Recertification Notice of Intent (NOI)
Regulated Small Municipal Separate Storm Sewer Systems (MS4's) General Permit ARR040000

You must **complete, certify, and sign this Recertification Notice of Intent (NOI) form** and return it along with the **updated Stormwater Management Program (SWMP)** to the Department in order to continue permit coverage under the General Permit ARR040000. You must submit this form **no later than July 1, 2019.** Please keep a copy of this form for your records once completed and signed.

Permittee Name	Permit Tracking Number	AFIN
City of Sherwood	ARR040027	88-00845

If any changes or additions need to be made to the information shown below, please update the new information in the corrections section below and/or attach documentation.

	Current Information in ADEQ's database	Corrections/Additions, If Needed
Small MS4 Physical Address	2199 E. Kiehl	
County	Pulaski	
Urbanized/Core Areas	Little Rock Urbanized Area	
Receiving Stream	Woodruff Creek	
Ultimate Receiving Stream	Arkansas River	
Contact Person & Title	~~Ellen Norvell, City Engineer~~	RICHARD PENN, CITY ENG.
Telephone Number	(501) 835-4753	
Cognizant Official & Title	~~Virginia Hillman,~~ Mayor	VIRGINIA YOUNG, MAYOR
Responsible Official & Title	~~Virginia Hillman,~~ Mayor	VIRGINIA YOUNG, MAYOR

Are the mailing and invoice addresses the same?

Yes or No* *If "No," please provide invoice address: _____

_____

_____

Additional Comments: _____

_____

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

I certify that I have read and will comply with all the requirements of the Regulated Small Municipal Separate Storm Sewer Systems (MS4's) General Permit ARR040000.

Responsible Official Name: VIRGINIA YOUNG
Responsible Official Title: MAYOR
Responsible Official Signature: Virginia R Young
Date: 1/30/20

Return the NOI form to the address below or send it electronically to: water.permit.application@adeq.state.ar.us **or via ePortal at the following web address:** https://eportal.adeq.state.ar.us/

NPDES Permits Section, Office of Water Quality
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

CITY OF SHERWOOD

STORMWATER MANAGEMENT PROGRAM

August 21, 2020

Prepared by the City of Sherwood Engineering Department
31 Shelby Road
Sherwood, AR 72120
501-835-4753

TABLE OF CONTENTS

THE CITY OF SHERWOOD

STORMWATER MANAGEMENT PROGRAM

Permit Tracking Number: ARR040027

AFIN: 88-00845

August 21, 2020

1. REQUIREMENTS

1.1 In accordance with NPDES Permit No. ARR040000, the City of Sherwood has developed a stormwater management program (SWMP) designed to reduce the discharge of pollutants from the small MS4 to the maximum extent practicable (MEP), to protect water quality, and to satisfy water quality requirements and the Clean Water Act. The City of Sherwood shall also implement and enforce the SWMP to meet the aforementioned criteria. The SWMP includes management practices; control techniques and system, design, and engineering methods; and shall be modified to include provisions as ADEQ determines appropriate after its review of the program for the control of such pollutants. The SWMP contains the following information for each of the six minimum control measures described in Section 2:

1.1.1 The best management practices (BMP's) that the City of Sherwood will or already does implement for each of the stormwater minimum control measures;

1.1.2 The measurable goals for each of the BMP's, the ones the City of Sherwood believes to have the authority to implement, including, as appropriate, the months and years in which the City will undertake required actions, including interim milestones and the frequency of the action.

1.1.3 The position title and contact information for those responsible for implementing or coordinating the BMP's for the SWMP. A Table of Organization is attached in Appendix "A." The Table of Organization includes a primary point of contact and identifies how implementation across multiple positions, agencies and departments will occur.

1.1.4 A rationale for how and why each of the BMP's and measurable goals were selected for the SWMP. The City of Sherwood initially had coverage under a previous version of NPDES Permit No. ARR040000, therefore, the City shall revise its program and its implementation to satisfy the general permit's performance standards within two years of August 1, 2019, the effective date of the new general permit.

2. MINIMUM CONTROL MEASURES

2.1 Public Education and Outreach on Stormwater Impacts

2.1.1 The City of Sherwood has implemented a public education program to distribute educational materials to the community and has conducted equivalent outreach activities about the impacts of stormwater discharges on water bodies.

2.1.2 *Decision Process*. The City of Sherwood has documented the decision process in the section below for the development of the stormwater public education and outreach program. The rationale statement addresses the overall public education program, the BMP's, the measurable goals, and the persons responsible for the program. The rationale statement includes the following:

2.1.2.1 The City of Sherwood plans to inform individuals and households about the steps they can take to reduce stormwater pollution through print media, social media, and website.

2.1.2.2 The City of Sherwood plans to inform individuals and groups on how to become involved in the stormwater program through the same mechanisms listed in 2.1.2.1 (print media, social media, and website notifications).

2.1.2.3 The target audiences selected for the education program are those that are likely to have significant impacts on stormwater. The selected audiences include: residential, commercial, industrial, and land development.

Common individual behaviors such as littering, disposing of trash and recyclables, applying lawn chemicals, washing cars, changing motor-oil on impervious driveways, and certain household behaviors like disposing of leftover paint and chemicals have the potential to generate stormwater pollution *(13)*. Therefore, the City selected the residential community as a target audience.

Many commercial activities contribute to stormwater pollution. These activities can include vehicle washing, landscape fertilization, improper disposal of automotive fluids, improper disposal of restaurant wastes, as well as many others *(19)*. The City, therefore, selected the commercial community as a target audience.

Like the commercial community, pollution from industrial activities can come from many different sources. Due to the City's low number and relatively small size of industries, it was decided that the industrial community should become a target audience sometime in the future when those activities are deemed to be significant.

Uncontrolled stormwater runoff from construction sites can significantly impact rivers, lakes and other water bodies *(10)*. New developments and subdivisions are always

under construction within the City. The City itself constructs capital improvement projects from time to time. For these reasons, and the fact that Part 3.2.1.3 of the new MS4 Permit (NPDES Permit No. ARR040000) requires it, the land development community has also been selected as a target audience.

2.1.2.4 The public education program is designed to address the following target pollutant sources:

- Soil Erosion from Construction Activities
- Pet Waste
- Concrete Wash Out
- Proper Leaf & Yard Waste Disposal
- Construction Site Paint Disposal
- Carwash Education
- Hazardous Chemicals
- Litter/Cigarette Butts

2.1.2.5 The outreach strategy for the City of Sherwood includes print and web-based media. Over the permit term, the City expects to reach over 50% of the population. The City's outreach strategy includes four different mechanisms, or Best Management Practices (BMP's). The individual BMP's, and their associated measurable goals, are described in more detail in Section 2.1.2.7.

2.1.2.6 The Engineering Department is responsible for the overall management and implementation of this stormwater program. However, other departments, as listed in Section 2.1.2.7, are responsible for implementation of specific BMP's or portions thereof.

2.1.2.7 The success of the public education and outreach minimum control measure will be evaluated according to the number of measurable goals that are successfully met each reporting year for their associated BMP's.

Measurable goals have been selected for the BMP's that are cost effective and easily achievable, but still allow the City to effectively reach high percentages of the population with the stormwater message. No schedule for deployment for the BMP's is listed because all four BMP's are already being implemented by the City and will continue to be implemented under the new permit. The individual BMP's and their associated measurable goals are listed below:

2.1.2.7.1 **BMP 1: Publish stormwater related articles and information for the residential, commercial, industrial, and land development communities on Facebook.**

Goal: Under the new permit, stormwater information and/or articles will continue to be posted at least 12 times annually on the City of Sherwood Stormwater Management page on Facebook.

According to the Pew Research Internet Project, 73% of online adults use social networking sights *(6)*. Posting stormwater related information and articles on a social networking site such as Facebook allows the City to reach a large segment of the population in an economical way.

After the Facebook page was developed, it was decided that the measureable goal for this BMP should be a minimum of 12 posts annually. This number was selected because it is easily achievable, allows for a diverse range of topics to be covered, and is small enough in number that recipients won't ignore posts due to too many items being posted.

This BMP will continue to be implemented under the new permit. The Engineering Department is responsible for developing the posts and maintaining the Facebook page.

2.1.2.7.2 **BMP 2: Post stormwater related information and contacts on the City's website.**

Goal: Stormwater related information and contacts will be updated as necessary under the new permit.

More and more people are turning to the internet as their primary source for information. Posting storm water information and contacts on the internet allows the City to reach those who may not be reached by more traditional means. Information is posted on the Engineering Department's website at https://www.cityofsherwood.net/156/Engineering-Permits-Planning. The information available on the website includes contact information for the Engineering Department, the telephone number for the Stormwater Hotline, and the City's Storm Drainage Standards. Since the contact information and Storm Drainage Standards rarely change, it was determined that the measurable goal for this BMP should only be to update the website as necessary.

This BMP will continue to be implemented under the new permit. The Engineering Department is responsible for ensuring that all information on the website is current.

2.1.2.7.3 **BMP 3: Broadcast stormwater related public service announcements on local radio channels.**

Goal: Under the new permit, short Public Information spots will be prerecorded and made available to local radio stations to broadcast within their programming schedule requirements to provide a certain number of Public Service Announcements free of charge.

Sherwood is a bedroom community of Central Arkansas, with a significant portion of the population commuting daily out of the city. These daily trips allow for drivers to listen to local radio stations for news, local traffic conditions, weather, and other information. Public Information spots run frequently on Talk Radio and on Sports Radio, as well as stations primarily providing music entertainment. This can be an effective way to make the commuting population of Sherwood aware of sources of information, such as the city's website and online resources. The number of times radio spots are played can be measured and reported.

2.1.2.7.4 **BMP 4: Distribute stormwater related brochures to land development and residential building community.**

Goal: Under the new permit, brochures dealing with soil erosion and construction site erosion control will continue to be distributed to all members of the land development community who are issued Grading & Land Alteration Permits or Building Permits for New Construction.

Stormwater runoff from construction sites not only carries sediment, but it can also carry pesticides, cleaning solvents, concrete wash, asphalt, fuel, and motor oil. When land is cleared for development activities, loose sediment and other materials washed from construction sites can pollute our waterways *(7)*. The land development community must be educated about these pollutants and how to prevent their discharge to our surface waters.

In order to spread the word about construction site erosion control to as many in the land development community as possible, it was decided that the measurable goal for this BMP should be to provide everyone who purchases a Grading & Land Alteration Permit or a Building Permit for New Construction with a brochure on the topic. This allows the information to be distributed to the larger developers as well as those only involved in residential and commercial construction.

This BMP will continue to be implemented under the new permit. The Engineering Department is responsible for keeping the brochure up-to-date and for distributing the brochure to all Fill and Grading Permit applicants. The Permits & Planning

Department is responsible for distributing the brochure to all applicants for Building Permits for New Construction.

2.1.3 *Performance Standards.* The stormwater public education and outreach program for the City of Sherwood includes four mechanisms or BMP's which have been discussed in the previous sections, and targets six different stormwater themes. The stormwater themes, along with the target audiences, are as follows:

- Proper Pet Waste Disposal.
  - Target Audience: General Public.
- Concrete Truck Wash Out.
  - Target Audience: Residential Builders, Developers, Concrete Companies and the General Public.
- Proper Leaf & Yard Waste Disposal.
  - Target Audience: General Public.
- Proper Construction Site Paint Disposal.
  - Target Audience: Residential Builders, Remodeling Contractors, Commercial Contractors and the General Public.
- Carwash Education.
  - Target Audience: Car Dealerships, Auto Repair Shops and the General Public.
- The Drain Is Just For Rain.
  Target Audience: General Public.

The stormwater public education and outreach program is projected to reach at least 50 percent of the population over the permit term.

2.1.4 *Annual Reporting.* The annual report shall identify each mechanism or BMP used, including each stormwater theme, audience targeted and estimate of how many people were reached by each mechanism.

2.2 Public Involvement/Participation

2.2.1 The City of Sherwood has complied and will continue to comply with State and local notice requirements when implementing the public involvement/participation program.

2.2.2 *Decision Process.* The City of Sherwood has documented the decision process in the section below for the development of the stormwater public involvement/participation program. The rationale statement addresses both the overall public involvement/participation program and the individual BMP's, measurable goals and responsible persons for the program. The rationale statement includes the following:

2.2.2.1 The City of Sherwood will receive public input on the NOI and SWMP. The NOI and SWMP will be posted on the City's website for a 30-day public review period beginning on 10/01/2020. The City will accept comments from the public during this review period. A hard copy will also be available in the Engineering Department office. See BMP 5 in Section 2.2.2.6 for more information.

2.2.2.2 The City of Sherwood plans to involve the public in the development and implementation of the program by providing citizens with a variety of activities where they can contribute. The two main considerations of the public involvement/participation program are to give citizens the opportunity to provide the necessary feedback to improve the overall SWMP and to give citizens with a desire to serve the community the chance to take an active role in the program.

2.2.2.3 The target audiences for the public involvement/participation program include the following:

- Single & Multi-Family Residences
- Commercial Businesses
- Industrial Businesses *(future)*
- Land Development Community
- Civic Clubs/Organizations
- Student Clubs/Organizations
- Religious Organizations

There are several different ethnic groups that will be engaged among the target audiences within the City. According to the latest data from the U.S. Census Bureau, the population of the City of Sherwood is 73.2% White, 21.0% Black or African American, 0.40% American Indian and Alaska Native, 1.6% Asian, 0.0% Native Hawaiian and Other Pacific Islander, 2.2% Two or More Races, and 1.5% Some Other Race. Of these, 5.9% are Hispanic or Latino, which can be of any race *(9)*. The economic groups that will be engaged include all ranges, from those areas where incomes are at or above the area median income, to those located within low and moderate income areas.

2.2.2.4 The types of public involvement activities or BMP's in the City's SWMP include a public review and comment period, volunteer groups marking of manholes, volunteer clean-up activities, and operating a stormwater hotline to receive stormwater complaints from citizens. The individual BMP's, and their associated measurable goals, are described in more detail in Section 2.2.2.6.

2.2.2.5 The Engineering Department is responsible for the overall management and implementation of this stormwater program. However, other departments, as listed in

Section 2.2.2.6, are responsible for implementation of specific BMP's or portions thereof.

2.2.2.6 The success of the public involvement/participation minimum control measure will be evaluated according to the number of measurable goals that are successfully met each reporting year for their associated BMP's.

Measurable goals have been selected for the BMP's that are cost effective and easily achievable, but still allow the City to effectively involve and engage the public in the stormwater program. A schedule for deployment is listed for BMP 5 only. No schedule is necessary for the other five BMP's, as they are already being implemented by the City and will continue to be implemented under the new permit. The individual BMP's and their associated measurable goals are listed below:

2.2.2.6.1 **BMP 5: The City will hold a public review and comment period for the NOI and SWMP.**

Goal: Before the NOI and SWMP are approved by ADEQ, the City will hold a 30-day public review period to receive comments and input from the public.

In order to give the public opportunity to provide input in the development of the NOI and SWMP, the City will hold a review period beginning on 10/01/2020 in order to receive questions and comments from the public. This review period will be advertised in the *Arkansas Democrat Gazette* on Sunday, 10/04/2020. The proposed SWMP will be available online on the City's website, and a hard copy will be available for review in the Engineering Department office. The Engineering Department was responsible for implementing this BMP.

2.2.2.6.2 **BMP 6: Utilize volunteer groups to clean curbs and gutters and pick up trash accumulated along city streets.**

Goal: Keep city streets clean of trash and debris.

Groups of citizens, such as church youth groups, Mayor's Youth Council, Boy Scouts, Girl Scouts, Rotary, etc. will occasionally "Adopt-A-Street" for the purpose of being recognized for their public service of maintaining a clean road right-of-way. The city has an annual clean up day each year where groups of volunteers perform tasks on targeted locations. These numbers of groups or targeted locations can be measured and reported.

2.2.2.6.3 **BMP 7: New storm sewer manhole covers will be marked with the warning: "Storm Sewer – No Dumping – Drains to River."**

Goal: Marking of new manhole covers will continue under the new permit.

For many years now, the City has required that all new manhole covers located in City rights-of-way, on both municipal projects and private developments, be marked with the following warning: "Storm Sewer – No Dumping – Drains to River." Placing these covers on new manholes educates both the general public and those installing the covers (the Land Development Community) on the environmental consequences of illegal dumping in storm drains. Installing these manholes also allows the Land Development Community to have an active role in preventing stormwater pollution within the community.

Placement of the marked manhole covers on all new construction will continue under the new permit. The Engineering Department is responsible for ensuring that all new storm sewer manholes have the marked covers.

2.2.2.6.4 **BMP 8: Existing storm sewer manholes will be marked with the warning: "No Dumping – Drains to River."**

Goal: Decals shall be placed on at least 20 manholes per year by citizen volunteers or the Sherwood Public Works Department.

Under the previous permit, the City began a storm drain marker program where members of the public place decals with the warning, "No Dumping – Drains to River," on existing storm sewer manholes. Citizens involved with this work include volunteers or the Sherwood Public Works Department. Placing these decals on existing manholes educates the public on the environmental consequences of illegal dumping in storm drains. It also allows citizens to become involved in preventing stormwater pollution within the community.

In order to prevent the program from becoming overly burdensome to those involved, it was decided that the minimum marking requirement should be no more than 20 manholes per year. The program for the marking of existing manholes will continue under the new permit. The Engineering Department is responsible for administering the manhole marking program.

2.2.2.6.5 **BMP 9: Operate a community hotline for reporting stormwater problems and complaints.**

Goal: Hotline will continue accepting calls under the new permit.

The Storm Water Hotline supplements the City's efforts to stop illicit discharges and determine where storm water problems currently exist. Advertising the hotline also further facilitates public involvement in the Storm Water Management Plan *(11)*. The Storm Water Hotline number is 501-835-4753 (Engineering Department phone number). It has been maintained by the Engineering Department and

advertised on the Engineering Department website. The hotline will continue to be advertised on the website, and it will continue to be maintained under the new permit.

2.2.2.6.6 **BMP 10: Maintain a volunteer Adopt-A-Street program to clear trash, yard wastes, and other debris from streets, right-of-way, parking lots, and parks.**

Goal: A volunteer Adopt-A-Street program will continue to be operational under the new permit.

Adopt-A-Street programs create a unique partnership between the City of Sherwood and its business community, civic organizations, and residents. The programs allow groups or individuals to become directly responsible for the litter abatement and the appearance and upkeep of public rights-of-way, parking lots, parks, planters and green areas. To show its appreciation, the City of Sherwood recognizes each of these civic contributions by installing a special "Adopt-A-Street" sign to commemorate the participating organization.

Both the Adopt-A-Street programs were fully implemented and operational prior to the original MS4 permit. The City will continue to maintain these programs under the new permit. The Mayor's office is responsible for maintaining the list of Adopt-A-Street groups. The Public Works Department is responsible for installing the roadway signs.

2.2.3 *Performance Standards.* The City of Sherwood stormwater public involvement/participation program shall include at least six public involvement activities over the permit term.

Leave Your Mark In Sherwood. General Public, Volunteer Organizations

Citywide Cleanup. Keep Sherwood Beautiful Group, General Public.

Adopt-A-Street Program. Volunteer Groups, General Public.

Pet Waste Education. Pet Owners, General Public.

If This Drain Could Talk. Students, General Public.

Stormwater Watch Program. Volunteer Group, General Public.

2.2.4 *Annual Reporting.* The City of Sherwood shall utilize the standard annual report form developed by ADEQ. The annual report shall identify each public involvement/participation activity conducted, including a brief description of the activity and an estimate of how many people participated.

2.3 Illicit Discharge Detection and Elimination

2.3.001 The City of Sherwood has developed, implemented and is enforcing a program to detect and eliminate illicit discharges. "Illicit Discharge" shall be defined as any discharge to a municipal separate storm sewer that is not composed entirely of stormwater except discharges pursuant to a NPDES permit (other than the NPDES permit for discharges from the municipal separate storm sewer) and discharges resulting from emergency fire-fighting activities.

2.3.002 Under the previous permit, the City of Sherwood completed a storm sewer system map for the entire MS4 system. The map includes the following: outfalls, surface waters of the State receiving discharges from those outfalls, catch basins, pipes, ditches, and public and private stormwater facilities.

Under the new permit, the storm sewer system map will be updated periodically to include any newly constructed stormwater facilities.

2.3.003 Prior to the original permit, the City of Sherwood effectively prohibited through ordinance illicit discharges into the storm sewer system. The City has also implemented appropriate enforcement procedures and actions.

2.3.004 Under the previous permit, the City of Sherwood developed and implemented a plan to detect and eliminate non-stormwater discharges to the system, including illegal dumping. See 2.3.6 and 2.3.7 for exceptions to this requirement.

2.3.005 Under the new permit, the City of Sherwood shall continue to inform public employees, businesses, and the general public of hazards associated with illegal discharges and improper disposal of waste.

2.3.006 The categories of non-stormwater discharges or flows (i.e. illicit discharges) listed in 2.3.7 have not been identified as significant contributors of pollutants to the City of Sherwood, therefore, they have not been addressed in the SWMP.

2.3.007 The following incidental non-stormwater discharges will not be addressed as illicit discharges:

- Waterline flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20))
- Uncontaminated pumped ground water
- Discharges from potable water sources

- Foundation drains
- Air conditioning condensation
- Irrigation water
- Springs
- Water from crawl space pumps
- Footing drains
- Lawn watering
- Individual residential car washing
- Non-commercial or charity car washes
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Discharges or flows from emergency fire-fighting activities

Any individual non-stormwater discharge that is determined to be contributing significant amounts of pollutants to the MS4 shall be prohibited.

2.3.008 *Decision Process.* The City of Sherwood has documented the decision process for the development of the stormwater illicit discharge detection and elimination program. The rationale statement addresses the overall illicit discharge detection and elimination program and the individual BMP's, measurable goals, and responsible persons for the program. The rationale statement includes the following:

2.3.008.1 The City of Sherwood will continue to update and maintain the storm sewer system map. The development process, as well as the process for updating the map, are described in more detail under BMP 11 in Section 2.3.8.7.

2.3.008.2 The City of Sherwood will continue to prohibit illicit discharges to the storm sewer system by ordinance. This ordinance is described in more detail under BMP 12 in Section 2.3.8.7. A copy of the relevant sections of the ordinance is also contained in Appendix "B."

2.3.008.3 The City of Sherwood will continue to ensure that the ordinance prohibiting illicit discharges is implemented through the use of appropriate enforcement procedures and actions. The plan for accomplishing this is described in more detail under BMP 12 in Section 2.3.8.7.

2.3.008.4 The City of Sherwood will continue to detect and address illicit discharges to the MS4 system, including discharges from illegal dumping and spills. The plan for accomplishing this is described in more detail under BMP's 12, 13, and 14 in Section 2.3.8.7. The plan includes: procedures for locating priority areas, procedures for tracing the source of an illicit discharge, procedures for removing the source of the illicit discharge, and procedures for program evaluation and assessment.

2.3.008.5 The City of Sherwood plans to inform businesses and the general public of the hazards associated with illegal discharges and improper disposal of wastes through the BMP's described in the public education and outreach minimum control measure. These BMP's include posting stormwater related articles and information on Facebook and through the City website.

The City plans to inform public employees about the same hazards through the employee training BMP described in the pollution prevention/good housekeeping minimum control measure in sections 2.6.3.2 and 2.6.3.3.2.

2.3.008.6 The City of Sherwood Engineering Department is responsible for overall management and implementation of the stormwater illicit discharge detection and elimination program. However, other departments, as listed in Section 2.3.8.7, are responsible for the implementation of specific BMP's or portions thereof.

2.3.008.7 The success of the illicit discharge detection and elimination minimum control measure will be evaluated according to the number of measurable goals that are successfully met each reporting year for their associated BMP's.

Measurable goals have been selected for the BMP's that will allow the City to detect and eliminate illicit discharges without creating the need for additional personnel. No schedule for deployment for the BMP's is listed because all four BMP's are already being implemented by the City and will continue to be implemented under the new permit. The individual BMP's and their associated measurable goals are listed below:

2.30.008.7.1 **BMP 11: Update and maintain storm sewer system map.**

Goal: Under the new permit, the storm sewer system map shall be updated at least once annually to include all newly constructed public and private storm sewers and drainage ditches.

The storm sewer map aids the City in targeting outfalls with dry weather flows and other suspicious discharges for more in-depth inspection. It also aids in coordinating management activities to remove illicit connections and track storm drain system maintenance *(11)*. The City has been updating the map since 2014 and will continue to update it at least once annually under the new permit. The Engineering Department is responsible for maintaining and updating the storm sewer system map.

2.3.008.7.2 **BMP 12: Prohibit illicit discharges by ordinance.**

Goal: Enforcement of the ordinance shall continue under the new permit.

An ordinance that prohibits illicit discharges to the storm sewer system within the City of Sherwood went into effect in 2008. Under the new permit, the City will continue to ensure that these regulations are being implemented through the use of appropriate enforcement measures. The enforcement measures and penalties are outlined in ordinance #1770 of the municipal code.

A copy of ordinance #1770 has been included in appendix B. The Engineering Department, is responsible for ensuring that the ordinance is enforced and illicit discharges are abated.

2.3.008.7.3 **BMP 13: Prohibit illegal dumping by ordinance.**

Goal: Enforcement of the ordinance will continue under the new permit.

Illegal dumps degrade surface water quality, give off offensive odors, and present direct health hazards from vectors among many other things *(1)*. Ordinances have been developed addressing these issues. Ordinances #1770 and ordinance #941 of the municipal code prohibiting illegal dumping. These ordinances are enforced by the Environmental Compliance Specialist or Code Enforcement. The City will continue to enforce these ordinances prohibiting illegal dumping under the new permit.

2.3.008.7.4 **BMP 14: Dry weather inspection of storm sewer system.**

Goal: A dry weather survey of 20% of the storm drain system outfalls per year will be conducted to identify non-storm water flows. After each year's survey is complete, areas found to have suspicious discharges will be inspected further to detect suspected direct connections to the wastewater system and identify areas where wastewater might be leaking into adjacent storm drain pipes. Inspections will continue under the new permit.

Inspections of outfalls began in the fall of 2008. Targeted inspection of areas where high nutrient levels, suds and oily discharges, or dry weather flows are found allows the City to efficiently and effectively identify locations where illicit connections to the storm drain system exist. Outfalls with suspicious discharges will be further tested in the field by single parameter analysis. The indicator chemical used will be ammonia.

Under the new permit, the City will only prioritize those areas where dry weather discharges are observed. Once a suspicious discharge has been identified, two different methodologies will be employed to trace the source of the possible illicit discharge—storm drain network investigation and on-site investigation. Both of these methodologies are more fully described in chapter 13 of Illicit Discharge

Detection and Elimination, *A Guidance Manual for Program Development and Technical Assessments (3)*.

With storm drain network investigation, field crews from the Public Works Department and Engineering Department will strategically inspect manholes within the storm sewer system to measure physical indicators or perform single parameter analysis (ammonia) in order to isolate discharges to a specific segment of the network. Field crews shall inspect the manholes and the storm sewer system by one of the following three options:

- Field crews can work progressively up the trunk from the outfall and test manholes along the way (Small diameter outfall, < 36"; Simple drainage network).
- Field crews can split the trunk into equal segments and test manholes at strategic junctions in the storm sewer system (Large diameter outfall > 36"; Complex drainage; Logistical or traffic issues).
- Field crews can work progressively down from the upper parts of the storm sewer network toward the problem outfall (Very large drainage area, > one square mile) *(3)*.

Once field crews have identified the pipe segment, on-site investigations will be used to find the specific discharge or improper connection. The three basic approaches that will be utilized for on-site investigations are dye, video, and smoke testing *(3)*.

In order to eliminate the source, the following questions must be answered by City staff about each individual illicit discharge to determine how to proceed:

- Who is responsible?
- What methods will be used to fix the problem?
- How long will it take?
- How will removal be confirmed *(3)*?

The answers to these questions will depend upon the source of the discharge. Illicit discharges will generally originate from one of the following sources:

- An internal plumbing connection
- A service lateral cross-connection
- An infrastructure failure within the sanitary sewer
- An indirect or transitory discharge resulting from leaks, spills, or overflows *(3)*

The financial responsibility for removal of the source will typically fall on property owners, the City, or some combination of the two *(3)*.

Dry weather inspections of the storm drain system will continue under the new permit. Initial inspections will be the responsibility of the Operations Department. Follow-up inspections on outfalls or segments found to have suspicious discharges will be the responsibility of the Engineering Department. The illicit discharge detection and elimination program will be evaluated at least once annually to assess if the goals of the program are being achieved.

2.3.009 *Performance Standards.* The stormwater illicit discharge detection and elimination program includes dry-weather screening of all stormwater outfalls located in the City's urbanized area. Outfalls draining undeveloped watersheds will not be screened for illicit discharges. The storm sewer system map shall be updated annually as needed for changes occurring in the urbanized area boundaries.

2.3.010 *Annual Reporting.* The City of Sherwood shall utilize the standard annual report form developed by ADEQ. The annual report will document the following:

- Number of outfalls dry-weather screened
- Number of dry-weather flows identified
- Number of illicit discharges identified
- Number of illicit discharges eliminated
- Schedules for elimination of illicit connections that have been identified but have yet to be eliminated
- Summary of any storm sewer mapping updates

2.4 Construction Site Stormwater Runoff Control

2.4.1 The City of Sherwood has developed, implemented, and is enforcing a program to reduce pollutants in stormwater runoff from construction activities that result in a land disturbance of greater than 1000 square feet. Reduction of pollutants in stormwater discharges from construction activity disturbing less than 1000 square feet has also been included in the program if that construction activity is part of a larger common plan of development or sale that would disturb 1000 square feet or more. This program included the development and implementation of:

2.4.1.1 An ordinance to require erosion and sediment controls, as well as sanctions to ensure compliance, to the extent allowable under State and local law. The ordinance is at least as stringent and not conflicting with the criteria set forth in the current, at time of issuance of the new MS4 permit, ADEQ NPDES General Stormwater Permit for Construction Activities.

2.4.1.2 Requirements for construction site operators to implement appropriate erosion and sediment control BMP's.

2.4.1.3 Requirements for construction site operators to control waste such as discarded building materials, concrete truck washout, chemicals, litter, and sanitary waste at the construction site that may cause adverse impacts on water quality.

2.4.1.4 Procedures for site plan review which incorporate consideration of potential water quality impacts.

2.4.1.5 Procedures for receipt and consideration of information submitted by the public.

2.4.1.6 Procedures for site inspection and enforcement of control measures.

2.4.2 *Decision Process.* The City of Sherwood has documented the decision process for the development of the construction site stormwater control program. The rationale statement addresses the overall construction site stormwater control program and the individual BMP's, measurable goals, and responsible persons for the program. The rationale statement includes the following information:

2.4.2.1 The City of Sherwood will continue to require erosion and sediment controls at construction sites. Erosion and sediment controls are required by the City's Stormwater Pollution Prevention Code and Grading & Land Alteration Ordinance. These ordinances are described in more detail under BMP 15 in Section 2.4.2.8. A copy of the relevant sections of the ordinances are also contained in Appendix "C."

2.4.2.2 The City of Sherwood will continue to ensure compliance with the Stormwater Pollution Prevention Code and Grading & Land Alteration Ordinance through the use of sanctions and other enforcement mechanisms. The sanctions, enforcement mechanisms, and enforcement procedures are described in more detail under BMP 15 in Section 2.4.2.8 and in the relevant sections of the ordinance which are included in Appendix "C."

2.4.2.3 The City of Sherwood will continue to require construction site operators to implement appropriate erosion and sediment control BMPs and control waste at construction sites that may cause adverse impacts to water quality. Such waste includes discarded building materials, concrete truck washouts, chemicals, litter, and sanitary waste. The control of these wastes at construction sites is discussed in more detail under BMP 15 in Section 2.4.2.8.

2.4.2.4 The City of Sherwood will continue to review pre-construction site plans for all sites disturbing 1000 square feet or more for potential water quality impacts. Procedures for the site plan review process are discussed in more detail under BMP 17 in Section 2.4.2.8.

2.4.2.5 The City of Sherwood will continue to receive and consider information submitted by the public. Procedures for receipt and consideration of this information are discussed in more detail under BMP's 18 and 19 in Section 2.4.2.8.

2.4.2.6 The City of Sherwood will continue to perform monthly inspections on all sites disturbing 1000 square feet or more. Sites will be inspected to ensure compliance with the City's Stormwater Pollution Prevention Code and Grading & Land Alteration Ordinance. Procedures for inspections are discussed in more detail under BMP 20 in Section 2.4.2.8.

2.4.2.7 The City of Sherwood Engineering Department is responsible for the overall management and implementation of the stormwater control program. However, other departments, as listed in Section 2.4.2.8, will be responsible for the implementation of specific BMP's or portions thereof.

2.4.2.8 The success of the construction site stormwater runoff control minimum control measure will be evaluated according to the number of measurable goals that are successfully met each reporting year for their associated BMP's.

Measurable goals have been selected for the BMP's that will allow the City to reduce pollutants from construction sites without creating the need for additional personnel. The individual BMP's and their associated measurable goals are listed below:

2.4.2.8.1 **BMP 15: Require erosion and sediment controls at construction sites by ordinance.**

Goal: Enforcement of the ordinance shall continue under the new permit.

In February of 2008, the City adopted a Stormwater Pollution Prevention Code that requires that excavation activities disturbing more than 1000 square feet to be permitted by the City. In May of 2007, the City adopted the Grading & Land Alteration Ordinance to address land development and tree removal citywide.

According to these ordinances, construction site operators are required to implement appropriate erosion and sediment control BMP's. Natural vegetation must be retained wherever practicable in order to minimize the potential for soil loss. Erosion control devices must be in place prior to the start of grading. Soil stabilization shall be complete within two weeks of clearing or inactivity in construction. If seeding or another vegetative erosion control method is used, the vegetation shall become established within three weeks or the City may require that the site be reseeded and/or mulched to stabilize the site. The entire disturbed area must be stabilized by seeding and mulching when site grading is complete. The City may require seeding and mulching on any part of the site that will remain inactive for longer than two weeks or when an erosion problem is identified.

If a wet watercourse will be crossed regularly during construction a temporary stream crossing will be required. The watercourse channel must be stabilized after any in-channel work. Stabilization adequate to prevent erosion shall be located at the outlets of all pipes and paved channels.

A temporary access road is required at all sites. Other measures may be required by the City to ensure that sediment is not washed into the storm drains and construction vehicles do not track sediment onto public streets.

Structural controls must be installed and maintained to reduce sediment from stormwater runoff. They must be installed after the clearing necessary for the installation of the controls, but before the clearing for the remaining portions of the site. Techniques that divert upland runoff past disturbed slopes shall also be employed.

Dust abatement measures must be provided as often as necessary to prevent the operations from producing dust in amounts damaging to property, cultivated vegetation, domestic animals, or causing a nuisance to persons living or occupying buildings in the vicinity of the work area.

Clearing and grading of natural resources, such as wetlands, shall not be permitted, except when in compliance with the ordinance and with applicable state and federal laws. Clearing, except that necessary to establish sediment control devices, shall not begin until all sediment control measures have been installed.

Measures must be installed that will prevent the discharge of solid materials, including building materials, to waters of the State. The measures utilized must ensure and demonstrate compliance with State and City waste disposal as well as temporary and permanent sanitary sewer or septic system regulations. If concrete washout will occur on site, measures must be provided to prevent the discharge of concrete washout waters to waters of the State. Measures must also be provided to prevent discharges from fuel storage areas, hazardous waste storage, and truck wash areas to waters of the State.

Permitting under the City's Stormwater Pollution Prevention Code and the Grading & Land Alteration Ordinance requires submittal of a permit application, an erosion and sediment control plan (stormwater pollution prevention plan), and a grading plan (site plan with erosion controls) for review and approval. The erosion and sediment control plan and the grading plan must meet the requirements of the latest version of the ADEQ NPDES General Stormwater Permit for Construction Activities. Sites disturbing less than 1000 square feet are not required to obtain a permit, however, all sites regardless of size must meet the minimum erosion control requirements outlined in the ordinance or be subject to enforcement actions.

An initial permit is valid for only six months. All permits are subject to review and re-approval and all re-approvals are subject to any reasonable additional

requirements as may be deemed necessary by the City Engineer. At any time the City Administrator or his/her designated agents become aware of a potential violation of the requirements, a notice to that affect is issued to the person(s) engaged in the activity. The notice specifies the alleged violation and requires the person(s) engaged in the activity to provide engineering documentation certifying the reasonableness of their actions with reference to the permit requirements. In absence of submitted documentation or after review of same, the City may proceed with enforcement. In the event that any person(s) fails to meet the minimum standards of this ordinance, the City may suspend the activities through a stop-work order or may revoke the permit. Any person(s) judicially determined to be in violation of the ordinance shall be deemed guilty of a misdemeanor and shall be subject to the penalties set forth in the municipal code. In addition, the City Council may, in lieu of or in addition to those penalties previously mentioned and just cause to be initiated an action in the Circuit Court for the Sherwood District of Pulaski County, Arkansas, for the purpose of restraining or abating any violation of the ordinance.

The City will continue to enforce the Stormwater Pollution Prevention Code and Grading & Land Alteration Ordinance under the new permit. The Engineering Department is responsible for enforcing both Ordinances. A copy of the Stormwater Pollution Prevention Code and Grading & Land Alteration Ordinance are attached in Appendix "C."

2.4.2.8.2 **BMP 16: Require all construction activities disturbing greater than one acre be covered under ADEQ Storm Water Construction General Permit.**

Goal: Under the new permit, the City will continue to require the following to be submitted prior to approval of a Stormwater Pollution Grading Permit: (a.) a copy of the NOI for coverage under ADEQ's Storm Water Construction General Permit for all construction projects disturbing five or more acres; (b.) for sites disturbing one or more acres, but less than five acres, a copy of the Automatic Coverage Construction Site Notice for coverage under ADEQ's Storm Water Construction General Permit.

Construction sites can be a significant source of sediment for City storm drains. To prevent sediment from entering storm drains it is important to plan for erosion and sediment control practices and procedures in advance of starting construction *(11)*. Requiring developers to submit a copy of an NOI or Automatic Coverage Construction Site Notice has provided some additional assurance that careful preliminary planning for erosion and sediment control has been accomplished.

Submittal of the NOI or Automatic Coverage Construction Site Notice will continue as a requirement of the Fill and Grading Ordinance under the new permit. With the exception of Utility Department projects, the Engineering Department is

responsible for ensuring that copies of the proper notices have been submitted. The Utility Department is responsible for maintaining records of notices on Utility Department projects.

2.4.2.8.3 **BMP 17: For all developments that will disturb 1000 square feet or more, review site plans to evaluate potential water quality impacts.**

Goal: Procedure for reviewing site plans is currently in place and shall be continued under the new permit.

No person shall conduct any grading that would alter an area one acre or more in size, or would occur over or within 15 feet of an existing utility line, without first obtaining a Fill & Grading Permit from the City. Each application for a permit must include a grading plan (site plan with erosion controls) and an erosion and sediment control plan (stormwater pollution prevention plan). No permit is required for the following activities:

- Cemetery graves;
- Refuse disposal – if controlled by other federal, state, or local regulations;
- Construction of one single-family or duplex residence;
- Building additions – less than 2,000 square feet authorized by a valid building permit;
- Emergency work or repairs immediately necessary to protect life, property or natural resources;
- Nursery and agricultural operations.

Public and private utility organizations may obtain a one-time approval for all routine underground electric, water, sewer, natural gas, telephone, or cable facilities. The approval will include a utility organization and its contractors, agents, or assigns and will be permanent in nature as long as the original approval procedures are followed.

Applications submitted to the Building Department for a Site Development Permit shall be reviewed by the Engineering Department to determine their conformance with the provisions of the Grading & Land Alteration Ordinance. Grading plans shall be evaluated for conformance with minimum erosion control requirements. Within seven working days after receiving a properly completed application, the City shall, in writing:

- Approve the permit application; or
- Approve the permit application subject to such reasonable conditions as may be necessary to secure substantially the objectives of the ordinance; or
- Disapprove the permit application, informing the applicant of the reason(s) therefore, and of the procedure for submitting a revised application and/or submission.

The requirements of the ordinance may be varied by the Engineering Department upon written application by the person engaged in the grading. Deviations may be granted upon determination that the literal application of the provisions of the ordinance would result in an unreasonable hardship. The denial of a deviation request is subject to review by the City Council. The review by the City Council shall be conducted on the written record and the applicant shall have the right to submit written support materials. The decision of the City Council shall constitute the final administrative action of the City.

The Engineering Department is responsible for reviewing site plans for potential water quality impacts.

2.4.2.8.4 **BMP 18: The City will address all construction stormwater complaints that fall within the jurisdiction of the City's Stormwater Pollution Prevention Code and the Grading & Land Alteration Ordinance. In the event that a substantiated complaint cannot be addressed by the Fill and Grading Ordinance, the City will forward that complaint to ADEQ.**

Goal: The City will continue to address all construction storm water complaints that fall within the jurisdiction of the City's Fill and Grading Ordinance under the new permit. Any substantiated complaint that cannot be addressed by the Fill and Grading Ordinance will be forwarded to ADEQ.

Under the new permit, the City will continue to address all construction stormwater complaints that fall within the jurisdiction of the City's Stormwater Pollution Prevention Code and the Grading & Land Alteration Ordinance. In the unlikely event that a substantiated complaint arises that cannot be dealt with by the Stormwater Pollution Prevention Code and the Grading & Land Alteration Ordinance, City Staff will forward that complaint to ADEQ.

In order to gain public input about possible violations, the City will coordinate this effort with the public education program through BMP 19. The Engineering Department is responsible for responding to construction stormwater complaints.

2.4.2.8.5 **BMP 19: Publicize the stormwater hotline on the City's website or on Facebook.**

Goal: Under the new permit, the stormwater hotline will be publicized at least once per year, either through a public service announcement on the City's website or in a post on the City of Sherwood Stormwater Management Facebook page.

City staff can't be on every construction site every day, therefore, staff will also have to rely on citizen input and complaints to determine problem areas. In order to achieve this, the City will coordinate the construction site stormwater control

program with the public education program. This will be accomplished by publicizing the stormwater hotline and its purpose, either through PSA's on the City' website or through Facebook posts on the City's Stormwater Management page. The Engineering Department will be responsible for developing PSA's and Facebook posts.

2.4.2.8.6 **BMP 20: Construction sites disturbing 1000 square feet or more shall be inspected monthly.**

Goal: Under the new permit, the City shall continue monthly inspections of construction sites that disturb one or more acres.

Under the new permit, monthly inspections of construction sites disturbing one or more acres shall continue. Engineering Department staff shall make the inspections and shall either approve that portion of the work completed or shall notify the property owner wherein the work fails to comply with the approved stormwater pollution prevention plan. During construction, the property owner shall keep approved plans for grading, stripping, excavating, and filling work on site. In order to obtain inspections, the property owner shall notify the Engineering Department at least two working days before the start of construction. At least one inspection per month will be conducted until the project is completed. The property owner shall notify the Engineering Department at least two working days before final stabilization occurs.

The property owner is also required to make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved stormwater pollution prevention plan. The purpose of such inspections will be to determine the overall effectiveness of the control plan, and the need for additional control measures. All inspections must be documented in written form. Engineering Department staff are also authorized to enter the property as deemed necessary to make regular inspections to ensure the validity of the reports filed by the property owner.

All sites disturbing one or more acres will be inspected monthly, therefore, no prioritization will be required. If deficiencies are found during the inspection, property owners will be given three days to correct the deficiencies. If the deficiencies are not corrected within three days, a stop-work order will be issued, and their Stormwater Permit or Grading & Land Alteration Permit may be revoked. If deficiencies continue, or if a property owner refuses to comply, the case may be turned over to the prosecuting attorney's office.

2.4.3 *Performance Standards.* The City of Sherwood construction site stormwater control program shall include pre-construction site plan reviews (reviews of construction site Stormwater Pollution Prevention Plans) of 100 percent of projects from construction activities that result in a land disturbance of greater than 1000 square feet or more. These applicable sites shall be inspected at least on a monthly basis to ensure compliance.

2.4.4 *Annual Reporting.* The City of Sherwood shall utilize the standard annual report form developed by ADEQ. The annual report shall document the following:

- Number of applicable sites in the jurisdiction of the City of Sherwood
- Number of pre-construction site plan reviews performed
- Number and frequency of site inspections
- Number of violation letters issued
- Number of enforcement actions taken
- Number of complaints received and number followed up on

2.5 Post-Construction Stormwater Management in New Development and Redevelopment

2.5.1 The City of Sherwood has developed, implemented, and is enforcing a program to address stormwater runoff from new development and redevelopment projects that disturb greater than or equal to 1000 square feet, including projects less than 1000 square feet that are part of a larger common plan of development or sale, that discharge within the City. The program ensures that controls are in place that will prevent or minimize water quality impacts.

2.5.2 The City of Sherwood has developed and implemented strategies which include a combination of structural and/or non-structural BMP's appropriate for the community.

2.5.3 The City of Sherwood Stormwater Pollution Prevention Code, which was adopted by ordinance in February 2008, addresses post-construction runoff from new development and redevelopment projects to the extent allowable under State and local law. The Stormwater Pollution Prevention Code are at least as stringent as the criteria set forth in the current, at the time of issuance of the new MS4 permit, ADEQ NPDES General Stormwater Permit for Construction Activities. The Stormwater Pollution Prevention Code also require a goal of at least 80% removal of total suspended solids from flows which exceed predevelopment levels when designing and installing stormwater management controls (where practicable).

2.5.4 The City of Sherwood post-construction SWMP also ensures adequate long-term operation and maintenance of BMP's. The Stormwater Pollution Prevention Code specify that public BMP's will be maintained by the City and private BMP's will be maintained by the property owner. For private BMP's, the property owner is required to have a signed maintenance agreement with the City.

2.5.5 *Decision Process.* The City of Sherwood has documented the decision process for the development of the post-construction SWMP. The rationale statement addresses both the overall post-construction SWMP and the individual BMP's, measurable goals, and responsible persons for the program. The rationale statement includes the following information:

2.5.5.1 The post-construction SWMP for the City of Sherwood addresses both new development and redevelopment projects. If hydrologic and hydraulic studies reveal that the post-development runoff for a proposed development or redevelopment project 1000 square feet or more in size will exceed the pre-development runoff, and the existing drainage system is not adequate to carry the post-development runoff, then the proposed development or redevelopment project is not permitted unless one or more of the following mitigation measures are used: onsite detention, off site or regional detention, or improvements to the existing drainage system.

Development and redevelopment projects 1000 square feet or more in size (or less than an 1000 square feet if part of a larger common plan of development) that will increase the impervious area onsite, are not permitted without employing BMP's to address the water quality of the surface waters being discharged from the site. All BMP's or systems of BMP's utilized to address water quality are required to capture and treat the Water Quality Volume (WQ_v).

Areas where the land use or activities on site generate highly contaminated runoff with concentrations of pollutants in excess of those typically found in stormwater are known as Stormwater Hot Spots. When developing or redeveloping a hot spot site, a greater level of stormwater treatment is needed to prevent pollutant wash off after construction. This typically involves preparing and implementing a SWPPP that involves a series of operational practices at the site that reduces the generation of pollutants by preventing contact with rainfall. For the purposes of the City's Stormwater Pollution Prevention Code, Stormwater Hot Spots are classified as industrial facilities that:

- Have Standard Industrial Classification (SIC) codes listed in "40 CFR 122.26(b)(14) Subpart (i) – (xi)"
- And, are required to submit applications for a stormwater permit to ADEQ.

2.5.5.2 The post-construction SWMP has been tailored to the City of Sherwood by allowing the use of various detention practices to maintain pre-development runoff conditions and allowing the use of both acceptable and sub-standard BMP's to minimize water quality impacts. Allowable publicly owned detention practices include stormwater ponds and wetlands. Other detention methods such as infiltration trenches, infiltration basins, etc., may be used with proper documentation for privately owned detention, however, the practice will be discouraged. Acceptable BMP's for water quality are

those that are designed to capture and treat the WQ_v with a goal of at least 80% removal of total suspended solids (TSS) from post-construction discharges. BMP's that meet this requirement can be divided into the following five basic groups:

- Stormwater Ponds
- Wetlands
- Infiltration Systems
- Filtering Systems
- Open Channel Systems *(8)*

Sub-standard BMP's are those which do not qualify as "stand alone" practices for full WQ_v treatment. By themselves, these BMP's are unable to remove 80% TSS from post-construction discharges. However, sub-standard BMP's can be used appropriately for pretreatment, or in combination with other BMP's as part of an overall "treatment train," or may be applied in redevelopment situations on a case by case basis where other practices are not feasible *(8)*.

2.5.5.3 *The City of Sherwood post-construction SWMP includes non-structural BMP's in the form of Stormwater Credits.* (FUTURE PROGRAM ELEMENT)

2.5.5.4 Structural BMP's in the City of Sherwood post-construction SWMP include both acceptable and sub-standard BMP's. Acceptable BMP's can be divided into five basic groups. The basic groups and individual BMP's are listed below:

Group 1: Stormwater Ponds

- Micro-pool Extended Detention Pond
- Wet Pond
- Wet Extended Detention Pond
- Multiple Pond System
- "Pocket" Pond

Group 2: Wetlands

- Shallow Wetland
- ED Shallow Wetland
- Pond/Wetland System
- "Pocket" Wetland

Group 3: Infiltration Systems

- Infiltration Trench
- Infiltration Basin

Group 4: Filtering Systems

- Surface Sand Filter
- Underground Sand Filter
- Perimeter Sand Filter
- Organic Filter
- Bio-retention

Group 5: Open Channel Systems

- Dry Swale
- Wet Swale
- Grass Channels *(8)*

Sub-standard BMP's include, but are not limited to, the following practices:

- Dry Extended Detention Ponds
- Catch Basin Inserts
- Water Quality Inlets and Oil/Grit Separators
- Hydro-Dynamic Structures
- Filter Strips
- Deep Sump Catch Basins
- Dry Wells
- On-Line Storage in the Storm Drain Network *(8)*

2.5.5.5 The mechanism the City of Sherwood uses to address post-construction runoff from new developments and redevelopments is the City's Storm Drainage Standards. Under the previous permit, new Storm Drainage Standards were developed and were adopted by ordinance #1770 on 02/25/2008. The new Standards contain a chapter on post-construction stormwater management.

2.5.5.6 For BMP's where ownership is vested in the City of Sherwood, long-term operation and maintenance is the responsibility of the City. When ownership of a BMP is not vested in the City, the operation and maintenance responsibility is vested with a responsible party by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval or the permitting process (also, see BMP 23 in Section 2.5.5.8.3).

2.5.5.7 The Engineering Department is responsible for the overall management and implementation of the post-construction SWMP, however, the Public Works Department is responsible for maintenance of publicly owned BMP's.

2.5.5.8 The success of the post-construction stormwater management minimum control measure will be evaluated according to the number of site plans reviewed for compliance with the City's post-construction stormwater management requirements and the number of post-construction stormwater BMP's correctly installed.

Measurable goals have been selected for the BMP's that will ensure developments are constructed with improvements that will reduce pollutant levels in post-construction stormwater without creating the need for additional City personnel to review and inspect the improvements. The individual BMP's and their associated measurable goals are listed below:

2.5.5.8.1 **BMP 21 Review site plans for compliance with the post-construction stormwater management requirements.**

Goal: All development and redevelopment projects disturbing one or more acres shall be reviewed for compliance with the post-construction stormwater management requirements contained in the City's Storm Drainage Standards.

In order to comply with the City's MS4 Permit, all pre-construction site plans for sites disturbing 1000 square feet or more are being reviewed for compliance with the new Standards. The Engineering Department is responsible for reviewing site plans for conformance to these requirements.

2.5.5.8.2 **BMP 22: Inspect post-construction stormwater BMP's for correct installation.**

Goal: All post-construction stormwater BMP's for sites disturbing 1000 square feet or more if part of a larger common plan of development, shall be inspected to ensure they were constructed in accordance with the approved plans.

In order to comply with the City's MS4 Permit, all post-construction stormwater BMP's for sites disturbing 1000 square feet or more are being inspected to ensure they are constructed in accordance with the approved plans. The Engineering Department is responsible for performing these inspections.

2.5.5.8.3 **BMP 23: Require long-term operation and maintenance (O&M) plans for privately maintained post-construction stormwater BMP's.**

Goal: A legally binding and enforceable maintenance agreement shall be executed for all privately owned post-construction stormwater BMP's. The maintenance agreement shall be required as part of plan approval or the permitting process.

As was stated above in Section 2.5.5.6, when BMP ownership is vested in the City of Sherwood, long-term operation and maintenance shall be the responsibility of the City. However, when ownership is not vested in the City, the long-term operation and maintenance responsibility is vested with a responsible party by means of a legally binding and enforceable maintenance agreement that is executed as a condition of plan approval or the permitting process. The Engineering Department is responsible for ensuring that long-term maintenance agreements for privately owned BMP's have been signed.

2.5.6 *Performance Standards.* The City of Sherwood SWMP shall include pre-construction site plan review (for compliance with local requirements for post-construction management of stormwater) of 100 percent of projects from construction activities that result in a land disturbance of greater than 1000 square feet or to ensure that required controls are designed per requirements. These applicable sites shall be inspected to ensure that controls are installed per requirements. The program shall also ensure that long-term operation and maintenance (O&M) plans are developed and agreements in place for all applicable sites.

2.5.7 *Annual Reporting.* The City of Sherwood shall utilize the standard annual report form developed by ADEQ. The annual report shall document the following:

- Number of applicable sites in the jurisdiction requiring post-construction controls
- Number of pre-construction site plan reviews performed
- Number of inspections performed to ensure as built per requirements
- Compliance rates with City of Sherwood requirements
- Number of long-term O&M plans developed and agreements in place

2.5.8 *Low Impact Development (LID).* No readily identifiable impediments to low impact development (LID) were found in the City Code of Ordinances. LID is encouraged in the City of Sherwood through Site Design Credits which allow developers to reduce or eliminate requirements for water quality in exchange for implementation of certain non-structural site design elements. Site Design Credits are discussed in more detail in Section 2.5.5.3.

2.6 Pollution Prevention/Good Housekeeping for Municipal Operations

2.6.1 The City of Sherwood has developed and implemented an operation and maintenance program that includes a training component and has the ultimate goal of preventing or reducing pollutant runoff from municipal operations.

2.6.2 Using training materials that are available from EPA, ADEQ, other organizations or developed in-house, the City of Sherwood pollution prevention/good housekeeping program includes employee training to prevent and reduce stormwater pollution from activities such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance; and

The City of Sherwood owns several facilities that discharge to the MS4 and are subject to ADEQ's Industrial Stormwater General Permit or an individual NPDES permit for discharges of stormwater associated with industrial activity. These facilities, and the applicable ADEQ permit numbers, are listed below:

- North Wastewater Plant (ARR0037176)(ARR000247)
- South Wastewater Plant (ARR0045608)

For facilities not requiring industrial stormwater coverage, the City of Sherwood requires annual inspections if they perform maintenance activities on mechanical equipment, have fueling stations, are involved in waste storage, transfer, or recycling, have material stockpiles, and/or store fertilizers or pesticides. Currently, there are only two municipally owned facilities meeting these requirements. SWPPP's have been developed for both. The facilities are listed below:

- Public Works Department and Maintenance Facility (ARR040027)
- Parks & Recreation Department Maintenance Facility (ARR040027)

2.6.3 *Decision Process.* The City of Sherwood has documented the decision process for the development of the pollution prevention/good housekeeping program for municipal operations. The rationale statement has addressed the overall pollution prevention/good housekeeping program and the individual BMP's, measurable goals, and responsible persons for the program. The rationale statement includes the following:

2.6.3.1 The City of Sherwood has implemented the operation and maintenance program, as described in Section 2.6.3.3 below, to prevent or reduce pollutant runoff from municipal operations. Departments that are impacted by this program include the following:

- Engineering
- Public Works

- Parks & Recreation
- Wastewater

The City operations that are impacted by this program include:

- Vehicle and equipment fueling, cleaning, and repair
- Outdoor storage of raw materials
- Waste handling and disposal
- Building and grounds maintenance
- Parking/storage area maintenance
- Road and street maintenance
- Landscape maintenance
- Drainage system maintenance
- Sewer utility maintenance

2.6.3.2 An employee training program designed to reduce and prevent stormwater pollution has been in place since the previous MS4 permit. As part of this program training materials are distributed semi-annually. This program will be continued for all eligible employees and shall cover such topics as park and open space maintenance, new construction and land disturbances, fleet and building maintenance, and stormwater system maintenance. Other areas of concern include educating employees about illegal dumping and recognizing and reporting illicit discharges. The materials that were utilized previously were developed by ADEQ and EPA, as well as a few in house materials. Fact sheets and training materials from ADEQ and EPA will continue to be used under the new permit.

2.6.3.3 The City's employee training program specifically addresses the following areas:

2.6.3.3.1 Maintenance activities, maintenance schedules, and long-term inspection procedures for controls to reduce floatables and other pollutants to the MS4. See BMP's 24, 25, and 26 in Section 2.6.3.5 for more information.

2.6.3.3.2 Controls for reducing or eliminating the discharge of pollutants from streets, roads, highways, municipal parking lots, maintenance and storage yards, waste transfer stations, fleet or maintenance shops with outdoor storage areas, and salt/sand storage locations and snow disposal areas. See BMP's 27, 28, and 29 in Section 2.6.3.5 for more information.

Additionally, all municipally-owned facilities were evaluated under the previous permit to ensure that industrial stormwater permit coverage, if needed, was obtained. Industrial stormwater permits for qualifying sites will be maintained under the new permit.

Facilities that did not require an industrial stormwater permit, but performed maintenance activities on mechanical equipment, had fueling stations, were involved in waste storage, transfer, or recycling, had material stockpiles, or stored fertilizers or pesticides were required under the previous permit to develop a SWPPP and perform annual inspections. Annual inspections of these sites will continue under the new permit.

2.6.3.3.3 Procedures for the proper disposal of waste removed from the MS4 and the municipal operations, including dredge spoil, accumulated sediments, floatables, and other debris. See BMP 30 in Section 2.6.3.5 for more information.

2.6.3.3.4 Procedures to ensure that new flood management projects are assessed for impacts on water quality and existing projects are assessed for incorporation of additional water quality protection devices or practices. See BMP 31 for more information.

2.6.3.4 The Public Works Department is responsible for the overall management and implementation of the pollution prevention/good housekeeping program. However, other departments, as listed in Section 2.6.3.5 are responsible for implementation of specific BMP's or portions thereof.

2.6.3.5 The success of the pollution prevention/good housekeeping minimum control measure will be evaluated according to the number of measurable goals that are successfully met each reporting year for their associated BMP's.

Measurable goals have been selected for the BMP's that will allow the City to reduce pollutants caused by municipal operations without creating the need for additional equipment and personnel. The individual BMP's and their associated measurable goals are listed below:

2.6.3.5.1 **BMP 24: Inspection and sweeping of streets.**

Goal: Streets with curb and gutter will continue to be swept an average of 4 times annually under the new permit.

This BMP was part of the previous MS4 permit. Pollutants, such as sediment, debris, trash, road salt, and trace metals, can be reduced by street sweeping. Street sweeping can also control dust, improve the aesthetics of roadways, and decrease the accumulation of pollutants in catch basins *(12)*.

The measurable goal for this BMP has been updated to clarify that only streets with curb and gutter are swept. Streets without curb and gutter are not swept because the brushes pull dirt and debris from the side of the street and can actually increase the amount of pollutants on the roadway. The City sweeps approximately 300 miles of streets with curb and gutter. The City will continue to sweep these streets at least

4 times annually under the new permit. The Public Works Department is responsible for overseeing the City's street sweeping program.

2.6.3.5.2 **BMP 25: Perform preventative maintenance on storm sewer system.**

Goal: Drain crews shall continue to perform at least 10 hours per month preventative maintenance on the City storm sewer system under the new permit.

As a stormwater best management practice (BMP), preventive maintenance should be used to monitor systems constructed to control storm water. These systems should be inspected to uncover cracks, leaks, and other conditions that could cause failures of storm water mitigation structures and equipment, which, in turn, could result in discharges of pollutants to surface waters either by direct overland flow or through storm drainage systems. A preventive maintenance program can prevent failures through adjustment, repair, or replacement of structures before a major failure occurs *(18)*. City crews currently perform maintenance on the municipal storm sewer system. While some of this work is complaint driven and occurs during heavy rainfall events, the majority of the maintenance is conducted during dry weather and can be classified as preventative. City crews shall continue performing at least 80 hours of preventative maintenance per month under the new permit. The Public Works Department is responsible for maintenance on the storm drain system.

2.6.3.5.3 **BMP 26: Schedule patching, resurfacing, and crack sealing for dry weather.**

Goal: City staff shall continue scheduling patching, resurfacing, and crack sealing only during dry weather under the new permit.

Proper planning for road and bridge resurfacing projects is a simple but effective pollution control method. Several techniques can be used to control the side-effects of road maintenance procedures. Scheduling paving operations only during dry weather is one of those techniques *(15)*. City staff will continue to schedule all patching, resurfacing, and crack sealing operations only during dry weather under the new permit. Both the Engineering and Public Works Departments are responsible for roadway maintenance and resurfacing.

2.6.3.5.4 **BMP 27: Distribute training materials on stormwater protection to City employees.**

Goal: Under the new permit, materials will continue to be distributed semi-annually to all eligible employees.

This BMP was part of the previous MS4 permit. Pollutants generated by municipal operations accumulate on ground surfaces where they are transported by runoff to receiving waters. Educating municipal employees through a training program about the impacts of their work on storm water quality can help prevent pollution from municipal operations *(11)*. As part of this program, employee training materials will be distributed that have been developed by ADEQ, EPA, and in house. The subject matter of the materials shall be related to reducing or eliminating the discharge of pollutants from streets, municipal parking lots, maintenance and storage yards, waste transfer stations, fertilizers, pesticides, new construction and land disturbances, fleet or maintenance shops with outdoor storage areas, and salt/sand storage locations. Employees shall also receive training on illegal dumping and recognizing and reporting illicit discharges. The City will continue to distribute training materials semi-annually to all eligible employees under the new permit. The Engineering Department is responsible for producing the employee training materials and distributing them to the departments. The individual departments are responsible for disseminating the information to their employees.

2.6.3.5.5 **BMP 28: Designate vehicle washing and maintenance areas for City fleet.**

Goal: Designated vehicle washing and maintenance areas will continue to be used under the new permit.

This BMP was part of the original MS4 permit. Used automobile fluids are toxic, even in small quantities, because of metal contaminants and organic petroleum-based constituents. They must be properly managed to prevent land, air, and water pollution *(2)*. Designating washing and maintenance areas for city vehicles allows for the proper containment of spills and leaks associated with those activities. The City has had designated vehicle washing and maintenance areas for the City fleet since the first year of the original MS4 permit (2004). The City will continue to maintain these areas under the new permit. The Public Works, Parks and Recreation, Sanitation, and Utility Departments each have designated vehicle maintenance and/or washing areas. The individual departments are responsible for the activities at their own facilities.

2.6.3.5.6 **BMP 29: Deicing salts and salt/sand stockpiles shall be stored outside of the 100-year floodplain and in containment areas that prevent discharge to the MS4.**

Goal: Under the new permit, the City shall continue to store deicing salts and salt/sand stockpiles outside of the floodplain and in containment areas that prevent discharge to the MS4.

The storage of deicing materials can lead to water quality problems for surrounding areas. Properly storing deicing salts prevents the salt from lumping together, which makes it easier to load and apply. In addition, covering salt storage piles reduces salt loss from stormwater runoff and potential contamination to streams, rivers, and other water bodies. Salt storage piles should also be located outside the 100-year floodplain for further protection against surface water pollution *(14)*. The City stores its deicing salts in an enclosed shelter, located outside of the 100-year floodplain, and will continue to do so under the new permit.

The City also has a pre-mixed salt and sand stockpile that is kept ready for use during the winter months. The City will continue to store the mixed salt and sand stockpile in this containment area under the new permit. The Public Works Department is responsible for storing and maintaining the City's deicing salts and pre-mixed salt and sand stockpile.

2.6.3.5.7 **BMP 30: Trash, debris, and other solid wastes removed from storm sewers shall be disposed of at sanitary landfill.**

Goal: Under the new permit, all trash, debris, and other solid wastes removed from the storm sewer system shall continue to be disposed of at the sanitary landfill.

Storm sewer systems need to be cleaned regularly. Routine cleaning reduces the amount of pollutants, trash, and debris in both the storm sewer system and the receiving waters. Clogged inlets can cause storm sewers to overflow, leading to increased erosion. Cleaning increases dissolved oxygen, reduces bacteria levels, and supports in-stream habitat *(16)*. When clogged inlets are encountered, the debris causing the blockage many times will have to be removed by hand. This debris must then be disposed of in a proper manner. The City will continue to dispose of all trash, debris, and other solid wastes removed from the storm sewer system at the sanitary landfill under the permit. The Public Works Department is responsible for cleaning out the storm drainage system and disposing of the materials removed.

2.6.3.5.8 **BMP 31: New flood management projects shall be assessed for impacts on water quality.**

Goal: Under the new permit, the City will continue to assess new flood management projects for water quality impacts.

Procedures are currently in place within the Engineering Department for the review of flood management projects. Typically, a consulting engineer will be selected to design the project. Then a scope of services will be agreed upon, an engineering services fee will be negotiated and approved, and an engineering services contract

will be executed. Dependent upon the complexity of the project, design will proceed in either two or three phases: preliminary and final design; or conceptual, preliminary, and final design. Submittals are required for each design phase. Engineering staff review the submittals for conformance to City design standards, City specifications, and appropriate engineering practice.

2.6.4 *Performance Standards.* The City of Sherwood pollution prevention/good housekeeping program includes semi-annual employee training for all eligible employees. An eligible employee is defined as a new or veteran employee whose day-to-day work activities have the potential to impact stormwater quality. Under the previous permit, the City evaluated all current municipally-owned facilities to ensure that industrial general stormwater permit coverage (ARR000000), if needed, was obtained. Annual inspections are required for all City facilities that do not require industrial stormwater permit coverage and that are performing maintenance activities on mechanical equipment, have fueling stations, are involved in waste storage, transfer or recycling, have material stockpiles, and/or are storing fertilizers or pesticides.

2.6.5 *Annual Reporting.* The City of Sherwood shall utilize the standard annual report form developed by ADEQ. The annual reports shall document the following:

- Summary of employee training program(s) implemented with number of employees that attended
- Summary of activities and procedures implemented for the operation and maintenance program

3. SHARING RESPONSIBILITY

Implementation of one or more of the minimum measures may be shared with another entity, or the entity may fully take over the measure. Currently, the City of Sherwood does not share responsibility for implementation of any of the control measures with another entity. However, in the future, the City may rely on another entity only if:

3.1 The other entity, in fact, implements all or part of the control measure;

3.2 The particular control measure, or component of that measure, is at least as stringent as the corresponding permit requirement; and

3.3 The other entity agrees to implement the control measure on the City's behalf. There shall be written acceptance of this obligation. This obligation shall be maintained as part of their SWMP. If the other entity agrees to report on the minimum measure, the City shall supply the other entity with the reporting requirements contained in Part 4.3 of NPDES Permit No. ARR040000.

4. REVIEWING AND UPDATING STORMWATER MANAGEMENT PROGRAMS

4.1 *SWMP Review:* The City of Sherwood shall do an annual review of the SWMP in conjunction with preparation of the annual report required under Part 4.3 of NPDES Permit No. ARR040000.

4.2 *SWMP Update:* The City of Sherwood shall change the SWMP during the life of the permit in accordance with the following procedures:

4.2.1 Changes adding (but not subtracting or replacing) components, controls, or requirements to the SWMP may be made at any time upon written notification to ADEQ. This includes any changes that affect the signatory authority of the permit. These changes will be considered a minor modification and are not subject to the public notice requirements in Part 2.4 of NPDES Permit No. ARR040000. This does not include changes adding a new BMP based on a newly applicable condition, such as BMPs required by Part 3.4.5 of NPDES Permit No. ARR040000 due to a newly impaired waterbody designation. Such changes will be considered a major modification to the SWMP and are required to undergo the process under Section 4.2.2.

4.2.2 Changes replacing an ineffective or infeasible BMP specifically identified in the SWMP with an alternate BMP may be requested at any time. These changes may be considered a major modification to the SWMP and be subject to the public notice process outlined in Part 2.4 of NPDES Permit No. ARR040000. ADEQ will review and provide a written decision within sixty (60) days of the request. ADEQ may approve with additional specific requirements. The revised BMPs shall be implemented immediately upon approval or within the timeframe specified by the approval. If the request is denied, ADEQ will send a written response giving the reason for the decision. The modification requests shall include the following:

4.2.2.1 An analysis of why the BMP is ineffective or infeasible (including cost prohibitive),

4.2.2.2 Expectations on the effectiveness of the replacement BMP, and

4.2.2.3 An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced.

4.2.3 Changes applicable to Sections 1.1.3 and 1.1.4 are considered minor modifications and do not require any notification to ADEQ.

4.2.4 Change requests shall be made in writing and signed in accordance with Part 5.7 of NPDES Permit No. ARR040000.

4.3 *SWMP Updates Required by ADEQ:* It is understood that ADEQ may require changes to the SWMP as needed to:

4.3.1 Address impacts on receiving water quality caused, or contributed to, by discharges from the City;

4.3.2 Include more stringent requirements necessary to comply with new Federal statutory or regulatory requirements; or

4.3.3 Include such other conditions deemed necessary by ADEQ to comply with the goals of the Clean Water Act.

4.3.4 It is understood that any changes requested by ADEQ will be made in writing, set forth the time schedule to develop the changes, offer the opportunity to propose alternative program changes to meet the objective of the requested modification, and discuss whether the changes are subject to the public notification requirements in Part 2.4 of NPDES Permit No. ARR040000.

4.4 *Transfer of Ownership, Operational Authority, or Responsibility for SWMP Implementation:* The City of Sherwood shall implement the SWMP on all new areas added to the City (or areas where the City becomes responsible for implementation of stormwater quality controls) as expeditiously as practicable, but not later than one year from addition of new areas. Implementation may be accomplished in a phased manner to allow additional time for controls that cannot be implemented immediately.

4.4.1 Within 30 days of transfer of ownership, operational authority, or responsibility for SWMP implementation, the City of Sherwood shall have a plan for implementing a SWMP on all affected areas. The plan may include schedules for implementation. Information on all new annexed areas and any resulting updates required to the SWMP shall be included in the annual report. ADEQ shall be notified within 30 days of any change of ownership, operational authority or responsibility for SWMP implementation.

5. REFERENCES

(1) Arkansas State. Arkansas Department of Environmental Quality. *Arkansas is Down on the Dumps.* April 16, 1999.

(2) Arkansas State. Arkansas Department of Environmental Quality. *Universal Waste – Used Oil Environmental Factsheet.* October 1999.

(3) Brown, E., D. Caraco, and R. Pitt. *Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments*. Center for Watershed Protection, Ellicott City, MD. 2004.

(4) Reserved

(5) *Reserved*

(6) Pew Internet Research Project, Social Networking Fact Sheet. http://www.pewinternet.org/fact-sheets/social-networking-fact-sheet/. February 2014.

(7) South Carolina State. South Carolina Department of Health and Environmental Control. *Turning the Tide: A Citizen's Guide to Reducing Runoff Pollution.*

(8) Stormwater Manager's Resource Center (SMRC) Website. www.stormwatercenter.net. Center for Watershed Protection, Inc. Ellicott City, MD. 2000.

(9) City of Sherwood. *Sherwood Vision 2040 Comprehensive Plan*. 2019 www.cityofsherwood.net

(10) United States. Environmental Protection Agency. *Construction Site Stormwater Runoff Control.* May 24, 2006.

(11) United States. Environmental Protection Agency. *Examples of Phase II BMPs and Associated Measurable Goals.* August 15, 2002.

(12) United States. Environmental Protection Agency. *Parking Lot and Street Cleaning.* May 24, 2006.

(13) United States. Environmental Protection Agency. *Public Education and Outreach on Stormwater Impacts.* September 17, 2008.

(14) United States. Environmental Protection Agency. *Road Salt Application and Storage*. May 24, 2006.

(15) United States. Environmental Protection Agency. May 24, 2006. *Roadway and Bridge Maintenance.* May 24, 2006.

(16) United States. Environmental Protection Agency. *Storm Drain System Cleaning.* February 11, 2009.

(17) United States. Environmental Protection Agency. *Stormwater Discharges From Industrial Facilities.* August 24, 2009.

(18) United States. Environmental Protection Agency. *Storm Water O&M Fact Sheet: Preventative Maintenance.* September 1999.

(19) United States. Environmental Protection Agency. *Stormwater Outreach for Commercial Businesses.* May 24, 2006.

APPENDIX “A”

TABLE OF ORGANIZATION/CONTACT LIST

EXHIBIT "A" **2019 SWMP** **TABLE OF ORGANIZATION**

CITY OF SHERWOOD

Sherwood Citizens

City Council

Mayor

Engineering Department

Engineering Department
Public Education and Outreach on Stormwater Impacts

- **BMP 1:** Engineering Dept, Public Information Office
- **BMP 2:** Engineering Dept, Public Information Office
- **BMP 3:** Engineering Dept, Public Information Office
- **BMP 4:** Engineering Dept, Permitting Dept

Engineering Department
Public Involvement/Participation

- **BMP 5:** Engineering Dept, Public Information Office
- **BMP 6:** Engineering Dept, Public Works Dept
- **BMP 7:** Engineering Dept, Public Works Dept
- **BMP 8:** Engineering Dept, Public Works Dept
- **BMP 9:** Engineering Dept
- **BMP 10:** Mayor's Office, Engineering Dept

Engineering Department
Illicit Discharge Detection & Elimination

- **BMP 11:** Engineering Dept, GIS Section
- **BMP 12:** Engineering Dept, Code Enforcement
- **BMP 13:** Engineering Dept, Code Enforcement
- **BMP 14:** Engineering Dept, Public Works Dept

Engineering Department
Construction Site Stormwater Runoff Control

- **BMP 15:** Engineering Dept
- **BMP 16:** Engineering Dept
- **BMP 17:** Engineering Dept
- **BMP 18:** Engineering Dept
- **BMP 19:** Engineering Dept, Public Information Office
- **BMP 20:** Engineering Dept

Engineering Department Post-Construction Stormwater Management in New Development and Redevelopment

- **BMP 21:** Engineering Dept
- **BMP 22:** Engineering Dept
- **BMP 23:** Engineering Dept

Engineering Department
Pollution Prevention/Good Housekeeping for Impacts

- **BMP 24:** Public Works Dept
- **BMP 25:** Public Works Dept
- **BMP 26:** Public Works Dept
- **BMP 27:** Engineering Dept
- **BMP 28:** Engineering Dept
- **BMP 29:** Engineering Dept, Public Works Dept
- **BMP 30:** Public Works Dept, Engineering Dept
- **BMP 31:** Engineering Dept

APPENDIX “A” - CONTACT LIST

DEPARTMENT	CONTACT	POSITION/TITLE	PHONE
Engineering Department	Richard T. Penn, PE*	City Engineer	501-835-4753
Environmental Management	Tracy D. Sims*	Compliance Officer	501-835-4753
Public Works	Brian Galloway	Public Works Director	501-835-3288
Code Enforcement	Sheila Reynolds	Code Enforcement Officer	501-835-4753
Mayor’s Office	Hon. Virginia Young	Mayor	501-835-6620
Inspections	Paul Brown	Chief Building Official	501-835-4753
Public Information Office	Misty Raper	Public Information Officer	501-835-6620

*Primary Points of Contact

APPENDIX “B”

MUNICIPAL CODES
REGARDING ILLICIT DISCHARGES

ORDINANCE NO. 1770

AN ORDINANCE CREATING A STORMWATER POLLUTION PREVENTION CODE FOR THE CITY OF SHERWOOD, ARKANSAS DECLARING AN EMERGENCY AND FOR OTHER PURPOSES.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF SHERWOOD, ARKANSAS, THAT;

SECTION 1: The City anticipates continued growth both in residential and commercial construction.

SECTION 2: A need exists to establish specific regulations and guidelines relative to Stormwater Pollution Prevention.

SECTION 3: The attached Code is hereby adopted as the City's Stormwater Pollution Prevention Code.

SECTION 4: This regulation is a necessary component in the overall regulation of construction in the City and therefore and emergency is declared. It shall be effective immediately after its passage.

SECTION 5: Any Ordinance or part of any ordinance found to be in conflict with this ordinance is repealed to the extent of the conflict.

ADOPTED on this **25th** day of **February 2008**

Virginia R. Hillman, Mayor

ATTEST:

Angela Nicholson, City Clerk

APPROVED AS TO FORM:

Stephen Cobb, City Attorney

CITY OF SHERWOOD STORMWATER POLLUTION PREVENTION PLAN

Contents:

ARTICLE 1.
GENERAL PROVISIONS.

(A) Purposes

The purpose and objectives of this Article are as follows:

(1) To maintain and improve the quality of water impacted by the storm drainage system within the City Limits of Sherwood Arkansas.

(2) To prevent the discharge of contaminated stormwater runoff and illicit discharges from industrial, commercial, residential, and construction sites into the storm drainage system within the
within the City Limits of Sherwood Arkansas.

(3) To promote public awareness of the hazards involved in the improper discharge of trash, yard waste, lawn chemicals, pet waste, wastewater, oil, petroleum products, cleaning products, paint
products, hazardous waste, sediment and other pollutants into the storm drainage system.

(4) To encourage recycling of used motor oil and safe disposal of other hazardous consumer products.

(5) To facilitate compliance with state and federal standards by owners of construction sites within the City Limits of Sherwood, Arkansas.

(6) To enable the City to comply with all federal and state laws and regulations applicable to the National Pollutant Discharge Elimination System (NPDES) permitting requirements for
stormwater discharges.

(B) Administration

Except as otherwise provided herein or by the City Council, the Technical Coordinator and/ or the City Engineer shall administer, implement, and enforce the provisions of this program.

(C) Abbreviations

The following abbreviations when and if used in this herein shall have the designated meanings:

ADEQ – Arkansas Department of Environmental Quality
BMP - Best Management Practices
CFR - Code of Federal Regulations
EPA - U.S. Environmental Protection Agency
HHW - Household Hazardous Waste
MS4 - Municipal Separate Storm Sewer System
NPDES - National Pollutant Discharge Elimination System
SWP3 - Stormwater Pollution Prevention Plan

(D) Definitions

Unless a provision explicitly states otherwise, the following terms and phrases when and if as used, herein, shall have the meanings hereinafter designated.

(1) Best Management Practices (BMP's) here refers to management practices and methods to control pollutants in stormwater. BMP's are of two types: "source controls" (nonstructural) and "treatment controls" (structural). Source controls are practices that prevent pollution by reducing potential pollutants at their source, before they come into contact with stormwater. Treatment controls remove pollutants from stormwater. The selection, application and maintenance of BMP's must be sufficient to prevent or reduce the likelihood of pollutants entering the storm drainage system. Specific BMP's shall be imposed by the City and are discussed further in Appendix A.

(2) City means urban settlement with large population.

(3) Clearing means the act of cutting, removing from the ground, burning, damaging or destroying trees, stumps, hedge, brush, roots, logs, or scalping existing vegetation

(4) Commercial means pertaining to any business, trade, industry, or other activity engaged in for profit.

(5) Construction Site means any location where construction activity occurs. during the construction or grading process.

(6) Construction Spoil means material of any nature which is removed or displaced during the construction or grading process.

(7) Contaminated means containing harmful quantities of pollutants.

(8) Contractor means any person or firm performing or managing construction work at a construction site, including any construction manager, general contractor or subcontractor. Also includes, but is not limited to, earthwork, paving, building, plumbing, mechanical, electrical or landscaping contractors, and material suppliers delivering materials to the site.

(9) Discharge means any addition or release of any pollutant, stormwater or any other substance whatsoever into storm drainage system.

(10) Discharger means any person who causes, allows, permits, or is otherwise responsible for, a discharge, including, without limitation, any owner of a construction site or industrial facility.

(11) Domestic Sewage means sewage originating primarily from kitchen, bathroom and laundry sources, including waste from food preparation, dishwashing, garbage grinding, toilets, baths, showers and sinks.

(12) Earthwork means the disturbance of soils on a site associated with clearing, grading, or excavation activities.

(13) Environmental Protection Agency (EPA) means the United States Environmental Protection Agency, the regional office thereof, any federal department, agency, or commission that may succeed to the authority of the EPA, and any duly authorized official of the EPA or such successor agency.

(14) Facility means any building, structure, installation, process, or activity from which there is or may be a discharge of a pollutant.

(15) Fertilizer means a substance or compound that contains an essential plant nutrient element in a form available to plants and is used primarily for its essential plant nutrient element content in promoting or stimulating growth of a plant or improving the quality of a crop, or a mixture of two or more fertilizers.

(16) Fire Protection Water means any water, and any substances or materials contained therein, used by any person to control or extinguish a fire, or to inspect or test fire equipment.

(17) Garbage means putrescible animal and vegetable waste materials from the handling, preparation, cooking, or consumption of food, including waste materials from markets, storage facilities, and the handling and sale of produce and other food products.

(18) Groundwater means any water residing below the surface of the ground or percolating into or out of the ground.

(19) Harmful Quantity means the amount of any substance that will cause an adverse impact to storm drainage system or will contribute to the failure of the City to meet

the water quality based Requirements of the NPDES permit for discharges from the MS4.

(20) Hazardous Substance means any substance listed in Table 302.4 of 40 CFR Part 302.

(21) Hazardous Waste means any substance identified or listed as a hazardous waste by the EPA pursuant to 40 CFR Part 261.

(22) Household Hazardous Waste (HHW) means any material generated in a household (including single and multiple residences) that would be classified as hazardous.

(23) Illegal Discharge see illicit discharge below.

(24) Illicit Discharge means any discharge to the storm drainage system that is prohibited under this program.

(25) Illicit Connection means any drain or conveyance, whether on the surface or subsurface, which allows an illicit discharge to enter the storm drainage system.

(26) Industrial Waste (or commercial waste) means any wastes produced as a byproduct of any industrial, institutional or commercial process or operation, other than domestic sewage.

(27) Land Alteration means the process of grading, clearing, filling, excavating, quarrying, tunneling, trenching, construction or similar activities

(28) Mechanical Fluid means any fluid used in the operation and maintenance of machinery, vehicles and any other equipment, including lubricants, antifreeze, petroleum products, oil and fuel.

(29) Mobile Commercial Cosmetic Cleaning (or mobile washing) means power washing, steam cleaning, and any other method of mobile cosmetic cleaning, of vehicles and/or exterior surfaces, engaged in for commercial purposes or related to a commercial activity.

(30) Municipal Separate Storm Sewer System (MS4) means the system of conveyances, including roads, streets, curbs, gutters, ditches, inlets, drains, catch basins, pipes, tunnels, culverts, channels, detention basins and ponds owned and operated by the City and designed or used for collecting or conveying stormwater, and not used for collecting or conveying sanitary sewage.

(31) NPDES means the National Pollutant Discharge Elimination System.

(32) NPDES Permit means a permit issued by EPA that authorizes the discharge of pollutants to Waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

(33) Notice of Violation means a written notice detailing any violations of this program and any action expected of the violators.

(34) Oil means any kind of oil in any form, including, but not limited to: petroleum, fuel oil, crude oil, synthetic oil, motor oil, cooking oil, grease, sludge, oil refuse, and oil mixed with waste.

(35) Open Drainage Channel means a ditch or depression, natural or constructed that may intercept and/ or carry stormwater runoff.

(36) Owner means the person who owns a facility, part of a facility, or land.

(37) Person means any individual, partnership, co-partnership, firm, company, corporation, association, joint-stock company, trust, estate, governmental entity, or

any other legal entity; or their legal representatives, agents, or assigns, including all federal, state, and local governmental entities.

(38) Pesticide means a substance or mixture of substances intended to prevent, destroy, repel, or migrate any pest.

(39) Pet Waste (or Animal Waste) means excrement and other waste from domestic animals.

(40) Petroleum Product means a product that is obtained from distilling and processing crude oil and that is capable of being used as a fuel or lubricant in a motor vehicle or aircraft, including motor oil, motor gasoline, gasohol, other alcohol blended fuels, aviation gasoline, kerosene, distillate fuel oil, and #1 and #2 diesel.

(41) Pollutant means any substance attributable to water pollution, including but not limited to rubbish, garbage, solid waste, litter, debris, yard waste, pesticides, herbicides, fertilizers, pet waste, animal waste, domestic sewage, industrial waste, sanitary sewage, wastewater, septic tank waste, mechanical fluid, oil, motor oil, used oil, grease, petroleum products, antifreeze, surfactants, solvents, detergents, cleaning agents, paint, heavy metals, toxins, household hazardous waste, small quantity generator waste, hazardous substances, hazardous waste, soil and sediment.

(42) Pollution means the alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water that renders the water harmful, detrimental, or injurious to humans, animal life, plant life, property, or public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(43) Potable Water means water that has been treated to drinking water standards and is safe for human consumption.

(44) Private Drainage System means all privately or other publicly owned ground, surfaces, structures or systems, that contribute to or convey stormwater, including but not limited to, roofs, gutters, downspouts, lawns, driveways, pavement, roads, streets, curbs, gutters, ditches, inlets, drains, catch basins, pipes, tunnels, culverts, channels, detention basins, ponds, draws, swales, streams and any ground surface.

(45) Public Improvement Plans means engineering drawings subject to approval by the Technical Coordinator and/ or the City Engineer for the construction of public improvements.

(46) Qualified Person means a person who possesses the required certification, license, or appropriate competence, skills, and ability as demonstrated by sufficient education, training, and/or experience to perform a specific activity in a timely and complete manner consistent with the regulatory requirements & generally accepted industry standards for such activity.

(47) Release means to dump, spill, leak, pump, pour, emit, empty, inject, leach, dispose or otherwise introduce into the storm drainage system.

(48) Rubbish means non-putrescible solid waste, excluding ashes, that consist of: (A) combustible waste materials, including paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, and similar materials; and (B) noncombustible waste materials, including glass, crockery, tin cans, aluminum cans, metal furniture, and
similar materials that do not burn at ordinary incinerator temperatures (1600 to 1800 degrees Fahrenheit).

(49) Sediment means soil (or mud) that has been disturbed or eroded and transported naturally by water, wind or gravity, or mechanically by any person.

(50) Septic Tank Waste means any domestic sewage from holding tanks such as vessels, chemical toilets, campers, trailers, septic tanks and aerated tanks and shall also include decentralized sewer systems.

(51) Shall means mandatory; **may** means discretionary.

(52) Site means the land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

(53) Solid Waste means any garbage, rubbish, refuse and other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from industrial, municipal, commercial, construction, mining or agricultural operations, and residential, community and institutional activities.

(54) State means The State of Arkansas.

(55) Storm Drainage System means all surfaces, structures and systems that contribute to or convey stormwater, including private drainage systems, the MS4, surface water, groundwater, Waters of the State and Waters of the United States.

(56) Stormwater means runoff resulting from precipitation.

(57) Stormwater Pollution Prevention Plan (SWP3) means a document that describes the Best Management Practices to be implemented at a site, to prevent or reduce the discharge of pollutants.

(58) Subdivision Development includes activities associated with the platting or division of any parcel of land into two or more lots or tracts and includes all construction activity taking place thereon.

(59) Surface Water means water bodies and any water temporarily residing on the surface of the ground, including oceans, lakes, reservoirs, rivers, ponds, streams, puddles, channelized flow and runoff.

(60) Uncontaminated means not containing harmful quantities of pollutants.

(61) Used Oil (or Used Motor Oil) means any oil that as a result of use, storage, or handling, has become unsuitable for its original purpose because of impurities or the loss of original properties.

(62) Utility Agency means private utility companies, engaged in the construction or maintenance of utility distribution lines and services, including water, sanitary sewer, storm sewer, electric, gas, telephone, television and communication services.

(63) Wastewater means any water or other liquid, other than uncontaminated stormwater, discharged from a facility.

(64) Water of the State (or water) means any groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, inside the territorial limits of the State, and all other bodies of surface water, natural or artificial, navigable or non-navigable, and including the beds and banks of all water courses and bodies of surface water, that are wholly or partially inside or bordering the State or inside the jurisdiction of the State.

(65) Water Quality Standard means the designation of a body or segment of surface water in the State for desirable uses and the narrative and numerical criteria deemed by State or Federal regulatory standards to be necessary to protect those uses.

(66) Waters of the United States means all waters which are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including

all waters which are subject to the ebb and the flow of the tide; all interstate waters, including interstate wetlands; all other waters the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce; all impoundments of waters otherwise defined as waters of the United States under this definition; all tributaries of waters identified in this definition; all wetlands adjacent to waters identified in this definition; and any waters within the federal definition of "waters of the United States" at 40 CFR Section 122.2; but not including any waste treatment systems, treatment ponds, or lagoons designed to meet the requirements of the Federal Clean Water Act.

(67) Wetland means any area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(68) Yard Waste means leaves, grass clippings, tree limbs, brush, soil, rocks or debris that result from landscaping, gardening, yard maintenance or land clearing operations.

ARTICLE 2.

PROHIBITIONS AND REQUIREMENTS.

(A) Prohibitions

(1) No person shall release or cause to be released into the storm drainage system any discharge that is not composed entirely of uncontaminated stormwater, except as allowed herein. Common stormwater contaminants include trash, yard waste, lawn chemicals, pet waste, wastewater, oils, petroleum products, cleaning products, paint products, hazardous waste and sediment.

(2) Any discharge is prohibited if the discharge in question has been determined by the Technical Coordinator and/ or the City Engineer to be a source of pollutants to the storm drainage system.

(3) The construction, use, maintenance or continued existences of illicit connections to the storm drain system are prohibited. This prohibition expressly includes, without limitation, illicit connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.

(4) No person shall connect a line conveying sanitary sewage, domestic sewage or industrial waste, to the storm drainage system, or allow such a connection to continue.

(5) No person shall maliciously destroy or interfere with BMP's implemented pursuant to this program.

(B) Exemptions

The following non-stormwater discharges are deemed acceptable and not a violation:

(1) A discharge authorized by an NPDES permit

(2) Uncontaminated waterline flushing and other infrequent discharges from potable water sources;

(3) Infrequent uncontaminated discharge from landscape irrigation or lawn watering;

(4) Discharge from the occasional non-commercial washing of vehicles

(5) Uncontaminated discharge from foundation, footing or crawl space drains, sump pumps and air conditioning condensation drains;

(6) Uncontaminated groundwater, including rising groundwater, groundwater infiltration into storm drains, pumped groundwater and springs;

(7) Diverted stream flows and natural riparian habitat or wetland flows;

(8) A discharge or flow of fire protection water that does not contain oil or hazardous substances or materials.

(C) Requirements Applicable to Certain Dischargers

(1) Private Drainage System Maintenance. The owner of any private drainage system shall maintain the system to prevent or reduce the discharge of pollutants. This maintenance shall include, but is not limited to, sediment removal, bank erosion repairs, maintenance of vegetative cover, and removal of debris from pipes and structures.

(2) Minimization of Irrigation Runoff. A discharge of irrigation water that is of sufficient quantity to cause a concentrated flow in the storm drainage system is prohibited. Irrigation systems shall be managed to reduce the discharge of water from a site.

(3) Cleaning of Paved Surfaces Required. The owner of any paved parking lot, or paved private drive shall clean the pavement as required to prevent the buildup and discharge of pollutants. The visible buildup of mechanical fluid, waste materials, sediment or debris is a violation of this program. Paved surfaces shall be cleaned by dry sweeping, wet vacuum sweeping, collection and treatment of wash water or other methods in compliance with this Program.

(4) Maintenance of Equipment. Any leak or spill related to equipment maintenance in an outdoor, uncovered area shall be contained to prevent the potential release of pollutants. Vehicles, machinery and equipment must be maintained to reduce leaking fluids.

(5) Materials Storage. In addition to any other requirements of the City, materials shall be stored to prevent the potential release of pollutants. The uncovered, outdoor storage of unsealed containers of hazardous substances is prohibited.

(6) Pet Waste. Pet waste should be monitored so as to prevent discharge to a storm drainage system.

(7) Pesticides, Herbicides and Fertilizers. Pesticides, herbicides and fertilizers shall be applied in accordance with manufacturer recommendations and applicable laws. Excessive application shall be avoided.

(8) Prohibition on Use of Pesticides and Fungicides Banned from Manufacture. Use of any pesticide, herbicide or fungicide, the manufacture of which has been either voluntarily discontinued or prohibited by the Environmental Protection Agency, or any Federal, or State regulation is prohibited.

(9) Open Drainage Channel Maintenance. Every person owning or occupying property through which an open drainage channel passes shall keep and maintain that part of the drainage channel within the property free of trash, debris, excessive vegetation, and other obstacles that would pollute, contaminate, or retard the flow of water through the drainage channel. In addition, the owner or occupant shall maintain existing privately owned structures adjacent to a drainage channel, so that such structures will not become a hazard to the use, function, or physical integrity of the drainage channel.

(D) Release Reporting and Cleanup

Any person responsible for a known or suspected release of materials which are resulting in or may result in illegal discharges to the storm drainage system shall take

all necessary steps to ensure the discovery, containment, abatement and cleanup of such release. In the event of such a release of a hazardous material, said person shall comply with all state, federal, and local laws requiring reporting, cleanup, containment, and any other appropriate remedial action in response to the release. In the event of such a release of non-hazardous materials, said person shall notify the Technical Coordinator no later than 4:00 p.m. of the next business day.

(E) Authorization to Adopt and Impose Best Management Practices

The Technical Coordinator may adopt and impose requirements identifying Best Management Practices for any activity, operation, or facility, which may cause a discharge of pollutants to the storm drainage system. Where specific BMP's are required, every person undertaking such activity or operation, or owning or operating such facility shall implement and maintain these BMP's at their own expense.

ARTICLE 3.

STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITIES.

(A) General Requirements for Construction Sites.

(1) The owner of a site of construction activity shall be responsible for compliance with the requirements of this program All sites, in accordance with State Law, must post appropriate notices, and keep such logs and records as required by ADEQ.

(2) Waste Disposal. Solid waste, industrial waste, yard waste and any other pollutants or waste on any construction site shall be controlled through the use of Best Management Practices. Waste or recycling containers shall be provided and maintained by the owner or contractor on construction sites where there is the potential for release of waste. Uncontained waste that may blow, wash or otherwise be released from the site is prohibited.

(3) Ready-mixed concrete, or any materials resulting from the cleaning of vehicles or equipment containing or used in transporting or applying ready-mixed concrete, shall be contained on construction sites for proper disposal. Release of these materials is prohibited.

(4) Erosion and Sediment Control. Best Management Practices shall be implemented to prevent the release of sediment from construction sites. Disturbed areas shall be minimized, disturbed soil shall be managed and construction site entrances shall be managed to prevent sediment tracking. Excessive sediment tracked onto public streets shall be removed immediately.

(5) Upon completion of permitted construction activity on any site, the property owner and subsequent property owners will be responsible for continued compliance with the requirements of this program, in the course of maintenance, reconstruction or any other construction activity on the site.

(6) All SWP3's filed with the Technical Coordinator shall be accompanied by a certification by a qualified person that said SWP3 complies with this program; the rules and regulations of ADEQ; and any regulations promulgated hereto.

(B) Construction Sites Requiring a SWP3

This provision applies to all construction sites where construction on a site will disturb soil or remove vegetation of 1000 sq. ft. or more during the life of the construction project; this shall include a single lot in a subdivision regardless of size. A Stormwater Pollution Prevention Plan (SWP3) for the project must be provided and implemented by the construction site owner as follows:

(1) The area disturbed shall be assumed to include the entire property area unless all applicable plans specifically exclude certain areas from disturbance.

(2) The SWP3 must be provided by the owner and filed with the Technical Coordinator for sites subject to review by the Planning Board such will not be approved for construction until a duly certified SWP3 has been filed with the Technical Coordinator.

(3) The Technical Coordinator may require revisions to the SWP3. Construction activity, including any soil disturbance or removal of vegetation, shall not commence on the site until a duly certified SWP3 has been filed with the Technical Coordinator.

(4) The owner shall bear the responsibility for implementation of the SWP3 and notification of all contractors and utility agencies on the site.

(C) Subdivision Developments Requiring a SWP3

Where construction of a subdivision development will disturb soil or remove vegetation on one (1) or more acres of land during the life of the development project, an approved Stormwater Pollution Prevention Plan (SWP3) for the project must be provided and implemented by the subdivision owner and/or the developer as follows:

(1) The area disturbed shall be assumed to include the entire platted area.

(2) An SWP3 must be provided by the subdivision owner and/or the developer.

(3) An SWP3 must be provided for all phases of development, including sanitary sewer construction, storm drainage system construction, waterline, street and sidewalk construction, general grading and the construction of individual homes. The subdivision owner will not be required to provide an SWP3 for the activities of utility agencies within the subdivision.

(4) The subdivision owner shall provide a copy of the SWP3 to all utility agencies prior to their working within the subdivision.

(5) The subdivision owner shall bear the responsibility for implementation of the approved SWP3 for all construction activity within the development, excluding construction managed by utility agencies.

(6) The subsequent owner of an individual lot bears the responsibility for continued implementation of the approved SWP3 for all construction activity within or related to the individual lot, excluding construction managed by utility agencies.

(D) Stormwater Pollution Prevention Plans

Preparation and implementation of Stormwater Pollution Prevention Plans for construction activity shall comply with the following:

(1) Preparation:

(a) The SWP3 shall be prepared under the direction of a qualified person.

(b) The SWP3 shall provide the name, address and phone number of the project owner for purposes of correspondence and enforcement.

(c) The SWP3 shall identify existing natural resources such as streams, forest cover and other established vegetative cover.

(d) The SWP3 shall specify and provide detail for all BMP's necessary to meet the requirements of this program, including any applicable BMP's that have been adopted and imposed by the Technical Coordinator.

(e) The SWP3 shall specify when each BMP will be installed, and for how long it will be maintained within the construction sequence. Multiple plans may be required for

major phases of construction such as rough grading, building construction and final grading.

(f) The SWP3 shall delineate all anticipated disturbed areas and specify the vegetative cover that must be established in those areas to achieve final stabilization.

(2) Implementation

(a) BMP's shall be installed and maintained by qualified persons. The owner and/or the developer or their representative shall be able to produce upon the Technical Coordinator request a copy of the SWP3 on site and shall be prepared to respond to unforeseen maintenance of specific BMP's.

(b) The owner and/or the developer or their representative shall inspect all BMP's at least twice per month and within 24 hours after a rainfall of one half of an inch or more as measured at the site or generally reported in the area.

(c) Based on inspections performed by the owner and/or the developer or the Technical Coordinator modifications to the SWP3 will be necessary if at any time the specified BMP's do not meet the objectives of this program. In this case, the owner/developer or authorized representative shall meet with the Technical Coordinator to determine the appropriate modifications. All modifications shall be completed within seven (7) days of the referenced inspection, except in circumstances necessitating more timely attention, and shall be recorded on the owner and/or the developers' copy of the SWP3.

(E) Requirements for Utility Construction

(1) Utility agencies shall be responsible for compliance with the requirements this program.

(2) Utility agencies shall develop and implement Best Management Practices (BMP's) to prevent the discharge of pollutants on any site of utility construction within the designated areas in the City. In addition, the Technical Coordinator may adopt and impose BMP's on utility construction activity.

(3) Utility agencies shall implement BMP's to prevent the release of sediment from utility construction sites. Disturbed areas shall be minimized, disturbed soil shall be managed and construction site entrances shall be managed to prevent sediment tracking. Excessive sediment tracked onto public streets shall be removed immediately.

(4) Prior to entering a construction site or subdivision development, utility agencies shall have obtained from the owner and/or the developer a copy of any SWP3's for the project. Any disturbance to BMP's resulting from utility construction shall be repaired immediately by the utility company in compliance with the SWP3.

(F) Grading Plans

(1) General requirements.

Persons engaged in land alteration activities regulated by this program shall take measures to protect neighboring public and private properties from damage by such activities. The requirements of this program, however, are not intended to prevent the reasonable use of properties.

(a) The responsible party shall be liable for all fines levied or remedial action required under this program. Each violation shall be considered a separate offense.

(b) Any person who engages in land alteration activities regulated herein without a grading plan, shall be required to restore the land, to the maximum extent practicable to its original condition.

(c) There shall be on the project site at all times an agent who is a competent superintendent capable of reading and thoroughly understanding plans, specifications and requirements. The job superintendent shall have full authority to issue orders or direction to employees working on site, without delay and to promptly supply such materials, labor, equipment, tools, and incidentals as may be required to complete the work in a proper manner. If no superintendent is on site, the Technical Coordinator may issue the notice of violation and stop work order to the person conducting the violation.

(2) Grading Plan Required.

(a) Any person proposing to engage in clearing, filling, cutting, quarrying, construction or similar activities on any piece of disturbed land of 1000 sq. ft or larger, including a single lot in a subdivision regardless or size shall file a grading and drainage plan with the Technical Coordinator, which shall include a certification by a qualified person that such complies with this program, the rules and regulations of ADEQ and any regulations promulgated hereto. No land shall be altered or cleared to the extent regulated in this program unless. a plan has been filed. The Technical Coordinator may require revisions to said plan Grading plans are not applicable to dirt pits, gravel pits, or quarries which are governed by State Laws; however, a SWP3 is still required. Clearing and grading for streets and drainage improvements may be done on residential subdivisions provided the preliminary plat and construction plans have been approved by the Planning Board and the Technical Coordinator and/ or the City Engineer complies with this program or any regulations promulgated hereto. In those cases where filling or cutting in areas with no trees is to be done, the area is to be graded suitable for mowing and shall be re-vegetated.

(b) A grading plan is required for land alteration activities specified in this program. However, all construction work shall include appropriate drainage and erosion control measures to protect neighboring properties. All land alteration in properties within the designated floodplain requires a grading plan without exception.

(c) Stockpiling of construction spoil material at particular locations for a limited time period is permitted, not to exceed six (6) months. Grading and replanting of grassed areas is required upon removal of stockpile.

(3) Exemptions.

A grading plan shall not be required for: emergency work or repairs to protect health, safety and welfare of the public.

(4) Contents of grading and drainage plans.

The grading and drainage plan shall identify the following:

(a) Acreage should be included in the proposed project.

(b) Land areas to be disturbed.

(c) Stages of grading showing the limits of sections to be graded and indicating the approximate order of development.

(d) The height and slope of cuts and fills. Cross sections shall be required every one hundred (100) feet on property where the depth of excavation or fills exceeds five (5) feet, showing original and final grades and will include visual aids to show how the

final development, including planting and landscaping will look. A grading plan showing existing and proposed contours with a maximum 2-foot contour interval for slopes less than 10% and a maximum 5-foot contour interval for slopes greater than 10% can be shown as an alternate to cross-sections every 50 feet.

(e) Provisions for collecting and discharging surface water.

(f) Erosion and sediment measures, including structural and vegetative measures.

(g) Seal, Certificate of Authority and signature of a registered engineer qualified under state regulations to certify that the grading and drainage plan complies with this program the regulations of ADEQ and any regulations promulgated hereto.

(h) A vicinity drawing showing location of property lines, location and names of all existing or platted streets or other public ways within or immediately adjacent to the tract on topographic mapping or approved equal.

(i) Location of all known existing sewers, water mains, culverts and underground utilities within the tract and immediately adjacent thereto; location of existing permanent buildings on or immediate adjacent to the site if right of entry can be obtained to locate same.

(j) Identification of rights-of-way or easements affecting the property.

(k) A plan of the site at a minimum scale of one (1) inch equals one hundred (100) feet or less, i.e. 1" = 50' or 1" = 30', etc.

(l) Such other information as may be required by the Technical Coordinator, including but not limited to:

01. Address and telephone number of owner, permit applicant and the designated agents responsible for maintenance of erosion and sediment control measures.

02. The approximate location and width of existing and proposed streets.

03. The locations and dimensions of all proposed or existing lots.

04. The locations and dimensions of all parcels of land proposed to be set aside for parks, playgrounds, natural condition perimeters, public use, or for the use of property owners in proposed development.

05. Existing and proposed topography at a maximum of two-foot contour intervals.

06. An approximate timing schedule, indicating the anticipated starting and completion dates of the development: a timing schedule for the sequence of grading and application of erosion and sediment control measures.

07. Square Footage should be included for the proposed project.

08. If there are any visible surface indications that unusual materials or soils that would cause street or lot instability, such as non-vertical tree growth, old slides, seepage, or depressions in the soil exists, they should be noted and accompanied by the engineer's recommendation for correcting such problem areas.

09. If there are any surface indications that local material is not suitable for fills, those areas to be filled with outside material and should be identified and the type and source of the fill noted.

10. Specification of measures to control runoff, erosion and sedimentation during the process of construction, noting those areas where control of runoff will be required during construction and indicating what will be used, such as straw bales, sediment basins, silt dams, silt fencing, check dams, lateral hillside ditches, catch basins, etc.

11. Measures to protect neighboring built-up areas and city property during process of construction, noting work to be performed, such as cleaning existing ditches, storm culverts and catch basins or raising existing curbs in neighboring areas.

12. Provisions to stabilize soils and slopes after completion of streets, sewers and other improvements, noting on the grading plan when and where ground cover will be planted, also noting any other means to be used such as placement of stone embankments and riprap or construction of retaining walls.

13. All fill areas shall be compacted to 95% standard proctor density unless otherwise approved in writing by the Technical Coordinator.

14. The grading and drainage plan shall include areas of tree protection, erosion and sediment control provisions meeting standards established in the appendix attached hereto and/ or promulgated by the Technical Coordinator.

(m) The Technical Coordinator may allow minor modifications of the plan to alleviate particular problems during the process of construction. In reviewing request for modifications, the Technical Coordinator may require from the applicant's engineer appropriate reports and data sufficient to make a decision on the request.

(n) Groups of trees and individual trees that are not to be removed and required undisturbed buffer areas shall be protected during construction by protective fencing and shall not be used for material storage or for any other purpose. The fencing shall be placed and maintained by the owner until all exterior construction except landscaping has been completed. Individual trees to be preserved outside the protected area shall be fenced at the critical root zone and shall be flagged with bright orange vinyl tape wrapped around the main trunk at a height of four (4) feet or more such that the tape is clearly visible to workers on foot or operating equipment.

(o) Major changes to grading plans shall only be permitted by the Technical Coordinator upon consultation with other interested departments and agencies. Examples of major changes are those that substantially increase the height of cuts, the area of clearing or grading, or impact on neighboring properties. More than twenty percent (20%) increase in height, area or impact will normally be considered a major change. Examples of increased impact include reductions in buffer area, increased runoff onto adjacent properties and increased site area that is visible from adjacent properties or public streets.

(5) Grading and drainage plan requirements.
Preparation of grading and drainage plans shall follow the appendix attached hereto and other regulations promulgated by the Technical Coordinator.

(6) Grading plans shall also conform to the Phase ll Stormwater Regulations as established by United States Environmental Protection Agency's regulations, Region Vl published in the July 6, 1998 Federal Register or it's latest revisions.

(7) A copy of all documents filed with the ADEQ shall also be filed with the Technical Coordinator.

(8) No more than **5 tons of sediment per acre** shall be released over a 12 month period using the Universal Soil Loss Equation for Construction Sites (**RUSLE 2**).

ARTICLE 4.

ENFORCEMENT.

(A) Enforcement Personnel Authorized

The following personnel employed by the City shall have the power to issue Notices of Violations and implement other enforcement actions under this program

(1) The Technical Coordinator or, the City Engineer.

(2) The Sherwood Police and Code Enforcement shall have the authority to issue any misdemeanor citations.

(B) Right of Entry and Sampling

(1) Whenever the Technical Coordinator has cause to believe that there exists, or potentially exists, in or upon any premises any condition which constitutes a violation of this program, he shall have the right to enter the premises at any reasonable time to determine if the discharger is complying with all requirements of this program. In the event that the owner or occupant refuses entry after a request to enter has been made, the Technical Coordinator is hereby empowered to seek assistance from a court of competent jurisdiction in obtaining such entry.

(2) The Technical Coordinator shall have the right to set up on the property of any discharger to the storm drainage system such devices that are necessary to conduct sampling of discharges.

(C) Enforcement Procedures

(1) Issuance of Notice of Violation:

If site deficiencies are noted, the owner and/or the developer or authorized agent shall be given a notice of violation. The notice of violation shall be specific as to the noted violation, corrective measures to be taken, and a time frame allowed to complete the work.

(2) Compliance Review

At the end of the time period specified above, a follow-up site inspection shall take place to determine whether compliance has been achieved. Depending on that determination, the following actions may occur:

(a) Site Violations Corrected:

If all previous site violations have been corrected, the site reviewer shall issue an inspection report stating that fact

(b) Previous Violations Not Corrected:

If previously noted violations have not been satisfactorily corrected, then ~~the~~ further actions may be initiated as outlined in the following section.

(3) Submissions from the General Public

Members of the General Public may submit information pertaining to this program to the Technical Coordinator. The Technical Coordinator will consider such submissions as they pertain to the implementation and enforcement of this program and will provide written or verbal response to the person submitting the information.

(4) Referrals from other agencies will be handled in the following manner:

(a) Cases will be referred directly to the Technical Coordinator At this point the Technical Coordinator will determine if enforcement actions are warranted and if proper documentation has been obtained. If the Technical Coordinator determines that action is required, the enforcement process will be set into motion.

(b) Cases received by the Technical Coordinator will handled on a first come, first served basis. All enforcement actions will be initiated by a site inspection to verify site conditions that caused the case to be referred. If conditions have been corrected or do

not exist as stated in the referral, such shall be documented. If conditions exist as stated in the referral, enforcement actions will proceed.

(c) Enforcement Options for Failure to Comply

(d) The Technical Coordinator may issue a stop work order to any persons violating any provision of this program by ordering that all site work stop except that necessary to comply with any administrative order.

(e) Action without Prior Notice

Any person who violates a prohibition or fails to meet a requirement of this program will be subject, without prior notice, to one or more of the enforcement actions, when attempts to contact the person have failed and the enforcement actions are necessary to stop an actual or threatened discharge which presents or may present imminent danger to the environment, or to the health or welfare of persons, or to the storm drainage system.

(f) Enforcement Actions

(1) Performance Bonds. Where necessary for the reasonable implementation of the program, the Technical Coordinator may, by written notice, order any owner and/or developer of a construction site or subdivision development to file a satisfactory bond, payable to the City of Sherwood, in a sum not to exceed a value determined by the Technical Coordinator to be necessary to achieve consistent compliance with this program. This person may protest the amount of the performance bond to the City Judge. The written protest must be received by the City Judge's Office within 15 days of the date of the notification. A hearing on the matter will be scheduled before the City Judge. Appeals from any ruling by the City Judge shall be directed to Circuit Court.

(g) Criminal Penalties If any violation is also considered a violation of State Law then such may be punishable as set out in A.C.A. 8-4-105

(h) Any other action by the Technical Coordinator may be appealed to the City Judge as stated above.

(i) Other Legal Action Notwithstanding any other remedies or procedures available to the City, if any person discharges into the storm drainage system in a manner that is contrary to the provisions of this program, the City Judge may commence an action for appropriate legal and equitable relief including damages costs, and attorney's fees in any court of competent jurisdiction. The City Judge may seek a preliminary or permanent injunction or both which restrains or compels the activities on the part of the violator.

(j) Applicability This program is effective for the MS4 areas or designated areas of the Stormwater Pollution Prevention Plan.

ARTICLE 5. FEES

(a) Enforcement

Program Administrator fee for processing violation compliance **$50.00/hr.**
Street Sweeper (minimum) **$100.00**
Other equipment as needed (minimum) **$100.00**
Violations - **$50.00** to **$1000** per violation.
Violation amounts shall be compounded daily.
Engineer services will constitute a fee of **$100.00** per hour.

APPENDIX “C”

FILLING & GRADING ORDINANCE

Grading and Excavation Code

DIVISION 1. GENERALLY

Section 1. **Penalty for violations.**

(a) In this section "violation of this Code" means:

(1) Doing an act that is prohibited or made or declared unlawful, an offense or a misdemeanor by ordinance or by rule or regulation authorized by ordinance;

(2) Failure to perform an act that is required to be performed by ordinance or by rule or regulation authorized by ordinance; or

(3) Failure to perform an act if the failure is declared a misdemeanor or an offense or unlawful by ordinance or by rule or regulation authorized by ordinance.

(b) In this section "violation of this Code" does not include the failure of a city officer or city employee to perform an official duty unless it is provided that failure to perform the duty is to be punished as provided in this section.

(c) Except as otherwise provided, a person convicted of a violation of this Code shall be punished by a fine not exceeding five hundred dollars ($500.00), or double such sum for each repetition thereof. If the violation is, in its nature, continuous in respect to time, the penalty for allowing the continuance thereof is a fine not to exceed two hundred fifty dollars ($250.00) for each day that the same is unlawfully continued.

(d) If a violation of this Code is also a misdemeanor under state law, the penalty for the violation shall be as prescribed by state law for the state offense.

(e) The imposition of a penalty does not prevent revocation or suspension of a license, permit or franchise.

(f) Violations of this Code that are continuous with respect to time are a public nuisance and may be abated by injunctive or other equitable relief. The imposition of a "penalty" however does not prevent the simultaneous granting of equitable relief in appropriate cases.

Section 2. **Findings.**

The city has experienced development activity causing the displacement of large amounts of earth and tree cover. Significant problems resulting from such development include flooding, soil erosion and sedimentation, unstable slopes, and impaired quality of life. These problems are a concern because of their negative effects on the safety and general welfare of the community.

Section 3. **Purpose**.

The purposes of this Code are to:
(1) Prohibit the indiscriminate clearing of property.
(2) Prevent excessive grading, clearing, filling, cutting or similar activities.
(3) Substantially reduce flooding, erosion and sediment damage within the city.

(5) Safeguard the safety and welfare of citizens.
(6) Establish reasonable standards and procedures for development which prevent potential flooding, erosion and sediment damage.
(7) Prevent the pollution of streams, ponds and other watercourses by sediment.
(8) Minimize the danger of flood loss and property loss due to unstable slopes.
(9) Preserve natural vegetation which enhances the quality of life of the community.
(10) To conceal hillside scars.
(11) To preserve the contours of the natural landscape and land forms.

Section 4. **General requirements**.

Persons engaged in land alteration activities regulated by this Code shall take measures to protect neighboring public and private properties from damage by such activities. The requirements of this Code, however, are not intended to prevent the reasonable use of properties as permitted by Ordinance 729.

Section 5. **Violation, enforcement and penalties**.

(a) Violations of any provisions of this Code shall be punishable as provided in section 1of this Code, except that the continuing violation provisions of subsection 1(c) shall not apply unless:
(1) An approved plan for correction of the violation(s) has not been implemented by the responsible party within the time specified in the plan, or
(2) The responsible party fails to submit a required plan within the time specified.
(b) The responsible party shall be liable for all fines levied and remedial action required under this Code. Each tree removed or improperly preserved or any other activity proscribed by this Code shall be a separate violation. Each violation shall be considered a separate offense.
(c) Any person who engages in land alteration activities regulated by this Code without obtaining a grading permit shall be required to restore the land to the maximum extent practicable to its original condition in accordance with section 30.
(d) When a violation of this Code is determined to exist, the city official shall issue written notice of violation to the responsible party. The notice shall specify those sections of this Code which are determined to be violated and shall include the time and conditions under which the violation(s) shall be corrected. If it is determined that the restoration is not feasible due to imminent construction, (1) a citation may be issued and fines may be levied; (2) the site shall be graded to obtain positive drainage; and (3) the site shall be stabilized with vegetation and the addition of erosion controls. If the responsible party has been issued either a notice of violation or stop work order within the previous twelve-month period, the notice may require the violation(s) to be corrected within twenty-four (24) hours.
(e) The responsible party shall have a maximum of ten (10) calendar days from the date of the written notice to appeal the finding of the violation(s) to the planning commission as provided in section 7.
(f) If the responsible party fails to comply with the written notice of violation the city official may issue a stop-work order, citation and revoke all permits including the grading

permit, building permit, and certificate of occupancy. Additionally, when the city official determines that trees to be protected are in the process of being removed or damaged or other emergencies exist, a stop work order to immediately cease and desist may be issued.

(g) The permit applicant shall have on the project site at all times an agent who is a competent superintendent capable of reading and thoroughly understanding the plans, specifications and requirements for areas of tree protection for the type of work being performed. The superintendent shall have full authority to issue orders or direction to employees working on site, without delay and to promptly supply such materials, labor, equipment, tools, and incidentals as may be required to complete the work in a proper manner. If no superintendent is on site, the city official may issue the notice of violation and stop work order to the person conducting the violation.

(h) Removal of trees with a diameter of twelve (12) inches or greater measured four and one-half (4.5) feet above the ground that have been removed without a grading permit or trees required in an approved plan that have been removed or which die shall be considered a violation.

(i) If a land alteration activity causes damage to off-site property or water, the responsible party shall be required to mitigate the damage and install such additional erosion controls, as approved by the city official, to prevent further damage.

(j) Damage to private or public property due to hauling operations or operation of construction related equipment from a nearby construction site shall be repaired by the responsible party prior to issuance of a certificate of occupancy.

Section 6. **Conflicts**.

Where provisions of this Code conflict with any other ordinance, regulation, or resolution of the city, the most stringent provision shall be enforced. The provisions of this Code are considered minimum requirements.

Section 7. **Hearing before planning commission**.

Appeals of a notice of violation as provided for in subsection 5(e), a grading and drainage plan decision, or a restoration plan requirement as provided in section 30 shall be heard by the planning commission provided an appeal is filed by the applicant within ten (10) calendar days after the date of the notice of violation, fee(s) are paid, and proper public notice is given. Any hearing before the planning commission regarding such appeal will be conducted in the following manner:

(a) The appellant shall submit an application and fee as provided in section 27 to the Permits and Planning Department within the time limits provided for in subsection 5(e). The appellant shall provide (1) a cover letter that clearly sets forth the provisions of the article that are being appealed and (2) a copy of all pertinent graphic materials or correspondence. Appealable issues are as follows:

1. For a notice of violation, appealable issues are the determination that a violation has occurred, the time frame for correcting the violation, and the corrective action to be required.

2. For a grading and drainage plan decision, appealable issues are the denial of a grading permit and the terms of a grading permit.
3. For a restoration plan, appealable issues are any requirements of section 30.
(b) Certified-mail notice of all appeals shall be given by the applicant to adjacent property owners, including those across a street or alley from the subject property, at least ten (10) days prior to the planning commission meeting at which the appeal is to be considered. At least three (3) business days prior to the hearing, the appellant shall provide proof of notice to the Permits and Planning Department. Failure to provide the required notice will cause the appeal to the planning commission to be dismissed, although minor irregularities in the giving of notice may be waived by the commission.
(c) At the conclusion of questioning and statements, the chairman will call the appeal to a vote as follows:
1. For an appeal of the finding of a violation, either to affirm or overturn the finding of violation; upon affirmation of a finding of violation, a citation may be issued to the appellant;
2. For an appeal of the time to correct the violation, either to affirm the time or determine a new time;
3. For an appeal of the corrective action, either to affirm, determine a new corrective action, or decide that a corrective action is not feasible. A finding that a corrective action is not feasible or appellant's refusal to comply with the commission's decision may result in a citation being issued to the appellant.
4. For an appeal of a grading and drainage plan decision, either affirm or overturn the decision to deny a grading permit, either affirm the permit term or establish a new permit term.
5. For an appeal of a restoration plan or plan provision, either to affirm, determine a new provision or provisions, or decide that restoration is not feasible. A citation may be issued after finding that restoration is not feasible or upon appellant's refusal to fully comply with the restoration measures required by the planning commission.
(d) Decisions by the commission shall be final and are not appealable to the Mayor or City Council Alderman.

Sections 8-19. **Reserved**.

DIVISION 2. GRADING PERMIT AND GRADING AND DRAINAGE PLAN

Section 20. **Grading permit required.**

(a) Any person proposing to engage in clearing, filling, cutting, harvesting, quarrying, construction or similar activities regulated by this Code shall apply by means of a grading permit application obtained from the city for a grading permit as specified in this Code. The city shall have a maximum five (5) working days to review the grading permit application before a permit is issued. Grading permits shall not be issued while applications are incomplete. A landscape permit as required in Ordinance 1492 shall be obtained from the city before Constructing or expanding a vehicular use area. Additionally, a permit is required when expanding or rehabilitating a building and landscaping is required under this Code. Except as otherwise provided in Ordinance

1492, the responsible party shall not allow the removal of more than seven (7) trees within any given twelve-month period without first obtaining a grading permit. No land shall be altered or cleared to the extent regulated in this Code unless approved by a permit.

(b) No land alteration shall be permitted until all necessary city approval of all plans and permits, except building permit, have been issued and construction is imminent. Clearing and grading for streets and drainage improvements may be done on residential subdivisions provided the preliminary plat has been approved. In those cases where filling or cutting in areas with seven (7) or fewer trees is to be done, the area is to be graded suitable for mowing and shall be revegetated within thirty (30) calendar days of grading completion. If building construction has not commenced and been diligently pursued within eight (8) months of grading permit issuance, then all disturbed areas must be restored in accordance with section 30 and landscaping and tree requirements in the buffers shall be installed, unless the city official determines that the existing buffers on the site meet the landscape planting and zoning requirements.

(c) A grading permit is required for land alteration activities specified in this section. All construction work shall include appropriate drainage and erosion control measures to protect neighboring properties. All land alteration on properties within the designated floodplain requires a grading permit without exception.

(d) Grading permits, which may be obtained as part of a building permit, shall be required for any of the following activities:

(1) A top of hill or hillside cuts or fills greater than ten (10) feet vertical.

(2) Any construction activity where the total volume of cut or fill is equal to or greater than one thousand (1,000) cubic yards.

(3) Clearing or cutting of trees on property in the city except for:

i. Areas with bona fide agriculture and forestry activities;

ii Areas with bona fide mining activities; and

iii. Properties abutting on a collector street of two (2) acres or less zoned single- or two-family districts R1, R2, R3, R4, or PRD, and residentially zoned properties of five (5) acres or less fronting on a residential street.

(e) Prior to issuance of a grading permit, a grading and drainage plan shall be submitted to and approved by the city for activities specified in subsections (d)(1), (2) and (3).

(f) When the application is for a planned zoning district, conditional use permit, site plan review, subdivision, or multiple building site approval, a sketch grading and drainage plan shall be required in the application to the planning commission only if any of the activities specified in subsection (d) are involved.

(g) Utility organizations may obtain a one-time approval from the city for all routine tree trimming and installation, maintenance, replacement and repair of fence and sign posts, telephone poles and other kinds of posts or poles and overhead or underground electric, water, sewer, natural gas, telephone or cable facilities. The approval will include a utility organization and its contractors, agents or assigns and will be permanent in nature as long as the original approved procedures are followed. However, large-scale utility projects involving clearing of areas over twenty-five (25) feet in width shall not be authorized by one-time approval of all projects. In such cases, a separate grading permit must be obtained for each project.

(h) One-time approval may be obtained by public or private entities for the stockpiling

of construction spoil material and concrete and asphalt rubble at particular locations for a limited time period, not to exceed six (6) months. Grading and replanting of grassed areas and trees is required upon removal of stockpile.

Section 21. **Exemptions and variances.**

(a) A grading permit shall not be required for:
(1) Construction on properties in the city (i) uses for bona fide agriculture, forestry or mining activities; (ii) properties abutting on a collector street of two (2) acres or less zoned single- or two-family districts R1, R2, R3, R4 or R7A, and residentially zoned property five (5) acres or less fronting on a residential street.
(2) Emergency work or repairs to protect health, safety and welfare of the public. Removal of damaged or diseased trees will be allowed; and
(3) Mining and mining operations because these activities are covered by the Arkansas Open Cut Land Reclamation Act [A.C.A. Section 15-57-301 as amended], which is regulated by the state Department of Environmental Quality.
(b) The planning commission may grant variances from the standards set forth in this article provided that a variance request is filed by the applicant, fee(s) are paid, and proper public notice is given. The applicant shall submit a variance request application and fee as provided in section 27 to the Permits and Planning Department. As part of the application, the applicant shall provide:
(1) A cover letter that clearly sets forth the provisions of the code from which a variance is requested and
(2) A copy of all pertinent graphic materials or correspondence.
(c) Certified-mail notice of all variance requests shall be given by the applicant to adjacent property owners, including those across a street or alley from the subject property, at least ten (10) days prior to the planning commission meeting at which the variance is to be considered. At least three (3) business days prior to the hearing, the applicant shall provide proof of proper notice to the Permits and Planning Department. Failure to provide the required notice will cause the variance request to the planning commission to be dismissed, although minor irregularities in the giving of notice may be waived by the commission.
(d) Appeals from the variance decision of the planning commission shall be filed with the appropriate court of jurisdiction within thirty (30) calendar days of the decision of the planning commission.
(e) Variances may be granted, to the extent that the change will not be contrary to the purposes set forth in section 3:
(1) To clear and grade a multilot or multiphase development where construction is not imminent on all phases of the development;
(2) To harvest timber on land not otherwise allowed under this section in accordance with a reasonable staff-approved forestry-management plan which is determined to be reasonable and prepared by a registered forester or certified arborist using best management practice guidelines for silviculture in urban areas, that complies with the purposes and requirements of this article; however, clear cutting or total harvests shall not be allowed;
(3) To exceed the cut, fill, and slope requirements of section 24;

(4) From the restoration requirements of section 30.
The planning commission may impose conditions on the approval of variances. Where variances are granted, applicants shall otherwise comply with all other provisions of the ordinance including, but not limited to, obtaining a grading permit prior to construction or tree removal, meeting the standards for grading, drainage, tree removal, maintaining buffer zones, erosion controls, and establishing of vegetative cover following grading activities.

Section 22. **Contents of grading and drainage plans.**

(a) The sketch grading and drainage plan shall identify the following:
(1) Acreage of the proposed project.
(2) Land areas to be disturbed.
(3) Stages of grading showing the limits of sections to be graded and indicating the approximate order of development.
(4) The height and slope of cuts and fills. Cross sections may be required every fifty (50) feet on property where the depth of excavation or fill exceeds ten (10) feet, showing original and final grades and will include visual aids to show how the final development, including planting, and landscaping will look.
(5) Provisions for collecting and discharging surface water.
(6) Erosion and sediment measures, including structural and vegetative measures for permanent slopes and bank stability.
(7) Seal and signature of a registered engineer, surveyor, architect, or landscape architect, qualified under state regulations to certify that the sketch grading and drainage plan complies with this Code. However, plans for less than two (2) acres fronting on a collector street, or residentially zoned areas less than five (5) acres fronting on a residential street, where cuts or fills are not greater than ten (10) feet in height or where only tree clearing activities are to be undertaken, may be required by the City Engineer to be prepared by a contractor or the property owner.
(b) A final grading and drainage plan shall include the following information prior to issuance of grading and special flood hazard development permits:
(1) Seal of a registered engineer, surveyor, architect or landscape architect qualified under state regulations to certify that the grading and drainage plan complies with this Code.
(2) A vicinity drawing showing location of property lines, location and names of all existing or platted streets or other public ways within or immediately adjacent to the tract.
(3) Location of all known existing sewers, water mains, culverts and underground utilities within the tract and immediately adjacent thereto; location of existing permanent buildings on or immediately adjacent to the site if right of entry can be obtained to locate the utilities.
(4) Identification of rights-of-way or easements affecting the property.
(5) Soil-loss calculations as estimated by the universal soil-loss equation. Allowable soil loss shall not exceed five (5) tons per acre per year. Examples of soil-loss calculations will be provided by the City Engineer’s Office.
(6) A plan of the site at a minimum scale of one (1) inch equals one hundred (100) feet.
(7) Such other information required by city officials, including, but not limited to:

a. Address and telephone number of owner, permit applicant and the designated agent responsible for maintenance of erosion and sediment control measures.
b. The approximate location and width of existing and proposed streets.
c. The locations and dimensions of all proposed or existing lots.
d. The locations and dimensions of all parcels of land proposed to be set aside for parks, playgrounds, natural condition perimeters, public use, or for the use of property owners in the proposed development.
e. Existing and proposed topography at a maximum of five-foot contour intervals for steep terrain; two-foot contour intervals for ten (10) percent or less grade terrain.
f. An approximate timing schedule, indicating the anticipated starting and completion dates of the development; a timing schedule for the sequence of grading and application of erosion and sediment control measures as well as restoration of vegetation.
g. Acreage of the proposed project.
h. Identification of unusual material or soils in land areas to be disturbed. If any surface indications of unusual materials or soils that would cause street or lot instability, such as nonvertical tree growth, old slides, seepage, or depressions in the soil are visible before grading, they should be noted and accompanied by the engineer's, architect's, landscape architect's, or contractor's recommendation for correcting such problem areas.
i. Identification of suitable material to be used for fills shall be accomplished before actual filling begins. If there are any surface indications that local material is not suitable for fills, those areas to be filled with outside material should be identified and the type and source of the fill noted.
j. Specification of measures to control runoff, erosion and sedimentation during the process of construction, noting those areas where control of runoff will be required during construction and indicating what will be used, such as straw bales, sediment basins, silt dams, brush check dams, lateral hillside ditches, catch basins, etc.
k. Measures to protect neighboring built-up areas and city property during process of construction, noting work to be performed, such as cleaning existing ditches, storm culverts and catch basins or raising existing curbs in neighboring areas.
l. Provisions to stabilize soils and slopes after completion of streets, sewers and other improvements, noting on the grading plan when and where ground cover will be planted, also noting any other means to be used such as placement of reinforced turf, staked sod, stone embankments, and riprap or construction of retaining walls.
(8) The grading and drainage plan shall include areas of tree protection, erosion and sediment control provisions meeting standards established by the city in the stormwater management and drainage manual. Tree lines and individual trees may be required to be shown.

Section 23. **Issuance procedure.**

(a) The following procedure shall be implemented for the issuance of a grading permit.
(1) The city official shall approve, disapprove or recommend modification of the grading and drainage plan in writing within five (5) working days after the date of submittal of a complete application.
(2) Applications for which planning commission approval is required shall be placed on the next available planning commission agenda following city staff review.

(3) Except for residential subdivision work, the approval of a sketch grading and drainage plan shall not eliminate the need to submit and have approved a final grading and drainage plan prior to issuance of a building permit or the initiation of land alteration activities.
(4) For residential subdivision work, only a sketch grading and drainage plan shall be required, and clearing and grading work may proceed upon approval of the preliminary plat and issuance of a grading permit. The sketch plan for residential subdivisions shall indicate how runoff, erosion, and sedimentation will be controlled.
(b) Upon approval of the final plan, the city shall issue a grading permit. A superintendent capable of understanding the plans and with authority to issue orders to employees performing the land alteration shall properly supervise the land alteration activities.
(c) The city official may issue a stop work order if, upon inspection, it is determined that the work is not progressing in accordance with the approved plan.
(d) Groups of trees and individual trees that are not to be removed or that can be preserved with reasonable effort in site design or are located within required undisturbed buffer areas shall be protected during construction by protective fencing. The buffer and any preservation areas shall not be used for material storage or for any other purpose. The fencing shall be placed and maintained by the owner until all exterior construction except landscaping has been completed. Individual trees or groups of trees to be preserved outside the buffer area shall be fenced at no less than seventy-five (75) percent of the area within the drip line of the critical root zone and shall be flagged with bright orange vinyl tape wrapped around the main trunk at a height of four (4) feet or more such that the tape is clearly visible to workers on foot or operating equipment.
(e) The city official may allow minor modifications of the plan to alleviate particular problems during the process of construction. In reviewing a request for modifications, the city official may require from the applicant's engineer, architect, or landscape architect appropriate reports and data sufficient to make a decision on the request.
(f) Major changes to plans approved by the planning commission either in sketch or final form shall only be permitted by the planning commission. Examples of major changes are those that substantially increase the height of cuts or the area of clearing or grading, or substantially impact neighboring properties. More than twenty (20) percent increase in height, area or impact will normally be considered a major change. Examples of increased impact include reductions in buffer area, increased runoff onto adjacentproperties, and increased site area that is visible from adjacent properties or public streets.

Section 24. **Grading and drainage plan requirements.**

Preparation of grading and drainage plans shall follow the Best Management Practices (BMP) for stormwater or city regulations and shall be designed on the basis of the following considerations:
(1) A maximum of thirty (30) vertical feet of fill or excavation (such as three (3) ten-foot vertical terraces or two (2) fifteen-foot vertical terraces) is permitted, however additional development areas may be constructed a minimum of one hundred fifty (150) feet in width and at a slope of no more than eight (8) percent. The maximum of thirty

(30) feet of fill or excavation may again be utilized.
a. The depth of fill or excavation shall be measured from the finish grade elevation to the original ground line elevation.
b. No more than two hundred (200) feet of terrace can be in a straight line and a minimum of a ten (10) feet curved section, jog, or offset is required for each additional two hundred (200) feet of terrace.
c. For excavations or fills constructed with slopes flatter than 3:1 (three horizontal to one vertical), terraces are not required nor is there a limit on the height of cut or fill. Planting requirements on these 3:1 slopes shall be the same as required for terraces and shall be spaced uniformly over the slope.
d. Cuts or fills shall be limited to ten (10) feet in height or to fifteen (15) feet if architectural stone is included to protect the vertical face. A series of smaller cuts or fills with terraces, preserving portions of natural vegetation and providing areas for planting, shall be used in situations where more than ten (10) feet of cut or fill is needed.
e. Terracing width shall be at a ratio of at least one (1) foot of horizontal terrace for every one (1) foot of vertical height, up to a maximum of ten (10) feet. Terraces shall be landscaped with dense evergreen plantings sufficient to screen the cut or fill slope. The terrace may be sloped to drain up to one (1) foot in ten (10) feet of width.
f. If the slope of the cut or fill is faced with an architectural stone wall, the terrace plantings shall be a minimum of two (2) rows of trees four (4) feet between the rows, staggered not more than thirty (30) feet on centers.
g. Shrubs and ground cover shall be required in accordance with Ordinance 1492.
h. Slopes steeper than 3:1 may be allowed for street improvements in the right-of-way due to rock outcropping or extreme slope intercepts if approved by the City Engineer.
(2) Development shall be planned to fit topography, soils, geology, hydrology, and other existing site conditions.
(3) Provisions shall be made for safety against unstable slopes or slopes subject to erosion and deterioration. The city official may require certified geotechnical analysis for sliding and global stability safety. New cuts and fills forming channel banks may require permanent provisions for erosion control upon determination by the city official.
(4) Grading shall complement natural landforms.
(5) After grading, all paving, seeding, sodding, or mulching shall be performed in accordance with a reasonable schedule approved by the city official.
(6) Open areas not planned for immediate use shall be seeded or sodded. Soil which is exposed for more than thirty (30) days with no construction activity shall be seeded, mulched or revegetated in accordance with this code.
(7) Areas not well suited to development, as evidenced by existing competent soils, geology, hydrology investigations and reports, should be allocated to open space and recreational uses.
(8) The potential for soil loss shall be minimized by retaining natural vegetation wherever possible.
(9) Appropriate provisions shall be used to accommodate stormwater runoff and soil loss occasioned by changed soil and surface conditions during and after development, including the use of vegetation and limitations on soil exposure. If staff determines upon visual inspection that excessive silt from the construction has migrated on or offsite, additional measures to reduce erosion may be required.

(10) Permanent improvements such as streets, storm sewers, curb and gutters, and other features for control of storm runoff shall be scheduled as soon as economically and physically feasible before removing vegetation cover from the area, so that large areas are not left bare and exposed for long periods of time beyond the capacity of temporary control measures.
(11) A temporary or permanent sediment basin, debris basin, desilting basin or silt trap shall be installed and maintained to substantially reduce sediment from water runoff upon determination by the city official. The volume of the sediment basin shall be three thousand six hundred (3,600) cubic feet per acre for property with average slope steeper than five (5) percent, or one thousand eight hundred (1,800) cubic feet per acre for property with an average slope five (5) percent or flatter. A properly sized sediment basin is required for each separate drainage area within the property being developed.
(12) Construction access shall be limited to locations as approved by the city official. Construction access points shall be paved in uniformly graded stone without fines for a minimum length of twenty (20) percent of the lot depth or fifty (50) feet, whichever is greater, up to a maximum of one hundred (100) feet to prevent tracking onto the city street.
(13) Appropriate provisions such as the addition of water or dust retardants shall be utilized to prevent excessive particulate matter from becoming airborne.
(14) A perimeter buffer strip shall be temporarily maintained around disturbed areas for erosion control purposes and shall be kept undisturbed except for reasonable access for maintenance. The width of the strip shall be six (6) percent of the lot width and depth. The minimum width shall be twenty-five (25) feet and the maximum shall be forty (40) feet. In no event shall these temporary strips be less than the width of the permanent buffers required for the development.
(15) A minimum strip twenty-five (25) feet wide, undisturbed except for reasonable access, shall be provided along each side of streams having a ten-year storm of greater than one hundred fifty (150) cubic feet per second. The twenty-five-foot strip shall be measured from the top of the bank. An exception to this requirement is allowed where the only work being done on the site is public street construction.
(16) Care shall be exercised to minimize the risk of damage from or to pedestrian and vehicular traffic in the vicinity of a cut or fill by placement of handrails, guardrails, fencing or landscaping.
(17) Additional landscape treatment shall be provided in accordance with Ordinance 1492.

Section 25. **Unified plan and permit.**

One (1) plan may be submitted incorporating all provisions for compliance with the applicable city zoning, landscaping, drainage detention, grading, clearing, filling, cutting, quarrying, and construction requirements.

Section 26. **Reserved.**

Section 27. **Fees.**

A fee for each grading permit shall be paid to the city as follows:
TABLE INSET:

Total Project Area	Fee
Less than one (1) acre.....	$30.00
Greater than 1 acre.....	$30.00 for first acre, $30.00 for each additional acre, up to a maximum of ten acres, not to exceed $300.00.

Fees for each grading permit will double if the grading permit is issued after a notice of violation(s) has been issued for violation(s) of the land alteration regulations that have occurred on the subject property.
A fee for each appeal and variance shall be paid to the city as Flat Fee . . . $50.00

Section 28. **Inspection and compliance.**

(a) The inspector designated by the City Engineer shall be responsible for determining whether construction is proceeding according to the approved grading and drainage plan.
(b) City officials shall perform inspections of the development site. In applying for a grading permit, the applicant shall be deemed to have consented to such inspections.
(c) The city official, through such periodic inspections, shall ensure that all erosion control measures are implemented within one (1) week after cessation or completion of all or portions of authorized work. The city official may where necessary, order remedial work or issue a stop work order in accordance with this Code.

Section 29. **Reserved.**

Section 30. **Land restoration requirements.**

All land restoration corrective action activities resulting from land alteration violations shall comply with following conditions:
(1) Submit site restoration and erosion control plans to the Permits and Planning Department for approval prior to beginning restoration work.
(2) All restoration work must be begin within ten (10) calendar days of plans approval and conclude within thirty (30) calendar days of commencement unless otherwise provided by the approved plan or other uncontrollable conditions.
(3) Prior to commencing restoration activities, erosion controls such as silt fence, hay bales, and rock check dams shall be installed and shall remain in place until restoration activities are complete.
(4) Return all ground surface contours to those in existence prior to land alteration violation while maintaining positive drainage. All slopes must be 3:1 or flatter. Terraces are prohibited.
(5) All spoil materials and debris including tree debris must be removed from the

property.
(6) Replant one (1) tree for every one thousand (1000) square feet of the area of violation, as determined by the city official, with an average linear spacing of not less than thirty (30) feet with at least two-inch caliper nursery- or farm-grown trees of the same species as those cleared, harvested, removed or damaged. Planting specifications shall be provided on the plan including soil preparation, staking and other necessary measures to ensure trees thrive. If the city official determines the current season of the year is not conducive to sustaining life for trees, the time compliance with these provisions may be extended for not more than one hundred eighty (180) days.
(7) Establish a permanent vegetative cover of perennial grasses with the addition of fertilizer mixes conducive to site conditions.
(8) It is the responsibility of the land owner to maintain restoration of vegetation, shrubs or trees in a manner that it does not constitute a public hazard or nuisance. The land owner shall maintain the vegetation, shrubs or trees in a manner that will allow the plants to grow and live.
(9) Final inspection and approval is required following completion of required restoration activities. All incomplete items or additional work identified during the final inspection must be completed within seven (7) calendar days following the final inspection.
(10) All restoration work is to be guaranteed by the responsible party in the form of cash or letter of credit for two (2) years following its installation and approval by the Permits and Planning Department.
(11) All permits and approvals must be obtained from all federal, state, and local agencies prior to commencing work.
(12) All restoration work shall be required as stated above unless approved otherwise by the city official.

Grading & Land Alteration Permit Application

Land Alteration Regulations Ordinance _____, require persons proposing to engage in clearing, harvesting, filling, cutting, quarrying, construction or similar activities to apply for a permit. To obtain the permit, known as a grading permit, applicants must fully complete and submit this form to the Sherwood Permits and Planning Department to initiate grading permit processing.

I. PROJECT IDENTIFICATION

Name of Project:_____

Address:_____

Description:_____

_____

Zoning: _____ **Building Permit #:** _____

II. APPLICANT INFORMATION

The applicant shall be the "responsible party" for compliance with the Land Alteration Regulations and this grading permit. The applicant may be either the contractor, developer, property owner or other person who is engaged in the land alteration activity.

Applicant:_____ **phone #:**_____

Applicant's Company:_____

Applicant's Address:_____

III. PERMIT CRITERIA (*Grading permits are required only when the activity meets threshold conditions and no exemption applies.*)

A. EXEMPTIONS *(No grading permit required)*

	check if applicable
Property of 2 acres or less fronting a collector standard street and zoned R1, R2, R3, R4, or PRD:	_____
Property uses for bona fide Agricultural, Forestry or Mining activities:	_____
Property of 5 acres or less fronting on a residential standard street and zoned R1, R2, R3, R4, or PRD:	_____
Work performed due to an emergency or a repair to protect public health, safety and welfare:	_____

B. THRESHOLD CONDITIONS

Check the below condition(s) that apply:

Site within SFHA (100-year Floodplain):	_____
Cutting/filling ≥ 10 vertical feet:	_____
Cutting/filling ≥ 1000 CY:	_____
Removing > 7 trees w/ ≥ 12" dia. ABH:	_____

APPROVALS

	Yes/No
Planning Dept. zoning approval:	_____
Planning Dept. approval (Landscape/Buffers):	_____
Building Permit issued:	_____
Grading and Drainage Plan approved:	_____
Erosion Control Plan approved:	_____

IV. SITE SPECIFICS

A permit can be issued only when all necessary city approvals have been obtained and construction is imminent. (*Imminent construction means the installation of a foundation or erection of a structure without delay following land alteration activities as determined by the City Engineer.)*

Construction period:	Start date_____	Est. Finish date _____
Soil Loss Estimates:	*w/o erosion controls(t/a/y)* _____	*w/ erosion controls (t/a/y)*_____
Area disturbed (acre)_____	Max. depth of cut/fill (ft)_____	Total project cut/fill (cy)_____

Est. quantity of fill material to haul in excluding gravel and asphalt (cy): _____

Source of fill material excluding gravel and asphalt: _____

Est. quantity of cut material to haul out (cy): _____

Destination of fill material hauled from site: _____

All off-site cut/fill areas within the corporate limits operated simultaneously with construction site(s) must be permitted separately.

Location of vehicular access tracking pad(s): _____

_____

Provide haul route of construction vehicles to/from site: *(Hauling activities are confined to identified routes.)*

_____

_____

_____

Required Submittals:
- **Grading and drainage plan** *(except residential subdivision)*
- **Erosion control plan**
- **Construction period soil loss estimates**

- The City shall have five (5) working days to review the grading permit application for permit issuance or denial.
- All construction work shall include appropriate drainage and erosion control measures to protect neighboring properties. If a land alteration activity causes damage to off-site property or water, the responsible party shall be required to mitigate the damage and install such additional erosion controls, as approved by the city official, to prevent further damage.
- Clearing and grading for streets and drainage improvements may be done on residential subdivisions only provided the preliminary plat has been approved. No installation of infrastructure including curb, gutter, road base, asphalt, sidewalks, and drainage system is allowed until grading and drainage plans have been approved by the City Engineer.
- Clearing and grading activities are restricted to work hours shall be allowed between the hours of 6:00 a.m. to 6:00 p.m., Monday through Saturday and 1:00 p.m. to 6:00 p.m. on Sunday.
- If building construction has not commenced and been diligently pursued within eight (8) months of grading permit issuance, then all disturbed areas must be restored in accordance with Section 30 and landscaping and tree requirements in the buffers shall be installed, unless the city official determines that the existing buffers on site meet the landscape planting requirements of Ordinance 1492 and zoning requirements of Ordinance 729.
- Any changes that occur during construction that deviate from the approved grading permit application must be approved by Permits and Planning Department.
- Damage to private or public property due to hauling operations or operation of construction related equipment from a nearby construction site shall be repaired by the responsible party prior to issuance of a certificate of occupancy.
- Grading Permit Fee: $30 for first acre plus $30 for each additional acre not to exceed $300, make check payable to "City of Sherwood"
- All grading permits must be signed and picked up at the Permits and Planning Department, prior to beginning construction at: **31 Shelby Road, Sherwood, Arkansas 72120; Ph #501-835-4753 Fax # 501-392-0088**

Public Works use:

Grading Permit Issuance: Approved_____ Denied_____

Signature of City Official: _____ Date:_____

Comments:

APPENDIX “D”

STORM DRAINAGE STANDARDS

Introduction

Effects of Urbanization

Urban development alters the hydrology of watersheds and streams by disrupting the natural water cycle. Impacts include:

- Runoff volumes increase up to 50 percent over pre-developed volumes.
- Peak runoff discharges increase two to five times pre-developed discharges.
- Runoff velocities increase.
- Time of concentrations decrease.
- Frequency of bankfull and near bankfull events increase.
- Flooding increases.
- Dry weather flows (baseflow) decrease.

These changes in the hydrology of the area translate into the changes shown in the typical hydrograph presented in Figure 1.

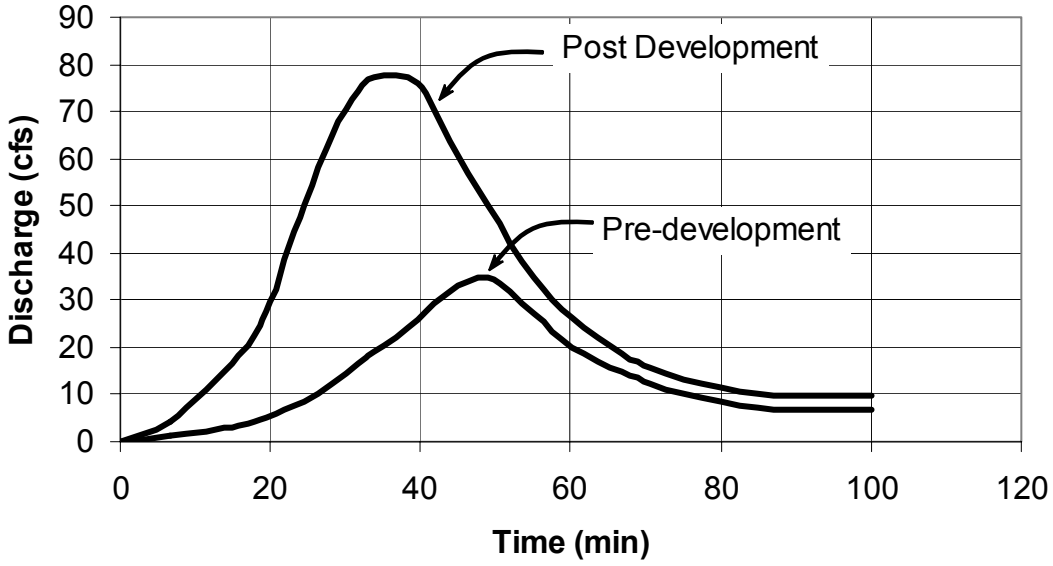

Figure 1. Effect of development on stormwater discharge rates.

Sources of Pollutants

Urbanization increases the amount of sediment, nutrients, microbes, organic matter, toxic pollutants, and trash in stormwater flows.

Sediment in water (suspended solids, dissolved solids, and/or turbidity) is the cause of:

- Filling of lakes and reservoirs
- Stream turbidity
- Habitat changes
- Recreation/aesthetic loss
- Transport of other contaminants

Nutrients in water (nitrate, nitrite, ammonia, organic nitrogen, phosphate, and total phosphorus) are the cause of:

- Algae blooms
- Eutrophication
- Ammonia Toxicity to aquatic life
- Nitrate Toxicity

Microbes in water (Total and Fecal Coliform, Fecal Streptococci, Viruses, E.Coli, Enteroccus) can be the cause of:

- Gastrointestinal diseases
- Ear/Intestinal infections
- Shellfish bed closure

Organic Matter (vegetation, septic tank overflows, pet waste) in water is the cause of:

- Dissolved oxygen depletion
- Odors
- Fish kills

Toxic Pollutants (heavy metals such as cadmium, copper, lead, zinc, organics, hydrocarbons, pesticides/herbicides) can be the cause of:

- Human & aquatic toxicity
- Bioaccumulation in the food chain
- Thermal Pollution Dissolved oxygen depletion
- Habitat changes

Trash and debris cause:

- Recreation loss
- Aesthetic loss

Construction BMPs

An Ounce of Prevention is Worth a Pound of Cure

Construction BMPs fall into two categories, erosion control and sediment control. Erosion control is the protection of the soil surface from the impact of rain drops and the resulting detachment of soil particles. Sediment control are the practices that capture soil particles that have been detached and transported down slope. It is far more efficient and cost effective to prevent erosion than to capture sediment.

Design Methodology and BMP Selection Criteria

Construction BMPs are typically designed for erosion control, sediment control, or control of wastes (hazardous, solid, etc.). For the best results, BMPs should be used in series with one or more BMPs. The operator of the construction site should concentrate efforts on erosion control; but, provide sediment control backup BMPs. A listing of construction erosion and sediment control BMPs and the benefits each provides is Shown in Table 1. Further information on each BMP is presented in the following sections of this chapter.

Table 1. Construction BMP characteristics chart

	Quantity		Quality			
Construction BMP	Flow atten-uation	Runoff volume reduction	Erosion Control	Sediment control	Nutrient loading (N,P)	Organic loading
Minimize Clearing & Compaction	⊙	O	●	O	⊙	⊙
Construction Sequencing	⊙	O	●	●	⊙	⊙
Construction Entrance	⊙	⊙	⊙	●	⊙	⊙
Interceptor Swale & Dike	⊙	⊙	●	●	⊙	⊙
Slope Drain	⊙	⊙	●	O	⊙	⊙
Energy Dissipation - Riprap Apron	⊙	⊙	●	⊙	⊙	⊙
Soil Roughening	O	O	●	●	⊙	⊙
Chemical Stabilization	O	O	●	●	O	O
Mulch	⊙	⊙	●	⊙	⊙	⊙
Erosion Control Mats	⊙	⊙	●	⊙	⊙	⊙
Vegetation	O	O	●	●	O	O
Embedded Silt Fence	O	O	O	●	⊙	⊙
Inlet Protection	⊙	⊙	O	●	⊙	⊙
Sediment Trap	●	●	O	●	O	O
Check Dams	●	O	O	●	⊙	⊙

● - Primary benefit O - Secondary benefit ⊙ - Little or no benefit

Construction Planning

Minimize Clearing and Compaction

Description

Clearing of natural vegetation and vehicular traffic on the site will expose and compact soils causing erosion and greater amounts of runoff.

Minimization of Clearing and Compaction will decrease the amount of soil exposed to erosion and will decrease the amount runoff from due to compacted soil.

Applicability

Existing vegetation can often be incorporated into the design and construction of a development lessening the amount of bare soil exposed to rain and wind. Compacted soil does not allow for adequate infiltration of precipitation, therefore increasing runoff quantities and flowrates. Increased flowrates increase erosion and sediment transport.

Design Criteria

Landscaping and clearing requirements vary from project to project. Vehicular traffic within the construction site should be limited and confined to areas that are protected with adequate sediment control practices.

Limitations

Some native plants and grasses are not considered appropriate for developed sites; so, non-native grasses and plants would need to be planted.

Maintenance Requirements

Maintenance of protective fencing as needed.

Construction Sequencing

Description

Exposing soil before required for construction can expose the soil to erosion for an extended period.

Construction Sequencing coordinates land disturbing activities with construction requirements to minimize the amount of soil exposed to erosion at any time.

Applicability

Only land needed for building activities and vehicular traffic should be cleared. Projects on larger sites and on projects that land disturbing activities can be phased are best suited for *Construction Sequencing*.

Design Criteria

Areas of the site to be preserved should be clearly marked on the plans and delineated on the site. The timing of clearing and access to different areas of the site should be indicated in the contract documents.

Limitations

Sometimes, smaller projects do not lend themselves to sequencing of land disturbing activities.

Maintenance Requirements

Maintenance of protective fencing as needed.

Runoff and Run-on Control BMPs

Construction Entrances

Description

Mud and sediment carried off-site on the tires of equipment and vehicles will be deposited on the neighboring streets. This sediment will end up in the local streams if not swept up.

Construction Entrances are systems that clean vehicles of mud, sediment, and aggregate prior to leaving the site.

Applicability

Any entrance/exit of a construction site.

Design Criteria

A six inch layer of washed gravel or round stone (greater than 1 inch) can be used to stabilize construction site entrances. The stabilized entrance should be at least 50 feet long. The entrance should be as long as the longest vehicle that will enter the site. If larger volumes of traffic are expected, a two-lane entrance is appropriate.

Other methods of removing mud from vehicles are wheel wash facilities (dunk or mechanical) and rubble strips (cattle guard, logs, etc.).

A dunk wheel wash is a water filled, stabilized (1 inch or greater gravel or stone) pit. The water depth should be at least two feet deep and the pit should be at least 20 foot long. The pit should be two vehicle lengths from the construction site exit and the entrance and exit to the pit should be stabilized.

Limitations

In order to avoid puncturing tires, stabilized entrances should not be constructed with sharp edge stones.

Maintenance Requirements

Stabilized entrances require periodic cleaning or addition of stone as the voids in the stones fill with mud and sediment.

Wheel wash facilities and rubble strips will need to be cleaned as the pits fill in order to provide more room to store new mud and sediment.

The street in front of the entrance should be cleaned as required to remove sediment that has been tracked off site.

Interceptor Swale & Dike

Description

Water running onto the site will increase erosion and be a nuisance to construction activities. Additionally, runoff from the construction site can have excessive amounts of sediment that can end up in local streams.

Interceptor Swales and Dikes are diversion systems used to divert runoff around a site or to direct runoff from a site to a pond in order to settle out sediment prior to discharge from the site.

Applicability

Any area that that is subject to runoff from up hill drainage areas.

Design Criteria

The swale (channel) and dike should be situated to capture runoff uphill of the work area with a vegetative buffer uphill of the swale to remove sediment before it enters the swale. The stabilized swale and ditch should be in-place prior to all other earth work on the project. The channel should be designed to handle the 10-year storm, with the bottom and sides protected for the anticipated water velocity. Typically, the ditch will be two foot wide at the bottom and six foot wide at the top. Maximum water velocity in the swale should not exceed five feet per second. Side slopes should be no steeper than 1:3 (vertical:horizontal). Energy dissipation should be provided at the exit from the swale as needed.

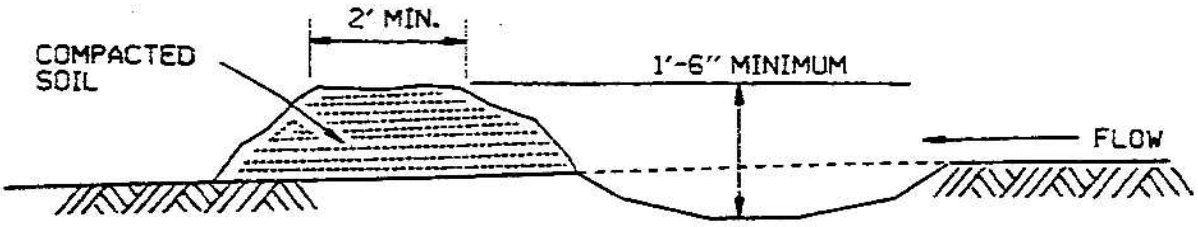

Figure 2. Swale configuration detail (Source: AHTD, 2001)

Limitations

Excessive flowrates can cause scour in the swale; therefore requiring a sediment control pond at the end of the swale.

In the event that the dike over flows during larger storm events, the site can be damaged and excessive erosion and sediment transport can occur.

Maintenance Requirements

The swale should be cleared of debris and excessive vegetation as required.

Slope Drain

Description

Gullying and excessive erosion will take place on slopes subjected to concentrated flows of runoff.

Slope Drains are conduits (open or closed) used to direct water down a slope while protecting the slope from erosion.

Applicability

Slopes with the potential for intended or unintended concentrated flows

Design Criteria

Slope drains (rundowns, pipe slope drains, etc.) should be placed where runoff from uphill drainage areas will concentrate. Slope drains should be sized to handle a 10 year storm from an area no greater than five acres. Minimum size for a pipe slope drain is 12 inch diameter. Slope rundowns (stone or riprap lined channels) should be constructed with the middle sufficiently lower than the sides to ensure flow stays in the rundown. Slope drains operate best when used in conjunction with interceptor swales and dikes on the top of the slope. Appropriate energy protection should be placed at the outlet of the pipe.

Limitations

For larger storms, the slope drain may not operate properly and can cause excessive gullying and slope erosion as well as damage to the construction site. Slope drains that are improperly designed or constructed such that the flow does not stay in the drain will cause excessive erosion.

Maintenance Requirements

Slope drains should be inspected weekly and kept clear of trash, debris, and vegetation.

Energy Dissipation – Riprap Aprons

Description

Water exiting a channel, swale, pipe, or culvert (any water carrying conduit) typically is in a concentrated stream with a relatively high velocity. This high energy stream of water erodes unprotected soil.

Energy Dissipation is a structural BMP placed at the exit of a water carrying conduit to slow the velocity and decrease the turbulence of the water. Permanent energy dissipation controls can be used during the construction phase of the project, and should be designed according to methods described in the Residential and Commercial BMPs section of this manual.

Applicability

All channels or pipes carrying runoff at velocities that will erode the soil in the discharge area.

Design Criteria

Determine the required median size (d_{50}) of riprap using graph in Figure 3 below. Enter the graph on the X-axis with the discharge in cubic feet per second, move vertically to intersect either the appropriate depth of flow (d) line or the velocity of flow (v) line, then read to the horizontally to Y-axis on the right side to determine the required median diameter of riprap (d_{50}).

Determine the minimum required apron length using the graph in Figure 3. Enter the graph on the X-axis with the discharge in cubic feet per second, move vertically to the second set of lines to intersect the appropriate depth of flow (d), then read horizontally to the left to determine the minimum required length of apron (L_a) in feet.

Limitations

Riprap aprons are best suited for applications where the Froude Number at the conduit exit is less than 2.5.

Some Communities do not allow riprap as a permanent control method of energy dissipation.

Maintenance Requirements

The apron should be inspected after large storms to ensure that the riprap is in place. riprap should be replaced when it is dislodged or missing.

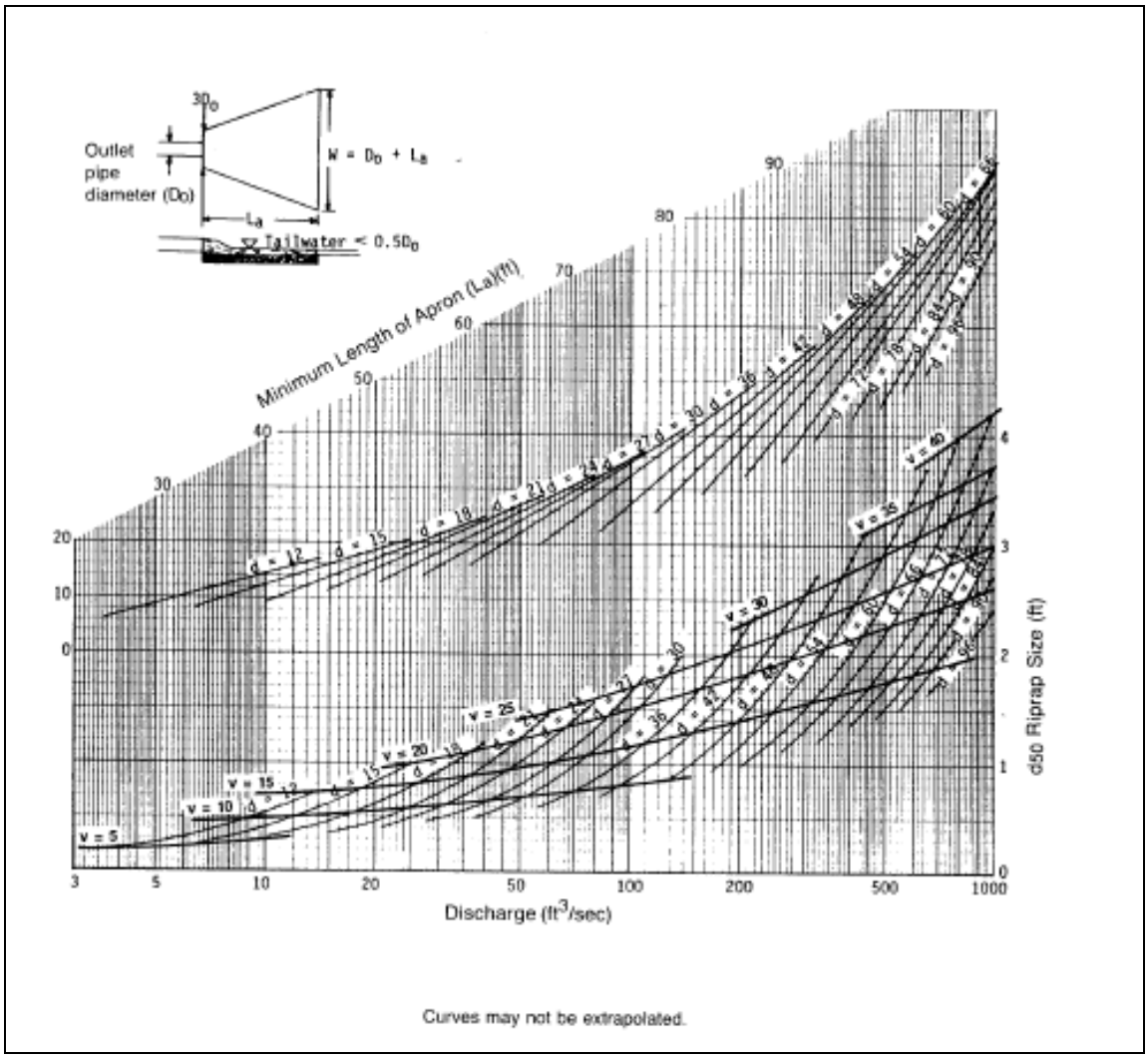

Figure 3. Riprap apron sizing. (SCS, 1975)

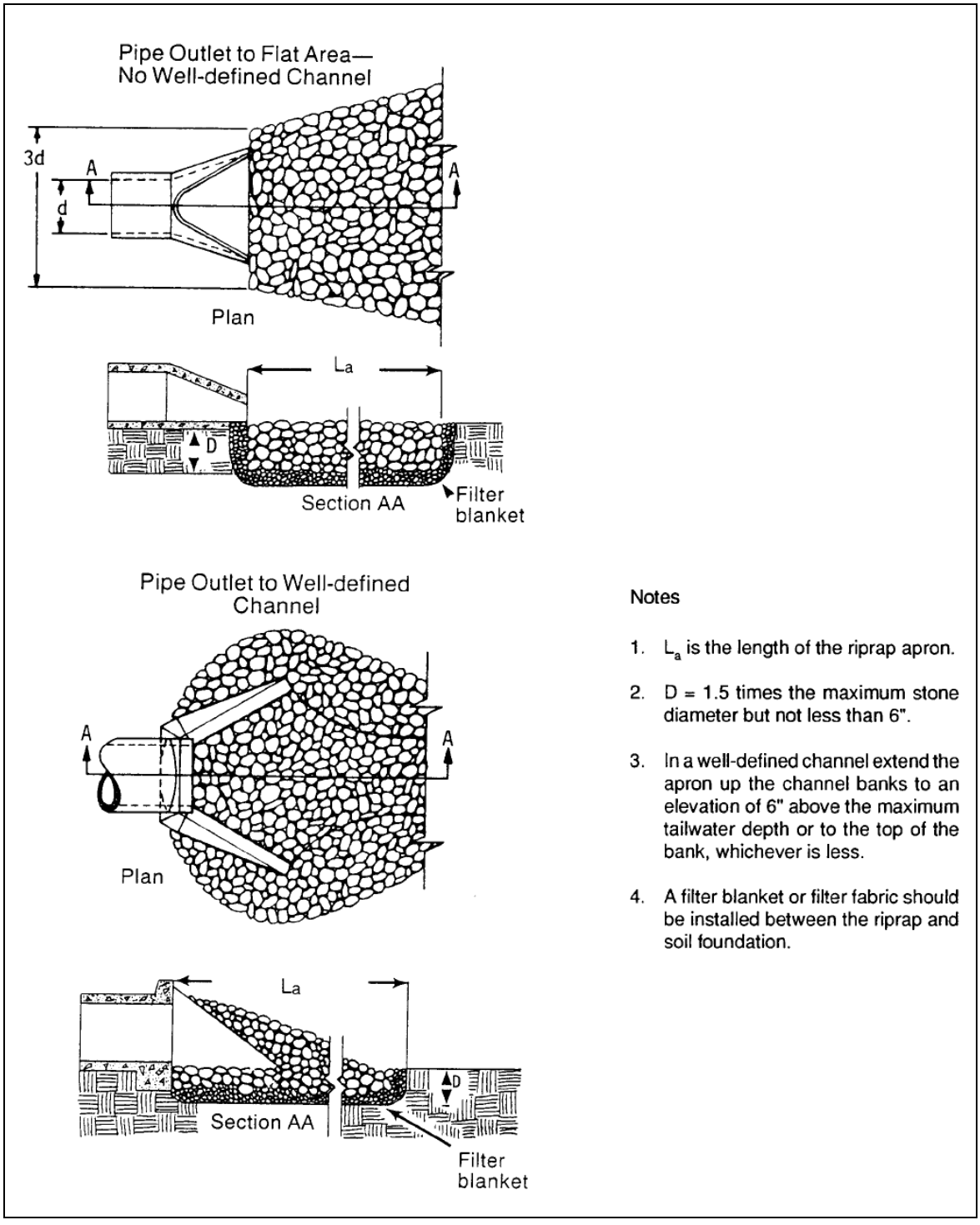

Figure 4. Riprap apron detail (Source: MESCG, 1996)

Erosion Control BMPs

Soil Roughening

Description

Water flowing down a bare slope will erode soil and transport soil to the bottom of the slope.

Soil roughening is the practice of increasing the roughness of exposed soil by making grooves, tracks, or terraces (stair-steps) which run perpendicular to the flow path (parallel to slope) slowing flow and trapping sediment.

Applications

Soil roughening can be used on a wide variety of slopes and in conjunction with seeding and mulching.

Design Criteria

Tracking with lugged tracked equipment is appropriate on sandy material so as to not excessively compact the soil.

Grooving can be accomplished using a plow with the furrows three inches deep and less than 15 inches apart.

Terraced (stair-stepping) slopes should have the vertical cuts no more than two feet deep and the horizontal steps should be wider than the depth of the vertical cut. The horizontal step should slope backward to the vertical cut upslope on the hill.

The slope should be seeded immediately after roughening and mulch or chemical stabilization should be utilized where appropriate.

Limitations

Soil roughening should not be used on rocky soils or soils that are high in clay content. Tracking may cause excessive compaction which can lead to greater erosion

Maintenance Requirements

Roughened slopes should be inspected after ½ inch and greater storms and problem areas noted. After a rain event, slopes may need reconstruction, re-roughening, reseeding, and remulching.

Chemical Stabilization

Description

Erosion is caused by rainfall impact detaching soil particles and runoff carrying the particles downslope. *Chemical stabilization* is the practice of spraying chemicals (tackifiers, soil binders) on the soil to hold the soil particles in place and protect against erosion.

Applicability

Areas that have been cleared of vegetation or do not have a protective cover on the soil. If temporary seeding can not be used or would not be effective due to the time of year, steepness of slope, or other reasons, chemical stabilizers can be applied to protect against erosion. Chemical stabilization can be used in conjunction with seeding and mulching.

Design Criteria

The type of chemical used (asphalt emulsion, polyacrylamides (PAM), vinyl, or rubber), the application rate, and application method should meet the manufactures recommendations.

Limitations

Improper application methods or rates can result in over application which can diminish infiltration and cause additional runoff.

Maintenance Requirements

Chemically stabilized areas should be inspected regularly and after ½ inch or greater rainfalls and stabilizer reapplied as required.

Mulch

Description

Erosion is caused by rainfall impact detaching soil particles and runoff carrying the particles downslope. Mulch can be applied to the area to hold the soil particles in place and protect against erosion.

Mulching is the practice of applying a layer of organic material (hay, straw, wood fiber, paper fiber, etc.) to protect the soil from impact of precipitation.

Applicability

Areas that have been cleared of vegetation or do not have a protective cover on the soil. Mulches are typically used to protect areas that have been seeded. Mulching can be used in conjunction with chemical stabilization.

Design Criteria

Straw mulch should be evenly applied at a rate of 2 tons of dry straw per acre. The mulch should be crimped into the soil immediately after application. Mulch should not be applied in areas with concentrated flows or on steep slopes.

Mulch is typically applied using a mulch blower; but, can be applied by hand in small or hard to reach areas.

Limitations

Wind and concentrated water flows can blow or wash mulch from the application area.

Maintenance Requirements

Mulched areas should be inspected regularly and after ½ inch or greater rainfalls and mulch reapplied as required.

Erosion Control Mats

Description

Erosion is caused by rainfall impact detaching soil particles and runoff carrying the particles downslope. *Erosion Control Mats* can be applied to the area to hold the soil particles in place and protect against erosion.

Erosion Control Mats are manufactured blankets of netting with organic filler or geosynthetic material used to protect the soil from impact of precipitation.

Applicability

Areas that have been cleared of vegetation or do not have a protective cover on the soil. Erosion Control Mats are typically used to protect short steep slopes or in areas of concentrated water flows.

Design Criteria

There are many different types of erosion control mats and each is made for different situations (slope, duration of protection, amount of protection, soil, degradability of mat, etc.); therefore, the type of erosion control mat used and the installation methods should meet the manufactures recommendations.

Limitations

If not properly installed (anchored to the ground and overlapped on the edges), erosion control mats can be washed downslope.

Maintenance Requirements

Areas with erosion control mats should be inspected regularly and after ½ inch or greater rainfalls and problem areas corrected as required.

Vegetation

Description

Erosion is caused by rainfall impact detaching soil particles and runoff carrying the particles downslope. Vegetation (seeded or sodded) can hold the soil particles in place and protect against erosion.

Applicability

Any area of a construction site that the natural vegetation has been removed. Seeding or sodding can be used as a temporary or a final erosion control measure. A substantial savings can be realized by completing the earth work for an area and implementing final vegetative stabilization.

Design Criteria

The type temporary vegetation appropriate for a site is dependent upon the time of year. Prior to application of seed, grading of the site should be complete including all erosion and sediment control practices. If the soils have become compacted, they should be loosened to a depth of at least six inches. If the pH of the soil is less than 6, lime should be added to the top six inches of soil. Fertilizer (10-10-10) should also be incorporated into the top six inches of soil at a rate of 100 lb/acre. Soil roughening techniques should be used for slopes greater than 3:1 (33%). The seed bed should be loose, without large clods, and uniform before seeding. Typical broadcast rates for temporary vegetation are given in Table 2.

Table 2. Temporary seeding planting materials, application dates, planting rates, and characteristics. (Adapted from MAACD, 1998)

Species	Planting Dates		Broadcast Rate (lb/acrea)	Plant Characteristics
Oats	2/1 - 5/30	8/1 - 9/30	80	not cold tolerant
Rye/Wheat	1/1 - 5/31	7/15 - 11/15	90 / 120	cold tolerant
Milet/Sudangrass	5/1 - 8/15	-	45 / 60	warm season
Annual Ryegrass	1/1 - 5/31	7/15 - 9/30	75	not heat tolerant
Annual Lespedeza plus Tall Fescue	5/1 - 8/15	-	15 / 45	warm season

Limitations

Vegetation is not appropriate for heavily trafficked areas (vehicular and pedestrian) and is not appropriate for rocky, gravelly, or course grained soils. For these types of soils, apply six inches of clean topsoil before seeding.

Maintenance Requirements

Vegetated areas should be protected from runoff from adjacent areas and traffic (vehicular and pedestrian). Until established, the vegetation will require fertilization and water.

Sediment Control BMPs

Embedded Silt Fence

Description

Water flowing in sheet or shallow flow will carry sediment down a slope and off-site.

Embedded Silt Fence (ESF) is a barrier made of geotextile fabric placed along a contour to capture water, slow the flowrate, trap sediment, and allow water to filter through the fabric.

Applications

Small drainage areas with sheet flow or shallow flow.

Design Criteria

Embedded Silt Fence (ESF) should be placed on a contour and designed to hold runoff from the 10 year storm from an area of 100 sq. ft for each foot of fence. The maximum depth of retained water on the upstream side of the fence should be two feet. The maximum slope length above the fence should be no more than 100 feet. The maximum slope above the fence is 1:1.

The fabric shall be buried in a trench that is at least eight inch deep and eight inches wide as shown below. The fabric shall be place on the upstream side of the posts.

Post shall be made of metal (T-post) or wood (2"x2") and placed no more than six feet apart.

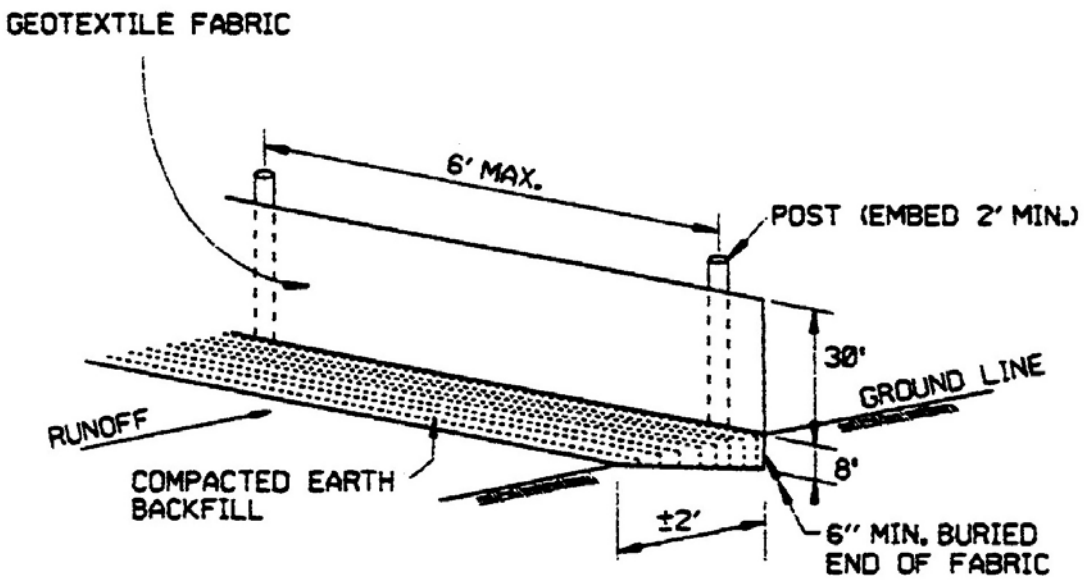

Figure 5. Embedded Silt Fence (Source: AHTD, 2001)

Limitations

Silt fence must be embedded or it will not function properly and should not be installed in rocky soil where it cannot be properly embedded.

Silt fence is not designed to hold back concentrated flow and therefore should not be placed across channels, gullies, or streams.

Silt fence should not be run down slopes as it will concentrate flow causing gully erosion and causing downstream BMPs to fail.

Silt fence should not be placed at the top of slopes as it will not provide any sediment control but will increase costs.

Maintenance Requirements

ESF should be inspected weekly and after ½ inch or greater rainfalls for proper installation, defective fencing, erosion on the ends, and excessive sediment buildup behind the fence (half the fence height).

Inlet Protection

Description

Runoff from a construction site often carries sediment into the stormwater sewer system, which discharges into local streams. Besides the problems caused by sediment, other pollutants (e.g. oil, grease, and nutrients) are often attached to the sediment.

Inlet Protection is the practice of placing gravel, sand bags, or silt fence around an inlet to allow runoff to pond and sediment to settle out prior to entering the stormwater sewer system.

Applications

Any storm drain inlet that could receive runoff from the construction site.

Design Criteria

For inlets that are not in paved areas, a detention pond should be excavated around the inlet that is at least one foot deep (below the inlet crest) and that has a detention volume of at least 35 yd^3 per disturbed acre of watershed. The pond should start at the toe of the dam material; so, if gravel or sandbags are to be used the pond will be at least three feet from the inlet, whereas if silt fence is used, the pond can start at the edge of the inlet. The side slopes of the detention pond should be no greater than 2:1.

If silt fence is used as the dam material, the post should be driven at the edge of the inlet and should be no greater than three feet apart. The fence should be installed according to the detail in Figure 6.

For inlets in paved areas, either gravel or sandbags should be used as the dam material. If gravel is to be used as the dam material, the gravel should be at least 1" in diameter. The dam should be no higher than one foot high and the side should have no greater than a 2:1 (horizontal:vertical) slope. If sandbags are used as the dam material, the bags shall be no heavier than 50 lbs and shall be stacked no higher than three bag diameters high, with the bags layered in a pyramid formation.

Limitations

Inlet protection control measures are not capable of handling large quantities of sediment and can require maintenance during rain events in order to protect nearby facilities and to eliminate flooding. Ponding can cause flooding problems for surrounding facilities.

Maintenance Requirements

Inlet protection measures should be inspected during storm events to ensure surrounding facilities are not flooded.

Inlet protection measures should be inspected weekly and after ½ inch or greater rainfalls for proper installation, defective fencing, erosion, and excessive sediment buildup and defective measures repaired or replaced within 24 hours.

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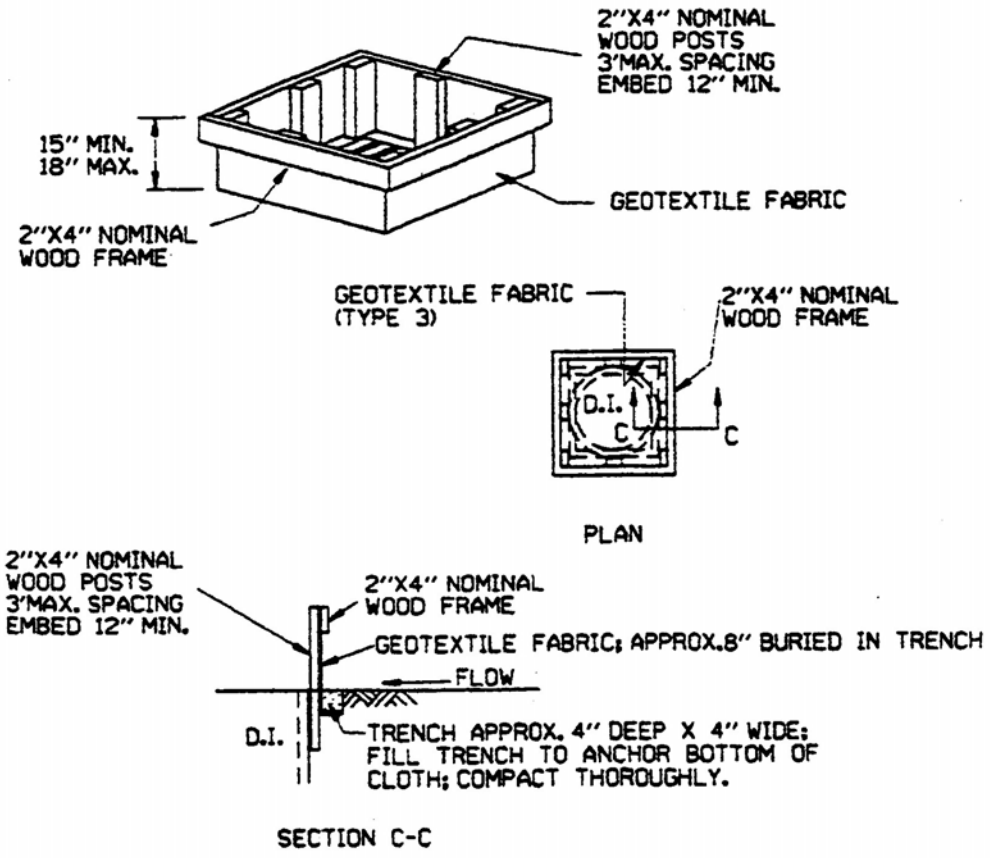


Figure 6. Silt fence inlet protection detail (Source: AHTD, 2001)

Sediment Trap

Description

Water carrying sediment off-site can cause damage to neighboring property and local streams.

Sediment Traps provide an area for sediment to settle out of the runoff prior to discharge from the site.

Applications

Sediment traps are well suited for sites that will be required to have a permanent stormwater control basin; but, should be used for any concentrated flow (culvert, pipe, swale, etc.) that could have sediment in the runoff leaving the site.

Design Criteria

The removal efficiency of Sediment Traps is a function of the total surface area of the pond, the shape of the pond, the influent flow rate, and the type of soil in the runoff. The maximum drainage area for a Sediment Trap shall be 3 acres, for larger areas a Sediment Basin shall be used.

Trap minimum bottom area and spillway width are given in Table 3. The berm or levee will curving upstream to hold the water, the berm will have 3:1 side slopes (maximum) and have a maximum depth of three feet. The outlet spillway shall be made of six inches of stone (6 inch diameter minimum) and be placed on a geotextile fabric.

Table 3 Minimum sediment trap dimensions

Drainage Area (acres)	Trap Water Bottom Area (sq ft)	Width Overflow Spillway (ft)
1 or less	250	6
1 to 2	675	12
2 to 3	1500	18

Limitations

Sediment Traps do not have sufficient surface area to allow for settling of very small particles (e.g. clay, silt). Sediment Traps are not appropriate for runoff from areas greater than three acres.

Maintenance Requirements

Sediment Traps should be inspected weekly and after ½ inch or greater rainfalls for proper installation, erosion, and excessive sediment buildup and defective measures repaired or replaced within 24 hours.

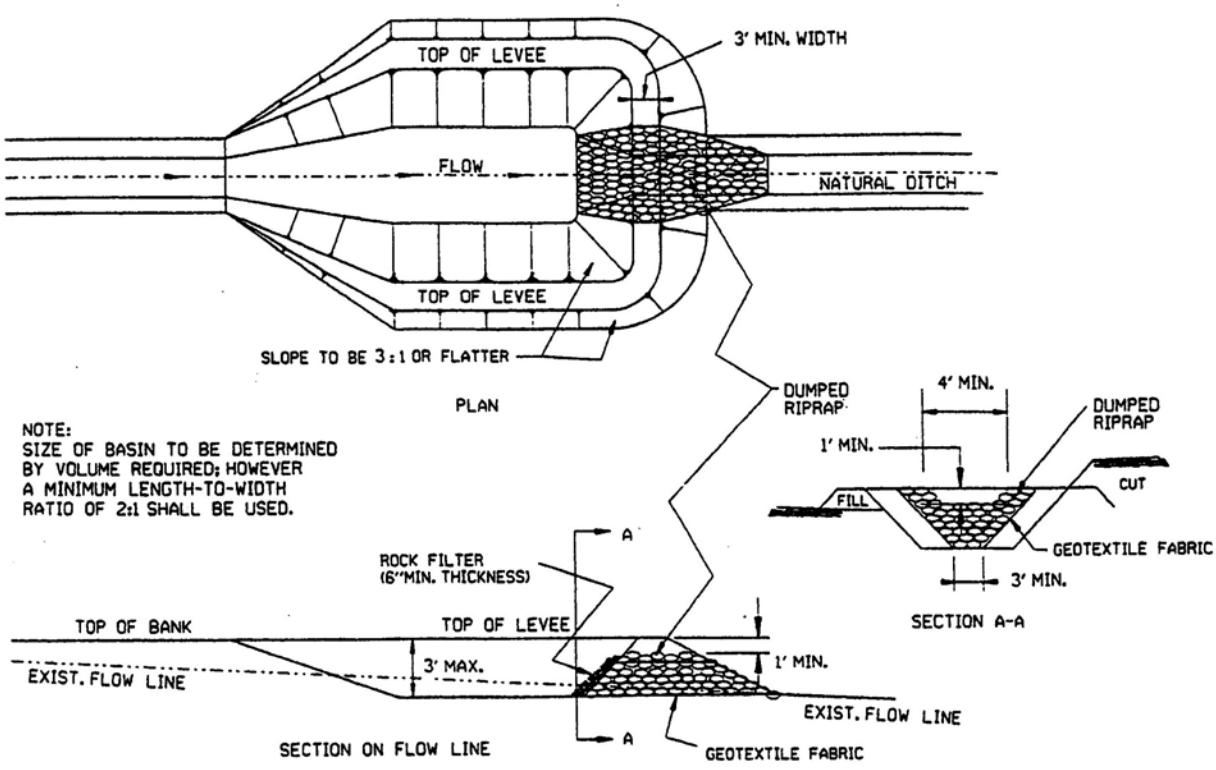


Figure 7 Sediment trap detail (Adapted from: AHTD, 2001)

Check Dams

Description

Excessive velocity of water in swales or channels causes erosion and transports the sediment downstream to local streams.

Check Dams (ditch check) slow water in channels and provide an area for sediment to settle out of the water before it flows over the dam.

Applications

Any unlined channel or any channel that the vegetative protection has not developed. Steeper slopes are more subject to erosion than flatter slopes.

Design Criteria

Place ditch checks such that the top of the downstream check is at the same elevation as the bottom of the next upstream check.

Checks must constructed such that the top elevation of the center of the check is at least six inches below the bottom elevation of both ends of the check. The dam must be excavated into the channel no less than six inches as shown in Figures 8, 9, and 10.

Limitations

If improperly constructed, water will flow around or through the check dam and erode the banks of the channel. Large flows (less frequent storms) can washout the check dams, erode the banks at the end of the check dams, or cause excessive scour at the outfall of the check dam.

Maintenance Requirements

Check Dams should be inspected weekly and after ½ inch or greater rainfalls for proper installation, erosion, and excessive sediment buildup and defectives should be repaired or replaced within 24 hours.

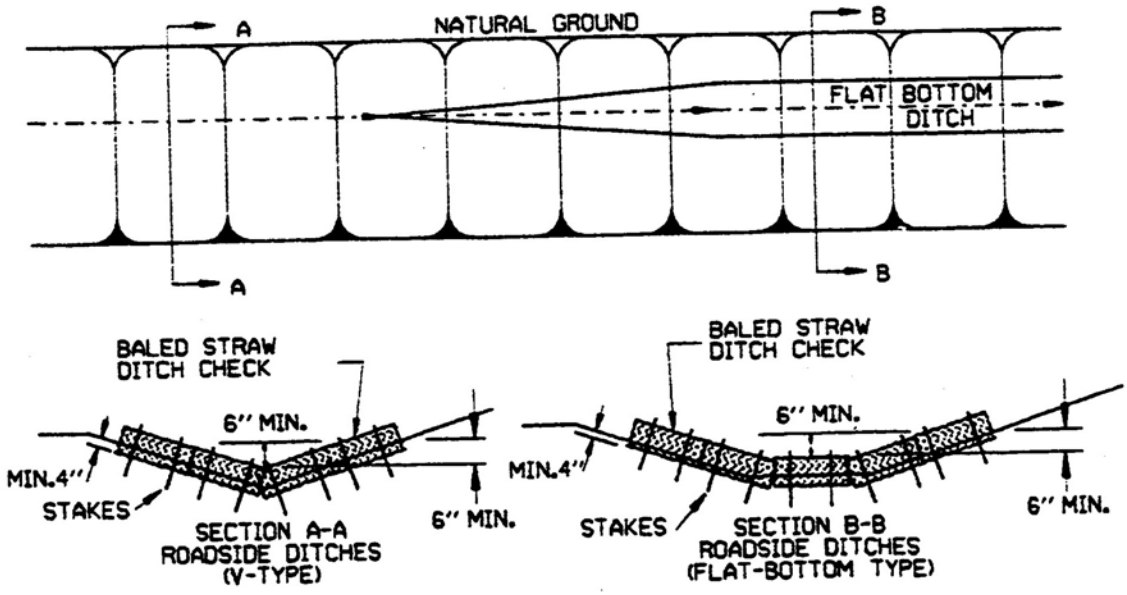


Figure 8 Baled straw check dam detail. (Source: AHTD, 2001)

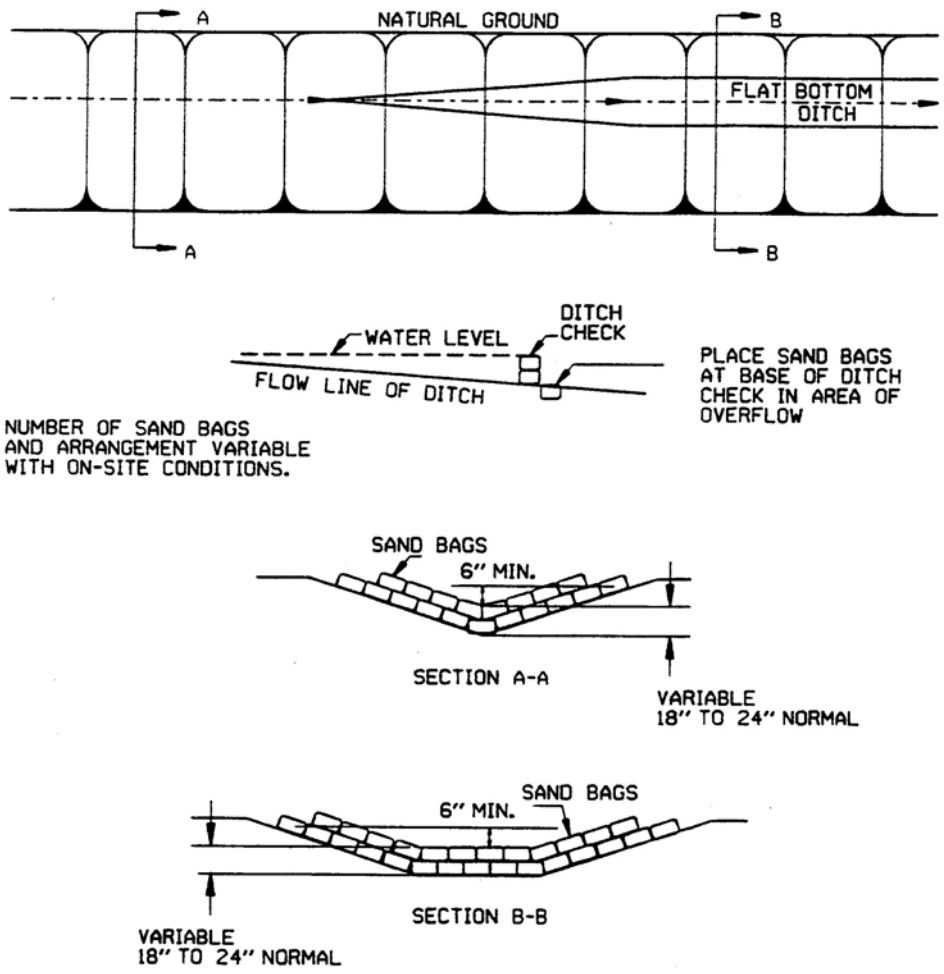


Figure 9 Sand bag check dam detail. (Source: AHTD, 2001)

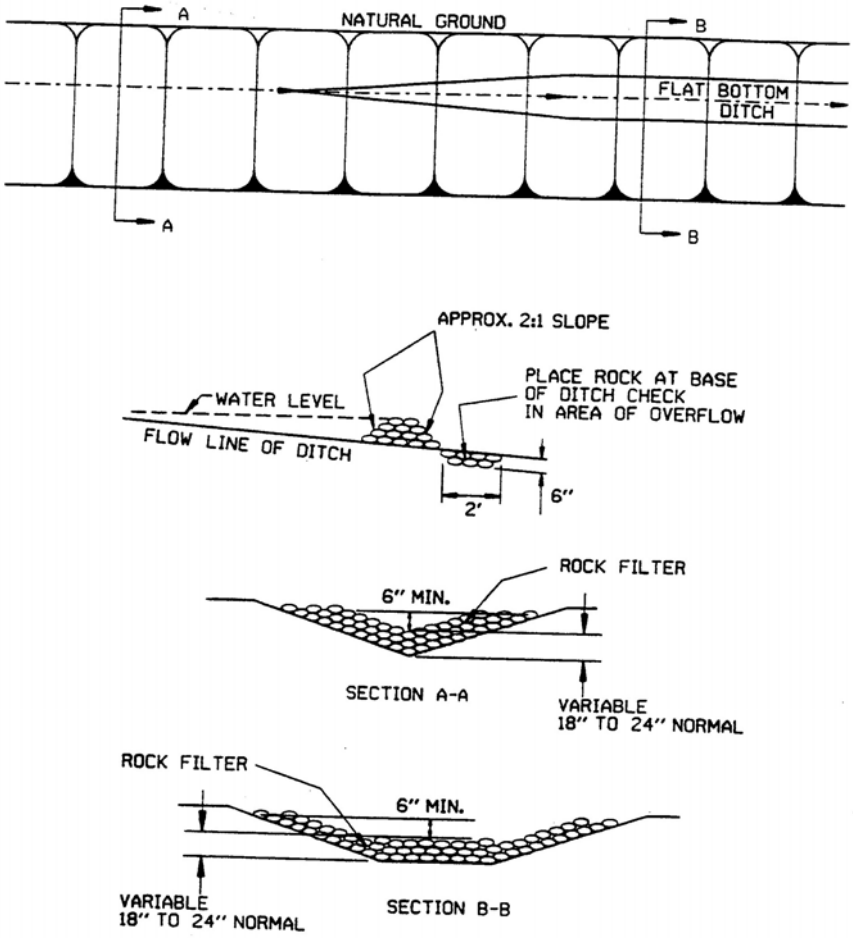


Figure 10 Rock check dam detail. (Source: AHTD, 2001)

Solid Waste Management

Description

Solid wastes that are improperly disposed of, can be blow or washed from construction sites causing others to pickup the wastes from their property. Solid Waste Management refers to the proper handling and disposal of all construction wastes.

Applications

All construction sites

Criteria

Trash and waste construction materials should be picked up daily and properly disposed of.

Limitations

None

Maintenance Requirements

Daily pickup of trash and construction waste materials.

Hazardous Waste Management

Description

Hazardous wastes can be washed or accidentally dumped into the storm water system causing serious pollution of local streams.

Hazardous Waste Management is the proper handling, storage, use, and disposal of material listed as hazardous by EPA and/or ADEQ

Applications

All materials listed as hazardous by EPA and/or ADEQ.

Criteria

Guidelines published by EPA and OSHA for the types of materials to be used on the construction site should be incorporated into the SWPPP.

The types of materials that are generally considered hazardous are:

- Fuels (diesel, gas, etc.)
- Oils and greases (lubricating, cutting, etc.)
- Petroleum based materials (asphalt, emulsions, solvents)
- Paints (including wood preservatives, stains, and lead based)
- Solvents (paint thinners, cleaners, etc.)
- Pesticides, herbicides, insecticides

Proper management of hazardous materials entails:

- Replace hazardous materials with a non-hazardous materials
- Minimize the use of hazardous materials
- Reuse and recycle hazardous materials
- Proper use of hazardous materials
- Proper storage and handling of hazardous materials
- Proper disposal of hazardous materials

Employees must be trained in the use, storage, and disposal of hazardous wastes. Hazardous materials should be stored so only authorized personnel can use the material.

The following methods should be followed for spill prevention and clean-up:

- The manufacturers recommended methods for spill clean-up should be clearly posted and personnel should be trained in the location of clean-up supplies and clean-up procedures.
- Clean-up supplies should be kept in a secure on site.
- Personnel should wear proper protective clothing when cleaning up the spill.
- Spills should be cleaned up immediately and the waste properly disposed of.
- Licensed hazardous waste haulers must be used to transport hazardous wastes to approved treatment and disposal sites.

Concrete Waste Management

Description

Concrete waste from washout of ready mix trucks, concrete pumps, and other concrete equipment causes chemical and changes in runoff by increasing sediment and changing the pH.

Concrete Waste Management is the practice of capturing all concrete wastes to allow

Applications

All construction sites with concrete work.

Design Criteria

Provide a minimum of six cubic feet of containment volume for every 10 cubic yards of concrete to be poured.

Limitations

Improperly sized washout area can overflow and washout will not be contained.

Maintenance Requirements

The washout pit should be cleaned weekly and the waste material properly disposed of.

Residential and Commercial BMPs

Introduction

Historically, stormwater management policies were developed to mitigate the impact of land development in terms of the quantity of water released; therefore, systems were sized to reduce the post-development peak discharge rates to the pre-development rates. But, storm water systems sized to reduce peak discharge are not effective at removal of pollutants; therefore, the design of storm water systems must now incorporate methods for improving water quality. The table below gives an overview of the capabilities of the BMPs discussed in this manual.

Table XX Post development BMP characteristics chart

	Quantity		Quality				
Construction BMP	Flow atten-uation	Runoff volume reduction	Sediment control	Nutrient loading (N,P)	Organic loading	Metals loading	Bacteria loading
Dry Basin	●	⭘	●	⭘	⊙	⭘	⊙
Wet Basin	●	⭘	●	●	●	●	●
Grass Filter Strip	●	⭘	●	⭘	●	●	⊙
Inlet Floatables Interceptor	⊙	⊙	⊙	⊙	⊙	⊙	⊙
Oil-Sediment Separator	⊙	⊙	●	●	●	●	●
Infiltration Trench	●	●	●	●	●	●	●
Porous Pavement	●	●	⭘	⭘	⭘	⭘	⊙
Underground Detention Vault	●	⭘	●	⭘	⊙	⭘	⊙

● - Primary benefit ⭘ - Secondary benefit ⊙ - Little or no benefit

Dry Basin

Description

Increased flowrates due to development cause increased erosion and increased stream bank erosion. In addition, runoff leaving as developed site it will carry sediment and attached pollutants.

A *Dry Basin* is a surface storage structure designed to provide water quantity control through decrease and attenuation runoff peaks and by providing an area for sedimentation to remove sediment and attached pollutants.

Application

Dry Basins are applicable for large drainage areas and should used in conjunction with a water quality control structure. In addition, the basin can be used for recreational and other open space opportunities between storm runoff events.

Design Criteria

The maximum contributing drainage area to be served by a Dry Basin is 75 acres. *Dry Basins* should be sized to temporarily store the volume of runoff required to reduce the post-development peak flow of the 5 year, 10 year, 25-year, and 50 year storm events to the pre-development rates, and control the 100-year storm if required. The basin should an elongated and irregular shape with a length to width ratio of 2:1; but, 3:1 is preferred. Routing calculations must be used to demonstrate that the storage volume is adequate. A detail of a *Dry Basin* is shown below.

Embankments shall be less than eight feet in height and shall have side slopes no steeper than 3:1 (horizontal to vertical). Geotechnical slope stability analysis is recommended for embankments greater than four feet in height.

The bottom area of storage facilities should be graded toward the outlet to prevent standing water conditions. A low flow or pilot channel across the facility bottom from the inlet to the outlet is recommended to convey low flows and prevent standing water conditions. Adequate maintenance access must be provided for all basins.

Inlet Inflow channels are to be stabilized with flared riprap aprons, or the equivalent. A sediment forebay sized to 0.1 inches per impervious acre of contributing drainage should be provided..

Seepage control or anti-seep collars should be provided for all outlet pipes. Riprap, plunge pools or pads, or other energy dissipators are to be placed at the end of the outlet to prevent scouring and erosion. If the basin discharges to a channel with dry weather flow, care should be taken to minimize tree clearing along the downstream channel, and to reestablish a forested riparian zone in the shortest possible distance.

An emergency spillway is to be included in the stormwater pond design to safely pass the extreme flood flow. The spillway prevents pond water levels from overtopping the embankment and causing structural damage. The emergency spillway must be designed and located so that downstream structures will not be impacted by spillway discharges.

A minimum of 1 foot of freeboard must be provided, measured from the top of the water surface elevation for the extreme flood, to the lowest point of the dam embankment not counting the emergency spillway.

In the event that further reduced peak flowrates are required to protect the downstream channel, a dry extended detention basin can be utilized. Dry Extended Detention Basins should be equipped with a low flow orifice capable of releasing the channel protection volume over 24 hours must. The channel protection orifice should have a minimum diameter of 3 inches and should be adequately protected from clogging by an acceptable external trash rack. A detail of a Dry Extended Detention Basin is shown below.

Limitations

Dry Basins are only moderately effective at removing suspended pollutants (sediment and attached pollutants, nutrients and metals) and are ineffective at removing dissolved pollutants. During some periods of the year, dry ponds can be a breeding site for mosquitoes.

Maintenance

Dry Ponds require inspection and maintenance as shown below.

- Bi-weekly or as needed, mow and tend to grass around pond.
- Monthly or more frequently if required, remove trash and debris from pond, outlet structure, and surrounding area.
- Annually, inspect embankments, outlets, and spillways for damage and maintain as required.
- Annually, inspect for sediment buildup and remove buildup as required.
- Annually, remove any invasive vegetation.

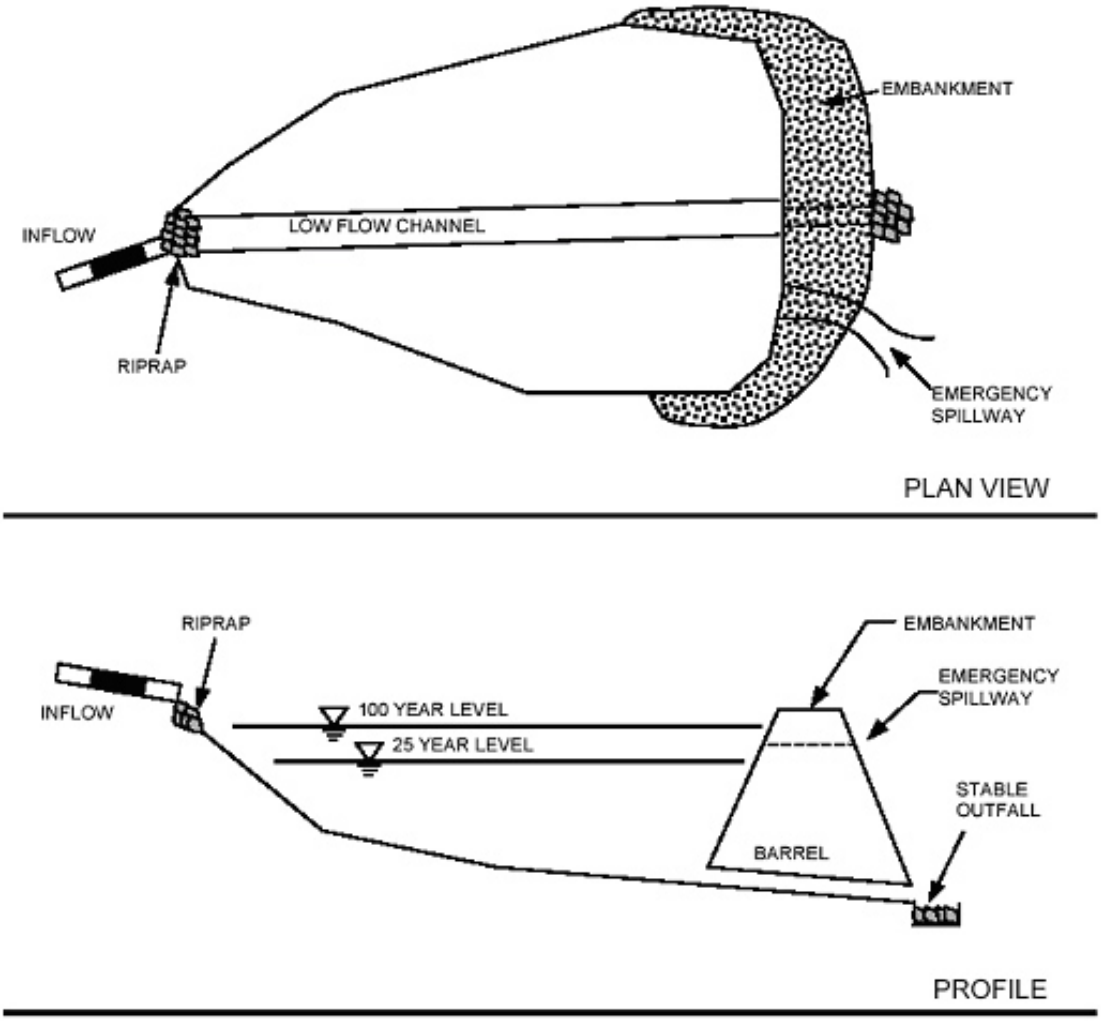


Figure 11 Dry detention basin detail. (Source: GSWMM, 2001)

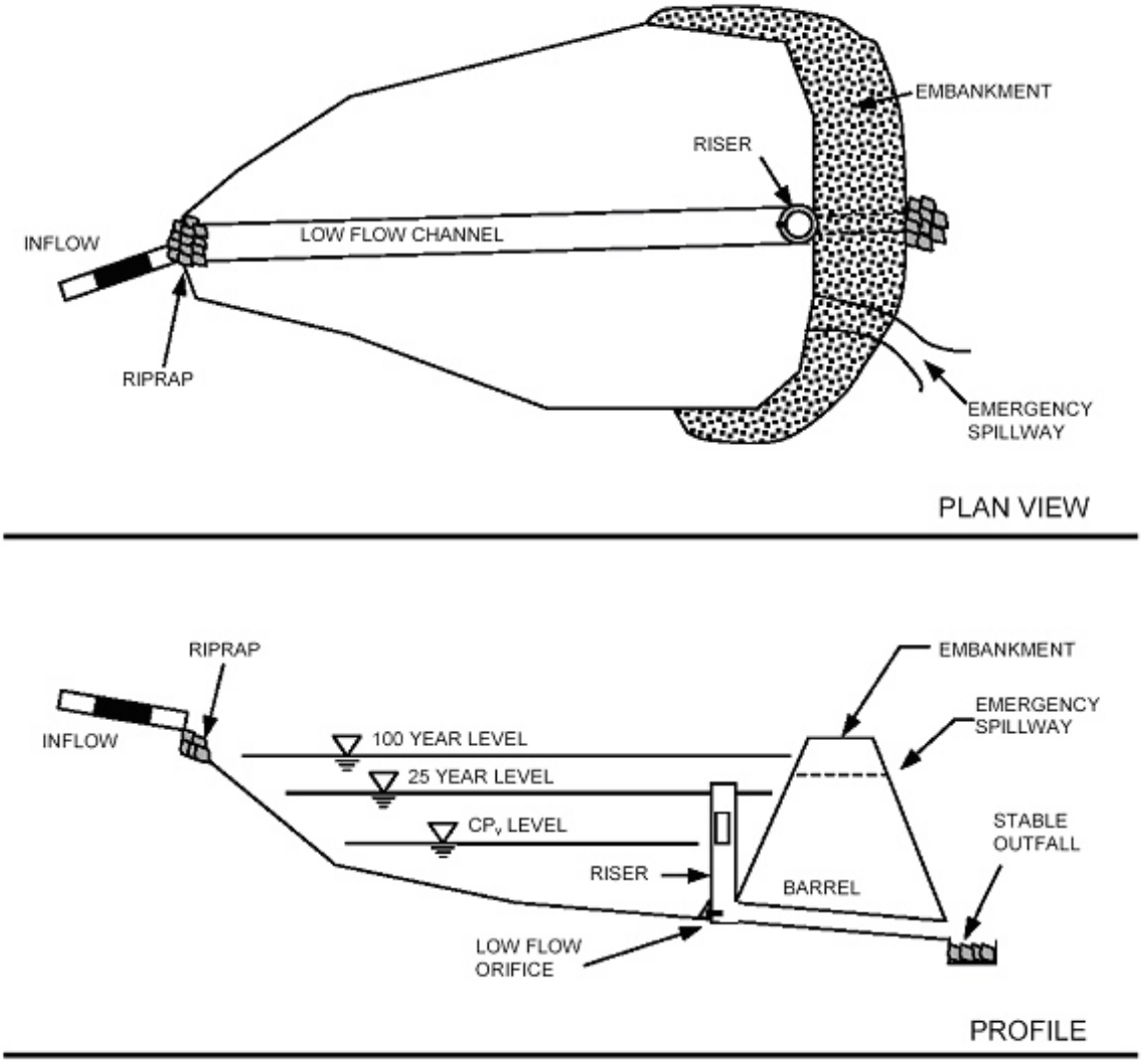


Figure 12 Extended dry detention basin detail (Source: GSWMM, 2001)

Wet Basin

Description

Increased flowrates due to development cause increased erosion and increased stream bank erosion. In addition, runoff leaving as developed site it will carry sediment and attached pollutants.

Wet Ponds (retention ponds, wet extended detention ponds) are constructed to provide a permanent pool of water during the wet season or year-round. The pond provides for peak discharge attenuation and pollutant removal. Pollutants are removed from stormwater by settling and biological uptake.

Applicability

Wet ponds can be designed to enhance the landscaping and provide an attractive addition to a development. To maintain a permanent pool, wet ponds typically require about a minimum drainage area of 25 acres. Maintenance needs, dissolved oxygen requirements, and safety concerns should be addressed during design.

Design Criteria

The maximum contributing drainage area to be served by a *Wet Basin* is 75 acres and the minimum is 25 acres. The active pool of the *Wet Basins* should be sized to temporarily store the volume of runoff required to reduce the post-development peak flow of the 5 year, 10 year, 25-year, and 50 year storm events to the pre-development rates, and control the 100-year storm if required. The basin should an elongated and irregular shape with a length to width ratio of 2:1; but, 3:1 is preferred. Routing calculations must be used to demonstrate that the storage volume is adequate. A detail of a *Wet Basin* is shown in Figure 13 and a typical cross section of a *Wet Basin* is shown in Figure 14. The designer must conduct a water balance to ensure that sufficient inflow is available to maintain the permanent pool. The permanent pool should be at least four feet deep is discourage growth of aquatic plants.

Embankments shall be less than eight feet in height and shall have side slopes no steeper than 3:1 (horizontal to vertical). Geotechnical slope stability analysis is recommended for embankments greater than four feet in height. Adequate maintenance access must be provided for all basins.

Inlet Inflow channels are to be stabilized with flared riprap aprons, or the equivalent. A sediment forebay sized to 0.1 inches per impervious acre of contributing drainage should be provided.

Seepage control or anti-seep collars should be provided for all outlet pipes. Riprap, plunge pools or pads, or other energy dissipators are to be placed at the end of the outlet to prevent scouring and erosion. If the basin discharges to a channel with dry weather flow, care should be taken to minimize tree clearing along the downstream channel, and to reestablish a forested riparian zone in the shortest possible distance.

An emergency spillway is to be included in the stormwater pond design to safely pass the extreme flood flow. The spillway prevents pond water levels from overtopping the embankment and causing structural damage. The emergency spillway must be designed and located so that downstream structures will not be impacted by spillway discharges.

A minimum of 1 foot of freeboard must be provided, measured from the top of the water surface elevation for the extreme flood, to the lowest point of the dam embankment not counting the emergency spillway.

Limitations

Depending on the location, *Wet Ponds* can require maintenance to remove trash and overgrowth. In developments with excess nutrients (nitrogen and phosphorus in particular) due to over fertilization, wet ponds can require mechanisms (fountains, bubblers) to input oxygen. In some developments a permanent pool of water can be viewed as a safety concern.

Inspection and Maintenance

Wet Ponds should be inspected and maintained according to the following schedule

- Bi-weekly or as needed, mow and tend to grass around pond.
- Monthly or more frequently if required, remove trash and debris from pond, outlet structure, and surrounding area.
- Annually, inspect embankments, outlets, and spillways for damage and maintain as required.
- Annually, inspect for sediment buildup in forebay and wet pool, remove buildup if required.
- Annually, harvest wetland vegetation (if used) and remove any invasive vegetation.

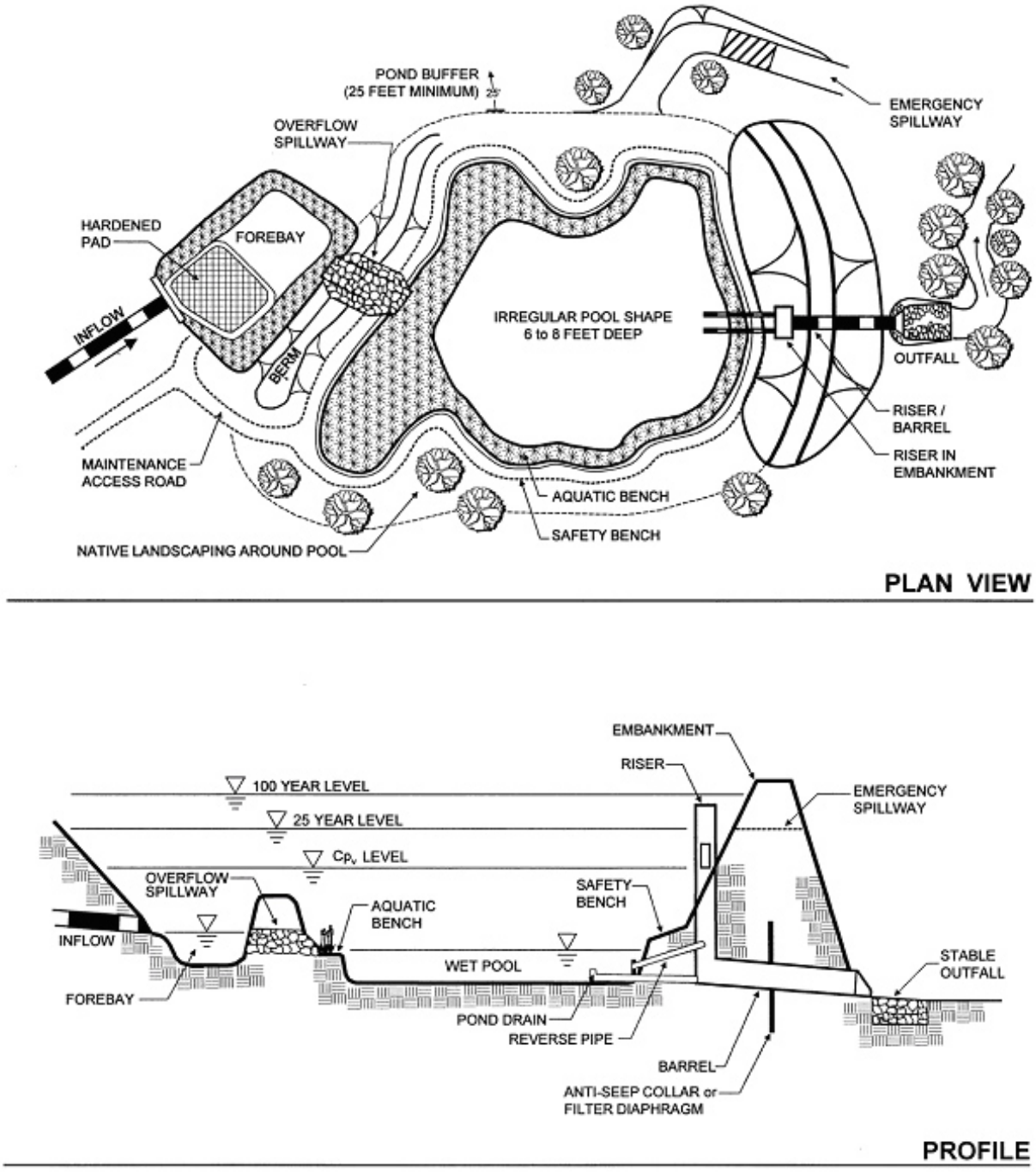


Figure 13 Wet pond detail. (Source: Center of Water Shed Protection)

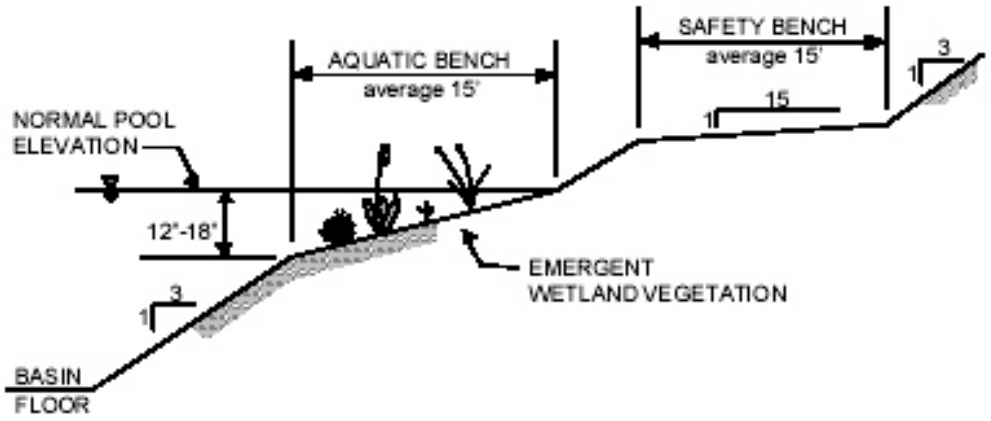


Figure 14 Cross section of a wet basin

Vegetated Swales and Strips

Description

Vegetated Swales (grass lined swales, biofilters, grassed channels) combine a channel, storage, and vegetation. The channel is used to move stormwater from one place to another; but, the channel is designed to provide some stormwater storage. The swale is designed to allow ponding (backwater) in the channel to enhance infiltration and pollutant removal. The vegetation provides increased pollutant (sediment, nutrients, metals) removal.

Selection Criteria

Swales are best suited for sites with long narrow areas available for stormwater handling and storage. Swales are also well suited for areas that generate highly contaminated runoff such as filling stations.

Generally swales are appropriate for drainage areas of five acres or less and should be constructed on flat slopes (1 to 2 percent). The bottom of the swale should be two feet above the seasonally high water table.

Design and Sizing

Swales function best if the stormwater moves through the channel slowly and they are designed to maximize the channel surface area wetted by the flow.

A swale should be designed such that a 1 inch storm will take 10 minutes to travel down the swale and should be designed as shown in the detail below.

Swales should be designed as trapezoidal or parabolic channels with longitudinal slopes of 1 to 2 percent and side slopes no greater than 4:1 (25 percent). The channel bottom should be 2 to 8 feet wide.

The swale should have dense vegetative cover that should be able to withstand the velocities induced by larger storms (25 year storm).

Limitations

Pollutant removal capabilities are substantially decreased for swales in highly impermeable soils, for swales constructed on steep slopes, and for swales handling runoff from too large of drainage areas.

Inspection and Maintenance

Swales should be inspected and maintained as indicated below.

- Bi-weekly or as needed, keep grass at a height of 3 to 4 inches.
- Monthly or more frequently if required, remove trash and debris, outlet structure, and surrounding area.
- Annually, inspect embankments and outlets for damage and maintain as required.
- Annually, inspect for sediment buildup and remove buildup when required.

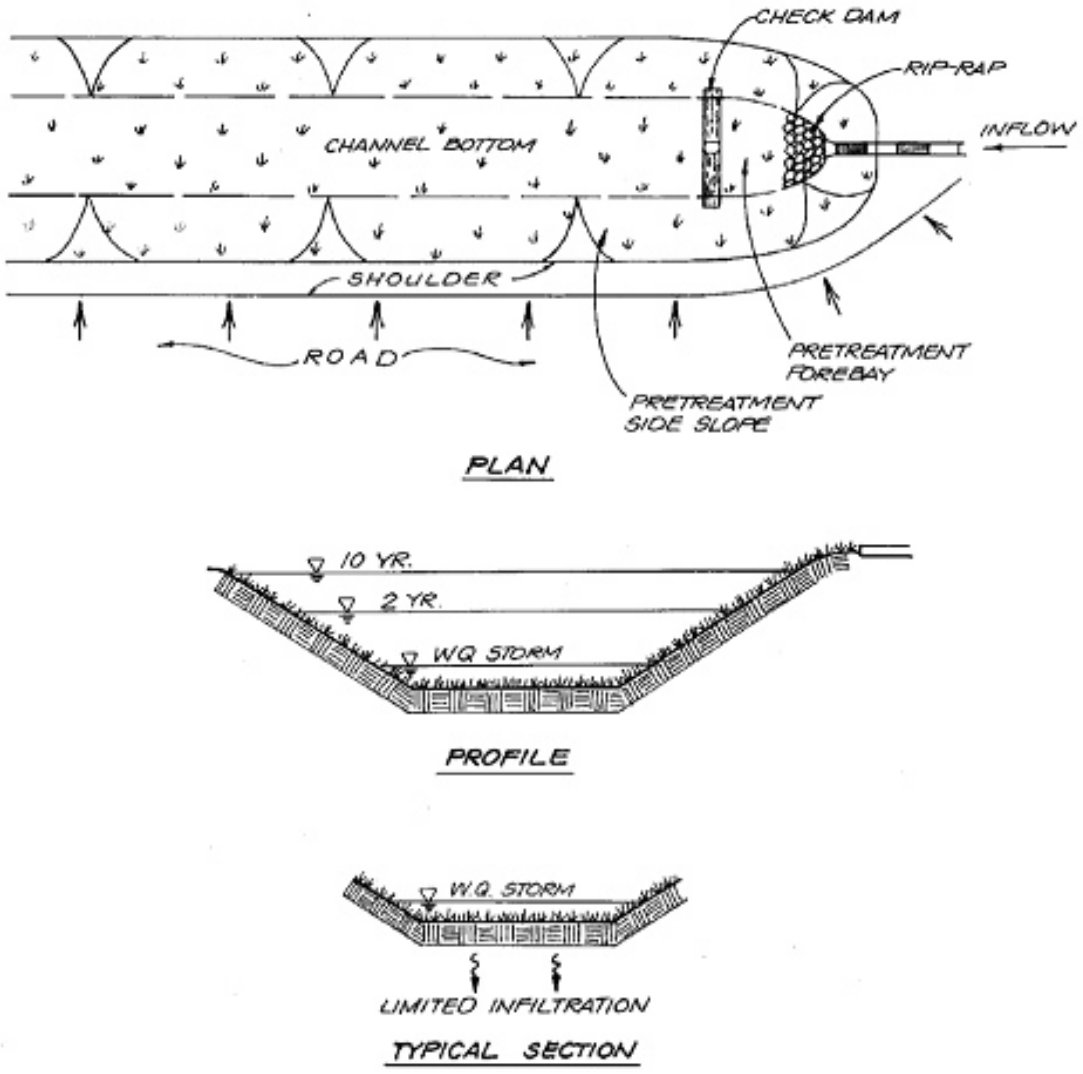


Figure 15 Grass swale detail. (Source: GSWMM, 2001)

Grass Filter Strip

Description

Runoff flowing in sheet flow and carrying sediment and associated pollutants will end up in the local streams causing the steams to be polluted.

Grass Filter Strips remove sediment from runoff in sheet flow.

Application

Areas adjacent to low or medium density residential or commercial areas on gentle slopes (less than 15%) with a width of strip running along the contour.

Design Criteria

Grass filter strips should be placed adjacent to low or medium density residential or commercial areas with a width equal to the width of the runoff area. The filter strip should have a dense mat of vegetation to bind the soil and should have a moderate slope (5% or less). The length of the strip should meet the minimum standards shown in Table 4. Filter strips should be layout according to the detail in Figure 16. A stone drop made from pea gravel should be built at the head of the filter to pretreat the runoff and to act as a level spreader. The stone drop should be at least one foot wide and one foot deep.

Table 4 Minimum length of filter strips (Source: MAACD, 1995)

Slope of strip (%)	Length of Grassed Fiter Strip (ft)	Length of Forested Filter Strip (ft)
0	10	25
2	12	29
4	14	33
6	16	37
8	18	41
10	20	45
15	25	55

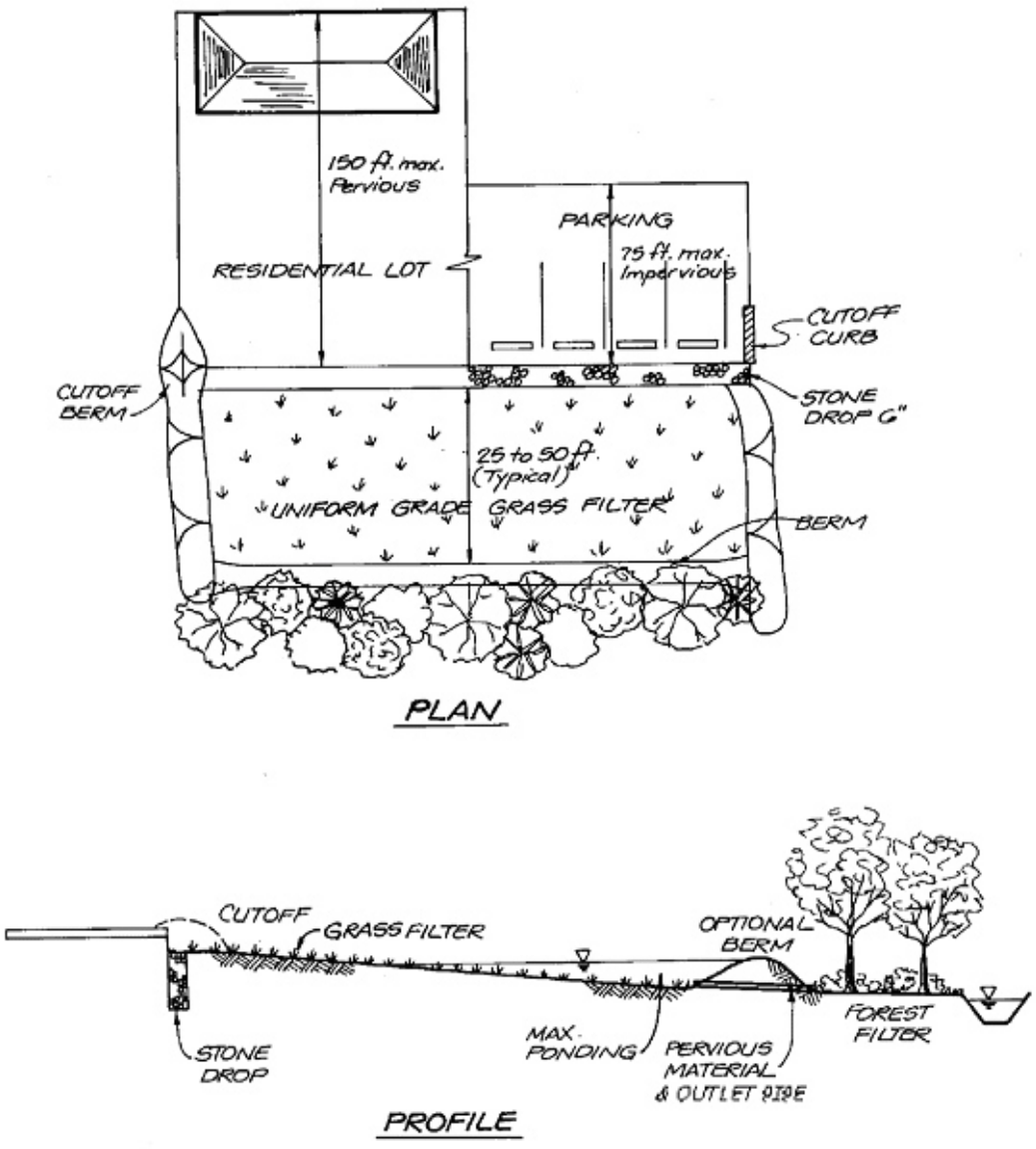


Figure 16 Filter strip detail. (Source: GSWMM, 2001)

Limitations

If not planned properly, the land requirements of filter strips can be a problem in some developments.

If the filter strip does not have a uniform grade, runoff will concentrate and could cause erosion in the filter strip.

Inspection and Maintenance

Filter strips should be inspected periodically to ensure that the filter strip is working properly and that no erosion is taking place. The strip should be mowed to height of 4 to 6 inches as required.

Inlet Floatables Interceptor

Description

Trash, debris, and lawn wastes are picked up by storm water and carried to local streams causing unsightly conditions and pollution of the stream.

Inlet Floatable Interceptors are placed in curb or drop inlets to screen the floatables out of the runoff.

Applicability

Curb inlets and drop inlets that are subject to excess trash and debris.

Design and Sizing

Inlet Floatable Interceptors are manufactured BMPs that fit into curb inlets or drop inlets. The inserts should be purchased, installed, and maintained according to the manufacturers recommendations.

Limitations

Inlet Floatable Interceptors are very high maintenance BMPs. Debris that is collected from one storm can dry between storms be resuspended during the next storm. Increased public education on proper disposal of trash might provide better results.

Inspection and Maintenance

Inlet Floatable Interceptors should be inspected at least weekly and after every ½" or greater rain and any accumulated debris removed.

Oil-Sediment Separator

Description

Runoff from filling stations, vehicle service areas, and truck parking lots typically has large concentrations of hydrocarbons (oil, grease, fuel) and other vehicle fluids.

Oil-Sediment Separators are used in these hot spots to remove the hydrocarbons from the storm water prior to discharge to the storm water system.

Applicability

Any high use area that has the potential for large amounts of sediment and/or hydrocarbons in the runoff.

Design and Sizing

Individual *Oil-Sediment Separators* are appropriate for drainage areas of one acre or less and should be sized to provide a detention volume of 400 cubic feet/acre of drainage area. The detention volume is the volume of water behind the last overflow weir as shown in the detail below. The minimum depth of water in the detention volume should be three feet. Sediment will be removed in the first chamber and oil and floating debris will be trapped in the first and second chambers; therefore, adequate volume must be provided for storage of these pollutants based upon the runoff source and the prescribed maintenance schedule.

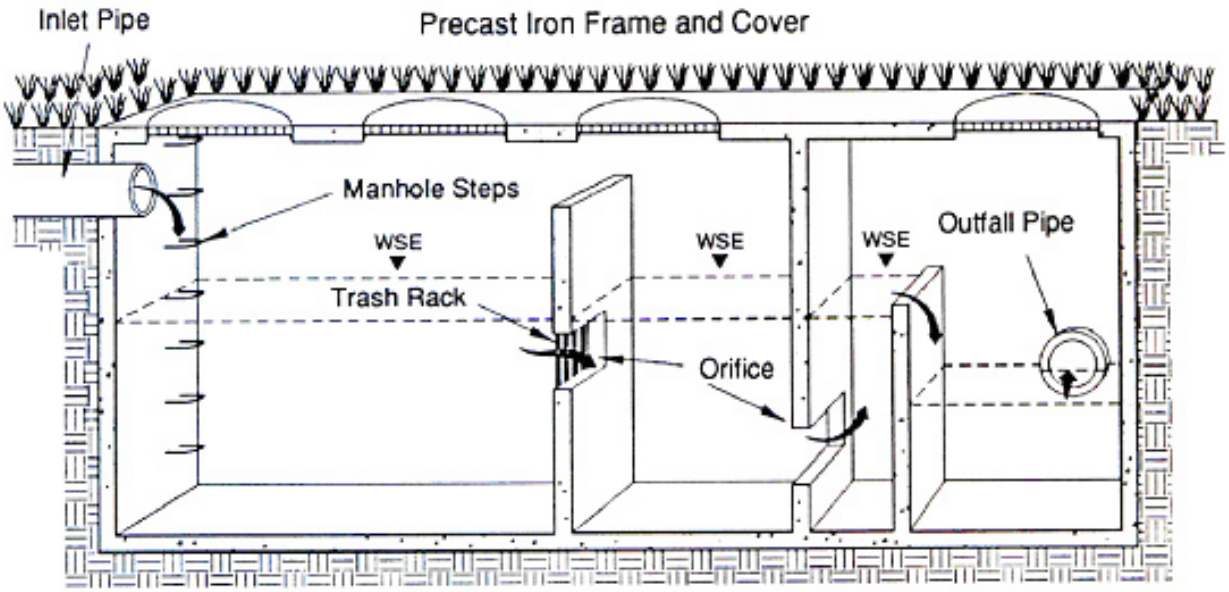


Figure 17 Oil-sediment separator vault detail (Source: GSWMM, 2001)

Limitations

If oil and sediment are not removed regularly, oil-sediment separators will not function properly.

Inspection and Maintenance

The separator should be inspected monthly for buildup of sediment, oil, and floatables and removed as required.

Infiltration Trench

Description

Pollutants and sediment in runoff from developed areas cause pollution in local streams.

Infiltration Trenches are structural BMPs that take the first flush of rainfall and provide for decreased peak runoff flowrates and removal of pollutants from

Applicability

Infiltration Trenches are appropriate BMPs for residential and light commercial areas. The runoff should not have large amounts of sediment.

Design Criteria

Infiltration trenches can be used for drainage areas of five acres or less and should only be constructed in areas with soils that have an infiltration rate of 0.5 inches per hour or greater. Infiltration Trenches should be only be placed in areas that the bottom of the trench will be a minimum of three feet above the season high water table. The trench should be designed such that the voids in the trench will hold ½ inch of rainfall from the drainage area. The trench should only be filled with uniform aggregate of 2 inch or 3 inch diameter. The trench should have a *Grass Filter Strip* on the upstream side to remove sediment and prolong the useful life of the trench. An observation well must be provided to allow inspection of the trench and determine if the trench is draining properly. The detail below is a typical layout of an infiltration trench.

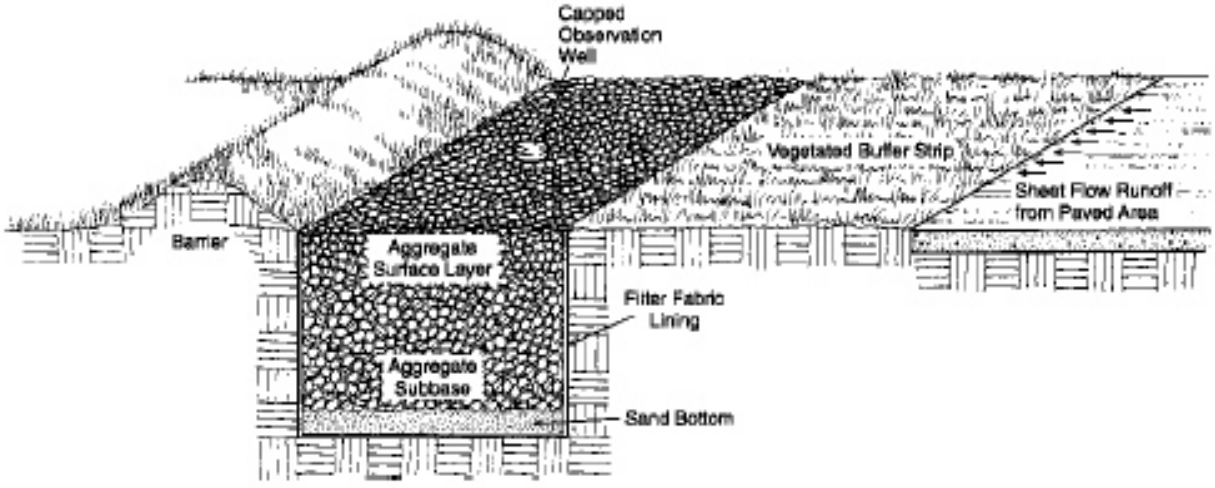


Figure 18. Infiltration trench detail (Source: GSWMM, 2001)

Limitations

Runoff with excessive sediment will plug the pore space in the trench and decrease the useful life of the trench; therefore, infiltration trenches should only be used for runoff that will not care large amounts of sediment.

Inspection and Maintenance

The trench and drainage area should be inspected monthly and after any rainfall event to ensure that both are fee of debris and sediment build up. The observation well should be checked four times a year to determine if the captured water is draining within three days after the rainfall stops. If the trench is not working properly, the rock media and filter fabric must be removed, the trench walls must be scarified to expose new soil, and the filter fabric and trench rock media replaced.

Porous Pavement

Description

Runoff from paved areas often pollutants from vehicles (e.g. oil, brake fluid, antifreeze) that are carried to the local streams. Excessive runoff from parking lots causes erosion and stream bank erosion.

Porous Pavement is a stormwater management practice that allows runoff to infiltrate into and through the pavement, which decreases the amount of the runoff from the pavement and for treatment of the pollutants.

Applicability

Porous Pavement is best suited for low traffic or overflow parking lots on soils with adequate infiltration capacity.

Design Criteria

Porous Pavement should only be used in low traffic or overflow parking lots that will not receive large amounts of sediment from vehicles. The pavement structure should be constructed according to the detail in Figure 19 and must be placed on soils with a minimum infiltration capacity of one inch per hour. The stone reservoir should have a capacity of holding one inch of rainfall in the voids of the stones. The pavement should be placed at least three feet above the seasonal high water table.

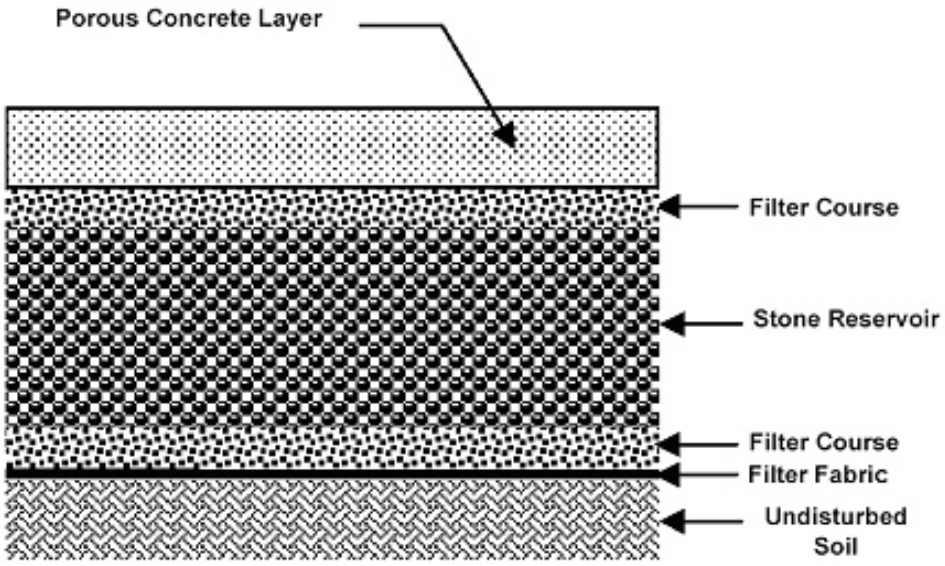


Figure 19 Porous pavement detail (Source: GSWMM, 2001)

Limitations

Failure of Porous Pavement is typically do to excessive sediment build up on the pavement surface from either too much sediment being tracked onto the pavement or from inadequate cleaning of the pavement.

Porous Pavement should not be used in areas that require sanding during icy conditions.

Inspection and Maintenance

The pavement should be inspected and vacuum swept monthly or more frequently as required to keep the pavement clean. Sediment buildup should be removed after ever storm. The pavement should not be resurfaced with non-porous pavement.

Underground Detention Vault

Description

In high density development areas, *Dry Basins* and *Wet Basins* may take too much land space that is needed for development.

Underground Detention Vaults provide are a structural BMP that provides for peak flow attenuation and reduction without taking up valuable surface area.

Application

Ultra-urban or high density developments where land space is not available for surface detention basins.

Design Criteria

Underground detention systems are sized to temporarily store the volume of runoff required to reduce the post-development peak flow of the 25-year storm event to the pre-development rate. Due to the storage volume required, underground detention vaults and tanks are typically not used to control the 100-year storm except for very small drainage areas (<1 acre). Routing calculations must be used to demonstrate that the storage volume is adequate.

Underground detention tanks and vaults must meet structural requirements for overburden support and traffic loading if appropriate. The minimum pipe diameter for underground detention tanks is 36 inches. Whereas, underground detention vaults must be constructed with a minimum of 3,000 psi structural reinforced concrete and all construction joints must be provided with water stops. Cast-in-place wall sections must be designed as retaining walls. The maximum depth from finished grade to the vault invert should be 20 feet. Underground vaults should be designed according to the detail shown below.

Adequate maintenance access must be provided for all underground detention systems. Access must be provided over the inlet pipe and outflow structure. Access openings can consist of a standard frame, grate and solid cover, or a removable panel. Vaults with widths of 10 feet or less should have removable lids.

A separate sediment sump or vault chamber sized to 0.1 inches per impervious acre of contributing drainage should be provided at the inlet for underground detention systems.

Outlet orifices or weirs should be designed to match the pre-development flowrates of the frequencies of storms as required by local regulations.

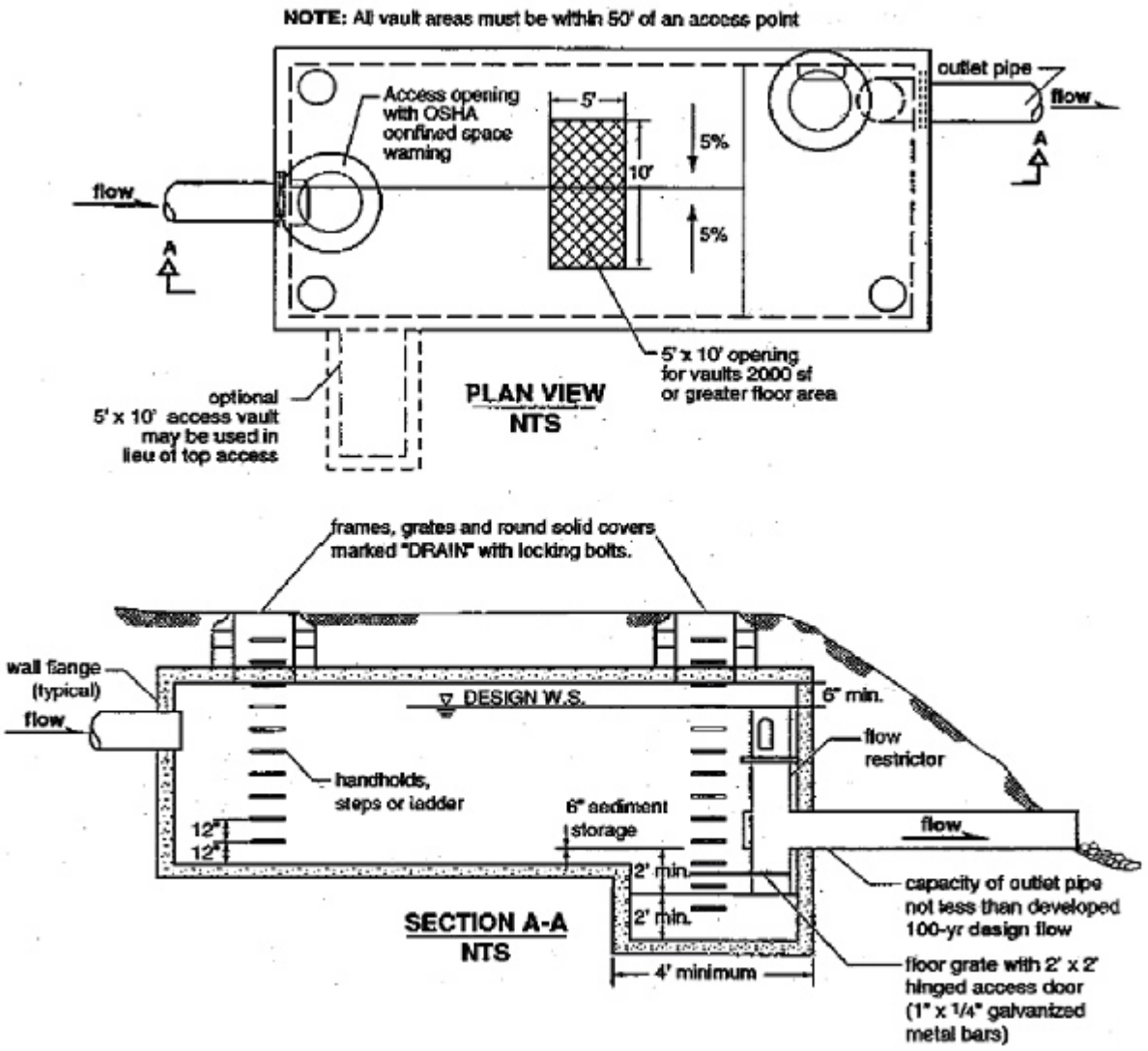


Figure 20 Underground detention vault detail. (Source: WDE, 2000)

Limitations

Underground Detention Vaults are not typically designed to remove pollutants. Extra construction costs and maintenance costs make utilization of Underground Detention Vaults prohibitively expensive except where land costs make them affordable. Runoff should go through a pollutant removal BMP prior to the underground vault.

Inspection and Maintenance

The inlet to the vault should be inspected and trash or sediment removed. Quarterly the vault or tank should be inspected for buildup of sediment and trash, which should be removed as required.

Sediment Control BMPs

Embedded Silt Fence

Description

Water flowing in sheet or shallow flow will carry sediment down a slope and off-site.

Embedded Silt Fence (ESF) is a barrier made of geotextile fabric placed along a contour to capture water, slow the flowrate, trap sediment, and allow water to filter through the fabric. **ALL SILT FENCE USED WITHIN THE PLANNING JURISDICTION OF THE CITY OF ROGERS MUST BE WIRE REINFORCED/WIRE BACKED.**

Applications

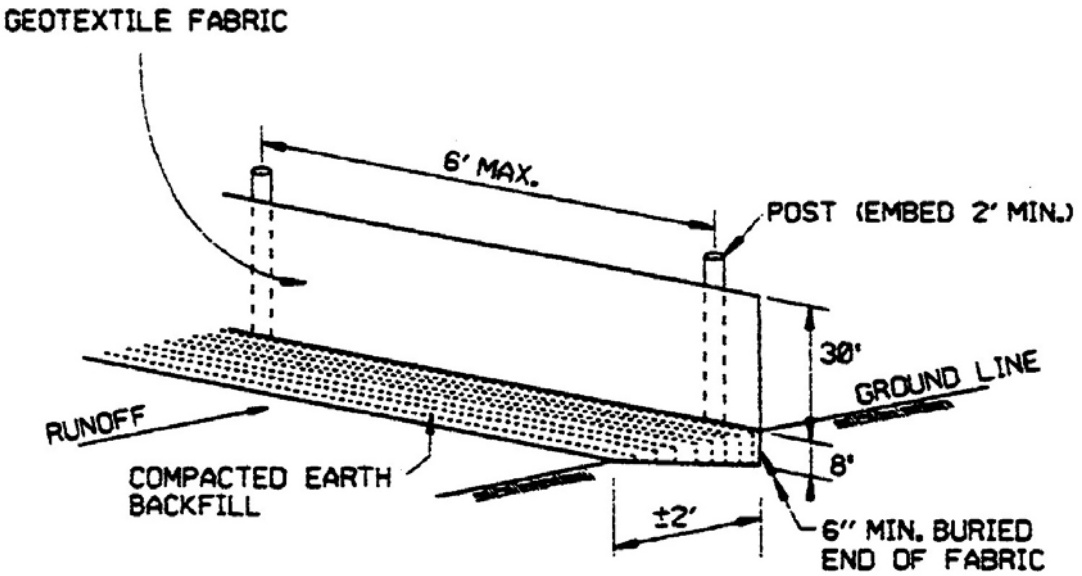
Small drainage areas with sheet flow or shallow flow.

Design Criteria

EMBEDDED SILT FENCE (ESF) USED WITHIN THE PLANNING JURISDICTION OF THE CITY OF ROGERS MUST BE WIRE REINFORCED/WIRE BACKED. It should be placed on a contour and designed to hold runoff from the 10 year storm from an area of 100 sq. ft for each foot of fence. The maximum depth of retained water on the upstream side of the fence should be two feet. The maximum slope length above the fence should be no more than 100 feet. The maximum slope above the fence is 1:1.

The fabric shall be buried in a trench that is at least eight inch deep and eight inches wide as shown below. The fabric shall be place on the upstream side of the posts.

Post shall be made of metal (T-post) or wood (2”x2”) and placed no more than six feet apart.



PASSED THIS _____ DAY OF _____, 2004.

APPROVED:

_____

Attest:

_____

City of Sherwood

Stormwater Permit Application

31 Shelby Road
Sherwood, Arkansas 72120
(501) 835-4753 Office
(501) 392-0088 Fax
permits@cityofsherwood.net

Permit Number: _____

Applicant's Name: _____Phone:_____

Applicant's Address: _____

Contractor's Name: _____Phone:_____

Contractor's Email Address: _____

Job Address: _____

Project Description: _____

Best Management Practices: Silt Fence Waddles Check Dams

ADEQ Permit_____Yes_____No

Project Start Date: _____Project End Date: _____

Signature: _____

"ALL PROTECTIVE DEVICES MUST BE IN PLACE BEFORE GRADING OCCURS"