

# 540/Drainage System Maintenance

**Community Rating System**  
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Activity 540 – Drainage System Maintenance

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Activity 540 – Drainage System Maintenance

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**540 Drainage System Maintenance**



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**540 Drainage System Maintenance**

**CRS Resources**

Home - 2013 Manual 100 Series 200 Series 300 Series 400 Series 500 Series 600 Series 700 Series

[www.CRSResources.org](http://www.CRSResources.org)

CRS Resources Home

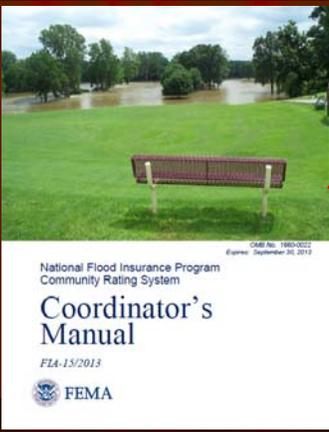
*This is the temporary location of the CRS Resources webpage. This website is provided for webinar participants, users groups, and CRS coordinators to obtain reference materials related to ongoing refinements of the CRS. Here you will find CRS guidance documents, worksheets, and tools relevant to the activities to be credited under the New CRS Coordinator's Manual.*

Use the menu above to find resources organized by CRS Activity.

Download the 2013 CRS Coordinator's Manual

New communities can click here to find the CRS application and Quick Check.

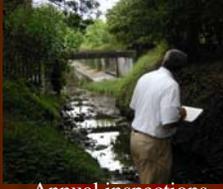
**540 Drainage System Maintenance**



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**540 Drainage System Maintenance**

Objective: keeps channels and storage basins clear of debris to maintain their flood carrying and storage capacity



Annual inspections



Identify problems



Remove debris

# 540/Drainage System Maintenance

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**541.a Activity description**

- Drainage system: all natural and man-made watercourses, conduits and storage basins
- Conveyance system: channels that must be maintained to prevent damage to buildings or infrastructure from smaller, more frequent, storms.
  - Generally focus on open channels
  - Generally concerned only with developed areas
  - Must include repetitive loss areas with drainage problems



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**541.a Activity description**

- Storage basins: all constructed stormwater runoff detention or retention facilities located on public and private property
- The first four elements deal with conveyance
- The fifth element addresses storage



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**541.b Activity credit criteria**

- (1) Inspections: annually, post-storm, after a complaint
  - ✓ Credit adjusted if not all of the system inspected annually
- (2) Operations and maintenance by any agency
  - ✓ Community responsible for the CRS documentation
- (3) Must have secure funding source
- (4) Must comply with EHP criteria (community certifications)
- (5) Include permit restrictions in the procedures



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**542.a Channel debris removal (CDR)**

Credit criteria

- (1) Meet all activity credit criteria
- (2) Inspections: annually, after a complaint, after storms
  - ✓ Take action when a problem is found
- (3) Map of the components of the conveyance system
- (4) Inventory of the conveyance system components
- (5) Written procedures
- (6) Records of inspections and maintenance



**540 Drainage System Maintenance** Page 540-6

**Map and Inventory**

Step 1. Identify the developed area of the community.

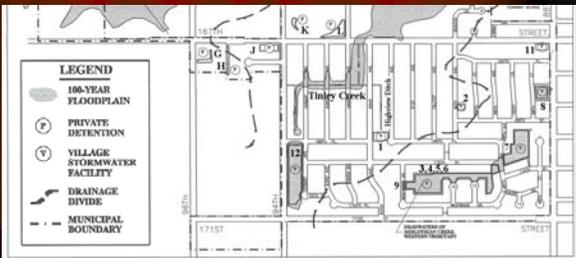
- ✓ Include: all developed portions of the community
- ✓ May exclude undeveloped areas
  - ✓ Areas of 5 acre lots may be eliminated
  - ✓ Areas with no buildings may be eliminated



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Step 2. Map the conveyance system

- (a) Include public and private areas
- (b) Include all channels in developed SFHA



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Step 2. Map the conveyance system

- (a) Include public and private areas
- (b) Include all channels in developed SFHA
- (c) Include all "blue lines" on USGS quadrangle maps
- (d) Include all channels draining > 40 acres, including pipes and underground segments

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Step 2. Map the conveyance system

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Step 2. Map the conveyance system

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Step 3. Identify and label the components

"Components" – structures (bridges, culverts)

- Channel segments between two structures
- Long segments are divided into < 1/5 mile lengths

Show underground components on the map, but not on the list

Label each component, if they are not already labeled

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Step 3. Identify and label the components

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Step 4. Inventory the components

Component	Type	Description	Owned By		
CH0001	Channel	Between 1st Street and Central	City		
CU0001	Culvert	Jones Creek at Central	City		
CH0002	Channel	Between Central and Main	City		
BR0001	Bridge	Jones Creek at Main	County		
CH0003	Channel	Between Main and Grand Avenue	Private		
CU0002	Culvert	Jones Creek at Grand Avenue	City		

Component labels are locally determined

There may already be names for components

# 540/Drainage System Maintenance

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Step 5. Show which components are covered by the program

Component (cCDC)	Type	Description	Owned By	Credited (nCDR)	Problem Site?
CH0001	Channel	Between 1st St. and Central	City	Yes	
CU0001	Culvert	Jones Creek at Central	City	Yes	Yes
CH0002	Channel	Between Central and Main	City	Yes	
BR001	Bridge	Jones Creek at Main	County	Yes	Yes
CH003	Channel	Between Main and Grand Avenue	Private	No	
CU001	Culvert	Jones Creek at Grand Avenue	City	Yes	

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Step 6. Show the problem site maintenance locations on the map and list the locations in the inventory

Component (cCDC)	Type	Description	Owned By	Credited (nCDR)	Problem Site?
CH0001	Channel	Between 1st St. and Central	City	Yes	
CU0001	Culvert	Jones Creek at Central	City	Yes	<u>Yes</u>
CH0002	Channel	Between Central and Main	City	Yes	
BR001	Bridge	Jones Creek at Main	County	Yes	<u>Yes</u>
CH003	Channel	Between Main and Grand Avenue	Private	No	
CU001	Culvert	Jones Creek at Grand Avenue	City	Yes	

If requesting problem site maintenance (PSM) credit

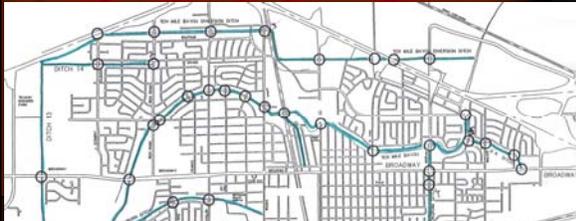
drainage	BR001	Channel
Problem site	CH0003	

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Procedures

The procedures document must include:

- (1) Who is responsible
- (2) Map of the conveyance system



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Procedures

The procedures document must include:

- (1) Who is responsible
- (2) Map of the conveyance system
- (3) List of all components

Component (cCDC)	Type	Description	Owned By	Credited (nCDR)	Problem Site?
CH0001	Channel	Between 1st St. and Central	City	Yes	
CU0001	Culvert	Jones Creek at Central	City	Yes	Yes
CH0002	Channel	Between Central and Main	City	Yes	
BR001	Bridge	Jones Creek at Main	County	Yes	Yes
CH003	Channel	Between Main and Grand Avenue	Private	No	
CU001	Culvert	Jones Creek at Grand Avenue	City	Yes	

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Procedures

The procedures document must include:

- (1) Who is responsible
- (2) Map of the conveyance system
- (3) List of all components
- (4) Procedures for inspections
- (5) Debris removal procedures

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(5) Debris removal procedures

Debris:



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(5) Debris removal procedures

Natural Channel      Human-Made Ditch

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(5) Debris removal procedures

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Procedures

The procedures document must include:

- (1) Who is responsible
- (2) Map of the conveyance systems
- (3) List of all components
- (4) Procedures for inspections
- (5) Debris removal procedures
- (6) Records

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Village of Orland Hills, Illinois  
Drainage Inspection Report - Public Properties

Date: \_\_\_\_\_ Inspector: \_\_\_\_\_

Type of inspection:  Semi-annual     Monthly Choke Point Check     Post-storm

I have inspected the following surface drainage facilities and found them as noted. The numbers and letters refer to locations on the Village's drainage system map. A Complaint Inquiry Form has been completed for all problems found on Village property. A notification letter has been sent to the owners of private property where problems were found.

Retention basin, 17001 94th Ave (#12)	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found
Tinley Creek from 169th Place to 167th Street	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found
Retention basin, 16901 92nd Ave (#1)	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found
Highview Ditch	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found
Tinley Creek from 167th Street to Lake Lorin	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found
Lake Lorin and dam	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found
Retention area, 8901 Elm Place (#14)	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found
Ashbourne Lake and drain to Tinley Creek	<input type="checkbox"/> No problem	<input type="checkbox"/> Problem found

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**DRAINAGE PROBLEM REPORT**

Date: \_\_\_\_\_ Inspector: \_\_\_\_\_

-----

Date: \_\_\_\_\_ Right of entry needed? \_\_\_\_\_

Work order description: \_\_\_\_\_

-----

State permit needed? \_\_\_\_\_ Work order number: \_\_\_\_\_

-----

Date: \_\_\_\_\_ Crew chief: \_\_\_\_\_

Maintenance performed: \_\_\_\_\_

-----

Inspected by: \_\_\_\_\_

Use other side for additional recommendations for this site.

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Credit points

CDR = 200 points for channel debris removal within the community's conveyance system in accordance with the credit criteria

Impact adjustment

$$rCDR = \frac{nCDR}{nCDC}, \text{ where}$$

nCDR = the number of conveyance system components inspected and maintained, and

nCDC = the total number of conveyance system components in the developed portion of the community's drainage system

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Impact adjustment example

nCDC = 6      nCDR = 5

Component (cCDC)	Type	Description	Owned By	Credited (nCDR)	Problem Site?
CH0001	Channel	Between 1st St. and Central	City	Yes	
CU0001	Culvert	Jones Creek at Central	City	Yes	Yes
CH0002	Channel	Between Central and Main	City	Yes	
BR001	Bridge	Jones Creek at Main	County	Yes	Yes
CH003	Channel	Between Main and Grand Avenue	Private	No	
CU001	Culvert	Jones Creek at Grand Avenue	City	Yes	

$rCDR = \frac{nCDR}{nCDC} = \frac{5}{6} = 0.83$   
If  $rCDR < 0.1$ , use 0.1

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Documentation

- At the verification visit
  - Procedures
  - Conveyance system map
  - Conveyance system inventory
  - Records of inspections and maintenance
  - EHP community certification
- With recertification:
  - Examples of records from the previous year

**540 (Drainage System Maintenance)** Appendix F

EHP Community Certification

Compliance with Environmental and Historic Preservation Requirements (see Section 541.1(a) in the CRIS Coordinator's Manual).

On each one of the tables below, initial to signify that the described steps were (or are) taken. Sign at the end of the certification. More information on these programs can be found in Figure 500-6 in the Coordinator's Manual.

Note: To receive credit under Activity 540, the self-certification of compliance with environmental and historic preservation requirements incorporated in this certification must be submitted with a CRIS application, a modification, or a cycle verification.

**All Projects**

**Certification Statement for Drainage System Maintenance**

**State and local requirements:** In addition to federal laws, implementing regulations, and executive orders, the drainage maintenance activities also must consider the applicable requirements of all state and local environmental and historic preservation laws, ordinances, and policies.

**Protection of threatened and endangered species (Endangered Species Act):** Consideration is given to the protection and preservation of threatened and/or endangered species (including plants and animals and their habitat) whose existence may be threatened by the maintenance activities. Communication takes place with the U.S. Fish and Wildlife Service for the National Marine Fisheries Service if activity is in a coastal area and the applicable state agencies for threatened species and its habitat. Any recommendations made by the federal or state agencies are carried out.

**Design and fill materials (Clean Water Act, Section 404):** Consideration is given to all permit requirements for discharging dredge and fill material into waters of the United States, including wetlands, and communication with the U.S. Army Corps of Engineers takes place. Any recommendations made by the Corps are carried out.

**For all activities that involve heavy equipment and work in the disturbance and release of sediment, such as dredging, channel alteration, bank stabilization, ditches, removal, and other activities, consideration is given to any permit requirements under the Clean Water Act, Section 404. Communication with the U.S. Army Corps of Engineers takes place. Any recommendations made by the Corps are carried out.**

I certify that the items included above are correct to the best of my knowledge.

Name (printed): \_\_\_\_\_  
Name (signed): \_\_\_\_\_  
Title: \_\_\_\_\_ Date: \_\_\_\_\_

**540 (Drainage System Maintenance)** Appendix F

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✓ Does the program have all state and local permits?  
✓ Consistent with the Endangered Species Act?  
✓ Have all required 404 permits?

New certification needed at cycle visit

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542.b Problem site maintenance (PSM)

Credit criteria

- Meet activity criteria
- Must get CDR credit
- Written procedures
- Sites are on the map
- Procedures include:
  - Inspect more often
  - Inspect after storm
  - Take action

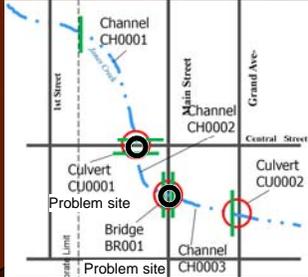


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542.b Problem site maintenance (PSM)

Procedures

- List each site
  - ✓ Why different
  - ✓ Inspection procedures
  - ✓ Who is responsible
- Records



# 540/Drainage System Maintenance

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**542.b Problem site maintenance (PSM)**

Credit points  
 PSM = 50

Impact adjustment  
 $rPSM = rCDR$

Documentation  
 Procedures  
 Records

Recertification  
 Records



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**542.c Capital improvement program (CIP)**

Ongoing program to make permanent changes  
 Not for a program of continuous maintenance  
 or one-time projects

Creditable examples:

- ✓ Enlarge culvert and bridge openings to eliminate bottlenecks
- ✓ Install permanent hard or soft bank protection measures
- ✓ Install grates to catch debris during high flows
- ✓ New retention basins to reduce flows into existing channels
- ✓ Convert problem channels into "low-maintenance" channels

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**542.c Capital improvement program (CIP)**

Credit criteria

- (1) Meet activity criteria
- (2) Must get CDR credit
- (3) Sites must be part of the conveyance system
- (4) Master list
- (5) [For full credit] engineering analysis
- (6) Annual expenditures

Projects that reduce flood levels may be eligible for 530 credit



**540 Drainage System Maintenance** Page 540-15

**542.c Capital improvement program (CIP)**

Credit points  
 CIP = 30  
 CIP = 70 if engineering analysis

Impact adjustment  
 $rCIP = rCDR$

Documentation

- (i) Master list of sites needing work
- (ii) Recommendations for the sites
- (iii) Show funds spent each year
- (iv) [For 70 points] Engineering analysis



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**542.d Stream dumping regulations (SDR)**



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**542.d Stream dumping regulations (SDR)**

Credit criteria

- (1) Must get CDR credit
- (2) Regulations must:
  - ✓ Be enforced throughout community
  - ✓ Designate responsible office
  - ✓ Have enforcement procedures
- (3) Additional credit with publicity



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**542.d Stream dumping regulations (SDR)**

Credit points

- SDR = 15
- SDR = 25 if publicized
- SDR = 30 if publicized via PPI

Impact adjustment

- None

Documentation

- (a) The regulations
- (b) [For > 15 points] Publicity



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**541.a Activity description**

Storage basins: all constructed stormwater runoff detention or retention facilities located on public and private property.



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**542.e Storage basin maintenance (SBM)**



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**542.e Storage basin maintenance (SBM)**

Credit criteria

- (1) Meet activity criteria
- (2) Must get 450 - SMR/PUB credit
- (3) Inspections:
  - (a) At least annually
  - (b) Upon complaint
  - (c) After big storms
- (4) Map all the basins
- (5) Inventory the basins
- (6) Records



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**542.e Storage basin maintenance (SBM)**

Procedures

- (1) Inventory of all the basins
- (2) Inspection procedures
- (3) Maintenance procedures
- (4) Records

Credit points

SBM = 120

Component (nSBC)	Type	Description	Owned by	Credited (nSBM)
Det0001	Detention	Central Creek Basin	City	Yes
Det00012	Detention	North Fork Clover	City	Yes
IN0001	Infiltration	Sunrise HOA	City	Yes
IN0002	Infiltration	Jones Creek at Main	County	Yes
Det0003	Detention	Northstar Safeway	Private	No
Det0004	Detention	Stonewater HOA	Private	Yes
Total:			6	5

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**542.e Storage basin maintenance (SBM)**

Impact adjustment

$$rSBM = \frac{nSBM}{nSBC} = \frac{5}{6} = 0.83$$

$nSBC = 6$                        $nSBM = 5$

Component (nSBC)	Type	Description	Owned by	Credited (nSBM)
Det0001	Detention	Central Creek Basin	City	Yes
Det00012	Detention	North Fork Clover	City	Yes
IN0001	Infiltration	Sunrise HOA	City	Yes
IN0002	Infiltration	Jones Creek at Main	County	Yes
Det0003	Detention	Northstar Safeway	Private	No
Det0004	Detention	Stonewater HOA	Private	Yes
Total:			6	5

# 540/Drainage System Maintenance

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**542.e Storage basin maintenance (SBM)**

Documentation

- (1) At the visit
  - (a) Procedures
  - (b) Map
  - (c) Inventory
  - (d) Records
  - (e) EHP certification
- (2) At recertification
  - (a) Records




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**542.f Coastal erosion protection maintenance (EPM)**

See *CRS Credit for Management of Coastal Erosion Hazards*



**540 Drainage System Maintenance**

**Verification**

Office review:  
inspection and  
maintenance  
records for a  
sample of sites

Field visit to  
those sites




**540 Drainage System Maintenance**

**Questions?**

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