

Control No. 2016-0\_\_  
Recording Requested by  
and when Recorded, return to:

CITY OF MILPITAS  
455 E. CALAVERAS BOULEVARD  
MILPITAS, CA 95035-5479

Attn: City Clerk

(SPACE ABOVE THIS LINE RESERVED FOR RECORDER'S USE)

Document Transfer Tax is \$ 0  
( ) Computed on full value of property conveyed  
( ) Computed on full value less value of liens and encumbrances remaining  
City transfer tax is \$ \_\_\_\_  
APN: 086-32-049, 054, 055 & 056

O&M PJ No. 9011

**STORMWATER MANAGEMENT FACILITIES  
OPERATION AND MAINTENANCE AGREEMENT  
FOR AMALFI APARTMENTS, Tract 10060**

This Stormwater Management Facilities Operation and Maintenance Agreement ("AGREEMENT") is made and entered into this \_\_\_\_ day of \_\_\_\_\_ 2016 ("Effective Date"), by and between Amalfi Milpitas, LLC ("Property Owner") and the City of Milpitas, a municipal corporation of the State of California ("City").

**RECITALS**

This AGREEMENT is made and entered into with reference to the following facts:

**WHEREAS**, the Property Owner is the owner of real property more particularly depicted and described on the attached as **Exhibit A** ("Property") and fully incorporated herein by reference; and

**WHEREAS**, on November 1st, 2011, the Milpitas City Council adopted Resolution No. 8132 approving the construction of 732 residential units and associated improvements on an 15.984 acre site at 1200 Piper Drive in Milpitas and a portion thereof (3.72± acres) more commonly known as Amalfi Apartments, Project No. PJ2527, (the "Project") on the Property; and

**WHEREAS**, the City's Stormwater and Urban Runoff Pollution Control Ordinance as codified in Milpitas Municipal Code Chapter 16 ("Ordinance"), Section XI-16-7 and the conditions of approval for the Project require proper installation, operation and maintenance of

Permanent Stormwater Pollution Prevention Measures (BMPs) on the Property as part of the Project; and

**WHEREAS**, the City has approved the Stormwater Control Operation and Maintenance Plan for the Project attached hereto as **Exhibit B** and fully incorporated herein by reference requiring the Property Owner to properly construct, operate and maintain the BMPs at its sole cost and expense; and

**WHEREAS**, the Stormwater Control Operation and Maintenance Plan attached hereto as **Exhibit B** may be subsequently modified from time to time with City's written approval and such changes shall be fully incorporated as part of this Agreement by this reference; and

**WHEREAS**, the Stormwater Control Operation and Maintenance Plan includes provisions for the BMP Operation and Maintenance and an annual inspection checklist for the BMPs constructed on the Property, and

**WHEREAS**, this Agreement memorializes the Property Owner's maintenance, operations, and inspection obligations under the City's Ordinance and the approved Stormwater Control Operation and Maintenance Plan.

**NOW, THEREFORE**, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

### **SECTION 1**

**Responsibility for Operation and Maintenance:** The Property Owner, at its sole cost and expense, shall make available copies of the approved Stormwater Control Operation and Maintenance Plan (hereinafter the "Plan") at the site with the facility or property manager and, at its sole cost and expense, shall maintain the BMPs in good working condition acceptable to the City for the life of the Project, and in compliance with the Ordinance and the approved Plan, and as required by the State Municipal Regional Permit (MRP).

### **SECTION 2**

**Inspection by Property Owner:** The Property Owner, at its sole cost and expense, shall conduct annual inspections of all permanent installed BMPs per the Plan. The annual inspection report shall include completion of the checklist described in the approved Stormwater Control Operation and Maintenance Plan. The BMPs must be inspected by a qualified independent inspector who is acceptable to the City. The Property Owner shall submit the Inspection Report on these BMPs to the City Engineer no later than July 15<sup>th</sup> of each year. The Annual Inspection Report submitted shall be accompanied by a nonrefundable processing fee per the City's standard fee schedule.

### **SECTION 3**

**Facility Inspection by the City:** The Property Owner grants permission to the City, its authorized agents and employees, to enter the Property, and to inspect the BMPs whenever the City deems necessary to enforce provisions of the City's Stormwater and Urban Runoff Pollution Control Ordinance, this Agreement, or any other local or state requirements. The City may enter the premises at any reasonable time to inspect the premises and BMP operation and maintenance, to inspect and copy records related to storm water compliance, and to

collect samples and take measurements. Whenever possible, the City will provide notice prior to entry. The Property Owner shall create a Private Job Account with the City and deposit Four Thousand Dollars (\$4,000.00) for inspection by City Staff pursuant to this Section 3. The deposit of Four Thousand Dollars (\$4,000.00) shall be made simultaneously with the execution of this Agreement and shall be replenished to the initial balance when drawdown reaches Two Thousand Dollars (\$2,000.00).

#### **SECTION 4**

**Failure to Perform Required Facility Repairs or Maintenance by the Property Owner:** If the Property Owner or its successors fail to operate and maintain the BMPs in good working order and in accordance with the approved Plan and the City's Ordinance, the City, with prior notice, may enter the Property to return the BMPs to good working order. The City is under no obligation to maintain or repair the BMPs, and this Agreement may not be construed to impose any such obligation on the City. If the City, under this Section 4 takes any action to return the BMPs to good working order, the Property Owner shall reimburse the City for all the costs and expenses incurred by the City. The City will provide the Property Owner with an itemized invoice of the City's costs and expenses and the Property Owner shall make full payments to the City within thirty (30) days of the date of the invoice. If the Property Owners fails to pay the invoice within thirty (30) days, the City may secure a lien against the real property of the Property Owner in the amount of such costs and expenses. This Section 4 does not prohibit the City from pursuing other legal recourse against the Property Owner.

#### **SECTION 5**

**Successors and Assigns:** This Agreement applies to the Property Owner and its successors. This agreement runs with the land and imposes a continuing obligation on anyone who owns the Property. Upon transfer of the property, the Property Owner shall provide the new owner with the current Plan and a copy of this Agreement.

#### **SECTION 6**

**Indemnity:** The Property Owner indemnifies and holds harmless the City and its authorized agents and employees for any and all damages, accidents, casualties, occurrences or claims against the City which may in anyway arise or relate to the construction, operation, presence, existence or maintenance of the BMPs, or from any personal injury or property damage that may arise or relate from the City entering the property under Section 4. If a claim is asserted against the City, its authorized agents or employees, the City shall promptly notify the Property Owner and the Property Owner shall defend the claim and any resulting litigation at its sole cost and expense. If any judgment is entered against the City, or its authorized agents or employees, the Property Owner must pay all costs and expenses to satisfy the judgment.

#### **SECTION 7**

**Severability:** Invalidation of any one of the provisions of this Agreement shall in no way effect any other provisions and all other provisions shall remain in full force and effect.

#### **SECTION 8**

**Non-Discrimination:** The Property Owner shall not discriminate, in any way, against any person on the basis of race, sex, color, age, religion, sexual orientation, actual or perceived



**SECTION 13**

**Venue:** In the event that suit shall be brought by either party to this contract, the parties agree that venue shall be exclusively vested in the state courts of the County of Santa Clara, or if federal jurisdiction is appropriate, exclusively in the United States District Court, Northern District of California, San Jose, California.

**SECTION 14**

**Interpretation, Prior Agreements:** This Agreement, including all Exhibits attached hereto, represents the entire understanding of the parties as to those matters contained herein. In the event that the terms specified in any of the Exhibits attached hereto conflict with any of the terms specified in the body of this Agreement, the terms specified in the body of this Agreement shall control. No prior oral or written understanding shall be of any force or effect with respect to those matters covered hereunder. This Agreement may be modified only by a written amendment duly executed by the parties to this Agreement.

**PROPERTY OWNER'S NAME:**

**AMALFI MILPITAS, LLC**

BY:   
Stephen C. Schott, Manager

404 Saratoga Avenue, Suite 100  
Santa Clara, CA 95050

**CITY OF MILPITAS, A MUNICIPAL CORPORATION:**

By: \_\_\_\_\_  
City Engineer's recommendation for approval

By: \_\_\_\_\_  
City Attorney as to form

By: \_\_\_\_\_  
City Manager

**CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT**

**CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California )  
County of Santa Clara )

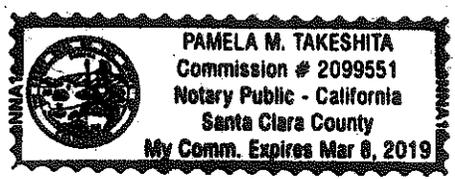
On August 2, 2016 before me, Pamela M. Takeshita, Notary Public,  
Date Here Insert Name and Title of the Officer

personally appeared Stephen C. Schott  
Name(s) of Signer(s)

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 that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Signature Pamela M. Takeshita  
Signature of Notary Public

Place Notary Seal Above

**OPTIONAL**

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

**Description of Attached Document**

Title or Type of Document: Stormwater Mgmt Facilities... Agreement Document Date: 08/02/2016  
Number of Pages: 5+ exhibits Signer(s) Other Than Named Above: \_\_\_\_\_

**Capacity(ies) Claimed by Signer(s)**

Signer's Name: \_\_\_\_\_  
 Corporate Officer — Title(s): \_\_\_\_\_  
 Partner —  Limited  General  
 Individual  Attorney in Fact  
 Trustee  Guardian or Conservator  
 Other: \_\_\_\_\_  
Signer Is Representing: \_\_\_\_\_

Signer's Name: \_\_\_\_\_  
 Corporate Officer — Title(s): \_\_\_\_\_  
 Partner —  Limited  General  
 Individual  Attorney in Fact  
 Trustee  Guardian or Conservator  
 Other: \_\_\_\_\_  
Signer Is Representing: \_\_\_\_\_

**EXHIBIT A**  
**Legal description and Plat Map**

REAL PROPERTY SITUATED IN THE CITY OF MILPITAS, COUNTY OF SANTA CLARA,  
STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

A portion of Tract #10060, filed October 2<sup>nd</sup>, 2013, in Map Book 864, Pages 48 thru53,  
inclusive, Santa Clara County Records, more particularly described as Parcel 1, Lot K, Lot C,  
Lot E and a portion of Lot F.

***Copy of map attached.***

CONFORMED TO CALIFORNIA TITLE INSURANCE COMPANY'S STANDARD POLICY. THIS DOCUMENT IS A PUBLIC RECORD IN SANTA CLARA COUNTY, CALIFORNIA.

**TRACT 10060**  
FOR CONDOMINIUM PURPOSES  
**WAUKESHA PROPERTY**  
BEING A SUBDIVISION OF PARCEL 1 OF DOCUMENT NO. 21822654 OF  
OFFICIAL RECORDS, SANTA CLARA COUNTY RECORDS  
CITY OF MILPITAS, SANTA CLARA COUNTY, CALIFORNIA  
**CARLSON, BARBEE AND GIBSON, INC.**  
ENGINEERS, SURVEYORS, PLANNERS  
SAN RAMON, CALIFORNIA  
JUNE 2013

**OWNER'S STATEMENT**

WE HEREBY STATE THAT WE ARE THE OWNERS OF OR HAVE SOME RIGHT, TITLE, OR INTEREST IN AND TO THE REAL PROPERTY INCLUDED WITHIN THE SUBDIVISION AND THAT WE ARE THE ONLY PERSONS WHOSE CONSENT IS REQUIRED FOR THE MAKING AND RECORDING OF THIS SUBDIVISION MAP AS SHOWN WITHIN THE DISTINCTIVE BOUNDARY LINE.

WE HEREBY OFFER FOR DEDICATION TO THE CITY OF MILPITAS IN FEE FOR PUBLIC USE FOR ROADWAY PURPOSES, OPERATION, ALTERATION, RELOCATION, MAINTENANCE, REPAIR AND REPLACEMENT OF ALL PUBLIC SERVICE FACILITIES AND THEIR APPURTENANCES, OVER, UNDER, ALONG AND ACROSS THE FOLLOWING:

1. GARDEN STREET AND MERRY LOOP
- WE HEREBY OFFER FOR DEDICATION TO THE CITY OF MILPITAS AN EASEMENT FOR PUBLIC USE FOR OPERATION, ALTERATION, RELOCATION, MAINTENANCE, REPAIR AND REPLACEMENT OF ALL PUBLIC SERVICE FACILITIES AND THEIR APPURTENANCES, OVER, UNDER, ALONG AND ACROSS THE FOLLOWING:
  1. EASEMENTS "A" FOR PUBLIC SERVICE AND UTILITY EASEMENT PURPOSES (PSUE).
  2. EASEMENTS "B" FOR EMERGENCY VEHICLE ACCESS PURPOSES (EVAE).

THE ABOVE MENTIONED EASEMENTS (PSUE & EVAE) SHALL REMAIN OPEN AND FREE FROM BUILDINGS AND STRUCTURES OF ANY KIND EXCEPT PUBLIC SERVICE AND PUBLIC UTILITY STRUCTURES AND THEIR APPURTENANCES, IRRIGATION SYSTEMS AND THEIR APPURTENANCES AND LAWFUL FENCES. UNOBSTRUCTED CONTINUOUS ACCESS SHALL BE MAINTAINED AT ALL TIMES.

WE ALSO HEREBY RETAIN FOR THE PRIVATE USE OF THE LOT OWNERS WITHIN THIS SUBDIVISION, THEIR LICENSEES, VISITORS, AND TENANTS WITH MAINTENANCE THEREOF BY THEIR LOT OWNERS IN ACCORDANCE WITH THE SUBDIVISION RESTRICTIONS GOVERNING THIS SUBDIVISION THE FOLLOWING:

1. LOTS 'C' AND 'D' FOR PRIVATE STREET PURPOSES. PRIVATE STREET IS TO BE KNOWN AS ANAHLI LOOP.
- THE DESIGNATED PRIVATE STREETS ON THIS MAP ARE NOT PART OF THE CITY OF MILPITAS STREET SYSTEM AND ARE NOT ACCEPTED FOR PUBLIC MAINTENANCE.
- PARCELS 1 AND 3 ARE FOR CONDOMINIUM PURPOSES (545 UNITS).
- PARCEL 2 TO BE RETAINED BY OWNER FOR FUTURE SUBDIVISION.
- LOT J TO BE RETAINED BY THE OWNER AND DEDICATED TO THE CITY OF MILPITAS FOR PARK PURPOSES BY SEPARATE INSTRUMENT.

LOTS A, E, F, G, H, & K ARE TO BE RETAINED BY OWNER.

OWNER:  
SCS DEVELOPMENT CO. A CALIFORNIA CORPORATION

BY: Stephen E. Schott  
NAME: Stephen E. Schott  
TITLE: Vice President

**ACKNOWLEDGMENT CERTIFICATE (OWNER'S)**

STATE OF California  
COUNTY OF Santa Clara  
ON September 10, 2013, before me, Pamela M. Takvashita, a Notary Public, personally appeared Stephen E. Schott 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 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 THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND:  
SIGNATURE: Pamela M. Takvashita  
NAME (PRINT): Pamela M. Takvashita  
PRINCIPAL COUNTY OF BUSINESS: Santa Clara  
MY COMMISSION NUMBER: 1924873  
MY COMMISSION EXPIRES: March 9, 2015

**SURVEYOR'S STATEMENT**

I, CHRISTOPHER S. HARMISON, HEREBY CERTIFY THAT I AM A LICENSED LAND SURVEYOR IN THE STATE OF CALIFORNIA, THAT THIS MAP WAS PREPARED BY ME OR UNDER MY DIRECTION IN JUNE 2011, AND IS BASED UPON A FIELD SURVEY IN CONFORMANCE WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT AND ANY LOCAL ORDINANCE AT THE REQUEST OF SCS DEVELOPMENT CO. IN MARCH 2008, AND IS TRUE AND COMPLETE AS SHOWN. I HEREBY STATE THAT THIS FINAL MAP COMPLETES WITH FINAL MAP PROCEDURES APPROVED BY THE CITY OF MILPITAS AND THAT THIS FINAL MAP SUBSTANTIALLY CONFORMS TO THE APPROVED FINAL MAP, AND THE CONDITIONS OF APPROVAL THEREOF WHICH WERE TO BE FULFILLED PRIOR TO THE FILING OF THE FINAL MAP, AND IT IS TECHNICALLY CORRECT. I HEREBY STATE THAT THE MONUMENTS WILL OCCUPY THE POSITIONS INDICATED BY DECEMBER 2014, AND ARE OF THE CHARACTER INDICATED, AND ARE SUFFICIENT TO ENABLE THE SURVEY TO BE RETRACED.

DATED: 9-9-2013  
Christopher S. Harmon  
CHRISTOPHER S. HARMISON  
L.S. NO. 7176



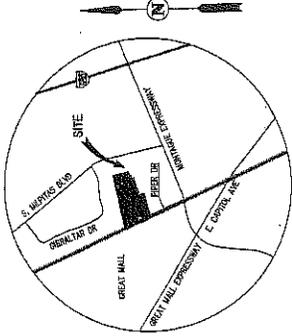
**RECORDER'S STATEMENT**

FILED THIS 2nd DAY OF October, 2013 AT 2:14 PM, IN BOOK OF MAPS 8104 AT PAGES 48-53, SERIES NUMBERS 22404820 AT THE REQUEST OF FIRST AMERICAN TITLE INSURANCE COMPANY.

FEES \$ 18 -  
REGINA ALCONDEMIAS  
SANTA CLARA COUNTY RECORDER  
BY: Regina AlcondeMIAS  
DEPUTY

22404820

**TRACT 10060**  
 FOR COMMUNITY PURPOSES  
**WAUKESHA PROPERTY**  
 BEING A SUBDIVISION OF PARCEL 1 OF DOCUMENT NO. 21822854 OF  
 OFFICIAL RECORDS, SANTA CLARA COUNTY RECORDS  
 CITY OF MILPITAS SANTA CLARA COUNTY CALIFORNIA  
**CARLSON, BARBEE AND GIBSON, INC.**  
 ENGINEERS SURVEYORS PLANNERS  
 SAN RAMON, CALIFORNIA  
 JUNE 2013



**VICINITY MAP**  
 NOT TO SCALE

**CITY CLERK'S CERTIFICATE**

I, MARY LAVELLE, CITY CLERK OF THE CITY OF MILPITAS, CALIFORNIA, HEREBY CERTIFY THAT SAID CITY COUNCIL, AS GOVERNING BODY OF SAID CITY AT A REGULAR MEETING HELD ON September 17, 2013, HAS TAKEN THE FOLLOWING ACTIONS:

1. APPROVED THIS TRACT MAP NO. 10060
2. ACCEPTED, SUBJECT TO IMPROVEMENT, ON BEHALF OF THE PUBLIC THOSE PARCELS OF LAND OFFERED FOR DEDICATION FOR PUBLIC USE IN CONFORMITY WITH THE TERMS OF OFFER OF DEDICATION TO WIT:
  1. EASEMENTS "A" FOR PUBLIC SERVICE AND UTILITY EASEMENT PURPOSES (PSUE).
  2. EASEMENTS "B" FOR EMERGENCY VEHICLE ACCESS PURPOSES (EVAE).
  3. GARDEN STREET AND MERRY LOOP IN FEE.

DATED: 9/30/2013  
  
 MARY LAVELLE  
 CITY CLERK, CITY OF MILPITAS

**CITY ENGINEER'S STATEMENT**

I HEREBY STATE THAT I HAVE EXAMINED THE WITHIN FINAL MAP, THAT THE SUBDIVISION AS SHOWN THEREIN IS SUBSTANTIALLY THE SAME AS IT APPEARED ON THE TENTATIVE MAP AND ANY APPROVED ALTERATIONS THEREOF; THAT THIS SUBDIVISION COMPLIES WITH PROVISIONS OF THE SUBDIVISION MAP ACT AND LOCAL ORDINANCES, APPLICABLE AT THE TIME OF APPROVAL OF THE TENTATIVE MAP.

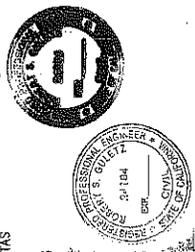
SIGNED:  DATE: 9/24/2013  
 IBRAHIM SORRAJI  
 PRINCIPAL CIVIL ENGINEER, CITY OF MILPITAS  
 R.C.E. NO. 42982, EXPIRATION DATE MARCH 31, 2014



**CITY SURVEYOR'S STATEMENT**

I HEREBY STATE THAT I HAVE EXAMINED THE HEREIN MAP AND THAT I AM SATISFIED THAT SAID MAP IS TECHNICALLY CORRECT.

SIGNED:  DATE: 9/25/13  
 ROBERT S. GULETZ  
 ACTING CITY SURVEYOR, CITY OF MILPITAS  
 HARRIS & ASSOCIATES  
 P.C.E. NO. 42982, EXPIRATION DATE: DECEMBER 31, 2013

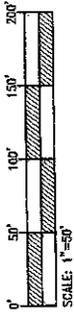


804 / 149 / 153

149



**TRACT 10060**  
 FOR CONDOMINIUM PURPOSES  
**WAKESHA PROPERTY**  
 BEING A SUBDIVISION OF PARCEL 1 OF DOCUMENT NO. 2482854 OF  
 OFFICIAL RECORDS, SANTA CLARA COUNTY RECORDS  
 CITY OF MILPITAS, SANTA CLARA COUNTY, CALIFORNIA  
**CARLSON, BARBEE AND GIBSON, INC.**  
 ENGINEERS SURVEYORS PLANNERS  
 SAN RAMON, CALIFORNIA  
 JUNE 2013



**BASIS OF BEARINGS:**

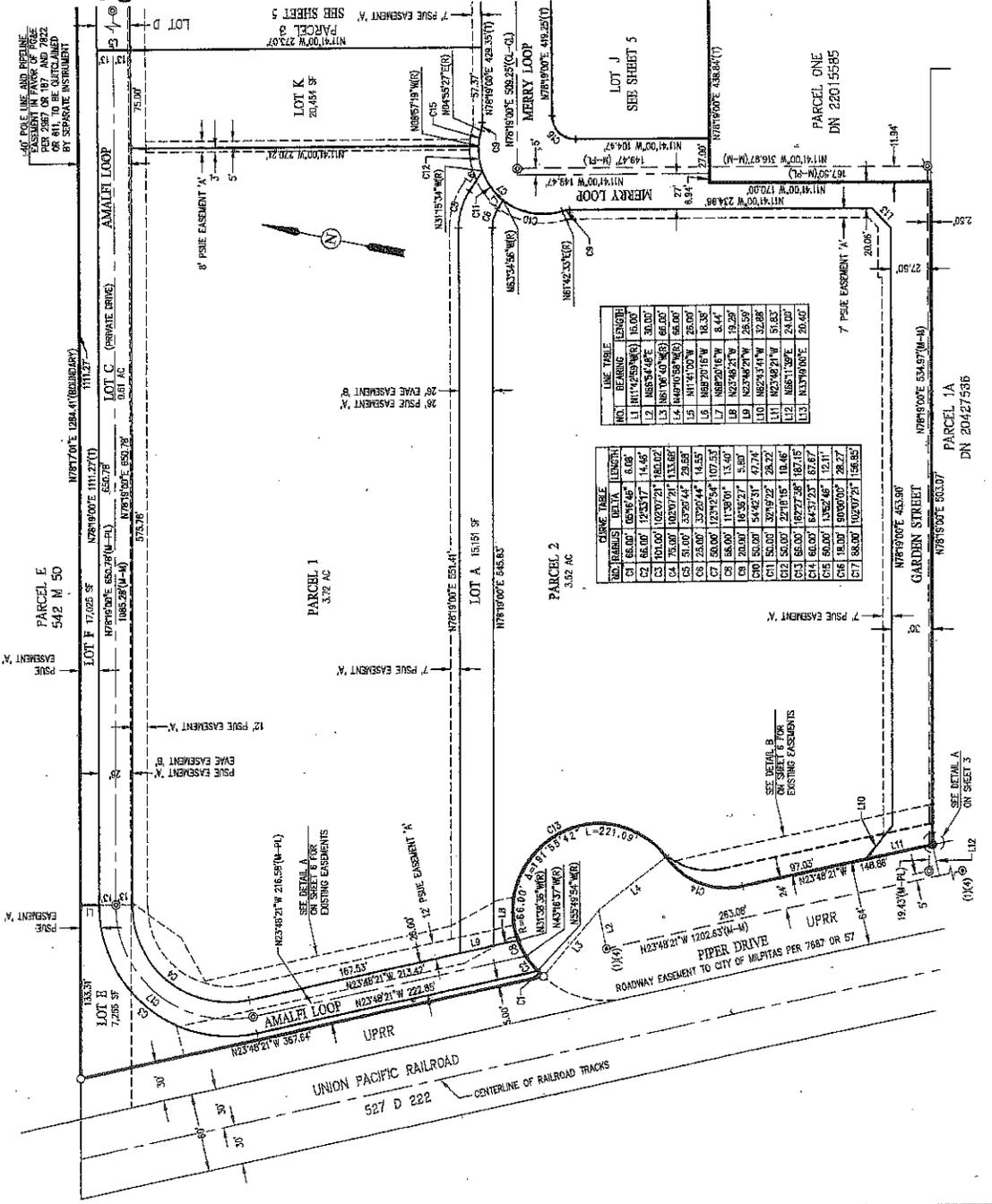
THE BASIS OF BEARING FOR THIS MAP IS DETERMINED BY FOUND MONUMENTS ON THE CENTERLINE OF THE RAILROAD TRACKS. BEING A SUBDIVISION OF PARCEL 1 OF DOCUMENT NO. 2482854 OF OFFICIAL RECORDS, SANTA CLARA COUNTY RECORDS, THE BEARINGS SHOWN HEREON ARE BASED ON CALIFORNIA COORDINATE SYSTEM ZONE 3 (NAD 27). MULTIPLY DISTANCE SHOWN BY 0.99994617 TO OBTAIN GRID DISTANCES.

**LEGEND**

- BOUNDARY LINE
- LOT LINE
- FEWER LINE
- EASEMENT LINE
- CL
- CS
- TRAIL
- MONUMENT TO MONUMENT
- MONUMENT TO PROPERTY LINE
- FOUND STANDARD STREET MONUMENT
- FOUND MONUMENT, AS NOTED
- SET 5/8" REBAR AND CAP, LS 7175
- SET STANDARD STREET MONUMENT, LS 7175
- STREET MONUMENT TO BE SET PER TRACT FOOT
- PUBLIC SERVICE UTILITY EASEMENT
- EMERGENCY VEHICLE ACCESS EASEMENT
- ACRE
- SQUARE FEET
- SANTA CLARA VALLEY TRANSPORTATION AUTHORITY RECORDS
- CHORD TO CENTERLINE
- (01-01)
- (01-02)
- (01-03)

**NOTE**

0 LOT B AND LOT I HAVE BEEN INTENTIONALLY OMITTED.



**LINE TABLE**

NO.	BEARING	LENGTH
1	N11°42'59"W	16.00'
2	N85°54'48"E	30.00'
3	N85°10'40"W	66.00'
4	N44°02'58"W	66.00'
5	N11°41'00"W	26.00'
6	N89°23'16"W	18.35'
7	N89°23'16"W	8.44'
8	N23°46'24"W	19.29'
9	N23°46'24"W	28.59'
10	N62°33'44"W	32.88'
11	N23°46'24"W	51.83'
12	N65°11'26"E	24.00'
13	N43°19'00"E	20.40'

**CHORD TABLE**

NO.	BEARING	CHORD	AREA	LENGTH
C1	S8°16'00"W	6.08'	6.08'	6.08'
C2	S8°16'00"W	12.16'	14.56'	14.56'
C3	S8°16'00"W	18.24'	29.12'	29.12'
C4	S8°16'00"W	24.32'	43.68'	43.68'
C5	S8°16'00"W	30.40'	58.24'	58.24'
C6	S8°16'00"W	36.48'	72.80'	72.80'
C7	S8°16'00"W	42.56'	87.36'	87.36'
C8	S8°16'00"W	48.64'	101.92'	101.92'
C9	S8°16'00"W	54.72'	116.48'	116.48'
C10	S8°16'00"W	60.80'	131.04'	131.04'
C11	S8°16'00"W	66.88'	145.60'	145.60'
C12	S8°16'00"W	72.96'	160.16'	160.16'
C13	S8°16'00"W	79.04'	174.72'	174.72'
C14	S8°16'00"W	85.12'	189.28'	189.28'
C15	S8°16'00"W	91.20'	203.84'	203.84'
C16	S8°16'00"W	97.28'	218.40'	218.40'
C17	S8°16'00"W	103.36'	232.96'	232.96'
C18	S8°16'00"W	109.44'	247.52'	247.52'
C19	S8°16'00"W	115.52'	262.08'	262.08'
C20	S8°16'00"W	121.60'	276.64'	276.64'
C21	S8°16'00"W	127.68'	291.20'	291.20'
C22	S8°16'00"W	133.76'	305.76'	305.76'
C23	S8°16'00"W	139.84'	320.32'	320.32'
C24	S8°16'00"W	145.92'	334.88'	334.88'
C25	S8°16'00"W	152.00'	349.44'	349.44'
C26	S8°16'00"W	158.08'	364.00'	364.00'
C27	S8°16'00"W	164.16'	378.56'	378.56'
C28	S8°16'00"W	170.24'	393.12'	393.12'
C29	S8°16'00"W	176.32'	407.68'	407.68'
C30	S8°16'00"W	182.40'	422.24'	422.24'
C31	S8°16'00"W	188.48'	436.80'	436.80'
C32	S8°16'00"W	194.56'	451.36'	451.36'
C33	S8°16'00"W	200.64'	465.92'	465.92'
C34	S8°16'00"W	206.72'	480.48'	480.48'
C35	S8°16'00"W	212.80'	495.04'	495.04'
C36	S8°16'00"W	218.88'	509.60'	509.60'
C37	S8°16'00"W	224.96'	524.16'	524.16'
C38	S8°16'00"W	231.04'	538.72'	538.72'
C39	S8°16'00"W	237.12'	553.28'	553.28'
C40	S8°16'00"W	243.20'	567.84'	567.84'
C41	S8°16'00"W	249.28'	582.40'	582.40'
C42	S8°16'00"W	255.36'	596.96'	596.96'
C43	S8°16'00"W	261.44'	611.52'	611.52'
C44	S8°16'00"W	267.52'	626.08'	626.08'
C45	S8°16'00"W	273.60'	640.64'	640.64'
C46	S8°16'00"W	279.68'	655.20'	655.20'
C47	S8°16'00"W	285.76'	669.76'	669.76'
C48	S8°16'00"W	291.84'	684.32'	684.32'
C49	S8°16'00"W	297.92'	698.88'	698.88'
C50	S8°16'00"W	304.00'	713.44'	713.44'
C51	S8°16'00"W	310.08'	728.00'	728.00'
C52	S8°16'00"W	316.16'	742.56'	742.56'
C53	S8°16'00"W	322.24'	757.12'	757.12'
C54	S8°16'00"W	328.32'	771.68'	771.68'
C55	S8°16'00"W	334.40'	786.24'	786.24'
C56	S8°16'00"W	340.48'	800.80'	800.80'
C57	S8°16'00"W	346.56'	815.36'	815.36'
C58	S8°16'00"W	352.64'	829.92'	829.92'
C59	S8°16'00"W	358.72'	844.48'	844.48'
C60	S8°16'00"W	364.80'	859.04'	859.04'
C61	S8°16'00"W	370.88'	873.60'	873.60'
C62	S8°16'00"W	376.96'	888.16'	888.16'
C63	S8°16'00"W	383.04'	902.72'	902.72'
C64	S8°16'00"W	389.12'	917.28'	917.28'
C65	S8°16'00"W	395.20'	931.84'	931.84'
C66	S8°16'00"W	401.28'	946.40'	946.40'
C67	S8°16'00"W	407.36'	960.96'	960.96'
C68	S8°16'00"W	413.44'	975.52'	975.52'
C69	S8°16'00"W	419.52'	990.08'	990.08'
C70	S8°16'00"W	425.60'	1004.64'	1004.64'
C71	S8°16'00"W	431.68'	1019.20'	1019.20'
C72	S8°16'00"W	437.76'	1033.76'	1033.76'
C73	S8°16'00"W	443.84'	1048.32'	1048.32'
C74	S8°16'00"W	449.92'	1062.88'	1062.88'
C75	S8°16'00"W	456.00'	1077.44'	1077.44'
C76	S8°16'00"W	462.08'	1092.00'	1092.00'
C77	S8°16'00"W	468.16'	1106.56'	1106.56'
C78	S8°16'00"W	474.24'	1121.12'	1121.12'
C79	S8°16'00"W	480.32'	1135.68'	1135.68'
C80	S8°16'00"W	486.40'	1150.24'	1150.24'
C81	S8°16'00"W	492.48'	1164.80'	1164.80'
C82	S8°16'00"W	498.56'	1179.36'	1179.36'
C83	S8°16'00"W	504.64'	1193.92'	1193.92'
C84	S8°16'00"W	510.72'	1208.48'	1208.48'
C85	S8°16'00"W	516.80'	1223.04'	1223.04'
C86	S8°16'00"W	522.88'	1237.60'	1237.60'
C87	S8°16'00"W	528.96'	1252.16'	1252.16'
C88	S8°16'00"W	535.04'	1266.72'	1266.72'
C89	S8°16'00"W	541.12'	1281.28'	1281.28'
C90	S8°16'00"W	547.20'	1295.84'	1295.84'
C91	S8°16'00"W	553.28'	1310.40'	1310.40'
C92	S8°16'00"W	559.36'	1324.96'	1324.96'
C93	S8°16'00"W	565.44'	1339.52'	1339.52'
C94	S8°16'00"W	571.52'	1354.08'	1354.08'
C95	S8°16'00"W	577.60'	1368.64'	1368.64'
C96	S8°16'00"W	583.68'	1383.20'	1383.20'
C97	S8°16'00"W	589.76'	1397.76'	1397.76'
C98	S8°16'00"W	595.84'	1412.32'	1412.32'
C99	S8°16'00"W	601.92'	1426.88'	1426.88'
C100	S8°16'00"W	608.00'	1441.44'	1441.44'

**TRACT 10060**  
 FOR CONDOMINIUM PURPOSES  
**WAUKESHA PROPERTY**  
 BEING A SUBDIVISION OF PARCEL 1 OF DOCUMENT NO. 4102854 OF  
 OFFICIAL RECORDS, SANTA CLARA COUNTY RECORDS  
 CITY OF MILPITAS SANTA CLARA COUNTY, CALIFORNIA  
**CARLSON, BARBEE AND GIBSON, INC.**  
 ENGINEERS SURVEYORS PLANNERS  
 SAN RAMON, CALIFORNIA

PARCEL B  
 502 M 30

**NOTE**  
 1) LOT B AND LOT I HAVE BEEN INTERNALLY QUARTED.

PARCEL A  
 517 M 1

**BASIS OF BEARINGS:**  
 THE BASIS OF BEARING FOR THIS MAP IS DETERMINED BY FOUND  
 MONUMENTS ON THE CENTERLINE OF PARK DRIVE. THE BEARING BEING  
 150° 00' 00" AND THE DISTANCE BEING 100.00 FEET. THE  
 SANTA CLARA COUNTY RECORDS, THE BEARINGS SHOWN HEREON ARE  
 BASED ON CALIFORNIA COORDINATE SYSTEM ZONE 1 (NAD 83). MULTIPLE  
 DISTANCE SHOWN BY 0.59984617 TO OBTAIN GRID DISTANCES.

PARCEL E  
 542 M 50

PARCEL D  
 2.92 AC

PARCEL C  
 542 M 50

PARCEL F  
 542 M 50

PARCEL G  
 542 M 50

PARCEL H  
 542 M 50

PARCEL I  
 542 M 50

PARCEL J  
 542 M 50

PARCEL K  
 542 M 50

PARCEL L  
 542 M 50

PARCEL M  
 542 M 50

PARCEL N  
 542 M 50

PARCEL O  
 542 M 50

PARCEL P  
 542 M 50

PARCEL Q  
 542 M 50

PARCEL R  
 542 M 50

PARCEL S  
 542 M 50

PARCEL T  
 542 M 50

PARCEL U  
 542 M 50

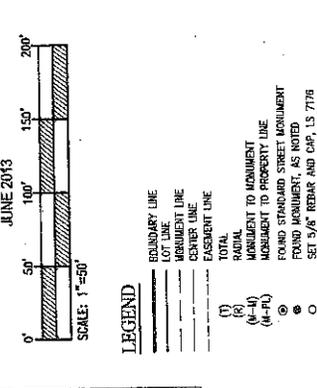
PARCEL V  
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PARCEL W  
 542 M 50

PARCEL X  
 542 M 50

PARCEL Y  
 542 M 50

PARCEL Z  
 542 M 50

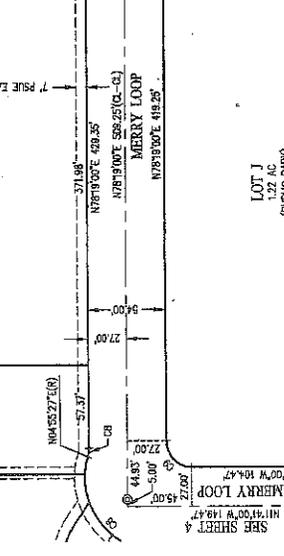
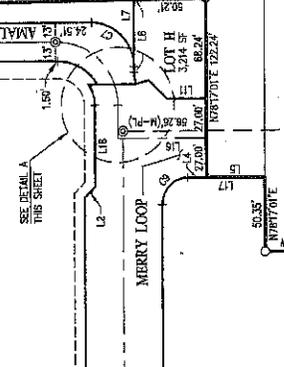
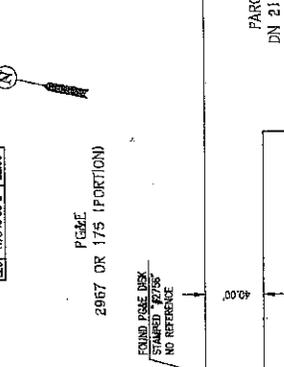
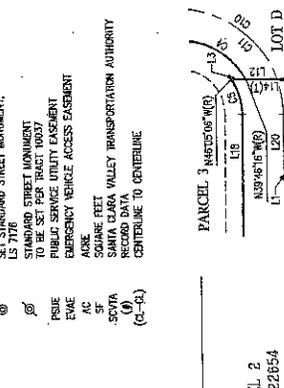
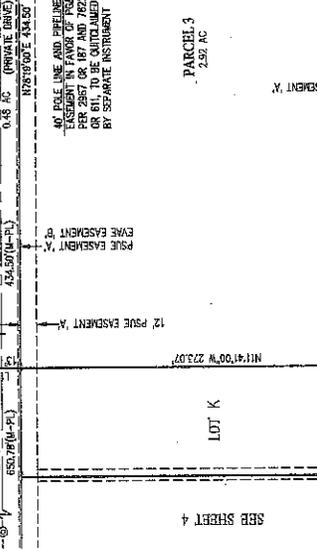


**LEGEND**

- BOUNDARY LINE
- LOT LINE
- MONUMENT TO PROPERTY LINE
- CENTER LINE
- EASEMENT LINE
- TOTAL
- RADIAL
- MONUMENT TO MONUMENT
- MONUMENT TO PROPERTY LINE
- FOUND STANDARD STREET MONUMENT
- FOUND MONUMENT, AS NOTED LS 7716
- SET STANDARD STREET MONUMENT, LS 7716
- STANDARD STREET MONUMENT TO BE SET PER TRACT 10057
- PUBLIC SERVICE UTILITY EASEMENT
- EMERGENCY VEHICLE ACCESS EASEMENT
- ADJACENT
- CONTRACT SET
- SANTA CLARA VALLEY TRANSPORTATION AUTHORITY RECORD DATA
- CENTERLINE TO CENTERLINE

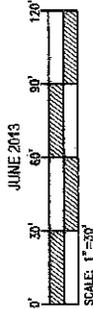
(1) (K) MONUMENT TO MONUMENT  
 (M-L) MONUMENT TO PROPERTY LINE  
 (A-F-L) FOUND STANDARD STREET MONUMENT  
 (O) FOUND MONUMENT, AS NOTED LS 7716  
 (C) SET STANDARD STREET MONUMENT, LS 7716  
 (S) STANDARD STREET MONUMENT TO BE SET PER TRACT 10057  
 (P) PUBLIC SERVICE UTILITY EASEMENT  
 (E) EMERGENCY VEHICLE ACCESS EASEMENT  
 (A) ADJACENT  
 (S) CONTRACT SET  
 (S) SANTA CLARA VALLEY TRANSPORTATION AUTHORITY RECORD DATA  
 (C-C) CENTERLINE TO CENTERLINE

NO.	BEARING	LENGTH	NO.	BEARING	LENGTH
C1	180°00'00"	42.11	C11	180°00'00"	42.11
C2	30°00'00"	153.03	C12	30°00'00"	153.03
C3	45°00'00"	170.04	C13	45°00'00"	170.04
C4	30°00'00"	153.03	C14	30°00'00"	153.03
C5	25°00'00"	132.72	C15	25°00'00"	132.72
C6	30°00'00"	153.03	C16	30°00'00"	153.03
C7	30°00'00"	153.03	C17	30°00'00"	153.03
C8	20°00'00"	163.27	C18	20°00'00"	163.27
C9	180°00'00"	42.11	C19	180°00'00"	42.11
C10	150°00'00"	53.16	C20	150°00'00"	53.16
C11	120°00'00"	67.57	C21	120°00'00"	67.57
C12	90°00'00"	87.52	C22	90°00'00"	87.52



50

**TRACT 10060**  
 FOR CONDOMINIUM PURPOSES  
**WAUKESHA PROPERTY**  
 BEING A SUBDIVISION OF PARCEL 1 OF DOCUMENT NO. 2192864 OF  
 OFFICIAL RECORDS, SANTA CLARA COUNTY RECORDS  
 CITY OF MILPITAS SANTA CLARA COUNTY CALIFORNIA  
**CARLSON, BARBEE AND GIBSON, INC.**  
 ENGINEERS SURVEYORS PLANNERS  
 SAN RAMON, CALIFORNIA



**BASIS OF BEARINGS:**

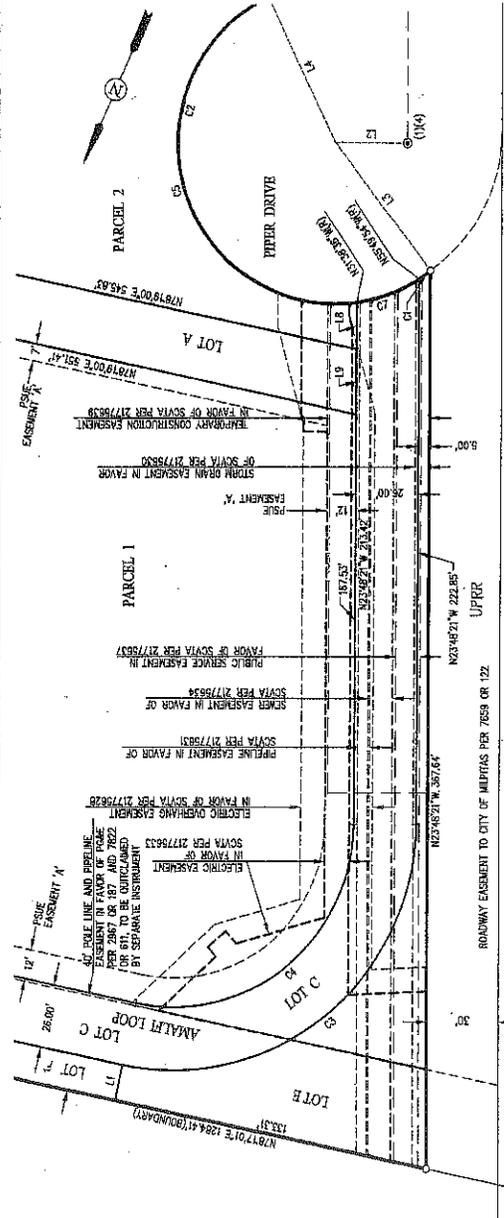
THE BASIS OF BEARINGS FOR THIS MAP IS DETERMINED BY FOUND MONUMENTS ON THE CENTERLINE OF PIPPER DRIVE. THE BEARING BEING  $N23^{\circ}48'21''W$  PER PARCEL MAP FILED IN BOOK 560 OF MAPS AT PAGE 49 OF OFFICIAL RECORDS, SANTA CLARA COUNTY RECORDS. BEARINGS ARE BASED ON CALIFORNIA COORDINATE SYSTEM ZONE 3 (NAD 83). METRIC DISTANCE SHOWN BY 0.59984617 TO OBTAIN CRO DISTANCES.

**LEGEND**

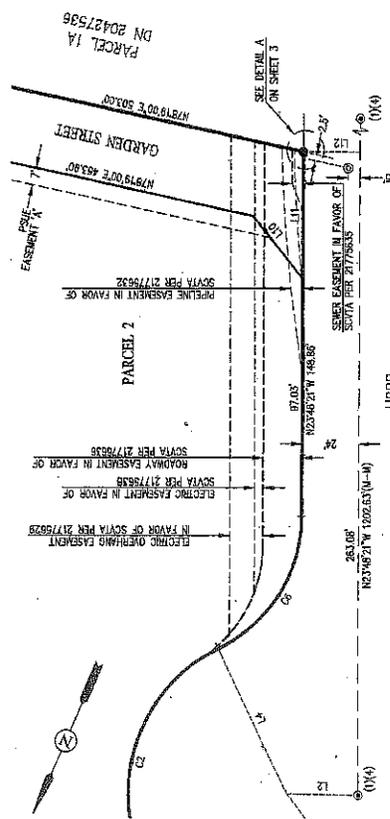
- BOUNDARY LINE
- LOT LINE
- MONUMENT LINE
- CENTER LINE
- EASEMENT LINE
- TOTAL
- (1) RADIAL MONUMENT TO MONUMENT MONUMENT TO PROPERTY LINE
- (2) FOUND STANDARD STREET MONUMENT
- (3) FOUND MONUMENT AS NOTED
- (4) SET 5/8" REBAR AND CAP I.S. 7176
- (5) SET STANDARD STREET MONUMENT, I.S. 7176
- (6) STANDARD STREET MONUMENT TO BE SET PER TRACT MAPS
- (7) PUBLIC SERVICE UTILITY EASEMENT
- (8) PROPERTY VEHICLE ACCESS EASEMENT
- (9) ACRES
- (10) SQUARE FEET
- (11) SANTA CLARA VALLEY TRANSPORTATION AUTHORITY RECORD DATA
- (12) CENTERLINE TO CENTERLINE

**NOTE**

1) LOT B AND LOT I HAVE BEEN INTENTIONALLY OMITTED.



**DETAIL A**



**DETAIL B**



NO.	BEARING	LENGTH
L1	$N11^{\circ}42'35''W$	15.00'
L2	$N88^{\circ}54'48''E$	30.00'
L3	$N81^{\circ}05'40''W$	66.00'
L4	$N23^{\circ}48'21''W$	19.29'
L5	$N22^{\circ}49'21''W$	26.99'
L6	$N62^{\circ}53'41''W$	32.96'
L7	$N68^{\circ}11'39''E$	24.00'

NO.	RADIUS	DELTA	LENGTH
C1	66.00'	$25^{\circ}16'46''$	6.05'
C2	66.00'	$18^{\circ}55'42''$	221.05'
C3	104.00'	$162^{\circ}07'21''$	133.85'
C4	76.50'	$162^{\circ}07'21''$	133.85'
C5	66.00'	$162^{\circ}27'38''$	187.14'
C6	66.00'	$64^{\circ}37'23''$	97.67'
C7	66.00'	$24^{\circ}11'18''$	27.56'

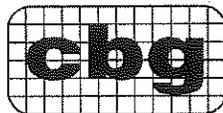
**EXHIBIT B**  
**Stormwater Control O&M Plan**

# Operation and Maintenance Plan

Amalfi Apartments  
TRACT 10060  
MILPITAS, CALIFORNIA

July 2016

Prepared by:



**Carlson, Barbee  
& Gibson, Inc.**

CIVIL ENGINEERS • SURVEYORS • PLANNERS

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### Appendix

Figure 1 – Vicinity Map

Figure 2 – BMP Maintenance Responsibility Exhibit

Figure 3 – Proposed Bioretention Areas and Raised Planters

Figure 4 – Proposed Media Filtration Areas

## **I. Introduction**

This Operations and Maintenance Manual (O&M) for the Amalfi Apartments within the Piper/Montague Subdistrict is submitted to the Department of Public Works of the City of Milpitas. The O&M Plan is for the operation and maintenance of on-site Best Management Practices (BMP) for the project. BMP technical requirements are presented in the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) C.3 Stormwater Handbook dated April 2012.

The Amalfi Apartment project is located on the northern side of the Piper/Montague Subdistrict at the north end of Piper Drive between the Union Pacific Railroad property and South Milpitas Boulevard, as shown in Figure 1. The Union Pacific Railroad property is currently under construction with the BART extension to San Jose. The eastern portion of the Piper/Montague Subdistrict (commonly known as the Metro project) is in design and construction by the Pulte Group. The improvements to the 3.72 acre Amalfi Apartment site will include one multi-story apartment building, a clubhouse and swimming pool, landscaped paseos, and open space areas.

Upon construction of the proposed improvements, approximately 3.21 acres (59%) of the site will be covered by impervious surfaces and about 2.23 acres (41%) will be covered by landscaped areas including lawn, shrubs, and trees.

### **The treatment BMPs used on this site include:**

Permanent Best Management Practices (BMPs) are required for the site. The recommended BMP alternatives for the project site are shown in Figure 2 and 3 and include bioretention areas, media filters and flow-through planter boxes. These BMPs provide a level of treatment that meets the C.3 requirements for the additional runoff generated by the project improvements:

1. Where possible, selected landscaping areas are used as bioretention area BMPs. Route pathway and patio runoff to the bioretention area BMP, with excess flows conveyed to the on-site storm drain system.
2. The media filtration stormwater treatment unit shall be installed prior to the point of connection to the public storm drain system along Piper Drive (See Figure 3 and 4 for typical Media Filtration BMP details).

## II. Responsibility for Maintenance

### A. General

#### 1. BMP Maintenance Responsibility

The BMP maintenance responsibility for this area is outlined in the attached exhibit, Figure 2. This document outlines the maintenance required for the Amalfi Apartments property is to be maintained through the Amalfi Milpitas LLC.

#### 2. Contact Information

#### **Designation of Individuals Responsible for Stormwater Treatment BMP Operation and Maintenance**

Date Completed: 4/29/2016  
Facility Name: Amalfi Apartments Tract 10060  
Facility Address: 500 Amalfi Loop, Milpitas, CA

#### Designated Contact for Operation and Maintenance

Primary Contact: Ken Perry  
Title or Position: Vice President of Construction  
Telephone: (408) 985-6000  
Email: kenp@scsdevelopment.com

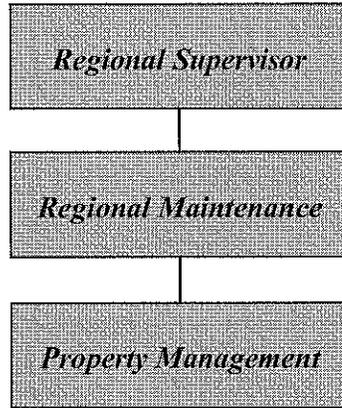
#### Off-Hours or Emergency Contact

Primary Contact: Ken Perry  
Title or Position: Vice President of Construction  
Telephone: (408) 985-6000  
Email: kenp@scsdevelopment.com

#### Corporate Officer (Authorized to Execute Contracts with City)

Primary Contact: Ken Perry  
Title or Position: Vice President of Construction  
Telephone: (408) 985-6000  
Email: kenp@scsdevelopment.com

3. Organization Chart



4. O&M Agreement

An operation and maintenance agreement between the Owner and City of Milpitas will be recorded with the County of Santa Clara.

5. Maintenance Funding

- a. Sources of funds for maintenance: Maintenance funds will be paid by the Amalfi Milpitas LLC.
- b. Budget category or line item: Funds for the maintenance of the BMPs will be listed under the “Maintenance Contracts” line item in the Amalfi Milpitas LLC budget.
- c. Description of procedure and process for ensuring adequate funding for maintenance: The cost of maintenance operations shall be covered by the Amalfi Milpitas LLC.

**B. Staff Training Program**

Amalfi Milpitas LLC representatives will be trained to comply with the terms of the Operations and Maintenance Agreement to be recorded. Employees will be trained in the proper disposal of trash materials and hazardous waste or will contract with an approved, licensed maintenance provider. Employees will be trained to comply with the storm water inlet labels printed with the logo “No Dumping / Flows to Bay.” This educational measure is intended to prevent unlawful dumping of waste materials, such as motor oil, into the storm drain system.

**C. Records**

Amalfi Milpitas LLC will maintain annual records of the operation and maintenance of the all BMP measures. The records will consist of annual inspection reports and certificates of compliance provided by the maintenance company contracted to service the BMP units. See Section VI for manufacture’s recommendations. The reports will be available to the City inspector upon request.

**D. Safety**

Only personnel with confined space training and possessing the necessary safety equipment should enter the structural BMP units to perform maintenance or inspection procedures. Inspections of the internal components can, in most cases, be accomplished through observations from the ground surface. The removal of the sediment from the units’ sump should be performed by trained personnel and all debris should be disposed of per EPA standards. See Section VI for manufacture’s recommendations.

### III. Summary of Drainage Areas and BMPs

#### A. **Drainage Areas**

1. Approximately 3.21 acres (59%) of the site will be covered by impervious surface and about 2.23 acres (41%) will be covered by landscaped areas including lawn, shrubs, and trees. All walkways within these areas will be sloped to drain into the surrounding landscaping.

#### B. **Treatment BMPs**

1. The treatment BMPs used on this site include:
  - Bioretention: selected landscaping areas are used as bioretention area BMPs. Route pathway and patio runoff to the bioretention area BMP, with excess flows conveyed to the on-site storm drain system.
  - Structural Stormwater Treatment: A Media Filtration stormwater treatment unit shall be installed prior to the point of connection to the public storm drain system along Piper Drive (see attached Improvement Plan sheet 21 for Media Filtration BMP details).
  - Flow-through Planters: Flow-through planters will be constructed throughout the site. Flow-through planters are designed to filter pollutants from stormwater runoff from adjacent roofs using a combination of vegetation, ponding, permeable planting soil, and a subdrain system.

Media Filtration BMP sizing was calculated using the *flow-based* methodology described in the SCVURPPP.

**IV. BMP Design Documentation**

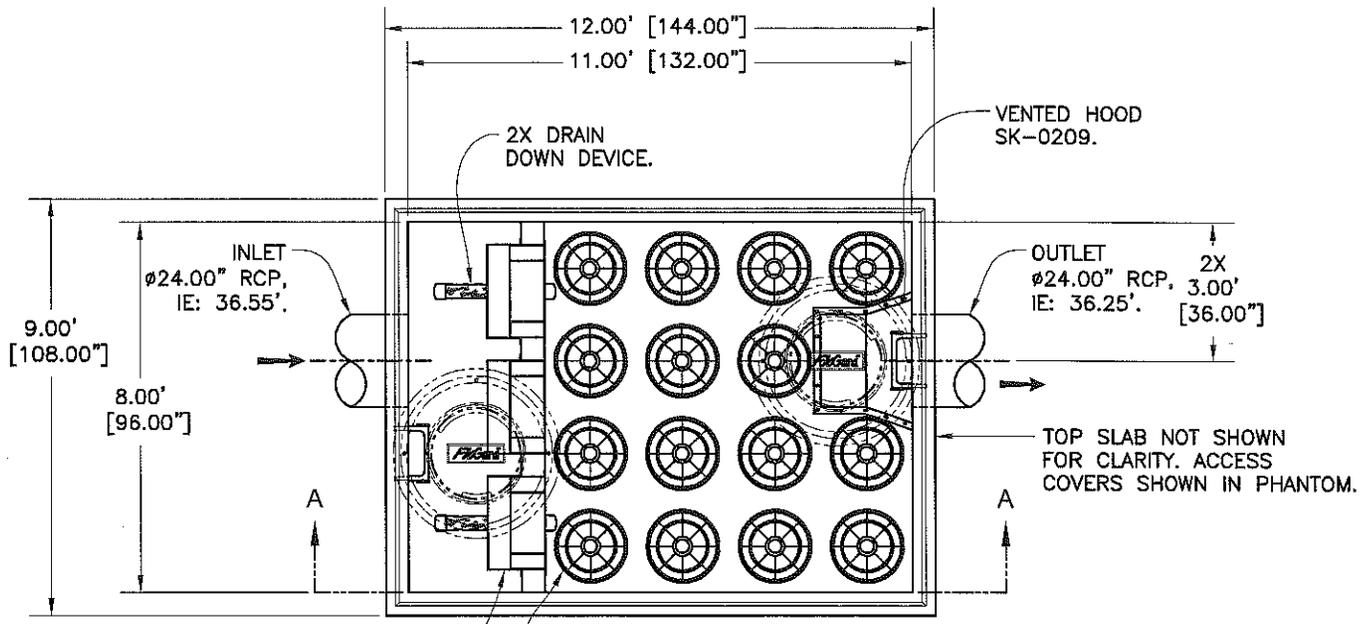
**A. Approved drawings of each BMP**

See attached details and sections.

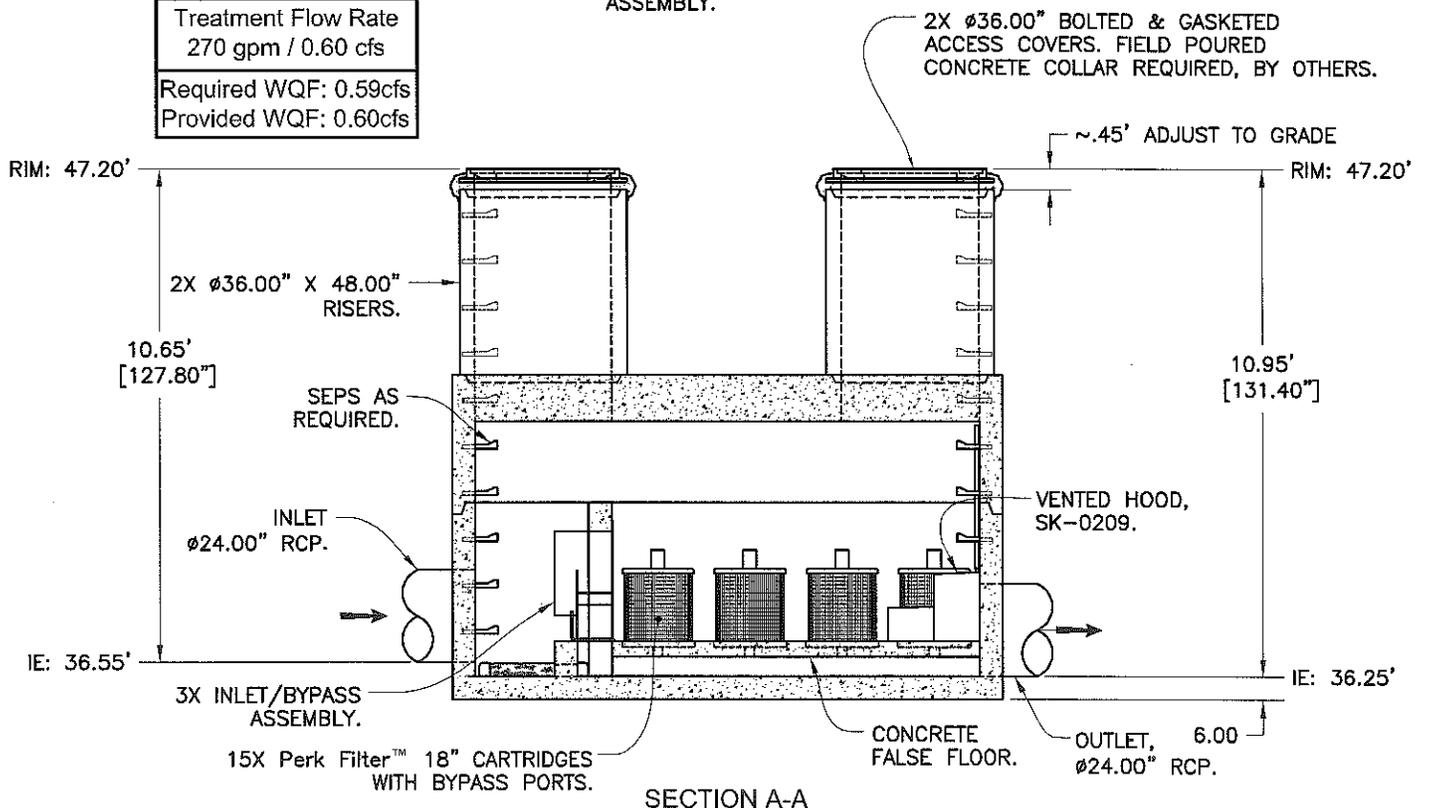




PDD-5989



<b>MF-A1</b>
Perk Filter™ Vault 18" Cartridges, 15 Each
Treatment Flow Rate 270 gpm / 0.60 cfs
Required WQF: 0.59cfs Provided WQF: 0.60cfs



**SECTION A-A**

NOTE:

1. MAXIMUM PICK WEIGHT: BASE SECTION = 26,250 LBS / 13.13 TONS [RC] FULLY ASSEMBLED WITH CARTRIDGES INSTALLED.
2. CONCRETE COMPONENTS ARE DESIGNED & MANUFACTURED IN ACCORDANCE WITH ASTM DESIGNATION C857 & C858.

P01	NONE	NEW.			N/A	
REV.	ECC. NO.	DESCRIPTION			APPROVED	
<b>JOB DETAIL</b>	<b>Perk Filter™ Vault</b> 8' X 11' - 18" Cartridges, 15 Each		APPROVALS	DATE	<b>KriStar Enterprises, Inc.</b> 360 Sulton Place, Santa Rosa, CA 95407 Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com	
CUSTOMER: Carlson, Barbee & Gibson		DRAWN	I. MARSHALL	6/26/13		SIZE
JOB NAME: Montague Village Backbone Milpitas, CA		CHECKED	J. RIGGAR	6/26/13		DRAWING NO.
		PROJECT ENGINEER	J. HARDESTY	6/26/13	<b>A</b>	<b>PDD-5989</b>
				SCALE: NONE DO NOT SCALE DRAWING	REV. <b>P01</b>	
				SHEET 1 OF 1		

APPROVED: DATE:

**IV. BMP Design Documentation**

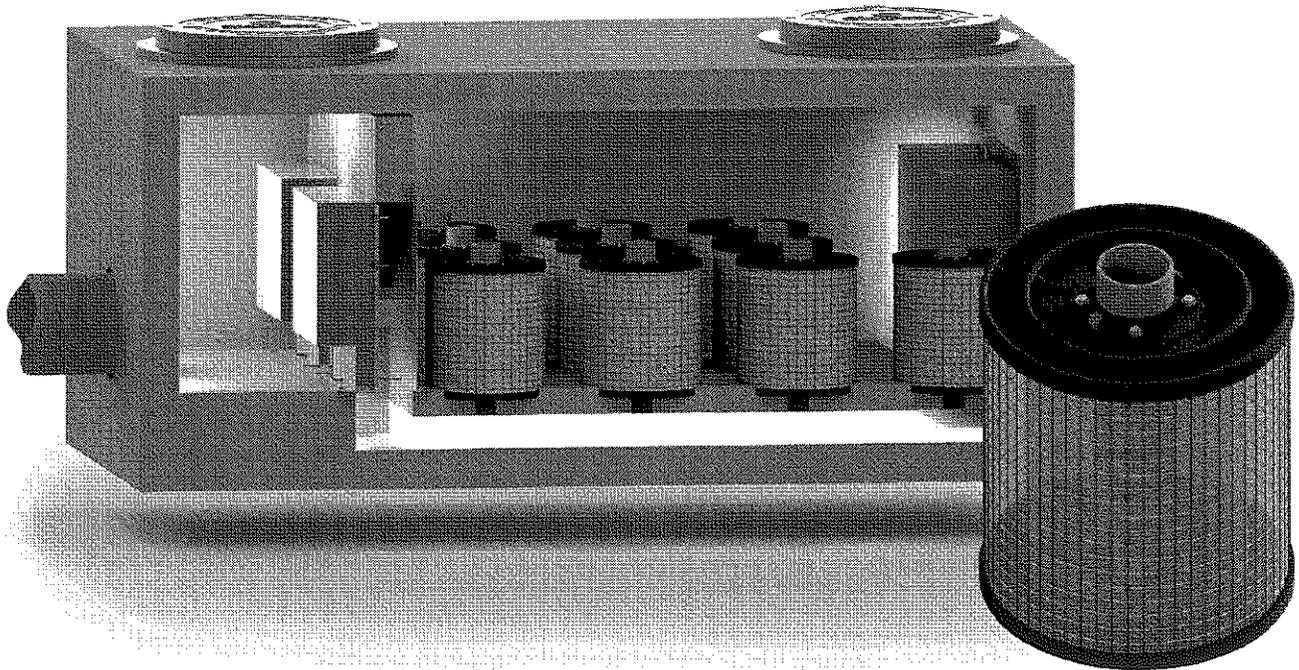
- B. Manufacturer's Data, manuals, and maintenance requirements for proprietary BMPs.**

# ***PERKFILTER***<sup>™</sup>

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## INSPECTION AND MAINTENANCE GUIDE

---



November 4, 2015  
Version 1



(800) 579-8819

oldcastlestormwater.com  
stormcapture.com



## PerkFilter™ Media Filtration System

### Description

The PerkFilter is a stormwater treatment device used to remove pollutants from urban runoff. Impervious surfaces and other urban and suburban landscapes generate a variety of contaminants that can enter stormwater and pollute downstream receiving waters. The PerkFilter is a media-filled cartridge filtration device designed to capture and retain sediment, gross solids, metals, nutrients, hydrocarbons, and trash and debris. As with any stormwater treatment system, the PerkFilter requires regular periodic maintenance to sustain optimum system performance.

### Function

The PerkFilter is a water quality treatment system consisting of three chambers: an inlet chamber, a filter cartridge treatment chamber, and an outlet chamber (Figure 1). Stormwater runoff enters the inlet chamber through an inlet pipe, curb opening, or grated inlet. Gross solids are settled out and floating trash and debris are trapped in the inlet chamber. Pretreated flow is then directed to the treatment chamber through an opening in the baffle wall between the inlet chamber and treatment chamber. The treatment chamber contains media-filled filter cartridges (Figure 2) that use physical and chemical processes to remove pollutants. During a storm event, runoff pools in the treatment chamber before passing radially through the cylindrical cartridges from the outside surface, through the media for treatment, and into the center of the cartridge. At the center of the cartridge is a center tube assembly designed to distribute the hydraulic load evenly across the surface of the filter cartridge and control the treatment flow rate. The center tube assembly discharges treated flow through the false floor and into the outlet chamber. A draindown feature built into each cartridge allows the treatment chamber to dewater between storm events.

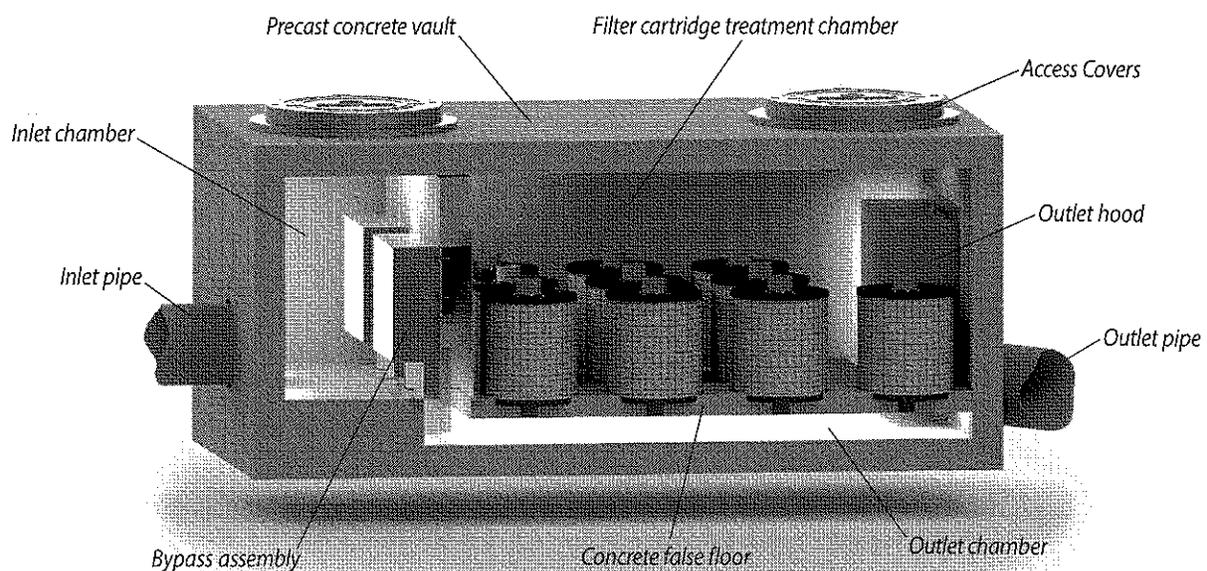
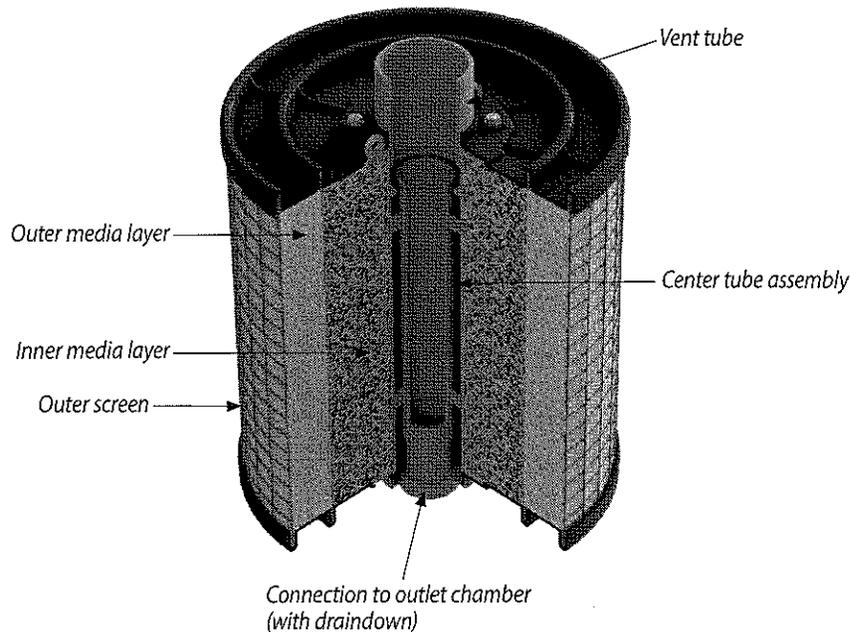


Figure 1. Schematic of the PerkFilter system.

All PerkFilter systems include a high flow bypass assembly to divert flow exceeding the treatment capacity of the filter cartridges around the treatment chamber. The bypass assembly routes peak flow from the inlet chamber directly to the outlet chamber, bypassing the treatment chamber to prevent sediment and other captured pollutants from being scoured and re-entrained by high flow. Treated flow and bypass flow merge in the outlet chamber for discharge by a single outlet pipe.



**Figure 2. Schematic of the PerkFilter cartridge.**

### **Configuration**

The PerkFilter structure may consist of a vault, manhole, or catch basin configuration. Catch basin units may be fabricated from concrete or steel. Internal components including the PerkFilter cartridges are manufactured from durable plastic and stainless steel components and hardware. All cartridges are 18 inches in diameter and are available in two heights: 12-inch and 18-inch. Cartridges may be used alone or may be stacked (Figure 3) to provide 24-inch and 30-inch combinations. The capacity of each cartridge or cartridge combination is dictated by the allowable operating rate of the media and the outer surface area of the cartridge. Thus, taller cartridges have greater treatment capacity than shorter cartridges but they also require more hydraulic drop across the system. Cartridges may be filled with a wide variety of media but the standard mix is composed of zeolite, perlite, and carbon (ZPC).

Access to an installed PerkFilter system is typically provided by ductile iron castings or hatch covers. The location and number of access appurtenances is dependent on the size and configuration of the system.

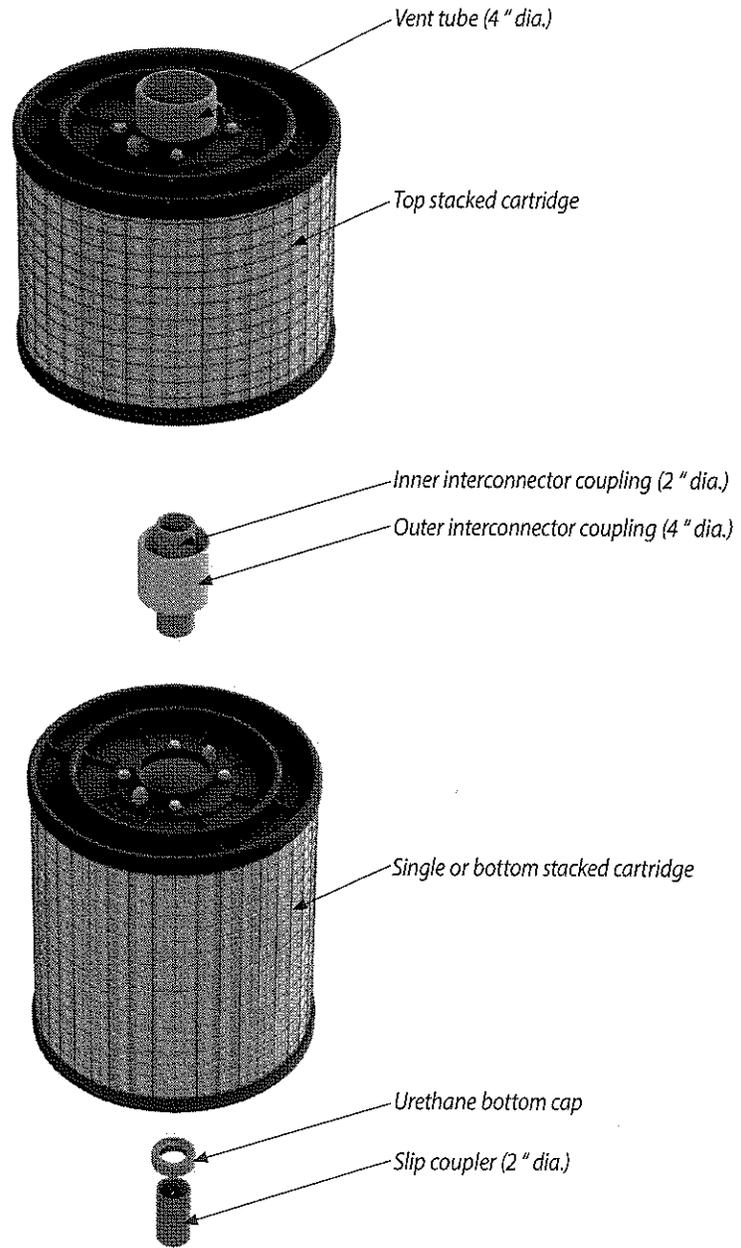


Figure 3. Schematic of stacked cartridges and connector components.

## ***Maintenance Overview***

State and local regulations require all stormwater management systems to be inspected on a regular basis and maintained as necessary to ensure performance and protect downstream receiving waters. Maintenance prevents excessive pollutant buildup that can limit system performance by reducing the operating capacity and increasing the potential for scouring of pollutants during periods of high flow.

## ***Inspection and Maintenance Frequency***

The PerkFilter should be inspected on a regular basis, typically twice per year, and maintained as required. Initially, inspections of a new system should be conducted more frequently to help establish an appropriate site-specific inspection frequency. The maintenance frequency will be driven by the amount of runoff and pollutant loading encountered by a given system. In most cases, the optimum maintenance interval will be one to three years. Inspection and maintenance activities should be performed only during dry weather periods.

## ***Inspection Equipment***

The following equipment is helpful when conducting PerkFilter inspections:

- Recording device (pen and paper form, voice recorder, iPad, etc.)
- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Socket and wrench for bolt-down access covers
- Manhole hook or pry bar
- Flashlight
- Tape measure
- Measuring stick or sludge sampler
- Long-handled net (optional)

## ***Inspection Procedures***

PerkFilter inspections are visual and may be conducted from the ground surface without entering the unit. To complete an inspection, safety measures including traffic control should be deployed before the access covers are removed. Once the covers have been removed, the following items should be checked and recorded (see form provided at the end of this document) to determine whether maintenance is required:

- Inspect the internal components and note whether there are any broken or missing parts. In the unlikely event that internal parts are broken or missing, contact Oldcastle Stormwater Solutions at (800) 579-8819 to determine appropriate corrective action.
- Note whether the inlet pipe is blocked or obstructed. The outlet pipe is covered by a removable outlet hood and cannot be observed without entering the unit.

- Observe, quantify, and record the accumulation of floating trash and debris in the inlet chamber. The significance of accumulated floating trash and debris is a matter of judgment. A long-handled net may be used to retrieve the bulk of trash and debris at the time of inspection if full maintenance due to accumulation of floating oils or settled sediment is not yet warranted.
- Observe, quantify, and record the accumulation of oils in the inlet chamber. The significance of accumulated floating oils is a matter of judgment. However, if there is evidence of an oil or fuel spill, immediate maintenance by appropriate certified personnel is warranted.
- Observe, quantify, and record the average accumulation of sediment in the inlet chamber and treatment chamber. A calibrated dipstick, tape measure, or sludge sampler may be used to determine the amount of accumulated sediment in each chamber. The depth of sediment may be determined by calculating the difference between the measurement from the rim of the PerkFilter to the top of the accumulated sediment and the measurement from the rim of the PerkFilter to the bottom of the PerkFilter structure. Finding the top of the accumulated sediment below standing water takes some practice and a light touch, but increased resistance as the measuring device is lowered toward the bottom of the unit indicates the top of the accumulated sediment.
- Finally, observe, quantify, and record the amount of standing water in the treatment chamber around the cartridges. If standing water is present, do not include the depth of sediment that may have settled out below the standing water in the measurement.

### ***Maintenance Triggers***

Maintenance should be scheduled if any of the following conditions are identified during the inspection:

- Internal components are broken or missing.
- Inlet piping is obstructed.
- The accumulation of floating trash and debris that cannot be retrieved with a net and/or oil in the inlet chamber is significant.
- There is more than 6" of accumulated sediment in the inlet chamber.
- There is more than 4" of accumulated sediment in the treatment chamber.
- There is more than 4" of standing water in the treatment chamber more than 24 hours after end of rain event.
- A hazardous material release (e.g. automotive fluids) is observed or reported.
- The system has not been maintained for 3 years (wet climates) to 5 years (dry climates).

### ***Maintenance Equipment***

The following equipment is helpful when conducting PerkFilter maintenance:

- Suitable clothing (appropriate footwear, gloves, hardhat, safety glasses, etc.)
- Traffic control equipment (cones, barricades, signage, flagging, etc.)
- Socket and wrench for bolt-down access covers
- Manhole hook or pry bar
- Confined space entry equipment, if needed

- Flashlight
- Tape measure
- 9/16" socket and wrench to remove hold-down struts and filter cartridge tops
- Replacement filter cartridges
- Vacuum truck with water supply and water jet

Contact Oldcastle Stormwater Solutions at **(800) 579-8819** for replacement filter cartridges. A lead time of four weeks is recommended.

### ***Maintenance Procedures***

Maintenance should be conducted during dry weather when no flow is entering the system. Confined space entry is necessary to maintain vault and manhole PerkFilter configurations. Only personnel that are OSHA Confined Space Entry trained and certified may enter underground structures. Confined space entry is not required for catch basin PerkFilter configurations. Once safety measures such as traffic control are deployed, the access covers may be removed and the following activities may be conducted to complete maintenance:

- Remove floating trash, debris, and oils from the water surface in the inlet chamber using the extension nozzle on the end of the boom hose of the vacuum truck. Continue using the vacuum truck to completely dewater the inlet chamber and evacuate all accumulated sediment from the inlet chamber. Some jetting may be required to fully remove sediment. The inlet chamber does not need to be refilled with water after maintenance is complete. The system will fill with water when the next storm event occurs.
- Remove the hold-down strut from each row of filter cartridges and then remove the top of each cartridge (the top is held on by four 9/16" bolts) and use the vacuum truck to evacuate the spent media. When empty, the spent cartridges may be easily lifted off their slip couplers and removed from the vault. The couplers may be left inserted into couplings cast into the false floor to prevent sediment and debris from being washed into the outlet chamber during washdown.
- Once all the spent cartridges have been removed from the structure, the vacuum truck may be used to evacuate all accumulated sediment from the treatment chamber. Some jetting may be required to fully remove sediment. Take care not to wash sediment and debris through the openings in the false floor and into the outlet chamber. All material removed from the PerkFilter during maintenance including the spent media must be disposed of in accordance with local, state, and/or federal regulations. In most cases, the material may be handled in the same manner as disposal of material removed from sumped catch basins or manholes.
- Place a fresh cartridge in each cartridge position using the existing slip couplers and urethane bottom caps. If the vault is equipped with stacked cartridges, the existing outer and inner interconnector couplers must be used between the stacked cartridges to provide hydraulic connection. Transfer the existing vent tubes from the spent cartridges to the fresh cartridges. Finally, refit the struts to hold the fresh cartridges in place.
- Securely replace access covers, as appropriate.
- Make arrangements to return the empty spent cartridges to Oldcastle Stormwater Solutions.

<h2 style="margin: 0;">PerkFilter</h2> <h3 style="margin: 0;">Inspection and Maintenance Log</h3>	
<b>Location</b> _____	
<b>Structure Configuration and Size:</b> <input type="checkbox"/> Vault _____ feet x _____ feet <input type="checkbox"/> Manhole _____ diameter <input type="checkbox"/> Catch Basin _____ feet x _____ feet	<b>Inspection Date</b> _____
<b>Number and Height of Cartridges:</b> Count _____ each <input type="checkbox"/> 12" <input type="checkbox"/> 18" <input type="checkbox"/> 24" <input type="checkbox"/> 30"	
<b>Media Type:</b> <input type="checkbox"/> ZPC <input type="checkbox"/> Perlite <input type="checkbox"/> Other _____	
<b>Condition of Internal Components</b> <input type="checkbox"/> Good <input type="checkbox"/> Damaged <input type="checkbox"/> Missing	Notes:
<b>Inlet Pipe Blockage or Obstruction</b> <input type="checkbox"/> Yes <input type="checkbox"/> No	Notes:
<b>Floating Trash and Debris</b> <input type="checkbox"/> Significant <input type="checkbox"/> Not Significant	Notes:
<b>Floating Oils</b> <input type="checkbox"/> Significant <input type="checkbox"/> Not Significant <input type="checkbox"/> Spill	Notes:
<b>Sediment Depth in Inlet Chamber</b> <input type="checkbox"/> Inches of Sediment: _____	Notes:
<b>Sediment Depth in Treatment Chamber</b> <input type="checkbox"/> Inches of Sediment: _____	Notes:
<b>Standing Water in Treatment Chamber</b> <input type="checkbox"/> Inches of Standing Water: _____	Notes:
<b>Maintenance Required</b> <input type="checkbox"/> Yes – Schedule Maintenance <input type="checkbox"/> No – Inspect Again in _____ Months	



## Design Considerations

- Soil for Infiltration
- Tributary Area
- Slope
- Aesthetics
- Environmental Side-effects

## Description

The bioretention best management practice (BMP) functions as a soil and plant-based filtration device that removes pollutants through a variety of physical, biological, and chemical treatment processes. These facilities normally consist of a grass buffer strip, sand bed, ponding area, organic layer or mulch layer, planting soil, and plants. The runoff's velocity is reduced by passing over or through buffer strip and subsequently distributed evenly along a ponding area. Exfiltration of the stored water in the bioretention area planting soil into the underlying soils occurs over a period of days.

## California Experience

None documented. Bioretention has been used as a stormwater BMP since 1992. In addition to Prince George's County, MD and Alexandria, VA, bioretention has been used successfully at urban and suburban areas in Montgomery County, MD; Baltimore County, MD; Chesterfield County, VA; Prince William County, VA; Smith Mountain Lake State Park, VA; and Cary, NC.

## Advantages

- Bioretention provides stormwater treatment that enhances the quality of downstream water bodies by temporarily storing runoff in the BMP and releasing it over a period of four days to the receiving water (EPA, 1999).
- The vegetation provides shade and wind breaks, absorbs noise, and improves an area's landscape.

## Limitations

- The bioretention BMP is not recommended for areas with slopes greater than 20% or where mature tree removal would

## Targeted Constituents

<input checked="" type="checkbox"/>	Sediment	■
<input checked="" type="checkbox"/>	Nutrients	▲
<input checked="" type="checkbox"/>	Trash	■
<input checked="" type="checkbox"/>	Metals	■
<input checked="" type="checkbox"/>	Bacteria	■
<input checked="" type="checkbox"/>	Oil and Grease	■
<input checked="" type="checkbox"/>	Organics	■

## Legend (Removal Effectiveness)

- Low
- High
- ▲ Medium



be required since clogging may result, particularly if the BMP receives runoff with high sediment loads (EPA, 1999).

- Bioretention is not a suitable BMP at locations where the water table is within 6 feet of the ground surface and where the surrounding soil stratum is unstable.
- By design, bioretention BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water.
- In cold climates the soil may freeze, preventing runoff from infiltrating into the planting soil.

### **Design and Sizing Guidelines**

- The bioretention area should be sized to capture the design storm runoff.
- In areas where the native soil permeability is less than 0.5 in/hr an underdrain should be provided.
- Recommended minimum dimensions are 15 feet by 40 feet, although the preferred width is 25 feet. Excavated depth should be 4 feet.
- Area should drain completely within 72 hours.
- Approximately 1 tree or shrub per 50 ft<sup>2</sup> of bioretention area should be included.
- Cover area with about 3 inches of mulch.

### **Construction/Inspection Considerations**

Bioretention area should not be established until contributing watershed is stabilized.

### **Performance**

Bioretention removes stormwater pollutants through physical and biological processes, including adsorption, filtration, plant uptake, microbial activity, decomposition, sedimentation and volatilization (EPA, 1999). Adsorption is the process whereby particulate pollutants attach to soil (e.g., clay) or vegetation surfaces. Adequate contact time between the surface and pollutant must be provided for in the design of the system for this removal process to occur. Thus, the infiltration rate of the soils must not exceed those specified in the design criteria or pollutant removal may decrease. Pollutants removed by adsorption include metals, phosphorus, and hydrocarbons. Filtration occurs as runoff passes through the bioretention area media, such as the sand bed, ground cover, and planting soil.

Common particulates removed from stormwater include particulate organic matter, phosphorus, and suspended solids. Biological processes that occur in wetlands result in pollutant uptake by plants and microorganisms in the soil. Plant growth is sustained by the uptake of nutrients from the soils, with woody plants locking up these nutrients through the seasons. Microbial activity within the soil also contributes to the removal of nitrogen and organic matter. Nitrogen is removed by nitrifying and denitrifying bacteria, while aerobic bacteria are responsible for the decomposition of the organic matter. Microbial processes require oxygen and can result in depleted oxygen levels if the bioretention area is not adequately

aerated. Sedimentation occurs in the swale or ponding area as the velocity slows and solids fall out of suspension.

The removal effectiveness of bioretention has been studied during field and laboratory studies conducted by the University of Maryland (Davis et al, 1998). During these experiments, synthetic stormwater runoff was pumped through several laboratory and field bioretention areas to simulate typical storm events in Prince George's County, MD. Removal rates for heavy metals and nutrients are shown in Table 1.

Pollutant	Removal Rate
Total Phosphorus	70-83%
Metals (Cu, Zn, Pb)	93-98%
TKN	68-80%
Total Suspended Solids	90%
Organics	90%
Bacteria	90%

Results for both the laboratory and field experiments were similar for each of the pollutants analyzed. Doubling or halving the influent pollutant levels had little effect on the effluent pollutant concentrations (Davis et al, 1998).

The microbial activity and plant uptake occurring in the bioretention area will likely result in higher removal rates than those determined for infiltration BMPs.

### **Siting Criteria**

Bioretention BMPs are generally used to treat stormwater from impervious surfaces at commercial, residential, and industrial areas (EPA, 1999). Implementation of bioretention for stormwater management is ideal for median strips, parking lot islands, and swales. Moreover, the runoff in these areas can be designed to either divert directly into the bioretention area or convey into the bioretention area by a curb and gutter collection system.

The best location for bioretention areas is upland from inlets that receive sheet flow from graded areas and at areas that will be excavated (EPA, 1999). In order to maximize treatment effectiveness, the site must be graded in such a way that minimizes erosive conditions as sheet flow is conveyed to the treatment area. Locations where a bioretention area can be readily incorporated into the site plan without further environmental damage are preferred. Furthermore, to effectively minimize sediment loading in the treatment area, bioretention only should be used in stabilized drainage areas.

### Additional Design Guidelines

The layout of the bioretention area is determined after site constraints such as location of utilities, underlying soils, existing vegetation, and drainage are considered (EPA, 1999). Sites with loamy sand soils are especially appropriate for bioretention because the excavated soil can be backfilled and used as the planting soil, thus eliminating the cost of importing planting soil.

The use of bioretention may not be feasible given an unstable surrounding soil stratum, soils with clay content greater than 25 percent, a site with slopes greater than 20 percent, and/or a site with mature trees that would be removed during construction of the BMP.

Bioretention can be designed to be off-line or on-line of the existing drainage system (EPA, 1999). The drainage area for a bioretention area should be between 0.1 and 0.4 hectares (0.25 and 1.0 acres). Larger drainage areas may require multiple bioretention areas. Furthermore, the maximum drainage area for a bioretention area is determined by the expected rainfall intensity and runoff rate. Stabilized areas may erode when velocities are greater than 5 feet per second (1.5 meter per second). The designer should determine the potential for erosive conditions at the site.

The size of the bioretention area, which is a function of the drainage area and the runoff generated from the area is sized to capture the water quality volume.

The recommended minimum dimensions of the bioretention area are 15 feet (4.6 meters) wide by 40 feet (12.2 meters) long, where the minimum width allows enough space for a dense, randomly-distributed area of trees and shrubs to become established. Thus replicating a natural forest and creating a microclimate, thereby enabling the bioretention area to tolerate the effects of heat stress, acid rain, runoff pollutants, and insect and disease infestations which landscaped areas in urban settings typically are unable to tolerate. The preferred width is 25 feet (7.6 meters), with a length of twice the width. Essentially, any facilities wider than 20 feet (6.1 meters) should be twice as long as they are wide, which promotes the distribution of flow and decreases the chances of concentrated flow.

In order to provide adequate storage and prevent water from standing for excessive periods of time the ponding depth of the bioretention area should not exceed 6 inches (15 centimeters). Water should not be left to stand for more than 72 hours. A restriction on the type of plants that can be used may be necessary due to some plants' water intolerance. Furthermore, if water is left standing for longer than 72 hours mosquitoes and other insects may start to breed.

The appropriate planting soil should be backfilled into the excavated bioretention area. Planting soils should be sandy loam, loamy sand, or loam texture with a clay content ranging from 10 to 25 percent.

Generally the soil should have infiltration rates greater than 0.5 inches (1.25 centimeters) per hour, which is typical of sandy loams, loamy sands, or loams. The pH of the soil should range between 5.5 and 6.5, where pollutants such as organic nitrogen and phosphorus can be adsorbed by the soil and microbial activity can flourish. Additional requirements for the planting soil include a 1.5 to 3 percent organic content and a maximum 500 ppm concentration of soluble salts.

Soil tests should be performed for every 500 cubic yards (382 cubic meters) of planting soil, with the exception of pH and organic content tests, which are required only once per bioretention area (EPA, 1999). Planting soil should be 4 inches (10.1 centimeters) deeper than the bottom of the largest root ball and 4 feet (1.2 meters) altogether. This depth will provide adequate soil for the plants' root systems to become established, prevent plant damage due to severe wind, and provide adequate moisture capacity. Most sites will require excavation in order to obtain the recommended depth.

Planting soil depths of greater than 4 feet (1.2 meters) may require additional construction practices such as shoring measures (EPA, 1999). Planting soil should be placed in 18 inches or greater lifts and lightly compacted until the desired depth is reached. Since high canopy trees may be destroyed during maintenance the bioretention area should be vegetated to resemble a terrestrial forest community ecosystem that is dominated by understory trees. Three species each of both trees and shrubs are recommended to be planted at a rate of 2500 trees and shrubs per hectare (1000 per acre). For instance, a 15 foot (4.6 meter) by 40 foot (12.2 meter) bioretention area (600 square feet or 55.75 square meters) would require 14 trees and shrubs. The shrub-to-tree ratio should be 2:1 to 3:1.

Trees and shrubs should be planted when conditions are favorable. Vegetation should be watered at the end of each day for fourteen days following its planting. Plant species tolerant of pollutant loads and varying wet and dry conditions should be used in the bioretention area.

The designer should assess aesthetics, site layout, and maintenance requirements when selecting plant species. Adjacent non-native invasive species should be identified and the designer should take measures, such as providing a soil breach to eliminate the threat of these species invading the bioretention area. Regional landscaping manuals should be consulted to ensure that the planting of the bioretention area meets the landscaping requirements established by the local authorities. The designers should evaluate the best placement of vegetation within the bioretention area. Plants should be placed at irregular intervals to replicate a natural forest. Trees should be placed on the perimeter of the area to provide shade and shelter from the wind. Trees and shrubs can be sheltered from damaging flows if they are placed away from the path of the incoming runoff. In cold climates, species that are more tolerant to cold winds, such as evergreens, should be placed in windier areas of the site.

Following placement of the trees and shrubs, the ground cover and/or mulch should be established. Ground cover such as grasses or legumes can be planted at the beginning of the growing season. Mulch should be placed immediately after trees and shrubs are planted. Two to 3 inches (5 to 7.6 cm) of commercially-available fine shredded hardwood mulch or shredded hardwood chips should be applied to the bioretention area to protect from erosion.

## Maintenance

The primary maintenance requirement for bioretention areas is that of inspection and repair or replacement of the treatment area's components. Generally, this involves nothing more than the routine periodic maintenance that is required of any landscaped area. Plants that are appropriate for the site, climatic, and watering conditions should be selected for use in the bioretention cell. Appropriately selected plants will aide in reducing fertilizer, pesticide, water, and overall maintenance requirements. Bioretention system components should blend over time through plant and root growth, organic decomposition, and the development of a natural

soil horizon. These biologic and physical processes over time will lengthen the facility's life span and reduce the need for extensive maintenance.

Routine maintenance should include a biannual health evaluation of the trees and shrubs and subsequent removal of any dead or diseased vegetation (EPA, 1999). Diseased vegetation should be treated as needed using preventative and low-toxic measures to the extent possible. BMPs have the potential to create very attractive habitats for mosquitoes and other vectors because of highly organic, often heavily vegetated areas mixed with shallow water. Routine inspections for areas of standing water within the BMP and corrective measures to restore proper infiltration rates are necessary to prevent creating mosquito and other vector habitat. In addition, bioretention BMPs are susceptible to invasion by aggressive plant species such as cattails, which increase the chances of water standing and subsequent vector production if not routinely maintained.

In order to maintain the treatment area's appearance it may be necessary to prune and weed. Furthermore, mulch replacement is suggested when erosion is evident or when the site begins to look unattractive. Specifically, the entire area may require mulch replacement every two to three years, although spot mulching may be sufficient when there are random void areas. Mulch replacement should be done prior to the start of the wet season.

New Jersey's Department of Environmental Protection states in their bioretention systems standards that accumulated sediment and debris removal (especially at the inflow point) will normally be the primary maintenance function. Other potential tasks include replacement of dead vegetation, soil pH regulation, erosion repair at inflow points, mulch replenishment, unclogging the underdrain, and repairing overflow structures. There is also the possibility that the cation exchange capacity of the soils in the cell will be significantly reduced over time. Depending on pollutant loads, soils may need to be replaced within 5-10 years of construction (LID, 2000).

## **Cost**

### ***Construction Cost***

Construction cost estimates for a bioretention area are slightly greater than those for the required landscaping for a new development (EPA, 1999). A general rule of thumb (Coffman, 1999) is that residential bioretention areas average about \$3 to \$4 per square foot, depending on soil conditions and the density and types of plants used. Commercial, industrial and institutional site costs can range between \$10 to \$40 per square foot, based on the need for control structures, curbing, storm drains and underdrains.

Retrofitting a site typically costs more, averaging \$6,500 per bioretention area. The higher costs are attributed to the demolition of existing concrete, asphalt, and existing structures and the replacement of fill material with planting soil. The costs of retrofitting a commercial site in Maryland, Kettering Development, with 15 bioretention areas were estimated at \$111,600.

In any bioretention area design, the cost of plants varies substantially and can account for a significant portion of the expenditures. While these cost estimates are slightly greater than those of typical landscaping treatment (due to the increased number of plantings, additional soil excavation, backfill material, use of underdrains etc.), those landscaping expenses that would be required regardless of the bioretention installation should be subtracted when determining the net cost.

Perhaps of most importance, however, the cost savings compared to the use of traditional structural stormwater conveyance systems makes bioretention areas quite attractive financially. For example, the use of bioretention can decrease the cost required for constructing stormwater conveyance systems at a site. A medical office building in Maryland was able to reduce the amount of storm drain pipe that was needed from 800 to 230 feet - a cost savings of \$24,000 (PGDER, 1993). And a new residential development spent a total of approximately \$100,000 using bioretention cells on each lot instead of nearly \$400,000 for the traditional stormwater ponds that were originally planned (Rappahanock, ). Also, in residential areas, stormwater management controls become a part of each property owner's landscape, reducing the public burden to maintain large centralized facilities.

### ***Maintenance Cost***

The operation and maintenance costs for a bioretention facility will be comparable to those of typical landscaping required for a site. Costs beyond the normal landscaping fees will include the cost for testing the soils and may include costs for a sand bed and planting soil.

### **References and Sources of Additional Information**

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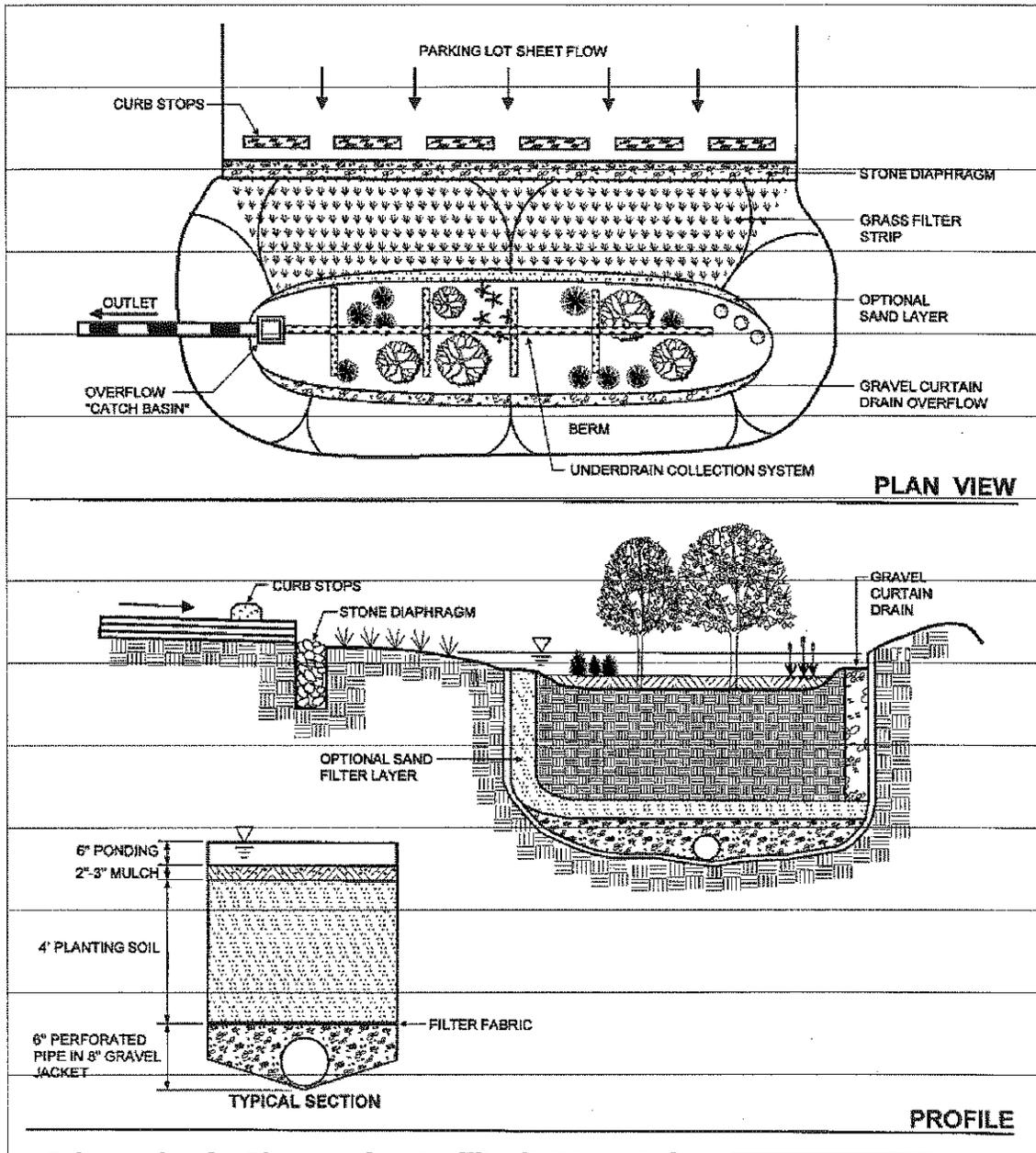
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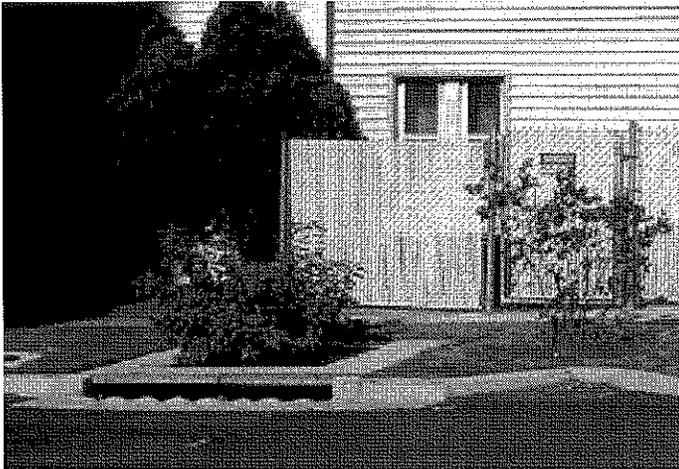
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Schematic of a Bioretention Facility (MDE, 2000)

# Planter Boxes



Source: www.americastusa.com, 2003

## General Description

There are two types of planter boxes: contained and infiltration/flow-through design. The contained planter boxes are designed to intercept rainfall and slowly drain through filter media and out of the planter. The infiltration and flow-through planter boxes are designed to intercept rainfall or receive runoff (e.g., downspout from rooftop), filter it through the planter, and allow infiltration into native soil (infiltration planter) or allow filtered runoff to be collected in a pipe and discharged off-site (flow-through planter). Pollution reduction is achieved as the water filters through the soil and plant roots. Water should drain through the planter within 3-4 hours after a storm event.

## Inspection/Maintenance Considerations

Planter boxes require maintenance of filter media to allow uniform percolation of stormwater through planter. Vegetation needs to be kept healthy and dense enough to provide filtering function while protecting underlying soils from erosion. Obstructions and debris need to be removed from source of runoff (e.g., downspout) to allow unimpeded flow to the planter. All holes, cracks and damage to planter construction need to be repaired to maintain structural integrity of planter.

## Maintenance Concerns, Objectives, and Goals

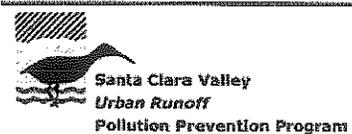
- Clogged Soil
- Vegetation Management
- Aesthetics

## Targeted Constituents

- |                    |   |
|--------------------|---|
| ✓ Sediment         | ■ |
| ✓ Nutrients        | ■ |
| ✓ Trash            |   |
| ✓ Metals           | ■ |
| ✓ Bacteria         | ■ |
| ✓ Oil and Grease   | ■ |
| ✓ Organics         | ■ |
| ✓ Oxygen Demanding | ■ |

## Legend (Removal Effectiveness)

- |          |        |
|----------|--------|
| ● Low    | ■ High |
| ▲ Medium |        |



# Planter Boxes

Inspection Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>■ Inspect for proper construction.</li> <li>■ Inspect for accumulated sediment/debris.</li> </ul>	<p>Immediately following construction</p> <p>As needed</p>
<ul style="list-style-type: none"> <li>■ Inspect runoff inlet structure to insure flow is unimpeded. Inspect rock splash pads to insure inflow is not creating erosion.</li> <li>■ Inspect filter media for clogging and check that infiltration rate meets target (drains 3-4 hours after storm event).</li> <li>■ Inspect planter box for structural deficiencies and needed repairs.</li> <li>■ Inspect vegetation for health and check if plant growth is interfering with planter operation. Inspect irrigation to see if it is working properly.</li> <li>■ Inspect overflow pipe for obstructions and debris.</li> </ul>	<p>Annually, or as needed</p>
Maintenance Activities	Suggested Frequency
<ul style="list-style-type: none"> <li>■ Excavate, clean and or replace filter media (sand, gravel, topsoil) to insure adequate infiltration rate.</li> <li>■ Plug holes in planter that are not consistent with the original design.</li> <li>■ Allow water to flow directly through the planter to the ground.</li> <li>■ Remove litter and debris, including fallen leaves from deciduous plants and accumulated sediments from the planter.</li> <li>■ Repair all cracks and structural deficiencies in planter.</li> <li>■ Add mulch to planter soil.</li> <li>■ Replant, and prune or remove plants that interfere with planter operation.</li> </ul>	<p>Annually, or as needed</p>

## References

Stormwater Management Manual, Chapter 6, O & M Requirements, City of Portland, 2002.

#### **IV. BMP Design Documentation**

##### **C. Specific operation and maintenance concerns and troubleshooting (Structural BMP)**

1. Only confined space certified personnel should enter the structural BMP units.
2. A vacuum truck is required to clean the structural BMP units.
3. MFS filter cartridges can weigh up to 250 lbs each. A small crane may be needed for removal if a vacuum truck cannot be utilized to remove the media from the cartridge before they are lifted out of the vault.
4. All debris should be disposed of per EPA standards.
5. See Manufactures recommendations (attached) for all other maintenance information.

## V. BMP Maintenance Schedule

### A. Annual Maintenance Schedule for all BMPs

Treatment BMPs require minimum maintenance similar to that for any landscape areas. BMPs must be regularly maintained to insure that they continue to be effective and do not cause flooding or other harmful nuisances.

### B. Inspection and Maintenance Schedule for each BMP

#### 1. Routine inspection and maintenance:

##### Bioretention Areas

- Irrigate bioretention areas throughout the dry season. Irrigation will be provided with sufficient quantity and frequency to allow plants to thrive.
- Limit the use of fertilizers and/or pesticides. Mosquito larvicides should be applied only when absolutely necessary.
- Replace and amend plants and soils as necessary to insure the BMPs are effective and attractive. Plants must remain healthy and trimmed if overgrown. Soils must be maintained to efficiently filter the stormwater.
- After all major storm events, inspect storm drain inlets, drain pipes, check dams, swales and channels for obstructions and remove if necessary.
- Continue general landscape maintenance, including pruning and cleanup throughout the year.

##### Disconnected Area Drain System

- Ensure positive flow from roof downspouts along vegetated front yard areas to sidewalk curb and gutter.
- Keep areas free and clear of debris.

##### Structural Stormwater Treatment

- The structural BMP unit shall be annually inspected and maintained. Any collected debris shall be removed from the unit, typically by an industry standard vacuum truck.

### Flow-through Planters

- Limit the use of fertilizers and/or pesticides. Mosquito larvicides should be applied only when absolutely necessary.
  - Replace and amend plants and soils as necessary to insure the planters are effective and attractive. Plants must remain healthy and trimmed if overgrown. Soils must be maintained to efficiently filter the storm water.
  - Visually inspect for ponding water to ensure that filtration is occurring.
  - After all major storm events remove trash, inspect planter boxes for structural integrity, and inspect drain pipes and bubble-up risers for obstructions and remove if necessary.
  - Inspect downspouts from roofs to ensure flow to the planter is unimpeded.
  - Continue general landscape maintenance, including pruning and cleanup throughout the year.
  - Irrigate throughout the dry season. Irrigation should be provided with sufficient quantity and frequency to allow plants to thrive.
  - Excavate, clean and or replace filter media (sand, gravel, topsoil) to insure adequate infiltration rate (annually or as needed).
2. Annual inspection and maintenance:
- Same as routine inspection and maintenance.
3. Inspection and maintenance after major storms:
- During the first rainy season the unit should be inspected at least once every 30 days.

### **C. Service Agreement Information**

The frequency of cleaning the treatment BMPs will depend on the generation of trash and debris and sediment at the site. Cleanout and preventive maintenance schedules will be determined based on operating experience. The structural BMP units should be periodically inspected to determine the amount of accumulated pollutants and to ensure the cleanout frequency is adequate to handle the predicted pollutant load being processed by the unit.

## **VI. Inspection and Maintenance Log**

**Stormwater Treatment Measure Operation and Maintenance  
Inspection Report to the City of Milpitas, California**

This report and attached Inspection and Maintenance Checklists document the inspection and maintenance conducted for the identified stormwater treatment measure(s) subject to the Maintenance Agreement between the City and the property owner during the annual reporting period indicated below.

**I. Property Information:**

Property Address or APN: 500 Amalfi Loop, Milpitas, CA 95035  
Property Owner: Amalfi Milpitas LLC.

**II. Contact Information:**

Name of person to contact regarding this report: Ken Perry  
Phone number of contact person: (408) 985-6000 Email: kenp@scsdevelopment.com  
Address to which correspondence regarding this report should be directed:  
404 Saratoga Avenue, Suite 100 Santa Clara, CA 95008

**III. Reporting Period:**

This report, with the attached completed inspection checklists, documents the inspections and maintenance of the identified treatment measures during the time period from \_\_\_\_\_ to \_\_\_\_\_.

**IV. Stormwater Treatment Measure Information:**

The following stormwater treatment measures (identified treatment measures) are located on the property identified above and are subject to the Maintenance Agreement:

Identifying Number of Treatment Measure	Type of Treatment Measure	Location of Treatment Measure on the Property
1	Bioretention Areas (14)	Spread amongst the property
2	Media Filter (MF-C1)	Northwest side of Amalfi Loop
3	Flow-through Planters (8)	Center of Buildings' courtyards

**V. Summary of Inspections and Maintenance:**

Summarize the following information using the attached Inspection and Maintenance Checklists:

Identifying Number of Treatment Measure	Date of Inspection	Operation and Maintenance Activities Performed and Date(s) Conducted	Additional Comments

**VI. Sediment Removal:**

Total amount of accumulated sediment removed from the stormwater treatment measure(s) during the reporting period: \_\_\_\_\_ cubic yards.

How was sediment disposed?

- landfill
- other location on-site as described in and allowed by the maintenance plan
- other, explain \_\_\_\_\_



## Bioretention Area Maintenance Plan for Amalfi Apartments

July 2016

Project Address and Cross Streets 500 Amalfi Loop (at Piper Drive), Milpitas, CA 95035

Assessor's Parcel No.: 086-32-049, 53-56

Property Owner: Amalfi Milpitas LLC.

Phone No.: (925) 983-4580

Designated Contact: Ken Perry

Phone No. (408) 849-1908

Mailing Address: 404 Saratoga Avenue Suite 100, Santa Clara, CA 95008

The property contains fourteen (14) bioretention areas, located as described below and as shown in the attached site plan<sup>1</sup>.

- **Bioretention Areas A through N** are located throughout the project site along Amalfi Loop

### I. Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to bioretention area failure. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

<b>Table 1 Routine Maintenance Activities for Bioretention Areas</b>		
<b>No.</b>	<b>Maintenance Task</b>	<b>Frequency of Task</b>
1	Remove obstructions, debris and trash from bioretention area and dispose of properly.	Monthly, or as needed after storm events
2	Inspect bioretention area for ponded water. If ponded water does not drain within 2-3 days, till and replace the surface soil and replant.	Monthly, or as needed after storm events
3	Inspect inlets for channels, soil exposure or other evidence of erosion. Clear obstructions and remove sediment.	Monthly, or as needed after storm events
4	Remove and replace all dead and diseased vegetation.	Twice a year
5	Maintain vegetation and the irrigation system. Prune and weed to keep bioretention area neat and orderly in appearance. Remove and or replace any dead plants.	Twice a year
6	Check that mulch is at appropriate depth (2 inches per soil specifications) and replenish as necessary before wet season begins.	Monthly
7	Inspect the energy dissipation at the inlet to ensure it is functioning adequately, and that there is no scour of the surface mulch.	Annually, before the wet season begins
8	Inspect bioretention area using the attached inspection checklist.	Monthly, or after large storm events, and after removal of accumulated debris or material

<sup>1</sup> Attached site plan must match the site plan exhibit to Maintenance Agreement.

Bioretention Area Maintenance Plan  
Property Address: 500 Amalfi Loop, Milpitas, CA 95035

Date of Inspection: \_\_\_\_\_  
Treatment Measure No.: \_\_\_\_\_

## II. Use of Pesticides

The use of pesticides and quick release fertilizers shall be minimized, and the principles of integrated pest management (IPM) followed:

1. Employ non-chemical controls (biological, physical and cultural controls) before using chemicals to treat a pest problem.
2. Prune plants properly and at the appropriate time of year.
3. Provide adequate irrigation for landscape plants. Do not over water.
4. Limit fertilizer use unless soil testing indicates a deficiency. Slow-release or organic fertilizer is preferable. Check with municipality for specific requirements.
5. Pest control should avoid harming non-target organisms, or negatively affecting air and water quality and public health. Apply chemical controls only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, apply the least toxic and the least persistent pesticide that will provide adequate pest control. Do not apply pesticides on a prescheduled basis.
6. Sweep up spilled fertilizer and pesticides. Do not wash away or bury such spills.
7. Do not over apply pesticide. Spray only where the infestation exists. Follow the manufacturer's instructions for mixing and applying materials.
8. Only licensed, trained pesticide applicators shall apply pesticides.
9. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging pesticides into runoff. With the exception of pre-emergent pesticides, avoid application if rain is expected.
10. Unwanted/unused pesticides shall be disposed as hazardous waste.

## III. Vector Control

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the Santa Clara Valley Vector Control District (District). Mosquito larvicides shall be applied only when absolutely necessary, as indicated by the District, and then only by a licensed professional or contractor. Contact information for the District is provided below.

Santa Clara Valley Vector Control District  
1580 Berger Dr.  
San José, California 95112  
Phone: (408) 918-4770 / (800) 675-1155 - Fax: (408) 298-6356  
[www.sccgov.org/portal/site/vector](http://www.sccgov.org/portal/site/vector)

## IV. Inspections

The attached Bioretention Area Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

## Bioretention Area Inspection and Maintenance Checklist

Property Address: 500 Amalfi Loop, Milpitas, CA 95035

Property Owner: Amalfi Milpitas LLC.

Treatment Measure No.: \_\_\_\_\_ Date of Inspection: \_\_\_\_\_ Type of Inspection:  Monthly  Pre-Wet Season  
 After heavy runoff  End of Wet Season  
 Other: \_\_\_\_\_

Inspector(s): \_\_\_\_\_

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Standing Water	Water stands in the bioretention area between storms and does not drain within 2-3 days after rainfall.			There should be no areas of standing water once storm event has ceased. Any of the following may apply: sediment or trash blockages removed, improved grade from head to foot of bioretention area, or added underdrains.
2. Trash and Debris Accumulation	Trash and debris accumulated in the bioretention area.			Trash and debris removed from bioretention area and disposed of properly.
3. Sediment	Evidence of sedimentation in bioretention area.			Material removed so that there is no clogging or blockage. Material is disposed of properly.
4. Erosion	Channels have formed around inlets, there are areas of bare soil, and/or other evidence of erosion.			Obstructions and sediment removed so that water flows freely and disperses over a wide area. Obstructions and sediment are disposed of properly.
5. Vegetation	Vegetation is dead, diseased and/or overgrown.			Vegetation is healthy and attractive in appearance.
6. Mulch	Mulch is missing or patchy in appearance. Areas of bare earth are exposed, or mulch layer is less than 2 inches in depth.			All bare earth is covered, except mulch is kept 6 inches away from trunks of trees and shrubs. Mulch is even in appearance, at a depth of 2 inches.
7. Miscellaneous	Any condition not covered above that needs attention in order for the bioretention area to function as designed.			Meets the design specifications.

## Media Filter Maintenance Plan for Amalfi Apartments

July 2016

Project Address and Cross Streets: 500 Amalfi Loop (at Piper Drive), Milpitas, CA 95035

Assessor's Parcel No.: 086-32-049, 53-56

Property Owner: Amalfi Milpitas LLC.

Phone No.: (925) 983-4580

Designated Contact: Ken Perry

Phone No.: (408) 985-6000

Mailing Address: 404 Saratoga Avenue Suite 100, Santa Clara, CA 95008

The property contains one (1) media filter, located as described below and as shown in the attached site plan<sup>1</sup>.

- **Media Filter No. 1** (MF-A1) is located northwest of the project site (adjacent to Amalfi Loop)

### I. Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to failure of the media filter. Follow manufacturer's requirements for maintenance. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

No.	Maintenance Task	Frequency of Task
1	Inspect for standing water, sediment, trash and debris.	Monthly during rainy season
2	Remove accumulated trash and debris in the unit during routine inspections.	Monthly during rainy season, or as needed after storm events
3	Inspect to ensure that the facility is draining completely within five days and per manufacturer's specifications.	Once during the wet season after major storm event.
4	Replace the media per manufacturer's instructions or as indicated by the condition of the unit.	Per manufacturer's specifications.
5	Inspect media filters using the attached inspection checklist.	Quarterly or as needed

### II. Vector Control

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the Santa Clara Valley Vector Control District (District). Mosquito larvicides shall be applied only when absolutely necessary, as indicated by the District, and then only by a licensed professional or contractor. Contact information for the District is provided below.

Santa Clara Valley Vector Control District  
1580 Berger Dr.

San José, California 95112

Phone: (408) 918-4770 / (800) 675-1155 - Fax: (408) 298-6356

[www.sccgov.org/portal/site/vector](http://www.sccgov.org/portal/site/vector)

Email: [info@smcmad.org](mailto:info@smcmad.org)

<sup>1</sup> Attached site plan must match the site plan exhibit to Maintenance Agreement.

Media Filter Maintenance Plan

Property Address: 500 Amalfi Loop, Milpitas, CA 95035

Date of Inspection: \_\_\_\_\_

Treatment Measure No.: \_\_\_\_\_

**IV. Inspections**

The attached Treatment Measure Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

## Media Filters Inspection and Maintenance Checklist

Property Address: 500 Amalfi Loop, Milpitas, CA 95035

Property Owner: Amalfi Milpitas LLC.

Treatment Measure No.: \_\_\_\_\_ Date of Inspection: \_\_\_\_\_

Type of Inspection:  Monthly  Pre-Wet Season  
 After heavy runoff  End of Wet Season  
 Other: \_\_\_\_\_

Inspector(s): \_\_\_\_\_

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Sediment, trash and debris accumulation on filter	Sediment, trash and debris accumulated in the media filter unit, vault or piping.			Sediment, trash and debris removed and disposed of properly.
2. Standing water	Treatment unit or vault does not drain within five days after rainfall.			Source of clogging removed. Filter drains per design specifications.
3. Mosquitoes	Evidence of mosquito larvae in treatment unit.			No evidence of mosquito larvae.
4. Miscellaneous	Any condition not covered above that needs attention in order for the manufactured treatment measure to function as designed.			Meet the design specifications.

## Flow-Through Planter Maintenance Plan for Amalfi Apartments

July 2016

Project Address and Cross Streets 500 Amalfi Loop (at Piper Drive), Milpitas CA 95035

Assessor's Parcel No.: 086-32-049, 53-56

Property Owner: Amalfi Milpitas LLC.

Phone No.: \_\_\_\_\_

Designated Contact: Ken Perry

Phone No.: (408) 985-6000

Mailing Address: 404 Saratoga Avenue Suite 100, Santa Clara, CA 95008

The property contains eight (8) Flow-Through Planter(s), located as described below and as shown in the attached site plan<sup>1</sup>.

- Flow-Through Planters No. 1 - 4 are located in the west courtyard of the project site apartment building.
- Flow-Through Planters No. 5 - 8 are located in the east courtyard of the project site apartment building.

### I. Routine Maintenance Activities

The principal maintenance objectives are to ensure that water flows unimpeded into the flow-through planter and landscaping remains attractive in appearance. Table 1 shows the routine maintenance activities, and the frequency at which they will be conducted.

Table 1 Routine Maintenance Activities for Flow-Through Planters		
No.	Maintenance Task	Frequency of Task
1	Evaluate health of trees and groundcover. Remove and replace all dead and diseased vegetation. Treat vegetation using preventative and low-toxic methods.	Twice a year
2	Maintain the vegetation and irrigation system. Prune and weed to keep flow-through planter neat and orderly in appearance.	As needed
4	Check that there is sufficient biotreatment soil media (18 inch depth). Check that soil is at the appropriate level to allow water to temporarily pond above soil surface (6-12 inches per design).	Before wet season and as necessary
5	Remove accumulated sediment, litter and debris from flow-through planter and dispose of properly. Replenish mulch as needed.	Before wet season and as necessary
6	Inspect flow-through planter to ensure that there are no clogs.	Monthly during the wet season, and as needed after storm events
7	Inspect downspouts from rooftops and sheet flow from paved areas to ensure flow to planter box is unimpeded. Remove debris and repair damaged pipes. Check splash blocks or rocks and repair, replace and replenish as necessary.	Monthly during the wet season, and as needed after storm events
8	Inspect overflow pipe to ensure that it will safely convey excess flows to storm drain. Repair or replace any damaged or disconnected piping.	Before the wet season, and as necessary
9	Inspect flow-through planter to ensure that box is structurally sound (no cracks or leaks). Repair as necessary.	Monthly during the wet season, and as needed after storm events
10	Inspect flow-through planter using the attached inspection checklist.	Monthly, or after large storm events, and after removal of accumulated debris or material

<sup>1</sup> Attached site plan must match the site plan exhibit to Maintenance Agreement.

Flow-through Planter Maintenance Plan  
Property Address: 500 Amalfi Loop, Milpitas, CA 95035

Date of Inspection: \_\_\_\_\_  
Treatment Measure No.: \_\_\_\_\_

## II. Use of Pesticides

The use of pesticides and quick release fertilizers shall be minimized, and the principles of integrated pest management (IPM) followed:

1. Employ non-chemical controls (biological, physical and cultural controls) before using chemicals to treat a pest problem.
2. Prune plants properly and at the appropriate time of year.
3. Provide adequate irrigation for landscape plants. Do not over water.
4. Limit fertilizer use unless soil testing indicates a deficiency. Slow-release or organic fertilizer is preferable. Check with municipality for specific requirements.
5. Pest control should avoid harming non-target organisms, or negatively affecting air and water quality and public health. Apply chemical controls only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, apply the least toxic and the least persistent pesticide that will provide adequate pest control. Do not apply pesticides on a prescheduled basis.
6. Sweep up spilled fertilizer and pesticides. Do not wash away or bury such spills.
7. Do not over apply pesticide. Spray only where the infestation exists. Follow the manufacturer's instructions for mixing and applying materials.
8. Only licensed, trained pesticide applicators shall apply pesticides.
9. Apply pesticides at the appropriate time to maximize their effectiveness and minimize the likelihood of discharging pesticides into runoff. With the exception of pre-emergent pesticides, avoid application if rain is expected.
10. Unwanted/unused pesticides shall be disposed as hazardous waste.

## III. Vector Control

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the Santa Clara Valley Vector Control District (District). Mosquito larvicides shall be applied only when absolutely necessary, as indicated by the District, and then only by a licensed professional or contractor. Contact information for the District is provided below.

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1580 Berger Dr.  
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[www.sccgov.org/portal/site/vector](http://www.sccgov.org/portal/site/vector)

## IV. Inspections

The attached Flow-Through Planter Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

## Flow-Through Planter Inspection and Maintenance Checklist

Property Address: 500 Amafifi Loop, Milpitas, CA 9035      Date of Inspection: \_\_\_\_\_      Type of Inspection:  Monthly       Pre-Wet Season  
 After heavy runoff       End of Wet Season  
 Other: \_\_\_\_\_

Inspector(s): \_\_\_\_\_      Property Owner: Amafifi Milpitas LLC.

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Vegetation	Vegetation is dead, diseased and/or overgrown.			Vegetation is healthy and attractive in appearance.
2. Soil	Soil too deep or too shallow.			Soil is at proper depth (per soil specifications) for optimum filtration and flow.
3. Mulch	Mulch is missing or patchy in appearance.			Mulch is even in appearance.
4. Sediment, Trash and Debris Accumulation	Sediment, trash and debris accumulated in the flow-through planter. Planter does not drain within 3-4 hours.			Sediment, trash and debris removed from flow-through planter and disposed of properly. Planter drains within 3-4 hours.
5. Clogs/Drainage	Planter does not drain within 3-4 hours after rainfall.			Planter drains per design specifications.
6. Downspouts and Sheet Flow	Flow to planter is impeded. Downspouts are clogged or pipes are damaged. Splash blocks and rocks in need of repair, replacement or replenishment.			Downspouts and sheet flow is conveyed efficiently to the planter.
7. Overflow Pipe	Does not safely convey excess flows to storm drain. Piping damaged or disconnected.			Overflow pipe conveys excess flow to storm drain efficiently.
8. Structural Soundness	Planter is cracked, leaking or falling apart.			Cracks and leaks are repaired and planter is structurally sound.
9. Miscellaneous	Any condition not covered above that needs attention in order for the flow-through planter to function as designed.			Meet the design specifications.

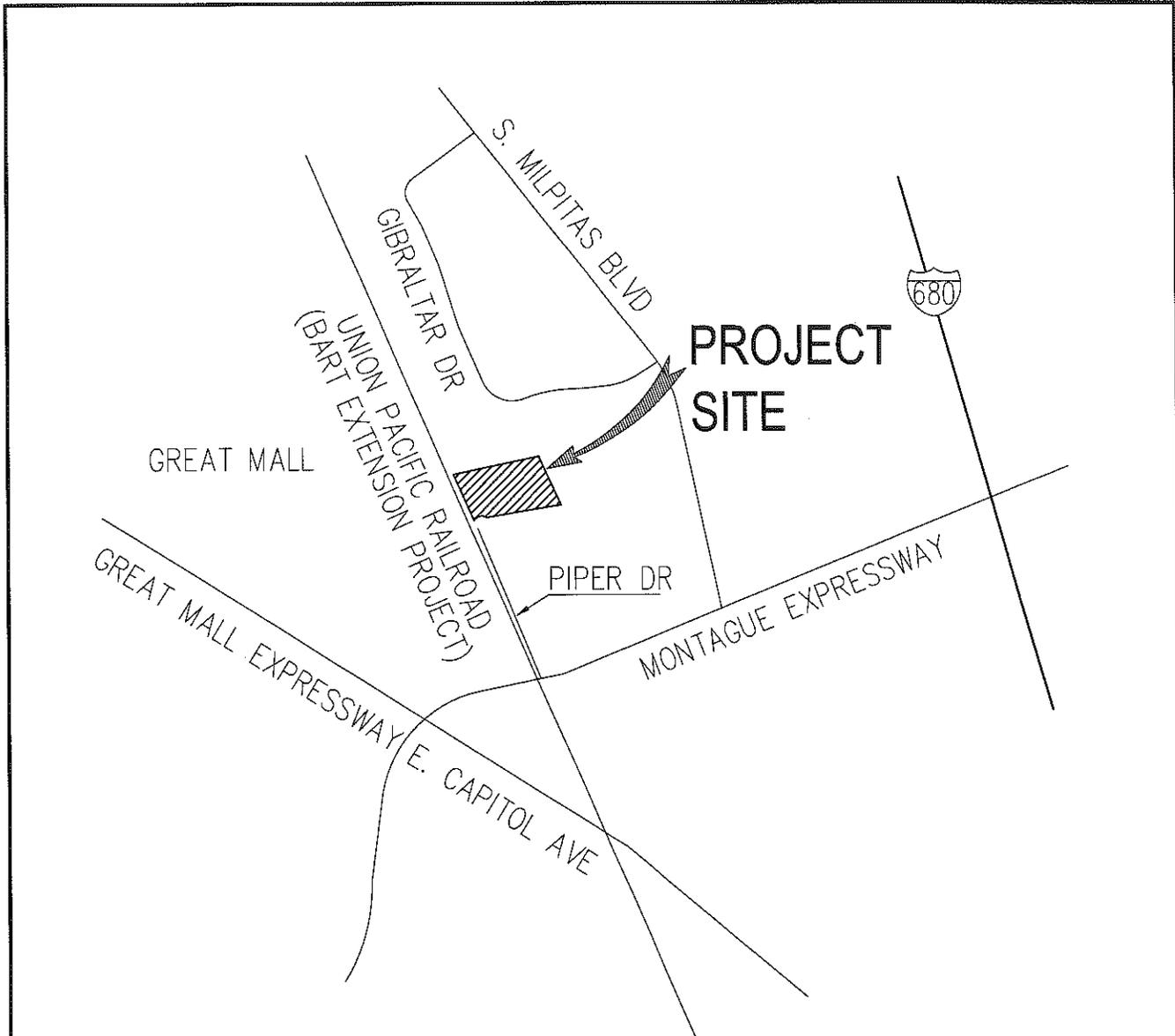
## **VII. Updates, Revisions and Errata**

Future updates, revisions and errata shall be listed in this section.

**VIII. Copy of O&M Agreement**

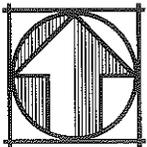
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# Appendix

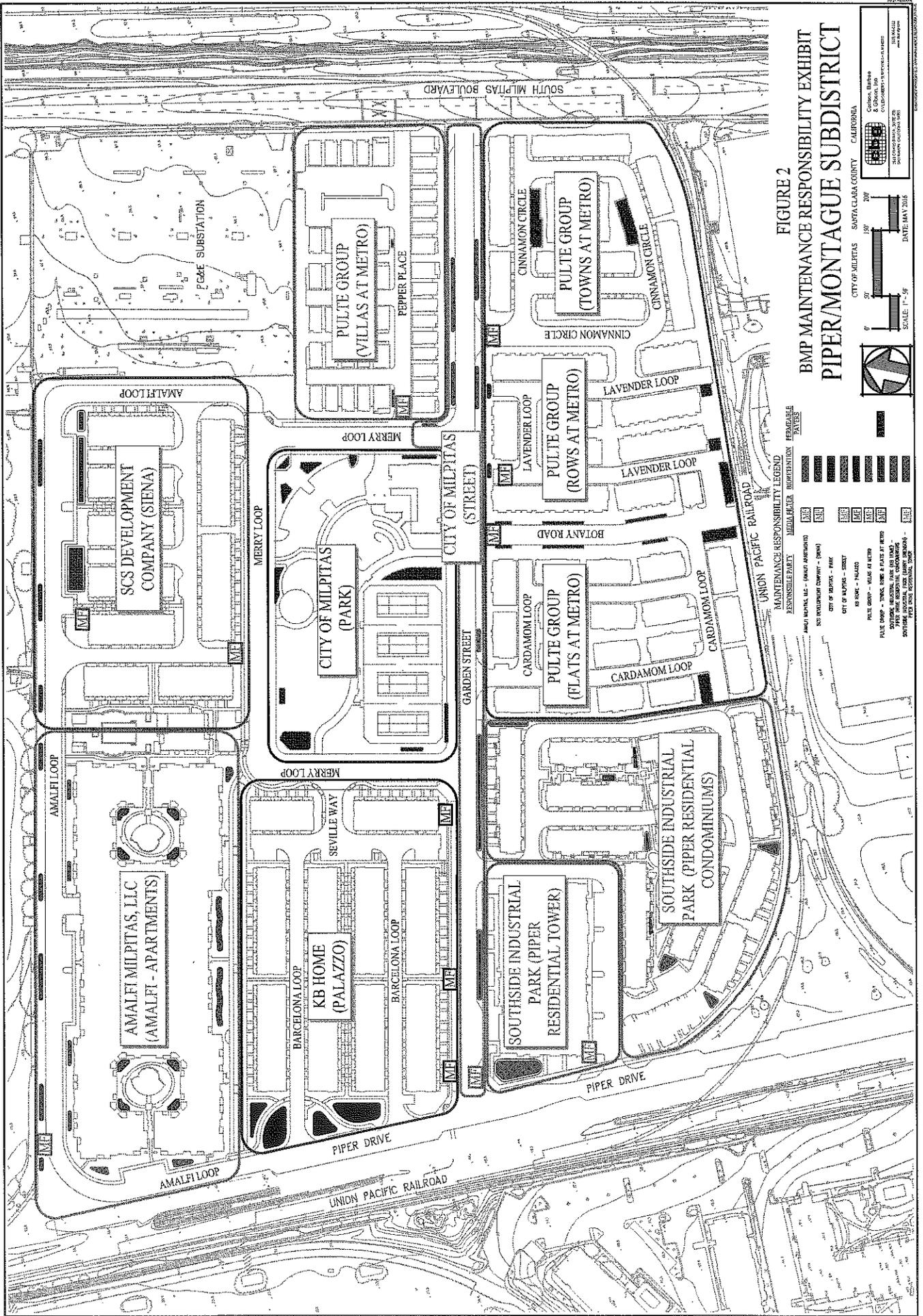


**FIGURE 1**  
**VICINITY MAP**  
**AMALFI APARTMENTS**

CITY OF MILPITAS SANTA CLARA COUNTY CALIFORNIA  
 DATE: JUNE 2016

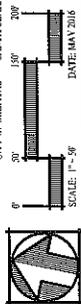


	<b>Carlson, Barbee &amp; Gibson, Inc.</b> CIVIL ENGINEERS • SURVEYORS • PLANNERS
	<small>2633 CAMINO RAMON, SUITE 350          SAN RAMON, CALIFORNIA 94583</small>



**FIGURE 2**  
**BMP MAINTENANCE RESPONSIBILITY EXHIBIT**  
**PIPER/MONTAGUE SUBDISTRICT**

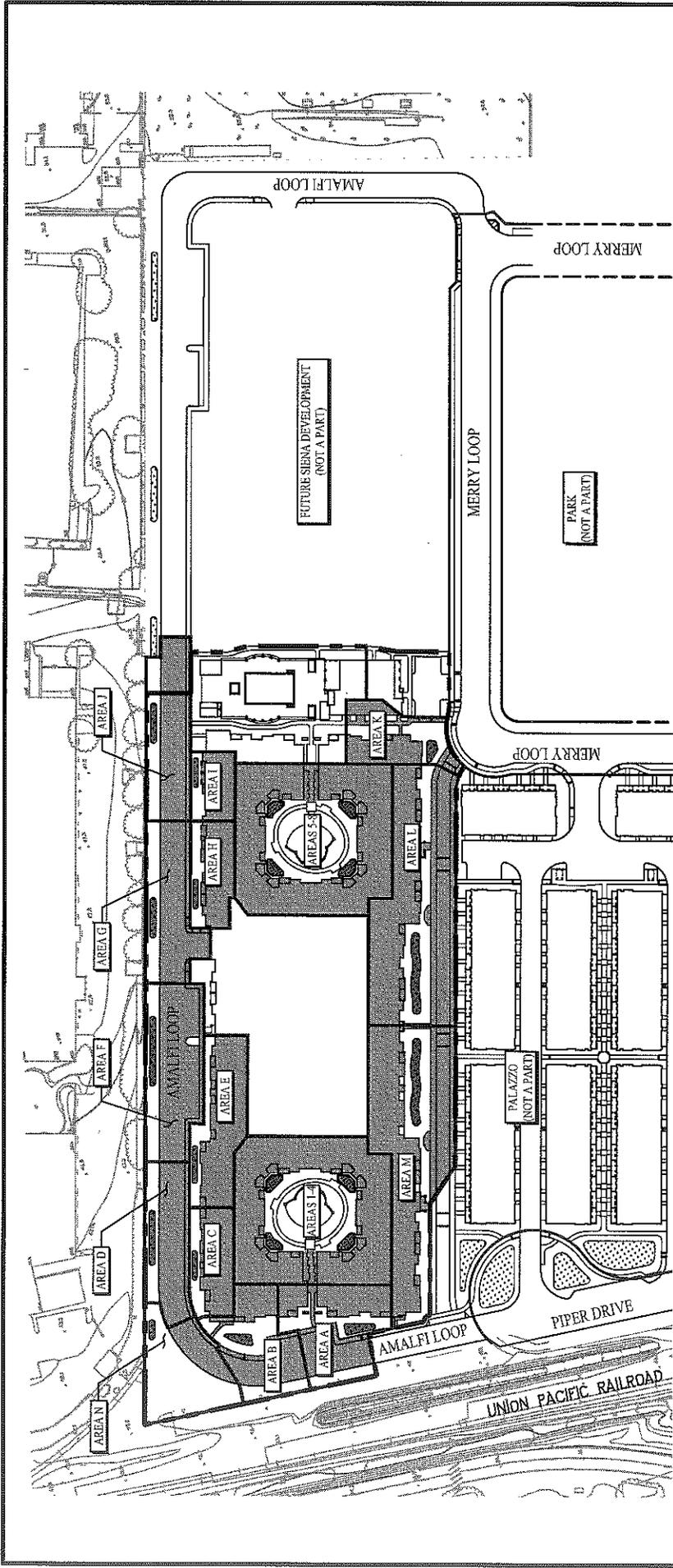
CITY OF MILPITAS  
 SOUTH MILPITAS BOULEVARD  
 DATE: MAY 2015  
 SCALE: 1" = 50'



**MAINTENANCE RESPONSIBILITY LEGEND**

MAINTENANCE RESPONSIBILITY	BOUNDARY	REPRESENTATION	REMARKS
MILPITAS CITY - MAINTENANCE RESPONSIBILITY	SOLID LINE	[Symbol]	
SCS DEVELOPMENT COMPANY - (SIENA)	DASHED LINE	[Symbol]	
CITY OF MILPITAS - PARK	DOTTED LINE	[Symbol]	
CITY OF MILPITAS - STREET	SOLID LINE	[Symbol]	
PIPER GROUP - VILLAS AT METRO	SOLID LINE	[Symbol]	
PIPER GROUP - TOWNS AT METRO	SOLID LINE	[Symbol]	
PIPER GROUP - ROWS AT METRO	SOLID LINE	[Symbol]	
PIPER GROUP - FLATS AT METRO	SOLID LINE	[Symbol]	
PIPER GROUP - PALAZZO	SOLID LINE	[Symbol]	
PIPER GROUP - SOUTH SIDE INDUSTRIAL PARK (PIPER RESIDENTIAL CONDOMINIUMS)	SOLID LINE	[Symbol]	
PIPER GROUP - SOUTH SIDE INDUSTRIAL PARK (RESIDENTIAL TOWER)	SOLID LINE	[Symbol]	
PIPER GROUP - PALAZZO	SOLID LINE	[Symbol]	
PIPER GROUP - PALAZZO	SOLID LINE	[Symbol]	

CITY OF MILPITAS  
 SANTA CLARA COUNTY  
 CALIFORNIA  
 300 MARKET STREET, SUITE 200  
 MILPITAS, CALIFORNIA 95035  
 408.386.2200  
 www.milpitas.gov



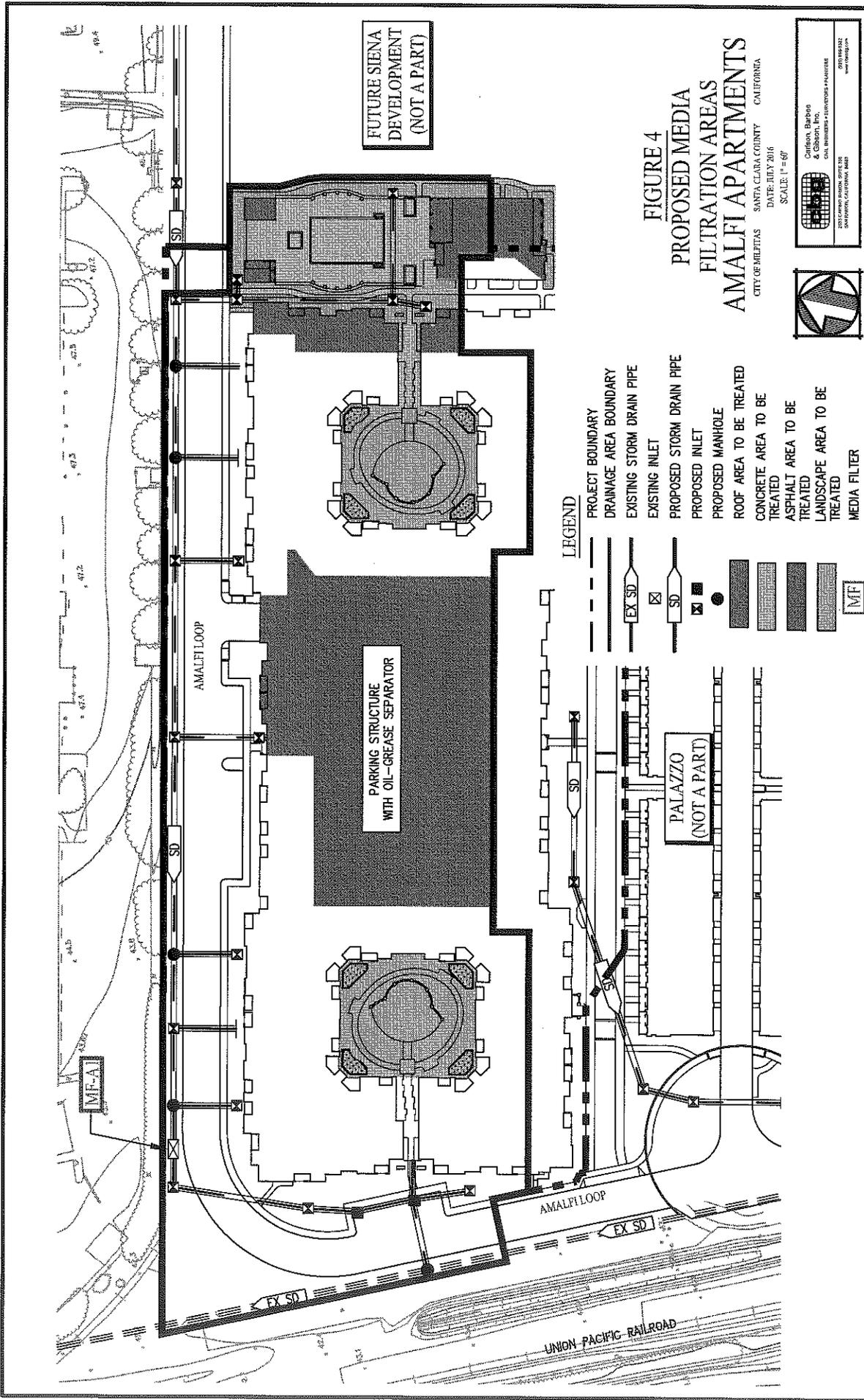
**FIGURE 3**  
**PROPOSED BIORETENTION AREAS**  
**AND RAISED PLANTERS**  
**AMALFI APARTMENTS**  
 CITY OF MILPITAS    SANTA CLARA COUNTY    CALIFORNIA

DATE: JULY 2016  
 SCALE: 1" = 10'

	Cullison, Barbee & Associates, Inc. 2000 BROADWAY SUITE 200 MILPITAS, CALIFORNIA 95035 TEL: (408) 352-1100 WWW.CBANDASSOCIATES.COM
	PROJECT NO. 16-0001 SHEET NO. 3 OF 3



- LEGEND**
- PROJECT BOUNDARY
  - DRAINAGE AREA BOUNDARY
  - IMPERVIOUS DRAINAGE AREA TO BE TREATED BY ONSITE BIORETENTION
  - ONSITE BIORETENTION AREA



FUTURE SIENA  
DEVELOPMENT  
(NOT A PART)

PARKING STRUCTURE  
WITH OIL-GREASE SEPARATOR

**FIGURE 4**  
**PROPOSED MEDIA**  
**FILTRATION AREAS**  
**AMALFI APARTMENTS**

CITY OF MILPITAS SANTA CLARA COUNTY CALIFORNIA  
DATE: JULY 2018  
SCALE: 1" = 60'



**LEGEND**

- PROJECT BOUNDARY
- DRAINAGE AREA BOUNDARY
- EXISTING STORM DRAIN PIPE
- EXISTING INLET
- PROPOSED STORM DRAIN PIPE
- PROPOSED INLET
- PROPOSED MANHOLE
- ROOF AREA TO BE TREATED
- CONCRETE AREA TO BE TREATED
- ASPHALT AREA TO BE TREATED
- TREATED LANDSCAPE AREA TO BE TREATED
- MEDIA FILTER