PRIVATE DETENTION BASIN /

STORMWATER QUALITY BEST MANAGEMENT PRACTICE

MAINTENANCE AGREEMENT AND EASEMENT

(SF2235)

This PRIVATE DETENTION BASIN / STORMWATER QUALITY BEST MANAGEMENT PRACTICE MAINTENANCE AGREEMENT AND EASEMENT (Agreement) is made by and between EL PASO COUNTY by and through THE BOARD OF COUNTY COMMISSIONERS OF EL PASO COUNTY, COLORADO (Board or County), CLASSIC SRJ LAND, LLC, a Colorado limited liability company (Developer), and **Sterling Ranch Metropolitan District No. 3**, a quasi-municipal corporation and political subdivision of the State of Colorado (Metro District). The above may occasionally be referred to herein singularly as "Party" and collectively as "Parties."

Recitals

A. WHEREAS, the Metro District provides various municipal services to certain real property in El Paso County, Colorado referred to as Sterling Ranch; and

B. WHEREAS, Developer is the owner of certain real estate (the Property or Subdivision) in El Paso County, Colorado, which Property is legally described in Exhibit A attached hereto and incorporated herein by this reference; and

C. WHEREAS, Developer desires to plat and develop on the Property a subdivision to be known as **Sterling Ranch East Filing No. 1**; and

D. WHEREAS, the development of this Property will substantially increase the volume of water runoff and will decrease the quality of the stormwater runoff from the Property, and, therefore, it is in the best interest of public health, safety and welfare for the County to condition approval of this subdivision on Developer's promise to construct adequate drainage, water runoff control facilities, and stormwater quality structural Best Management Practices ("BMPs") for the subdivision; and

E. WHEREAS, Chapter 8, Section 8.4.5 of the El Paso County Land Development Code, as periodically amended, promulgated pursuant to Section 30-28-133(1), Colorado Revised Statutes (C.R.S.), requires the County to condition approval of all subdivisions on a developer's promise to so construct adequate drainage, water runoff control facilities, and BMPs in subdivisions; and

F. WHEREAS, the Drainage Criteria Manual, Volume 2, as amended by Appendix I of the El Paso County Engineering Criteria Manual (ECM), as each may be periodically amended, promulgated pursuant to the County's Colorado Discharge Permit System General Permit (MS4 Permit) as required by Phase II of the National Pollutant Discharge Elimination System (NPDES), which MS4 Permit requires that the County take measures to protect the quality of stormwater from sediment and other contaminants, requires subdividers, developers, landowners, and owners of facilities located in the County's rights-of-way or easements to provide adequate permanent stormwater quality BMPs with new development or significant redevelopment; and

G. WHEREAS, Section 2.9 of the El Paso County Drainage Criteria Manual provides for a developer's promise to maintain a subdivision's drainage facilities in the event the County does not assume such responsibility; and

H. WHEREAS, developers in El Paso County have historically chosen water runoff detention basins as a means to provide adequate drainage and water runoff control in subdivisions, which basins, while effective, are less expensive for developers to construct than other methods of providing drainage and water runoff control; and

I. WHEREAS, Developer desires to construct for the subdivision one detention basin/stormwater quality BMP(s) ("detention basin/BMP(s)") as the means for providing adequate drainage and stormwater runoff control and to meet requirements of the County's MS4 Permit, and to provide for operating, cleaning, maintaining and repairing such detention basin/BMP(s); and

J. WHEREAS, Developer desires to construct the detention basin/BMP(s) on property that will be platted as **Tract C**, as indicated on the final plat of the subdivision, and as set forth on Exhibit B attached hereto; and

K. WHEREAS, Developer shall be charged with the duty of constructing the detention basin/BMP(s) and the Metro District shall be charged with the duties of operating, maintaining and repairing the detention basin/BMP(s) on the property described in Exhibit B; and

L. WHEREAS, it is the County's experience that subdivision developers and metro districts historically have not properly cleaned and otherwise not properly maintained and repaired these detention basins/BMPs, and that these detention basins/BMPs, when not so properly cleaned, maintained, and repaired, threaten the public health, safety and welfare; and

M. WHEREAS, the County, in order to protect the public health, safety and welfare, has historically expended valuable and limited public resources to so properly clean, maintain, and repair these detention basins/BMPs when developers and property owners have failed in their responsibilities, and therefore, the County desires the means to recover its costs incurred in the event the burden falls on the County to so clean, maintain and repair the detention basin/BMP(s) serving this Subdivision due to the Developer's or the Metro District's failure to meet its obligations to do the same; and

N. WHEREAS, the County conditions approval of this Subdivision on the Developer's promise to so construct the detention basin/BMP(s), and further conditions approval on the Metro District's promise to reimburse the County in the event the burden falls upon the County to so clean, maintain and/or repair the detention basin/BMP(s) serving this Subdivision; and

O. WHEREAS, the County could condition subdivision approval on the Developer's promise to construct a different and more expensive drainage, water runoff control system and BMPs than those proposed herein, which more expensive system would not create the possibility of the burden of cleaning, maintenance and repair expenses falling on the County; however, the County is willing to forego such right upon the performance of Developer's and the Metro District's promises contained herein; and

P. WHEREAS, the County, in order to secure performance of the promises contained herein, conditions approval of this Subdivision upon the Developer's grant herein of a perpetual

Easement over a portion of the Property for the purpose of allowing the County to periodically access, inspect, and, when so necessary, to clean, maintain and/or repair the detention basin/BMP(s); and

Q. WHEREAS, pursuant to the Colorado Constitution, Article XIV, Section 18(2) and Section 29-1-201, Colorado Revised Statutes, governmental entities may cooperate and contract with each other to provide any function, services or facilities lawfully authorized to each.

Agreement

NOW, THEREFORE, in consideration of the mutual Promises contained herein, the sufficiency of which are hereby acknowledged, the Parties agree as follows:

1. Incorporation of Recitals: The Parties incorporate the Recitals above into this Agreement.

2. Covenants Running with the Land: Developer and the Metro District agree that this entire Agreement and the performance thereof shall become a covenant running with the land, which land is legally described in Exhibit A attached hereto, and that this entire Agreement and the performance thereof shall be binding upon themselves and their respective successors and assigns.

3. Construction: Developer shall construct on that portion of the Property described in Exhibit B attached hereto and incorporated herein by this reference, one detention basin/BMP(s). Developer shall not commence construction of the detention basin/BMP(s) until the El Paso County Planning and Community Development Department (PCD) has approved in writing the plans and specifications for the detention basin/BMP(s) and this Agreement has been signed by all Parties and returned to the PCD. Developer shall complete construction of the detention basin/BMP(s) in substantial compliance with the County-approved plans and specifications for the detention basin/BMP(s). Failure to meet these requirements shall be a material breach of this Agreement and shall entitle the County to pursue any remedies available to it at law or in equity to enforce the same. Construction of the detention basin/BMP(s) shall be substantially completed within one (1) year (defined as 365 days), which one year period will commence to run on the date the approved plat of this Subdivision is recorded in the records of the El Paso County Clerk and Recorder. Rough grading of the detention basin/BMP(s) must be completed and inspected by the El Paso County Planning and Community Development Department prior to commencing road construction.

In the event construction is not substantially completed within the one (1) year period, then the County may exercise its discretion to complete the project, and shall have the right to seek reimbursement from the Developer and its successors and assigns, for its actual costs and expenses incurred in the process of completing construction. The term actual costs and expenses shall be liberally construed in favor of the County, and shall include, but shall not be limited to, labor costs, tool and equipment costs, supply costs, and engineering and design costs, regardless of whether the County uses its own personnel, tools, equipment and supplies, etc. to correct the matter. In the event the County initiates any litigation or engages the services of legal counsel in order to enforce the provisions arising herein, the County shall be entitled to its damages and costs, including reasonable attorney fees, regardless of whether the County contracts with outside legal counsel or utilizes in-house legal counsel for the same.

4. Maintenance: The Metro District agrees for itself and its successors and assigns, that it will regularly and routinely inspect, clean and maintain the detention basin/BMP(s) in compliance with the County reviewed Operation and Maintenance Manual, attached hereto as Exhibit C and incorporated herein by this reference, and otherwise keep the same in good repair, all at its own cost and expense. No trees or shrubs that will impair the structural integrity of the detention basin/BMP(s) shall be planted or allowed to grow on the detention basin/BMP(s).

5. Creation of Easement: Developer hereby grants the County and the Metro District a non-exclusive perpetual easement upon and across that portion of the Property described in Exhibit B. The purpose of the easement is to allow the County and the Metro District to access, inspect, clean, repair and maintain the detention basin/BMP(s); however, the creation of the easement does not expressly or implicitly impose on the County a duty to so inspect, clean, repair or maintain the detention basin/BMP(s).

6. County's Rights and Obligations: Any time the County determines, in the sole exercise of its discretion, that the detention basin/BMP(s) is not properly cleaned, maintained and/or otherwise kept in good repair, the County shall give reasonable notice to the Developer, the Metro District, and their respective successors and assigns that the detention basin/BMP(s) needs to be cleaned, maintained and/or otherwise repaired. The notice shall provide a reasonable time to correct the problem(s). Should the responsible parties fail to correct the specified problem(s), the County may enter upon the Property to so correct the specified problem(s). Notice shall be effective to the above by the County's deposit of the same into the regular United States mail, postage pre-paid. Notwithstanding the foregoing, this Agreement does not expressly or implicitly impose on the County a duty to so inspect, clean, repair or maintain the detention basin/BMP(s).

7. Reimbursement of County's Costs: The Developer and the Metro District agree and covenant, for themselves and their respective successors and assigns, that they will reimburse the County for its costs and expenses incurred in the process of completing construction of, cleaning, maintaining, and/or repairing the detention basin/BMP(s) pursuant to the provisions of this Agreement.

The term "actual costs and expenses" shall be liberally construed in favor of the County, and shall include, but shall not be limited to, labor costs, tools and equipment costs, supply costs, and engineering and design costs, regardless of whether the County uses its own personnel, tools, equipment and supplies, etc. to correct the matter. In the event the County initiates any litigation or engages the services of legal counsel in order to enforce the provisions arising herein, the County shall be entitled to its damages and costs, including reasonable attorney's fees, regardless of whether the County contracts with outside legal counsel or utilizes in-house legal counsel for the same.

8. Contingencies of Subdivision Approval: Developer's and the Metro District's execution of this Agreement is a condition of subdivision approval. Additional conditions of this Agreement include, but are not limited to, the following:

a. Conveyance of Tract C, Sterling Ranch East Filing No. 1, as indicated on the final plat of the subdivision, from Developer to the Metro District, which conveyance shall include a reservation of easement in favor of the County for purposes of accessing inspecting, cleaning, maintaining, and repairing the detention basin/BMP(s), and recording of the Deed for the same; and

b. A copy of the Covenants of the Subdivision, if applicable, establishing that the Metro District is obligated to inspect, clean, maintain, and repair the detention basin/BMP(s).

The County shall have the right, in the sole exercise of its discretion, to approve or disapprove any documentation submitted to it under the conditions of this Paragraph, including but not limited to, any separate agreement or amendment, if applicable, identifying any specific maintenance responsibilities not addressed herein. The County's rejection of any documentation submitted hereunder shall mean that the appropriate condition of this Agreement has not been fulfilled.

9. Agreement Monitored by El Paso County Planning and Community Development Department and/or El Paso County Department of Public Works: Any and all actions and decisions to be made hereunder by the County shall be made by the Director of the El Paso County Planning and Community Development Department and/or the Director of the El Paso County Department of Public Works. Accordingly, any and all documents, submissions, plan approvals, inspections, etc. shall be submitted to and shall be made by the Director of the Planning and Community Development Department and/or the Director of the El Paso County Department of Public Works.

10. Indemnification and Hold Harmless: To the extent authorized by law, Developer and the Metro District agree, for themselves and their respective successors and assigns, that they will indemnify, defend, and hold the County harmless from any and all loss, costs, damage, injury, liability, claim, lien, demand, action and causes of action whatsoever, whether at law or in equity, arising from or related to their respective intentional or negligent acts, errors or omissions or that of their agents, officers, servants, employees, invitees and licensees in the construction, operation, inspection, cleaning (including analyzing and disposing of any solid or hazardous wastes as defined by State and/or Federal environmental laws and regulations), maintenance, and repair of the detention basin/BMP(s), and such obligation arising under this Paragraph shall be joint and several. Nothing in this Paragraph shall be deemed to waive or otherwise limit the defense available to the County pursuant to the Colorado Governmental Immunity Act, Sections 24-10-101, *et seq.* C.R.S., or as otherwise provided by law.

11. Severability: In the event any Court of competent jurisdiction declares any part of this Agreement to be unenforceable, such declaration shall not affect the enforceability of the remaining parts of this Agreement.

12. Third Parties: This Agreement does not and shall not be deemed to confer upon or grant to any third party any right to claim damages or to bring any lawsuit, action or other proceeding against either the County, the Developer, the Metro District, or their respective successors and assigns, because of any breach hereof or because of any terms, covenants, agreements or conditions contained herein.

13. Solid Waste or Hazardous Materials: Should any refuse from the detention basin/BMP(s) be suspected or identified as solid waste or petroleum products, hazardous substances or hazardous materials (collectively referred to herein as "hazardous materials"), the Developer and the Metro District shall take all necessary and proper steps to characterize the solid waste or hazardous materials and properly dispose of it in accordance with applicable State and/or Federal environmental laws and regulations, including, but not limited to, the following: Solid Wastes Disposal Sites and Facilities Acts, §§ 30-20-100.5 – 30-20-119, C.R.S., Colorado Regulations Pertaining to Solid Waste Disposal Sites and Facilities, 6 C.C.R. 1007-2, *et seq.*, Solid Waste Disposal Act, 42 U.S.C. §§ 6901-6992k, and Federal Solid Waste Regulations 40 CFR Ch. I. The County shall not be responsible or liable for identifying, characterizing, cleaning up, or disposing of such solid waste or hazardous materials. Notwithstanding

the previous sentence, should any refuse cleaned up and disposed of by the County be determined to be solid waste or hazardous materials, the Developer and the Metro District, but not the County, shall be responsible and liable as the owner, generator, and/or transporter of said solid waste or hazardous materials.

14. Applicable Law and Venue: The laws, rules, and regulations of the State of Colorado and El Paso County shall be applicable in the enforcement, interpretation, and execution of this Agreement, except that Federal law may be applicable regarding solid waste or hazardous materials. Venue shall be in the El Paso County District Court.

15. Limitation on Developer's Obligation and Liability: The obligation and liability of the Developer hereunder shall only continue until such time as the Final Plat described in Paragraph C of the Recitals set forth above is recorded and Developer completes the construction of the detention basin/BMP(s) and transfers all applicable maintenance and operation responsibilities to the Metro District. By execution of this agreement, the Metro District agrees to accept all responsibilities and to perform all duties assigned to it, including those of the Developer, as specified herein, upon transfer of Tract D, Sterling Ranch East Filing No. 1 from Developer to the Metro District.

IN WITNESS WHEREOF, the Parties affix their signatures below.

Executed this 26th day of June, 2024, by:

Classic SRJ Land, LLC

By: _____
Loren Moreland, V.P. of Manager

The foregoing instrument was acknowledged before me this 26th day of June, 2024, by Loren Moreland, V.P. of Manager of Classic SRJ Land, LLC.

Witness my hand and official seal.

My commission expires: 2-14-27

_____
Notary Public

STEPHANIE SARAH WOOLFOLK
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19964012660
MY COMMISSION EXPIRES FEBRUARY 14, 2027

Executed this 26th day of June, 2024, by:

STERLING RANCH METROPOLITAN DISTRICT NO. 3, a quasi-municipal corporation.

By: _____
Doug Stimple, President

The foregoing instrument was acknowledged before me this 26th day of June, 2024, by Doug Stimple, President, STERLING RANCH METROPOLITAN DISTRICT NO. 3, a Colorado nonprofit corporation.

Witness my hand and official seal.

My commission expires: 2-14-27

Stephanie Woolfolk
Notary Public

STEPHANIE SARAH WOOLFOLK
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 19964012660
MY COMMISSION EXPIRES FEBRUARY 14, 2027

Executed this _____ day of _____, 20___, by:

BOARD OF COUNTY COMMISSIONERS
OF EL PASO COUNTY, COLORADO

By: _____
_____, Executive Director
Planning and Community Development Department
Authorized signatory pursuant to LDC

The foregoing instrument was acknowledged before me this _____ day of _____, 20___, by _____, Executive Director of El Paso County Planning and Community Development Department.

Witness my hand and official seal.

My commission expires: _____

_____
Notary Public

Approved as to Content and Form:

Lori L. Seago
_____
Assistant County Attorney

EXHIBIT "A"

1183.30-01R

CLASSIC CONSULTING SM
619 N. Cascade Avenue, Suite 200 (719) 785-0790
Colorado Springs, Colorado 80903

LEGAL DESCRIPTION: STERLING RANCH EAST FILING NO. 1

A PARCEL OF LAND BEING A PORTION OF SECTION 33, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, EL PASO COUNTY, COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BASIS OF BEARINGS: THE SOUTH LINE OF THE SOUTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN, BEING MONUMENTED AT THE WEST END WHICH IS THE CENTER-EAST ONE-SIXTEENTH CORNER OF SAID SECTION 28, BY A 3-1/4" ALUMINUM SURVEYORS CAP STAMPED "ESI PLS 10376, 2006" AND AT THE EAST END, WHICH IS A 30' WITNESS CORNER TO THE EAST OF THE EAST QUARTER CORNER OF SAID SECTION 28, BY A 3-1/4" ALUMINUM SURVEYORS CAP STAMPED "ESI 10376, 2006", IS ASSUMED TO BEAR N89°08’28"E, A DISTANCE OF 1356.68 FEET.

COMMENCING AT THE CENTER-EAST ONE-SIXTEENTH CORNER OF SECTION 28, TOWNSHIP 12 SOUTH, RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN EL PASO COUNTY, COLORADO, SAID POINT BEING THE SOUTHWESTERLY CORNER OF RETREAT AT TIMBERRIDGE FILING NO. 1 RECORDED UNDER RECEPTION NO. 220714653 RECORDS OF EL PASO COUNTY, COLORADO;

THENCE S02°29’39”E, TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF BRIARGATE PARKWAY AS PLATTED IN HOMESTEAD NORTH AT STERLING RANCH FILING NO. 1 RECORDED UNDER RECEPTION NO. _____, RECORDS OF EL PASO COUNTY, COLORADO, A DISTANCE OF 3615.96 FEET SAID POINT BEING THE POINT OF BEGINNING;

THENCE ON THE SOUTHERLY RIGHT OF WAY LINE OF SAID BRIARGATE PARKWAY AND THE WESTERLY RIGHT OF WAY LINE OF STERLING RANCH ROAD AS PLATTED IN SAID HOMESTEAD NORTH AT STERLING RANCH FILING NO. 1 THE FOLLOWING ELEVEN (11) COURSES:

1. S50°26'12"E, A DISTANCE OF 400.79 FEET TO A POINT OF CURVE;
2. ON THE ARC OF A CURVE TO THE LEFT, HAVING A DELTA OF 26°05'19", A RADIUS OF 2,065.00 FEET, AND A DISTANCE OF 940.26 FEET TO A POINT OF TANGENT;
3. S76°31'31"E, A DISTANCE OF 232.57 FEET;
4. S31°31'31"E, A DISTANCE OF 49.50 FEET;
5. S13°28'29"W, A DISTANCE OF 1,168.84 FEET TO A POINT OF CURVE;
6. ON THE ARC OF A CURVE TO THE RIGHT, HAVING A DELTA OF 62°50'51", A RADIUS OF 1,460.00 FEET, AND A DISTANCE OF 1,601.47 FEET TO A POINT OF TANGENT;
7. S76°19'20"W, A DISTANCE OF 1,779.02 FEET;
8. N13°40’40”W, A DISTANCE OF 44.22 FEET;
9. N58°40’40”W, A DISTANCE OF 19.87 FEET;
10. S70°06’35”W, A DISTANCE OF 170.61 FEET;
11. S01°19’20”W, A DISTANCE OF 7.43 FEET TO A POINT ON THE EASTERLY BOUNDARY OF TRACT D AS PLATTED IN STERLING RANCH FILING NO. 1 RECORDED UNDER RECEPTION NO. 218714161;

THENCE ON THE EASTERLY BOUNDARY OF SAID TRACT D THE FOLLOWING TWENTY-FIVE (25) COURSES:

1. N76°13’42”W, A DISTANCE OF 207.54 FEET;
2. N17°53’47”W, A DISTANCE OF 105.91 FEET;
3. N46°52’24”E, A DISTANCE OF 128.28 FEET;
4. N15°27’56”W, A DISTANCE OF 241.77 FEET;
5. N00°53’19”W, A DISTANCE OF 131.63 FEET;
6. N35°47’33”E, A DISTANCE OF 139.61 FEET;
7. N46°04’45”E, A DISTANCE OF 252.38 FEET;
8. N60°18’33”E, A DISTANCE OF 166.84 FEET;

9. N65°39’18”E, A DISTANCE OF 252.42 FEET;
10. N02°44’27”E, A DISTANCE OF 452.46 FEET;
11. N26°06’12”W, A DISTANCE OF 393.42 FEET;
12. N04°22’24”W, A DISTANCE OF 296.69 FEET;
13. N13°28’59”E, A DISTANCE OF 371.46 FEET;
14. S88°53’18”E, A DISTANCE OF 56.14 FEET;
15. S19°39’33”E, A DISTANCE OF 163.51 FEET;
16. S50°40’25”E, A DISTANCE OF 72.52 FEET;
17. N50°58’40”E, A DISTANCE OF 94.24 FEET;
18. N40°27’16”E, A DISTANCE OF 150.60 FEET;
19. N65°02’48”E, A DISTANCE OF 632.56 FEET;
20. N87°30’37”E, A DISTANCE OF 117.08 FEET;
21. N59°31’52”E, A DISTANCE OF 178.71 FEET;
22. N00°14’13”E, A DISTANCE OF 243.48 FEET;
23. N31°50’18”E, A DISTANCE OF 229.19 FEET;
24. N42°37’17”E, A DISTANCE OF 138.57 FEET;
25. N14°40’14”W, A DISTANCE OF 12.64 FEET TO A POINT ON THE SOUTHERLY RIGHT OF WAY LINE OF SAID BRIARGATE PARKWAY;

THENCE ON THE SOUTHERLY RIGHT OF WAY LINE OF SAID BRIARGATE PARKWAY THE FOLLOWING TWO (2) COURSES:

1. S79°16’20”E, A DISTANCE OF 122.46 FEET;
2. N39°33’48”E, A DISTANCE OF 14.16 FEET TO THE POINT OF BEGINNING.

CONTAINING A CALCULATED AREA OF 161.524 ACRES (7,035,999 SQUARE FEET).

LEGAL DESCRIPTION STATEMENT:

I, ROBERT L. MEADOWS, JR., A LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY STATE THAT THE ABOVE LEGAL DESCRIPTION AND ATTACHED EXHIBIT WERE PREPARED UNDER MY RESPONSIBLE CHARGE AND ON THE BASIS OF MY KNOWLEDGE, INFORMATION AND BELIEF, ARE CORRECT.

2-27-23

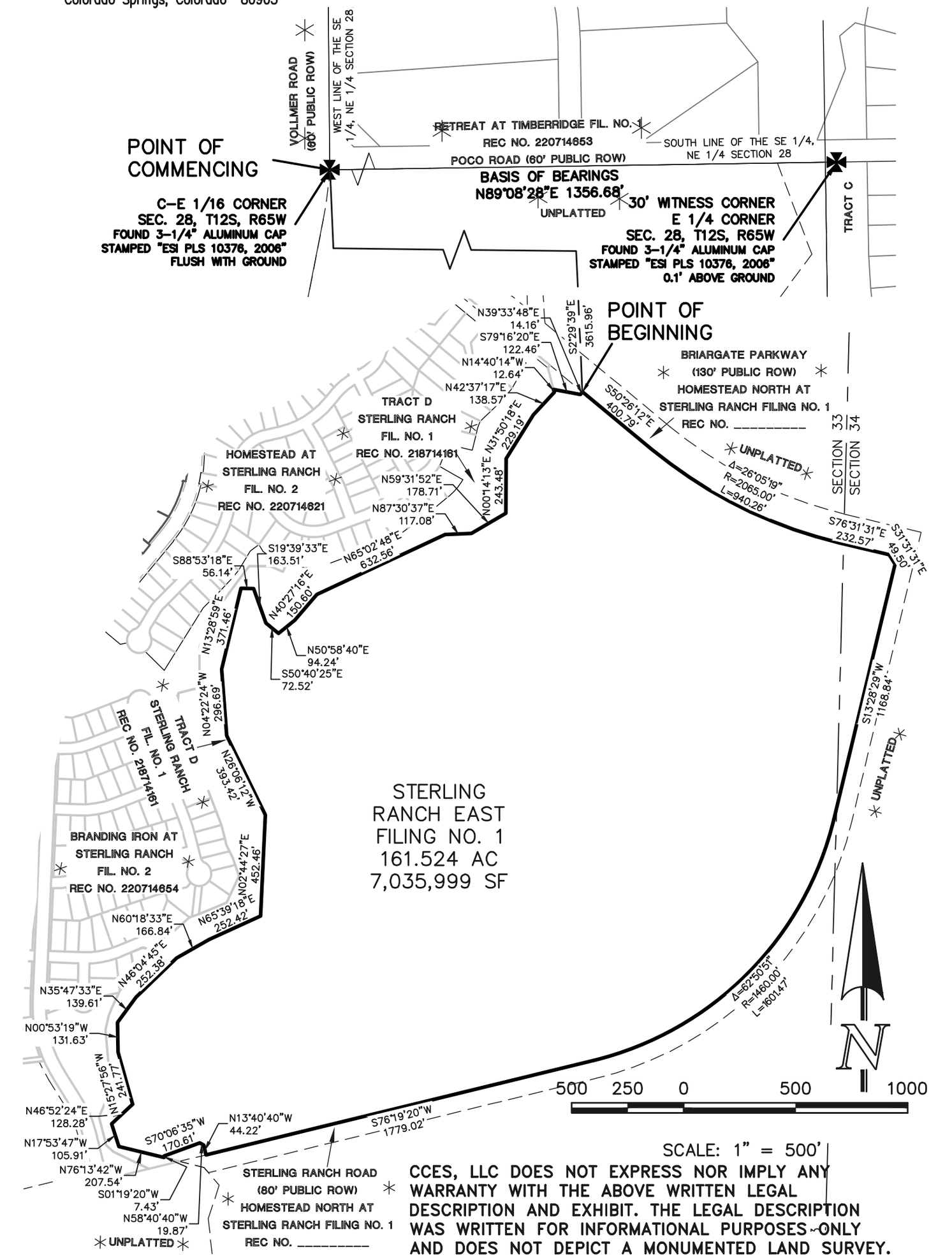
ROBERT L. MEADOWS, JR., PROFESSIONAL LAND SURVEYOR
COLORADO P.L.S. NO. 34977
FOR AND ON BEHALF OF CLASSIC CONSULTING
ENGINEERS AND SURVEYORS, LLC

DATE

CLASSIC CONSULTING SM

619 North Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903

STERLING RANCH EAST
FILING NO. 1
JOB NO. 1183.30-01R2
AUGUST 9, 2022
REV. AUGUST 26, 2022
REV. FEB. 27, 2023
SHEET 3 OF 3



SCALE: 1" = 500'

CCES, LLC DOES NOT EXPRESS NOR IMPLY ANY WARRANTY WITH THE ABOVE WRITTEN LEGAL DESCRIPTION AND EXHIBIT. THE LEGAL DESCRIPTION WAS WRITTEN FOR INFORMATIONAL PURPOSES ONLY AND DOES NOT DEPICT A MONUMENTED LAND SURVEY.

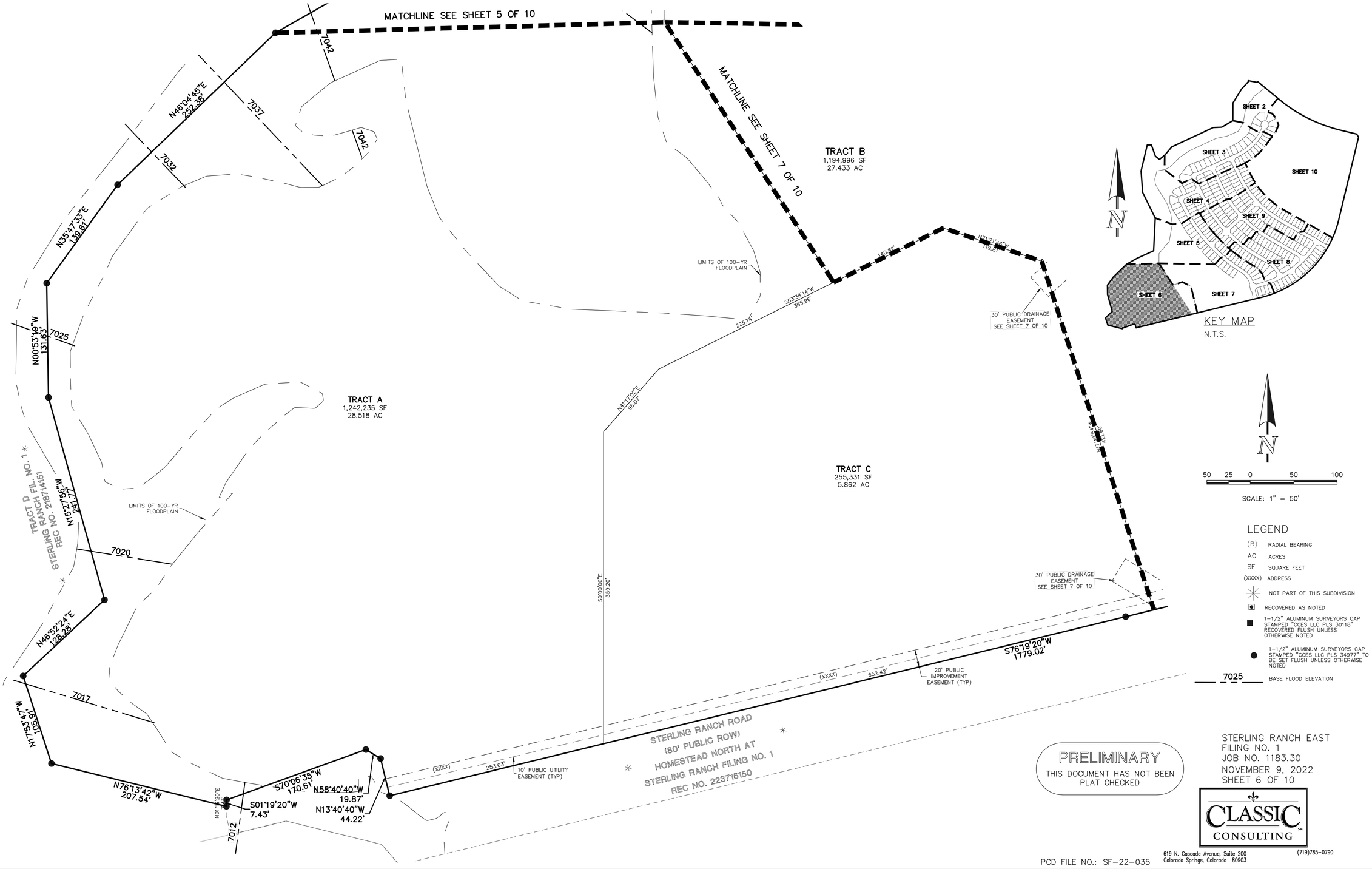
\\SVR-CES-FPBQE01\CCESNEW\118330\DRAWINGS\SURVEY\LEGALS\01R2-118330\01R2-118330FIL1 BDY 23 02-27.DWG

EXHIBIT "B"

Tract C, Sterling Ranch East Filing No. 1

STERLING RANCH EAST FILING NO. 1

A PORTION OF SECTION 33, TOWNSHIP 12 SOUTH,
RANGE 65 WEST OF THE SIXTH PRINCIPAL MERIDIAN,
EL PASO COUNTY, COLORADO



LEGEND

(R)	RADIAL BEARING
AC	ACRES
SF	SQUARE FEET
(XXXX)	ADDRESS
✳	NOT PART OF THIS SUBDIVISION
◉	RECOVERED AS NOTED
■	1-1/2" ALUMINUM SURVEYORS CAP STAMPED "CCES LLC PLS 30118" RECOVERED FLUSH UNLESS OTHERWISE NOTED
●	1-1/2" ALUMINUM SURVEYORS CAP STAMPED "CCES LLC PLS 34977" TO BE SET FLUSH UNLESS OTHERWISE NOTED
7025	BASE FLOOD ELEVATION

PRELIMINARY
THIS DOCUMENT HAS NOT BEEN PLAT CHECKED

STERLING RANCH EAST
FILING NO. 1
JOB NO. 1183.30
NOVEMBER 9, 2022
SHEET 6 OF 10

CLASSIC CONSULTING
619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790

PCD FILE NO.: SF-22-035

EXHIBIT “C”

Operation and Maintenance Manual

Stormwater Best Management Practices
Inspection and Maintenance Plan (IM Plan)

for:

Sterling Ranch East Filing No. 1
POND 14A

EDARP File Number
SF2235

Prepared for:
Classic SRJ Land, LLC
2138 Flying Horse Club Drive
Colorado Springs CO 80921

Prepared by:
Classic Consulting Engineers & Surveyors, LLC
619 N. Cascade Avenue, Suite 200
Colorado Springs CO 80903

Appendix A

General Location and Description of Stormwater Best Management Practices

A. General Site Description

The Sterling Ranch East Filing No. 1 development is 161.52 acres of the 321.37 total acres of Sterling Ranch East, a phased master planned community located in northern El Paso County, Colorado. The Filing 1 limits contains the adjacent Sand Creek Reach SC-8 channel improvements, Tract A – 28.61 acres to the west of the proposed home lots. Filing 1 also contains a large neighborhood park and further open space along the adjacent channel – Tract B, 27.72 acres. The remaining 66.65 acres of Filing 1 consists of Public residential roadways and 294 single family home lots. The property lies to the east of the aforementioned Sand Creek Reach SC-8 and the existing subdivisions Branding Iron @ Sterling Ranch No. 2 and Homestead at Sterling Ranch Filings 1 & 2. A future D20 school site is located directly northeast of the Filing boundary and southwest of the intersection of Briargate Parkway and Sterling Ranch Road. North of the Filing 1 boundary is future Briargate Parkway and to the east and south is future Sterling Ranch Road. Beyond these future roadways is unplatted and future Sterling Ranch subdivisions. The site is in the upper portion of both the Sand Creek and Sand Creek East Fork Drainage Basins. Sterling Ranch East Filing No. 1 is located in portions of Sections 28 & 33, Township 12 South, Range 65 West of the Sixth Principal Meridian. Pond 14A is located in Tract C of Sterling Ranch East Filing No. 1.

B. General Stormwater Management Description

All stormwater is conveyed via curb and gutter and conventional reinforced concrete pipe (RCP) storm sewer to the proposed extended detention basin that provides both water quality treatment and detention. Restricted release rates from the extended detention basin are discharged into Sand Creek via a proposed outfall pipe and per the MDDP and Preliminary Drainage Report.

C. Stormwater Facilities Site Plan

Inspection or maintenance personnel may utilize the documents in Appendix F for locating the stormwater facilities within this development.

D. On-Site/Off-Site Stormwater Management Facilities

Storage Facilities (Detention)

Sterling Ranch East Filing 1 detention is provided in the proposed facility in Tract C

Water Quality Facilities

Sterling Ranch East Filing 1 WQCV is provided in proposed facility in Tract C

Source Control Best Management Practices

Residential sites do not include any permanent nonstructural BMPs.

Stormwater Best Management Practices
Inspection and Maintenance Plan (IM Plan) Procedures/Forms

for:

Extended Detention Basins (EDBs)

Reference:
This plan is adapted from various maintenance manuals developed in the Colorado Front Range

Stormwater Best Management Practices
Inspection and Maintenance Plan Procedures/Forms for
Extended Detention Basins (EDBs)

Table of Contents

Stormwater Best Management Practices
Inspection and Maintenance Plan Procedures/Forms for
Extended Detention Basins (EDBs)

I. Compliance with Stormwater Best Management Practices Maintenance Requirements

All property owners are responsible for ensuring that stormwater best management practices (BMPs) or facilities installed on their property are properly maintained and that they function as designed. In some cases, this maintenance responsibility may be assigned to others through special agreements. The maintenance responsibility for a stormwater facility may be designated on the subdivision plat, the site development plan, and/or within a maintenance agreement for the property. Property owners should be aware of their responsibilities regarding stormwater facility maintenance and need to be familiar with the contents of this Inspection and Maintenance Plan (IM Plan). Maintenance agreement(s) associated with this property are provided.

II. Inspection & Maintenance – Annual Reporting

Requirements for the inspection and maintenance of stormwater facilities, as well as reporting requirements are included in this Stormwater Best Management Practices Inspection and Maintenance Plan.

Verification that the stormwater BMPs have been properly inspected and maintained and submittal of the required Inspection and Maintenance Forms shall be provided to the County on an annual basis. The annual reporting form shall be provided to the County prior to May 31st of each year.

Copies of the Inspection and Maintenance forms for each of the stormwater BMPs are located in Appendix C and D. A standard annual reporting form is provided in Appendix E. Each form shall be reviewed and submitted by the property owner or property manager to the county Stormwater Team.

III. Groundwater Monitoring

Shallow groundwater levels are anticipated to be encountered in this development based on test borings provided by Entech Engineering. Much of the site development area has been designed requiring additional material to be brought in to raise the site, thus minimizing the groundwater issues. However, there are still some areas that will partially be in a cut situation (proposed detention facilities) and are likely to encounter groundwater during and after construction. Based on the existing topography constraints, neither of the detention/stormwater quality facilities are able to be designed with a conventional underdrain system with an adequate outfall. Thus, both facilities have been designed with manual valving systems built-in to the outlet structure allowing for the release of any groundwater. This release will take place through the outlet structure itself.

As these facilities are proposed to be owned and maintained by the Sterling Ranch Metropolitan District No. 3, this entity will also be responsible for the monitoring of the

groundwater conditions within these two facilities. The intent of the valves is for the release of groundwater conditions only, while maintaining the base water surface elevation at or below that of the design plans and allowing the outlet structures to still provide the required stormwater quality treatment. Thus, valves shall remain closed unless the groundwater conditions are such that the consistent water surface elevation becomes greater than 24" above the bottom hole in the orifice plate (as these facilities have been designed to provide adequate detention and release even with this additional 24" of volume already taken). When this condition exists, the valve(s) should be opened immediately until the water surface elevation is at or below the bottom hole in the orifice plate.

Please note: monitoring the groundwater levels within these facilities within 48 hours of a storm event is not recommended as the facilities have been designed to slowly release and treat stormwater during this timeframe. The groundwater monitoring is recommended at least 48 hours after a storm event.

IV. Preventative Measures to Reduce Maintenance Costs

The most effective way to maintain your water quality facility is to prevent the pollutants from entering the facility. Common pollutants include sediment, trash & debris, chemicals, pet wastes, runoff from stored materials, illicit discharges into the storm drainage system and many others. A thoughtful maintenance program will include measures to address these potential contaminants and will save money and time in the long run. Key points to consider in your maintenance program include:

- Educate property owners/residents to be aware of how their actions affect water quality and how they can help reduce maintenance costs.
- Keep properties, streets and gutters, and parking lots free of trash, debris, and lawn clippings.
- Ensure the proper use, storage, and disposal of hazardous wastes and chemicals. Promptly clean up any spilled materials and dispose of properly.

- Plan lawn care to minimize and properly use chemicals and pesticides.
- Sweep paved surfaces and put the sweepings back on the lawn.
- Be aware of automobiles leaking fluids. Use absorbents such as cat litter to soak up drippings – dispose of properly.
- Encourage pet owners to clean up pet wastes.
- Re-vegetate disturbed and bare areas to maintain vegetative stabilization.
- Clean any private storm drainage system components, including inlets, storm sewers, and outfalls.
- Do not store materials outdoors (including landscaping materials) unless properly protected from runoff.

V. Access and Right to Enter

All stormwater management facilities located on the site should have both a designated access location and the County has the right to enter for the purpose of inspecting and for maintaining BMPs where the owner has failed to do so.

VI. Safety

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (outlet structure, manhole, etc) without proper training, number of personal, and equipment.

Potentially dangerous (e.g., fuel, chemicals, hazardous materials) substances found in the areas must be referred to emergency services at 911 (non-emergency number is 444-7000). If a toxic or flammable substance is discovered, leave the immediate area and contact the local emergency services at 911.

Vertical drops may be encountered in areas located within and around the facility. Avoid walking on top of retaining walls or other structures that have a significant vertical drop. If a vertical drop is greater than 48" in height, make the appropriate note/comment on the maintenance inspection form.

If any hazard is found within the facility area that poses an immediate threat to public safety, contact emergency services at 911 immediately.

VII. Field Inspection Equipment

It is imperative that the appropriate equipment is taken to the field with the inspector(s). This is to ensure the safety of the inspector and allow the inspections to be performed as efficiently as possible. Below is a list of the equipment that may be necessary to perform the inspections of all Stormwater BMPs:

- Protective clothing and boots.
- Safety equipment (vest, hard hat, confined space entry equipment [if certified to perform confined space entry]).
- Communication equipment.
- IM Plan for the site.
- Clipboard.
- Stormwater BMP Inspection Forms (See Appendix C).
- Manhole Lid Remover
- Shovel.

Some of the items identified above need not be carried by the inspector (manhole lid remover, shovel, and confined space entry equipment), but should be available in the vehicle driven to the site. Specialized equipment may require specific training related to that equipment and should only be used by trained individuals.

VIII. Inspecting Stormwater BMPs

The quality of stormwater entering the waters of the state relies heavily on the proper operation and maintenance of permanent BMPs. Stormwater BMPs must be periodically inspected to ensure that they function as designed. The inspection will determine the appropriate maintenance that is required for the facility.

A. <u>Inspection Procedures</u>

All Stormwater BMPs are required to be inspected a minimum of once per year. Inspections should follow the inspection guidance found in the SOP for the specific type of facility. (Appendix B of this manual).

B. Inspection Report

The person(s) conducting the inspection activities shall complete the appropriate inspection report for the specific facility. Inspection reports are located in Appendix C. A copy of each inspection form shall be kept by the owner a minimum of 5 years.

The following information explains how to fill out the Inspection Forms:

General Information

This section identifies the facility location, person conducting the inspection, the date and time the facility was inspected, and approximate days since the last rainfall. Property classification is identified as single-family residential, multi-family residential, commercial, or other.

The reason for the inspection is also identified on the form depending on the nature of the inspection. All facilities must be inspected on an annual basis at a minimum. In addition, all facilities should be inspected after a significant precipitation event to ensure the facility is draining appropriately and to identify any damage that occurred as a result of the increased runoff.

Inspection Scoring

For each inspection item, a score must be given to identify the urgency of required maintenance. The scoring is as follows:

0 = No deficiencies identified.

1 = Monitor – Although maintenance may not be required at this time, a potential problem exists that will most likely need to be addressed in the future. This can include items like minor erosion, concrete cracks/spalling, or minor sediment accumulation. This item should be revisited at the next inspection.

2 = Routine Maintenance Required – Some inspection items can be addressed through the routine maintenance program. This can include items like vegetation management or debris/trash removal.

3 = Immediate Repair Necessary – This item needs immediate attention because failure is imminent or has already occurred. This could include items such as structural failure of a feature (outlet works, forebay, etc), significant erosion, or significant sediment accumulation. This score should be given to an item that can significantly affect the function of the facility.

N/A This is checked by an item that may not exist in a facility. Not all facilities have all of the features identified on the form (forebay, micro-pool, etc.).

Inspection Summary/Additional Comments

Additional explanations to inspection items, and observations about the facility not covered by the form, are recorded in this section.

Overall Facility Rating

An overall rating must be given for each facility inspected. The overall facility rating should correspond with the highest score (0, 1, 2, 3) given to any feature on the inspection form.

C. Verification of Inspection and Form Submittal

The Stormwater BMP Inspection Form provides a record of inspection of the facility. Inspection Forms for each facility type are provided in Appendix C. Verification of the inspection of the stormwater facilities and the facility inspection form(s) shall be provided to the County Stormwater Team on an annual basis. The verification and the inspection form(s) shall be reviewed and submitted by the property owner or property manager on behalf of the property owner.

Refer to Section II of this Manual regarding the annual reporting of inspections.

IX. Maintaining Stormwater BMPs

Stormwater BMPs must be properly maintained to ensure that they operate correctly and provide the water quality treatment for which they were designed. Routine maintenance performed on a frequently scheduled basis, can help avoid more costly rehabilitative maintenance that results when facilities are not adequately maintained.

A. Maintenance Categories

Stormwater BMP maintenance programs are separated into three broad categories of work. The categories are separated based upon the magnitude and type of the maintenance activities performed. A description of each category follows:

Routine Work

The majority of this work consists of scheduled mowings and trash and debris pickups for stormwater management facilities during the growing season. This includes items such as the removal of debris/material that may be clogging the outlet structure well screens and trash racks. It also includes activities such as weed control, mosquito treatment, and algae treatment. These activities normally will be performed numerous times during the year. These items can be completed without any prior correspondence with the County Stormwater Team; however, inspection and maintenance forms shall be completed with the information also being reported on the annual report forms that are submitted to the County.

Restoration Work

This work consists of a variety of isolated or small-scale maintenance and work needed to address operational problems. Most of this work can be completed by a small crew, with minor tools, and small equipment. These items do not require prior correspondence with County Stormwater Team, but do require that completed maintenance forms be submitted to County Stormwater Team with the annual report forms.

Rehabilitation Work

This work consists of large-scale maintenance and major improvements needed to address failures within the stormwater BMP. This work requires consultation with County Stormwater Team and may require an engineering design with construction plans to be prepared for review and approval by the County. This work may also require more specialized maintenance equipment, surveying, construction permits or assistance through private contractors and consultants. These items require prior correspondence with County Stormwater Team and require that completed maintenance forms be submitted to County Stormwater Team with the annual report forms.

B. Maintenance Personnel

Maintenance personnel should be qualified to properly maintain stormwater BMPs, especially for restoration or rehabilitation work. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs. Periodic training will be offered by the County Stormwater Team (fees apply).

C. Maintenance Forms

The Stormwater BMP Maintenance Form provides a record of maintenance activities and includes general cost information to assist property owners in budgeting for future maintenance. Maintenance Forms for each facility type are provided in Appendix D. Maintenance Forms shall be completed by the property owner, management company, or contractor completing the required maintenance items. The form shall then be reviewed by the property owner or an authorized agent of the property owner and submitted on an annual basis by May 31st.

Refer to Section II of this Manual regarding the annual reporting of inspections and maintenance activities performed

Appendix B

Standard Operation Procedures
for
Inspection and Maintenance

Extended Detention Basins (EDBs)

August 2013

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EDB-1 BACKGROUND

Extended Detention Basins (EDBs) are one of the most common types of Stormwater BMPs utilized within the Front Range of Colorado. An EDB is a sedimentation basin designed to "extend" the runoff detention time, but to drain completely dry sometime after stormwater runoff ends. The EDB's drain time for the water quality portion of the facility is typically 40 hours. The basins are considered to be "dry" because the majority of the basin is designed not to have a significant permanent pool of water remaining between runoff events.

EDBs are an adaptation of a detention basin used for flood control, with the primary difference is the addition of forebays, micropools and a slow release outlet design. Forebays are shallow concrete "pans" located at the inflow point to the basin and are provided to facilitate sediment removal within a contained area prior to releasing into the pond. These forebays collect and briefly hold stormwater runoff resulting in a process called sedimentation, dropping sediment out of the stormwater. The stormwater is then routed from the forebay into the concrete trickle channel and upper basin, the large grassy portion of the basin. The EDB uses a much smaller outlet that extends the emptying time of the more frequently occurring runoff events to facilitate pollutant removal. An EDB should have a small micropool just upstream of the outlet. This micropool is designed to hold a small amount of water to keep sediment and floatables from blocking the outlet orifices.

EDB-2 INSPECTING EXTENDED DETENTION BASINS (EDBs)

EDB-2.1 Access and Easements

Inspection or maintenance personnel may utilize the figures located in Appendix E containing the location(s) of the access points and potential maintenance easements of the EDB(s) within this development.

EDB-2.2 Stormwater Best Management Practice (BMP) Locations

Inspection or maintenance personnel may utilize the figures located in Appendix E containing the location(s) of the EDB(s) within this development.

EDB-2.3 Extended Detention Basin (EDB) Features

EDBs have a number of features that are designed to serve a particular function. Many times the proper function of one feature depends on another. For example, if a forebay is not properly maintained, it could negatively affect the performance of a feature downstream (trickle channel, micropool, etc.). Therefore, it is critical that each feature of the EDB is properly inspected and maintained to ensure that the overall facility functions as it was intended. Below is a list and description of the most common features within an EDB and the corresponding maintenance inspection items that can be anticipated:

Table EDB-1
Typical Inspection & Maintenance Requirements Matrix

EDB Features	Sediment Removal	Mowing/ Weed control	Trash & Debris Removal	Erosion	Overgrown Vegetation Removal	Standing Water (mosquito/ algae control)	Structure Repair
Inflow Points (outfalls)	X		X	X	X		X
Forebay	X		X			X	X
Low-flow channel	X		X	X	X		X
Bottom Stage	X	X	X	X	X	X	
Micropool	X		X		X	X	X
Outlet Works	X		X			X	X
Emergency Spillway			X	X	X		X
Upper Stage		X	X	X	X		
Embankment		X	X	X	X		

EDB-2.3.1 Inflow Points

Inflow Points or Outfalls into EDBs are the point source of the stormwater discharge into the facility. An inflow point is commonly a storm sewer pipe with a flared end section that discharges into the EDB. In some instances, an inflow point could be a drainage channel or ditch that flows into the facility.

An energy dissipater (riprap or hard armor protection) is typically immediately downstream of the discharge point into the EDB to protect from erosion. In some cases, the storm sewer outfall can have a toe-wall or cut-off wall immediately below the structure to prevent undercutting of the outfall from erosion.

The typical maintenance items that are found with inflow points are as follows:

a. Riprap Displaced – Many times, because the repeated impact/force of water, the riprap can shift and settle. If any portion of the riprap apron appears to have settled, soil is present between the riprap, or the riprap has shifted, maintenance may be required to ensure future erosion is prevented.

b. Erosion Present/Outfall Undercut – In some situations, the energy dissipater may not have been sized, constructed, or maintained appropriately and erosion has occurred. Any erosion within the vicinity of the inflow point will require maintenance to prevent damage to the structure(s) and sediment transport within the facility.

c. Sediment Accumulation – Because of the turbulence in the water created by the energy dissipater, sediment often deposits immediately downstream of the inflow point. To prevent a loss in hydraulic performance of the upstream infrastructure, sediment that accumulates in this area must be removed in a timely manner.

d. Structural Damage – Structural damage can occur at any time during the life of the facility. Typically, for an inflow, the structural damage occurs to the pipe

flared end section (concrete or steel). Structural damage can lead to additional operating problems with the facility, including loss of hydraulic performance.

e. Woody Growth/Weeds Present – Undesirable vegetation can grow in and around the inflow area to an EDB that can significantly affect the performance of the drainage facilities discharging into the facility. This type of vegetation includes trees (typically cottonwoods) and dense areas of shrubs (willows). If woody vegetation is not routinely mowed/removed, the growth can cause debris/sediment to accumulate, resulting in blockage of the discharge. Also, tree roots can cause damage to the structural components of the inflow. Routine maintenance is essential for trees (removing a small tree/sapling is much cheaper and "quieter" than a mature tree). In addition, noxious weeds growing in the facility can result in the loss of desirable native vegetation and impact adjacent open spaces/land.

EDB-2.3.3 Trickle Channel (Low-Flow)

The trickle channel conveys stormwater from the forebay to the micro-pool of the EDB. The trickle channel is typically made of concrete. However, grass lined (riprap sides protected) is also common and can provide for an additional means of water quality within the EDB. The trickle channel is typically 6-9 inches in depth and can vary in width.

The typical maintenance items that are found with trickle channels are as follows:

a. Sediment/Debris Accumulation – Trickle channels are typically designed with a relatively flat slope that can promote sedimentation and the collection of debris. Also, if a trickle channel is grass lined it can accumulate sediment and debris at a much quicker rate. Routine removal of accumulated sediment and debris is essential in preventing flows from circumventing the trickle channel and affecting the dry storage portion of the pond.

b. Concrete/Riprap Damage – Concrete can crack, spall, and settle and must be repaired to ensure proper function of the trickle channel. Riprap can also shift over time and must be replaced/repaired as necessary.

c. Woody Growth/Weeds Present – Because of the constant moisture in the area surrounding the trickle channel, woody growth (cottonwoods/willows) can become a problem. Trees and dense shrub type vegetation can affect the capacity of the trickle channel and can allow flows to circumvent the feature.

d. Erosion Outside of Channel – In larger precipitation events, the trickle channel capacity will likely be exceeded. This can result in erosion immediately adjacent to the trickle channel and must be repaired to prevent further damage to the structural components of the EDB.

EDB-2.3.4 Bottom Stage

The bottom stage is at least 1.0 to 2.0 feet deeper than the upper stage and is located in front of the outlet works structure. The bottom stage is designed to store the smaller runoff events, assists in keeping the majority of the basin

bottom dry resulting in easier maintenance operations, and enhances the facilities pollutant removal capabilities. This area of the EDB may develop wetland vegetation.

The typical maintenance items that are found with the bottom stage are as follows:

a. Sediment/Debris Accumulation – The micro-pool can frequently accumulate sediment and debris. This material must be removed to maintain pond volume and proper function of the outlet structure.

b. Woody Growth/Weeds Present - Because of the constant moisture in the soil surrounding the micro-pool, woody growth (cottonwoods/willows) can create operational problems for the EDB. If woody vegetation is not routinely mowed/removed, the growth can cause debris/sediment to accumulate outside of the micro-pool, which can cause problems with other EDB features. Also, tree roots can cause damage to the structural components of the outlet works. Routine management is essential for trees (removing a small tree/sapling is much cheaper and "quieter" than a mature tree).

c. Bank Erosion – The micro-pool is usually a couple feet deeper than the other areas of the ponds. Erosion can be caused by water dropping into the micro-pool if adequate protection/armor is not present. Erosion in this area must be mitigated to prevent sediment transport and other EDB feature damage.

d. Mosquitoes/Algae Treatment – Nuisance created by stagnant water can result from improper maintenance/treatment of the micro-pool. Mosquito larvae can be laid by adult mosquitoes within the permanent pool. Also, aquatic vegetation that grows in shallow pools of water can decompose causing foul odors. Chemical/mechanical treatment of the micro-pool may be necessary to reduce these impacts to adjacent homeowners.

e. Petroleum/Chemical Sheen – Many indicators of illicit discharges into the storm sewer systems will be present in the micro-pool area of the EDB. These indicators can include sheens, odors, discolored soil, and dead vegetation. If it is suspected that an illicit discharge has occurred, contact the supervisor immediately. Proper removal/mitigation of contaminated soils and water in the EDB is necessary to minimize any environmental impacts downstream.

EDB-2.3.5 Micro-pool

The micro-pool is a concrete or grouted boulder walled structure directly in front of the outlet works. At a minimum, the micropool is 2.5 feet deep and is designed to hold water. The micro-pool is critical in the proper function of the EDB; it allows suspended sediment to be deposited at the bottom of the micro-pool and prevents these sediments from being deposited in front of the outlet works causing clogging of the outlet structure, which results in marshy areas within the top and bottom stages.

The typical maintenance items that are found with micro-pools are as follows:

a. Sediment/Debris Accumulation – The micro-pool can frequently accumulate sediment and debris. This material must be removed to maintain pond volume and proper function of the outlet structure.

b. Woody Growth/Weeds Present - Because of the constant moisture in the soil surrounding the micro-pool, woody growth (cottonwoods/willows) can create operational problems for the EDB. If woody vegetation is not routinely mowed/removed, the growth can cause debris/sediment to accumulate outside of the micro-pool, which can cause problems with other EDB features. Also, tree roots can cause damage to the structural components of the outlet works. Routine management is essential for trees (removing a small tree/sapling is much cheaper and "quieter" than a mature tree).

c. Mosquitoes/Algae Treatment – Nuisance created by stagnant water can result from improper maintenance/treatment of the micro-pool. Mosquito larvae can be laid by adult mosquitoes within the permanent pool. Also, aquatic vegetation that grows in shallow pools of water can decompose causing foul odors. Chemical/mechanical treatment of the micro-pool may be necessary to reduce these impacts to adjacent homeowners.

d. Petroleum/Chemical Sheen – Many indicators of illicit discharges into the storm sewer systems will be present in the micro-pool area of the EDB. These indicators can include sheens, odors, discolored soil, and dead vegetation. If it is suspected that an illicit discharge has occurred, contact the supervisor immediately. Proper removal/mitigation of contaminated soils and water in the EDB is necessary to minimize any environmental impacts downstream.

EDB-2.3.6 Outlet Works

The outlet works is the feature that drains the EDB in specified quantities and periods of time. The outlet works is typically constructed of reinforced concrete into the embankment of the EDB. The concrete structure typically has steel orifice plates anchored/embedded into it to control stormwater release rates. The larger openings (flood control) on the outlet structure typically have trash racks over them to prevent clogging. The water quality orifice plate (smaller diameter holes) will typically have a well screen covering it to prevent smaller materials from clogging it. The outlet structure is the single most important feature in the EDB operation. Proper inspection and maintenance of the outlet works is essential in ensuring the long-term operation of the EDB.

The typical maintenance items that are found with the outlet works are as follows:

a. Trash Rack/Well Screen Clogged – Floatable material that enters the EDB will most likely make its way to the outlet structure. This material is trapped against the trash racks and well screens on the outlet structure (which is why they are there). This material must be removed on a routine basis to ensure the outlet structure drains in the specified design period.

b. Structural Damage - The outlet structure is primarily constructed of concrete, which can crack, spall, and settle. The steel trash racks and well screens are also susceptible to damage.

c. Orifice Plate Missing/Not Secure – Many times residents, property owners, or maintenance personnel will remove or loosen orifice plates if they believe the pond is not draining properly. Any modification to the orifice plate(s) will significantly affect the designed discharge rates for water quality and/or flood

control. Modification of the orifice plates is not allowed without approval from the County.

d. Manhole Access – Access to the outlet structure is necessary to properly inspect and maintain the facility. If access is difficult or not available to inspect the structure, chances are it will be difficult to maintain as well.

e. Woody Growth/Weeds Present - Because of the constant moisture in the soil surrounding the outlet works, woody growth (cottonwoods/willows) can create operational problems for the EDB. If woody vegetation is not routinely mowed/removed, the growth can cause debris/sediment to accumulate around the outlet works, which can cause problems with other EDB features. Also, tree roots can cause damage to the structural components of the outlet works. Routine management is essential for trees (removing a small tree/sapling is much cheaper and "quieter" than a mature tree).

EDB-2.3.7 Emergency Spillway

An emergency spillway is typical of all EDBs and designed to serve as the overflow in the event the volume of the pond is exceeded. The emergency spillway is typically armored with riprap (or other hard armor) and is sometimes buried with soil. The emergency spillway is typically a weir (notch) in the pond embankment. Proper function of the emergency spillway is essential to ensure flooding does not affect adjacent properties.

The typical maintenance items that are found with emergency spillways are as follows:

a. Riprap Displaced – As mentioned before, the emergency spillway is typically armored with riprap to provide erosion protection. Over the life of an EDB, the riprap may shift or dislodge due to flow.

b. Erosion Present – Although the spillway is typically armored, stormwater flowing through the spillway can cause erosion damage. Erosion must be repaired to ensure the integrity of the basin embankment, and proper function of the spillway.

c. Woody Growth/Weeds Present – Management of woody vegetation is essential in the proper long-term function of the spillway. Larger trees or dense shrubs can capture larger debris entering the EDB and reduce the capacity of the spillway.

d. Obstruction Debris – The spillway must be cleared of any obstruction (man made or natural) to ensure the proper design capacity.

EDB-2.3.8 Upper Stage (Dry Storage)

The upper stage of the EDB provides the majority of the water quality flood detention volume. This area of the EDB is higher than the micro-pool and typically stays dry, except during storm events. The upper stage is the largest feature/area of the basin. Sometimes, the upper stage can be utilized for park space and other uses in larger EDBs. With proper maintenance of the micro-pool and forebay(s), the upper stage should not experience much sedimentation; however, bottom elevations should be monitored to ensure adequate volume.

The typical maintenance items that are found with upper stages are as follows:

a. Vegetation Sparse – The upper basin is the most visible part of the EDB, and therefore aesthetics is important. Adequate and properly maintained vegetation can greatly increase the overall appearance and acceptance of the EDB by the public. In addition, vegetation can reduce the potential for erosion and subsequent sediment transport to the other areas of the pond.

b. Woody Growth/Undesirable Vegetation – Although some trees and woody vegetation may be acceptable in the upper basin, some thinning of cottonwoods and willows may be necessary. Remember, the basin will have to be dredged to ensure volume, and large trees and shrubs will be difficult to protect during that operation.

c. Standing Water/Boggy Areas – Standing water or boggy areas in the upper stage is typically a sign that some other feature in the pond is not functioning properly. Routine maintenance (mowing, trash removal, etc) can be extremely difficult for the upper stage if the ground is saturated. If this inspection item is checked, make sure you have identified the root cause of the problem.

d. Sediment Accumulation – Although other features within the EDB are designed to capture sediment, the upper storage area will collect sediment over time. Excessive amounts of sedimentation will result in a loss of storage volume. It may be more difficult to determine if this area has accumulated sediment without conducting a field survey.

Below is a list of indicators:

1. Ground adjacent to the trickle channel appears to be several inches higher than concrete/riprap
2. Standing water or boggy areas in upper stage
3. Uneven grades or mounds
4. Micro-pool or Forebay has excessive amounts of sediment

e. Erosion (banks and bottom) – The bottom grades of the dry storage are typically flat enough that erosion should not occur. However, inadequate vegetative cover may result in erosion of the upper stage. Erosion that occurs in the upper stage can result in increased dredging/maintenance of the micro-pool.

f. Trash/Debris – Trash and debris can accumulate in the upper area after large events, or from illegal dumping. Over time, this material can accumulate and clog the EDB outlet works.

g. Maintenance Access – Most EDBs typically have a gravel/concrete maintenance access path to either the upper stage or forebay. This access path should be inspected to ensure the surface is still drivable. Some of the smaller EDBs may not have maintenance access paths; however, the inspector should verify that access is available from adjacent properties.

EDB-2.3.9 Miscellaneous

There are a variety of inspection/maintenance issues that may not be attributed to a single feature within the EDB. This category on the inspection form is for maintenance items that are commonly found in the EDB, but may not be attributed to an individual feature.

a. Access – Access needs to be maintained.

b. Graffiti/Vandalism – Damage to the EDB infrastructure can be caused by vandals. If criminal mischief is evident, the inspector should forward this information to the local enforcement agency.

c. Public Hazards – Public hazards include items such as vertical drops of greater than 4-feet, containers of unknown/suspicious substances, exposed metal/jagged concrete on structures. **If any hazard is found within the facility area that poses an immediate threat to public safety, contact the local emergency services at 911 immediately!**

d. Burrowing Animals/Pests – Prairie dogs and other burrowing rodents may cause damage to the EDB features and negatively affect the vegetation within the EDB.

e. Other – Any miscellaneous inspection/maintenance items not contained on the form should be entered here.

EDB-2.4 Inspection Forms

EDB Inspection forms are located in Appendix C. Inspection forms shall be completed by the person(s) conducting the inspection activities. Each form shall be reviewed and submitted by the property owner or property manager to the County Stormwater Team per the requirements of the Inspection and Maintenance Plan. These inspection forms shall be kept a minimum of 5 years and made available to the County Stormwater Team upon request.

EDB-3 MAINTAINING EXTENDED DETENTION BASINS (EDBs)

EDB-3.1 Maintenance Personnel

Maintenance personnel must be qualified to properly maintain EDBs. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

EDB-3.2 Equipment

It is imperative that the appropriate equipment and tools are taken to the field with the operations crew. The types of equipment/tools will vary depending on the task at hand. Below is a list of tools, equipment, and material(s) that may be necessary to perform maintenance on an EDB:

1.) Loppers/Tree Trimming Tools
2.) Mowing Tractors
3.) Trimmers (extra string)
4.) Shovels
5.) Rakes
6.) All Surface Vehicle (ASVs)
7.) Skid Steer
8.) Back Hoe
9.) Track Hoe/Long Reach Excavator
10.) Dump Truck
11.) Jet-Vac Machine
12.) Engineers Level (laser)
13.) Riprap (Minimum - Type M)
14.) Filter Fabric
15.) Erosion Control Blanket(s)
16.) Seed Mix (Native Mix)
17.) Illicit Discharge Cleanup Kits
18.) Trash Bags
19.) Tools (wrenches, screw drivers, hammers, etc)
20.) Chain Saw
21.) Confined Space Entry Equipment
22.) Approved Inspection and Maintenance Plan

Some of the items identified above may not be needed for every maintenance operation. However, this equipment should be available to the maintenance operations crews should the need arise.

EDB-3.3 Safety

Vertical drops may be encountered in areas located within and around the facility. Avoid walking on top of retaining walls or other structures that have a significant vertical drop. If a vertical drop is identified within the EDB that is greater than 48” in height, make the appropriate note/comment on the maintenance inspection form.

EDB-3.4 Maintenance Forms

The EDB Maintenance Form provides a record of each maintenance operation performed by maintenance contractors. The EBD Maintenance Form shall be filled out in the field

after the completion of the maintenance operation. Each form shall be reviewed and submitted by the property owner or property manager to the County Stormwater Team per the requirements of the Inspection and Maintenance Plan. The EDB Maintenance form is located in Appendix D.

EDB-3.5 Maintenance Categories and Activities

A typical EDB Maintenance Program will consist of three broad categories of work: Routine, Restoration (minor), and Rehabilitation (major). Within each category of work, a variety of maintenance activities can be performed on an EDB. A maintenance activity can be specific to each feature within the EDB, or general to the overall facility. This section of the SOP explains each of the categories and briefly describes the typical maintenance activities for an EDB.

A variety of maintenance activities are typical of EDBs. The maintenance activities range in magnitude from routine trash pickup to the reconstruction of drainage infrastructure. Below is a description of each maintenance activity, the objectives, and frequency of actions:

EDB-3.6 Routine Maintenance Activities

The majority of this work consists of regularly scheduled mowing and trash and debris pickups for stormwater management facilities during the growing season. This includes items such as the removal of debris/material that may be clogging the outlet structure well screens and trash racks. It also includes activities such as includes weed control, mosquito treatment, and algae treatment. These activities normally will be performed numerous times during the year. These items can be completed without any prior correspondence with the County Stormwater Team; however, completed inspection and maintenance forms shall be submitted to the County Stormwater Team for each inspection and maintenance activity.

The Maintenance Activities are summarized below, and further described in the following sections.

TABLE – EDB-2
Summary of Routine Maintenance Activities

Maintenance Activity	Minimum Frequency	Look for:	Maintenance Action
Mowing	Twice annually	Excessive grass height/aesthetics	Mow grass to a height of 4" to 6"
Trash/Debris Removal	Twice annually	Trash & debris in EDB	Remove and dispose of trash and debris
Outlet Works Cleaning	As needed - after significant rain events – twice annually min.	Clogged outlet structure; ponding water	Remove and dispose of debris/trash/sediment to allow outlet to function properly
Weed control	Minimum twice annually	Noxious weeds; Unwanted vegetation	Treat w/ herbicide or hand pull; Consult the local weed specialist
Mosquito Treatment	As needed	Standing water/mosquito habitat	Treat w/ EPA approved chemicals
Algae Treatment	As needed	Standing water/ Algal growth/green color	Treat w/ EPA approved chemicals

EDB-3.6.1 Mowing

Occasional mowing is necessary to limit unwanted vegetation and to improve the overall appearance of the EDB. Native vegetation should be mowed to a height of 4-to-6 inches tall. Grass clippings should be collected and disposed of properly.

Frequency – Routine - Minimum of twice annually or depending on aesthetics.

EDB-3.6.2 Trash/Debris Removal

Trash and debris must be removed from the entire EDB area to minimize outlet clogging and to improve aesthetics. This activity must be performed prior to mowing operations.

Frequency – Routine – Prior to mowing operations and minimum of twice annually.

EDB-3.6.3 Outlet Works Cleaning

Debris and other materials can clog the outlet work's well screen, orifice plate(s) and trash rack. This activity must be performed anytime other maintenance activities are conducted to ensure proper operation.

Frequency - Routine – After significant rainfall event or concurrently with other maintenance activities.

EDB-3.6.4 Weed Control

Noxious weeds and other unwanted vegetation must be treated as needed throughout the EDB. This activity can be performed either through

mechanical means (mowing/pulling) or with herbicide. Consultation with the local Weed Inspector is highly recommended prior to the use of herbicide.

Frequency – Routine – As needed based on inspections.

EDB-3.6.5 Mosquito/Algae Treatment

Treatment of permanent pools is necessary to control mosquitoes and undesirable aquatic vegetation that can create nuisances. Only EPA approved chemicals/materials can be used in areas that are warranted.

Frequency – As needed.

EDB- 3.7 Restoration Maintenance Activities

This work consists of a variety of isolated or small-scale maintenance or operational problems. Most of this work can be completed by a small crew, tools, and small equipment. These items do not require prior correspondence with County Stormwater Team and require completed inspection and maintenance forms to be submitted to County Stormwater Team for each inspection and maintenance activity.

Table – EDB-3
Summary of Restoration Maintenance Activities

Maintenance Activity	Minimum Frequency	Look for:	Maintenance Action
Sediment Removal	As needed; typically every 1 –2 years	Sediment build-up; decrease in pond volume	Remove and dispose of sediment
Erosion Repair	As needed, based upon inspection	Rills/gullies forming on side slopes, trickle channel, other areas	Repair eroded areas Revegetate; address source of erosion
Vegetation Removal/Tree Thinning	As needed, based upon inspection	Large trees/wood vegetation in lower chamber of pond	Remove vegetation; restore grade and surface
Drain Cleaning/Jet Vac	As needed, based upon inspection	Sediment build-up /non draining system	Clean drains; Jet Vac if needed

EDB-3.7.1 Sediment Removal

Sediment removal is necessary to maintain the original design volume of the EDB and to ensure proper function of the infrastructure. Regular sediment removal (minor) from the forebay, inflow(s), and trickle channel can significantly reduce the frequency of major sediment removal activities (dredging) in the upper and lower stages. The minor sediment removal activities can typically be addressed with shovels and smaller equipment. Major sediment removal activities will require larger and more specialized equipment. The major sediment activities will also require surveying with an engineer's level, and consultation with the County's Engineering staff to ensure design volumes/grades are achieved.

Stormwater sediments removed from EDBs do not meet the criteria of "hazardous waste". However, these sediments are contaminated with a wide array of organic and inorganic pollutants and handling must be done with care. Sediments from permanent pools must be carefully removed to minimize turbidity, further sedimentation, or other adverse water quality impacts. Sediments should be transported by motor vehicle only after they are dewatered. All sediments must be taken to a landfill for proper disposal. Prompt and thorough cleanup is important should a spill occur during transportation.

Frequency –Non routine – As necessary based upon inspections. Sediment removal in the forebay and trickle channel may be necessary as frequently as every 1-2 years.

EDB-3.7.2 Erosion Repair

The repair of eroded areas is necessary to ensure the proper function of the EDB, minimize sediment transport, and to reduce potential impacts to other features. Erosion can vary in magnitude from minor repairs to trickle channels, energy dissipaters, and rilling to major gullies in the embankments and spillways. The repair of eroded areas may require the use of excavators, earthmoving equipment, riprap, concrete, erosion control blankets, and turf reinforcement mats. Major erosion repair to the pond embankments, spillways, and adjacent to structures will require consultation with the County's Engineering staff.

Frequency –Non routine – As necessary based upon inspections.

EDB-3.7.3 Vegetation Removal/Tree Thinning

Dense stands of woody vegetation (willows, shrubs, etc) or trees can create maintenance problems for the infrastructure within an EDB. Tree roots can damage structures and invade pipes/channels thereby blocking flows. Also, trees growing in the upper and lower stages of the EDB will most likely have to be removed when sediment/dredging operations occur. A small tree is easier to remove than a large tree, therefore, regular removal/thinning is imperative. All trees and woody vegetation that is growing in the bottom of the EDB or near structures (inflows, trickle channels, outlet works, emergency spillways, etc) should be removed. Any trees or woody vegetation in the EDB should be limited to the upper portions of the pond banks.

Frequency –Non routine – As necessary based upon inspections.

EDB-3.7.4 Clearing Drains/Jet-Vac

An EDB contains many structures, openings, and pipes that can be frequently clogged with debris. These blockages can result in a decrease of hydraulic capacity and create standing water in areas outside of the micro-pool. Many times the blockage to this infrastructure can be difficult to access and/or clean. Specialized equipment (jet-vac machines) may be necessary to clear debris from these difficult areas.

Frequency –Non routine – As necessary based upon inspections.

EDB-3.8 Rehabilitation Maintenance Activities

This work consists of larger maintenance/operational problems and failures within the stormwater management facilities. All of this work requires consultation with County Engineering staff to ensure the proper maintenance is performed. This work requires that the engineering staff review the original design and construction drawings to access the situation and assign the necessary maintenance. This work may also require more specialized maintenance equipment, design/details, surveying, or assistance through private contractors and consultants. Any proper permits required for this activity must be obtained.

Table – EDB-4
Summary of Rehabilitation Maintenance Activities

Maintenance Activity	Minimum Frequency	Look for:	Maintenance Action
Major Sediment Removal	As needed – based upon scheduled inspections	Large quantities of sediment; reduced pond capacity	Remove and dispose of sediment. Repair vegetation as needed
Major Erosion Repair	As needed – based upon scheduled inspections	Severe erosion including gullies, excessive soil displacement, areas of settlement, holes	Repair erosion – find cause of problem and address to avoid future erosion
Structural Repair	As needed – based upon scheduled inspections	Deterioration and/or damage to structural components – broken concrete, damaged pipes, outlet works	Structural repair to restore the structure to its original design

EDB-3.8.1 Major Sediment Removal

Major sediment removal consists of removal of large quantities of sediment or removal of sediment from vegetated areas. Care shall be given when removing large quantities of sediment and sediment deposited in vegetated areas. Large quantities of sediment need to be carefully removed, transported and disposed of. Vegetated areas need special care to ensure design volumes and grades are preserved.

Frequency – Non routine – Repair as needed based upon inspections.

EDB-3.8.2 Major Erosion Repair

Major erosion repair consist of filling and revegetating areas of severe erosion. Determining the cause of the erosion as well as correcting the condition that caused the erosion should also be part of the erosion repair. Care should be given to ensure design grades and volumes are preserved.

Frequency – Non routine – Repair as needed based upon inspections.

EDB-3.8.3 Structural Repair

An EDB includes a variety of structures that can deteriorate or be damaged during the course of routine maintenance. These structures are constructed of steel and concrete that can degrade or be damaged and may need to be repaired or re-constructed from time to time. These structures include items like outlet works, trickle channels, forebays, inflows and other features. In-house operations staff can perform some of the minor structural repairs. Major repairs to structures may require input from a structural engineer and specialized contractors. Consultation with the County Engineering staff should take place prior to all structural repairs.

Frequency –Non routine – Repair as needed based upon inspections.

Appendix C: Inspection Form

EXTENDED DETENTION BASIN (EDB) INSPECTION FORM

Date:_____

Subdivision/Business Name:_____ Inspector:_____

Subdivision/Business Address:_____ _____

Weather: _____

Date of Last Rainfall:_____ Amount:_____Inches

Property Classification: Residential Multi Family Commercial Other:_____
(Circle One)

Reason for Inspection: Routine Complaint After Significant Rainfall Event
(Circle One)

INSPECTION SCORING - For each facility inspection item, insert one of the following scores:

0 = No deficiencies identified
1 = Monitor (potential for future problem)
2 = Routine maintenance required
3 =Immediate repair necessary
N/A = Not applicable

FEATURES

1.) Inflow Points
____Riprap Displaced
____Erosion Present/Outfall Undercut
____Sediment Accumulation
____Structural Damage (pipe, end-section, etc.)
____Woody Growth/Weeds Present

2.) Forebay
____Sediment/Debris Accumulation
____Concrete Cracking/Failing
____Drain Pipe/Wier Clogged (not draining)
____Wier/Drain Pipe Damage

3.) Trickle Channel (Low-flow)
____Sediment/Debris Accumulation
____Concrete/Riprap Damage
____Woody Growth/Weeds Present
____Erosion Outside Channel

4.) Bottom Stage (Micro-Pool)
____Sediment/Debris Accumulation
____Woody Growth/Weeds Present
____Bank Erosion
____Mosquitoes/Algae Treatment
____Petroleum/Chemical Sheen

5.) Outlet Works
____Trash Rack/Well Screen Clogged
____Structural Damage (concrete,steel,subgrade)
____Orifice Plate(s) Missing/Not Secure
____Manhole Access (cover, steps, etc.)
____Woody Growth/Weeds Present

6.) Emergency Spillway
____Riprap Displaced
____Erosion Present
____Woody Growth/Weeds Present
____Obstruction/Debris

7.) Upper Stage (Dry Storage)
____Vegetation Sparse
____Woody Growth/Undesirable Vegetation
____Standing Water/Boggy Areas
____Sediment Accumulation
____Erosion (banks and bottom)
____Trash/Debris
____Maintenance Access

8.) Miscellaneous
____Encroachment in Easement Area
____Graffiti/Vandalism
____Public Hazards
____Burrowing Animals/Pests
____Other

Inspection Summary / Additional Comments:_____

OVERALL FACILITY RATING (Circle One)

0 = No Deficiencies Identified
1 = Monitor (potential for future problem exists)
2 = Routine Maintenance Required
3 = Immediate Repair Necessary

This inspection form shall be kept a minimum of 5 years and made available to the County upon request.

Appendix D: Maintenance Form

EXTENDED DETENTION BASIN (EDB) MAINTENANCE FORM

Subdivision/Business Name:_____ Completion Date:_____

Subdivision/Business Address:_____ Contact Name:_____

Maintenance Category: (Circle All That Apply) Routine Restoration Rehabilitation

MAINTENANCE ACTIVITIES PERFORMED

ROUTINE WORK

____ MOWING
____ TRASH/DEBRIS REMOVAL
____ OUTLET WORKS CLEANING (TRASH RACK/WELL SCREEN)
____ WEED CONTROL (HERBICIDE APPLICATION)
____ MOSQUITO TREATMENT
____ ALGAE TREATMENT

RESTORATION WORK

____ SEDIMENT REMOVAL
- ____ FOREBAY
- ____ TRICKLE CHANNEL
- ____ INFLOW

____ EROSION REPAIR
- ____ INFLOW POINT
- ____ TRICKLE CHANNEL

____ VEGETATION REMOVAL/TREE THINNING
- ____ INFLOW(S)
- ____ TRICKLE CHANNEL
- ____ UPPER STAGE
- ____ BOTTOM STAGE

____ REVEGETATION
____ JET-VAC/CLEARING DRAINS
- ____ FOREBAY
- ____ OUTLET WORKS
- ____ INFLOWS

REHABILITATION WORK

____ SEDIMENT REMOVAL (DREDGING)
- ____ BOTTOM STAGE
- ____ UPPER STAGE

____ EROSION REPAIR
- ____ OUTLET WORKS
- ____ UPPER STAGE
- ____ BOTTOM STAGE
- ____ SPILLWAY

____ STRUCTURAL REPAIR
- ____ INFLOW
- ____ OUTLET WORKS
- ____ FOREBAY
- ____ TRICKLE CHANNEL

OTHER_____
_____
_____

ESTIMATED TOTAL MANHOURS: _____

COSTS INCURRED (include description of costs): _____

EQUIPMENT/MATERIAL USED (include hours of equipment usage and quantity of material used):

_____

_____

COMMENTS/ADDITIONAL INFO:

_____

_____

This Maintenance Activity Form shall be kept a minimum of 5 years and made available to the County upon request.

Appendix E: Annual Inspection and Maintenance Submittal Form

Annual Inspection and Maintenance Reporting Form
for
Stormwater BMPs

Date: _____

Re: Certification of Inspection and Maintenance; Submittal of forms

Property/Subdivision Name: _____

Property Address: _____

Contact Name: _____

Contact Phone #:_____

Contact Email Address:_____

I verify that the required stormwater facility inspections and required maintenance have been completed in accordance with the Stormwater BMP Maintenance Agreement and the Inspection and Maintenance Manual associated with the above referenced property.

The required Stormwater Facility Inspection and Maintenance forms are attached to this form.

_____	_____
Name of Party Responsible for Inspection & Maintenance	Property Owner
_____	_____
Authorized Signature	Signature

Appendix F

As-Built Plans
(When Complete)

Appendix G

BMP Maintenance Cost Estimates (2007)

Routine maintenance costs can usually be predicted for an annual budget and may range from four percent of original capital construction costs per year for an EDB to nine percent of original capital costs per year for an infiltration BMP.

A general rule of thumb is that annual maintenance costs may run from $100 per acre for minor maintenance, such as mowing, to $500 per acre for more intensive maintenance including weed control, debris removal, etc.

Non-routine maintenance costs, however, can be substantial over the long run, especially when considering the possibility of eventual BMP replacement. To lessen the immediate financial impact of non-routine costs, it is advised that a BMP maintenance fund, with annual contributions, be established.

Type of BMP	Sediment Removal Frequency	Facility Life Span*
Retention Pond	5 to 15 years	20 to 50 years
EDB	2 to 10 years	20 to 50 years
Sand Filter	Every 6 months or as required	20 to 50 years
PLD	5 to 10 years	10 to 25 years
Grass Swale/Grass Buffer	As needed	10 to 25 years
Porous Paving	3 to 4 times per year	25 years

As an example, for EDBs, which need to have sediment removed once every two to ten years, ten to 50 percent of anticipated dredging costs should be collected annually. In addition, the average EDBs has a life expectancy of 20 to 50 years. A separate fund that collects two to five percent a year should be established for replacement. Anticipated interest may be used to offset the effects of inflation.

*Assumes the facility is maintained on a regular basis.

Estimating and Planning for Non-routine Costs for BMPs

Costs for non-routine maintenance of BMPs are highly specific and will vary depending upon:

- the type, size, and depth of the facility;
- the volume of the sediment trapped in the BMP;
- the accessibility of the BMP; and
- whether or not on-site disposal of the sediment is possible.

Retention Pond and EDB Sediment Removal

The technique used to remove sediment from a retention pond or EDB is very site-specific. The information below provides an estimate of costs associated with the dredging process.

- Mobilization and Demobilization of Machinery

Associated Costs: $1,000 to $10,000

Large retention ponds or regional facilities will often require a waterborne operation during which an excavator or a crane must be mounted to a floating barge and moved into position. For smaller ponds, larger ponds that can be drained or dredged from the shore, and extended detention basins, a perimeter or dry operation will usually suffice. In this case, a backhoe, truck equipment, or crane may be used to scoop out the sediment. Additional costs for the construction and restoration of access roads for trucks and heavy equipment may be accrued.

- Dredging

Associated Costs: $10 per cubic yard to $20 per cubic yard

The cost of dredging a BMP depends on the volume of sediment removed. The cost (expressed by cubic yard) is largely influenced by the depth of the water and the distance between the excavation area and the "staging area" where sediment is transferred to trucks for removal. Another consideration is whether equipment can easily access the BMP bottom. The following equation can be used to estimate the volume of sediment in cubic yards.

Equation to Estimate the Volume of Sediment in a BMP (in cubic yards)

surface area _____ (acres) **x** depth of sediment _____ (feet) **x** 43,560 **=** _____ cubic feet

cubic feet _____ **/** 27 **=** _____ **cubic yards**

- Disposal

Associated Costs: $5 per cubic yard - on-site to $47 per cubic yard - off-site

The primary determinant of disposal costs is whether on-site disposal is an option. If on-site disposal is not available, then locating a landfill or large area to apply the spoils may prove challenging and transportation costs may increase considerably. Dredged materials will require special disposal if found to contain hazardous materials.

Adding the likely costs of the sediment removal components establishes a range in which an owner can expect to pay for sediment/pollutant removal. For a facility with a small surface area (0.25 acres) overall costs can range from $4,000 to $10,000+. For a large facility (10 acres) overall costs can range from $170,000 to $550,000+.

	Maintenance	Annual Associated Cost
PLD	Removal of sediments and replacement of some level of soil is required periodically. Mulch should be replaced annually, or as needed.	Between $1,500 and $2,000, depending upon the size and complexity of the facility.
Grass Swale/ Grass Buffer	Remove sediments, replace check dams (usually made of earth, riprap, or wood), reseed or sod (if grassed) or replace dead plants, every two years.	
Porous Paving	Vacuum sediments from surface, twice a year.	Between $500 and $1,000, depending on the size of the facility.
Sand Filter	Remove the top filter cloth and remove/replace the filter gravel, when a semiannual inspection reveals that it is necessary. Remove and replace the filter cloth and gravel every three to five years.	Between $3,000 to $10,000, depending on the type and size of the sand filter and the amount of impervious surface draining to it.

If an oil sheen is present in the facility, it should be removed by a qualified oil recycler, which increases costs. Other expenses, such as removal of trash and hydrocarbons from water traps may also be required.

Removing sediment from stormwater facilities can be a considerable expense. Look for opportunities to reduce the amount of sediment entering the pond from the surrounding drainage area.

Reference: Information adapted from “Maintaining Stormwater Systems, A Guidebook for Private Owners and Operators in Northern Virginia”, January 2007, Northern Virginia Regional Commission

Appendix H

Civil Engineer
Stormwater Best Management Practice (permanent) Certification Letter

(date)

Attn.:

Gentlemen:

The permanent stormwater Best Management Practices (BMPs) for *(Name of project & Subdivision Name (required) & address)* consist of *(description of the BMPs, e.g.,type, WQCV, drainage area, etc.)*. (*Name of Civil Engineering Firm)* has reviewed the attached letter(s) from (*Name of Geotechnical Engineering Firm*) and from *(Name(s) Landscape Architect Firm and/or Other Involved Firms)*, as appropriate. Based upon this information and information gathered during periodic site visits to the project during significant/key phases of the stormwater BMP installation, *(Name of Engineering Firm)* is of the opinion that the stormwater BMPs have been constructed in general compliance with the approved Erosion and Stormwater Quality Control Plan, Construction Plans, and Specifications as filed with the County.

Statement Of Engineer In Responsible Charge:

I, _____*(print name)*, a registered Professional Engineer in the State of Colorado, in accordance with Sections 5.2 and 5.3 of the Bylaws and Rules of the State Board of Registration for Professional Engineers and Professional Land Surveyors, do hereby certify that I or a person under my responsible charge periodically observed the construction of the above mentioned project. Based on the on-site field observations and review of pertinent documentation, it is my professional opinion that the required permanent BMPs have been installed and are in general compliance with the approved Erosion and Stormwater Quality Control Plan, Construction Plans, and Specifications as filed with the of County. For BMPs with a Water Quality Capture Volume (WQCV), I have attached the post-construction As-Built drawings. The As-Built drawings accurately depict the final installation of the stormwater BMPs and verify the WQCV.

(Name of Engineer, P.E.)
Colorado No. XXXXX *Seal & Signature of P.E. Goes Here*