Cobb County Water System

Community Partners for Healthy Streams

SERIES #6: SITE DESIGN & CONSTRUCTION

SERIES #6: Site Design and Construction

Community Partners for Healthy Streams is a cooperative effort between the Cobb County Water System and local business community.

COMMUNITY PARTNERS FOR HEALTHY STREAMS

NOTE: This handbook is one in a series of handbooks that describe specific practices businesses can use to protect water quality. A complete list of all handbooks and fact sheets available through the Community Partners for Healthy Streams program is provided on the back cover. To obtain other handbooks in this series, contact the Cobb County Water System at the address or phone number provided below.

Becoming a "Community Partner for Healthy Streams"

We hope you'll join with the Cobb County Water System and other area businesses and institutions by participating in the Community Partners for Healthy Streams program. Through this program, businesses help protect local streams.

To participate in the program, fill out the checklist in the back of this handbook. Send it to the address below and our staff will work with you to become a Community Partner for Healthy Streams. In return for your effort, we'll publicly acknowledge your business through press releases, displays and speaking engagements. We'll also encourage consumers to look for the Community Partners logo at your business when they select services.

Community Partners for Healthy Streams Program Manager
Cobb County Water System
662 South Cobb Drive
Marietta, GA 30060

Phone: (770) 528-1482

Fax: (770) 528-1483

www.cobbstreams.org

Handbook Design and Illustration by David Zinn

This program is modeled on the Community Partners for Clean Streams program created through a US EPA Clean Water Act Grant by the Offfice of Washtenaw County Drain Commissioner Janis A. Bobrin, Washtenaw County, Michigan.

Directions for Completing the Water Quality Assessment Checklist Questions at the End of this Booklet

- Please Read Carefully -

1. For each question, check the appropriate answer box in the Assessment column (*Always*, *Needs Improvement*, or *Not Applicable*).

2. Next, check the corresponding box in the Action Plan column (*Plan to Continue* or *Plan to Improve*).

3. For every activity, indicate:

- The **Responsible job or staff position(s)**. It is best to answer with a specific job position, i.e. facility manager.
- **Schedule** or proposed date by which the activity will be completed.
- **Action(s)** - please provide additional details regarding the implementation of a proposed activity, or explain what is already being done.
- If the action requires ongoing employee training or commitment from management, check that box as a reminder to include it in your employee education activities.

(See example below)

THE SELF-ASSESSMENT IS NOT COMPLETE UNTIL THIS INFORMATION IS PROVIDED FOR EACH QUESTION.

4. Finally, remove completed checklist sheets from the handbook and return them to the Community Partners for Healthy Streams Program. If you need help completing the Water Quality Assessment questions, please call the number listed below.

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Cobb County Water System
662 South Cobb Drive
Marietta, GA 30060

Phone: (770) 528-1482 Fax: (770) 528-1483

SAMPLE CHECKLIST QUESTION:

1. Steps are taken to minimize the amount of potentially polluting materials and wastes kept in storage.

ASSESSMENT

- ☐ Not applicable
- ☐ Always ..... ACTION PLAN: ☐ Plan to continue
- ☒ Needs Improvement ..... ACTION PLAN: ☒ Plan to improve

Responsible job or staff position(s): Safety Manager

Schedule: Materials will be in place by 12/01

Action(s): Spill kits, absorbent pads, and spill response plans will be placed near all areas that have the potential for spills.

☐ Requires ongoing education/commitment

COBB COUNTY WATER SYSTEM
COMMUNITY PARTNERS FOR HEALTHY STREAMS - FACT SHEET NO. **6.1**

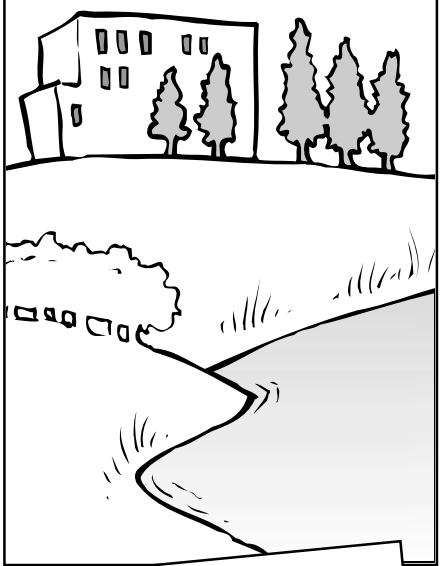
Designing Landscapes for Water Quality

SERIES #6:
SITE DESIGN & CONSTRUCTION

Why be concerned?

One of the most important ways to protect our streams and rivers is to preserve existing features that naturally manage stormwater such as wetlands, floodplains, vegetated areas, and permeable soils. Each of these helps to slow and store stormwater, as well as filter out pollutants. Preserving natural features also makes economic sense by reducing the need for building and maintaining structural stormwater controls.

Choosing low-maintenance plantings reduces the need for irrigation and landscape chemicals.



Local environmental protection regulations vary. Contact the community where the property is located to find out if any existing features are considered environmentally sensitive.

Protecting Natural Features and Drainage Patterns

Before preliminary site design, identify the following:

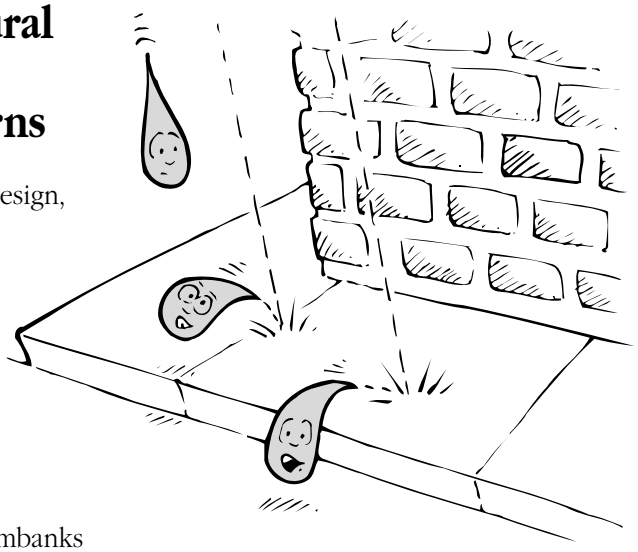
- wetlands
- woodlands
- floodplains
- permeable soils
- natural drainageways and depressions
- vegetation along streambanks

Once these have been delineated, provide for their protection and incorporation into drainage systems.

For help identifying the natural features on a site, contact the government offices where the property is located or one of the agencies listed under "Getting Help." For help incorporating natural features into your stormwater management system, contact Cobb County Stormwater Management.

Buffering Waterways

Maintain a variety of plantings (preferably, native) along pond and stream banks to help reduce the volume, velocity and pollutant loading of stormwater before it flows into the receiving waterway. Vegetated buffer areas should be as wide as possible since, the wider the buffer, the greater the opportunity for plants to slow and filter stormwater.



The Impact of Impervious Surfaces

Impervious surfaces (such as buildings, pavement, and compacted soils) prevent stormwater from filtering into the ground, increasing the volume and velocity of runoff. Since infiltration removes pollutants from stormwater, impervious surfaces also impair water quality.

• Minimize the use of concrete, asphalt and other impermeable surfaces. Consider alternatives such as modular pavers, grass block pavers or gravel.

• Design roads and pathways to reduce runoff velocities and increase stormwater infiltration. (For example, by reducing width and straightaway design.)

• Convey stormwater through grassed swales instead of enclosed pipes, whenever possible. For more information about designing stormwater management systems to protect water quality, call Cobb County Stormwater Management.

• Keep parking spaces to a minimum. Consider parking space banking for future expansion.

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"Disconnecting" Impervious Areas

Avoid directly discharging drainage pipes onto pavement and other impervious surfaces. Direct runoff from roofs, streets and parking lots to lawns, vegetated swales or other areas where stormwater can filter into the ground.

Designing Irrigation Systems

Design irrigation systems to prevent overwatering. Incorporating separate irrigation zones saves water and minimizes runoff by applying the appropriate amount of water in each zone.

Select systems that are easy to adjust and reschedule as weather patterns change. Place and adjust sprinkler heads to ensure comprehensive coverage, instead of watering longer to irrigate areas that are just out of reach.

Improving Pond and Stream Banks

Stream bank erosion, limited planting types and channel straightening degrade water quality. The first two problems may be improved by planting pond and stream banks with a variety of native plantings. For more information about planting pond and stream banks to improve water quality, contact one of the agencies listed under "Getting Help."

If you replant a pond or stream bank, replace unwanted plants gradually, so that their roots can hold the soil in place until the desired plants are established. For more information about how to prevent soil erosion when replacing plants, contact UGA Extension for Cobb County.

If stream improvement plans involve more than installing plants, a permit may be required. Contact Cobb County Stormwater Management for more information.

GETTING HELP

UGA Cooperative Extension
Service for Cobb County ... (770) 528-4070

Cobb County
Stormwater Management .. (770) 419-6435
Water Quality Section .... (770) 419-6441

Community Partners for
Healthy Streams ..... (770) 528-1482

COBB COUNTY WATER SYSTEM
COMMUNITY PARTNERS FOR HEALTHY STREAMS - FACT SHEET NO. 6.2

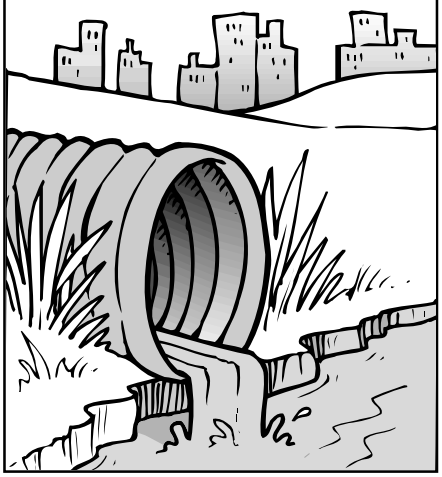
Designing Stormwater Management Systems

SERIES #6:
SITE DESIGN & CONSTRUCTION

Why be concerned?

In the past, stormwater was often transported off-site as quickly as possible. Today, this quick off-site transfer of stormwater is known to deliver pollutants to receiving waters much more efficiently, as well as to seriously erode pond and stream banks.

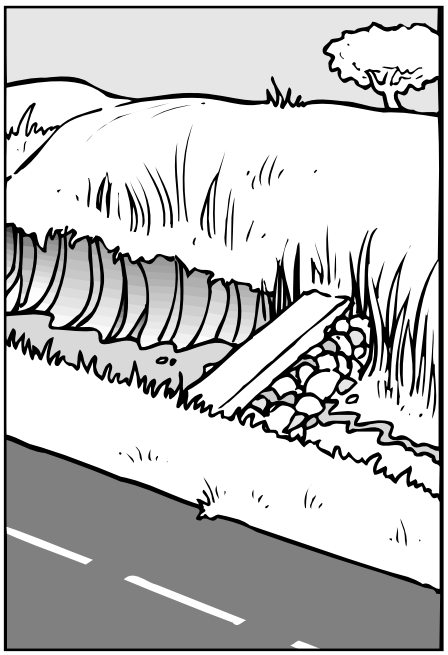
Current stormwater management practice is much more comprehensive. Objectives now include controlling bank erosion and water quality, as well as flooding. To achieve these objectives, the volume, velocity and pollutant load of runoff leaving a site after development must be similar to that which occurred under natural conditions. This can be accomplished by putting in place a coordinated network of both natural and engineered "best management practices" (BMPs) that work together to reduce, convey and treat stormwater runoff. In such a system, each BMP by itself may not provide major benefits but, when combined with others, becomes very effective.



Reducing Runoff and Pollutants at their Source

Source controls reduce the volume of runoff and eliminate opportunities for pollutants to enter the drainage system. By working to *prevent* problems, source controls are the best option for controlling stormwater and include:

- preserving wetlands, swamps, bogs, vegetation and other natural features that manage stormwater
- promoting stormwater infiltration by minimizing roads, parking lots and other impervious surfaces
- directing stormwater to open lawns and swales rather than to pavement or underground conveyances
- controlling soil erosion



Designing Systems to Protect Water Quality

After all practical source controls have been implemented, other controls will still be needed to manage runoff. These will be dictated, to some degree, by the soils, topography, and other conditions on-site, as well as the receiving waterway and local government standards. While each site will be different, there are some universal guidelines for controlling stormwater quantity and quality. For detailed information on designing stormwater management systems to protect water quality, call Cobb County Stormwater Management.

Designing Ponds to Control "Bankfull" Flooding

Studies show that pavement and other impervious surfaces increase the frequency of smaller, flashy, "bankfull" floods that fill stream channels but don't overflow them. These smaller floods – associated with storms that occur every 1.5 years or more often – seriously erode stream channels and destroy aquatic habitat. Designing ponds to capture and detain the 1.5-year storm will help avoid the negative impacts associated with "bankfull" flooding.

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Designing Ponds to Capture and Treat the "First Flush"

Most pollutants that accumulate on urban surfaces are washed off by the first half inch of runoff, which then carries a shock loading of these pollutants into receiving rivers and streams. The term "first flush" is used to describe the more heavily polluted runoff that this washing action initially generates. By capturing and treating the first half inch of runoff, up to 90% of pollutants can be removed from stormwater before it enters the drainage system.

GETTING HELP

Cobb County
Stormwater Management .. (770) 419-6435
Water Quality Section .... (770) 419-6441

Community Partners for
Healthy Streams ..... (770) 528-1482

COBB COUNTY WATER SYSTEM
COMMUNITY PARTNERS FOR HEALTHY STREAMS - FACT SHEET NO. 6.3

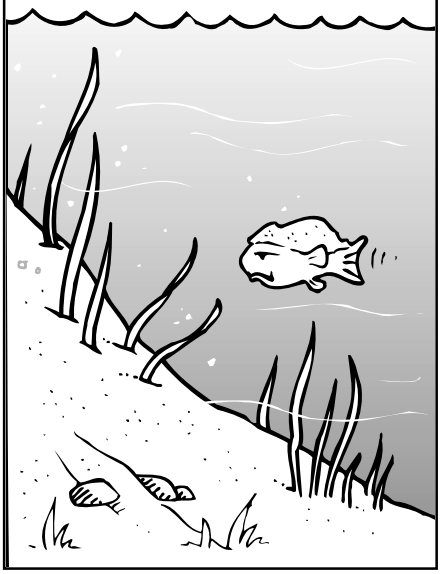
Clearing and Grading Land

SERIES #6:
SITE DESIGN & CONSTRUCTION

Why be concerned?

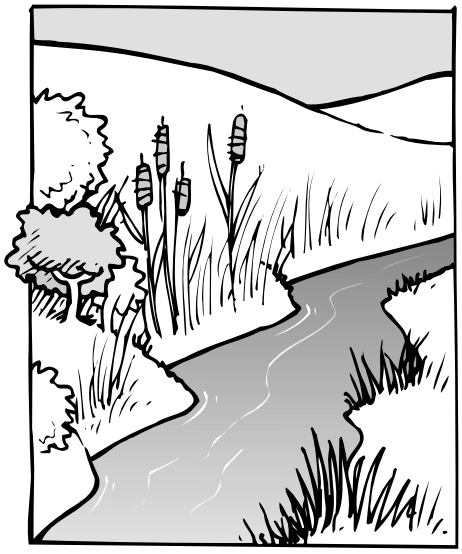
Eroded soil is our #1 water pollutant in the Cobb County streams. As it settles in streams, sediment can smother fish eggs and bottom-dwelling organisms and destroy aquatic habitat. Suspended sediment can interfere with the respiration and digestion of aquatic animals. Other pollutants such as metals and nutrients are often attached to soil particles. Finally, uncontrolled sediment can clog stormwater management systems, leading to higher maintenance costs and flooding.

Construction activities can also cause soils to become seriously compacted. Compacted soils prevent stormwater from filtering into the ground, increasing the volume and velocity of runoff. Since infiltration removes pollutants from stormwater, compacted soils also reduce water quality.



Preventing Soil Compaction

Removing, storing and replacing the original topsoil on-site can destroy the natural soil structure, increasing compaction and lowering the soil's infiltration capacity. Mixing mulch into the sub-soil before replacing the topsoil can dramatically improve the soil's ability to store and filter stormwater. Be sure to mix mulches into the soil thoroughly. To help *prevent* soil compaction, concentrate construction traffic patterns as much as possible and indicate the designated traffic areas.



Preserving Vegetation: the First Step

Vegetation prevents erosion. It also helps to slow and filter pollutants from stormwater. Therefore, it's important to preserve existing vegetation, wherever possible. Maintaining a vegetated buffer zone along pond and stream banks is especially important. Vegetated buffers should be as wide as possible since more plants will slow and filter stormwater before it enters the receiving waterway.

SOILS EXPOSED!

In areas that must be cleared, limit the amount of disturbed area and the length of time that soils are exposed. This can be accomplished by:

- designing projects to retain as much open space as possible.
- phasing construction and, in general, clearing no sooner than necessary for construction activities.
- prohibiting clearing and grading along streambanks.

Once soils have been exposed, take steps to stabilize them *as soon as possible* with vegetation (such as sod laid perpendicular to the slope) or another type of cover (such as seed, straw, mulch or netting). See your local regulatory agency about stability time requirements.

Directing Stormwater

Erosion can be further reduced by slowing stormwater and diverting it from exposed soils. Runoff can be diverted using vegetated berms or ditches. Runoff can be slowed by roughening surfaces, planting grass, terracing or contouring the site, installing filter fabric fencing, and installing stone check dams.

Controlling Sediment

Settling ponds, filter fences and other sediment control devices are used to keep eroded soil on site. Sediment controls filter soil from stormwater and/or reduce its velocity, allowing particles to settle out. For more information about how to choose and install sediment controls, contact one of the agencies listed under "Getting Help."

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Local and State Permits

• Local land clearing and grading laws vary. Before clearing *any* land, check with the local government agency to find out about local restrictions and permit requirements.

For more information about County or state permit requirements, call one of the numbers listed under "Getting Help."

Maintaining Erosion and Sediment Controls

Erosion and sediment controls must be inspected frequently to assure function. This is especially important before and after rainstorms. Specific monitoring and maintenance activities may be required to comply with NPDES or municipal permit conditions. Again, check with relevant county, state and local agencies to find out more about permit requirements.

GETTING HELP

Cobb County Community Development - Erosion and Sediment Control ..... (770) 528-2191

Cobb County Stormwater Management .. (770) 419-6435
Water Quality Section .... (770) 419-6441

Community Partners for Healthy Streams ..... (770) 528-1482

Community Partners for Healthy Streams
WATER QUALITY ACTION PLAN

Series #6: Site Design and Construction
Fact Sheets 6.1, 6.2 and 6.3

Completing Your Water Quality Assessment and Action Plan

Assessment and action planning requires respondants to assess their current activities and identify any specific actions needed to prevent pollution and improve water quality stewardship.

To create your own "Water Quality Action Plan," please fill out the following checklist. Directions are included on the other side of this page. The "Actions" in this checklist directly correspond to recommendations made within this handbook. If you have any questions or would like help completing this form, please contact the Community Partners for Healthy Streams Program Manager at (770) 528-1482. Send completed checklists to:

Community Partners for Healthy Streams
Cobb County Water System
662 South Cobb Drive
Marietta, GA 30060
Fax: (770) 528-1483

NOTE: To become a "Community Partner for Healthy Streams," all checklists that apply to your business must be completed and returned. A complete listing of all program handbooks/checklists is provided on the inside of the back cover. To obtain copies, contact the Community Partners Program Manager.

Business Information

Business name: _____

Type of Business: _____ No. of employees: _____

Address: _____

_____ Zip: _____

Contact person: _____

Title: _____ Phone: _____

Water Quality Action Plan prepared by: _____ Date: _____

e-mail: _____ Fax: _____

Business Activities That Can Affect Water Quality

Please check the activities that your business is responsible for:

- ☐ Storing materals
- ☐ Spill containment and response
- ☐ Site design and/or construction
- ☐ Managing wastes
- ☐ Maintaining buildings/pavement
- ☐ Maintaining constructed stormwater controls
- ☐ Maintaining landscapes
- ☐ Managing employees

IMPORTANT!
Directions for Completing this Checklist:

1. For each question, check the appropriate answer box in the Assessment column (*Always*, *Needs Improvement*, or *Not Applicable*).

2. Next, check the corresponding box in the Action Plan column (*Plan to Continue* or *Plan to Improve*).

3. For every activity, indicate:

- The **Responsible job or staff position(s)**. It is best to answer with a specific job position, i.e. facility manager.
- **Schedule** or proposed date by which the activity will be completed.
- **Action(s)** - please provide additional details regarding the implementation of a proposed activity, or explain what is already being done.
- If the action requires ongoing employee training or commitment from management, check that box as a reminder to include it in your employee education activities.

(See example below)

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4. Finally, remove completed checklist sheets from the handbook and return them to the Community Partners for Healthy Streams Program. If you need help completing the Water Quality Assessment questions, please call the number listed below.

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Marietta, GA 30060
Fax: (770) 528-1483
Phone: (770) 528-1482

SAMPLE CHECKLIST QUESTION:

1. Steps are taken to minimize the amount of potentially polluting materials and wastes kept in storage.

ASSESSMENT

- ☐ Not applicable
- ☐ Always — ACTION PLAN: ☐ Plan to continue
- ☒ Needs Improvement — ACTION PLAN: ☒ Plan to improve

Responsible job or staff position(s): Safety Manager

Schedule: Materials will be in place by 12/01

Action(s): Spill kits, absorbent pads, and spill response plans will be placed near all areas that have the potential for spills.

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☐ Requires ongoing education/commitment

SERIES #6: SITE DESIGN AND CONSTRUCTION (Fact Sheets 6.1, 6.2 and 6.3)

1. Natural features are identified and protected during both site design and construction.

ASSESSMENT
- ☐ Not applicable
- ☐ Always ..... ☐ Plan to continue
- ☐ Needs Improvement ..... ☐ Plan to improve

ACTION PLAN

Responsible job or staff position(s): _____

Schedule: _____

Action(s): _____

_____

_____ ☐ Requires ongoing education/commitment

2. Opportunities to reduce impervious surfaces are investigated and pursued whenever possible.

ASSESSMENT
- ☐ Not applicable
- ☐ Always ..... ☐ Plan to continue
- ☐ Needs Improvement ..... ☐ Plan to improve

ACTION PLAN

Responsible job or staff position(s): _____

Schedule: _____

Action(s): _____

_____

_____ ☐ Requires ongoing education/commitment

3. Drainage systems are designed to promote infiltration and to otherwise protect water quality.

ASSESSMENT
- ☐ Not applicable
- ☐ Always ..... ☐ Plan to continue
- ☐ Needs Improvement ..... ☐ Plan to improve

ACTION PLAN

Responsible job or staff position(s): _____

Schedule: _____

Action(s): _____

_____

_____ ☐ Requires ongoing education/commitment

4. Vegetated buffer strips (as wide as possible) are maintained along all water bodies.

ASSESSMENT
- ☐ Not applicable
- ☐ Always ..... ☐ Plan to continue
- ☐ Needs Improvement ..... ☐ Plan to improve

ACTION PLAN

Responsible job or staff position(s): _____

Schedule: _____

Action(s): _____

_____

_____ ☐ Requires ongoing education/commitment

5. Irrigation systems are designed to minimize runoff.

ASSESSMENT

☐ Not applicable
☐ Always
☐ Needs Improvement

ACTION PLAN

☐ Plan to continue
☐ Plan to improve

Responsible job or staff position(s): _____

Schedule: _____

Action(s): _____

_____

_____ ☐ Requires ongoing education/commitment

6. Soil erosion and sedimentation are prevented during construction. (e.g., clearing is phased, exposed soils are immediately covered and controls are rigorously maintained.)

ASSESSMENT

☐ Not applicable
☐ Always
☐ Needs Improvement

ACTION PLAN

☐ Plan to continue
☐ Plan to improve

Responsible job or staff position(s): _____

Schedule: _____

Action(s): _____

_____

_____ ☐ Requires ongoing education/commitment

Additional Comments: _____

_____

_____

_____

_____

Community Partners for Healthy Streams Fact Sheets

SERIES #1 - HOUSEKEEPING PRACTICES

SERIES #2 - MAINTAINING ENGINEERED STORMWATER CONTROLS

SERIES #3 - MAINTAINING EQUIPMENT AND VEHICLES

SERIES #4 - MAINTAINING BUILDINGS AND PAVEMENT

SERIES #5 - MAINTAINING LANDSCAPES

SERIES #6 - SITE DESIGN AND CONSTRUCTION

SERIES #7 - MANAGING WASTES

SERIES #8 - EDUCATION

This is an official publication
of the Cobb County Board of Commissioners.

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David Handerson, *County Manager*

COBB COUNTY - GEORGIA

Cobb County Water System
www.cobbcounty.org

662 South Cobb Drive, Marietta, GA 30060