STORM SEWER SYSTEM MAINTENANCE AGREEMENT

(Woodland Park)

THIS STORM SEWER SYSTEM MAINTENANCE AGREEMENT ("Agreement') is made this ____ day of _____, 2016 by and between the City of Rochester Hills, a Michigan municipal corporation (the "City"), whose address is 1000 Rochester Hills Drive, Rochester, Michigan 48309-3033, and Pulte Homes of Michigan LLC, a Michigan limited liability company ("Developer") whose address is 100 Bloomfield Hills Parkway, Bloomfield Hills, Michigan 48304.

RECITALS

A. Developer is the owner of real property located in the City of Rochester Hills, Oakland County, Michigan, depicted and described on attached Exhibit A (the "Property").

B. Developer intends to develop the Property as a residential condominium to be known as Woodland Park ("Development").

C. The Development will alter the natural flow of surface and storm water drainage.

D. Developer desires to extend to the future owners of units in the Development ("Units") the right to use and benefit from the storm water detention facilities of the Development and to provide a permanent method for the support and upkeep of the detention facilities.

E. Developer has proposed and the City has approved a storm water drainage and detention system (the "Storm Sewer System") as shown on the plans attached as Exhibit B ("Storm Sewer Plan").

F. Both the Developer and the City will benefit from the proper operation, use and maintenance of the Storm Sewer System and desire to enter into this Agreement for the use and maintenance of the Storm Sewer System.

G. Developer intends to record the Master Deed for Woodland Park ("Master Deed") which will incorporate the terms of this Agreement, and establish the Woodland Park Condominium Association ("Association") to administer the affairs of the Development.

H. The Storm Sewer System is fully delineated on the Condominium Subdivision Plan to be attached to the Master Deed and recorded.

I. The owners of the Units in the Development will be bound and benefitted by this Agreement.

NOW THEREFORE, in consideration of less than $100 and the mutual promises contained herein, the parties hereto agree as follows:

1. Storm Sewer System. Pursuant to the Master Deed and this Agreement, Developer will grant to each of the Unit owners and the Association the right to use, maintain, replace and repair the Storm Sewer System, including but not limited to the detention basin area and the storm sewer lines within the Development as delineated on the Storm Sewer Plan and the Condominium Subdivision Plan. Components of the Storm Sewer System include any and all storm water conveyance, storm water detention and storm water quality treatment facilities and devices, storm sewer pipe, catch basins, manholes, end-sections, ditches, swales, open water courses and rip-rap and shall be used solely for the purpose of conveying and detaining storm and surface drainage in the Development until such time as: (i) the City determines and notifies the Developer or Developer's successors and assigns, including the Association, in writing that it is no longer necessary to convey, or detain the storm and surface drainage; and (ii) an adequate alternative for conveying and detaining storm and surface drainage has been provided which is acceptable to the City and which includes the granting of any easements to the City or third parties as may be required or necessary for the alternative drainage system

2. Association. Control and jurisdiction over the Storm Sewer System shall be vested in the Association. Membership in the Association shall be mandatory for all Unit owners. The Association shall be responsible at its sole expense for the proper maintenance of the Storm Sewer System and for compliance with the terms of this Agreement.

The Association members, being the Unit owners, shall each bear their pro rata share of the total costs of maintaining the Storm Sewer System (including, without limitation, any real and personal property taxes assessed against the Storm Sewer System, and insurance policies maintained with respect to the Storm Sewer System), which shall constitute a lien against each member's Unit. The prorated share of the cost shall be based on each Unit owner's percentage of value as set forth in the Master Deed.

The Association shall have the authority to make and enforce regulations pertaining to the use and maintenance of the Storm Sewer System, which regulations shall be binding upon all members of the Association and consistent with this Agreement.

3. Maintenance of Storm Sewer System. The Association shall be responsible for the proper maintenance, repair and replacement of the Storm Water System and all of its parts as set forth in the Maintenance Schedule and Checklist attached hereto as Exhibit C (the "Maintenance Plan"). In no event shall the detention basin areas be used for any purpose other than detention of surface water without the prior written consent of the Association and the City.

4. Failure to Maintain Storm Sewer System. In the event the Association fails at any time to maintain the Storm Sewer System (including without limitation the detention basin) in

reasonable order and condition, the City may serve written notice upon the Association or upon its members setting forth the manner in which the Association has failed to maintain the Storm Sewer System in a reasonable condition and such notice shall include a demand that deficiencies of maintenance be cured within thirty (30) days thereof. The notice shall further state the date and place of a hearing thereon before the City Council or other such board, body or official to whom the City shall delegate such responsibility, which shall be held at least fourteen (14) days after the date of the notice. At such hearing, the City Council or other designated board, body or official may affirm or modify the list and description of maintenance deficiencies and, for good cause shown, may give an extension of the time within which such deficiencies shall be cured.

Thereafter, if the deficiencies set forth in the original notice, or in the modification thereof; shall not be cured within the time allowed, the City may maintain the Storm Water System for a period of one (1) year. Such maintenance by the City shall not be construed as a trespass, constitute a taking of the Storm Sewer System, nor vest in the public any rights to use or enter the Storm Water System. Thereafter, if the Association does not properly maintain the Storm Water System, the City may, after providing similar written notice, schedule and hold another hearing to determine whether the City should maintain the Storm Water System for another year, and subject to a similar notice, hearing and determination in subsequent years.

In the event the City determines an emergency condition caused by or relating to the Storm Water System threatens the public health, safety or general welfare, the City shall have the right to immediately and without notice enter the Storm Water System and undertake appropriate corrective action.

5. Charges. The cost of any maintenance by the City, plus a ten percent (10%) administrative fee, shall be assessed against the Association and, if not timely paid, added to the tax rolls pro rata as to each Unit, which charges shall be a lien and shall be collectable and enforceable in the same manner general property taxes are collected and enforced.

The Association members shall each bear a pro rata share of the total costs of maintaining the Storm Sewer System, which pro rata share shall constitute a lien against each member's Unit, and if not paid, the City shall have the right to add a pro rata share of such charges to the tax rolls and collect it in the same manner as provided above. The pro rata share of the cost shall be based on each Unit owner's percentage of value as set forth in the Master Deed. The cost of maintenance by the City shall be assessed against the Association or the Association members at the City's discretion.

In the event the City declares the existence of an emergency upon, caused by or relating to the Storm Sewer System, and the City takes appropriate corrective action, the City shall have the right to charge and collect the costs for such corrective action, as provided in this Agreement.

6. Notice. Any notices required under this Agreement shall be sent by certified mail to the address for each party set forth below, or to such other addresses as such party may notify the other parties in writing:

To the Developer: PULTE HOMES OF MICHIGAN LLC
100 Bloomfield Hills Parkway

Bloomfield Hills, Michigan 48304

To the City: City Clerk
CITY OF ROCHESTER HILLS
1000 Rochester Hills Drive
Rochester Hills, Michigan 48309

To the Association: WOODLAND PARK CONDOMINIUM ASSOCIATION
100 Bloomfield Hills Parkway
Bloomfield Hills, Michigan 48304

7. Successors and Assigns. This Agreement shall constitute restrictions and covenants running with the Property. This Agreement shall be binding upon and benefit the parties and their respective transferees, successors and assigns.

8. Recording. This Agreement shall be recorded at the Oakland County Register of Deeds.

[*signatures on the following pages*]

DATED: _____, 2016

CITY OF ROCHESTER HILLS, a Michigan municipal corporation

By: _____

Its: Mayor

and

By: _____

Its: Clerk

STATE OF MICHIGAN)
) ss
COUNTY OF OAKLAND)

Acknowledged before me on _____, 2016 by _____, the Mayor, and _____, the Clerk, of the City of Rochester Hills, a Michigan municipal corporation, on behalf of the corporation.

_____
Notary Public
_____ County, MI
Acting in Oakland County, MI
My Commission Expires: _____

[*signatures continue on the following page*]

PULTE HOMES OF MICHIGAN LLC

By: _____
Paul Schyck
Its: Authorized Agent

STATE OF MICHIGAN)
) ss.
COUNTY OF OAKLAND)

Acknowledged before me on August 30, 2016, by Paul Schyck, Authorized Agent of Pulte Homes of Michigan LLC, a Michigan limited liability company, on behalf of the company.

_____

Notary Public Wayne County, Michigan
Acting in Oakland County, Michigan
My Commission Expires: _____

Zina P. Thomas
Notary Public, State of Michigan
County of Wayne
My Commission Expires Feb. 01, 2019
Acting in the County of Oakland

Drafted by:
Sandra Sorini Elser
Bodman PLC
201 S. Division Street, Suite 400
Ann Arbor, MI 48104

When recorded, return to:
City of Rochester Hills
1000 Rochester Hills Drive
Rochester Hills, MI 48309

TAX PARCEL ID: _____

John Staran
Approved 10/11/16

EXHIBIT "A"

15-002
WOODLAND PARK

LEGAL DESCRIPTION

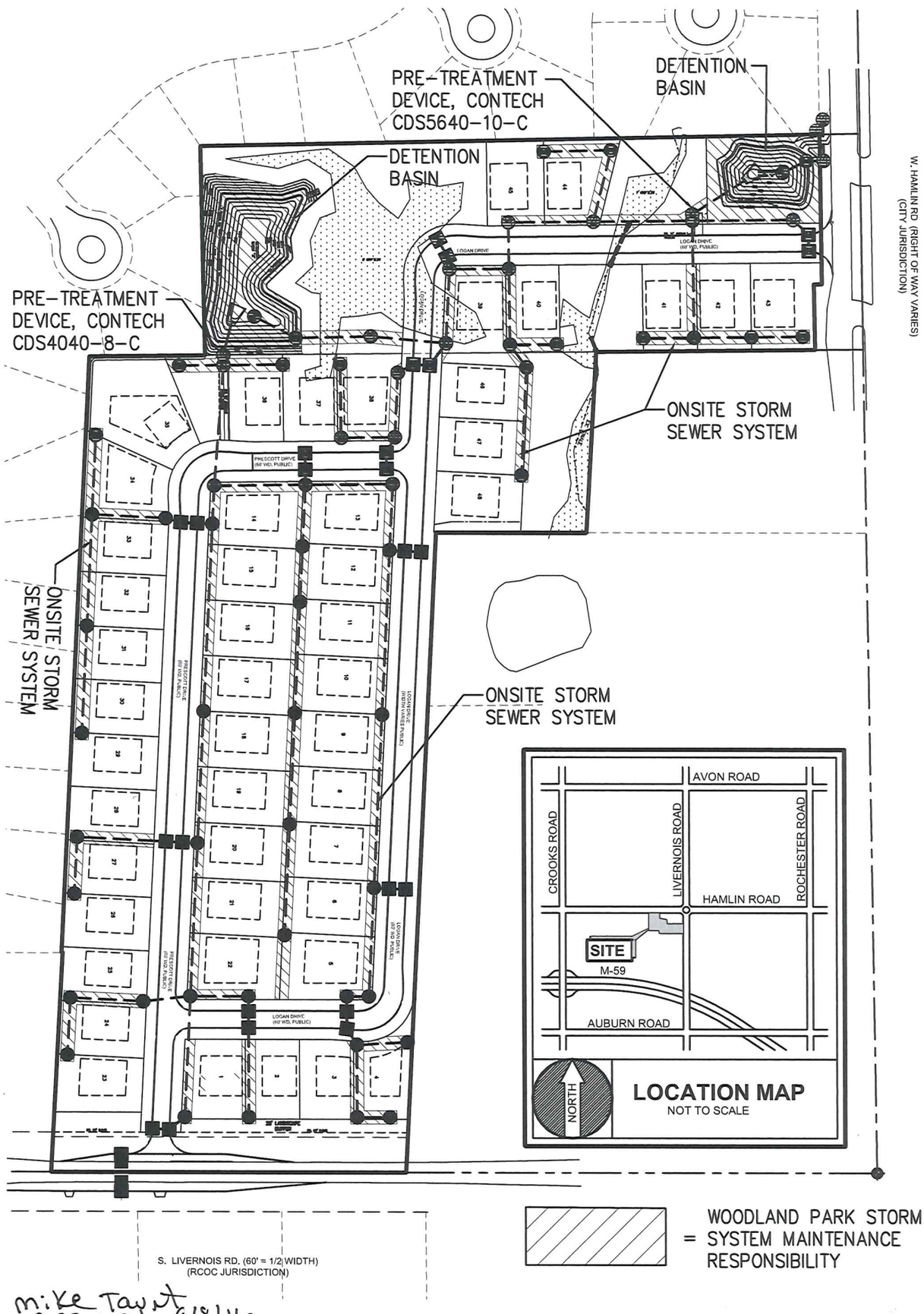
A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS; COMMENCING AT NORTHEAST CORNER OF SAID SECTION 28; THENCE SOUTH 705.50 FEET ALONG THE EAST LINE OF SECTION 28 AND N87°1047"W 60.07 FEET TO THE POINT OF BEGINNING; THENCE EXTENDING SOUTH 530.28 FEET ALONG THE WEST LINE OF LIVERNOIS ROAD (60.00 FEET 1/2 WIDTH); THENCE N.86°50'01"W 271.11 FEET; THENCE SOUTH 1.60 FEET; THENCE ALONG THE NORTHERLY AND EASTERLY LINE OF "WHISPERING WILLOWS NO. 1 AS RECORDED IN LIBER 173 ON PAGES 1-4, OAKLAND COUNTY RECORDS THE FOLLOWING COURSES AND DISTANCES; N87°10'47"W 898.39 FEET, N00°38'51"W 172.73 FEET, S88°51'51"W 314.56 FEET AND N01°17'26"W 927.16 FEET TO THE SOUTH RIGHT OF WAY LINE OF HAMLIN ROAD; THENCE ALONG THE SOUTH RIGHT OF WAY LINE OF HAMLIN ROAD THE FOLLOWING (3) THREE COURSES AND DISTANCES. (1) N89°12'02"E 226.31 FEET, (2) S00°47'58"E 12.00 FEET, (3) N89°12'02"E 98.62 FEET; THENCE S00°38'51"E 328.00 FEET; THENCE S86°46'06"E 271.56 FEET; THENCE SOUTH 225.34 FEET; THENCE S87°10'47"E 906.53 FEET TO THE POINT OF BEGINNING. CONTAINING 22.423 ACRES OF LAND.

SUBJECT TO ANY EASEMENTS AND/OR RIGHTS OF WAY RECORDED OR OTHERWISE.

#15-28-226-001, -007, -008, -021, -022
& #15-28-204-004

Mike Taunt
Approved 11/3/16

WOODLAND PARK
EXHIBIT B
STORM WATER MAINTENANCE AGREEMENT



Mike Taunt Approved 9/8/16

CLIENT	PROJECT NO.	FIELD BOOK
PULTE HOMES	15-002	000
	DATE 02-17-16	SHEET 1
SCALE 1"=200'	DRAWN BY L.A.	CHECKED BY C.T.

FAZAL KHAN & ASSOCIATES, INC.
CIVIL ENGINEERS & LAND SURVEYORS
43279 SCHOENHERR STERLING HEIGHTS, MI 48313
PHONE (586) 739-8007 FAX (586) 739-6994
WWW.FAZALKHAN.COM

EXHIBIT 'C'
OPERATIONS AND MAINTENANCE MANUAL

Woodland Park
STORMWATER MAINTENANCE PLAN
ROCHESTER HILLS, MICHIGAN

PROPERTY OWNER:
Pulte Land Company, LLC
100 Bloomfield Hills Parkway
Bloomfield Hills, MI 4830

Prepared by:
Fazal Khan & Associates, Inc.
43279 Schoenherr
Sterling Heights, MI 48313
Phone: (586) 739-8007
Contact: Carol P. Thurber, PE, CFM

OPERATION AND MAINTENANCE MANUAL

INTRODUCTION:

This manual identifies the ownership, operation and maintenance responsibilities for all storm water management systems including the sedimentation and detention basins, underground storm sewer system, mechanical pre-treatment devices and bioswales as incorporated into and detailed on the approved Construction Plans as prepared by Fazal Khan & Associates, Inc. In order to comply with the local best management practices (BMP) and requirements, this manual should serve as a minimum performance standard. This manual should be retained intact and read in its entirety by all parties responsible for the operations and maintenance of the on-site BMP's.

Developer:
Pulte Land Company, LLC
100 Bloomfield Hills Parkway
Bloomfield Hills, MI 48304

PROPERTY INFORMATION:

This Operations and Maintenance Manual covers the storm water systems located at the following subject property:

LEGAL DESCRIPTION: (see Exhibit 'A' of the Storm Water Maintenance Agreement)
A PARCEL OF LAND LOCATED IN THE NORTHEAST 1/4 OF SECTION 28, TOWN 3 NORTH, RANGE 11 EAST, CITY OF ROCHESTER HILLS, OAKLAND COUNTY, MICHIGAN, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS; COMMENCING AT NORTHEAST CORNER OF SAID SECTION 28; THENCE SOUTH 705.50 FEET ALONG THE EAST LINE OF SECTION 28 TO THE POINT OF BEGINNING; THENCE EXTENDING SOUTH 530.65 FEET ALONG THE EAST LINE OF SECTION 28; THENCE N.86°50'01"W 331.20 FEET; THENCE SOUTH 1.60 FEET; THENCE ALONG THE NORTHERLY AND EASTERLY LINE OF "WHISPERING WILLOWS NO. 1 AS RECORDED IN LIBER 173 ON PAGES 1-4, OAKLAND COUNTY RECORDS THE FOLLOWING COURSES AND DISTANCES; N87°10'47"W 898.39 FEET, N00°38'51"W 172.73 FEET, S88°51'51"W 314.56 FEET AND N01°17'26"W 927.16 FEET TO THE SOUTH RIGHT OF WAY LINE OF HAMLIN ROAD; THENCE ALONG THE SOUTH RIGHT OF WAY LINE OF HAMLIN ROAD THE FOLLOWING (3) THREE COURSES AND DISTANCES. (1) N89°12'02"E 226.31 FEET, (2) S00°47'58"E 12.00 FEET, (3) N89°12'02"E 98.62 FEET; THENCE S00°38'51"E 328.00 FEET; THENCE S86°46'06"E 271.56 FEET; THENCE SOUTH 225.34 FEET; THENCE S87°10'47"E 966.61 FEET TO THE POINT OF BEGINNING. CONTAINING 23.154 ACRES OF LAND.

STORMWATER MAINTENANCE EXHIBIT:

Exhibit 'B' of the Storm Sewer Maintenance Agreement is the Storm Water System Plan which provides a clear presentation of all components of the storm water system. This system is subject to the long-term operation and maintenance responsibilities detailed in this manual. The system includes:

- Storm sewer pipes
- Storm sewer structures (manholes, inlets, catch basins etc.)
- Detention Basins
- Pre-Treatment Devices (CDS 4040-8 and CDS 5640-10)

INSPECTIONS:
The frequency of system inspections outlined in the manual and attached exhibits should be considered the minimum, if no events warrant additional inspections. The frequency of inspections should be fine-tuned over time as system specific conditions are better known and the rate at which certain maintenance operations need to be performed is better understood. Maintenance Inspection Checklists are provided for each of the BMP's in this system. Inspections should be performed by personnel responsible for maintenance and may need to be certified for confined space entry, depending on the component being inspected. Operation of the detention basin, sediment basin, outlet control structures and pre-treatment devices may need to be inspected by a practicing civil engineer familiar with their operation.

Records of all routine inspections and any work performed on the system for maintenance, repair or replacement should be maintained by the owner and kept for a minimum of ten (10) years. A copy of all records should be provided to the City of Rochester Hills Engineering Division. The records should include this manual, all inspection sheets, approved construction plans and as-built documents, a maintenance log of work performed to the system(s) and contact information for the system inspector, civil engineer, landscape architect, geotechnical engineer and contractor involved with the system.

STORM SEWER SYSTEMS MAINTENANCE:
Regular inspection and maintenance of BMP's are necessary if these facilities are to consistently perform up to expectations. Storm water systems are expected to perform quality and quantity control functions as long as the land use they serve exists. Failure to maintain these systems can create the following adverse impacts:

Increased pollutants to surrounding surface water features
Potential loss of life or property resulting from catastrophic failure of the facility
Aesthetic or nuisance conditions, such as mosquitoes or reduced property values due to a degraded facility appearance.

Most of these impacts can be avoided through proper and timely inspection and maintenance. A major concern associated with these impacts is the general public's expectations related to the quality of life provided, in part, by construction of these systems. Inadequate maintenance means the general public may have a false sense of security. The most common cause of storm water system failure is the lack of adequate and proper operation, inspection, maintenance and management.

Good design and construction can reduce subsequent maintenance needs and costs, but they cannot eliminate the need for maintenance altogether Maintenance requires a long term commitment of time, money, personnel and equipment. Monitoring the overall performance of the storm water management system is a major aspect of any maintenance program.

The maintenance responsibilities for these systems lie with the current property owner and transfer with the property in perpetuity. If maintenance of the system is not performed, the City of Rochester Hills reserves the right to enter the property and perform all necessary work at the property owners' cost. Refer to the Agreement for Storm Sewer System Maintenance for additional details.

General Maintenance Items:
Grass Mowing and Maintenance:
Mowing requirements for a development should be designed to the specific site conditions, grass types and seasonal variations in climate. Grassed areas require periodic fertilizing, de-thatching and soil conditioning in order to maintain healthy growth. Provisions will need to be made to reseed and reestablish grass cover in areas damaged by sediment accumulation, storm water flow, erosion or other causes. Dead turf will need to be replaced after being discovered. Inspection of the grass areas and other landscaping features should be made annually. Grass mowing and maintenance shall be the responsibility of the individual

homeowners.

Trash and Debris Removal:
Removal of trash and debris from all areas of the property should be performed monthly. Removal of these items will prevent damage to vegetated areas and eliminate their potential to inhibit the operation of any of the storm water management systems. Sediment, debris and trash that are removed and collected should be disposed of according to local, State and Federal regulations at suitable disposal and/or recycling centers.

Storm Sewer System Maintenance Items:

The following narratives give an overview of the maintenance requirements of the different components of the storm water system. The inspection checklists attached to this report offer a more complete listing of what should be inspected, when inspection should occur and the likely frequency of maintenance activities.

Storm Sewer and Structures:
Catch basins, inlets, manholes and sewer pipes should be inspected to check for sediment accumulation and clogging, floatable debris, dead vegetation etc. The structures and sewers should also be observed during a wet weather event to ensure their proper operation. Accumulated sediment and debris should be removed on an annual basis or as needed based on observed conditions. Structural repairs or maintenance should occur as needed based on observed conditions such as cracks, spalling, joint failure, leakage, misalignment or settlement of structures. A civil engineer should be retained if problems are thought to exist.

Storm water Pre-Treatment Devices (CDS 4040-8 and CDS 5640-10):
Refer to the attached maintenance manual from the manufacturer for all inspection and maintenance requirements for the SWTC structure.

Detention Basin Outlet Control Structure and Overflow Structure:
Both the outlet control and overflow structures and connecting pipes should be inspected for sediment accumulation, floatable debris, trash and any other foreign matter that may impede flow or restrict the devices from working properly. The stone jacket surrounding the outlet control structure should be inspected for sediment build up, and the holes at the base of the outlet control structure should be inspected to make sure they do not become blocked. The grates of the two structures should be inspected for structural integrity and build-up of debris. The outlet control system should be inspected during a wet weather event to ensure all components are functioning properly. A civil engineer should be retained if problems are thought to exist.

Maintenance will include the removal of any debris, trash or sediment from the structures and/or pipe, cleaning of the stone jacket on the outlet control structure and removal of debris from the structure grates. The stone jacket may need replacement if cleaning does not adequately remove sediment build-up.

Detention Basin:
The inlet pipes to the basins should be inspected for structural integrity (pipes cracked, broken, spalled) and that the grates are free from debris. The area around and immediately downstream of the inlet pipes should be inspected for sediment build-up, erosion and the riprap should be inspected for integrity and sedimentation. Maintenance of the inlet pipes would include removal of any sediment build-up and debris, repair or replacement of any components that are in need of attention and to restore any areas that have eroded.

The basin should be inspected for healthy grass growth, side slope erosion, and excessive sedimentation. The basin should be inspected during a wet weather event to ensure all aspects of the basin are functioning correctly. A civil engineer should be retained if problems are thought to exist or if the inspection personnel are not familiar with the operating conditions of the basin.

The planted vegetation within the basin should conform to that shown on the construction plans, and any invasive species should be removed from the swale. The vegetation should be inspected for healthy growth by a landscape architect if the inspection personnel are not familiar with the specific plantings inside the basin.

Any resident complaints regarding the basin's aesthetics or operation should be investigated during inspections and wet weather operations.

The following pages include inspection checklists for the various devices and components listed above as well as the manufacturer's manual for the CDS storm water treatment structure.

SEDIMENTATION AND DETENTION BASINS

DATE / TIME OF INSPECTION: _____

INSPECTOR: _____

MAINTENANCE TASKS AND SCHEDULE SYSTEM COMPONENTS POST-CONSTRUCTION MAINTENANCE ACTIVITIES	Riprap at Inlets	Overflow Spillway	Sideslopes & Banks	Buffer Strips	Basins	FREQUENCY	COMMENTS
MONITORING / INSPECTION							
Inspect for Sediment Accumulation	x	x			x	Annually	
Inspect for Floatables, dead vegetation and debris	x	x	x	x	x	Annually and after major rainfall	
Inspect for erosion	x	x	x	x	x	Annually	
Inspect all components during wet weather and compare to as-built plans*	x	x			x	Annually	
Inspect for Invasive Plant Species			x	x	x	Annually	
PREVENTATIVE MAINTENANCE							
Remove accumulated sediment	x	x		x	x	Annually or as needed	
Remove floatables, dead vegetation and debris	x	x	x	x	x	Annually or as needed	
Professional application of herbicide for invasive species that may be present			x	x	x	Annually or as needed	
Repair Erosion and/or reseed bare areas	x	x	x	x	x	Annually or as needed	
REMEDIAL ACTIONS							
Repair / stabilize areas of erosion	x	x	x	x	x	As Needed	
Structural repairs	x	x				As Needed	
Make adjustments / repairs to ensure proper functioning	x	x			x	As Needed	
Excavate and reshape Sed. Basin after major sediment removal (once sediment accumulates to 6"-12" or re-suspension of sediment is observed)*					x	As Needed	

* A civil engineer should be retained to observe basin operation

SUMMARY:

INSPECTOR'S REMARKS: _____

_____

_____

OVERALL CONDITION OF SYSTEM: _____

RECOMMENDED ACTIONS NEEDED: _____

DATES ANY MAINTENANCE MUST BE COMPLETED BY: _____

CONTECH®
ENGINEERED SOLUTIONS

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.9	0.7
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3
CDS5640	10	3.0	6.3	1.9	8.7	6.7
CDS5653	10	3.0	7.7	2.3	8.7	6.7
CDS5668	10	3.0	9.3	2.8	8.7	6.7
CDS5678	10	3.0	10.3	3.1	8.7	6.7

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

Contech Engineered Solutions LLC provides site solutions for the civil engineering industry. Contech's portfolio includes bridges, drainage, sanitary sewer, stormwater, earth stabilization and wastewater treament products. For information, visit www.ContechES.com or call 800.338.1122

The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; 7,296,692; 7,297,266; 7,517,450 related foreign patents or other patents pending.

CONTECH
ENGINEERED SOLUTIONS
800.925.5240
www.ContechES.com

CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than the values listed in table 1 the system should be cleaned out. **Note: to avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.