetuity?	Fairfield Realty III, LLC
What is the funding mechanism for maintenance?	Revenue from the property

Project Name: Morena Apartment Homes

Structural BMP ID No. 6	
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) ☒ Proprietary Biofiltration (BF-3) meeting all requirements of Appendix F ☐ 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 discussion section below) ☐ 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 forms if required by the City Engineer (See Section 1.12 of the BMP Design Manual)	Project Design Consultants 619-235-6471
Who will be the final owner of this BMP?	Fairfield Realty III, LLC
Who will maintain this BMP into perpetuity?	Fairfield Realty III, LLC
What is the funding mechanism for maintenance?	Revenue from the property

Project Name: Morena Apartment Homes

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

Date Prepared: Click here to enter text.	Project No.: Click here to enter text.
Project Applicant: Click here to enter text.	Phone: Click here to enter text.
Project Address: Click here to enter text.	
Project Engineer: Click here to enter text.	Phone: Click here to enter text.

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. Click here to enter text.; 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: _Insert Date__

Printed Name: _Click here to enter text.__

Title: _Click here to enter text.__

Phone No. _Click here to enter text.__

Engineer's

DS-563 (12-15)

ATTACHMENT 1

BACKUP FOR PDP POLLUTANT CONTROL BMPS

This is the cover sheet for Attachment 1.

Project Name: Morena Apartment Homes

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 1a	DMA Exhibit (Required) See DMA Exhibit Checklist.	☒ Included
Attachment 1b	Tabular Summary of DMAs Showing DMA ID matching DMA Exhibit, DMA Area, and DMA Type (Required)* *Provide table in this Attachment OR on DMA Exhibit in Attachment 1a	☒ Included on DMA Exhibit in Attachment 1a ☐ Included as Attachment 1b, separate from DMA Exhibit
Attachment 1c	Form I-7, Harvest and Use Feasibility Screening Checklist (Required unless the entire project will use infiltration BMPs) Refer to Appendix B.3-1 of the BMP Design Manual to complete Form I-7.	☒ Included ☐ Not included because the entire project will use infiltration BMPs
Attachment 1d	Form I-8, Categorization of Infiltration Feasibility Condition (Required unless the project will use harvest and use BMPs) Refer to Appendices C and D of the BMP Design Manual to complete Form I-8.	☒ Included ☐ Not included because the entire project will use harvest and use BMPs
Attachment 1e	Pollutant Control BMP Design Worksheets / Calculations (Required) Refer to Appendices B and E of the BMP Design Manual for structural pollutant control BMP design guidelines and site design credit calculations	☒ Included

Project Name: Morena Apartment Homes

ATTACHMENT 1a,b

DMA Exhibit

Project Name: Morena Apartment Homes

Use this checklist to ensure the required information has been included on the DMA Exhibit:

The DMA Exhibit must identify:

- ☐ Underlying hydrologic soil group
- ☐ Approximate depth to groundwater
- ☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☐ Critical coarse sediment yield areas to be protected
- ☐ Existing topography and impervious areas
- ☐ Existing and proposed site drainage network and connections to drainage offsite
- ☐ Proposed demolition
- ☐ Proposed grading
- ☐ Proposed impervious features
- ☐ Proposed design features and surface treatments used to minimize imperviousness
- ☐ Drainage management area (DMA) boundaries, DMA ID numbers, and DMA areas (square footage or acreage), and DMA type (i.e., drains to BMP, self-retaining, or self-mitigating)
- ☐ Potential pollutant source areas and corresponding required source controls (see Chapter 4, Appendix E.1, and Form I-3B)
- ☐ Structural BMPs (identify location, type of BMP, and size/detail)

DMA SUMMARY

DMA #	DMA TYPE	DRAINAGE AREA Ac./(SF)	DMA #	DMA TYPE	DRAINAGE AREA Ac./(SF)
1	Drains to BMP	0.31	9	De-Minimis	(245 SF)
2	Drains to BMP	1.42	10	Self-Mitigating	0.09
3	Drains to BMP	1.77	11	De-Minimis	(250 SF)
4	Drains to BMP	0.40	12	Self-Mitigating	0.01
5	Drains to BMP	0.40	13	De-Minimis	(60 SF)
6	Drains to BMP	0.78	14	Self-Mitigating	0.10
7	Self-Mitigating	0.15	15	De-Minimis	(50 SF)
8	Self-Mitigating	0.28	16	Self-Mitigating	0.01

DMA #7
0.15 Ac.
SELF-MITIGATING

DMA #8
0.28 Ac.
SELF-MITIGATING

DMA #5
0.40 Ac.
Drains to
BMP#5

DMA #6
0.78 Ac.
Drains to
BMP#6

DMA #3
1.77 Ac.
Drains to
BMP#3

DMA #4
0.40 Ac.
Drains to
BMP#3

DMA #2
1.42 Ac.
Drains to
BMP#2

DMA #1
0.31 Ac.
Drains to
BMP#1

DMA #9
245 SF
DE-MINIMIS

DMA #10
0.09 Ac.
SELF-MITIGATING

DMA #11
250 SF.
DE-MINIMIS

DMA #16
0.01 Ac.
SELF-MITIGATING

DMA #15
(50 SF)
De-Minimis

DMA #14
0.1 Ac.
SELF-MITIGATING

DMA #13
60 SF
De-Minimis

DMA #12
0.01 Ac.
SELF-MITIGATING

BMP #5
NON-STANDARD
PARTIAL RETENTION
BIOFILTRATION BASIN

BMP #6
MODULAR WETLAND
(MWS-L-8-8)

BMP #4
NON-STANDARD
PARTIAL RETENTION
BIOFILTRATION BASIN

BMP #3
NON-STANDARD
PARTIAL RETENTION
BIOFILTRATION BASIN

BMP #2
MODULAR WETLAND
(MWS-L-8-12)

BMP #1
MODULAR WETLAND
(MWS-L-4-6)

PUMP

FF=21.0
PAD=20.0

FF=21.6
PAD=20.6

FF=19.9
PAD=18.9

FF=19.8
PAD=18.8

FF=19.5
PAD=18.5

FF=20.0
PAD=19.0

MORENCI STREET

TONOPAH AVE.

FRANKFORT STREET

WEST MORENA BLVD.

MORENA BLVD

LEGEND

- DMA BOUNDARY
- FLOW DIRECTION
- POTENTIAL DISPERSION AREA (SD-4,5)
- DISPERSED IMPERVIOUSNESS

BMP NOTES:

1. SITE DESIGN BMPS INCLUDE:
   - MINIMIZATION OF IMPERVIOUS FOOTPRINT
   - IMPERVIOUS DISPERSION
   - RUNOFF COLLECTION (DISTRIBUTED TREATMENT BMPs)
2. SOURCE CONTROL BMPs FOR PROJECT INCLUDE:
   - INTEGRATED PEST MANAGEMENT PRINCIPLES
   - EFFICIENT LANDSCAPE AND IRRIGATION DESIGN
   - STORMDRAIN STENCILING
   - PROTECTION OF TRASH STORAGE AREAS
   - BUILDING MANAGEMENT PRACTICES (MANAGEMENT OF FIRE SPRINKLER SYSTEM DISCHARGES, AIR CONDITIONING CONDENSATE DISCHARGES, AND THE USE OF NON-TOXIC ROOFING MATERIALS.)
3. THE TREATMENT BMPS SELECTED FOR THIS PROJECT ARE (3) PARTIAL RETENTION BIORFILTRATION BASINS AND (3) MODULAR WETLANDS
4. PROJECT IS HYDROMOD EXEMPT, SITE DISCHARGES TO HARDLINED CONNECTION THAT OUTFALLS TO TECOLOTE CHANNEL
5. THE NRCS SOIL SURVEY CLASSIFIES THE SITE SOILS AS HYDROLOGIC SOIL GROUP 'D'
6. GROUNDWATER WAS ENCOUNTERED between 7' and 9' MSL
7. PROJECT TO IMPLEMENT GREEN STREETS ELEMENTS FOR FRONTAGE IMPROVEMENTS (SEE FORM J1 IN APPENDIX A OF SWQMP)

N

0 10 20 40 60

GRAPHICAL SCALE

SCALE: 1"=20'

JOB #: 4197

CREATED: 1/17/18

PREPARED BY:

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey
701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
619.234.0349 Fax

CITY OF SAN DIEGO

MORENA APARTMENT HOMES

Attachment 1a
DMA EXHIBIT

Project Name: Morena Apartment Homes

ATTACHMENT 1c

Harvest & Use Feasibility

Harvest and Use Feasibility Checklist	Form I-7

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]

Total Demand = 643 + 338 = 981 CF

Landscape Irrigation:
Landscaping area = 1.72 ac
Assume Mod. Water Use:
1470 g/ac/36 hours x 1.72 Ac. = 2528 gallons (CF/7.48 gallons) = 338 CF

Toilet & urinal flushing:
Population = 75 1 Bedroom + 75 2 Bedroom = 75 x (1.8 pop/1 Bd) + 75 x (2.8 pop/2 Bd) = 345 pop
Population Demand = 9.3 gal/resident/24-hr
36 hr Demand = 9.3 gal/res/day x 1.5 days/36 hr x 345 pop = 4812.8 gallons (CF/7.48 gal) = 643 CF

3. Calculate the DCV using worksheet B-2.1.

DCV = 7596 CF (cubic feet) (for 6.0 acre drainage area)

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 ⇨ ⇩ 0.25DCV=1899 CF	☒ 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.

Is harvest and use feasible based on further evaluation?

☐ Yes, refer to Appendix E to select and size harvest and use BMPs.
☒ No, select alternate BMPs.

Project Name: Morena Apartment Homes

ATTACHMENT 1d

Infiltration Feasibility

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1 Page 1 of 4	
Part 1- Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without and undesirable consequences that cannot be reasonable 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 the Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.		X

Provide basis:

The infiltration test results of the proposed northwestern biofiltration basin had an unadjusted (pre-factor of safety) infiltration rate of 0.10 to 0.24 inches per hour. Infiltration test results of the proposed northeastern biofiltration basin area had an unadjusted (pre-factor of safety) infiltration rate of 0.81 to 2.87 inches per hour. The third basin located in the southern portion of the site will be located in a fill area. The infiltration for this basin was determined by obtaining a representative sample of soil that could be used as fill in the area of the basin. The sample was remolded to a 90-percent relative compaction and a saturated hydraulic conductivity test run on the sample. The test result indicated an infiltration rate of 0.10 inches per hour.

Based on the tested infiltration rates, only the northeastern biofiltration basin has an infiltration rate greater than 0.5 inches per hour; as a result, full infiltration is not feasible. Additionally, full infiltration is not considered feasible, due to the highly variable nature of the Old Paralic Deposits/Baypoint Formation soil types that are anticipated below the biofiltration basin bottoms and preponderance of infiltration rates well-below (or significantly lower than) 0.5 inches per hour.

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:

Geotechnical analysis of the proposed biofiltration basins and adjacent proposed buildings, retaining wall, and slope, indicates that lateral migration of the infiltration water may have a detrimental impact on the proposed improvements. However, the impact can be mitigated to an acceptable level by the placement of an impermeable liner along the sides of the biofiltration basins.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study source applicability.

Categorization of Infiltration Feasibility Condition		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: **Impacts relative to the risk of increasing groundwater contamination does not appear to be a constraint from a geotechnical standpoint at the site.** 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 C.3.	X	
Provide basis: **Impacts relative to causing potential water balance issues or increased discharge of contaminated groundwater to surface waters does not appear to be a constraint at the site.** Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study 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.	Result **Full Infiltration is NOT Feasible**	

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

Categorization of Infiltration Feasibility Condition		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 the Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
Provide basis: **The infiltration rates of the three proposed basin locations vary from 0.01 to 2.87 inches per hour; and consequently, are at or greater than an infiltration rate of 0.01 inches per hour. As a result, partial infiltration is feasible.** 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: **Geotechnical analysis of the proposed biofiltration basins and adjacent proposed buildings, retaining wall, and slope, indicates that lateral migration of the infiltration water may have a detrimental impact on the proposed improvements. However, the impact can be mitigated to an acceptable level by the placement of an impermeable liner along the sides of the biofiltration basins.** 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.			

Categorization of Infiltration Feasibility Condition		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: **Groundwater was encountered during the preliminary investigation of the site at an approximate elevation of 7 to 9 feet. Based on the elevation of the bottom of the gravel storage layer, the current groundwater elevation is within 6 to 8 feet of the proposed biofiltration basin bottom elevations.**			
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 C.3.	X	
Provide basis: **Based on Section C.3.7 of the San Diego City BMP Design Manual, downstream water rights should not be a constraint to partial infiltration at the site.**			
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 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 5-8 is "No", then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category in No Infiltration.	**Result** **Partial Infiltration is Feasible**	
Prepared by: Randall K Wagner **Randall K Wagner, CEG 1612** **LGC Valley, Inc.**		**Dated: June 23, 2017**	

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

Factor of Safety and Design Infiltration Rate Worksheet					Worksheet D.5-1 Page 1 of 1
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w * v
A	Suitability Assessment	Soil assessment methods	0.25	**2**	**0.50**
		Predominant soil Texture	0.25	**3**	**0.75**
		Site soil variability	0.25	**3**	**0.75**
		Depth to groundwater/impervious layer	0.25	**2**	**0.50**
		Suitability Assessment Safety Factor, $S_A = \sum_p$			**2.50**
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/ resiliency	0.25		
		Compaction during construction	0.25	**2**	**0.50**
		Design Safety Factor, $S_B = \sum_p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = {}^{K_{observed}}/_{S_{total}}$					

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

The percolation/infiltration field-testing for the northwestern and northeastern biofiltration basins was performed in general accordance with Section D.3.3.2 - Borehole Percolation Tests (various methods) of the San Diego City BMP Design Manual. Adjustment of the field percolation test results to an "infiltration rate" was performed utilizing the Porchet Method. The infiltration testing for the southern biofiltration basin was determined by obtaining a saturated hydraulic conductivity test of a representative sample of the on-site soil that could be used as fill in accordance with Section D.4.2 of the San Diego City BMP Design Manual.

The results of the percolation/infiltration testing is provided in the report entitled "Preliminary Bioretention Basin Infiltration Study, Proposed Apartment Complex Development, 1579 and 1623 Morena Boulevard, City of San Diego, California" by LGC Valley, Inc., dated November 29, 2016.

Project Name: Morena Apartment Homes

ATTACHMENT 1e

BMP Worksheets/Calculations

ATTACHMENT 1B: Worksheet B.2-1: DCV

85th percentile 24-hr storm depth from Figure B.1.= 0.52 in

DMA ID	BMP TYPE	BMP Drainage Area (ac)	Impervious Area (ac)	Amended Soils (ac) (C=0.1)	Natural A Soils (ac) (C=0.1)	% Impervious	Composite C^1	Tree Credit Volume (cf)	Design Capture Volume (DCV) (CF)
1	MOD. WETLAND	0.309	0.266	0.043		86%	0.79	0	460
2	MOD. WETLAND	1.417	1.219	0.197		86%	0.79	0	2109
3	BIOFILTRATION	1.780	1.547	0.233		87%	0.80	0	2673
4	BIOFILTRATION	0.402	0.307	0.095		76%	0.71	0	540
5	BIOFILTRATION	0.399	0.305	0.094		76%	0.71	0	536
6	MOD. WETLAND	0.730	0.589	0.141		81%	0.75	0	1027
12	STREET TREE (SD-1)	0.030	0.011	0.019		38%	0.41	23	0
13	STREET TREE (SD-1)	0.030	0.007	0.023		23%	0.29	16	0

Feasability Analysis for Proprietary BMP Utilization:

Alternative Minimum Sizing Factor

For DMA #1, 2 and 6 the ability to place a bioretention basin of any size toward the lower elevations of the site where these drain, is constrained by the amount of vertical fall between the proposed grade elevations and the outfall inverts. Because these inverts are so shallow, it would not be possible to ensure an adequate slope for the outlet pipes with the required bioretention basin profile of approximately 3 to 4 feet. The allowable depth change between inlet and outlet of a Modular Wetland unit at 1.33' makes them significantly less constrained vertically, which in the case of DMA #6 and #1 is the prevailing constraint. For DMA #2, while there may be enough fall, the proposed storm drain would have to be dropped potentially conflicting with other utilities. This would be exacerbated by the deep gravel profile required to meet Option #2 of the sizing methodology requiring that 75% of the DCV be stored.

Furthermore, due to the site plan constraints, the tight spacing of the driveways, parking lots and club house which could not be adjusted without compromising the site plan and program. This makes it infeasible to fit an alternatively sized BMP for the significant drainage area leading to it. There is only about 500 square feet of area total in between the pathways and buildings adjacent to the Modular Wetland (BMP #2) while an alternatively sized biofiltration would have to have an effective area of more than this amount which with sides slopes makes it clearly infeasible to place at this location.

DMA #6

Alt. Min Sf. = .012

Drainage Area = 1.42 ac

C = 0.79

Effective D.A. = 1.12 ac

Alt. Min. Basin Size Effective Area =0.012 x 0.79 x 1.42 ac x 43560 sf/ac = **586 sf**

Meeting Volume Retention Requirements Approach:

In order to meet the retention requirements on a site wide basis the partial retention biofiltration basins have been sized with an adequate gravel storage layer to meet and exceed the required volume for their respective DMAs. Due to the site constraints addressed above, the remaining DMAs are treated by Modular Wetlands and therefore are highly limited in their ability to meet their own partial retention needs.

The reliable infiltration rates for the DMAs draining to Modular Wetlands has been assumed to be 0.05 in/hr based on the City's Supplemental Guidance from November 2016. The updated spreadsheets forthcoming in the new manual release have been utilized to determine the target retention value for all DMAs as well as the marginal infiltration from the Modular Wetland units. The target and expected retention values have been summarized below.

Site Wide Volume Retention Requirements Fulfillment

DMA	Target Retention Volume - from Ws B.5-2 (cf)	BMP Retention -from WS B.5-3 (cf)
1	49	0
2	224	0
3	284	330
4	174	356
5	57	130
6	110	6
Sum	897	822
	Deficit:	75 CF

To make up the deficit of 75 CF and to provide cushion in case of issues in final engineering, a number of viable landscaping areas to implement dispersion (SD-4,5) have been located on the DMA map. One or more of these areas will be implemented in Final Engineering to ensure volume retention requirements are met.

De-Minimis Area Calculations

DMA#9 = 245 SF

DMA#11 = 250 SF

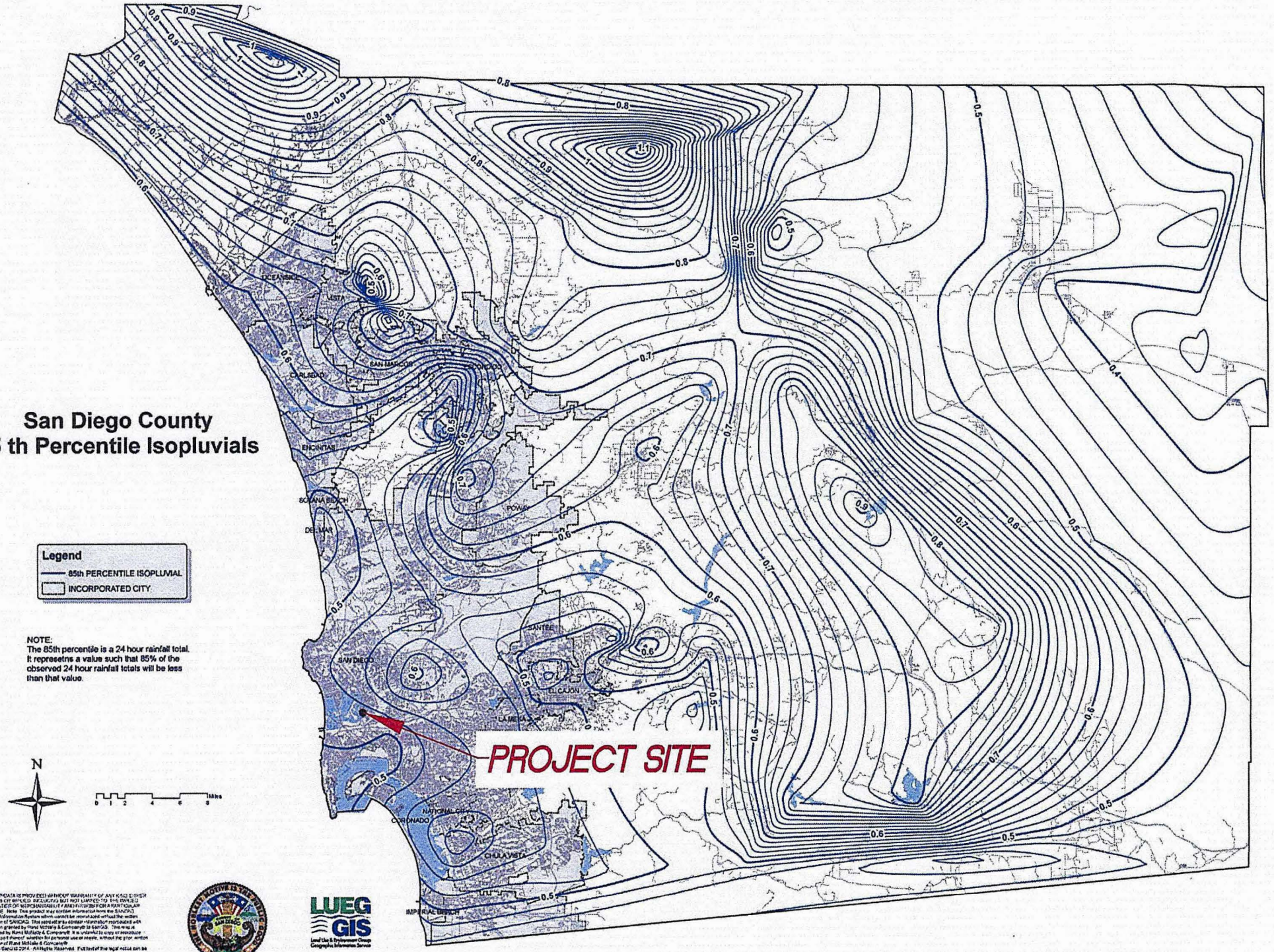
DMA#13 = 60 SF

DMA#15 = 50 SF

TOTAL De-Minimis Area = 605 SF

TOTAL Area = 249,599 SF (FROM TM Sheet 1 – Graded Net Site Area)

Percent De-Minimis: = 605/249,599 * 100% = 0.2%


San Diego County
85 th Percentile Isopluvials
Legend
85th PERCENTILE ISOPLUVIAL
INCORPORATED CITY
NOTE:
The 85th percentile is a 24 hour rainfall total. It represetns a value such that 85% of the observed 24 hour rainfall totals will be less than that value.
PROJECT SITE
N
Miles
0 1 2 4 6 8
OCEANSIDE
VISTA
SAN MARCOS
ESCONDIDO
CARLSBAD
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
NATIONAL CITY
CORONADO
CHULA VISTA
IMPERIAL BEACH
LUEG GIS

The City of SAN DIEGO	Project Name	Morena Apartments	
	BMP ID	3	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	77536.8	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.80	
3	85th percentile 24-hour rainfall depth	0.52	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	2673	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	12	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	4	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	23.2	inches
15	Total Depth Treated [Line 13 + Line 14]	53.2	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	4009	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	904	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	2004	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	1037	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-3)	0.011	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	678	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	904	sq. ft.
23	Provided BMP Footprint	1,400	sq. ft.
24	Is Line 23 > Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	Morena Apartments	
	BMP ID	3	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	77536.8	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.80	
3	85th percentile 24-hour rainfall depth	0.52	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	2673	cu. ft.
BMP Parameters			
5	Footprint of the BMP	1,400	sq. ft.
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Media retained pore space [50% of (FC-WP)]	0.05	in/in
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
9	Porosity of aggregate storage	0.4	in/in
Volume Retention Requirement			
10	Measured infiltration rate in the DMA	0.02	in/hr.
11	Factor of safety	2	
12	Reliable infiltration rate, for biofiltration BMP sizing [Line 10/ Line 11] Note: This worksheet is not applicable if Line 12 < 0.01 in/hr.	0.01	in/hr.
13	Average annual volume reduction target (Figure B.5-2) When Line 12 ≥ 0.01 in/hr. = Minimum (40, 166.9 x Line 12 +6.62)	8.3	%
14	Fraction of DCV to be retained (Figure B.5-3) $0.0000013 \times \text{Line } 13^3 - 0.000057 \times \text{Line } 13^2 + 0.0086 \times \text{Line } 13 - 0.014$	0.054	
15	Target volume retention [Line 14 x Line 4]	144	cu. ft.
Evapotranspiration: Average Annual Volume Retention			
16	Effective evapotranspiration depth [Line 6 x Line 7]	1.2	inches
17	Retained Pore Volume [(Line 16 x Line 5)/12]	140	cu. ft.
18	Fraction of DCV retained in pore spaces [Line 17/Line 4]	0.05	
19	Evapotranspiration average annual capture [ET nomographs in Figure B.5-5]	3.5	%
Infiltration: Average Annual Volume Retention			
20	Drawdown for infiltration storage [(Line 8 x Line 9)/Line 12]	480	hours
21	Equivalent DCV fraction from evapotranspiration (use Line 19 and Line 20 in Figure B.4-1; Refer to Appendix B.4.2.2)	0.04	
22	Infiltration volume storage [(Line 5 x Line 8 x Line 9)/12]	560	cu. ft.
23	Infiltration Storage Fraction of DCV [Line 22/Line 4]	0.21	
24	Total Equivalent Fraction of DCV [Line 21 + Line 23]	0.25	
25	Biofiltration BMP average annual capture [use Line 24 and 20 in Figure B.4-1]	20.87	%
Volume retention required from site design and other BMPs			
26	Fraction of DCV retained (Figure B.5-3) $0.0000013 \times \text{Line } 25^3 - 0.000057 \times \text{Line } 25^2 + 0.0086 \times \text{Line } 25 - 0.014$	0.152	
27	Remaining target DCV retention [(Line 14 – Line 26) x Line 4] Note: If Line 27 is equal to or smaller than 0 then the BMP meets the volume retention performance standard. If Line 27 is greater than 0, the applicant must implement site design and/or other BMPs within the DMA that will retain DCV equivalent to or greater than Line 27 to meet the volume retention performance standard	-262	cu. ft.
Volume Retention Performance Standard is Met			

The City of SAN DIEGO	Project Name	Morena Apartments
	BMP ID	3
Alternative Minimum Footprint Sizing Factor		**Worksheet B.5-3**

1	Area draining to the BMP	77536.8	sq. ft.
2	Adjusted Runoff Factor for drainage area (Refer to Appendix B.1 and B.2)	0.80	
3	Load to Clog	2	lb/sq. ft.
4	Allowable Period to Accumulate Clogging Load (T_L)	10	years

Volume Weighted EMC Calculation

Land Use	Fraction of Total DCV	TSS EMC (mg/L)	Product
Single Family Residential		123	0
Commercial		128	0
Industrial		125	0
Education (Municipal)		132	0
Transportation		78	0
Multi-family Residential	1	40	40
Roof Runoff		14	0
Low Traffic Areas		50	0
Open Space		216	0
Other, specify:			0
Other, specify:			0
Other, specify:			0

5	Volume Weighted EMC (sum of all products)	40	mg/L

Sizing Factor for Clogging

6	Adjustment for pretreatment measures Where: Line 6 = 0 if no pretreatment; Line 6 = 0.25 when pretreatment is included; Line 6 = 0.5 if the pretreatment has an active Washington State TAPE approval rating for "pre-treatment."	0	
7	Average Annual Precipitation [Provide documentation of the data source in the discussion box; SanGIS has a GIS layer for average annual precipitation]	11	inches
8	Calculate the Average Annual Runoff (Line 7 x Line 1/12) x Line2	56536	cu-ft/yr
9	Calculate the Average Annual TSS Load (Line 8 x 62.4 x Line 5 x (1 – Line 6))/10^6	141	lb/yr
10	Calculate the BMP Footprint Needed (Line 9 x Line 4)/Line 3	706	sq. ft.
11	Calculate the Minimum Footprint Sizing Factor for Clogging [Line 10/ (Line 1 x Line 2)]	0.011	

Discussion:

The City of SAN DIEGO	Project Name	Morena Apartments	
	BMP ID	4	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	17522	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.71	
3	85th percentile 24-hour rainfall depth	0.52	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	540	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	6	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	4	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	0	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	12.4	inches
15	Total Depth Treated [Line 13 + Line 14]	42.4	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	810	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	229	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	405	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	392	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-3)	0.011	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	137	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	229	sq. ft.
23	Provided BMP Footprint	710	sq. ft.
24	Is Line 23 > Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	Morena Apartments	
	BMP ID	4	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	17522	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	1	
3	85th percentile 24-hour rainfall depth	0.52	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	540	cu. ft.
BMP Parameters			
5	Footprint of the BMP	710	sq. ft.
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Media retained pore space [50% of (FC-WP)]	0.05	in/in
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	0	inches
9	Porosity of aggregate storage	0.4	in/in
Volume Retention Requirement			
10	Measured infiltration rate in the DMA	0.2	in/hr.
11	Factor of safety	2	
12	Reliable infiltration rate, for biofiltration BMP sizing [Line 10/ Line 11] Note: This worksheet is not applicable if Line 12 < 0.01 in/hr.	0.1	in/hr.
13	Average annual volume reduction target (Figure B.5-2) When Line 12 ≥ 0.01 in/hr. = Minimum (40, 166.9 x Line 12 +6.62)	23.3	%
14	Fraction of DCV to be retained (Figure B.5-3) $0.0000013 \times \text{Line } 13^3 - 0.000057 \times \text{Line } 13^2 + 0.0086 \times \text{Line } 13 - 0.014$	0.172	
15	Target volume retention [Line 14 x Line 4]	93	cu. ft.
Evapotranspiration: Average Annual Volume Retention			
16	Effective evapotranspiration depth [Line 6 x Line 7]	1.2	inches
17	Retained Pore Volume [(Line 16 x Line 5)/12]	71	cu. ft.
18	Fraction of DCV retained in pore spaces [Line 17/Line 4]	0.13	
19	Evapotranspiration average annual capture [ET nomographs in Figure B.5-5]	8.1	%
Infiltration: Average Annual Volume Retention			
20	Drawdown for infiltration storage [(Line 8 x Line 9)/Line 12]	0	hours
21	Equivalent DCV fraction from evapotranspiration (use Line 19 and Line 20 in Figure B.4-1; Refer to Appendix B.4.2.2)	0.02	
22	Infiltration volume storage [(Line 5 x Line 8 x Line 9)/12]	0	cu. ft.
23	Infiltration Storage Fraction of DCV [Line 22/Line 4]	0.00	
24	Total Equivalent Fraction of DCV [Line 21 + Line 23]	0.02	
25	Biofiltration BMP average annual capture [use Line 24 and 20 in Figure B.4-1]	8.08	%
Volume retention required from site design and other BMPs			
26	Fraction of DCV retained (Figure B.5-3) $0.0000013 \times \text{Line } 25^3 - 0.000057 \times \text{Line } 25^2 + 0.0086 \times \text{Line } 25 - 0.014$	0.052	
27	Remaining target DCV retention [(Line 14 – Line 26) x Line 4] Note: If Line 27 is equal to or smaller than 0 then the BMP meets the volume retention performance standard. If Line 27 is greater than 0, the applicant must implement site design and/or other BMPs within the DMA that will retain DCV equivalent to or greater than Line 27 to meet the volume retention performance standard	65	cu. ft.

Target Volume retention from site design and other BMPs = 65 cubic feet

The City of SAN DIEGO	Project Name	Morena Apartments	
	BMP ID	5	
Sizing Method for Pollutant Removal Criteria		**Worksheet B.5-1**	
1	Area draining to the BMP	17375	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.71	
3	85th percentile 24-hour rainfall depth	0.52	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	536	cu. ft.
BMP Parameters			
5	Surface ponding [6 inch minimum, 12 inch maximum]	6	inches
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Aggregate storage (also add ASTM No 8 stone) above underdrain invert (12 inches typical) – use 0 inches if the aggregate is not over the entire bottom surface area	4	inches
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
9	Freely drained pore storage of the media	0.2	in/in
10	Porosity of aggregate storage	0.4	in/in
11	Media filtration rate to be used for sizing (maximum filtration rate of 5 in/hr. with no outlet control; if the filtration rate is controlled by the outlet use the outlet controlled rate (includes infiltration into the soil and flow rate through the outlet structure) which will be less than 5 in/hr.)	5	in/hr.
Baseline Calculations			
12	Allowable routing time for sizing	6	hours
13	Depth filtered during storm [Line 11 x Line 12]	30	inches
14	Depth of Detention Storage [Line 5 + (Line 6 x Line 9) + (Line 7 x Line 10) + (Line 8 x Line 10)]	17.2	inches
15	Total Depth Treated [Line 13 + Line 14]	47.2	inches
Option 1 – Biofilter 1.5 times the DCV			
16	Required biofiltered volume [1.5 x Line 4]	804	cu. ft.
17	Required Footprint [Line 16/ Line 15] x 12	204	sq. ft.
Option 2 - Store 0.75 of remaining DCV in pores and ponding			
18	Required Storage (surface + pores) Volume [0.75 x Line 4]	402	cu. ft.
19	Required Footprint [Line 18/ Line 14] x 12	280	sq. ft.
Footprint of the BMP			
20	BMP Footprint Sizing Factor (Default 0.03 or an alternative minimum footprint sizing factor from Line 11 in Worksheet B.5-3)	0.009	
21	Minimum BMP Footprint [Line 1 x Line 2 x Line 20]	111	sq. ft.
22	Footprint of the BMP = Maximum(Minimum(Line 17, Line 19), Line 21)	204	sq. ft.
23	Provided BMP Footprint	710	sq. ft.
24	Is Line 23 > Line 22?	**Yes, Performance Standard is Met**	

The City of SAN DIEGO	Project Name	Morena Apartments	
	BMP ID	5	
Sizing Method for Volume Retention Criteria		**Worksheet B.5-2**	
1	Area draining to the BMP	17375	sq. ft.
2	Adjusted runoff factor for drainage area (Refer to Appendix B.1 and B.2)	0.71	
3	85th percentile 24-hour rainfall depth	0.52	inches
4	Design capture volume [Line 1 x Line 2 x (Line 3/12)]	536	cu. ft.
BMP Parameters			
5	Footprint of the BMP	710	sq. ft.
6	Media thickness [18 inches minimum], also add mulch layer and washed ASTM 33 fine aggregate sand thickness to this line for sizing calculations	24	inches
7	Media retained pore space [50% of (FC-WP)]	0.05	in/in
8	Aggregate storage below underdrain invert (3 inches minimum) – use 0 inches if the aggregate is not over the entire bottom surface area	12	inches
9	Porosity of aggregate storage	0.4	in/in
Volume Retention Requirement			
10	Measured infiltration rate in the DMA	1.62	in/hr.
11	Factor of safety	2	
12	Reliable infiltration rate, for biofiltration BMP sizing [Line 10/ Line 11] Note: This worksheet is not applicable if Line 12 < 0.01 in/hr.	0.81	in/hr.
13	Average annual volume reduction target (Figure B.5-2) When Line 12 ≥ 0.01 in/hr. = Minimum (40, 166.9 x Line 12 +6.62)	40.0	%
14	Fraction of DCV to be retained (Figure B.5-3) $0.0000013 \times \text{Line } 13^3 - 0.000057 \times \text{Line } 13^2 + 0.0086 \times \text{Line } 13 - 0.014$	0.322	
15	Target volume retention [Line 14 x Line 4]	173	cu. ft.
Evapotranspiration: Average Annual Volume Retention			
16	Effective evapotranspiration depth [Line 6 x Line 7]	1.2	inches
17	Retained Pore Volume [(Line 16 x Line 5)/12]	71	cu. ft.
18	Fraction of DCV retained in pore spaces [Line 17/Line 4]	0.13	
19	Evapotranspiration average annual capture [ET nomographs in Figure B.5-5]	8.1	%
Infiltration: Average Annual Volume Retention			
20	Drawdown for infiltration storage [(Line 8 x Line 9)/Line 12]	6	hours
21	Equivalent DCV fraction from evapotranspiration (use Line 19 and Line 20 in Figure B.4-1; Refer to Appendix B.4.2.2)	0.02	
22	Infiltration volume storage [(Line 5 x Line 8 x Line 9)/12]	284	cu. ft.
23	Infiltration Storage Fraction of DCV [Line 22/Line 4]	0.53	
24	Total Equivalent Fraction of DCV [Line 21 + Line 23]	0.55	
25	Biofiltration BMP average annual capture [use Line 24 and 20 in Figure B.4-1]	90.44	%
Volume retention required from site design and other BMPs			
26	Fraction of DCV retained (Figure B.5-3) $0.0000013 \times \text{Line } 25^3 - 0.000057 \times \text{Line } 25^2 + 0.0086 \times \text{Line } 25 - 0.014$	1.259	
27	Remaining target DCV retention [(Line 14 – Line 26) x Line 4] Note: If Line 27 is equal to or smaller than 0 then the BMP meets the volume retention performance standard. If Line 27 is greater than 0, the applicant must implement site design and/or other BMPs within the DMA that will retain DCV equivalent to or greater than Line 27 to meet the volume retention performance standard	-502	cu. ft.
Volume Retention Performance Standard is Met			

The City of SAN DIEGO	Project Name	Morena Apartments	
	BMP ID	Site Wide	
Volume Retention From Amended Soils		Worksheet B.5-6	
1	Impervious area draining to the pervious area	24331	sq. ft.
2	Pervious area (must meet the requirements in SD-4 and SD-5 Fact Sheets)	8415	sq. ft.
3	Measured Infiltration Rate	0.61	in/hr.
4	Factor of Safety	2	
5	Reliable Infitlration Rate [Line 3/Line 4]	0.305	
6	Impervious area runoff factor	0.9	
7	Runoff factor of pervious area Line 5 < 0.01 in/hr. = 0.9 0.01 ≤ Line 5 < 0.05 in/hr. = 0.30 0.05 ≤ Line 5 < 0.15 in/hr. = 0.23 0.15 ≤ Line 5 < 0.30 in/hr. = 0.14 Line 5 ≥ 0.30 in/hr. = 0.10	0.1	
8	Area weighted runoff factor [(Line 1 x Line 6 + Line 2 x Line 7)/(Line 1 + Line 2)]	0.69	
9	85th Percentile 24-hour rainfall depth	0.52	inches
10	Dispersion Ratio [Line 1/Line 2] Note: This worksheet is not applicable when Line 5 > 50 or Line 5 < 0.25	2.9	
11	Amendment Depth (Choose from 3", 6", 9", 12", 15" and 18")	12	inches
12	Post amendment runoff factor (Based on Figures B.5.6 to B.5.11)	0.05	
13	Volume retention due to dispersion and amendment If Line 12 ≥ Line 8 then Line 13 = 0; Else [(Line 8 – Line 12) x (Line 1 + Line 2) x Line 9 x 1/12]	908	cu. ft.

Modular Wetland Sizing Calculations

DMA-ID	A (sf)	Impervious (sf)	%IMP	C	1.5 x Q (cfs)	MWS Qdesign	MWS Model
1	13447	11587	86%	0.7893	0.073	0.073	MWS-L-4-6
2	61710	53114	86%	0.7886	0.335	0.346	MWS-L-8-12
6	31799	25661	81%	0.7456	0.163	0.23	MWS-L-8-8

Onsite Proprietary Biofiltration BMP Checklist | Form I-10

A proprietary biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA and the performance certification/data of the proprietary biofiltration BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite alternative compliance program to meet its pollutant control obligations.

An applicant using a proprietary biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

Criteria	Answer	Progression
Criteria 1 and 3: What is the infiltration condition of the DMA? Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. Complete and attach Worksheet C.4-1: Categorization of Infiltration Feasibility Condition to support the feasibility determination.	☐ Full Infiltration Condition	**Stop.** Proprietary biofiltration BMP is not allowed.
	☐ Partial Infiltration Condition	Proprietary biofiltration BMP is only allowed, if 40% (average annual capture) volume reduction is achieved within the BMP or downstream of the BMP. If the 40% volume reduction is achieved from within the BMP or downstream of the BMP **proceed to Criteria 2.** If the 40% of the volume reduction is not achieved, proprietary biofiltration BMP is not allowed. **Stop.**
	☒ No Infiltration Condition	Proprietary biofiltration BMP is allowed if one of the two criteria listed below are met: ☐ Documentation is provided to the satisfaction of the City Engineer that a larger footprint biofiltration BMP (i.e. minimum sizing factor calculated using worksheet B.5.2) is not feasible onsite; or ☐ Documentation is provided that volume reduction achieved by the larger footprint biofiltration BMP can be achieved through other measures (e.g., downstream site design BMPs, evapotranspiration from proprietary BMP, etc.) If one of the two criteria listed above is met **proceed to Criteria 2.** If neither criteria are met, proprietary biofiltration BMP is not allowed. **Stop.**

Onsite Proprietary Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:
Summarize findings and attach Worksheet C.4-1

If Partial Infiltration Condition:
Provide documentation that 40% (average annual capture; or 0.375*DCV when using a 36-hour drawdown BMP) volume reduction is achieved within the BMP or downstream of the BMP. This could be achieved through downstream site design BMPs, downstream infiltration BMP, incidental retention by having an open bottom in the proprietary BMP or other similar measures.

If No Infiltration Condition:
Provide documentation that the alternative minimum sizing factor (attach Worksheet B.5-2) BMP is not feasible onsite or the volume reduction achieved by a non-proprietary BMP sized to the alternative minimum sizing factor can be achieved through downstream site design BMPs, downstream evapotranspiration BMPs, incidental evapotranspiration from the proprietary BMP or other similar measures.

Criteria	Answer	Progression
Criteria 2: Is the proprietary biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Meets Flow based Criteria	Use guidance from Appendix F.2 to size the proprietary BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft cannot be designed using a loading rate of 1.5 gpm/sq. ft) **Proceed to Criteria 4.**
	☐ Meets Volume based Criteria	Provide documentation that the proprietary biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	☐ Does not Meet either criteria	**Stop.** Proprietary biofiltration BMP is not allowed.

Onsite Proprietary Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

Criteria	Answer	Progression
Criteria 4: Does the proprietary biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Yes, meets the TAPE certification.	Provide documentation that the proprietary BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	☐ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a proprietary biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the proprietary biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

Onsite Proprietary Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 5: Is the proprietary biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Yes	Provide documentation that the proprietary biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.
Provide basis for Criteria 5: Provide documentation that appropriate biological activity is supported by the proprietary biofiltration BMP to maintain treatment process.		
Criteria	**Answer**	**Progression**
Criteria 6: Is the proprietary biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	☒ Yes	Provide documentation that the proprietary biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.
Provide basis for Criteria 6: Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).		

Onsite Proprietary Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the proprietary biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	☒ Yes, and the proprietary BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop.** The proprietary biofiltration BMP meets the required criteria.
	☐ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop.** Consult the City Engineer for a determination.
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. Attachment 3A of the PDP SWQMP must include a statement that the proprietary BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

Onsite Proprietary Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed proprietary BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	☐ Yes ☐ No, See explanation below
Explanation/reason if the proprietary BMP is not accepted by the City for onsite pollutant control compliance:	

Onsite Proprietary Biofiltration BMP Checklist — Form I-10

A proprietary biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA and the performance certification/data of the proprietary biofiltration BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite alternative compliance program to meet its pollutant control obligations.

An applicant using a proprietary biofiltration BMP to meet the pollutant control requirements onsite must complete Section 1 of this form and include it in the PDP SWQMP. A separate form must be completed for each DMA. In instances where the City Engineer does not agree with the applicant's determination, Section 2 of this form will be completed by the City and returned to the applicant.

Section 1: Biofiltration Criteria Checklist (Appendix F)

Refer to Part 1 of the Storm Water Standards to complete this section. When separate forms/worksheets are referenced below, the applicant must also complete these separate forms/worksheets (as applicable) and include in the PDP SWQMP. The criteria numbers below correspond to the criteria numbers in Appendix F.

Criteria	Answer	Progression
Criteria 1 and 3: What is the infiltration condition of the DMA? Refer to Section 5.4.2 and Appendix C of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance. Complete and attach Worksheet C.4-1: Categorization of Infiltration Feasibility Condition to support the feasibility determination.	☐ Full Infiltration Condition	**Stop.** Proprietary biofiltration BMP is not allowed.
	☐ Partial Infiltration Condition	Proprietary biofiltration BMP is only allowed, if 40% (average annual capture) volume reduction is achieved within the BMP or downstream of the BMP. If the 40% volume reduction is achieved from within the BMP or downstream of the BMP **proceed to Criteria 2.** If the 40% of the volume reduction is not achieved, proprietary biofiltration BMP is not allowed. **Stop.**
	☒ No Infiltration Condition	Proprietary biofiltration BMP is allowed if one of the two criteria listed below are met: ☐ Documentation is provided to the satisfaction of the City Engineer that a larger footprint biofiltration BMP (i.e. minimum sizing factor calculated using worksheet B.5.2) is not feasible onsite; or ☐ Documentation is provided that volume reduction achieved by the larger footprint biofiltration BMP can be achieved through other measures (e.g., downstream site design BMPs, evapotranspiration from proprietary BMP, etc.) If one of the two criteria listed above is met **proceed to Criteria 2.** If neither criteria are met, proprietary biofiltration BMP is not allowed. **Stop.**

Onsite Proprietary Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:
Summarize findings and attach Worksheet C.4-1

If Partial Infiltration Condition:
Provide documentation that 40% (average annual capture; or 0.375*DCV when using a 36-hour drawdown BMP) volume reduction is achieved within the BMP or downstream of the BMP. This could be achieved through downstream site design BMPs, downstream infiltration BMP, incidental retention by having an open bottom in the proprietary BMP or other similar measures.

If No Infiltration Condition:
Provide documentation that the alternative minimum sizing factor (attach Worksheet B.5-2) BMP is not feasible onsite or the volume reduction achieved by a non-proprietary BMP sized to the alternative minimum sizing factor can be achieved through downstream site design BMPs, downstream evapotranspiration BMPs, incidental evapotranspiration from the proprietary BMP or other similar measures.

Criteria	Answer	Progression
Criteria 2: Is the proprietary biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Meets Flow based Criteria	Use guidance from Appendix F.2 to size the proprietary BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft cannot be designed using a loading rate of 1.5 gpm/sq. ft) **Proceed to Criteria 4.**
	☐ Meets Volume based Criteria	Provide documentation that the proprietary biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	☐ Does not Meet either criteria	**Stop.** Proprietary biofiltration BMP is not allowed.

Onsite Proprietary Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

Criteria	Answer	Progression
Criteria 4: Does the proprietary biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Yes, meets the TAPE certification.	Provide documentation that the proprietary BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	☐ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a proprietary biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the proprietary biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

Onsite Proprietary Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 5: Is the proprietary biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Yes	Provide documentation that the proprietary biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.
Provide basis for Criteria 5: Provide documentation that appropriate biological activity is supported by the proprietary biofiltration BMP to maintain treatment process.		
Criteria	**Answer**	**Progression**
Criteria 6: Is the proprietary biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	☒ Yes	Provide documentation that the proprietary biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.
Provide basis for Criteria 6: Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).		

Onsite Proprietary Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the proprietary biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	☒ Yes, and the proprietary BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop.** The proprietary biofiltration BMP meets the required criteria.
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	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. Attachment 3A of the PDP SWQMP must include a statement that the proprietary BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

Onsite Proprietary Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed proprietary BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	☐ Yes ☐ No, See explanation below
Explanation/reason if the proprietary BMP is not accepted by the City for onsite pollutant control compliance:	

Onsite Proprietary Biofiltration BMP Checklist	Form I-10

A proprietary biofiltration BMP may satisfy the pollutant control requirements for a DMA onsite in some cases. This depends on the characteristics of the DMA and the performance certification/data of the proprietary biofiltration BMP. If the pollutant control requirements for a DMA are met onsite, then the DMA is not required to participate in an offsite alternative compliance program to meet its pollutant control obligations.

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	☐ Partial Infiltration Condition	Proprietary biofiltration BMP is only allowed, if 40% (average annual capture) volume reduction is achieved within the BMP or downstream of the BMP. If the 40% volume reduction is achieved from within the BMP or downstream of the BMP **proceed to Criteria 2.** If the 40% of the volume reduction is not achieved, proprietary biofiltration BMP is not allowed. **Stop.**
	☒ No Infiltration Condition	Proprietary biofiltration BMP is allowed if one of the two criteria listed below are met: ☐ Documentation is provided to the satisfaction of the City Engineer that a larger footprint biofiltration BMP (i.e. minimum sizing factor calculated using worksheet B.5.2) is not feasible onsite; or ☐ Documentation is provided that volume reduction achieved by the larger footprint biofiltration BMP can be achieved through other measures (e.g., downstream site design BMPs, evapotranspiration from proprietary BMP, etc.) If one of the two criteria listed above is met **proceed to Criteria 2.** If neither criteria are met, proprietary biofiltration BMP is not allowed. **Stop.**

Onsite Proprietary Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 1 and 3:

Feasibility Analysis:
Summarize findings and attach Worksheet C.4-1

If Partial Infiltration Condition:
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Criteria	Answer	Progression
Criteria 2: Is the proprietary biofiltration BMP sized to meet the performance standard from the MS4 Permit? Refer to Appendix B.5 and Appendix F.2 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Meets Flow based Criteria	Use guidance from Appendix F.2 to size the proprietary BMP to meet the flow based criteria. Include the calculations in the PDP SWQMP. Use parameters for sizing consistent with manufacturer guidelines and conditions of its third party certifications (i.e. a BMP certified at a loading rate of 1 gpm/sq. ft cannot be designed using a loading rate of 1.5 gpm/sq. ft) **Proceed to Criteria 4.**
	☐ Meets Volume based Criteria	Provide documentation that the proprietary biofiltration BMP has a total static (i.e. non-routed) storage volume, including pore-spaces and pre-filter detention volume (Refer to Appendix B.5 for a schematic) of at least 0.75 times the portion of the DCV not reliably retained onsite. **Proceed to Criteria 4.**
	☐ Does not Meet either criteria	**Stop.** Proprietary biofiltration BMP is not allowed.

Onsite Proprietary Biofiltration BMP Checklist	Form I-10

Provide basis for Criteria 2:

Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., loading rate, etc., as applicable).

Criteria	Answer	Progression
Criteria 4: Does the proprietary biofiltration BMP meet the pollutant treatment performance standard for the projects most significant pollutants of concern? Refer to Appendix B.6 and Appendix F.1 of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Yes, meets the TAPE certification.	Provide documentation that the proprietary BMP has an appropriate TAPE certification for the projects most significant pollutants of concern. **Proceed to Criteria 5.**
	☐ Yes, through other third-party documentation	Acceptance of third-party documentation is at the discretion of the City Engineer. The City engineer will consider, (a) the data submitted; (b) representativeness of the data submitted; and (c) consistency of the BMP performance claims with pollutant control objectives in Table F.1-2 and Table F.1-1 while making this determination. If a proprietary biofiltration BMP is not accepted, a written explanation/ reason will be provided in Section 2. **Proceed to Criteria 5.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.

Provide basis for Criteria 4:

Provide documentation that identifies the projects most significant pollutants of concern and TAPE certification or other third party documentation that shows that the proprietary biofiltration BMP meets the pollutant treatment performance standard for the projects most significant pollutants of concern.

Onsite Proprietary Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 5: Is the proprietary biofiltration BMP designed to promote appropriate biological activity to support and maintain treatment process? Refer to Appendix F of the BMP Design Manual (Part 1 of Storm Water Standards) for guidance.	☒ Yes	Provide documentation that the proprietary biofiltration BMP support appropriate biological activity. Refer to Appendix F for guidance. **Proceed to Criteria 6.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.
Provide basis for Criteria 5: Provide documentation that appropriate biological activity is supported by the proprietary biofiltration BMP to maintain treatment process.		
Criteria	**Answer**	**Progression**
Criteria 6: Is the proprietary biofiltration BMP designed with a hydraulic loading rate to prevent erosion, scour and channeling within the BMP?	☒ Yes	Provide documentation that the proprietary biofiltration BMP is used in a manner consistent with manufacturer guidelines and conditions of its third-party certification. **Proceed to Criteria 7.**
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.
Provide basis for Criteria 6: Provide documentation that the BMP meets the numeric criteria and is designed consistent with the manufacturer guidelines and conditions of its third-party certification (i.e., maximum tributary area, maximum inflow velocities, etc., as applicable).		

Onsite Proprietary Biofiltration BMP Checklist		Form I-10
Criteria	**Answer**	**Progression**
Criteria 7: Is the proprietary biofiltration BMP maintenance plan consistent with manufacturer guidelines and conditions of its third-party certification (i.e., maintenance activities, frequencies)?	☒ Yes, and the proprietary BMP is privately owned, operated and not in the public right of way.	Submit a maintenance agreement that will also include a statement that the BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification. **Stop.** The proprietary biofiltration BMP meets the required criteria.
	☐ Yes, and the BMP is either owned or operated by the City or in the public right of way.	Approval is at the discretion of the City Engineer. The city engineer will consider maintenance requirements, cost of maintenance activities, relevant previous local experience with operation and maintenance of the BMP type, ability to continue to operate the system in event that the vending company is no longer operating as a business or other relevant factors while making the determination. **Stop.** Consult the City Engineer for a determination.
	☐ No	**Stop.** Proprietary biofiltration BMP is not allowed.

Provide basis for Criteria 7:

Include copy of manufacturer guidelines and conditions of third-party certification in the maintenance agreement. Attachment 3A of the PDP SWQMP must include a statement that the proprietary BMP will be maintained in accordance with manufacturer guidelines and conditions of third-party certification.

Onsite Proprietary Biofiltration BMP Checklist	Form I-10
Section 2: Verification (For City Use Only)	
Is the proposed proprietary BMP accepted by the City Engineer for onsite pollutant control compliance for the DMA?	☐ Yes ☐ No, See explanation below
Explanation/reason if the proprietary BMP is not accepted by the City for onsite pollutant control compliance:	

WASHINGTON STATE DEPARTMENT OF ECOLOGY

April 2014

GENERAL USE LEVEL DESIGNATION FOR BASIC, ENHANCED, AND PHOSPHORUS TREATMENT

For the

MWS-Linear Modular Wetland

Ecology's Decision:

Based on Modular Wetland Systems, Inc. application submissions, including the Technical Evaluation Report, dated April 1, 2014, Ecology hereby issues the following use level designation:

1. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Basic treatment
   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
2. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Phosphorus treatment
   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.
3. General use level designation (GULD) for the MWS-Linear Modular Wetland Stormwater Treatment System for Enhanced treatment
   - Sized at a hydraulic loading rate of 1 gallon per minute (gpm) per square foot (sq ft) of wetland cell surface area. For moderate pollutant loading rates (low to medium density residential basins), size the Prefilters at 3.0 gpm/sq ft of cartridge surface area. For high loading rates (commercial and industrial basins), size the Prefilters at 2.1 gpm/sq ft of cartridge surface area.

4. Ecology approves the MWS - Linear Modular Wetland Stormwater Treatment System units for Basic, Phosphorus, and Enhanced treatment at the hydraulic loading rate listed above. Designers shall calculate the water quality design flow rates using the following procedures:
    - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
    - Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
    - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.
5. These use level designations have no expiration date but may be revoked or amended by Ecology, and are subject to the conditions specified below.

Ecology's Conditions of Use:

Applicants shall comply with the following conditions:

1. Design, assemble, install, operate, and maintain the MWS – Linear Modular Wetland Stormwater Treatment System units, in accordance with Modular Wetland Systems, Inc. applicable manuals and documents and the Ecology Decision.
2. Each site plan must undergo Modular Wetland Systems, Inc. review and approval before site installation. This ensures that site grading and slope are appropriate for use of a MWS – Linear Modular Wetland Stormwater Treatment System unit.
3. MWS – Linear Modular Wetland Stormwater Treatment System media shall conform to the specifications submitted to, and approved by, Ecology.
4. Maintenance: The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a "one size fits all" maintenance cycle for a particular model/size of manufactured filter treatment device.
    - Typically, Modular Wetland Systems, Inc. designs MWS - Linear Modular Wetland systems for a target prefilter media life of 6 to 12 months.
    - Indications of the need for maintenance include effluent flow decreasing to below the design flow rate or decrease in treatment below required levels.
    - Owners/operators must inspect MWS - Linear Modular Wetland systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. You must conduct inspections monthly during the wet season, and every other month during the dry season. (According to the SWMMWW, the wet season in western Washington is October 1 to April 30. According to SWMMEW, the wet season in eastern Washington is October 1 to June 30). After the

first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.

- Conduct inspections by qualified personnel, follow manufacturer's guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.
- When inspections are performed, the following findings typically serve as maintenance triggers:
  - Standing water remains in the vault between rain events, or
  - Bypass occurs during storms smaller than the design storm.
  - If excessive floatables (trash and debris) are present (but no standing water or excessive sedimentation), perform a minor maintenance consisting of gross solids removal, not prefilter media replacement.
  - Additional data collection will be used to create a correlation between pretreatment chamber sediment depth and pre-filter clogging (see *Issues to be Addressed by the Company* section below)

6. Discharges from the MWS - Linear Modular Wetland Stormwater Treatment System units shall not cause or contribute to water quality standards violations in receiving waters.

Applicant:	Modular Wetland Systems, Inc.
Applicant's Address:	*PO. Box 869* *Oceanside, CA 92054*

Application Documents:

- *Original Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., January 2011
- *Quality Assurance Project Plan*: Modular Wetland system – Linear Treatment System performance Monitoring Project, draft, January 2011.
- *Revised Application for Conditional Use Level Designation*, Modular Wetland System, Linear Stormwater Filtration System Modular Wetland Systems, Inc., May 2011
- *Memorandum: Modular Wetland System-Linear GULD Application Supplementary Data, April 2014*
- *Technical Evaluation Report: Modular Wetland System Stormwater Treatment System Performance Monitoring, April 2014.*

Applicant's Use Level Request:

General use level designation as a Basic, Enhanced, and Phosphorus treatment device in accordance with Ecology's Guidance for Evaluating Emerging Stormwater Treatment Technologies Technology Assessment Protocol – Ecology (TAPE) January 2011 Revision.

Applicant's Performance Claims:

- The MWS – Linear Modular wetland is capable of removing a minimum of 80-percent of TSS from stormwater with influent concentrations between 100 and 200 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 50-percent of Total Phosphorus from stormwater with influent concentrations between 0.1 and 0.5 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 30-percent of dissolved Copper from stormwater with influent concentrations between 0.005 and 0.020 mg/l.
- The MWS – Linear Modular wetland is capable of removing a minimum of 60-percent of dissolved Zinc from stormwater with influent concentrations between 0.02 and 0.30 mg/l.

Ecology Recommendations:

- Modular Wetland Systems, Inc. has shown Ecology, through laboratory and field-testing, that the MWS - Linear Modular Wetland Stormwater Treatment System filter system is capable of attaining Ecology's Basic, Total phosphorus, and Enhanced treatment goals.

Findings of Fact:

Laboratory Testing

The MWS-Linear Modular wetland has the:

- Capability to remove 99 percent of total suspended solids (using Sil-Co-Sil 106) in a quarter-scale model with influent concentrations of 270 mg/L.
- Capability to remove 91 percent of total suspended solids (using Sil-Co-Sil 106) in laboratory conditions with influent concentrations of 84.6 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 93 percent of dissolved Copper in a quarter-scale model with influent concentrations of 0.757 mg/L.
- Capability to remove 79 percent of dissolved Copper in laboratory conditions with influent concentrations of 0.567 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 80.5-percent of dissolved Zinc in a quarter-scale model with influent concentrations of 0.95 mg/L at a flow rate of 3.0 gpm per square foot of media.
- Capability to remove 78-percent of dissolved Zinc in laboratory conditions with influent concentrations of 0.75 mg/L at a flow rate of 3.0 gpm per square foot of media.

Field Testing

- Modular Wetland Systems, Inc. conducted monitoring of an MWS-Linear (Model # MWS-L-4-13) from April 2012 through May 2013, at a transportation maintenance facility in Portland, Oregon. The manufacturer collected flow-weighted composite

samples of the system's influent and effluent during 28 separate storm events. The system treated approximately 75 percent of the runoff from 53.5 inches of rainfall during the monitoring period. The applicant sized the system at 1 gpm/sq ft. (wetland media) and 3gpm/sq ft. (prefilter).

- Influent TSS concentrations for qualifying sampled storm events ranged from 20 to 339 mg/L. Average TSS removal for influent concentrations greater than 100 mg/L (n=7) averaged 85 percent. For influent concentrations in the range of 20-100 mg/L (n=18), the upper 95 percent confidence interval about the mean effluent concentration was 12.8 mg/L.
- Total phosphorus removal for 17 events with influent TP concentrations in the range of 0.1 to 0.5 mg/L averaged 65 percent. A bootstrap estimate of the lower 95 percent confidence limit (LCL95) of the mean total phosphorus reduction was 58 percent.
- The lower 95 percent confidence limit of the mean percent removal was 60.5 percent for dissolved zinc for influent concentrations in the range of 0.02 to 0.3 mg/L (n=11). The lower 95 percent confidence limit of the mean percent removal was 32.5 percent for dissolved copper for influent concentrations in the range of 0.005 to 0.02 mg/L (n=14) at flow rates up to 28 gpm (design flow rate 41 gpm). Laboratory test data augmented the data set, showing dissolved copper removal at the design flow rate of 41 gpm (93 percent reduction in influent dissolved copper of 0.757 mg/L).

Issues to be addressed by the Company:

1. Modular Wetland Systems, Inc. should collect maintenance and inspection data for the first year on all installations in the Northwest in order to assess standard maintenance requirements for various land uses in the region. Modular Wetland Systems, Inc. should use these data to establish required maintenance cycles.
2. Modular Wetland Systems, Inc. should collect pre-treatment chamber sediment depth data for the first year of operation for all installations in the Northwest. Modular Wetland Systems, Inc. will use these data to create a correlation between sediment depth and pre-filter clogging.

Technology Description:
Download at http://www.modularwetlands.com/

Contact Information:

Applicant: Greg Kent
Modular Wetland Systems, Inc.
P.O. Box 869
Oceanside, CA 92054
gkent@biocleanenvironmental.net

Applicant website: http://www.modularwetlands.com/

Ecology web link: http://www.ecy.wa.gov/programs/wg/stormwater/newtech/index.html

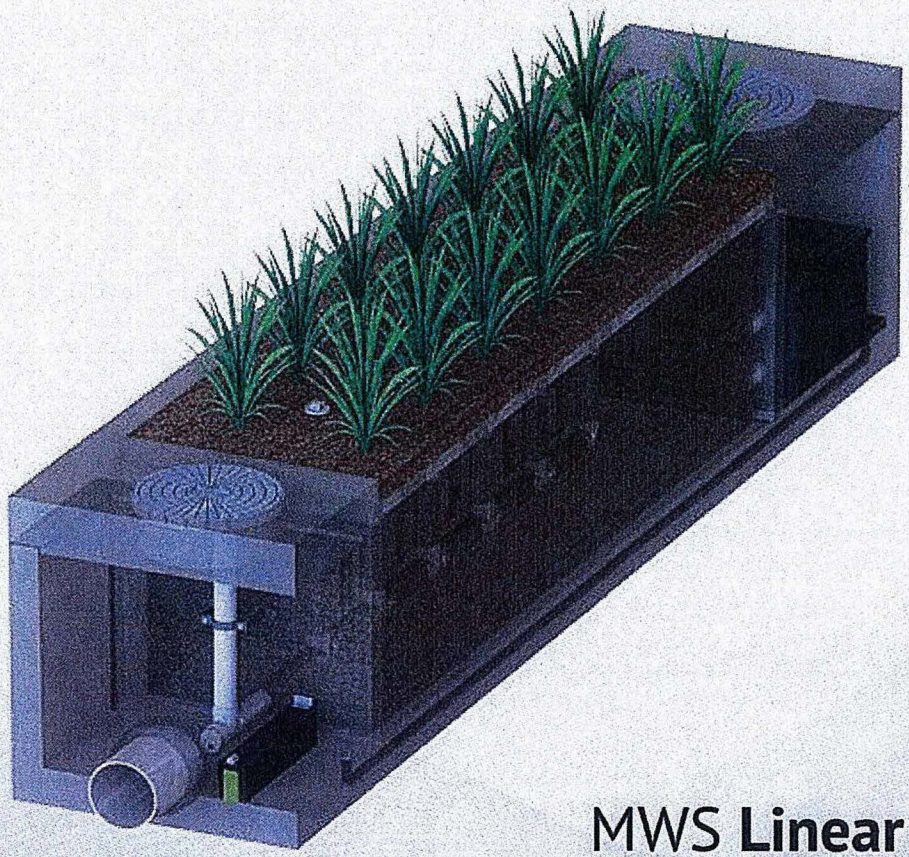
Ecology: Douglas C. Howie, P.E.
Department of Ecology
Water Quality Program
(360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

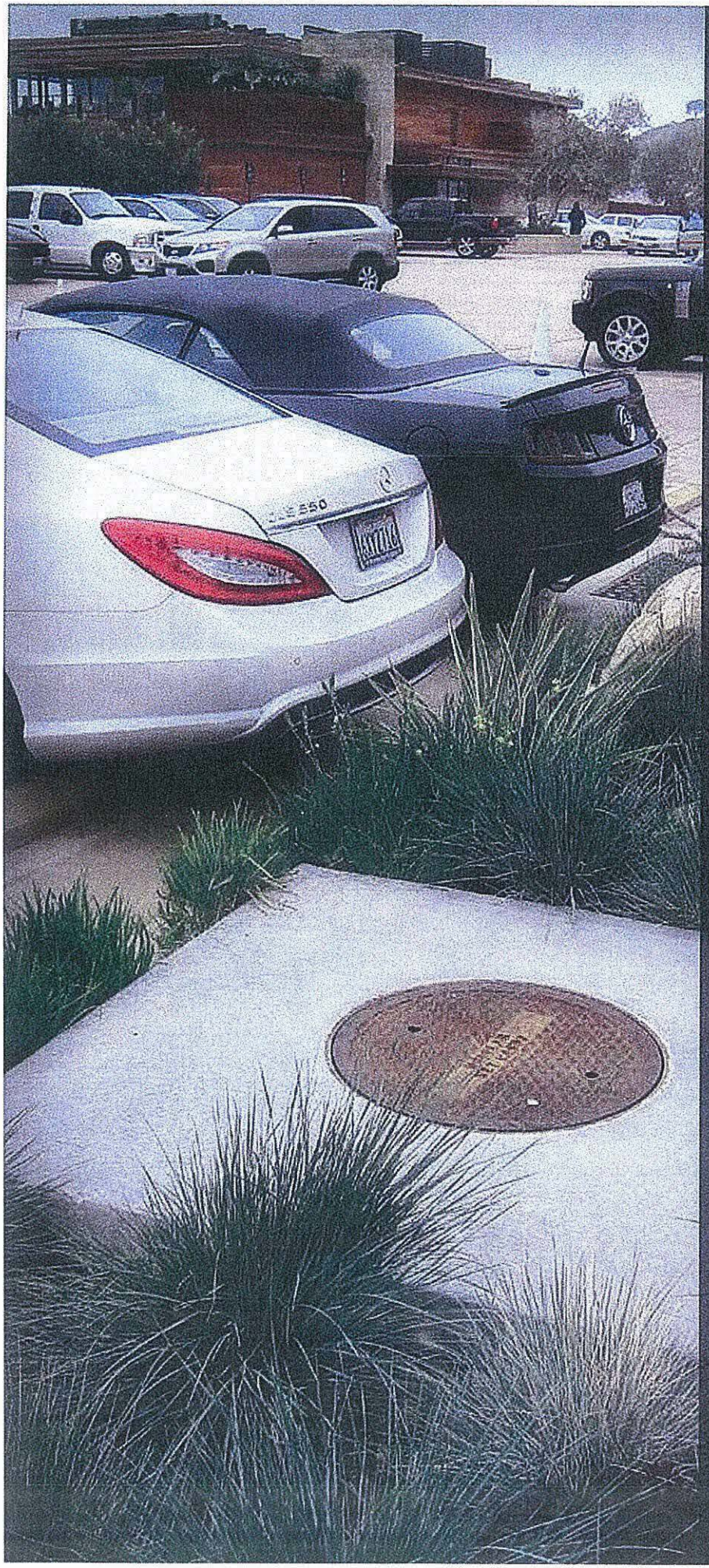
Date	Revision
June 2011	Original use-level-designation document
September 2012	Revised dates for TER and expiration
January 2013	Modified Design Storm Description, added Revision Table, added maintenance discussion, modified format in accordance with Ecology standard
December 2013	Updated name of Applicant
April 2014	Approved GULD designation for Basic, Phosphorus, and Enhanced treatment

MODULAR WETLANDS™

*Advanced **Stormwater** Biofiltration*



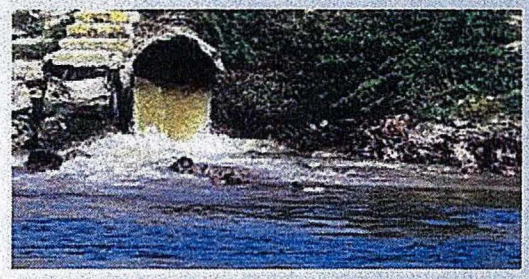
MWS **Linear**



Contents

The Urban Impact

For hundreds of years natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.



Plant A Wetland

Without natural wetlands our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate water ways in urban areas.

MWS Linear

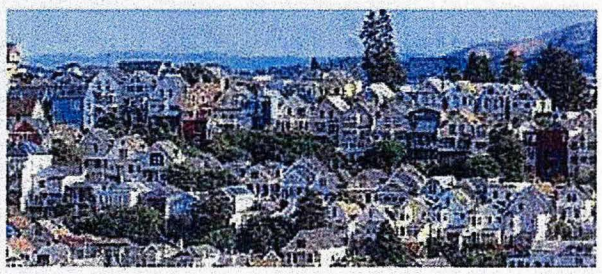
The Modular Wetland System Linear represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pre-treatment, the MWS Linear incorporates an advanced pre-treatment chamber that includes separation and pre-filter cartridges. In this chamber sediment and hydrocarbons are removed from runoff before it enters the biofiltration chamber, in turn reducing maintenance costs and improving performance.

Applications

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.

Industrial

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA mandated effluent limits for dissolved metals and other pollutants.



Residential

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.

Streets

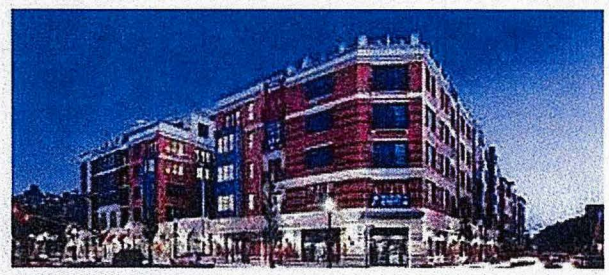
Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.

Parking Lots

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.

Commercial

Compared to bioretention systems, the MWS Linear can treat far more area in less space - meeting treatment and volume control requirements.

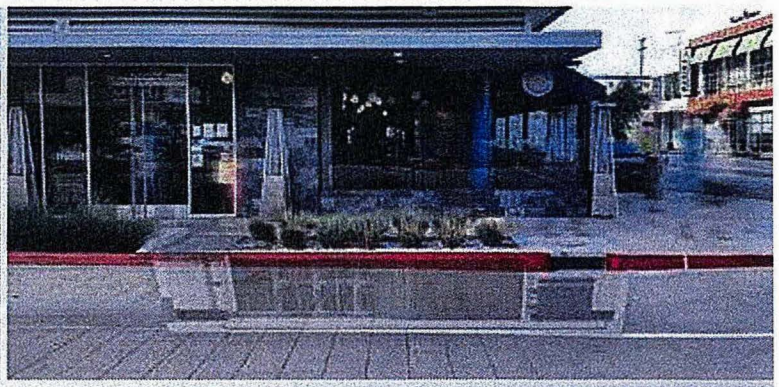


Mixed Use

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications are available on our website: www.ModularWetlands.com/Applications

- Agriculture
- Reuse
- Low Impact Development
- Waste Water



Configurations

The MWS Linear is the preferred biofiltration system of Civil Engineers across the country due to its versatile design. This highly versatile system has available "pipe-in" options on most models, along with built-in curb or grated inlets for simple integration into your stormdrain design.

Curb Type

The *Curb Type* configuration accepts sheet flow through a curb opening and is commonly used along road ways and parking lots. It can be used in sump or flow by conditions. Length of curb opening varies based on model and size.

Grate Type

The *Grate Type* configuration offers the same features and benefits as the *Curb Type* but with a grated/drop inlet above the systems pre-treatment chamber. It has the added benefit of allowing for pedestrian access over the inlet. ADA compliant grates are available to assure easy and safe access. The *Grate Type* can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.

Vault Type

The system's patented horizontal flow biofilter is able to accept inflow pipes directly into the pre-treatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretention systems. Another benefit of the "pipe in" design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.

Downspout Type

The *Downspout Type* is a variation of the *Vault Type* and is designed to accept a vertical downspout pipe from roof top and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

Advantages & Operation

The MWS Linear is the most efficient and versatile biofiltration system on the market, and the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure-1 and Figure-2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

Featured Advantages

- Horizontal Flow Biofiltration
- Greater Filter Surface Area
- Pre-Treatment Chamber
- Patented Perimeter Void Area
- Flow Control
- No Depressed Planter Area

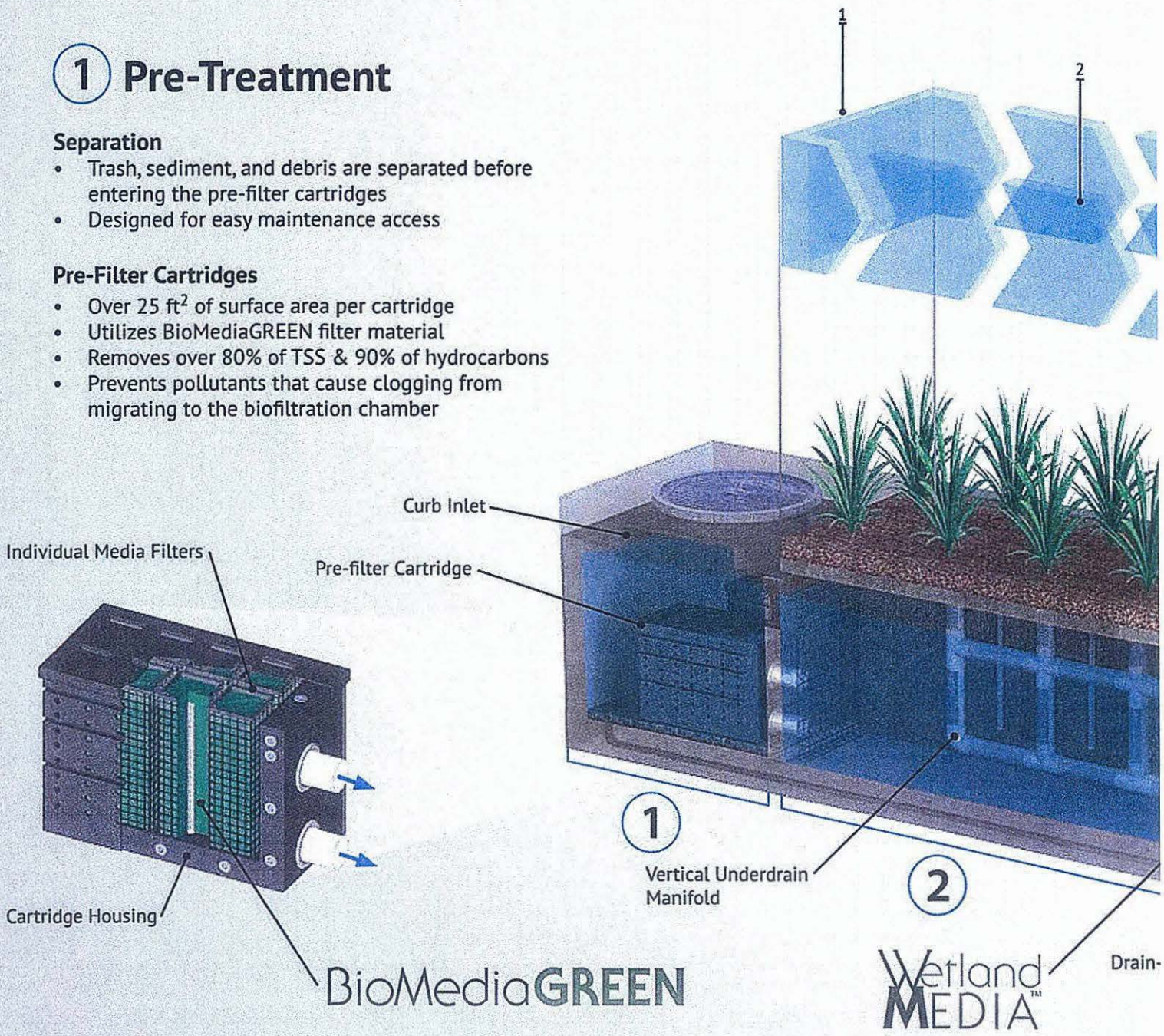
1 Pre-Treatment

Separation

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

Pre-Filter Cartridges

- Over 25 ft^2 of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS & 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber



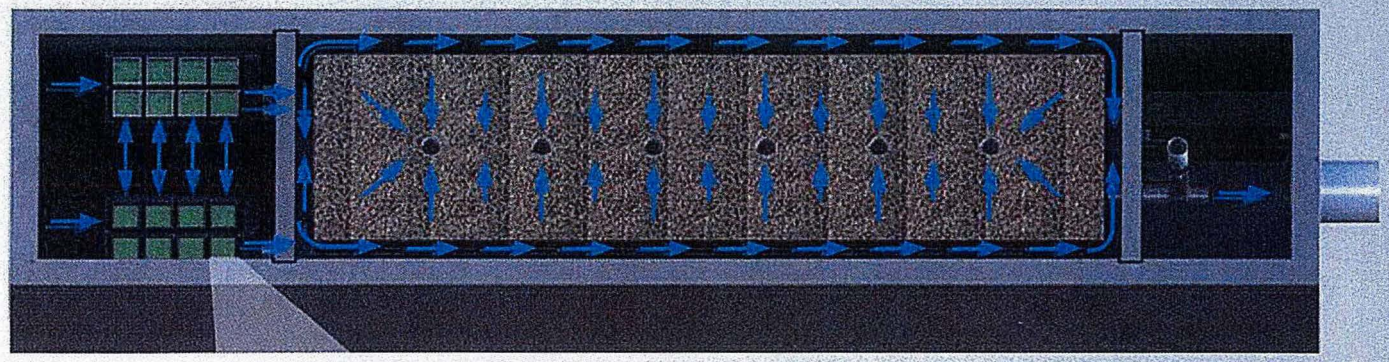


Fig. 2 - Top View

2x to 3x More Surface Area Than Traditional Downward Flow Bioretention Systems.

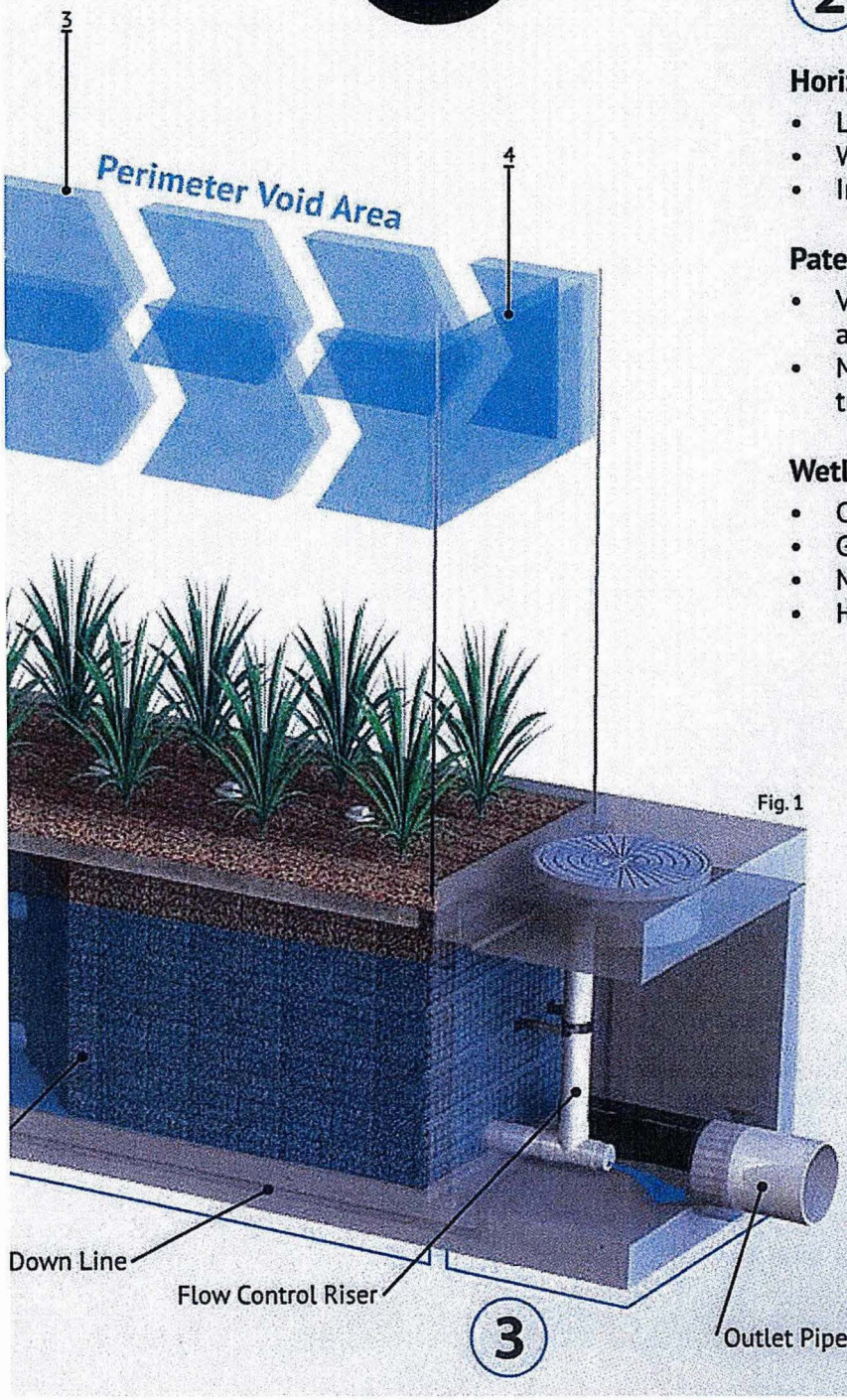


Fig. 1

2 Biofiltration

Horizontal Flow

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

Patented Perimeter Void Area

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides.
- Maximizes surface area of the media for higher treatment capacity

WetlandMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and light weight

3 Discharge

Flow Control

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity.
- Extends the life of the media and improves performance

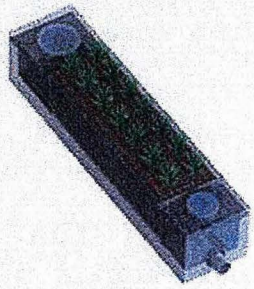
Drain-Down Filter

- The Drain-Down is an optional feature that completely drains the pre-treatment chamber
- Water that drains from the pre-treatment chamber between storm events will be treated

Orientations

Side-By-Side

The *Side-By-Side* orientation places the pre-treatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.



End-To-End

The *End-To-End* orientation places the pre-treatment and discharge chambers on opposite ends of the biofiltration chamber therefore minimizing the width of the system to 5 ft (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is bypass must be external.

Bypass

Internal Bypass Weir (Side-by-Side Only)

The *Side-By-Side* orientation places the pre-treatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pre-treatment chamber directly to the discharge chamber.

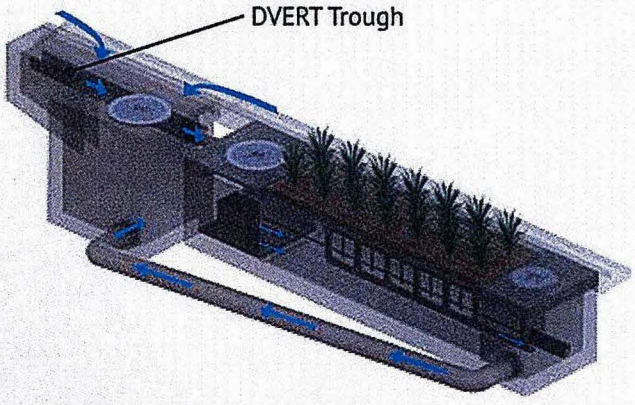
External Diversion Weir Structure

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

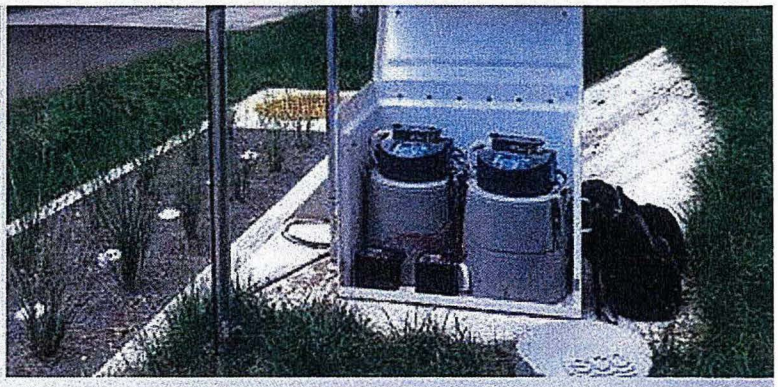
Flow By Design

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT Low Flow Diversion



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allows the MWS Linear to be installed anywhere space is available.



Performance

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With it's advanced pre-treatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses natures ability to process, transform, and remove even the most harmful pollutants.

Approvals

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation, and perhaps the world.

Washington State TAPE Approved

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft^2 loading rate. The highest performing BMP on the market for all main pollutant categories.

TSS	Total Phosphorus	Ortho Phosphorus	Nitrogen	Dissolved Zinc	Dissolved Copper	Total Zinc	Total Copper	Motor Oil
85%	64%	67%	45%	66%	38%	69%	50%	95%

DEQ Assignment

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Technical Criteria.

Maryland Department Of The Environment Approved

Granted ESD (Environmental Site Design) status for new construction, redevelopment and retrofitting when designed in accordance with the Design Manual.

MASTEP Evaluation

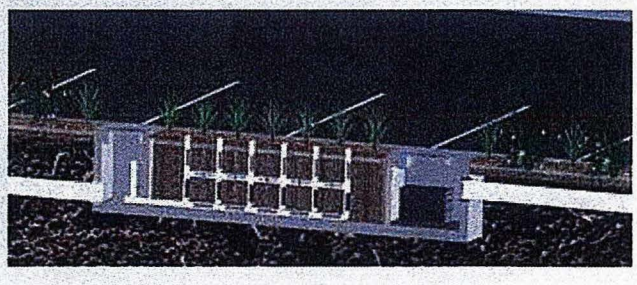
The University of Massachusetts at Amherst – Water Resources Research Center, issued a technical evaluation report noting removal rates up to 84% TSS, 70% Total Phosphorus, 68.5% Total Zinc, and more.

Rhode Island DEM Approved

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% Pathogens, 30% Total Phosphorus, and 30% Total Nitrogen.

Flow Based Sizing

The MWS Linear can be used in stand alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

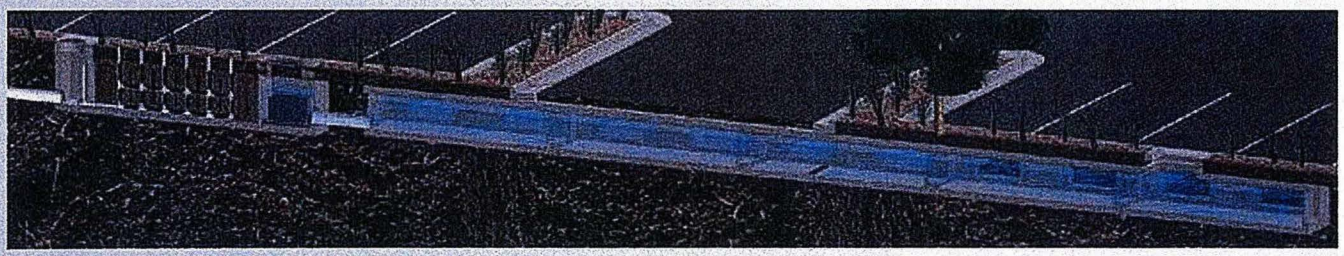


Treatment Flow Sizing Table

Model #	Dimensions	WetlandMedia Surface Area	Treatment Flow Rate (cfs)
MWS-L-4-4	4' x 4'	23 ft^2	0.052
MWS-L-4-6	4' x 6'	32 ft^2	0.073
MWS-L-4-8	4' x 8'	50 ft^2	0.115
MWS-L-4-13	4' x 13'	63 ft^2	0.144
MWS-L-4-15	4' x 15'	76 ft^2	0.175
MWS-L-4-17	4' x 17'	90 ft^2	0.206
MWS-L-4-19	4' x 19'	103 ft^2	0.237
MWS-L-4-21	4' x 21'	117 ft^2	0.268
MWS-L-8-8	8' x 8'	100 ft^2	0.230
MWS-L-8-12	8' x 12'	151 ft^2	0.346
MWS-L-8-16	8' x 16'	201 ft^2	0.462

Volume Based Sizing

Many states require treatment of a water quality volume and do not offer the option of flow based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume based design installed downstream of ponds, detention basins, and underground storage systems.



Treatment Volume Sizing Table

Model #	Treatment Capacity (cu. ft.) @ 24-Hour Drain Down	Treatment Capacity (cu. ft.) @ 48-Hour Drain Down
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145

Installation

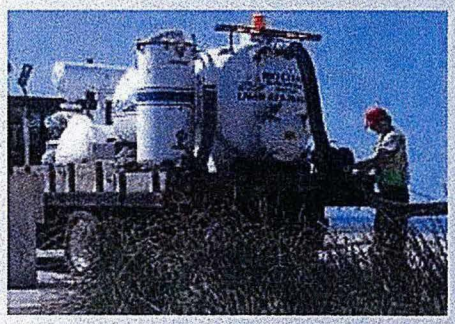
The MWS Linear is simple, easy to install, and has a space efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles pre-cast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.

Maintenance

Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pre-treatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pre-treatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pre-treatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pre-treatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long term operation and there is absolutely no need to replace expensive biofiltration media.



Plant Selection

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more "contact time" so that pollutants are more successfully decomposed, volatilized and incorporated into the biomass of The MWS Linear's micro/macro flora and fauna.

A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by selecting the list relative to your project location's hardy zone.

Please visit **www.ModularWetlands.com/Plants** for more information and various plant lists.

www.ModularWetlands.com | (855) 5MOD-WET | info@ModularWetlands.com

BMP Applicability and Selection for Green Street Exemption	Form J-1
Project Identification	
Project Name: Morena Apartment Homes	
Permit Application Number: 526167	Date: 5/8/17
Project Characterization and Selection Synopsis	
The purpose of this form is to guide the selection of BMPs, given project specific constraints to meet the Green Streets exemption as defined in Appendix J.2 of the BMP Design Manual. In order to qualify for a PDP exemption, the project must incorporate all applicable Green Street BMP elements described in Appendix J.2, based on the applicability guidance provided in Appendix J.2. Complete the sections below providing detailed justification for each selection.	
Step 1: Does this project include retrofitting or redevelopment of an existing alley, street, or roadway criteria? Exemptions do not apply for projects that construct new alleys, streets, or roadways. See Appendix J for additional guidance on distinguishing between redevelopment of a street and new development. ☒ Yes ☐ No (if No is selected, the Green Street exemption is not applicable)	
Provide a brief overview of the project, key details, and site-specific opportunities and constraints: The Morena Boulevard Apartment Homes are being constructed on a former mobile home park and will include 9 apartments buildings, a club house and a pool. Groundwater sits 3-4' below existing site, which will be filled to bring it out of the floodplain. The project is conditioned to improve Morena Boulevard, Frankfort Street and Tonopah Ave.	
Step 2: Complete the BMP-specific applicability checklists on the following pages and attach them to this form. Complete forms for all BMPs, including those that were used and those that were not used.	
Step 3: Summarize the BMP(s) that were selected through the guidance process (Select all that apply):	

BMP Type	Applicable?	Used?	Summary of justification for Inclusion or Finding of Non-applicability
Vegetated Swales	☐	☐	Street trees have been chosen as the feature to be implemented based on the site constraints and the scale. The street design requirement necessitating a contiguous sidewalk along Morena preclude the use of vegetated swales, rain gardens, green gutters, curb extensions, or sidewalk planters from implementation. The steep slopes along Frankfort also limit or preclude the viability of these features. Permeable surfaces are not viable because of the large amount of runon from streets that would be expected to include high sediment loads. Given the large width of wide Morena Boulevard, street trees will fit in well in terms of architectural scale where planters or rain gardens would contrastingly seem disproportionately sited. Due to shallow stormdrain, and the tight space constraints due to existing utilities there are very limited opportunities for LID stormwater controls beyond street trees.
Sidewalk Planters	☐	☐	
Curb Extensions	☐	☐	
Permeable Surfaces	☐	☐	
Green Gutters	☐	☐	
Rain Gardens	☐	☐	
Trees	☒	☐	
Other_____	☐	☐	

Form J-1 Page 2 of 8: Vegetated Swale			
Brief Description: Vegetated Swales are shallow, open channels that are designed to remove storm water pollutants by physically straining/filtering runoff through vegetation in the channel.			
Site Type (Check all that apply):	Street Type	Rating[12]	Present in Project?
	Residential Streets	◉	☐
	Commercial Street/ Business District	○	☐
	Collector Street	◉	☒
	Arterial and Boulevard	◉	☒
	Alleys	○	☐
	Parking Areas	◉	☐
Key Opportunities for Vegetated Swales (Check all that apply):	Parkway strips		☐
	Medians		☐
	Long, mostly continuous space		☒
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Vegetated Swales		
	Slope > 1% and <3%		☐
	Conveying run-on to a site		☐
	Infiltration is partially feasible or not feasible		☒
	Long continuous segments available		☐
	More parkway width		☒
	Unfavorable Conditions for Vegetated Swales		
	Available width is < 8 feet		☐
	Frequent driveway interruption		☐
	ROW width too limited		☐
Summary of Findings:			
Were Vegetated Swales determined to be applicable as part of the Green Streets BMP plan? ☐ Yes ☒ No	If yes, were they used? ☐ Yes ☐ No		
Provide discussion/justifications for selections and decisions above: The steep slopes along Frankfort and the street design requirements necessitating a contiguous sidwalk along Morena Blvd preclude vegetated swales from being implemented.			

12 ● High applicability within this category, however may still be limited by site-specific factors
◉ Generally applicable in this category; largely dependent on site-specific factors
○ Limited applicability within this category; may still be applicable in some cases; should be considered

Form J-1 Page 3 of 8: Sidewalk Planters			
Brief Description: A planter imbedded in the sidewalk designed to manage storm water runoff from the adjacent roadway and sidewalk.			
Site Type (Check all that apply):	Street Type	Rating	Present in Project?
	Residential Streets	◉	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	●	☒
	Arterial and Boulevard	●	☒
	Alleys	○	☐
	Parking Areas	◉	☐
Key Opportunities for Sidewalk Planters (Check all that apply):	Parkway strips		☐
	Medians		☐
	Between driveways		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Sidewalk Planters		
	Slope <4%		☐
	Wide sidewalks		☒
	More parkway width		☐
	Unfavorable Conditions for Sidewalk Planters		
	Conflicts with car egress		☐
	ROW width too limited		☐

Summary of Findings:

Were Sidewalk Planters determined to be applicable as part of the Green Streets BMP plan?	If yes, were they used?
☐ Yes ☒ No	☐ Yes ☐ No

Provide discussion/justifications for selections and decisions above:

The steep slopes along Frankfort and the street design requirements necessitating a contiguous sidwalk along Morena Blvd preclude sidewalk planters from being implemented.

Form J-1 Page 4 of 8: Curb Extensions			
Brief Description: Curb extensions expand the edge of the sidewalk into the roadway or parking area and allow storm water runoff to collect and infiltrate through a detention area of porous media.			
Site Type (Check all that apply):	Street Type	Rating	Present in Project?
	Residential Streets	●	☐
	Commercial Street/ Business District	●	☐
	Collector Street	◉	☒
	Arterial and Boulevard	◉	☒
	Alleys	○	☐
	Parking Areas	◉	☐
Key Opportunities for Curb Extensions (Check all that apply):	Intersections		☐
	Parking area		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Curb Extensions		
	Slope <4%		☐
	Traffic calming needed		☐
	Unfavorable Conditions for Curb Extensions		
	Conflicts with bike lanes		☐
	Site distance issues at intersection		☒
Summary of Findings:			
Were Curb Extensions determined to be applicable as part of the Green Streets BMP plan? ☐ Yes ☒ No	If yes, were they used? ☐ Yes ☐ No		
Provide discussion/justifications for selections and decisions above: Curb extensions can not be integrated with the street designs which are already set based on traffic design requirements.			

Form J-1 Page 5 of 8: Permeable Surfaces			
Brief Description: Permeable surfaces are pavement that allows for percolation through void spaces into subsurface layers.			
Site Type (Check all that apply):	Street Type	Rating	Present in Project?
	Residential Streets	●	☐
	Commercial Street/ Business District	●	☐
	Collector Street	◉	☒
	Arterial and Boulevard	◉	☒
	Alleys	●	☐
	Parking Areas	◉	☐
Key Opportunities for Permeable Surfaces (Check all that apply):	Sidewalks		☐
	Parking strips		☐
	Shoulders		☐
	Low traffic roadways		☐
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Permeable Surfaces		
	Slope < 2-3%		☐
	Conveying limited run-on to a site		☐
	Low traffic area		☐
	Unfavorable Conditions for Permeable Surfaces		
	High traffic area		☒
	Run-on has high sediment load		☒

Summary of Findings:

Were Permeable Surfaces determined to be applicable as part of the Green Streets BMP plan?	If yes, were they used?
☐ Yes ☒ No	☐ Yes ☐ No

Provide discussion/justifications for selections and decisions above:

Streets are taking significant areas of runon from major arterial streets which would be expected to have a high sediment load.

Form J-1 Page 6 of 8: Green Gutters			
Brief Description: Green Gutters are shallow and narrow strips of landscaping in a typical curb and gutter location with a lower elevation than the street gutter elevation to allow capture of storm water from the sidewalk and street.			
Site Type (Check all that apply):	Street Type	Rating	Present in Project?
	Residential Streets	○	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	●	☒
	Arterial and Boulevard	●	☒
	Alleys	◉	☐
	Parking Areas	○	☐
Key Opportunities for Green Gutters (Check all that apply):	Parkway strips		☐
	Medians		☐
	Long, mostly continuous space		☒
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Green Gutters		
	Slope > 1% and <3%		☐
	Conveying run-on to a site		☒
	Infiltration is partially feasible or not feasible		☒
	Long continuous segments available		☒
	Narrower spaces (as little as 2 to 3 feet)		☐
	Unfavorable Conditions for Green Gutters		
	Frequent driveway interruption		☐
	ROW width too limited		☐

Summary of Findings:

Were Green Gutters determined to be applicable as part of the Green Streets BMP plan?	If yes, were they used?
☐ Yes ☒ No	☐ Yes ☐ No

Provide discussion/justifications for selections and decisions above:

Green gutters can not be integrated with the street designs which are already set based on traffic design and planning needs and requirements.

Form J-1 Page 7 of 8: Rain Gardens			
Brief Description: Rain Gardens are shallow detention basins with vegetation that temporarily store water to allow for infiltration of the stored volume.			
Site Type (Check all that apply):	Street Type	Rating	Present in Project?
	Residential Streets	◉	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	◉	☒
	Arterial and Boulevard	◉	☒
	Alleys	○	☐
	Parking Areas	●	☐
Key Opportunities for Rain Gardens (Check all that apply):	Irregularly shaped areas in ROW		☐
	Broad and flat areas		☒
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Rain Gardens		
	Slope <2%		☒
	Infiltration is partially feasible or not feasible		☒
	Large area available		
	Unfavorable Conditions for Rain Gardens		
	Slope > 2%		☐
	ROW too limited		☐

Summary of Findings:

Were Rain Gardens determined to be applicable as part of the Green Streets BMP plan?	If yes, were they used?
☐ Yes ☒ No	☐ Yes ☐ No

Provide discussion/justifications for selections and decisions above:

The steep slopes along Frankfort and the street design requirements necessitating a contiguous sidwalk along Morena Blvd preclude rain gardens from being implemented.

Form J-1 Page 8 of 8: Trees			
Brief Description: Trees planted in the sidewalk right-of-way provide rainfall interception and infiltration benefits and typically supplements other storm water management tools.			
Site Type (Check all that apply):	Street Type	Rating[1]	Present in Project?
	Residential Streets	●	☐
	Commercial Street/ Business District	◉	☐
	Collector Street	◉	☒
	Arterial and Boulevard	◉	☒
	Alleys	◉	☐
	Parking Areas	●	☐
Key Opportunities for Trees (Check all that apply):	Parkway strips		☐
	Medians		☐
	Irregularly shaped areas		☐
	Extra ROW on back side of sidewalk		☒
	Other (must justify below)		☐
Site-Specific Factors (Check all that apply):	Favorable Conditions for Trees		
	Located outside of clear zone		☐
	Infiltration is feasible		☐
	ROW not limiting		
	Unfavorable Conditions for Trees		
	Limited space for root growth		☐
	Clear zone issues		☐

Summary of Findings:

Were Trees determined to be applicable as part of the Green Streets BMP plan?	If yes, were they used?
☒ Yes ☐ No	☒ Yes ☐ No

Provide discussion/justifications for selections and decisions above:

Based on the requirements for a contiguous sidewalk along Morena, street trees can be incorporated while maintaining the street to sidewalk connection. Furthermore, street trees will fit in well in terms of architectural scale along wide Morena Boulevard where planters or rain gardens would contrastingly seem disproportionately sited.

Project Name: Morena Apartment Homes

ATTACHMENT 2
BACKUP FOR PDP HYDROMODIFICATION CONTROL MEASURES

This is the cover sheet for Attachment 2.

☐ Mark this box if this attachment is empty because the project is exempt from PDP hydromodification management requirements.

Project Name: Morena Apartment Homes

Indicate which Items are Included:

Attachment Sequence	Contents	Checklist
Attachment 2a	Hydromodification Management Exhibit (Required)	☐ Included See Hydromodification Management Exhibit Checklist on the back of this Attachment cover sheet.
Attachment 2b	Management of Critical Coarse Sediment Yield Areas (WMAA Exhibit is required, additional analyses are optional) See Section 6.2 of the BMP Design Manual.	☐ Exhibit showing project drainage boundaries marked on WMAA Critical Coarse Sediment Yield Area Map (Required) Optional analyses for Critical Coarse Sediment Yield Area Determination ☐ 6.2.1 Verification of Geomorphic Landscape Units Onsite ☐ 6.2.2 Downstream Systems Sensitivity to Coarse Sediment ☐ 6.2.3 Optional Additional Analysis of Potential Critical Coarse Sediment Yield Areas Onsite
Attachment 2c	Geomorphic Assessment of Receiving Channels (Optional) See Section 6.3.4 of the BMP Design Manual.	☐ Not performed ☐ Included ☐ Submitted as separate stand-alone document
Attachment 2d	Flow Control Facility Design, including Structural BMP Drawdown Calculations and Overflow Design Summary (Required) See Chapter 6 and Appendix G of the BMP Design Manual	☐ Included ☐ Submitted as separate stand-alone document
Attachment 2e	Vector Control Plan (Required when structural BMPs will not drain in 96 hours)	☐ Included ☐ Not required because BMPs will drain in less than 96 hours

Project Name: Morena Apartment Homes

Use this checklist to ensure the required information has been included on the Hydromodification Management Exhibit:

The Hydromodification Management Exhibit must identify:

- ☐ Underlying hydrologic soil group
- ☐ Approximate depth to groundwater
- ☐ Existing natural hydrologic features (watercourses, seeps, springs, wetlands)
- ☐ Critical coarse sediment yield areas to be protected
- ☐ Existing topography
- ☐ Existing and proposed site drainage network and connections to drainage offsite
- ☐ Proposed grading
- ☐ Proposed impervious features
- ☐ Proposed design features and surface treatments used to minimize imperviousness
- ☐ Point(s) of Compliance (POC) for Hydromodification Management
- ☐ Existing and proposed drainage boundary and drainage area to each POC (when necessary, create separate exhibits for pre-development and post-project conditions)
- ☐ Structural BMPs for hydromodification management (identify location, type of BMP, and size/detail)

Morena Apartment Homes (PTS 526167)
Hydromodification Exemption Justification

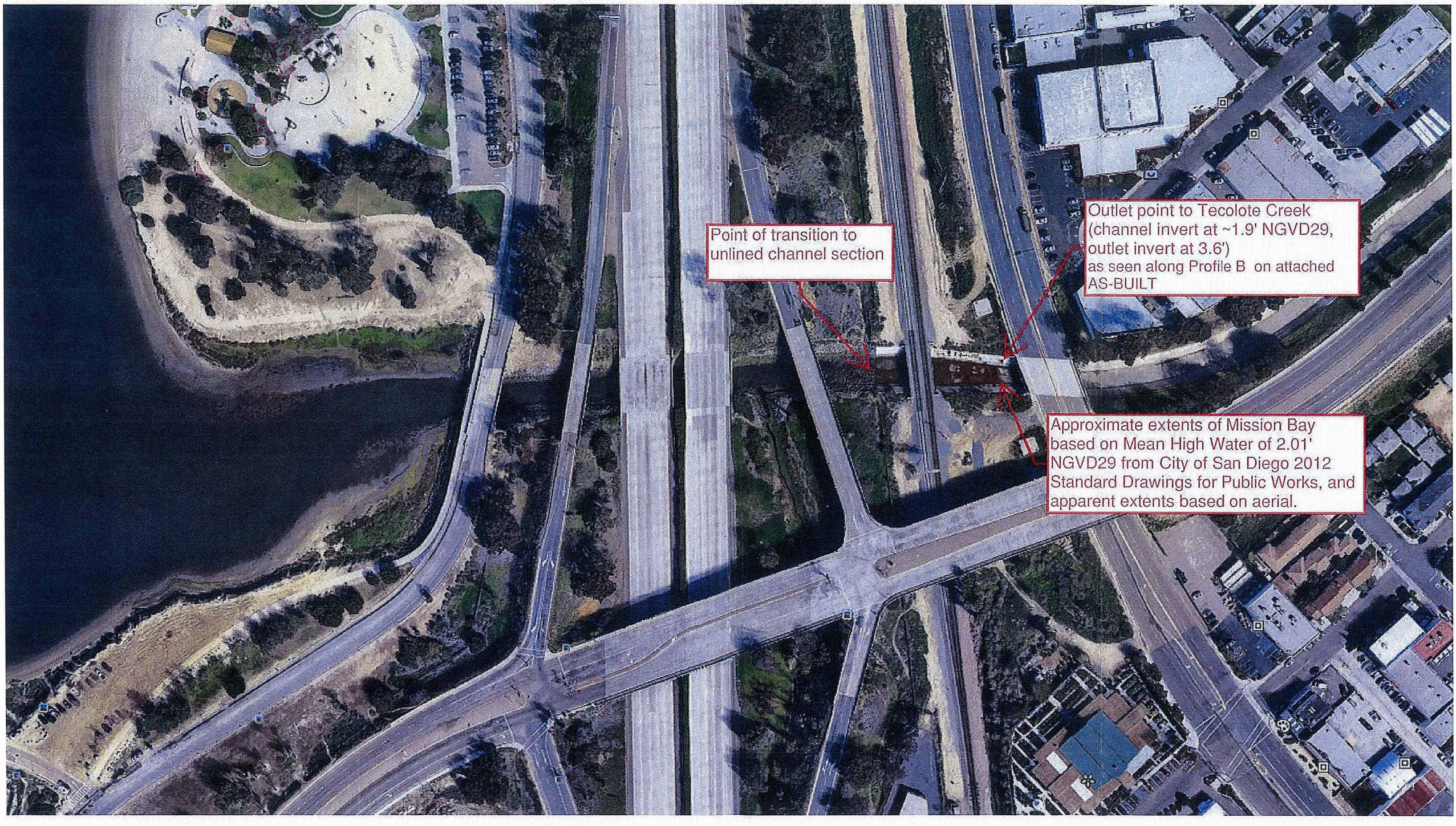
According to the hydromodification guidelines, if the project discharge point to an embayment is below the mean high tide level, then the project is exempt from hydromodification requirements. The invert of Tecolote Creek at the point where it transitions to an unlined condition, after the underground stormdrain outlets to the concrete lined creek, is below the mean high tide of Mission Bay. This implies that the limits of the bay extend upstream into the channel and that the actual "discharge point" is within the bay, before this transition point. That is, the unlined water body being discharged to is Mission Bay at a point upstream from the transition point, at the high tide elevation along the lined portion of the channel. Thus making this an exempt discharge condition.

Ultimately the issue turns on whether the mean high tide defines the extents of Mission Bay and that the unlined water body being discharged to is Mission Bay and that the unlined channel is not a distinct section but part of the bay. While this could be a matter of interpretation and definition, based on our reading of the BMP guidelines it would seem that the intent of using the high tide elevation as the cut off point for exemption was specifically to define the extents of the bay. Which is to say that it would be logically inconsistent to claim this unlined channel is not part of the bay but is rather a distinct and separate channel requiring hydromodification control.

Given that no other definition for the limits of an embayment is cited in the BMP design manual, any other would seem arbitrary and without legitimate defense in this context, thus we feel confident that the project is technically discharging to an embayment and is therefore exempt. We will present all of the data to back up our conclusion with the reviewer that made the comment.

HYDROMODIFICATION EXEMPTION

MORENA APARTMENT HOMES - PUBLIC STORM DRAIN OUTFALL POINT


Point of transition to unlined channel section
Outlet point to Tecolote Creek (channel invert at ~1.9' NGVD29, outlet invert at 3.6') as seen along Profile B on attached AS-BUILT
Approximate extents of Mission Bay based on Mean High Water of 2.01' NGVD29 from City of San Diego 2012 Standard Drawings for Public Works, and apparent extents based on aerial.

Project Name: Morena Apartment Homes

ATTACHMENT 2b

CCSY Documentation

NO CRITICAL COARSE SEDIMENT YIELD AREAS IN VICINITY OF PROJECT

LEGEND

WMAA CCSYA

MAPPING OF WMAA CCSYA HAS BEEN OVERLAID ON THIS EXHIBIT HOWEVER THERE ARE NONE NEARBY AND THEREFORE THIS MAP DEPICTS ONLY THE SITE PLAN

PREPARED BY:

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey

701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
619.234.0349 Fax

CITY OF SAN DIEGO

LUMINA

Attachment 2c
CCSYA VICINITY MAP

SCALE: NTS *JOB #:* 2357.35 *CREATED:* 1/11/18

Project Name: Morena Apartment Homes

ATTACHMENT 3

STRUCTURAL BMP MAINTENANCE INFORMATION

This is the cover sheet for Attachment 3.

Project Name: Morena Apartment Homes

Indicate which Items are Included behind this cover sheet:

Attachment Sequence	Contents	Checklist
Attachment 3a	Structural BMP Maintenance Thresholds and Actions (Required)	☒ Included See Structural BMP Maintenance Information Checklist.
Attachment 3b	Draft Maintenance Agreement (when applicable)	☐ Included ☐ Not Applicable

Project Name: Morena Apartment Homes

Use this checklist to ensure the required information has been included in the Structural BMP Maintenance Information Attachment:

Preliminary Design / Planning / CEQA level submittal:

- Attachment 3a must identify:
  - ☐ Typical maintenance indicators and actions for proposed structural BMP(s) based on Section 7.7 of the BMP Design Manual
- Attachment 3b is not required for preliminary design / planning / CEQA level submittal.

Final Design level submittal:

Attachment 3a must identify:

- ☐ Specific maintenance indicators and actions for proposed structural BMP(s). This shall be based on Section 7.7 of the BMP Design Manual and enhanced to reflect actual proposed components of the structural BMP(s)
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ When applicable, frequency of bioretention soil media replacement
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management

Attachment 3b: For private entity operation and maintenance, Attachment 3b must include a Storm Water Management and Discharge Control Maintenance Agreement (Form DS-3247). The following information must be included in the exhibits attached to the maintenance agreement:

- ☐ Vicinity map
- ☐ Site design BMPs for which DCV reduction is claimed for meeting the pollutant control obligations.
- ☐ BMP and HMP location and dimensions
- ☐ BMP and HMP specifications/cross section/model
- ☐ Maintenance recommendations and frequency
- ☐ LID features such as (permeable paver and LS location, dim, SF).

Project Name: Morena Apartment Homes

THE CITY OF SAN DIEGO
RECORDING REQUESTED BY:
THE CITY OF SAN DIEGO
AND WHEN RECORDED MAIL TO:

Click or tap here to enter text.
Click or tap here to enter text.
Click or tap here to enter text.

(THIS SPACE IS FOR THE RECORDER'S USE ONLY)

STORM WATER MANAGEMENT AND DISCHARGE CONTROL MAINTENANCE AGREEMENT

APPROVAL NUMBER:	ASSESSOR'S PARCEL NUMBER:	PROJECT NUMBER:
Click or tap here to enter text.	Click or tap here to enter text.	Click or tap here to enter text.

This agreement is made by and between the City of San Diego, a municipal corporation [City] and Click or tap here to enter text.

the owner or duly authorized representative of the owner [Property Owner] of property located at:
Click or tap here to enter text.

(PROPERTY ADDRESS)

and more particularly described as: Click or tap here to enter text.

(LEGAL DESCRIPTION OF PROPERTY)

in the City of San Diego, County of San Diego, State of California.

Property Owner is required pursuant to the City of San Diego Municipal Code, Chapter 4, Article 3, Division 3, Chapter 14, Article 2, Division 2, and the Land Development Manual, Storm Water Standards to enter into a Storm Water Management and Discharge Control Maintenance Agreement [Maintenance Agreement] for the installation and maintenance of Permanent Storm Water Best Management Practices [Permanent Storm Water BMP's] prior to the issuance of construction permits. The Maintenance Agreement is intended to ensure the establishment and maintenance of Permanent Storm Water BMP's onsite, as described in the attached exhibit(s), the project's Storm Water Quality Management Plan [SWQMP] and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s): Click or tap here to enter text.

Property Owner wishes to obtain a building or engineering permit according to the Grading and/or Improvement Plan Drawing No(s) or Building Plan Project No(s): Click or tap here to enter text.

Continued on Page 2

Project Name: Morena Apartment Homes

NOW, THEREFORE, the parties agree as follows:

1. Property Owner shall have prepared, or if qualified, shall prepare an Operation and Maintenance Procedure [OMP] for Permanent Storm Water BMP's, satisfactory to the City, according to the attached exhibit(s), consistent with the Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s):Click or tap here to enter text..

2. Property Owner shall install, maintain and repair or replace all Permanent Storm Water BMP's within their property, according to the OMP guidelines as described in the attached exhibit(s), the project's WQTR and Grading and/or Improvement Plan Drawing No(s), or Building Plan Project No(s)Click or tap here to enter text..

3. Property Owner shall maintain operation and maintenance records for at least five (5) years. These records shall be made available to the City for inspection upon request at any time.

This Maintenance Agreement shall commence upon execution of this document by all parties named hereon, and shall run with the land.

Executed by the City of San Diego and by Property Owner in San Diego, California.

See Attached Exhibits(s):Click or tap here to enter text.

(Owner Signature)

Click or tap here to enter text.

(Print Name and Title)

Click or tap here to enter text.

(Company/Organization Name)

Click or tap to enter a date.

(Date)

THE CITY OF SAN DIEGO

APPROVED:

(City Control engineer Signature

(Print Name)

(Date)

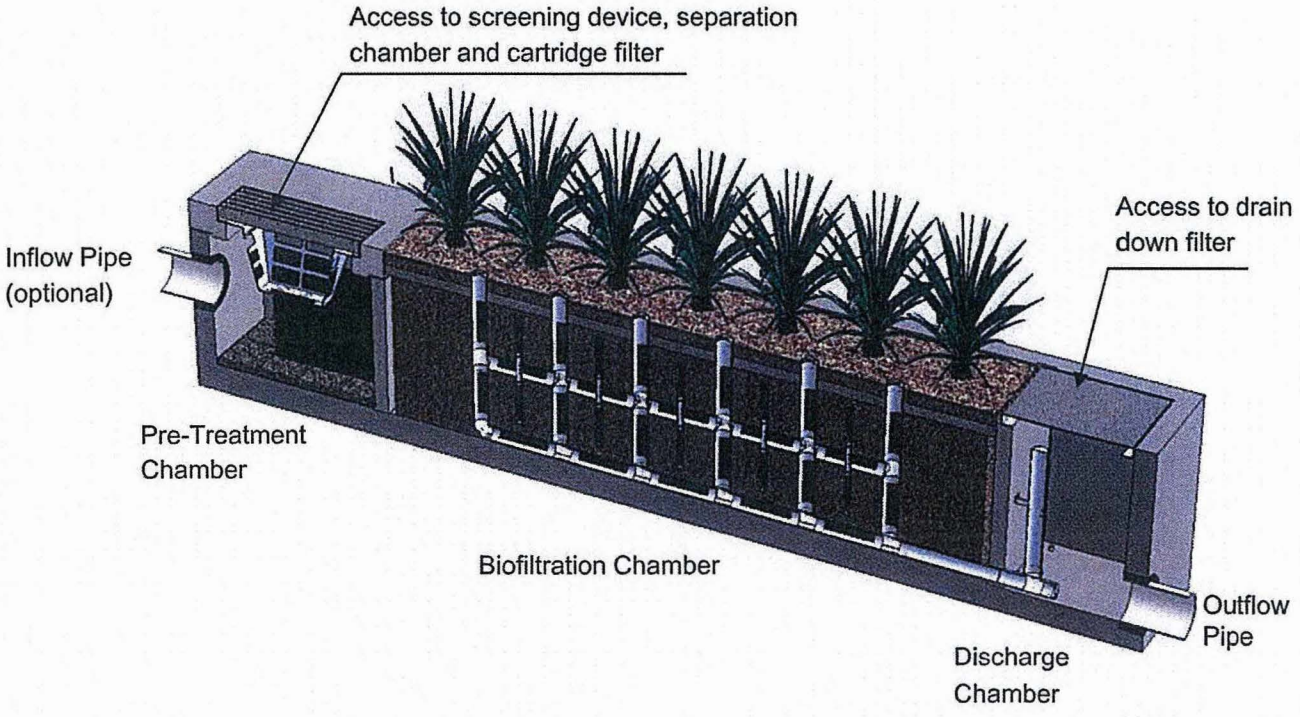
NOTE: ALL SIGNATURES MUST INCLUDE NOTARY ACKNOWLEDMENTS PER CIVIL CODE SEC. 1180 ET.SEQ

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
  - (*5 minute average service time*).
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
  - (*10 minute average service time*).
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
  - (*10-15 minute per cartridge average service time*).
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
  - (*5 minute average service time*).
- Trim Vegetation – average maintenance interval is 6 to 12 months.
  - (*Service time varies*).

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.

Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.

2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.

3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.

4. Entry into chambers may require confined space training based on state and local regulations.

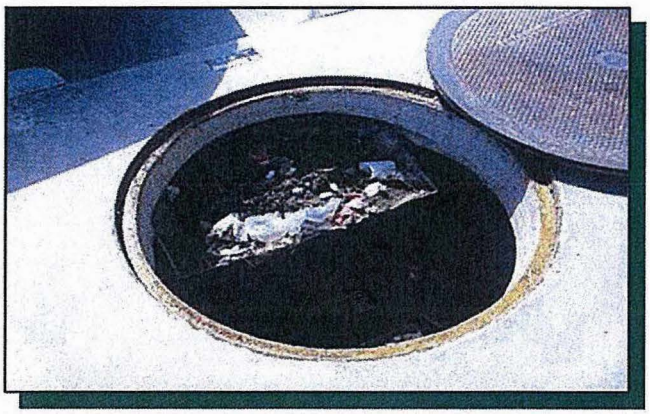
5. No fertilizer shall be used in the Biofiltration Chamber.

6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

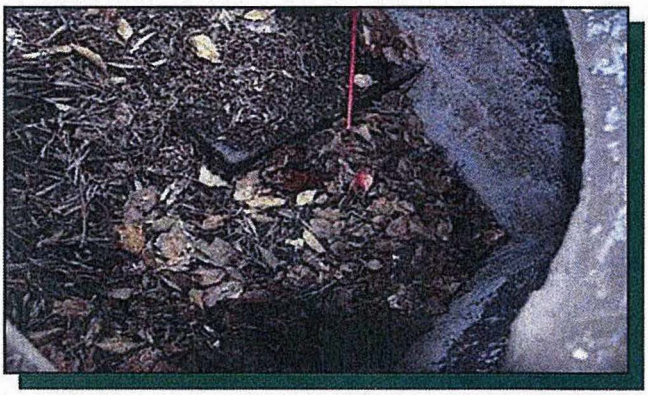
Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.



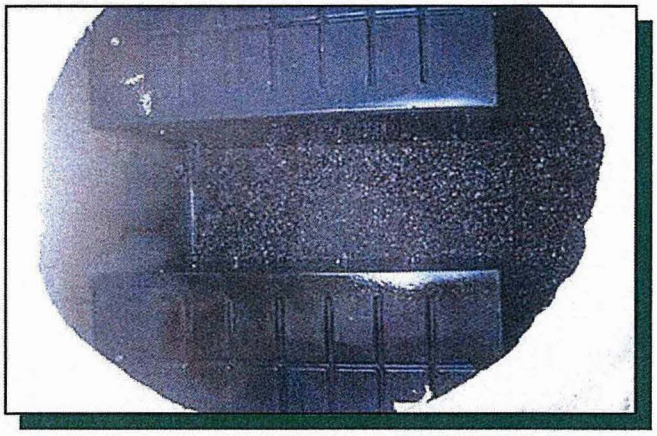
Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



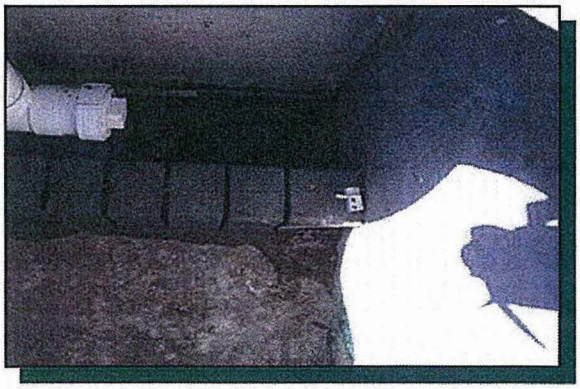
Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.



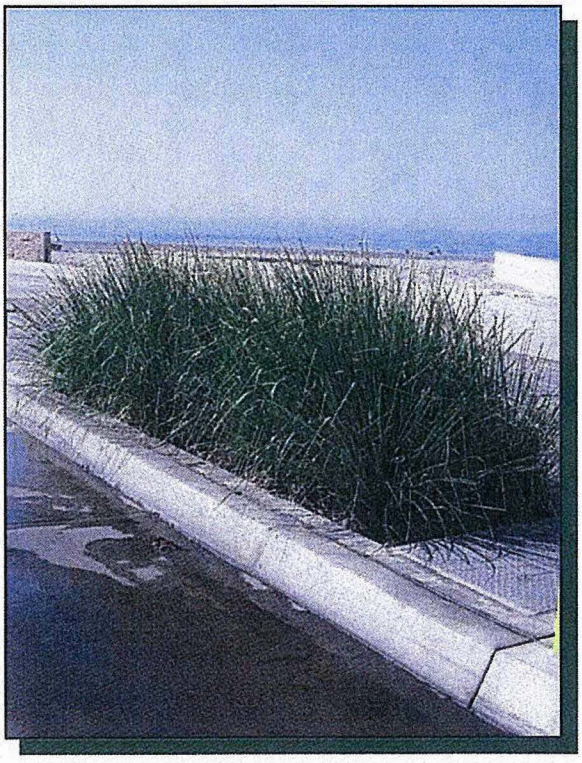
Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.

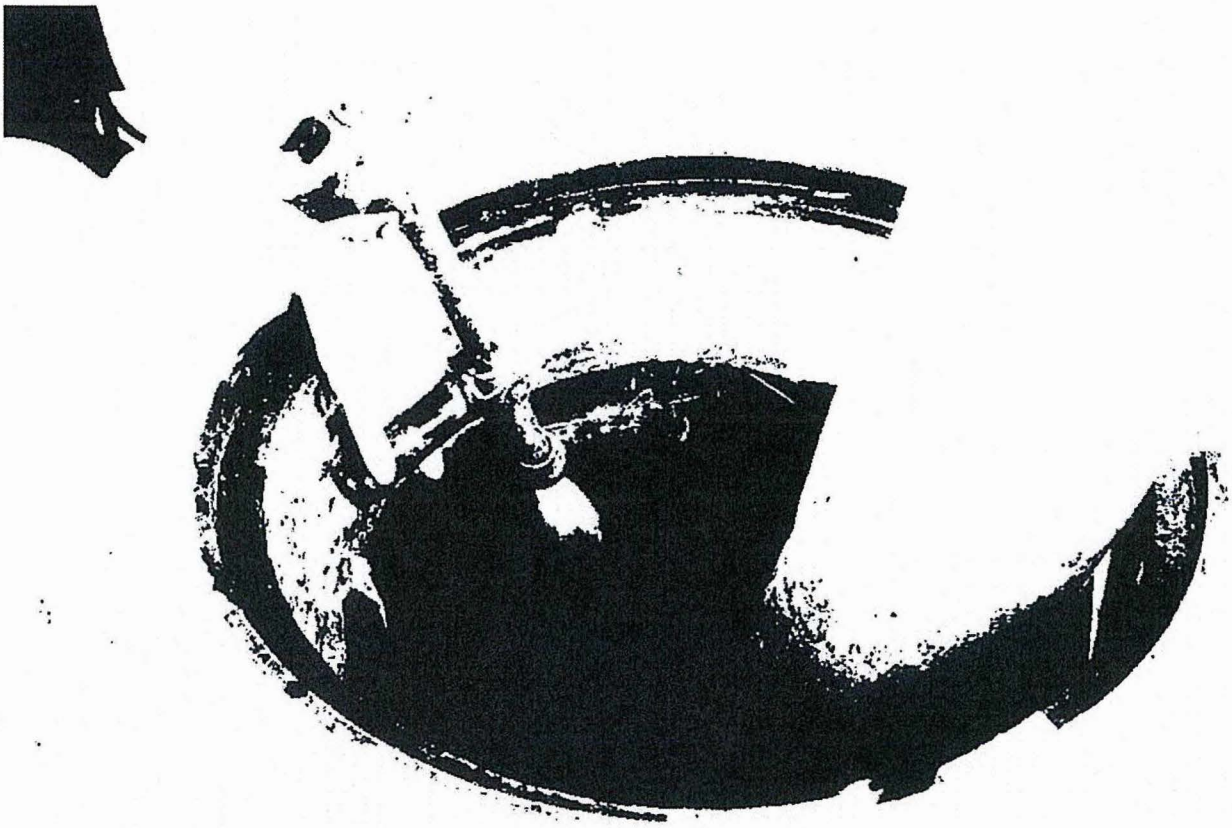


Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.



Inspection Form



Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

BIO CLEAN ENVIRONMENTAL SERVICES, INC.

Inspection Report
Modular Wetlands System

MODULAR WETLANDS

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	Yes	No	Comments
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	Yes	No
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

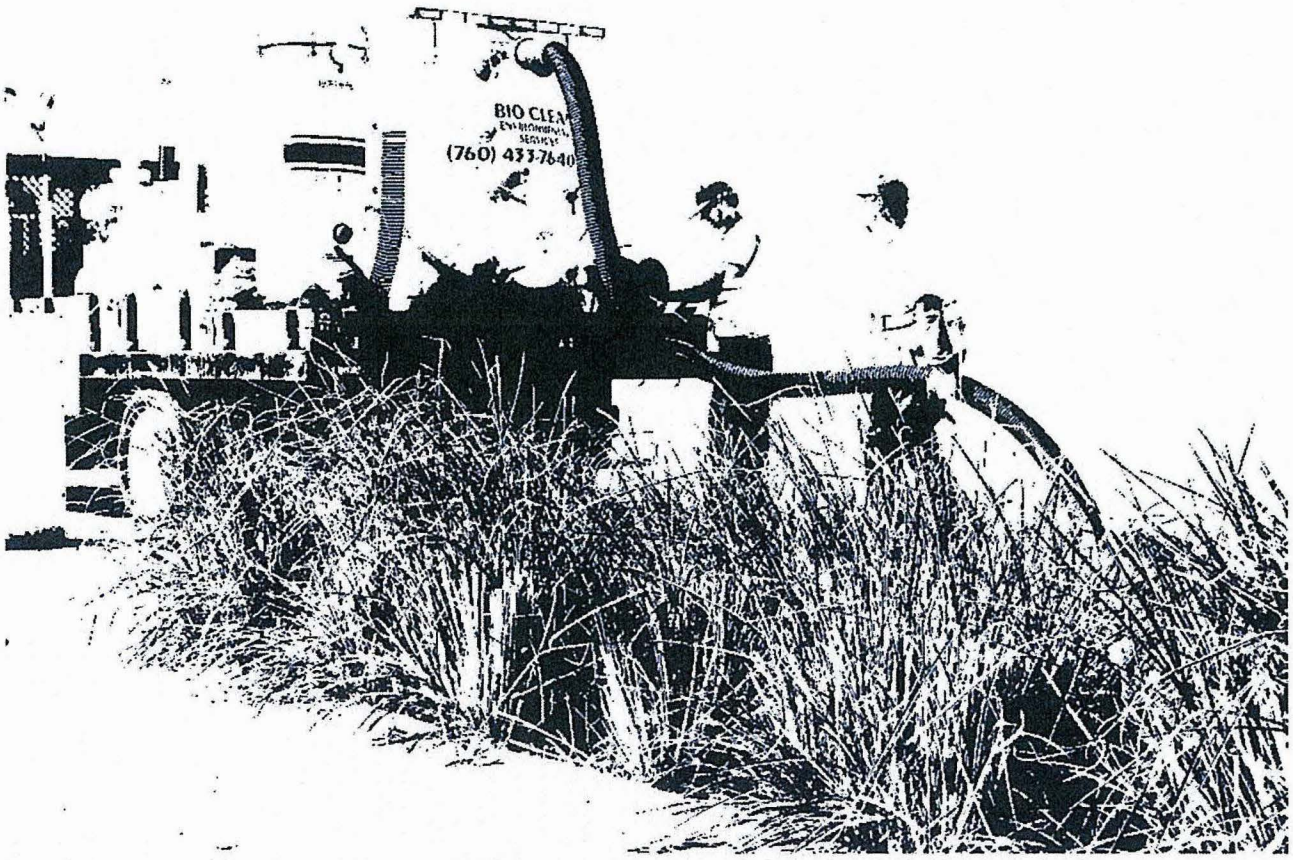
Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

2972 San Luis Rey Road, Oceanside, CA 92058 P (760) 433-7640 F (760) 433-3176

Maintenance Report



Modular Wetland System, Inc.
P. 760.433-7640
F. 760-433-3176
E. Info@modularwetlands.com

www.modularwetlands.com

Cleaning and Maintenance Report
Modular Wetlands System

Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone ( ) –

Inspector Name _____ Date ____/____/____ Time _____ AM / PM

For Office Use Only
(Reviewed By)
(Date)
Office personnel to complete section to the left.

Type of Inspection ☐ Routine ☐ Follow Up ☐ Complaint ☐ Storm Storm Event in Last 72-hours? ☐ No ☐ Yes

Weather Condition _____ Additional Notes _____

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

2972 San Luis Rey Road, Oceanside, CA 92058 P. 760.433.7640 F. 760.433.3176

Project Name: Morena Apartment Homes

ATTACHMENT 4
COPY OF PLAN SHEETS SHOWING PERMANENT STORM WATER BMPS

This is the cover sheet for Attachment 4.

Project Name: Morena Apartment Homes

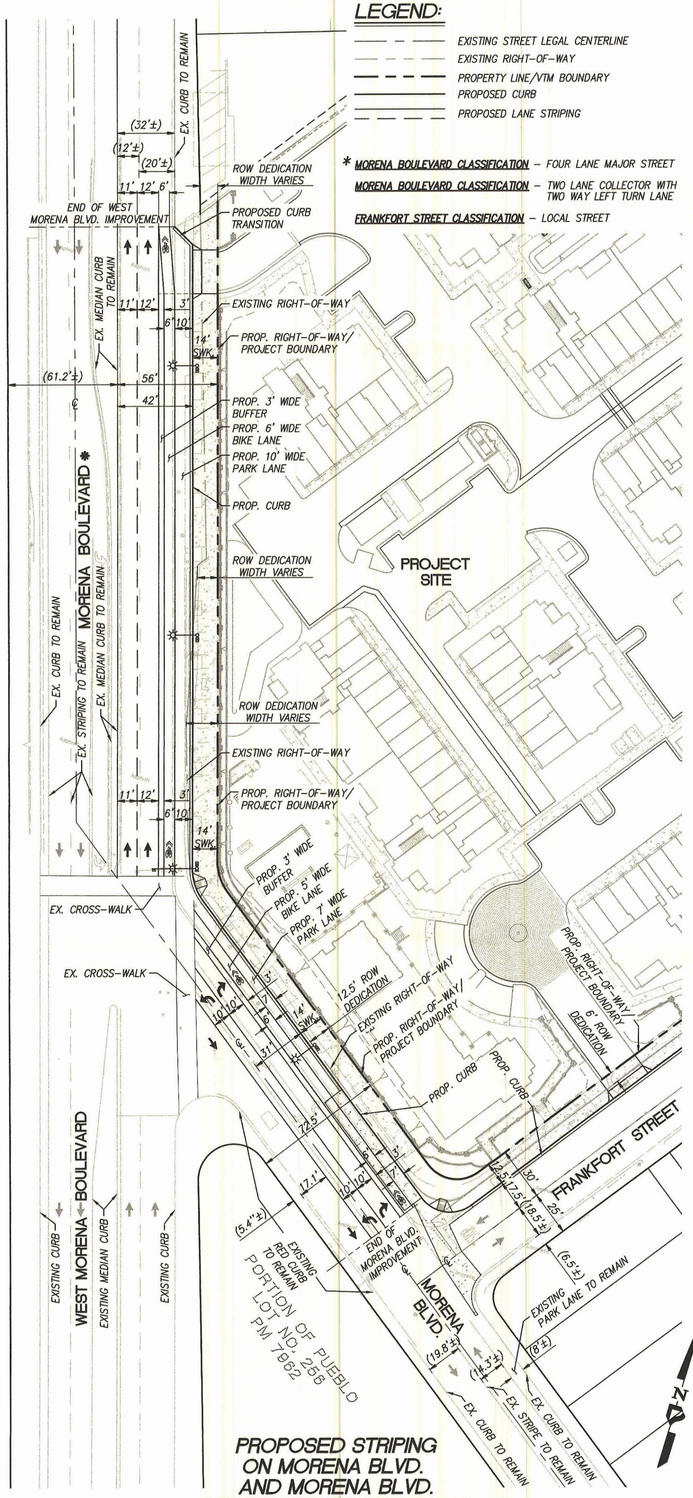
Use this checklist to ensure the required information has been included on the plans:

The plans must identify:

- ☐ Structural BMP(s) with ID numbers matching Form I-6 Summary of PDP Structural BMPs
- ☐ The grading and drainage design shown on the plans must be consistent with the delineation of DMAs shown on the DMA exhibit
- ☐ Details and specifications for construction of structural BMP(s)
- ☐ Signage indicating the location and boundary of structural BMP(s) as required by the City Engineer
- ☐ How to access the structural BMP(s) to inspect and perform maintenance
- ☐ Features that are provided to facilitate inspection (e.g., observation ports, cleanouts, silt posts, or other features that allow the inspector to view necessary components of the structural BMP and compare to maintenance thresholds)
- ☐ Manufacturer and part number for proprietary parts of structural BMP(s) when applicable
- ☐ Maintenance thresholds specific to the structural BMP(s), with a location-specific frame of reference (e.g., level of accumulated materials that triggers removal of the materials, to be identified based on viewing marks on silt posts or measured with a survey rod with respect to a fixed benchmark within the BMP)
- ☐ Recommended equipment to perform maintenance
- ☐ When applicable, necessary special training or certification requirements for inspection and maintenance personnel such as confined space entry or hazardous waste management
- ☐ Include landscaping plan sheets showing vegetation requirements for vegetated structural BMP(s)
- ☐ All BMPs must be fully dimensioned on the plans
- ☐ When propritery BMPs are used, site specific cross section with outflow, inflow and model number shall be provided. Broucher photocopies are not allowed.

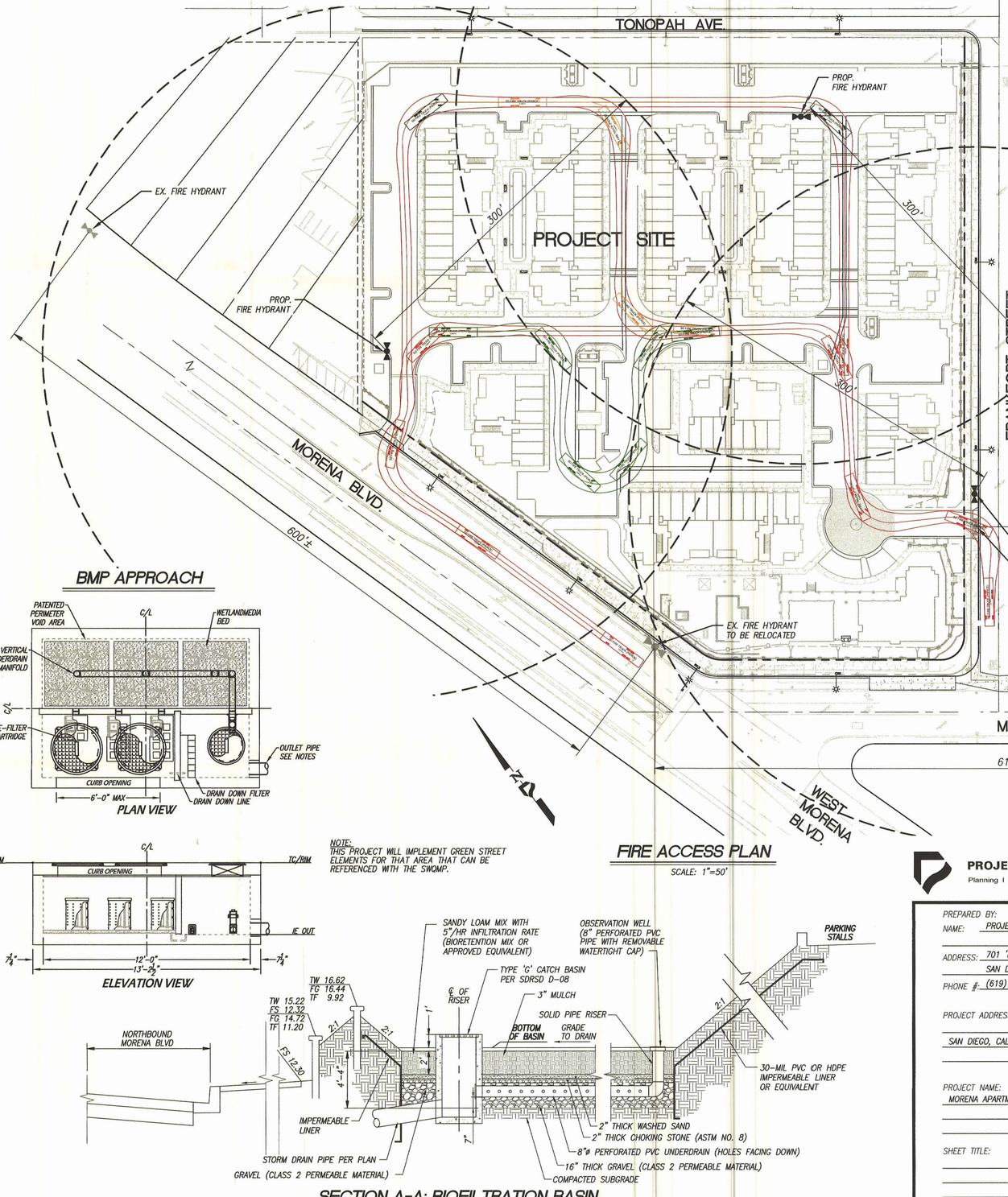
MORENA APARTMENT HOMES

REZONE NO. 1868548/VESTING TENTATIVE MAP NO. 1868551/PLANNED DEVELOPMENT PERMIT NO. 1868549
SITE DEVELOPMENT PERMIT NO. 1868547/ COMMUNITY PLAN AMENDMENT NO. 1868552



PROPOSED STRIPING ON MORENA BLVD. AND MORENA BLVD.

SCALE: 1"=40'



FIRE ACCESS PLAN

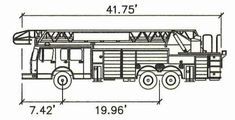
SCALE: 1"=50'

NOTE:
ALL BUILDINGS AND SITES UNDERGOING CONSTRUCTION, ALTERATION, OR DEMOLITION SHALL COMPLY WITH THE REQUIREMENTS OF CHAPTER 33 OF THE CFC.

LEGEND:

PROPOSED FIRE HYDRANT

300' RADIUS FIRE HYDRANT



SD Fire Truck (Pierce)

	Feet
Width	: 8.00
Track	: 6.83
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

NOT TO SCALE

BMP APPROACH

PLAN VIEW

ELEVATION VIEW

NOTE:
THIS PROJECT WILL IMPLEMENT GREEN STREET ELEMENTS FOR THAT AREA THAT CAN BE REFERENCED WITH THE SWQMP.

SECTION A-A: BIOFILTRATION BASIN

NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
GREGORY M. SHIELDS
No. 42951
Exp. 03-31-18
CIVIL
STATE OF CALIFORNIA

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey
701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
619.234.0349 Fax

PREPARED BY:
NAME: PROJECT DESIGN CONSULTANTS
ADDRESS: 701 'B' STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101
PHONE #: (619) 235-6471

PROJECT ADDRESS:
SAN DIEGO, CALIFORNIA

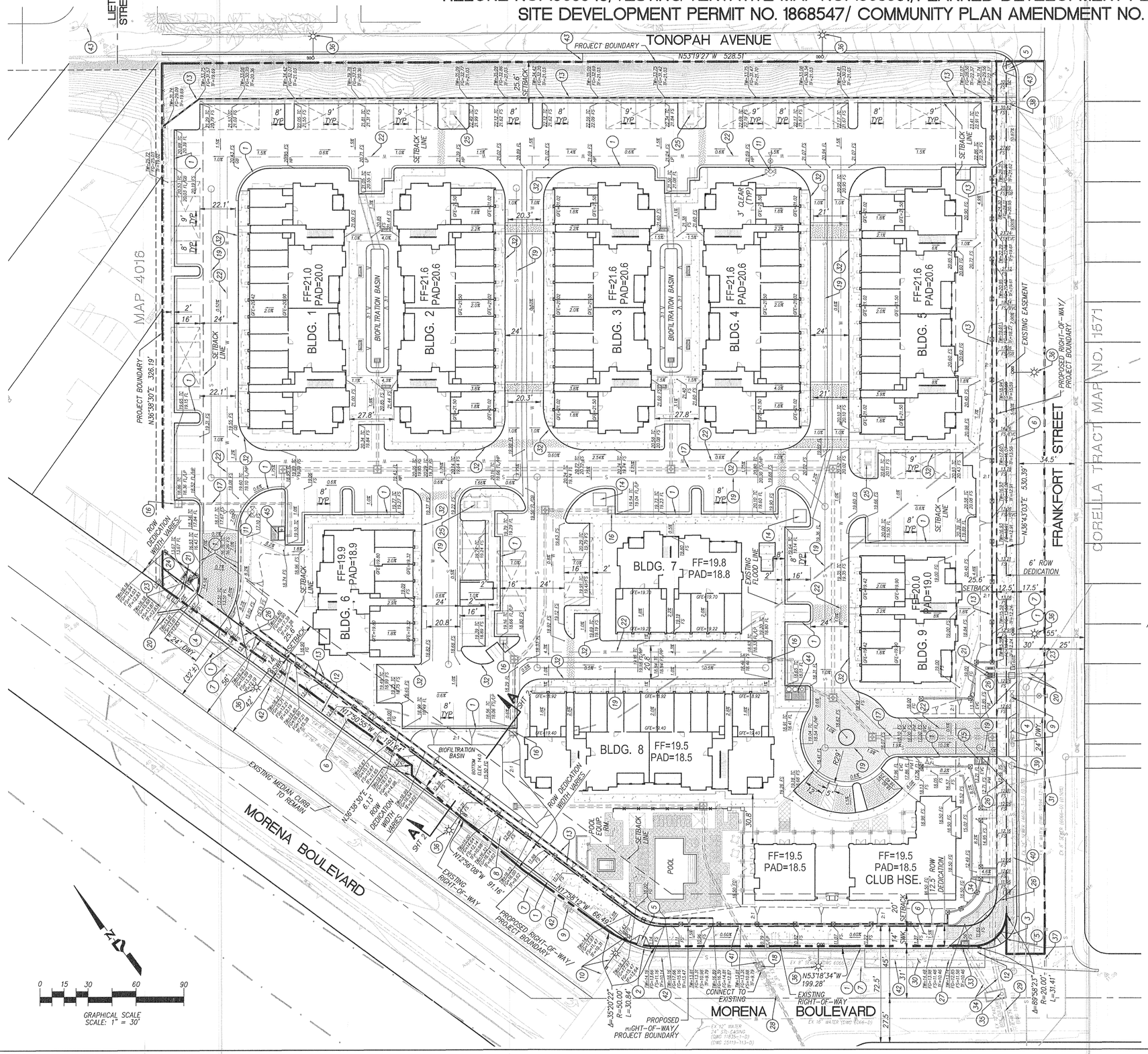
PROJECT NAME:
MORENA APARTMENT HOMES

SHEET TITLE:
DETAILS

REVISION 14:	
REVISION 13:	
REVISION 12:	
REVISION 11:	
REVISION 10:	
REVISION 09:	
REVISION 08:	
REVISION 07:	
REVISION 06:	
REVISION 05:	
REVISION 04:	11/16/2017
REVISION 03:	07/21/2017
REVISION 02:	05/08/2017
REVISION 01:	01/19/2017
ORIGINAL DATE:	12/05/2016
SHEET	2 OF 58
DEP #	

MORENA APARTMENT HOMES

REZONE NO. 1868548/VESTING TENTATIVE MAP NO. 1868551/PLANNED DEVELOPMENT PERMIT NO. 1868549
SITE DEVELOPMENT PERMIT NO. 1868547/ COMMUNITY PLAN AMENDMENT NO. 1868552



KEY NOTES:

1. PROPOSED TYPE 'G' CURB & GUTTER PER SDG-151
2. PROPOSED 30' RADIUS CURB RETURN
3. PROPOSED 20' RADIUS CURB RETURN
4. PROPOSED 24' DRIVEWAY PER SDG-159
5. PROPOSED TYPE A CURB RAMP PER SDG-133
6. PROPOSED PCC SIDEWALK PER SDG-155
7. EXISTING TYPE 'G' CURB & GUTTER TO BE REMOVED
8. EXISTING SDG&E TRANSFORMER TO BE RELOCATED
9. EXISTING FIRE HYDRANT TO BE RELOCATED
10. EXISTING TRAFFIC SIGNAL POLE AND STREET LIGHT TO BE RELOCATED
11. PROPOSED FIRE HYDRANT ASSEMBLY
12. EXISTING STREET TREE TO BE REMOVED (TYPICAL)
13. PROPOSED RETAINING WALL
14. PROPOSED ELECTRIC TRANSFORMER LOCATION
15. PROPOSED 4'x6'-L MODULAR WETLAND UNIT (PRIVATE)
16. PROPOSED STORM DRAIN INLET (PRIVATE)
17. PROPOSED STORM DRAIN (PRIVATE) – SIZE VARIES FROM 18" TO 24" RCP
18. PROPOSED TYPE A-4 STORM DRAIN CLEANOUT PER D-09 (PUBLIC)
19. PROPOSED 6" SEWER LATERAL (PRIVATE)
20. PROPOSED WATER SERVICE METER (PUBLIC)
21. PROPOSED DOMESTIC/FIRE BACKFLOW (PRIVATE)
22. PROPOSED 8" DOMESTIC/FIRE WATER MAIN (PRIVATE)
23. PROPOSED 2" IRRIGATION SERVICE (PUBLIC)
24. PROPOSED IRRIGATION 2" REDUCED PRESSURE DETECTOR ASSEMBLY (PRIVATE)
25. PROPOSED TRASH ENCLOSURE
26. SIGHT DISTANCE LINE, SEE SIGHT DISTANCE NOTE RIGHT
27. EXISTING BUS STOP/ BENCH TO BE RELOCATED
28. EXISTING 18" STORM DRAIN PER DWG 3475-D TO REMAIN
29. EXISTING 12"X42" BOX CULVERT PER DWG 10162-L TO REMAIN
30. PROPOSED BUS STOP PAD 12' X 75' PER SDG-102
31. EXISTING OVERHEAD ELECTRIC LINE (50± LF) TO BE UNDERGROUNDED
32. PROPOSED 6" CURB PER SDG-150
33. PROPOSED TYPE B INLET PER SDD-116 (PUBLIC)

KEY NOTES (CONT.):

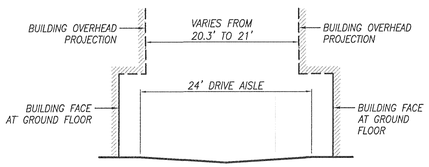
34. PROPOSED 12" X 42" CONCRETE CULVERT BOX (PRIVATE) AN EMRA WILL BE REQUIRED
35. PROPOSED 4' X 12' MODIFIED TYPE 'A' STORM DRAIN CLEANOUT PER D-09 (PUBLIC) AN EMRA WILL BE REQUIRED
36. PROPOSED TYPE 15 (250 W HPS) STREET LIGHT PER SDE-101 TO COMPLY WITH MARCH 2017 CITY OF SAN DIEGO STREET DESIGN MANUAL (LED LIGHTS)
37. PROPOSED HALF-WIDTH CROSS GUTTER PER SDG-157 (PUBLIC)
38. PROPOSED CURB OUTLET PER D-25 (PUBLIC)
39. PROPOSED PRIVATE SEWER LINE POINT OF CONNECTION AT NEW MANHOLE
40. EXISTING 6" SEWER LINE TO BE PRIVATIZED – EMRA REQUIRED
41. PROPOSED PRIVATE 18" RCP – EMRA REQUIRED
42. EXISTING 8" SEWER LINE TO REMAIN
43. EXISTING STREET LIGHT TO REMAIN
44. PROPOSED 8'x12'-L MODULAR WETLAND UNIT (PRIVATE)
45. PROPOSED 8'x8'-L MODULAR WETLAND UNIT (PRIVATE)

WATER AND SEWER NOTES:

1. ALL PROPOSED WATER AND SEWER FACILITIES WITHIN THE PUBLIC ROW OR PUBLIC EASEMENT (PUBLIC AND PRIVATE) MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED WITHIN THE CITY OF SAN DIEGO'S CURRENT WATER AND SEWER FACILITY DESIGN GUIDELINES, REGULATIONS, STANDARDS, AND PRACTICES PERTAINING THERETO.
2. ALL PROPOSED PRIVATELY MAINTAINED WATER AND SEWER FACILITIES LOCATED WITHIN A SINGLE LOT OR PRIVATE EASEMENT MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CRITERIA ESTABLISHED WITHIN THE CURRENT CALIFORNIA PLUMBING CODE.
3. ALL WATER SERVICES TO THE SITE (EXCEPTING SINGLE FAMILY DOMESTIC SERVICE LINES, AND SINGLE FAMILY DOMESTIC/FIRE COMBINED SERVICE LINES WHERE THE RESIDENTIAL FIRE SPRINKLER SYSTEM UTILIZES PASSIVE PURGE DESIGN) MUST PASS THROUGH A PRIVATE ABOVE GROUND BACK FLOW PREVENTION DEVICE (BFPD). BFPD'S ARE TO BE LOCATED ABOVE GROUND, ON PRIVATE PROPERTY, IN LINE WITH THE SERVICE, AND IMMEDIATELY ADJACENT TO THE RIGHT-OF-WAY.

NOTES:

1. FILL PLACED IN THE SFHA FOR THE PURPOSE OF CREATING A BUILDING PAD MUST BE COMPACTED TO 95% OF THE MAXIMUM DENSITHY OBTAINABLE WITH THE STANDARD PROCTOR TEST FILL METHOD ISSUED BY THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM STANDARD D-698). GRANULAR FILL SLOPES MUST HAVE ADEQUATE PROTECTION FOR A MINIMUM FLOOD WATER VELOCITY OF FIVE FEET PER SECOND.
2. AN EMRA WILL BE REQUIED FOR ALL PRIVATE STORM DRAINS, LANDSCAPING AND IRRIGATION WITHIN THE PUBLIC RIGHT-OF-WAY.
3. THIS PROJECT WILL IMPLEMENT GREEN STREET ELEMENTS FOR THAT AREA THAT CAN BE REFERENCED WITH THE SWQMP.
4. IF A 3" OR LARGER METER IS REQUIRED FOR THIS PROJECT, THE OWNER/PERMITTEE SHALL CONSTRUCT A NEW METER ABOVE GROUND WITHIN THE PUBLIC ROW, OR AN ADEQUATELY SIZED PUBLIC WATER EASEMENT, IN A MANNER SATISFACTORY TO THE PUBLIC UTILITIES DIRECTOR AND THE CITY ENGINEER.



DRIVE AISLE SECTION
NOT TO SCALE

SIGHT DISTANCE NOTE:

NO OBSTRUCTION INCLUDING SOLID WALLS IN THE VISIBILITY AREA SHALL EXCEED 3 FEET IN HEIGHT. PLANT MATERIAL, OTHER THAN TREES, WITHIN THE PUBLIC RIGHT-OF-WAY THAT IS LOCATED WITHIN THE VISIBILITY AREAS SHALL NOT EXCEED 24 INCHES IN HEIGHT, MEASURED FROM THE TOP OF THE ADJACENT CURB.

SITE AND GRADING PLAN

SCALE: 1"=30'

REGISTERED PROFESSIONAL ENGINEER GREGORY M. SHIELDS No. 42951 Exp. 03-31-18 CIVIL STATE OF CALIFORNIA

PROJECT DESIGN CONSULTANTS
Planning | Landscape Architecture | Engineering | Survey
701 B Street, Suite 800
San Diego, CA 92101
619.235.6471 Tel
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PREPARED BY:
NAME: PROJECT DESIGN CONSULTANTS
ADDRESS: 701 'B' STREET, SUITE 800
SAN DIEGO, CALIFORNIA 92101
PHONE #: (619) 235-6471

PROJECT ADDRESS:
SAN DIEGO, CALIFORNIA

PROJECT NAME:
MORENA APARTMENT HOMES

SHEET TITLE:
SITE AND GRADING PLAN

REVISION 14:
REVISION 13:
REVISION 12:
REVISION 11:
REVISION 10:
REVISION 09:
REVISION 08:
REVISION 07:
REVISION 06:
REVISION 05:
REVISION 04: 11/16/2017
REVISION 03: 07/21/2017
REVISION 02: 05/08/2017
REVISION 01: 01/19/2017
ORIGINAL DATE: 12/05/2016
SHEET 4 OF 58
DEP #

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Project Name: Morena Apartment Homes

ATTACHMENT 5
DRAINAGE REPORT

Attach project's drainage report. Refer to Drainage Design Manual to determine the reporting requirements.

Project Name: Morena Apartment Homes

ATTACHMENT 6
GEOTECHNICAL AND GROUNDWATER INVESTIGATION REPORT

Attach project's geotechnical and groundwater investigation report. Refer to Appendix C.4 to determine the reporting requirements.

LGC Valley, Inc.
Geotechnical Consulting

June 23, 2017 Project No. 154004-03

Mr. Shon Finch
FF Realty III, LLC
5510 Morehouse Drive, Suite 200
San Diego, California 92121

Subject: ***Addendum Geotechnical Study and Response to 2nd City of San Diego LDR-Geology Multi-Discipline Cycle Issues/Review Comments, Proposed Morena Apartment Homes, 1579 and 1623 Morena Boulevard, San Diego, California***

Introduction

LGC Valley, Inc. (LGC) has prepared this letter to address the review comments made in the recent City of San Diego LDR-Geology Plan Check Comments (San Diego City, 2017) regarding geotechnical issues relative to the apartment home complex located at the northeast corner of Morena Boulevard and Frankfort Street in the Bay Park area of the City of San Diego, California. The findings, conclusions and recommendations of our addendum geotechnical study and our response to the outstanding/unresolved cycle issues/review comments are presented below.

Addendum Study

Based on the results of this current addendum study and our recent update geotechnical study (LGC Valley, 2016), it is our professional opinion that the proposed site development is suitable for the currently proposed development from a geotechnical standpoint provided the recommendations included in this report and the other project geotechnical reports (Appendix A) are incorporated into the project plans and specifications, and followed during site grading and construction. Additional geotechnical recommendations are provided in the Review Comments Section of this report.

Review Comments

Comments Issue No. 5: The project geotechnical consultant must indicate if the site is suitable for the currently proposed development.

Response: Acknowledged. See comment above in the Addendum Study Section of this report.

Comments Issue No. 11: Submit an addendum geotechnical report or update letter that specifically addresses the proposed development for the purposes of environmental review and the following:

Response: Acknowledged.

LGC Valley, Inc.
Geotechnical Consulting

June 23, 2017 Project No. 154004-03

Mr. Shon Finch
FF Realty III, LLC
5510 Morehouse Drive, Suite 200
San Diego, California 92121

Subject: ***Addendum Geotechnical Study and Response to 2nd City of San Diego LDR-Geology Multi-Discipline Cycle Issues/Review Comments, Proposed Morena Apartment Homes, 1579 and 1623 Morena Boulevard, San Diego, California***

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Response: Acknowledged. See comment above in the Addendum Study Section of this report.

Comments Issue No. 11: Submit an addendum geotechnical report or update letter that specifically addresses the proposed development for the purposes of environmental review and the following:

Response: Acknowledged.

Comments Issue No. 12: The project's geotechnical consultant indicates that the site development is feasible from geotechnical standpoint; however, as previously requested the geotechnical consultant must indicate if the site is suitable for the currently proposed development (per the City of San Diego's Guidelines for Geotechnical Reports, page 9).

Response: Acknowledged. See comment above in the Addendum Study section of this report.

Comments Issue No. 13: The answers to the screening question for Criteria #1 and 5 of worksheet C.4-1 should be based on the infiltration rates. The yes/ no response for Criteria #1 and 5 should be based on the infiltration rates from the site. Note: A 'Partial Infiltration' condition exists when the infiltration rates are between 0.01 inches per hour (in/hr) and 0.50 in/hr. Criterion #5 should be updated to reflect this information.

Response: The City of San Diego Worksheet C.4-1 - Categorization of Infiltration Feasibility Condition and Worksheet D.5-1 - Factor of Safety and Design Infiltration Rate Worksheet have been revised and included in Appendix B of this report. Criteria No. 1 and 5 have been updated to indicate that a partial infiltration category is applicable to the site. We understand that a partial infiltration condition exists when the site infiltration rates range between 0.01 and 0.5 inches per hour. The recommended unadjusted infiltration rates for the project biofiltration basins are 0.01 inches per hour for the southern basin, 0.10 inches per hour for the northwestern range, and 0.81 inches per hour for the northeastern biofiltration basin.

Comments Issue No. 14: Currently, Criteria #2 & 6 includes a general statement of geotechnical hazards on the site. In order for the City to accept the current geotechnical hazard(s) justification, the project's geotechnical consultant must address each specific geologic or geotechnical hazard associated with storm water infiltration. If geologic or geotechnical hazards are demonstrated, describe the measures available to mitigate the hazard to an acceptable level of risk and recommend specifications for each storm water basin. The analyses and supporting documentation should be submitted for review.

Response: Two geotechnical cross-sections were prepared showing the proposed biofiltration basins relative to the adjacent buildings and retaining wall along the south side of the site. As indicated in Cross-Sections E-E' and F-F' (Figures 1 and 2), the northwestern and northeastern biofiltration basins are located, as close as, 7 feet from the proposed residential buildings (Figure 1) while the southern bioretention basin is located, as close as, 2 feet from the corner of Building 8 and within approximately 5 to 6 feet of the retaining wall along the toe-of-slope. Figure 1 is located approximately 10 from the northern end of the northwestern biofiltration basin while Figure 2 is located approximately 30 feet from the eastern end of the southern biofiltration basin.

Geotechnical analysis indicates that lateral migration of the storm water infiltration water may have a detrimental impact on the proposed improvements. However, the impact can be mitigated to an acceptable level by the placement of an impermeable liner along the sides of the biofiltration basins (as indicated in Figures 1 and 2). The 30-mil thick impermeable liner should extend to at least 6-inches above the top of the catch basin riser/high water level in each of the biofiltration basins.

Groundwater mounding may also be a concern; however, the relatively low infiltration rates obtained on the site indicate that mounding should be minimal.

Based on our revised analysis, and as indicated on Worksheet C.4-1 - Categorization of Infiltration Feasibility Condition, we conclude that the site infiltration category should be considered a "partial infiltration" condition and that the biofiltration basins should be designed accordingly.

Closure

The opportunity to be of service is appreciated. Should you have any questions regarding the content of this report, or should you require additional information, please do not hesitate to contact this office at your earliest convenience.

If you should have any questions, please do not hesitate to contact us. The undersigned can be reached at (760) 599-7000.

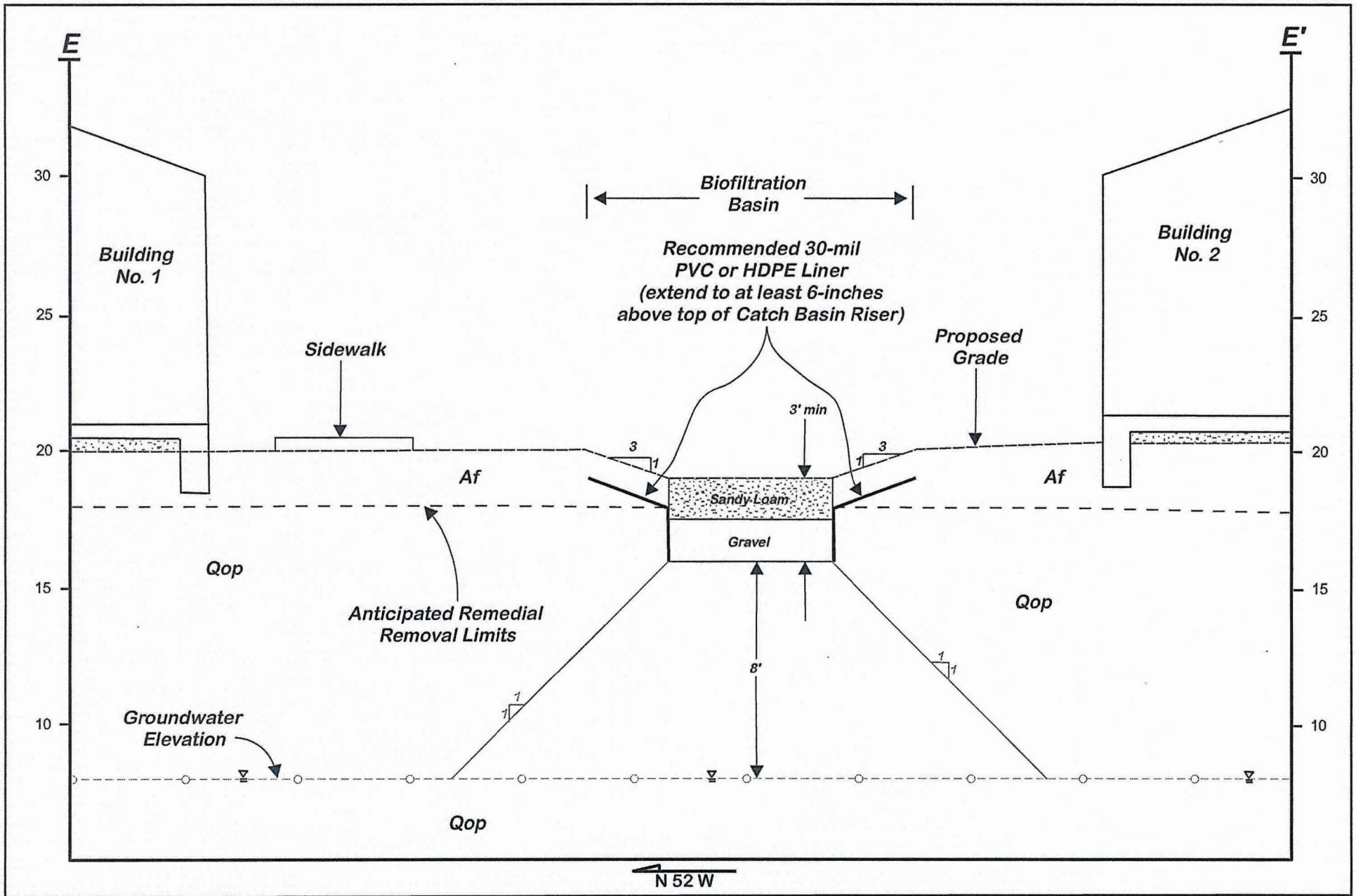
Respectfully submitted,

LGC Valley, Inc.

Randall Wagner, CEG 1612
Senior Project Geologist

Attachments: Figure 1 - Cross-Section E-E'
Figure 2 - Cross-Section F-F'
Appendix A - References
Appendix B - City of San Diego Worksheet C.4-1 - Categorization of Infiltration Feasibility Condition and Worksheet D.5-1 - Factor of Safety and Design Infiltration Rate Worksheet

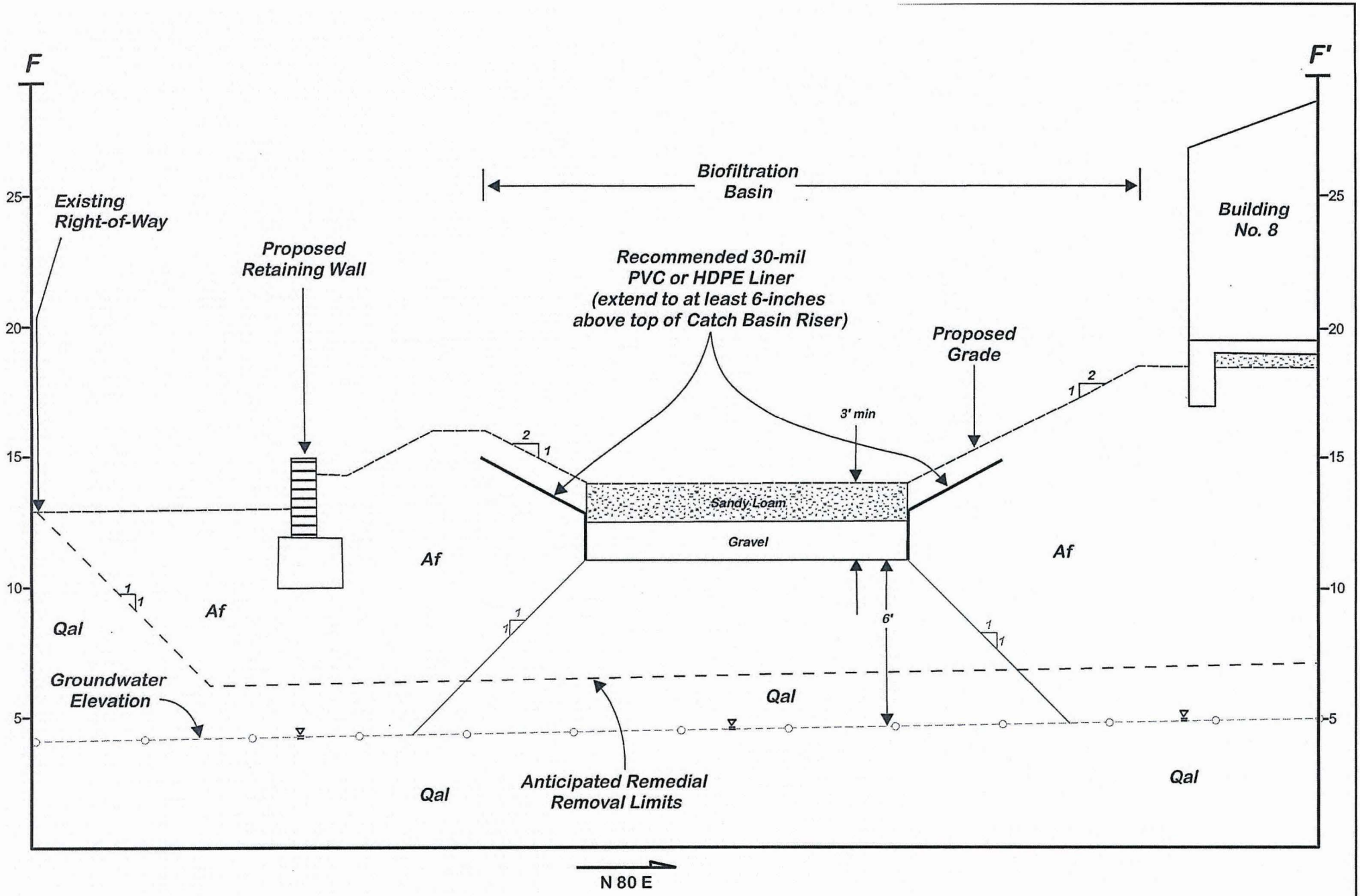
Distribution: (1) Addressee (via e-mail)
(1) Project Design Consultants; Attention Ms. Marina Wurst (via e-mail)
(1) Project Design Consultants; Attention Ms. Chelisa Pack (via e-mail)
(1) Project Design Consultants; Attention Ms. Cameron Bell (via e-mail)



LGC

Figure 1
Cross Section E-E'
Morena Apartment Homes
1597 and 1623 Morena Boulevard
San Diego, California

Project Name	Fairfield Morena Boulevard
Project Number	154004-03
Eng./Geo.	BIH/RKW
Date	June 23, 2017
Scale	1" = 5'



LGC

Figure 2
Cross Section F-F'
Morena Apartment Homes
1597 and 1623 Morena Boulevard
San Diego, California

Project Name	Fairfield Morena Boulevard
Project Number	154004-03
Eng./Geo.	BIH/RKW
Date	June 23, 2017
Scale	1" = 5'

APPENDIX A

References

LGC Valley, Inc., 2015, Preliminary Geotechnical Investigation Report for a Proposed Apartment Complex Development, 1579 and 1623 Morena Boulevard, San Diego, California, Project No. 154004-01, dated October 6, 2015.

LGC Valley, Inc., 2016, Preliminary Bioretention Basin Infiltration Study, Proposed Apartment Complex Development, 1579 and 1623 Morena Boulevard, City of San Diego, California, Project No. 154004-01, dated November 29, 2016.

LGC Valley, Inc., 2017, Update Geotechnical Study and Response to City Review Comments, Proposed Morena Apartment Homes, 1579 and 1623 Morena Boulevard, San Diego, California, Project Number 154004-03, dated May 4, 2017.

Project Design Consultants, 2017, Site Development Plans, Morena Apartment Homes, Vesting Tentative Map No. 186551, 58 sheets, dated December 5, 2016, revised May 8, 2017.

San Diego City, 2016, Storm Water Standards, Part 1: BMP Design Manual for Permanent Site Design, Storm Water Treatment and Hydromodification Management with Appendices, dated January 2016.

San Diego City, 2017, LDR-Geology Multi-Discipline Cycle Issues, Project No. 526167, Pages 28 and 29 of 37, dated June 1, 2017.

APPENDIX B

City of San Diego

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

and

Worksheet D.5-1 - Factor of Safety and Design Infiltration Rate Worksheet

LGC Valley, Inc.
Geotechnical Consulting

August 28, 2017 Project No. 154004-02

Mr. Shon Finch
FF Realty III, LLC
5510 Morehouse Drive, Suite 200
San Diego, California 92121

Subject: ***Response to City of San Diego LDR-Geology Cycle Issues/Review Comments Proposed Apartment Complex Development, 1579 and 1623 Morena Boulevard, City of San Diego, California***

References: *Project Design Consultants, 2017, Morena Apartment Homes, Rezone No. 1868548 / Vesting Tentative Map No. 1868551 / Planned Development Permit No. 1868549 / Site Development Permit No. 1868547 / Community Plan Amendment No. 1868552, 9 Sheets, dated December 5, 2016, revised May 8, 2017*

LGC Valley, Inc., 2016, Preliminary Bioretention Basin Infiltration Study, Proposed Apartment Complex Development, 1579 and 1623 Morena Boulevard, City of San Diego, California, Project No. 154004-01, dated November 29, 2016

LGC Valley, Inc., 2017, Addendum Geotechnical Study and Response to 2nd City of San Diego LDR-Geology Multi-Discipline Cycle Issues/Review Comments, Proposed Morena Apartment Homes, 1579 and 1623 Morena Boulevard, San Diego, California, Project Number 154004-03, dated June 23, 2017

San Diego City, 2017, LDR-Geology Cycle 8 Issues, Project No. 526167, dated August 11, 2017

Introduction

LGC Valley, Inc. (LGC) has prepared this letter to address the review comments made in the recent City of San Diego LDR-Geology Plan Check Comments (San Diego City, 2017) regarding geotechnical issues relative to the construction of the proposed Apartment Development Complex located at 1579 and 1623 Morena Boulevard in the City of San Diego, California. Our response to the outstanding/unresolved cycle issues/review comments is presented below.

Review Comments

Comments Issue No. 17: The answers to the screening question for Criteria #1 and 5 of worksheet C.4-1 should be based on the infiltration rates. The yes/no response for Criteria #1 and 5 should be based on the infiltration rates from the site. A 'Partial Infiltration' condition exists when the infiltration rates are between 0.01 inches

per hour (in/hr) and 0.50 in/hr. A 'Full Infiltration' condition exists when the rates are greater than 0.5 in/hr. Criterion #1 should be updated to reflect this condition.

Response: Two sets of worksheets have been prepared based on the infiltration rates obtained during our field percolation/ infiltration study. One set of worksheets was prepared for BMP #4 (with the unadjusted infiltrations rates of 0.81 and 2.87 inches per hour), the other for BMP #3 and #5 (where the unadjusted infiltration rates range from 0.10 to 0.24 inches per hour). The two sets of Worksheets C.4-1 and D.5-1 are attached.

Comments Issue No. 18: Based on the geotechnical consultants calculated infiltration rates it appears that both a partial and a full infiltration condition exist at the site. The project's geotechnical consultant should provide a completed Worksheet C.4-1 for each infiltration condition (if applicable).

Response: Two separate sets of worksheets have been prepared for the project and are attached.

Comments Issue No. 19: Provide an updated geologic map that delineates the area(s) where partial infiltration is feasible and the area(s) where full infiltration is feasible (if applicable).

Response: Since all of the proposed basins on the site are considered to have partial infiltration conditions, a map delineating the areas of full or partial infiltration conditions is not needed.

If you should have any questions, please do not hesitate to contact us. The undersigned can be reached at (760) 599-7000.

Respectfully submitted,

LGC Valley, Inc.

Randall Wagner, CEG 1612
Senior Project Geologist

Enclosures:
(1) Morena Boulevard BMP #4 Basin (Adjacent to Buildings 3 and 4) Worksheets C.4-1 - Categorization of Infiltration Feasibility Condition and D.5-1 - Factor of Safety and Design Infiltration Rate (Pages 1 through 5)
(2) Morena Boulevard BMP #3 and #5 Biofiltration Basin (Adjacent to Buildings 1 and 2) Worksheets C.4-1 - Categorization of Infiltration Feasibility Condition and D.5-1 - Factor of Safety and Design Infiltration Rate (Pages 6 through 10)

Distribution:
(1) Addressee (via e-mail)
(1) FF Reality III, LLC, Attention: Shon Finch (via e-mail)

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1 Page 1 of 4	
Part 1- Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without and undesirable consequences that cannot be reasonable 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 the Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
Provide basis: **The Infiltration test results of the proposed BMP #4 biofiltration basin located between proposed Buildings 3 and 4 had an unadjusted (pre-factor of safety) infiltration rate of 0.81 to 2.87 inches per hour (or an average of 1.84 inches per hour). Utilizing the feasibility screening factor-of-safety of 2, the adjusted infiltration rate is 0.92 inches per hour.** 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: **Geotechnical analysis of the proposed biofiltration basin BMP #4 and adjacent proposed buildings, indicates that lateral migration of the infiltration water may have a detrimental impact on the proposed improvements. However, the impact can be mitigated to an acceptable level by the placement of an impermeable liner along the sides of the biofiltration basin.** Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study source applicability.			

Categorization of Infiltration Feasibility Condition		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:

Impacts relative to the risk of increasing groundwater contamination does not appear to be a constraint from a geotechnical standpoint at the site. However, the groundwater table at the site was encountered at an elevation of 7 to 9 feet (or approximately 6 to 8 feet below the bottom of the basin gravel storage elevation). As a result, the current ground water elevation is within 10 feet of the basin bottom and likely is even less when considering the high ground water level.

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 C.3.	X	

Provide basis:

Impacts relative to causing potential water balance issues or increased discharge of contaminated groundwater to surface waters does not appear to be a constraint at the site.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study 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.	**Result** **Full Infiltration is NOT Feasible**

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

Categorization of Infiltration Feasibility Condition	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 the Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	

Provide basis:

The Infiltration test results of the proposed BMP #4 biofiltration basin area had an unadjusted (pre-factor of safety) infiltration rate of 0.81 to 2.87 inches per hour (or an average of 1.84 inches per hour). Utilizing the feasibility screening factor-of-safety of 2, the adjusted infiltration rate is 0.92 inches per hour..

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:

Geotechnical analysis of the proposed BMP #4 biofiltration basins and adjacent proposed buildings, indicates that lateral migration of the infiltration water may have a detrimental impact on the proposed improvements. However, the impact can be mitigated to an acceptable level by the placement of an impermeable liner along the sides of the biofiltration basins.

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.

Categorization of Infiltration Feasibility Condition		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:

Groundwater was encountered during the preliminary investigation of the site at an approximate elevation of 7 to 9 feet. Based on the elevation of the bottom of the gravel storage layer, the current groundwater elevation is within 6 to 8 feet of the proposed biofiltration basin bottom elevation.

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 C.3.	X	

Provide basis:

Based on Section C.3.7 of the San Diego City BMP Design Manual, downstream water rights should not be a constraint to partial infiltration at the site.

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 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 5-8 is "No", then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category in No Infiltration.	**Result** **Partial Infiltration is Feasible**

Prepared by: _____ **Dated:** **August 28, 2017**

Randall K Wagner, CEG 1612
LGC Valley, Inc.

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

Factor of Safety and Design Infiltration Rate Worksheet					Worksheet D.5-1 Page 1 of 1
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w * v
A	Suitability Assessment	Soil assessment methods	0.25	**2**	**0.50**
		Predominant soil Texture	0.25	**3**	**0.75**
		Site soil variability	0.25	**3**	**0.75**
		Depth to groundwater/impervious layer	0.25	**2**	**0.50**
		Suitability Assessment Safety Factor, $S_A = \sum_p$			**2.50**
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/ resiliency	0.25		
		Compaction during construction	0.25	**2**	**0.50**
		Design Safety Factor, $S_B = \sum_p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = {}^{K_{observed}}/_{S_{total}}$					

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

The percolation/infiltration field-testing for the northeastern biofiltration basin was performed in general accordance with Section D.3.3.2 - Borehole Percolation Tests (various methods) of the San Diego City BMP Design Manual. Adjustment of the field percolation test results to an "infiltration rate" was performed utilizing the Porchet Method.

The results of the percolation/infiltration testing is provided in the report entitled "Preliminary Bioretention Basin Infiltration Study, Proposed Apartment Complex Development, 1579 and 1623 Morena Boulevard, City of San Diego, California" by LGC Valley, Inc., dated November 29, 2016.

Categorization of Infiltration Feasibility Condition		Worksheet C.4-1 Page 1 of 4	
Part 1- Full Infiltration Feasibility Screening Criteria Would infiltration of the full design volume be feasible from a physical perspective without and undesirable consequences that cannot be reasonable mitigated			
Criteria	Screening Question	Yes	No
1	Is the estimated reliable infiltration rate below proposed facility locations greater than ~~0.5~~ 0.1 inches per hour? The response to the Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	
Provide basis: **The infiltration test results of the proposed BMP #5 basin located between Buildings No. 1 and 2 had an unadjusted (pre-factor of safety) infiltration rate of 0.10 and 0.24 inches per hour (or an average of 0.17 inches per hour). Utilizing the feasibility screening factor-of-safety of 2, the adjusted infiltration rate is 0.09 inches per hour. BMP #3 located in the southern portion of the site will be located in a fill area. The infiltration for this basin was determined by obtaining a representative sample of soil that could be used as fill in the area of the basin. The sample was remolded to a 90-percent relative compaction and a saturated hydraulic conductivity test run on the sample. The test result indicated an infiltration rate of 0.10 inches per hour (or a feasibility screening infiltration rate is 0.05 inches per hour).** 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: **Geotechnical analysis of the proposed biofiltration basins and adjacent proposed buildings, retaining wall, and slope, indicates that lateral migration of the infiltration water may have a detrimental impact on the proposed improvements. However, the impact can be mitigated to an acceptable level by the placement of an impermeable liner along the sides of the biofiltration basins.** Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study source applicability.			

Categorization of Infiltration Feasibility Condition		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:

Impacts relative to the risk of increasing groundwater contamination does not appear to be a constraint from a geotechnical standpoint at the site. However, the groundwater table at the site was encountered at an elevation of 7 to 9 feet (or approximately 6 to 8 feet below the bottom of the Biofiltration Basin BMP #5 and approximately 3 feet below the bottom of the basin gravel storage elevation of Biofiltration Basin BMP #3). As a result, the current ground water elevation is within 10 feet of the basin bottom and likely is even less when considering the anticipated high ground water level.

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 C.3.	X	

Provide basis:

Impacts relative to causing potential water balance issues or increased discharge of contaminated groundwater to surface waters does not appear to be a constraint at the site.

Summarize findings of studies; provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study 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.	**Result**
	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.	**Full Infiltration is NOT Feasible**

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

Categorization of Infiltration Feasibility Condition	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 the Screening Question shall be based on a comprehensive evaluation of the factors presented in Appendix C.2 and Appendix D.	X	

Provide basis:

The infiltration test results of the proposed Biofiltration Basin BMP #5 had an unadjusted (pre-factor of safety) infiltration rate of 0.10 to 0.24 inches per hour (or an average of 0.17 inches per hour) while BMP #3 had an unadjusted infiltration rate of 0.10 inches per hour. Utilizing the feasibility screening factor-of-safety of 2, the adjusted infiltration rate is 0.09 inches per hour for BMP #5 and 0.05 inches per hour for BMP #3. Consequently, both values are at or greater than an infiltration rate of 0.01 inches per hour; and as a result, partial infiltration is feasible.

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:

Geotechnical analysis of the proposed biofiltration basins and adjacent proposed buildings, retaining wall, and slope, indicates that lateral migration of the infiltration water may have a detrimental impact on the proposed improvements. However, the impact can be mitigated to an acceptable level by the placement of an impermeable liner along the sides of the biofiltration basins.

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.

Categorization of Infiltration Feasibility Condition		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:

Groundwater was encountered during the preliminary investigation of the site at an approximate elevation of 7 to 9 feet. Based on the elevation of the bottom of the gravel storage layer, the current groundwater elevation is within 6 to 8 feet of the basin bottom elevation of BMP #5 and within approximately 3 feet of the basin bottom elevation of BMP #3.

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 C.3.	X	

Provide basis:

Based on Section C.3.7 of the San Diego City BMP Design Manual, downstream water rights should not be a constraint to partial infiltration at the site.

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 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 5-8 is "No", then infiltration of any volume is considered to be infeasible within the drainage area. The feasibility screening category in No Infiltration.	**Result** **Partial Infiltration is Feasible**

Prepared by: _____ **Dated:** August 28, 2017

Randall K Wagner, CEG 1612
LGC Valley, Inc.

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

Factor of Safety and Design Infiltration Rate Worksheet				Worksheet D.5-1 Page 1 of 1	
Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w * v
A	Suitability Assessment	Soil assessment methods	0.25	**2**	**0.50**
		Predominant soil Texture	0.25	**3**	**0.75**
		Site soil variability	0.25	**3**	**0.75**
		Depth to groundwater/impervious layer	0.25	**2**	**0.50**
		Suitability Assessment Safety Factor, $S_A = \sum_p$			**2.50**
B	Design	Level of pretreatment/ expected sediment loads	0.5		
		Redundancy/ resiliency	0.25		
		Compaction during construction	0.25	**2**	**0.50**
		Design Safety Factor, $S_B = \sum_p$			
Combined Safety Factor, $S_{total} = S_A \times S_B$					
Observed Infiltration Rate, inch/hr, $K_{observed}$ (corrected for test-specific bias)					
Design Infiltration Rate, in/hr, $K_{design} = {}^{K_{observed}}/_{S_{total}}$					

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

The percolation/infiltration field-testing for the northwestern biofiltration basin was performed in general accordance with Section D.3.3.2 - Borehole Percolation Tests (various methods) of the San Diego City BMP Design Manual. Adjustment of the field percolation test results to an "infiltration rate" was performed utilizing the Porchet Method. The infiltration testing for the southern biofiltration basin was determined by obtaining a saturated hydraulic conductivity test of a representative sample of the on-site soil that could be used as fill in accordance with Section D.4.2 of the San Diego City BMP Design Manual.

The results of the percolation/infiltration testing is provided in the report entitled "Preliminary Bioretention Basin Infiltration Study, Proposed Apartment Complex Development, 1579 and 1623 Morena Boulevard, City of San Diego, California" by LGC Valley, Inc., dated November 29, 2016.