SOUTH JORDAN CITY

STORM WATER MANAGEMENT PROGRAM

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South Jordan City

Policy Name: Storm Water Management Program

Subject: City Storm Water Management Program		
Effective Date: 12/23/2013	Policy Number: 26.18A	Supersedes: N/A

Submitted by: Glen Kennedy	Date: 12/23/2013
Approved by (Dept. Head):	Date: 12/23/2013
Approved by (City Manager):	Date: 12/23/2013

1. Purpose:

The Storm Water Management Program for South Jordan City seeks to reduce the quantity of pollutants that are introduced into the City's storm water system during storm events. This program is being established in accordance with the EPA's Storm Water Phase II Rule.

2. Policy:

As required by the EPA, goals and measures have been established in the following six areas and these goals will be actively pursued by the City of South Jordan.

- Public Education & Outreach
- Public Participation/Involvement
- Illicit Discharge Detection & Ellimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping

3. Responsibility:

It will be the responsibility of the Public Works Department to review, maintain and lead the efforts of accomplishing the objectives, goals and reporting for the work outlined in the SWMP document. Specifically, the City's Storm Water Manager will actively work to accomplish these goals.

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Introduction

EPA's Storm Water Phase II Rule dictates that a Municipal Separate Storm Sewer System (MS4), establish a Storm Water Management Program (SWMP) that is intended to improve the Nation's waterways by reducing the quantity of pollutants that are introduced into storm water systems during storm events. Common pollutants include oil and grease from roadways, roadway salts and deicing materials, pesticides and fertilizers from lawns, sediment from construction sites, and carelessly discarded trash, such as cigarette butts, paper wrappers, and plastic bottles. When deposited into nearby waterways through MS4 discharges, these pollutants may impair the waterways, thereby discouraging use of the resource, contaminating water supplies, and degrading the habitat of fish, other aquatic organisms, and wildlife.

In 1990, the EPA promulgated rules establishing Phase I of the National Pollutant Discharge Elimination System (NPDES) storm water program. The Phase I program for MS4s requires operators of "medium" and "large" MS4s (those that generally serve populations of 100,000 or greater), to implement a storm water management program as a means to control polluted discharges from these MS4s. The Storm Water Phase II Rule extends coverage of the NPDES storm water program to certain "small" MS4s but takes a slightly different approach to how the storm water management program is developed and implemented.

Permit Application and Notice of Intent

NPDES Phase II Rule encourages the development of a storm water management program by requiring a Notice of Intent (NOI) describing the storm water management program to be submitted to the NPDES permitting authority. The Notice of Intent becomes the permit application and/or permit.

Cities required to permit under Phase II are allowed to collaborate with neighboring cities in the application process. The permittee may join with a Phase I city or another Phase II city in applying for a permit. The individual MS4s may share responsibility for program development with neighboring communities and/or take advantage of existing local or state programs.

Permit Requirements

The MS4's chosen measurable goals that are submitted in the Notice of Intent as a permit application become the required SWMP; however, the NPDES permitting authority can require changes of chosen BMPs and measurable goals if all or some of them are found to be inconsistent with the provisions of the Phase II Final Rule. Likewise, the permittee is allowed to change its BMPs if it determines that the program is not as effective as it could be.

Annual Reports

The permit requires that the City review the SWMP annually, report on its activities and make any necessary and/or required updates. The annual reports should use the form provided by the State. The annual report may include the following information:

- The status of compliance with permit conditions, including an assessment of the appropriateness of the selected BMPs and progress toward achieving the selected measurable goals for each minimum measure;
- Results of any information collected and analyzed, including monitoring data if any;
- A summary of the storm water activities planned for the next reporting cycle;
- A change in any identified BMP or measurable goals for any minimum measure; and
- Notice of relying on another governmental entity to satisfy some of the permit obligations (if applicable).

Record Keeping

Records that are required by the NPDES permitting authority must be kept for at least 5 years, and made accessible to the public at reasonable times during regular business hours. Records need not be submitted to the NPDES permitting authority unless the Permittee is requested to do so.

Completion Dates

The following are dates permit in which the listed requirements have been completed

Date	Description
09-05-2013	New permit goes into effect
12-31-2013	SWMP updated, posted, and submitted to the State
06-2-2011	Inventory of City-owned facilities and assessments
12-04-2012	Update and adopt storm water ordinance
03-14-2013	Fully implement construction program
03-14-2013	Fully implement post-construction program

Penalties

The NPDES permit is federally enforceable, thus subjecting the Permittee to potential enforcement actions and penalties by the NPDES permitting authority. This federal enforceability also includes the right for interested parties to sue under citizen suit provision (section 405) of CWA.

South Jordan SWMP Overview

This document contains a description of the community-specific Storm Water Management Program for South Jordan City. The Program includes the following;

- Best Management Practices (BMPs) for each of the six minimum control measures;

    1. Public Education and Outreach
    2. Public Participation/Involvement
    3. Illicit Discharge Detection and Elimination
    4. Construction Site Runoff Control
    5. Post-Construction Runoff Control
    6. Pollution Prevention/Good Housekeeping

- Measurable goals for each minimum control measure (i.e., narrative or numeric standards used to gauge program effectiveness)
- Estimated months and/or years in which actions to implement each measure will be undertaken, including interim milestones and frequency; and
- The department/position responsible for implementing or coordinating the SWMP

Appendices Overview

This document contains the following information and documentation in its appendices:

- **Appendix A** – Supplemental Guides to Storm Water Management for Contractors and Developers
- **Appendix B** – Standard Operating Procedures, Documentation and elements of the Illicit Discharge Detection and Elimination program

- **Appendix C** – General program documentation including inspection forms.

- **Appendix D** – Copies of the most current City ordinances applicable to storm water

- **Appendix E** – Copies of State permits and documents regulating the South Jordan City SWMP

- **Appendix F** – Map of City Storm Water Infrastructure

- **Appendix G-** Interlocal Agreements

South Jordan City Characteristics

General Information

Management and maintenance of the South Jordan City Storm Drain System falls under the South Jordan Public Works Department. The Public Works Director and/or Stormwater Manager can be contacted at the following address and phone number:

Public Works Facility
10996 S Redwood Road
South Jordan City, Utah 84095
(801) 253-5230

Some general information about South Jordan City:

Population: 56132 (June 2013).
Size: City Acreage 14,145
City Elevation (City Hall) 4,330
Square Miles in City 22.25

Ongoing Documentation Process

The SWMP has been organized to make it a working document with multiple appendices to help the City become more effective in record keeping and documenting its activities. Much of the required documentation will be included in Appendix D. Other report forms, logs, evaluation forms, and back up information are included in the applicable appendices. The City strives to build on the accomplishments of its SWMP, and seeks to continually make effective improvements to said SWMP.

Public Education and Outreach

Permit Requirements

The permit requirements for Public Education and Outreach on Storm Water Impacts can be found in Section 4.2.1 of the permit. A copy of the permit is included in Appendix F for reference. The permit outlines in general the following requirements.

1. The MS4 must promote behavior change by the public to reduce water quality impacts associated with pollutants in storm water runoff and illicit discharges. This is a multimedia approach targeted to specific audiences. The four audiences are: (1) residents, (2) businesses, institutions, and commercial facilities, (3) developers and contractors (construction), and (4) MS4 industrial facilities.

2. Target pollutants and pollutant sources and their potential impacts relating to storm water quality.

3. Provide and document information given to the four focus audiences.

4. Provide documentation or rationale as to why particular BMPs were chosen for its public education and outreach program.

Plan and Implementation Measures

Only those BMPs listed below will be utilized by South Jordan City as part of the SWMP at the present time. The BMPs chosen for the Public Education and Outreach MCM were chosen upon the basis that they reach all of the targeted audiences in an effective and cost efficient manner.

BMP	Code
Classroom Education On Storm Water	CESW
Educational Materials	EM
Employee Training	ET
Public Education/Participation	PEP
Using Media	UM

Goals

In order to realize the maximum benefit of the BMPs to be used, the City has set goals listed below. These goals, in conjunction with existing efforts, fulfill the requirements of the Final Storm Water Phase II Rule for Public Education and Outreach.

The following table includes the goals for MCM 1.

Public Education and Outreach on Storm Water Impacts

MCM	Target		Desired Result	Measurable Goal	Milestone Date	Associated BMPs	Measure of Success (Effectiveness)
	Pollutant(s)	Audience(s)					
1	Oil and Grease, Phosphorous, Soaps and Detergents, Total Dissolved Solids, Total Suspended Solids	Residents and Businesses	4.2.1.1 To educate audiences about impacts from storm water discharge	Continue supporting TV ads.	Ongoing	PEP and UM	Ads continue to run.
1	Oil and Grease, Phosphorous, Soaps and Detergents, Total Dissolved Solids, Total Suspended Solids	Residents (4th graders)	4.2.1.1 To educate audiences on ways to avoid, minimize, and reduce impacts of storm water discharge	Continue Storm Water Fair annually.	Annually	PEP and CESW	Fair occurs annually.
1	Oil and Grease, Phosphorous, Soaps and Detergents, Total Dissolved Solids, Total Suspended Solids	Residents and Businesses	4.2.1.1 To educate audiences on actions individuals can take to improve water quality	Continue supporting TV ads.	Ongoing	PEP and UM	Ads continue to run.

1	See list in "desired result" column	General Public	4.2.1.2 Information is provided to target audience on prohibitions against illicit discharges and improper disposal of waste including: maintenance of septic systems; effects of outdoor activities, such as lawn care; benefits of on-site infiltration of storm water; effects of automotive work and car washing on water quality; proper disposal of swimming pool water; and proper management of pet wastes.	Include information on the website and include information in utility bills and/or South Valley Journal.	Ongoing information on the website, annually include information in utility bills and/or South Valley Journal.	PEP and UM	Information is current on website and included in utility bills and/or South Valley Journal.

1	See list in "desired result" column	Business and Institutions	4.2.1.3 Information is provided to target audience on prohibitions against illicit discharges and improper disposal of waste including: Proper lawn maintenance, benefits of appropriate on-site infiltration of storm water, building and equipment maintenance, use of salt or other deicing materials, proper storage of materials, proper management of waste materials and dumpsters, and proper management of parking lot surfaces.	Include information on the website.	Ongoing	PEP and UM	Information is current on website.

1	Illicit discharge and waste	Contractors, Developers, and plan review staff	4.2.1.4 Reduce adverse impacts from development sites.	Assemble packets of information on SWPPP and BMPs that the contractor must read and sign.	Dec. 2011	EM	Information packets are signed for every new development.
1	Illicit discharge and waste	Contractors, developers, and MS4	4.2.1.4 Reduce adverse impacts from development sites.	Cooperate with the County Coalition to help facilitate RSI trainings on a bi-annual basis that is available to other MS4s, contractors, and developers.	Ongoing	CESW	RSI training is held within the County annually, available to all interested parties.

1	Illicit discharge and waste	Employees	4.2.1.5 Information is provided to target audience on prohibitions against illicit discharges and improper disposal of waste including: Equipment inspection to ensure timely maintenance, benefits of appropriate on-site infiltration of storm water, minimization of use of salt or other deicing materials, proper storage of industrial materials, proper management of waste materials and dumpsters, and proper management of parking lot surfaces.	SOPs on Storm water protection concerning municipal operations provided to all Public Works employees and reviewed annually.	Annually	ET	SOPs provided to appropriate staff and annually reviewed.

1	All pollutants	Permittee engineers, development and plan review staff, land use planners.	4.2.1.6 Training on LID, Green Infrastructure, and post construction BMPs.	Have appropriate staff attend Utah's Annual Storm Water Expo and attend applicable classes.	Annually	CESW	If appropriate staff attend.
1	All pollutants	All Audiences	4.2.1.7 Evaluate the effectiveness of the public education program by a defined method.	Continue to support periodic surveys sponsored by the Salt Lake County Coalition.	Ongoing	PEP	Periodic Surveys are conducted.
1	All pollutants	All Audiences	4.2.1.8 Document why certain BMPs were chosen for public education program. (over others)	Include an explanation in the SWMP.	Dec. 2011	UM	Documented rationale included in the SWMP.

Public Participation/Involvement

Permit Requirements

The permit requirements for Public Participation and Involvement on Storm Water Impacts can be found in Section 4.2.2 of the permit. A copy of the permit is included in Appendix F for reference. The permit outlines in general the following requirements.

1. Comply with applicable State, and local public notice requirements to involve interest groups and stakeholders for their input on the SWMP.

2. Make available to the public a current version of the SWMP document for review and input for the life of the permit. This should be posted on the City's website.

Plan and Implementation Measures

In order to help meet the goals and objectives of this SWMP South Jordan City has chosen to adopt the following BMPs for use within the City as applicable.

BMP	Code
Public Education/ Participation	PEP

Goals

In order to realize the maximum benefit of the BMPs to be used, the City has set goals listed below. These goals, in conjunction with existing efforts, fulfill the requirements of the Final Storm Water Phase II Rule for Public Involvement and Participation.

The following table summarizes the goals for MCM 2.

Public Involvement/Participation

MCM	Target		Desired Result	Measurable Goal	Milestone Date	Associated BMPs	Measure of Success (Effectiveness)
	Pollutant(s)	Audience(s)					
2	All Pollutants	General Public	4.2.2.1 Have a program or policy in place that allows for the public to provide input.	Notify the public 14 days in advance of the City Council meeting when the SWMP update will be reviewed.	Nov-11	PEP	The program or policy is in place.
2	All Pollutants	General Public	4.2.2.2 Have SWMP document available for public review before it's submitted to the state.	Have a hard copy of the draft of the permit available at the City offices within a week of the public hearing.	Nov-11	PEP	SWMP document is available for public review a week before public hearing.
2	All Pollutants	General Public	4.2.2.3 Have SWMP document available to the public at all times.	Post the SWMP on the website.	Dec-11	PEP	SWMP is updated and posted on the website.
2	All Pollutants	General Public	4.2.2.3 Make updated SWMP document available to the public annually.	Post updated SWMP annually.	Ongoing	PEP	SWMP is updated and posted on the website annually.
2	All Pollutants	General Public	4.2.2.4 Comply with State and Local public notice requirements.	Follow State and local public notice requirements.	Ongoing	PEP	Public notice requirements are followed.

Illicit Discharge Detection and Elimination

Permit Requirements

The permit requirements for Illicit Discharge Detection and Elimination on Storm Water Impacts can be found in Section 4.2.3. A copy of the permit is included in Appendix F for reference. The permit outlines in general the following requirements.

1. Maintain a storm sewer system map of the MS4, showing the location of all outfalls and the names and location of all State waters that receive discharges from those outfalls.

2. Through an ordinance, or other regulatory mechanism, a prohibition (to the extent allowable under State, or local law) on non-storm water discharges into the MS4, and appropriate enforcement procedures and actions.

3. Develop and implement a plan to detect and address non-storm water discharges, including spills, illicit connections, and illegal dumping to the MS4.

4. Develop and implement standard operating procedures (SOPs) for:

    a. Tracing the source of an illicit discharge.
    b. Characterizing the nature of, and the potential public or environmental threat posed by, any illicit discharges found or reported.
    c. Ceasing the illicit discharge, including notification of appropriate authorities, property owners, and technical assistance for removing the source and follow-up inspections.

5. Inform public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste.

6. Promote or provide services for the collection of household hazardous waste.

7. Publicly list and publicize a hotline or other local number for public reporting of spills and other illicit discharges.

8. Develop a written spill/dumping response procedure, and a flowchart for internal use, including various responsible agencies and their contacts.

9. Adopt and implement procedures for program evaluation and assessment.

10. Provide employees with pertinent information, at a minimum, annually on the IDDE program.

Plan and Implementation Measures

In order to help meet the goals and objectives of this SWMP, South Jordan City has chosen to adopt the following BMPs for use within the City as applicable.

BMP	Code
Community Hotline	CH
Employee Training	ET
Hazardous Waste Management	HWM
Illegal Dumping Control	IDC
Identify Illicit Connections	IIC
Illegal Solids Dumping Controls	ISDC
Map Storm Water Drains	MSWD
Non-Storm Water Discharge to Drains	NSWD
Ordinance Development	OD
Public Education/ Participation	PEP
Used Oil Recycling	UOR

Goals

In order to realize the maximum benefit of the BMPs to be used, the City has set goals listed below. These goals, in conjunction with existing efforts, fulfill the requirements of the Final Storm Water Phase II Rule for Illicit Discharge Detection and Elimination.

The following table includes the goals for MCM 3.

Illicit Discharge Detection and Elimination

MCM	Target		Desired Result	Measurable Goal	Milestone Date	Associated BMPs	Measure of Success (Effectiveness)
	Pollutant(s)	Audience(s)					
3	All Pollutants	Contractors, Developers, City Council	4.2.3 Enforcement ability for storm water rules.	Review and update Storm Water ordinances to conform to new permit.	Draft by Nov 2011 & Adopted by Feb 2012	OD	If ordinances are in place and meet the permit requirements.
3	N/A	Public Works	4.2.3.1 Maintain Storm Water Map.	Establish policy to maintain a Current SD System Map on all new developments within 6 months.	Dec. 2011	MSWD	If policy is in place and meets the permit requirements.
3	"	"	"	Implementing policy and have all map updates done within 12 months of final approval.	Dec. 2012	MSWD	Successful if 90% are input within 12 months.
3	"	"	"	Implementing policy and have all map updates done within 6 months of final approval.	Dec. 2014	MSWD	Successful if 90% are input within 6 months.
3	All Pollutants	All Audiences	4.2.3.2 Develop, implement, and prepare in writing a plan to detect and	Do Dry weather screening on 80% of all outfalls each year.	Annually	NSWD	Successful if all screens are done.

			address non-SW discharges.				
3	"	Public Works	"	Have SOP in place and training to Staff for outfall inspection.	Jan 2011	NSWD	Successful if completed by that date and staff is following SOP
3	All Pollutants	Public Works	4.2.3.4 Develop and implement standard operating procedures for tracing the source of illicit discharge.	Camera/Video 90% of SD System to view/find illegal connections or discharges.	July, 2013	IIC	Successful if completed by that date.
3	All Pollutants	All Audiences	4.2.3.5 Develop and implement standard operating procedures for characterizing the nature of any illicit discharges found or reported to the Permittee by the hotline developed in 4.2.3.9.	Create the Incidence Response Flow Chart and train personnel.	Dec 2011	IIC, CH	Successful if completed by that date and staff is following Flow Chart.
3	All Pollutants	All Audiences	4.2.3.6 Develop and implement standard operating procedures for ceasing the illicit discharge.	Create the Incidence Response Flow Chart and train personnel.	Dec 2011	IDC, ISDC	Successful if flow chart is created and personnel trained.

1	All Pollutants	Public Employees, Businesses and Residents	4.2.3.7 Inform public employees, businesses, and general public of hazards associated with illicit discharges and improper disposal of waste.	See MCM 1		PEP, ET	See MCM 1
3	Household Hazardous Waste	Residents	4.2.3.8 Promote or provide services for the collection of household hazardous waste.	Put the HHW Address and Phone number on City Web Site	Dec 2011	UOR, HWM	Successful if complete by that date.
3	Household Hazardous Waste	Residents	4.2.3.9 Publicly list and publicize a hotline or other telephone number for public reporting of spills and other illicit discharges.	Put the HHW Address and Phone number on City Web Site.	Dec 2011	CH	Successful if complete by that date.
3	All Pollutants	All Audiences	4.2.3.10 Adopt and implement procedures for program evaluation and assessment.	The StormPro database will be used for tracking Illicit Discharges.	Dec 2011	IIC, MSWD	Successful if complete by that date.

Construction Site Storm Water Runoff Control

Permit Requirements

The permit requirements for Construction Site Storm water Runoff Control on Storm Water Impacts can be found in Section 4.2.4. A copy of the permit is included in Appendix F for reference. The permit outlines in general the following requirements.

1. Develop, implement, and enforce a program to reduce pollutants in any storm water runoff from construction sites.

2. Develop and adopt an ordinance or other regulatory mechanism that requires the use of erosion and sediment control practices at construction sites.

3. Require construction operators to prepare a Storm Water Pollution Prevention Plan (SWPPP) and apply sediment and erosion control BMPs as necessary to protect water quality.

4. Develop an ordinance that allows qualified personnel to inspect construction storm water BMPs on private properties that discharge to the MS4.

5. Develop a written enforcement strategy and implement the enforcement provisions of the ordinance.

6. Document and track all enforcement actions.

7. Develop and implement SOPs for pre-construction SWPPP review that includes a review of site design, planned operations on the construction site, planned BMP use for both pre and post construction, potential water quality impacts, and opportunities for low impact design (LID) and green infrastructure. The City must keep records on projects required to have SWPPPs for a minimum of five years.

8. Identify priority construction sites, including at minimum construction sites discharging directly into or immediately upstream of waters that the State recognizes as impaired or high quality.

9. Develop and implement SOPs for construction site inspection and enforcement of construction storm water pollution control measures.

10. Ensure that all staff, whose primary job duties are related to implementing the construction storm water program, including permitting, plan review, construction site inspections, and enforcement, is trained to conduct those activities.

Plan and Implementation Measures

In order to help comply with the goals and objectives of this SWMP South Jordan City has chosen to adopt the following BMPs for use within the City as applicable.

BMP	Code
Contractor Certification and Inspector Training	CCIT
Erosion Control Plan	ECP
Map Storm Water Drains	MSWD
Ordinance Development	OD
Zoning	ZO

Goals

In order to realize the maximum benefit of the BMPs to be used, the City has set goals listed below. These goals, in conjunction with existing efforts, fulfill the requirements of the Final Storm Water Phase II Rule for Construction Site Runoff Control.

The following table includes the goals for MCM 4.

Construction Site Storm Water Runoff Control

MCM	Target		Desired Result	Measurable Goal	Milestone Date	Assoc. BMP	Measure of Success (Effectiveness)
	Pollutant(s)	Audience(s)					
4	Sediment, Construction Site Debris, Hydrocarbons	Contractors and Developers	4.2.4.1 Raise awareness of contractors and developers on what is expected on construction sites.	Require a SWPPP and Land Disturbance Permit for all construction sites over 1 acre, or that are part of a Common Plan of Development.	Dec 2011	OD	Successful if 95% of all active construction sites have a working SWPPP, and LDP.
4	Sediment, Construction Site Debris, Hydrocarbons	Contractors and Developers	4.2.4.2 Develop a written enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism.	Draft ordinance to include escalating enforcement provisions.	See MCM 2	OD	Successful if completed by milestone.
4	Sediment, Construction Site Debris, Hydrocarbons	Contractors, Developers, City Council, Plan Reviewers	Have an ordinance that is meaningful and enforceable.	Revise ordinance to require a SWPPP on every active construction site over 1 acre, or that are part of a Common Plan of Development.	See MCM 2	OD	If ordinance is in place and meets the permit requirements.
4	"	"	4.2.4.2 Documentation and tracking of all enforcement actions.	Develop and begin using a construction site enforcement action log/database.	Feb 2012	OD	Successful if database/log exists and is being used.

4	Sediment, Construction Site Debris, Hydrocarbons	Contractors and Developers	4.2.4.3 Develop and implement SOP's for pre-construction SWPPP review for construction sites.	Develop checklist and begin to do preconstruction reviews of SWPPP.	Dec 2011	ECP	Successful if SWPPP reviews are being completed.
4	"	"	4.2.4.3.1 Conduct a pre-construction meeting.	Hold Pre-con meetings on all sites greater than 1 acre.	Ongoing		Successful if Pre-con meetings are being held.
4	"	"	4.2.4.3.2 Incorporate into the SWPPP review procedures the consideration of potential water quality impacts and procedures for pre-construction review which shall include the use of a checklist.	Develop a policy to consider potential water quality impacts on all projects - private or municipal.	Feb 2012	ZO	Successful if policy is complete and its use documented.
4	"	"	4.2.4.3.3 Incorporate into the SWPPP review procedures for an evaluation of opportunities for use of Low Impact Development (LID) and green infrastructure and when the opportunity exists, encourage such BMPs to be incorporated into the site design.	Develop a policy to consider Low Impact Development practices on all projects - private or municipal.	Feb 2012	ZO	Successful if policy is complete and its use documented.

4	"	"	4.2.4.3.4 Identify priority construction sites, including at a minimum those construction sites discharging directly into or immediately upstream of waters that the State.	Develop a "sensitive area" map showing areas within the city where "additional" protection may be desired.	July 2012	LIP	Successful when map is completed and ready for use.
4	Sediment, Construction Site Debris, Hydrocarbons	Contractors and Developers	4.2.4.4.1 Inspections of all new construction sites ... at least monthly by qualified personnel.	Conduct monthly inspections of all construction sites. Emphasize self-inspections. Sensitive areas to be inspected twice monthly.	Feb 2012	CCIT	Successful if 90% of all active construction sites are inspected monthly.
4	"	Contractors, developers, and MS4 staff	4.2.4.5 Provide training to City staff and 3rd party designers.	Conduct annual Training for city employees who have job related activities that effect StormWater. Cooperate with the County Coalition to help facilitate RSI trainings on a bi-annual basis that is available to other MS4s, contractors, and developers.	Ongoing	CCIT	RSI training is held within the County annually, available to all interested parties. Conduct employee SOP training.

4	"	Contractors, developers and MS4 staff	4.2.4.4.2 ...The Permittee must include in its SWMP document a procedure for being notified by construction operators of their completion of active construction so that verification of final stabilization and removal of all temporary control measures may be conducted.	Develop a written Notice of Termination process for use within the City.	Feb 2012	ECP	Successful if 95% of all active construction sites are terminated appropriately.
	"	"	4.2.4.4.3 Conduct Bi-weekly inspections on high priority construction sites	Inspect high priority sites. Refer to "sensitive area map" for guidance.	Feb 2012	ECP	Successful if all high priority sites are inspected bi-weekly.
	"	"	4.2.4.6 Maintain a log of active construction sites	Establish a log	Dec 2011	ECP	Successful if active construction sites are recorded in the log.

Long-Term Storm Water Management in New Development and Redevelopment (Post Construction Storm Water Management)

Permit Requirements

The permit requirements for Construction Site Storm water Runoff Control on Storm Water Impacts can be found in Section 4.2.5. A copy of the permit is included in Appendix F for reference. The permit outlines in general the following requirements.

1. Develop, implement, and enforce a program to address post-construction storm water runoff to the MS4 from new development and redevelopment construction sites.

2. Develop and adopt an ordinance or other regulatory mechanism that requires long-term post-construction storm water controls at new and redevelopment sites.

3. Develop an enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism.

4. Provide documentation and reasoning for choosing long-term BMPs including, pollutant removal expectation and the technical basis behind those expectations.

5. Develop a retrofit plan on existing developed sites that are adversely impacting water quality.

6. Require private property owner/operators or qualified third parties to conduct maintenance and provide annual certification that adequate maintenance has been performed and the structural controls are operating as designed to protect water quality.

7. Conduct or require through a maintenance agreement annual inspections on private facilities. On sites where the owner/operator is conducting maintenance, the Permitee must inspect the site at least once every five years.

8. Maintain an inventory of post construction BMPs.

Plan and Implementation Measures

In order to help meet the goals and objectives of this SWMP, South Jordan City has chosen to adopt the following BMPs for use within the City as applicable.

BMP	Code
Erosion Control Plan	ECP
BMP Inspection and Maintenance	BMPIM
Infrastructure Planning	IPL
Land Use Planning/Management	LIP
Ordinance Development	OD

Goals

In order to realize the maximum benefit of the BMPs to be used, the City has set goals listed below. These goals, in conjunction with existing efforts, fulfill the requirements of the Final Storm Water Phase II Rule for Long-Term Storm Water Management in New Development and Redevelopment (Post Construction Storm Water Management).

The following table includes the goals for MCM 5.

Long-Term Storm Water Management in New and Redevelopment (Post Construction Storm Water Management)

MCM	Target		Permit Reference/Desired Result	Measurable Goal	Milestone Date	Assoc. BMP	Measure of Success (Effectiveness)
	Pollutant(s)	Audience(s)					
5	All Pollutants	All Audiences	4.2.5.1. Develop and adopt an ordinance or other regulatory mechanism that requires long-term post-construction storm water controls at new development and redevelopment sites. (4.2.5.3.1 for flood control structure issues and 4.2.5.3.2 for LID)	Review existing ordinance to determine if it meets requirements of new permit - Use checklist from coaching sessions.	See MCM 2	OD	If review is complete.
5	"	"	"	Draft ordinance revisions.	See MCM 2	OD	If draft is complete and ready for others to review.
5	"	"	"	Adopt updated ordinance.	See MCM 2	OD	If ordinance has been passed.
5	"	"	4.2.5.2.2 Documentation on how the requirements of the ordinance or other regulatory mechanism will protect water quality and reduce the discharge	Draft a standard to require contractors and developers to submit documentation on: how long-term BMPs were selected,	July 2012	IPL	If draft is completed by the milestone date.

			of pollutants to the MS4.	pollutant removal expected from the BMP, and technical basis supporting performance claims.			
5	"	"	"	Adopt revised standard.	Sep 2012	IPL	
5	"	MS4 Staff, City Council	4.2.5.3.3 The Permittee must develop a plan to retrofit existing developed sites that are adversely impacting water quality.	Update Storm Drain Master Plan and Capital Improvement Plan to include Water Quality.	Dec 2013	IPL	If SDMP includes water quality projects and yearly budgets account for these projects and their completion.
5	"	MS4 Staff, Contractors and Developers	4.2.5.3.4 Each Permittee shall develop and define specific hydrologic method or methods for calculating runoff volumes and flow rates…	Review existing design standards to see if they meet new permit requirements	Sep 2012	IPL	If standards have been reviewed and comments made.
5	"	"	"	Update design standards.	Sep 2012	IPL	If updated standards have been adopted.
5	"	"	4.2.5.4.1 Review Storm Water Pollution Prevention Plans (SWPPPs).	See goals for MCM 4			

5	"	"	4.2.5.4.2 Permittees shall provide developers and contractors with preferred design specifications to more effectively treat storm water for different development types...projects located in, adjacent to, or discharging to environmentally sensitive areas.	Locate environmentally sensitive areas within the MS4.	July 2012	IPL	Completed map identifying environmentally sensitive areas.
5	"	"	4.2.5.4.3 Permittees shall keep a representative copy of information that is provided to design professionals;...the dates of the mailings and lists of recipients.	Keep a copy of when and who received information in Appendix A - Supplemental Guide to Contractors and Developers.	June 2012	EM	If those receiving Appendix A are documented.
5	"	"	4.2.5.5.1 ... require private property owner/operators or qualified third parties to conduct maintenance and provide annual certification that adequate maintenance has been performed and the structural controls are operating as designed to	Draft a maintenance agreement template.	Dec 2011	BMPIM	If draft is completed by the milestone date.

			protect water quality. In this case, the Permittee must require a maintenance agreement addressing maintenance requirements for any control measures installed on site.				
5	"	"	"	Adopt a maintenance agreement template.	See MCM 2 (Ordinance completion)	BMPIM	If template is adopted and being used by milestone date.
5	"	"	4.2.5.5.3 Inspections and any necessary maintenance must be conducted annually by either the Permittee or through a maintenance agreement, the property owner/operator. On sites where the property owner/operator is conducting maintenance, the Permittee shall inspect those storm water control measures at least once every five years, ...	Inventory post-construction BMPs - see 4.2.5.7.1 for inventory inclusion items.	July 2013	BMPIM	If inventory is complete.
5	"	"	"	Identify who is responsible to inspect and/or maintain each post-construction	July 2013	BMPIM	If list identifies person responsible for inspections/

				BMP.			maintenance.
5	"	"	"	Develop inspection report form for post-construction BMPs.	July 2013	BMPIM	If form is completed.
5	"	"	"	Conduct inspections annually for City owned BMPs.	Ongoing	BMPIM	If completed inspection reports are properly filed.
5	"	"	"	Conduct inspections on 10 privately owned BMP's per year.	Starting July 2013 then annually.	BMPIM	If completed inspection reports are properly filed.
5	"	MS4 staff	4.2.5.6. Permittees shall provide adequate training for all staff involved in post-construction storm water management, planning and review, and inspections and enforcement.	Schedule and conduct training for appropriate personnel.	Annually	BMPIM	If all appropriate personnel are trained.
5	"	"	4.2.5.7 Maintain an inventory of post construction BMP's.	Inventory log updated annually.	Ongoing		If log is updated.

5	"	MS4 staff	4.2.5.6. Permittees shall provide adequate training for all staff involved in post-construction storm water management, planning and review, and inspections and enforcement.	Have appropriate staff attend Utah's Annual Storm Water Expo and attend applicable classes.	Annually	BMPIM	If appropriate personnel attend.
5	"	"	4.2.5.7 Maintain an inventory of post construction BMP's.	Inventory log updated annually.	Ongoing	BMPIM	If log is updated.

Pollution Prevention and Good Housekeeping for Municipal Operations

Permit Requirements

The permit requirements for Construction Site Storm water Runoff Control on Storm Water Impacts can be found in Section 4.2.6. A copy of the permit is included in Appendix F for reference. The permit outlines in general the following requirements.

1. Develop and implement an operations and maintenance program for Permittee-owned and operated facilities, operations, and structural storm water controls that includes standard operating procedures (SOPs) and a training component that has the ultimate goal of preventing or reducing pollutant runoff from all Permittee-owned or operated facilities and operations.

2. Develop and keep a written inventory of Permittee-owned or operated facilities and storm water controls.

3. Initially assess and rate the written inventory of facilities for the degree of potential hazard and pollution of State waters.

4. Assess existing flood management structural controls and determine any necessary changes to improve water quality.

5. Develop facility-specific SOPs for "high priority" facilities that include BMP maintenance, training of responsible personnel, inspection schedule and standards, and good housekeeping procedures pertaining to the protection of water quality.

6. Inspect "high priority" sites weekly and perform comprehensive inspections quarterly.

7. Perform quarterly storm water inspections by sampling storm water leaving "high priority" sites.

8. Develop a training schedule and program for all employees/staff associated with storm water quality specific to their involvement.

Plan and Implementation Measures

In order to help meet the goals and objectives of this SWMP, South Jordan City has chosen to adopt the following BMPs for use within the City as applicable.

BMP	Code
Employee Training	ET
Housekeeping Practices	HP
Infrastructure Planning	IPL

Goals

In order to realize the maximum benefit of the BMPs to be used, the City has set goals listed below. These goals, in conjunction with existing efforts, fulfill the requirements of the Final Storm Water Phase II Rule for Pollution Prevention and Good Housekeeping for Municipal Operations.

The following table includes the goals for MCM 6.

Pollution Prevention and Good Housekeeping for Municipal Operations

MCM	Target		Desired Result	Measurable Goal	Milestone Date	Assoc. BMP	Measure of Success (Effectiveness)
	Pollutant(s)	Audience(s)					
6	All pollutants	MS4 staff	4.2.6 ...All components of an O & M program shall be included in the SWMP document and must identify the department (and where appropriate, the specific staff) responsible for performing each activity described in this section…	Complete SOPs for Municipal Operations for each division.	Dec 2011	HP	If SOPs are created and provided to appropriate divisions.
6	"	"	4.2.6.1. Permitees shall develop and keep current a written inventory of Permittee-owned or operated facilities.	Complete listing of MS4 owned/operated facilities.	Dec 2011	HP	If list is completed by milestone date.
6	"	"	4.2.6.2. All Permittees must initially assess the written inventory of Permittee-owned or operated facilities, operations and storm water controls identified in Part 4.2.6.1. for their potential to discharge to storm water the following typical urban pollutants:…	Complete assessments and identify "high priority" facilities.	Dec. 2011	HP	If assessments are completed and documentation recorded in SWMP.

6	"	"	4.2.6.4. Each “high priority” facility identified in Part 4.2.6.3. must develop facility-specific standard operating procedures (SOPs) or similar type of documents.	Review, customize and update appropriate SOPs.	Dec 2011	HP	If SOPs are updated and current by milestone date.
6	"	"	4.2.6.6.1 Weekly visual inspections: The Permittee must perform weekly visual inspections of “high priority” facilities in accordance with the developed SOPs to minimize the potential for pollutant discharge.	Develop weekly inspection form and log.	Dec 2011	HP	Completed inspection form and log.
6	"	"	"	Conduct weekly inspections.	Ongoing	HP	If at annual review all weekly inspections are logged and reports completed.
6	"	"	4.2.6.6.2 Quarterly comprehensive inspections: At least once per quarter, a comprehensive inspection of “high priority” facilities, including all storm water controls, must be performed	Develop quarterly inspection form(s) and log.	Dec 2011	HP	Completed inspection form and log.

6	"	"	"	Conduct quarterly comprehensive inspections.	Ongoing	HP	If at annual review all quarterly inspections are logged and reports completed.
6	"	"	4.2.6.6.3 Quarterly visual observation of storm water discharges: At least once per quarter, the Permittee must visually observe the quality of the storm water discharges from the “high priority” facilities.	Conduct quarterly visual observations of storm water discharges at high priority facilities.	Ongoing	HP	If at annual review all quarterly visual monitoring is completed and logged and reports completed.
6	"	MS4 Staff, Contractors and Developers	4.2.6.7. The Permittee must develop and implement a process to assess the water quality impacts in the design of all new flood management structural controls that are associated with the Permittee or that discharge to the MS4.	Draft a policy/process to assess water quality impacts on all new flood control projects.	July 2012	IPL	If draft is prepared and ready for internal review process by milestone date.
6	"	"	"	Get policy approved.	Sep 2012	IPL	If policy is approved and adopted by milestone date.

6	"	MS4 staff	4.2.6.7.1 Existing flood management structural controls must be assessed to determine whether changes or additions should be made to improve water quality.	See MCM 5 for goals (part of the retrofit program)			
6	"	"	4.2.6.9. Permittees shall provide training for all employees who have primary construction, operation, or maintenance job functions that are likely to impact storm water quality.	See individual training goals within other MCMs.			
6	"	"	"	Develop a training schedule.	Mar 2012	ET, HP	If schedule is complete by milestone date.
6	"	"	"	Conduct ongoing training according to schedule.	Ongoing	ET, HP	If training is completed and documented according to schedule at annual evaluation.

Definitions related to this SWMP, its appendices and/or attachments.

"40 CFR" refers to Title 40 of the Code of Federal Regulations, which is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal government.

"Act" means the Utah Water Quality Act.

"Analytical monitoring" refers to monitoring of water bodies (streams, ponds, lakes, etc.) or of storm water, according to UAC R317-2-10 and 40 CFR 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants," or to State or Federally established protocols for bio monitoring or stream bio assessments.

"Beneficial Uses" means uses of the Waters of the State, which include but are not limited to: domestic, agricultural, industrial, recreational, and other legitimate beneficial uses.

"Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"CWA" means The Clean Water Act of 1987, formerly referred to as the Federal Water Pollution Control Act.

"Co-Permittee" means any operator of a regulated Small MS4 that is applying jointly with another applicant for coverage under this Permit. A Co-Permittee owns or operates a regulated Small MS4 located within or adjacent to another regulated MS4. A Co-Permittee is only responsible for complying with the conditions of this Permit relating to discharges from the MS4 the Co-Permittee owns or operates. See also 40 CFR 22.26(b)(l).

"Control Measure" refers to any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to Waters of the State.

"Common plan of development or sale" means one plan for development or sale, separate parts of which are related by any announcement, piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, plat, blueprint, contract, Permit application, zoning request, computer design, etc.), physical demarcation (including contracts) that identify the scope of the project. A plan may still be a common plan of development or sale even if it is taking place in separate stages or phases, is planned in combination with other construction activities, or is implemented by different owners or operators.

"Discharge" for the purpose of this Permit, unless indicated otherwise, refers to discharges from the Municipal Separate Storm Sewer System (MS4).

"Dry weather screening" is monitoring done in the absence of storm events to discharges representing, as much as possible, the entire storm drainage system for the purpose of obtaining information about illicit connections and improper dumping.

"Escalating enforcement procedures" refers to a variety of enforcement actions in order to apply as necessary for the severity of the violation and/or the recalcitrance of the violator.

"Entity" means a governmental body or a public or private organization.

"EPA" means the United States Environmental Protection Agency.
"General Permit" means a Permit which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual Permits being issued to each discharger.

"Ground water" means water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

"High quality waters" means any water, where, for a particular pollutant or pollutant parameter, the water quality exceeds that quality necessary to support the existing or designated uses, or which supports an exceptional use.

"Illicit connection" means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

"Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a UP DES Permit (other than the UPDES Permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

"Impaired waters" means any segment of surface waters that has been identified by the Division as failing to support classified uses. The Division periodically compiles a list of such waters known as the 303(d) List.

"Low Impact Development" (LID) is an approach to land development (or re-development) that works with nature to more closely mimic pre-development hydrologic functions. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product. There are many practices that have been used to adhere to these principles such as bio retention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements.

"MS4" is an acronym for "municipal separate storm sewer system".

"Maximum Extent Practicable" (MEP) is the technology-based discharge standard for Municipal Separate Storm Sewer Systems established by paragraph 402(p)(3)(B)(iii) of the Federal Clean Water Act (CWA), which reads as follows: "Permits for discharges from municipal storm sewers shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system, design, and engineering methods, and other such provisions as the Administrator or the State determines appropriate for the control of such pollutants."

"Monitoring" refers to tracking or measuring activities, progress, results, etc.

"Municipal separate storm sewer system" means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) pursuant to paragraphs R317 -8-1.6(4), (7), & (14), or designated under UAC R317-8-3.9(l)(a)5: that is owned or operated by a state, city, town, county, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of wastes, storm water, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the CWA that discharges to Waters of the State; that is designed or used for collecting or conveying storm water; which is not a combined sewer; and which is not part of a Publicly Owned Treatment Works (POTW) as defined in 40 CFR 122.2.

"NOI" is an acronym for "Notice of Intent" to be covered by this Permit and is the mechanism used to "register" for coverage under a general Permit.

"Non-analytical monitoring" refers to monitoring for pollutants by means other than UAC R317- 2-10 and 40 CFR 136, such as visually or by qualitative tools that provide comparative or rough estimates.

"Operator" is the person or entity responsible for the operation and maintenance of the MS4.

"Outfall" means a point source as defined by UAC R317-8-1.5(34) at the point where a municipal separate storm sewer discharges to Waters of the State and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other Waters of the State and are used to convey waters of the State.

"Phase II areas" means areas regulated under UPDES storm water regulations encompassed by Small MS4's (see definition.).

"Priority construction site" means a construction site that has potential to threaten water quality when considering the following factors: soil erosion potential; site slope; project size and type; sensitivity of receiving water bodies; proximity to receiving water bodies; non-storm water discharges and past record of non-compliance by the operators of the construction site.

"Redevelopment" is the replacement or improvement of impervious surfaces on a developed site.

"Runoff' is water that travels across the land surface, or laterally through the ground near the land surface, and discharges to water bodies either directly or through a collection and conveyance system. Runoff includes storm water and water from other sources that travels across the land surface.

"SWMP" is an acronym for storm water management program. The SWMP document is the written plan that is used to describe the various control measures and activities the Permittee will undertake to implement the storm water management plan.

"SWPPP" is an acronym for storm water pollution prevention plan.

"Small municipal separate storm sewer system" is any MS4 not already covered by the Phase I program as a medium or large MS4. The Phase II Rule automatically covers on a nationwide basis all Small MS4s located in "urbanized areas" (UAs) as defined by the Bureau of the Census (unless waived by the UPDES Permitting authority), and on a case-by-case basis those Small MS4s located-outside -or UAs that the UP DES Permitting authority designates.

"SOP" is an acronym for standard operating procedure which is a set of written instructions that document a routine or repetitive activity. For the purpose of this Permit, SOPs should emphasize pollution control measures to protect water quality.

"Storm water" means storm water runoff, snowmelt runoff, and surface runoff and drainage.

"Storm water management program" means a set of measurable goals, actions, and activities designed to reduce the discharge of pollutants from the Small MS4 to the maximum extent practicable and to protect water quality.

"TMDL" is an acronym for "Total Maximum Daily Load" and in this Permit refers to a study that: 1) quantifies the amount of a pollutant in a stream; 2) identifies the sources of the pollutant; and 3) recommends regulatory or other actions that may need to be taken in order for the impaired water body to meet water quality standards.

"Urbanized area" is a land area comprising one or more places and the adjacent densely settled surrounding area that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile.

"Waters of the State" means all streams, lakes, ponds, marshes, water-courses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private which are contained within, flow through, or border upon this state or any portion

thereof, except bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife which shall not be considered to be "Waters of the State" under this definition ("UAC" R317-1-1.32).

Appendix A

SOUTH JORDAN
UTAH

SOUTH JORDAN CITY

SUPPLEMENTAL DEVELOPMENT GUIDE FOR WATER QUALITY

Storm Water Management Plan

Revision date:

January 3, 2013

SOUTH JORDAN
UTAH

SUPPLEMENTAL GUIDE FOR CONTRACTORS AND DEVELOPERS

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Note: sections above marked with * do not apply for residential Common Plan of Development projects.

INTRODUCTION

This Supplemental Guide for Contractors and Developers is part of the South Jordan City Storm Water Management Plan (SWMP), included as Supplemental Development Guide for Water Quality. Developers, Contractors, and Engineers are required to understand the elements of this guide and any updates. Designs, construction methods and recording of plats are affected by the requirements herein. This guide has been adopted by South Jordan City for compliance with the Contractor/Developer Education requirements of State and Federal Storm Water permit law.

Including Water Quality on All Projects

4.2.6.7. The Permittee must develop and implement a process to assess the water quality impacts in the design of all new flood management structural controls that are associated with the Permittee or that discharge to the Municipal Separate Storm Sewer System (MS4). This process must include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while meeting project objectives. A description of this process must be included in the SWMP document.

4.2.6.8. Construction Projects. Public construction projects shall comply with the requirements applied to private projects. All construction projects disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, owned or operated by the Permittee are required to be covered under the General UPDES Permit for Storm Water Discharges Associated with Construction Activities. All public projects approved after the effective date of this Permit shall include construction and post-construction controls selected and implemented pursuant to the requirements in Parts 4.2.4. and 4.2.5.

Developer/Contractor Required Design Review Questions (not applicable for projects that qualify as a common plan of development):

The following questions must be addressed in the design process and submitted to the Development Review Committee, and/or the City Engineer or designee.

1. During conceptual design review meetings – answer the questions –
    a. *Is there opportunity to include water quality aspects to this project?*
    b. *Are there any highly impacted areas?*
    c. *Are there low-impact development concepts and ideas that might work for this project?*
    d. *Can we limit directly connected impervious areas (DCIA) on this project?*
    e. *What could be done to minimize runoff?*

The following items will need to be addressed, or performed during the review process.

1. Train all employees, contractors and developers on SOP's and BMP's for all projects.
2. Include SWPPP discussion as part of the agenda for preconstruction meetings for all projects.
3. Follow normal SWPPP review process/checklist review for all projects.

HYDROLOGIC METHODS AND DESIGN STANDARDS - (not applicable for projects that qualify as a common plan of development):

4.2.5.3. The Permittee's ***(SOUTH JORDAN CITY)*** new development/redevelopment program must have requirements or standards to ensure that any storm water controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality.

4.2.5.3.4 Each Permittee ***(SOUTH JORDAN CITY)*** shall develop and define specific hydrologic method or methods for calculating runoff volumes and flow rates to ensure consistent sizing of structural BMPs in their jurisdiction and to facilitate plan review. Specific criteria which require that Best Management Practices (BMPs) are designed to treat the water from a specific design storm (e.g., the 2-year, 24-hour event) must be incorporated into the permittee's post-construction minimum control measure and documented in the SWMP. Permittees may allow other unique or complex methodologies.

DESIGN STANDARDS SHOULD INCLUDE:

In developing/revising standards you are encouraged (not required) to work with neighboring communities to develop consistency with analytical methods within the same watershed. The following subjects should be addressed.

1. Hydrology
    a. Design storm (frequency and duration) for peak flows
    b. Design storm for piping (10yr- 24hr event)
    c. Design storm for storage (100yr- 24hr event)

2. Storage
    a. Peak discharge allowances
        i. 0.2 cfs per acre
        ii. Match predevelopment runoff hydrograph
    b. Freeboard requirement= 1'

3. System policies
    a. No stormwater in irrigation ditches and canals
    b. Minimum pipe sizing = 18"
    c. Deal with storm water at the source

4. Permitting requirements
    a. Possible Permits from others: 404, Stream Alteration

REQUIREMENTS FOR NOTICE OF INTENT

Who Must File a Notice of Intent (NOI) Form? State law UAC R317-8-3.9 prohibits point source discharges of storm water from construction activities to a waterbody(ies) of the State without a Utah Pollutant Discharge Elimination System (UPDES) permit. The operator of a construction activity that has such a storm water discharge must submit an NOI to obtain coverage under the UPDES Storm Water General Permit. If you have questions about whether you need a permit under the UPDES Storm Water program, or if you need information as to whether a particular program is administered by EPA or a state agency, contact the State Storm Water Coordinator at (801) 536-4300

File NOI Form with fee payment(s), at the following address:

Department of Environmental Quality
Division of Water Quality
P.O. Box 144870
Salt Lake City, UT 84114-4870

NOI can also be completed on line at:

http://www.waterquality.utah.gov/UPDES/stormwatercon.htm

Requirements per UPDES Permit No. UTR090000

> ***Section 4.2.4*** (South Jordan City) "shall develop, implement and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction sites with a land disturbance of greater than or equal to one acre, **including projects less than one acre that are part of a larger common plan of development or sale**"
>
> ***Section 4.2.4.1.1*** (South Jordan City) "shall, at a minimum, require construction operators to prepare a Storm Water Pollution Prevention Plan (SWPPP) and apply sediment and erosion control BMPs as necessary to protect water quality, reduce the discharge of pollutants, and control waste such as, but not limited to, discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality.

NOTE: A template for a SWPPP is available at the following location:
http://www.sjc.utah.gov/engineeringinfo.asp

ENFORCEMENT

The South Jordan City Engineer or Designee, Stormwater Inspector, and/or Code Enforcement Officer shall enforce provisions of the UPDES permit within their jurisdiction by Municipal Code/ Land Disturbance Permit **including but not limited to; Class A or B Misdemeanor, Stop Work Order with reinstatement fee, and/or fines.**

Note: To view the South Jordan Municipal code visit the city website at **http://www.sjc.utah.gov/municipalcode.asp**

PRE-CONSTRUCTION REVIEW

Contractor/Developer is required to submit a compliant SWPPP with an erosion control plan for review before any construction activities begin. Failure to submit for review, and or properly permit per South Jordan City construction standards will result in a stop work order per South Jordan Municipal Code/Construction Standards**.**

South Jordan City Construction Standard Requirements

6.1.1 GENERAL

A. Storm Water Pollution Prevention Plan:

1. Shall be required for all construction activities as required under the Utah Pollutant Discharge and Elimination System (UPDES) permits and the following:

a) Construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.

b) Any construction activity the City Engineer or Designee deems to pose a unique threat to water quality, air quality, or public health or safety.

2. SWPPP shall be managed through the South Jordan City online storm water management system.

NOTICE OF TERMINATION PROCESS

The Notice of Termination (NOT) formally closes the temporary permit to discharge stormwater from construction sites. This is a permit issued by the State and as such the State of Utah is the entity that grants a termination of the permit. However, the State of Utah requires through a permit with an MS4 that the MS4 inspect all phases of construction activity required within the permit. In this light the MS4 permit states:

4.2.4.4.2 The Permittee (South Jordan City) must inspect all phases of construction: prior to land disturbance, during active construction, and following active construction. The Permittee must include in its SWMP document a procedure for being notified by construction operators/owners of their completion of active construction so that verification of final stabilization and removal of all temporary control measures may be conducted.

Steps for Terminating the Discharge of Water Associated with Construction Activities

When a Construction Site is nearing completion and the permittee is desirous of terminating their permit with the State of Utah for discharging water associated with construction activities, the following steps should be taken:

1. The Contractor's SWPPP coordinator for the project should notify the City stormwater inspector that they are ready for final inspection, and file for an NOT with the State. This can be done by logging into the State's database to change the status of the permit from active to unconfirmed termination. http://www.waterquality.utah.gov/UPDES/stormwatercon.htm
2. The City storm water inspector will verify the State database for permit status change. If the permit status has changed, the City inspector visits the site to determine if the site has reached final stabilization as determined by the UPDES Storm Water General Permit for Construction Activities. The City inspector also checks to see if all temporary BMP'S have been removed.
3. If the conditions have not been met to terminate the permit, the City inspector will issue Corrective Actions needed for completion of the Termination, and provide a copy to the permit holders SWPPP coordinator.
4. After all requirements for termination have been met, the City inspector will use the State database to confirm the termination of the permit.
5. Once the State has received confirmation that the site meets all the requirements the NOT is granted.
6. New responsible owner/operator; A Permittee may terminate its coverage under the Permit by submitting an NOT if another party (or parties) assumes responsibility for all remaining SWPPP requirements. Termination of the Permittee's responsibilities under the SWPPP will not be final until the other party (or parties) submits an NOI.

Special Environmental Considerations

Discharges to Water Quality Impaired Waters

The MS4 permittee "must determine whether storm water discharge from any part of the MS4 contributes to a 303(d) listed (i.e. impaired) waterbody." (Small MS4 General UPDES Permit 3.1.1.1) The 303(d) list of impaired waterbodies is found at:

http://www.waterquality.utah.gov/TMDL/index.htm

Threatened or Endangered Species

Where applicable, compliance efforts to this law shall be reflected in the SWMP document. (Small MS4 General UPDES Permit 3.2) The following web sites are helpful in determining the status of any species of interest.

http://wildlife.utah.gov/habitat/pdf/endgspec.pdf.

http://www.fws.gov/endangered/

Historic Properties

Where applicable, compliance efforts to this law shall be reflected in the SWMP document. (Small MS4 General UPDES Permit 3.2) Web sites include the following, along with possible County and City listings:

http://history.utah.gov/historic_buildings/index.html

Low-Impact Development Techniques-(not applicable for projects that qualify as a common plan of development):

The state permit requires that South Jordan City consider Low Impact Developments (LID's). The following 7 categories with associated references are intended to assist communities in proper planning and construction to encourage LID practices.

South Jordan City requires the Developer/Contractor to submit the Low –Impact Development Techniques that were considered for the project during the design/review process. These should list the techniques considered, and reason for use. Use the example below to help with this requirement.

Bio-Retention areas: Designed for site specific conditions to optimize the effectiveness of water filtration and retention. There is no standard. Creativity, ingenuity and dedication are the key to success.

- Aquatic Buffers
- Green Parking Lots
- Bioretention
- Soil Amendments
- Soil Restoration
- Created Wetlands
- Dispersal Trench
- Conveyance Furrow
- Urban Forestry
- Vegetation Restoration
- Biofiltration
- Stormwater Planters

Green Roofs: A bio retention area as well as a form of rain water collection; it also adds a public place and social element.

- Green Roofs
- Biofiltration

Permeable Pavements: Allow for water to permeate through the surface, yet still give a hard surface for pedestrian and vehicular traffic.

- Break Up Flow Directions From Paved Surfaces
- Use Alternative Surfaces
- Green Parking Lots

Rain water collection: Utah law allows for re-use on site. For larger buildings such as offices and malls this is an impact that could greatly reduce storm drain usage in the area.

- Water Harvesting and Reuse
- Parking Lot and Street Storage
- Dispersal Trench
- Pop-Up Emitter

Riparian Buffers: Applied along a watershed by restricting development along creeks, streams, washes, etc. This keeps the natural flow of water, mitigates erosion and contamination, as well as provides an interconnected habitat for animals, and recreation opportunities.

- Protect Natural Site Functions
- Preserve Natural Corridors

- Aquatic Buffers

Green Street System: Includes the different aspects of rain gardens and swales along roads into an incorporated system for retention and filtration of storm water.

- Reduced Clearing and Grading
- Functional Grading
- Locate Impervious Surfaces to Drain to Natural Systems
- Minimize Directly Connected Impervious Areas
- Break Up Flow Directions From Paved Surfaces
- Trail and Path Network
- Narrow Roadways
- Reconfigure Driveways
- Alternative Turnarounds
- Green Parking Lots
- Stormwater Planters
- Urban Forestry
- Alternative Street Layouts
- Eliminate Curb and Gutter

Zoning/Alternative Development Configurations and Standards: creative zoning and development standards directed towards minimizing disturbances of the natural habitat and hydrology of the area.

- Site Fingerprinting
- Fit Development to Natural Gradient
- Alternative Development Configurations
- Define Development Envelope
- Identify Sensitive Areas
- Alternative Lot Configuration
- Reconfigure Driveways
- Alternative Turnarounds
- Reduced Sidewalk Application
- Alternative Street Layouts
- Eliminate Curb and Gutter
- Large lot sizes – higher impervious area percentage
- Cluster Zoning – consolidating development – fewer impacted areas
- Development credits – limiting overall development in a community
- Considering conservation easements
- Limit maximum Directly Connected Impervious Areas (DCIA)

References:

www.lid-stormwater.net (Tool created through Cooperative Assistance Agreement under the US EPA Office of Water 104b(3) Program)

http://www.epa.gov/owow/NPS/lid/lid.pdf

http://www.deq.idaho.gov/water/data_reports/storm_water/catalog/sec_3/text.pdf

Permit Reference #: 4.2.5.3.2, 4.2.6.4, 4.2.4.3.3

Maintenance Agreements and Arrangements

The State of Utah Small MS4 General UPDES Permit section (4.2.5.5.1) requires the use of Maintenance Agreements between developer and the MS4 for any post construction BMP or Stormwater Treatment Practices (STP).

> 4.2.5.5.1 The ordinance or other regulatory mechanism shall include provisions for both construction-phase and post-construction access for Permittees to inspect storm water control measures on private properties that discharge to the MS4 to ensure that adequate maintenance is being performed. The ordinance or other regulatory mechanism may, in lieu of requiring that the Permittee's staff inspect and maintain storm water controls on private property, instead require private property owner/operators or qualified third parties to conduct maintenance and provide annual certification that adequate maintenance has been performed and the structural controls are operating as designed to protect water quality. In this case, the MS4 Permittee must require a maintenance agreement addressing maintenance requirements for any control measures installed on site. The agreement must allow the Permittee to conduct oversight inspections of the storm water control measures and also account for transfer of responsibility in leases and/or deeds. The agreement must also allow the Permittee to perform necessary maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from the property owner/operator as needed.
>
> A stormwater maintenance agreement is a formal contract between a local government and a property owner designed to guarantee that specific maintenance functions are performed in exchange for permission to develop that property. Local governments benefit from these agreements in that responsibility for regular maintenance of the Stormwater Treatment Practice (STP) can be placed upon the property owner or other legally recognized party, allowing agency staff more time for plan review and inspection.

Note: The South Jordan City Maintenance Agreement can be obtained from the development review engineer.

References **and Additional Materials**

SWPPP template: **http://www.sjc.utah.gov/engineeringinfo.asp**

NOI- filing for notice of intent: **http://www.waterquality.utah.gov/UPDES/stormwatercon.htm**

NOT- filing for notice of termination: **http://www.waterquality.utah.gov/UPDES/stormwatercon.htm**

South Jordan City Construction Standards: **http://www.sjc.utah.gov/engineeringinfo.asp**

Signature Page:

By signing below the signee acknowledges that he/she has read the Supplemental Development Guide for Water Quality and understands the content herein; and have fulfilled the requirements listed below. Furthermore the signee acknowledges that they are an approved representative of the developer, and/or contractor, or representative contracted to fulfill such obligations for the development listed below.

Requirements of this Guide:

1. Developer and\or representative has read and understands the content of this guide.
2. Developer has considered LID techniques, and submitted the required information on the consideration of such techniques as required in this Guide.
3. Developer agrees to obtain and follow the UPDES permit for construction activities, and South Jordan Construction Standards regarding said permit.

Development:_____

Representative Name/Title:_____

Signature:_____ Date:_____

Storm Water Management Plan: Statement of Basis and Purpose for SJSP3 Template

Rules and/or definitions for administering a Residential Common Plan of Development Template "SJSP3", for use with appropriate development activity within the Jurisdiction of South Jordan, for the purpose of residential construction under the Utah Construction General Permit "UCGP ". The UCGP is administered by the DIVISION OF WATER QUALITY for Discharges from Construction Activities.

Statement of Basis and Purpose: Residential SJSP3 Template

The basic purposes of these rules and/or definitions are to effectively ensure all construction activity within the jurisdiction of South Jordan to meet the objective: To protect the public health, safety and general welfare of the citizens of the City, by controlling discharges of pollutants to the City's system and improve the quality of the receiving waters into which the stormwater outfalls flow.

An additional purpose of this statement is to also clarify the SJSP3 template use in correlation to the "common plan of development" term in the UCGP within the jurisdiction of South Jordan in order to effectively enforce the applicable measures of the UCGP.

To ensure the City can effectively and efficiently process and inspect construction activities for compliance, while streamlining the process to eliminate duplicative information which can be required.

To ensure all sites that meet the "UGCP" permit requirements and file for the appropriate permit Notice of Intent "NOI".

Definitions

For the purpose of this statement, the following definitions shall apply: Words used in the singular shall include the plural, and the plural shall include the singular; words used in the present tense shall include the future tense. The word "shall" is mandatory and not discretionary. The word "may" is permissive. Words not defined in this section shall be construed to have the meaning given by common and ordinary use as defined in the latest edition of Webster's Dictionary.

1. "Best management practices" or "BMPs" are physical, structural, and/or managerial practices that, when used singly or in combination, prevent or reduce pollution of water, that have been approved by South Jordan City and that have been incorporated by reference into this ordinance as if fully set out therein. For purposes of this Title, the relevant BMP's are more particularly defined in the South Jordan City Standards and Specifications as approved by the City Engineer.
2. City: City of South Jordan
3. City Engineer: The City Engineer of South Jordan City, or authorized designee.

4. City Storm Water System: Storm Systems that receives runoff from a public way, public right-of-way, natural waterways and systems identified in a City easement.
5. Common Plan of development: a term as used and defined in the UCGP.
6. "Discharge" means dispose, deposit, spill, pour, inject, seep, dump, leak or place by any means, or that which is disposed, deposited, spilled, poured, injected, seeped, dumped, leaked, or placed by any means including any direct or indirect entry of any solid or liquid matter into the municipal separate storm sewer system.
7. Erosion and sediment control plan" means a written plan (including drawings or other graphic representations) that is designed to minimize the accelerated erosion and sediment runoff at a site during construction activities.
8. General Construction Storm Water Permit: Permit required by the Utah Department of Environmental Quality, Division of water Quality.
9. "Home building" or "Residential home construction" means construction activity for a single family dwelling.
10. "Residential SJSP3 Template" or "SJSP3" a template to be used for SWPPP purposes for residential home construction.
11. "SRD" means small residential development, for a single family dwelling.
12. "Stormwater" means stormwater runoff, snow melt runoff, surface runoff, street wash waters related to street cleaning or maintenance, infiltration and drainage.
13. "Stormwater pollution prevention plan (SWPPP)" means the set of drawings and other documents that comprise all the information and specifications for the programs, drainage systems, structures, BMPs, concepts and techniques intended to maintain or restore quality and quantity of stormwater runoff to pre-development levels during and after construction.

14. “Stormwater runoff” means flow on the surface of the ground, resulting from precipitation.
15. UPDES: Utah Pollution Discharge Elimination System.

SJSP3

The Residential SJSP3 Template shall comprise of 8 sections:

1. Site evaluation, assessment, and planning.
2. Erosion and sediment control BMP’s.
3. Good housekeeping BMP’s.
4. Post construction BMP’s and final stabilization.
5. Inspections.
6. Certification and notification.
7. Notice of intent “NOI”.
8. Erosion Control Plan.

Rules for uses of the Residential SJSP3 template within the jurisdiction of South Jordan:

1. Residential construction activity “home building” in a common plan of development, up to three lots under 1 acre total.
2. Any SRD or other residential activity the City Engineer deems appropriate.

Note:

The SJSP3 template is for use within the jurisdiction of South Jordan for the purposes listed above. The SJSP3 reduces duplicative information which has already been obtained by the original developer. The permit holder may be required to compile additional information for the UCGP, if requested by the State under the conditions of the UCGP.

Appendix B

SOUTH JORDAN
UTAH

IDDE Investigation Standard Operating Procedure

Purpose:
To detect and eliminate illicit discharges or pollutants into waterways of the State.

Introduction:
Crew will consist of two members of the Storm Water Division and will follow the guidelines of this S.O.P. and the attached flow chart in inspecting City owned outfalls and in investigating any detected discharges during times of dry weather.

Equipment:
- IPAD
- Clear sampling jar
- Access to SOP
- Camera
- Grate/lid puller
- Shovel and pry bar
- Traffic control signs and cones as necessary
- PPE (Orange vest, gloves, steel toe boots, etc.)

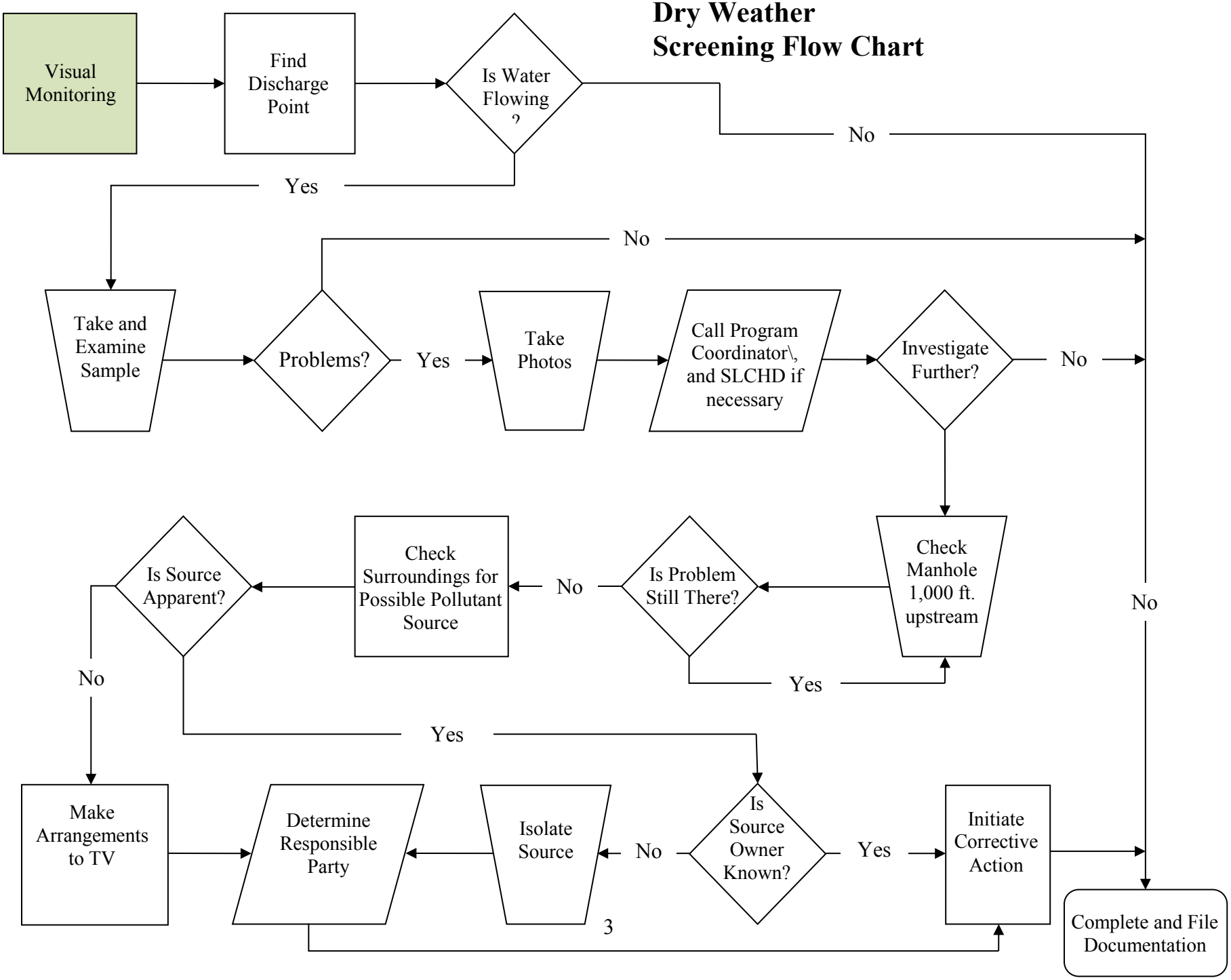
Personnel Qualifications:
- Must be trained in the procedures of this S.O.P. and attached flow chart
- Valid driver's license

Protocol (Procedure):
Inspection
- Check for dry weather discharge
- If discharge is present – pull sample
- Follow procedures on Screening Flow Chart
- Photo document findings
- If there is cause for concern move to inspection follow up procedures

Follow up Procedures:
Inspection Follow-Up Procedures
- File any Photos
- Call health department if applicable and report findings 801-580-6681
- Trace discharge upstream by checking manholes – 1,000 foot intervals
- Find last manhole with any evidence of illicit discharge
- Look at surface improvements in the area to determine possible suspects
- If determination cannot be made from surface investigations, then TV or smoke test line for unknown connections.

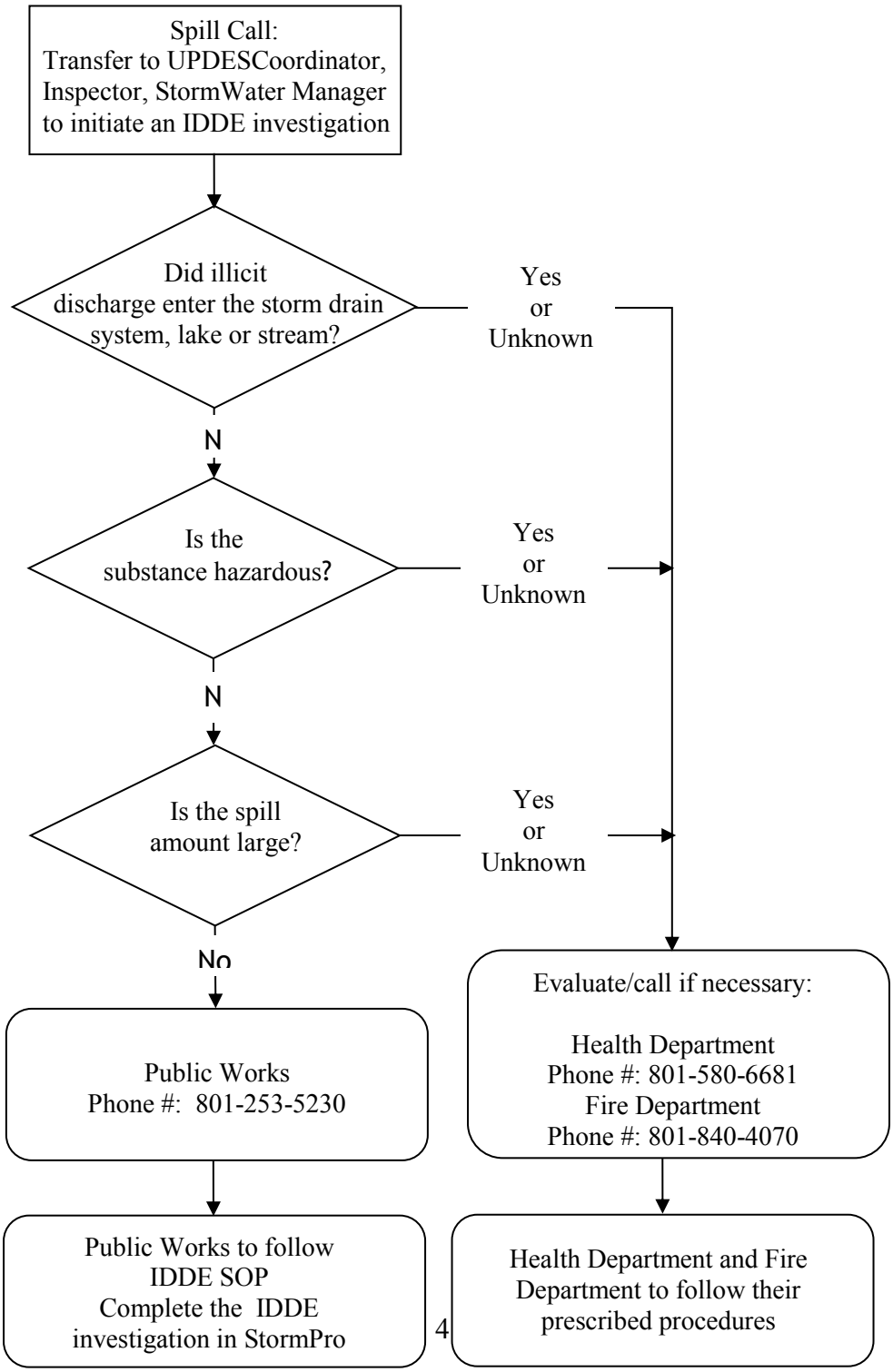
Refer also to the following forms:
Dry Weather Screening Flow Chart
Dry Weather Screening Examination Report

Dry Weather Screening Flow Chart



Incident Response Flow Chart

*** NOTE* in your own judgment, a serious environmental threat to humans or the environment justifies immediate notification of the Health Department 801-580-6681.**



Removing Illicit Discharges

1. **Preparation**

   a. Obtain available property ownership information for the source of the illicit discharge.

2. **Process**

   a. Determine who is financially responsible; and follow associated procedures as given below.

   For Private Property Owner:
   Contact Owner,
   Issue Notice of Violation for violations of the municipal ordinance, and
   Determine schedule for removal.

   For Municipal Facility:
   Notify appropriate municipal authority or department head,
   Schedule removal, and
   Remove illicit connection.

   b. Suspend access to storm drain if threats of serious physical harm to humans or the environment are possible.

   c. Direct responsible party to initiate repairs/corrections/cleanup. Coordinate with enforcement official for escalating penalties in accordance with the municipal ordinance.

   d. Repair/correct cause of discharge if municipality is responsible. Schedule the work through the appropriate municipal authority or department head.

   e. Seek technical assistance from the Salt Lake County Health Department or Utah Department of Water Quality, if needed.

3. **Clean up**

   a. Confirm illicit discharge is removed or eliminated by follow-up inspection.

4. **Documentation**

   a. Maintain records of notice of violation and penalties.

   b. Document repairs, corrections, and any other actions required.

Policy for Identifying Priority Construction Sites

Overview:

The City of South Jordan in compliance with its current Storm Water Management Plan (SWMP); has implemented the following policy for Identifying Priority Construction Sites.

Purpose:

The purpose of the policy is to Identify priority construction sites, including at a minimum those construction sites discharging directly into or immediately upstream of waters that the State recognizes as impaired (for sediment) or high quality;.

Involvement: StormWater

Current departments who will be involved are: StormWater, Engineering.

Procedure:
1. StormWater:

A. Before a Land Disturbance Permit is issued, during the SWPPP review reference the Sensitive Area Map to determine if the site is High Priority.
B. Increase the inspection frequency for the Operator, and the StormWater division inspector.
C. Evaluate if there should be increased BMP's based on the proximity to the Area.

StormWater Department Policy for Notice of Termination (NOT) of the Utah Construction General Permit (CGP).

Overview:

The City of South Jordan in compliance with its current Storm Water Management Plan (SWMP); has implemented the following policy for receiving notification from contractors that their permit is ready for NOT.

Purpose:

The purpose of the policy is to ensure the proper procedures and inspections are completed, thus terminating construction StormWater permits per procedures listed within said CGP.

Involvement:

Current departments who will be involved are: StormWater, and Engineering.

Procedure:

1. Engineering:

    A. Upon receipt of notice of occupancy, the Engineering Division will initiate a Land Disturbance Permit "LDP" close out inspection in StormPro which triggers a notification to the StormWater division.

2. StormWater:

    A. The UPDES Coordinator and/or StormWater inspector use the LDP close out inspection as a notice to begin the NOT inspection process following the procedures of the CGP.
    B. The StormWater inspector will also use StormPro during/after site visits/inspections to prompt contractors when the site conditions are perceived to meet the permit requirements for termination. StormPro will also be used to complete the NOT inspection and action item documentation until the NOT is granted.
    C. The StormWater inspector will also use the State database to check for sites that have filed for NOT; which will initiate the termination process, and complete the process when approved or "terminated" in the database.

3. Contractor:

    A. Contractor/Operator can use notations within their StormPro inspection entry to note completion /filing for NOT, or email or call for NOT inspection.

Policy for Post Construction Inspection and Enforcement.

Overview:

The City of South Jordan in compliance with its current Storm Water Management Plan (SWMP); has implemented the following policy for inspection and enforcement of post construction StormWater utilities in new developments, or changes to the current StormWater system within the city.

Purpose:

The purpose of the policy is to ensure the proper inspection and maintenance of post construction StormWater control measures in new or reconstructed StormWater systems.

Involvement:

Current departments who will be involved are: StormWater, Development Services, and Engineering.

Procedure:

1. Engineering:

    A. Before a Land Disturbance Permit is issued, the assigned engineer shall require completed submittal of the South Jordan City StormWater Facilities Maintenance Agreement. A copy of the agreement will be sent to the StormWater department.

2. Development Services:

    B. Before occupancy is given to commercial building permits who have an South Jordan City StormWater Facilities Maintenance Agreement, notification shall be given to the StormWater department to verify said agreement.

3. StormWater:

    A. Upon receiving copy of maintenance agreement from Engineering, enter the agreement into the StormPro database.

    B. Upon notification from development services for occupancy, verify contacts for the appropriate notifications required within the agreement.

    C. Set up Agreement inspection schedules; attach appropriate drainage and system details. Inspect site and follow agreement requirements, and enforcement.

Storm Water Protection for All Municipal Operations

Standard Operating Procedures

Created: March 18, 2010
Last Revision: July 28, 2011

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Chemical Application Pesticides, Herbicides, Fertilizers

1. Preparation

a. Calibrate fertilizer and pesticide application equipment to avoid excessive application and ensure that guards are in place to control material

b. Use pesticides only if there is an actual pest problem and periodically test soils to determine proper fertilizer use with soil probes

c. Time and apply the application of fertilizers, herbicides or pesticides to coincide with the manufacturer's recommendation for best results ("Read the Label")

d. Know the weather conditions. Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph)

2. Process

a. Always follow the manufacturer's recommendations for mixing, application and disposal. ("Read the Label")

b. Do not mix or prepare pesticides for application near storm drains, preferably mix inside a protected area with impervious secondary containment (preferably indoors) so that spills or leaks will not contact soils

c. Employ techniques to minimize off-target application (e.g. spray drift, over broadcasting.) of pesticides and fertilizers

3. Clean-up

a. Sweep pavements or sidewalks where fertilizers or other solid chemicals have fallen, back onto grassy areas before applying irrigation water or use blowers to move materials onto the turf

b. Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste at an authorized disposal site

c. Always follow all federal and state regulations governing use, storage and disposal of fertilizers, herbicides or pesticides and their containers. ("Read the Label")

4. Documentation

a. Keep copies of MSDS sheets for all pesticides, fertilizers and other hazardous products used

b. Record fertilizing and pesticide application activities

Mowing and Trimming

1. Preparation

a. Process overview with all employees

b. Load trucks, trailers, and other equipment with material for temporary inlet protection

2. **Process**

   a. Temporary catch basin protection installed on affected basins

   b. Clippings to be swept or blown back on to grass areas

   c. Remove inlet protection

3. **Clean-up**

   a. Mowers are scraped and brushed at shop – dry spoils are dry swept and disposed of properly

   b. Equipment washed in approved wash station

4. **Documentation**

Planting Vegetation (Starters)

1. **Preparation**

   a. Call the Blue Stakes Center of Utah at least 2 working days before any digging will be done, to reveal the location of any underground utilities

   b. Dial 811 or 1-800-662-4111

   c. Decide where any spoils will be taken.

2. **Process**

   a. Dig holes; place spoils near the hole where they may easily be placed back around roots. Avoid placing spoils in the gutter

   b. Bring each plant near the edge of the hole dug for it

   c. Check the depth of the hole, and adjust the depth if necessary. The depth of the hole for a tree should be as deep as the root ball, so that the top of the root ball is level with the top of the hole

   d. Carefully remove pot or burlap

   e. Place the plant in the hole

   f. Backfill the hole with existing spoils, compost, and a litter fertilizer if desired. Do not use excessive amendments

   g. Water the plant

   h. Stake the plant, if necessary, to stabilize it

3. **Clean-up**

   a. Move any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed

   b. Sweep dirt from surrounding pavement(s) into the planter area

   c. Transport spoils to their designated fill or disposal area

Planting Vegetation (Seeds)

1. **Preparation**

   a. Call the Blue Stakes Center of Utah at least 2 working days before any digging will be done, to reveal the location of any underground utilities

   b. Dial 811 or 1-800-662-4111

   c. Decide on the application rate, method, water source, and ensure adequate materials are in possession

   d. Grade and prepare the soil to receive the seed. Place any extra soil in a convenient location to collect

2. **Process**

   a. Place the seed and any cover using the pre-determined application method (and rate)

   b. Lightly moisten the seed

3. **Clean-up**

   a. Move any extra spoils into truck or trailer. Place the spoils on a tarp if there is likelihood that some of the dirt would be lost through openings in the bed

   b. Sweep dirt, seed, and any cover material from surrounding pavement(s) into the planter area

   c. Transport spoils to their designated fill or disposal area

Parking Lot Maintenance

1. **Preparation.**

a. Restrict parking in areas to be swept prior to and during sweeping using regulations as necessary or perform sweeping activities during times of low parking.

c. Perform regular maintenance and services in accordance with the recommended vehicle maintenance schedule on sweepers to increase and maintain efficiency.

2. **Process.**

a. Sweep parking areas, as needed, or as directed by the City's responsible official.

b. Hand sweep sections of gutter if soil and debris accumulate.

c. Pick-up litter as required to keep parking areas clean and orderly.

3. **Clean-up**.

a. Dispose of sweepings properly (appropriate solid waste facility).

b. Street sweepers to be cleaned out in a manner as instructed by the manufacturer and in a location that swept materials cannot be introduced into a storm drain.

4. **Documentation.**

a. Keep accurate logs to track swept parking areas.

Vehicle Maintenance and Repair Activities

1. Preparation

a. Store vehicles indoors where possible and in an area with no floor drains that lead to storm water system.

b. Watch for leaking equipment and vehicles.

2. Process

a. Use drip pans to collect leaking fluids from equipment or vehicles.

b. Repair leaking vehicles as soon as possible to protect storm drain system.

c. Wash vehicles and equipment in dedicated areas.

3. Clean-up

a. Properly clean any areas that have been polluted by leaking vehicles.

b. Discharge all wash water containing contaminates (degreasers, acids, and oil bases) to a treatment facility or sanitary sewer if it meets treatment plant standards.

c. Do not store or wash vehicles over storm drain inlets.

Cleaning Parks Maintenance Equipment

1. **Preparation**

   a. Review process with all Parks employees

2. **Process**

   a. Wipe off dirt, dust and fluids with disposable towel

   b. Wash equipment in approved wash station

3. **Clean-up**

   a. Dispose of towels in proper trash receptacle

   b. Sweep floor and dispose of debris.

Vehicle Washing

1. **Preparation**

   a. No vehicle washing will be done where the drain system is connected to the storm sewer system.

   a. All vehicles should be washed in the Municipal Services wash bay which is connected to the sanitary sewer.

2. **Process**

   a. Never wash vehicles over or a storm drain.

3. **Clean Up**

   a. Sweep wash areas after every washing to collect what solids can be collected to prevent them from washing down the drain system.

   b. Clean solids from the settling pits on an as needed basis.

Vehicle Fueling

1. **Preparation**

a. Absorbent spill clean-up materials and spill kits shall be available in fueling areas and on mobile fueling vehicles and shall be disposed of properly after use.

2. **Process**

a. Shut off the engine.

b. Ensure that the fuel is the proper type of fuel for the vehicle.

c. Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut off to prevent overfill.

d. Fuel vehicle carefully to minimize drips to the ground.

e. Fuel tanks shall not be 'topped off'.

f. Mobile fueling shall be minimized. Whenever practical, vehicles and equipment shall be transported to the designated fueling area.

g. When fueling small equipment from portable containers, fuel in an area away from storm drains and water bodies.

3. **Clean Up**

a. Immediately clean up spills using dry absorbent (e.g., kitty litter, sawdust, etc.) sweep up absorbent material and properly dispose of contaminated clean up materials.

b. Large spills shall be contained as best as possible and the HazMat team should be notified ASAP.

Open Space Management

1. **Preparation**

a. Provide a regular observation and maintenance of parks, golf courses, and other public open spaces.

b. Identify public open spaces that are used for stormwater detention and verify that detention areas are included on the storm drain system mapping, inspection schedules, and maintenance schedules.

2. **Process**

a. Ensure that any storm drain or drainage system components on the property are properly maintained.

b. Follow all SOPs related to irrigation, mowing, landscaping, and pet waste management.

3. **Clean Up**

a. Keep all outdoor work areas neat and tidy. Clean by sweeping instead of washing whenever possible. If areas must be washed, ensure that wash water will enter a landscaped area rather than the storm drain. Do not use soap for outdoor washing.

b. Pick up trash on a regular basis.

4. **Documentation**

a. Document any observed deficiencies for correction or repair.

Creek Management

1. Preparation

a. Monitor streams on a regular basis (Suggested interval?)

b. Check culverts and crossings after every storm

c. Maintain access to stream channels wherever possible

2. Process

a. Identify areas requiring maintenance

b. Determine what labor or equipment will be required

c. Identify access and easements to area requiring maintenance

d. Determine method of maintenance that will be least damaging to the channel

3. Clean-up

a. Stabilize all disturbed soils

b. Remove all tracking from paved surfaces near maintenance site, if applicable

c. Haul all debris or sediment removed from area to approved dumping site

4. **Documentation**

   a. Keep log of actions performed

   b. Record the amount of materials removed or imported

   c. Keep any notes or comments of any problems

Chip Seal

1. **Preparation**

   a. Clean and dry areas where materials are to be applied. Manholes and catch basins are covered to prevent oil and materials from getting inside the structures or system

2. **Process**

   a. Chip spreader follows closely behind emulsion distributor, and travels slowly enough to prevent chips from rolling when they hit the surface. Street sweeper is used to pick up excess chips. Rollers follow closely behind the chip spreader. Maximum speed 5 mph. Roll entire surface twice

3. **Clean-up**

   a. All loose aggregate from brooming is removed from the roadway. Excessive asphalt applications and spills are removed. When covers are removed any materials which have entered the storm drain structures shall be removed.

4. **Documentation**

   a. Record project in Cartegraph

Slurry Seal

1. **Preparation**

   a. Weeds shall be removed from the roads. Clean and dry areas where materials are to be applied. Verify that existing pavement has been inspected for detrimental effects of poor drainage and protect all storm inlets and basins

   b. Cover all manholes and valve boxes with roofing/tar paper

2. **Process**

   a. Application of materials should be smooth and uniform. Slurry material should not run onto adjacent pavement surface

3. **Clean-up**

   a. Ensure that all loose aggregate from brooming is removed from travelway. Ensure that excess emulsion and spill materials are removed from the site and disposed of properly

4. **Documentation** Record project in Cartegraph

Overlays and Patching

1. **Preparation**

   a. Manholes and catch basins are covered to prevent oil and materials from getting inside the structures or system

   b. Cracks should be properly sealed. Alligator cracks and potholes should be removed and patched. Rutting should be milled

   c. Surface should be clean and dry

   d. Uniform tack coat applied and cured prior to placement of overlay

2. **Process**

   a. Check aggregate for proper temperature, percentage asphalt, gradation, air voids and any other agency requirements

   b. Surface texture should be uniform, no tearing or scuffing

   c. Rolling should be done to achieve proper in-place air void specification

   d. Comply with the latest edition of APWA

3. **Clean-up**

   a. Covering should be removed as soon as the threat of imported materials entering the system is reduced and prior to a storm event. Structure rims should be installed to ¼ to ½" below asphalt elevation

4. **Documentation**

   a. Record project in Cartegraph

Crack Seal

1. **Preparation**

   a. Remove weeds from the road

b. Protect storm inlets and basins

c. Cracks are then air-blasted to remove sediments from the crack to allow for proper adhesion

d. Surface should be clean and dry

e. Provide submittal on material used

2. Process

a. Proper temperature of material should be maintained

b. Sufficient material is applied to form the specified configuration

3. Clean-up

a. Excessive sealant application or spills are removed

b. All loose debris from cleaning is removed from the pavement

c. Remove storm inlet/basin protection

4. Documentation

a. Record project in Cartegraph

Curb Painting

1. Preparation

a. Calculate the amount of paint required for the job

b. Use water based paints if possible

c. Determine whether the wastes will be hazardous or not and the required proper disposal of said wastes

d. Determine locations of storm drain inlets and sewer inlets that may need to be protected

e. Prepare surfaces to be painted without generating wastewater; eg. Use sandblasting and or scraping

f. Use a citrus-based paint remover whenever possible, less toxic than chemical strippers

g. If wastewater will be generated, use curb, dyke, etc. around the activity to collect the filter and collect the debris. Dispose of contaminates collected properly

2. Process

a. Paint curb

b. Prevent over-spraying of paints and/or excessive sandblasting

c. Use drip pans and drop clothes in areas of mixing paints and painting

d. Store latex paint rollers and brushes in air tight bags to be reused later with the same color

e. Have available absorbent material and other BMP's ready for an accidental paint spill

3. Clean-up

a. Paint out brushes and rollers as much as possible. Squeeze excess paint from brushes and rollers back into the containers prior to cleaning them

b. Pour excess paint from trays and buckets back into the paint can containers and wipes with cloth or paper towels. Dispose of the towels according to the recommendations on the paint being used

c. Rinse water-based paint brushes in the sink after pre-cleaning. Never pour excess paint or wastewater from cleanup of paint in the storm drain

d. Cleanup oil based paints with paint thinner. Never clean oil based brushes in a sink or over a storm drain. Filter solvents for reuse if possible and/or store in approved drum for recycling

4. Documentation

a. Write-up/report of any discharges into storm drain system

Shouldering and Mowing

1. Preparation

a. Use traffic control devices as necessary per MUTCD

b. Any roadside maintenance shall be performed in a way to prevent eroded materials from entering the storm drain system

2. Process

a. Place import material as needed and perform grading to achieve proper drainage

b. Grass clippings should be small enough to not cause problems by blocking drain grates

3. **Clean-up**

   a. Clean any loose material off asphalt or gutter

4. **Documentation**

   a. Record project in Cartegraph

Planned Waterline Excavation Repair/Replacement

1. **Preparation**

   a. Determine where discharge flow will go

   b. Protect Storm drain inlet

   c. Clean Gutters leading to inlet

2. **Process**

   a. Direct any discharge to pre-determined area backfill excavation

   b. Haul off excavated material or stock pile nearby

3. **Clean up**

   a. Clear gutter/ waterway where water flowed

   b. Clean up all areas around excavation

   c. Clean up travel path of truck material

4. **Documentation**

   a. Report project in Cartegraph

Unplanned Waterline Excavation Repair/Replacement

1. **Preparation**

   a. Equip leak repair equipment with filter material (Inlet Protection Filter bags)

2. **Process**

   a. Stop the discharge

   b. Inspect flow path of discharged water

   c. Protect water inlet areas

d. Follow planned repair procedures

e. Haul off spoils of excavation

f. Consider use of silt filter bags on pumps

3. Clean-up

a. Repair eroded areas as needed

b. Follow planned repair procedures

c. Travel path of trucked excavated material

Transporting Wet Excavated Materials & Spoils

1. Preparation

a. Utilize truck with containment for material

b. Determine disposal site of excavated material

2. Process

a. Load and Transport in manner to eliminate spillage & tracking of material

b. Check truck for spillage

c. Utilize one route of transport

3. Clean-up

a. Clean route of transport to provide cleaning of any spilled material

b. Wash out equipment truck and other equipment

Waterline Flushing for Routine Maintenance

1. Preparation

a. Determine flow path of discharge to inlet of waterway

b. Determine chlorine residual

2. Process

a. Clean flow path

b. Protect inlet structures

c. Use diffuser to dissipate pressure to reduce erosion possibilities

3. Clean-up

a. Clean flow path

b. Remove inlet protection if desired

4. Documentation

a. Residual tests of discharge water

Waterline Flushing and Disinfection after Construction Activity

1. Preparation

a. Determine chlorine content of discharged water and utilize de-chlorination equipment

b. Determine flow path of discharge

2. Process

a. Protect inlets in flow path

b. Sweep and clean flow path

c. Use diffuser to reduce velocities

3. Clean-up

a. Pick up inlet protection

b. Clean flow paths

c. Remove equipment from flush point

4. Documentation

a. Residual test of discharged water

Chemical Handling/Transporting and Spill Response

1. Preparation

a. Understand MSDS sheets for handling of product

b. Determine proper place of handling

c. Have necessary containment and spill kits at handling place

2. Process

a. Begin transfer process

b. Discontinue operations if spill levels occurs

c. Disconnect and store handling equipment

3. Clean-up

a. Clean up spills with proper material

b. Dispose of contaminated material at appropriate facility

4. Documentation

a. Report any spills to Salt Lake County

Transporting Dry Excavated Materials & Spoils

1. Preparation

a. Utilize truck with proper containment of materials

b. Determine disposal site of excavated materials

2. Process

a. Load

b. Check truck after loading for possible spillage and clean-up spillage before transporting

c. Transport in manner to eliminate spillage & tracking

d. Utilize one route for transporting

3. Clean-up

a. Clean loading area

b. Clean transporting route

c. Wash off truck and other equipment

Concrete Work

1. **Preparation**

    a. Train employees and contractors in proper concrete waste management

    b. Store dry and wet materials under cover, away from drainage areas

    c. Concrete washout required on pours requiring more than one cement truck

2. **Process**

    a. Avoid mixing excess amounts of fresh concrete on-site

    b. Repair gutters, sidewalks, grind trip hazards, remove and replace concrete sections as necessary

3. **Clean-up**

    a. Perform washout of concrete trucks in designated areas only

    b. Do not washout concrete trucks into storm drains, open ditches, streets or streams

    c. Cement and concrete dust from grinding activities is swept up and removed from the site

Garbage Storage

1. **Preparation**

    a. Locate dumpsters and trash cans with lids in convenient and easily observable areas

    b. Provide properly-labeled recycling bins to reduce the amount of garbage disposed

    c. Provide training to employees to prevent improper disposal of general trash

2. **Process**

    a. Inspect garbage bins for leaks regularly, and have repairs made immediately by responsible party

    b. Locate dumpsters on a flat, concrete surface that does not slope or drain directly into the storm drain system

    c. Install berms, curbing or vegetation strips around storage areas to control water entering/leaving storage areas

3. **Clean-up**

a. Keep areas around dumpsters clean of all garbage

b. Have garbage bins empted as often as needed to keep from overfilling

c. Wash out bins or dumpsters as needed to keep orders from becoming a problem

Snow Removal and De-icing

1. Preparation

a. Store de-icing material under a covered storage area

b. Slope loading area away from parking lot

c. Design drainage from loading area to collect runoff before entering storm water system

d. Wash out vehicles (if necessary) in approved washout area before preparing them for snow removal

e. Calibrate spreaders to minimize amount of de-icing material used and still be effective

f. Train employees in spill cleanup procedures and proper handling and storage of de-icing materials

2. Process

a. Load material into trucks minimizing spillage

b. Distribute the minimum amount of de-icing material to be effective on roads

c. Park trucks with de-icing material inside when possible

3. Cleanup

a. Sweep up all spilled de-icing material around loading area

b. Clean out trucks after snow removal duty in approved washout area

c. Provide maintenance for vehicles in covered area

d. Sweep up residual sand from streets when weather permits

Transporting Soil and Gravel

1. Preparation

a. Dry out wet materials before transporting

b. Spray down dusty materials to keep from blowing

c. Make sure you know and understand the SWPPP requirements for the site you will be working at

2. Process

a. Use a stabilized construction entrance to access or leave the site where materials are being transported to/from

b. Cover truck bed with a secured tarp before transporting

c. Follow the SWPPP requirements for the specific site to/from which the materials are being hauled

d. Make sure not to overfill materials when loading trucks

3. Clean up

a. Use sweeper to clean up any materials tracked out on the roads from site

b. Have wash off truck site before leaving

c. Wash out equipment truck and other equipment

Storm Drain System Inspection and Maintenance

Purpose:
To provide a guideline and method to follow in the storm drain system inspection and maintenance process.

Scope and Applicability:
Applies to all City owned and maintained storm drain infrastructure.

Introduction:
The crews involved in the storm drain system inspection and maintenance process are to follow the documentation and communication procedures outlined in the protocol section of this S.O.P. This plan is to ensure that the storm drain system is being maintained in an efficient manner and that the system is fully operational during storm events.

Equipment:
Refer to S.O.P.s - Ditch and detention maintenance, Catch basin cleaning, Routine SD Line cleaning, and Televising storm drain lines

Personnel Qualifications:
Refer to S.O.P.s - Ditch and detention maintenance, Catch basin cleaning, Routine SD Line cleaning, and Televising storm drain lines

Protocol (Procedure):
The City owned camera truck and crew will inspect the storm drain system as designated by a schedule set forth by the Division Manager and Division Lead Worker. This is generally outlined by inspecting one map grid completely and then moving to the next map grid. An inspection report and video is created for each asset/pipe within a map grid and stored in the GraniteXP database. Reports are to be printed for any asset or pipe that needs cleaning or maintenance and placed in a folder designated for each map grid. When a complete map grid is inspected the folder containing the cleaning/maintenance reports is given to the appropriate crew.

The vactor crew completes the necessary cleaning per the generated reports, and the maintenance crew completes any necessary maintenance. The labor and work for maintenance and cleaning is tracked in Cartegraph.

Televising Stormwater Lines

Purpose:
To assess the condition, size, type, and location of storm drain lines and system.

Scope and Applicability:
Applies to all City owned and maintained storm drain lines.

Introduction:
T.V. truck crew will consist of two persons. . The crew will follow the schedule set forth by the Division Manager or Division Lead Worker concerning the location and frequency of line inspection using the Granite XP database for tracking and documenting.

Equipment:
City owned T.V. truck
Grate/lid puller
Shovel and pry bar
Traffic control signs and cones
PPE (Orange vest, hardhat, gloves, hearing protection, safety glasses or face shield, steel toe boots, etc.)

Personnel Qualifications:
Training and proficiency in operating City owned T.V. truck

Flagger and/or traffic control training

Protocol (Procedure):

1. Pre-trip inspection of vehicle and equipment
2. When on job-site setup necessary traffic control
3. Open manhole lid or grate and using the crane, lower down tractor unit into box/pipe. Lower down tiger tail to protect tractor and camera cables.
4. Watching the TV monitor inside the truck, track the camera through the pipe inspecting condition and cleanliness of pipe. Make voice notes as necessary on the recorded inspection. Verify and change if necessary any information on Granite XP concerning the pipe. Grade the condition of the pipe using the Granite XP software scale and create work order for any needed maintenance.
5. When inspection is complete back tractor/camera out of the pipe and lift out of the box using the crane. Spray down unit before placing it back in the truck.
6. Remove traffic control and move to next inspection site.

Ditch and Detention Facility Maintenance

Purpose:
Properly maintain ditches, swales, detention/retention basins to ensure the storm drain system operates correctly during storm events and to maintain the visual appearance of these facilities. This S.O.P. will serve as policy for maintaining stormwater and flood control facilities.

Scope and Applicability:
Applies to all City owned and maintained storm drain ditches, swales, and detention/retention basins.

Introduction:
Crews will consist of two or more persons. The crew will follow the schedule set forth by the Division Manager or Division Lead Worker concerning the location, frequency, and type of maintenance concerning storm drain ditches, swales, and detention/retention basins.

Equipment:
Trucks
Mowers
Brush-cutters
Weed-eaters
Rakes
Chainsaws
Backhoe

Grate/lid puller
Shovel and pry bar
Traffic control signs and cones as necessary
PPE (Orange vest, hardhat, gloves, hearing protection, safety glasses or face shield, steel toe boots, etc.)

Personnel Qualifications:
Training and proficiency in operating backhoe
CDL Class A
Flagger and/or traffic control training

Protocol (Procedure):

Swales are planted or grassed open channels that trap pollutants by filtering and slowing flows and allowing particles to settle out. The swale should drain within 48 hours of a storm event. All facility components, vegetation and source controls shall be inspected for proper operations and structural stability two times and within 48 hours after each major storm event

The following items shall be inspected and maintained as stated:
Swale Inlet (such as curb cuts or pipes) shall maintain a calm flow of water entering the swale.
Source of erosion shall be identified and controlled when native soil is exposed or erosion channels are forming.
Sediment accumulation shall be hand-removed with minimum damage to vegetation using proper erosion control measures. Sediment shall be removed if it is more than 4" thick or so thick as to damage or kill vegetation.
Inlet shall be cleared when conveyance capacity is plugged. Sources of sediment and debris shall be identified and corrected.
Rock splash pads shall be replenished to prevent erosion.

Side Slopes shall be maintained to prevent erosion that introduces sediment into the swale. Slopes shall be stabilized and planted using appropriate erosion control measures when native soil is exposed or erosion channels are forming.

Swale Media shall allow storm water to percolate uniformly through the landscape swale. If the swale does not drain within 48 hours, it shall be maintained to do so.

Storm Water Catch Basin Cleaning

Purpose:
To remove sediment and debris from catch basins to prevent it from entering into the piping. This prevents pollution risks and helps to ensure the storm drain system will operate effectively and efficiently during storm events. This S.O.P. will serve as policy for maintaining stormwater and flood control facilities.

Scope and Applicability:
Applies to all City owned and maintained boxes.

Introduction:
Cleaning crew will consist of two-person team. The crew will follow the schedule set forth by the Division Manager or Division Lead Worker concerning the location and frequency of the basins to be cleaned.

Equipment:
Vacuum Truck
Grate/lid puller
Shovel and pry bar
Traffic control signs and cones
PPE (Orange vest, hardhat, gloves, hearing protection, safety glasses or face shield, steel toe boots, etc.)

Personnel Qualifications:
Class A CDL with tanker endorsement and current medical card
Training and proficiency in operating City owned vacuum truck
Flagger and/or traffic control training
Training on confined space entry
Protocol (Procedure):

1. Pre-trip inspection of vehicle and equipment to be used
2. After vehicle and equipment pass inspection proceed to area of work
3. To ensure traffic safety use all flashing lights installed on the vacuum truck
4. If necessary set-up traffic control, cones and, signage
5. Remove catch basin grate
6. Vacuum out debris and sediment using the City owned vacuum truck. Use water pressure handgun to assist with debris removal and clean up. Use shovel or hand bar to break up hard debris if necessary.

Routine Storm Drain Line Cleaning

Purpose:
To remove sediment, and other potential pollutants and debris from storm drain lines to ensure that the lines operate effectively and efficiently in storm events. This S.O.P. will serve as policy for maintaining stormwater and flood control facilities.

Scope and Applicability:
Applies to all City owned and maintained storm drain lines.

Introduction:
Cleaning crew will consist of a two-person team. The crew will follow the schedule set forth by the Division Manager or Division Lead Worker concerning the location and frequency of line cleaning.

Equipment:
Vacuum truck
Grate/lid puller
Shovel and pry bar
Traffic control signs and cones
PPE (Orange vest, hardhat, gloves, hearing protection, safety glasses or face shield, steel toe boots, etc.)

Personnel Qualifications:
Class A CDL with tanker endorsement and current medical card
Training and proficiency in operating City owned vacuum truck
Flagger and/or traffic control training

Protocol (Procedure):

7. Pre-trip inspection of vehicle and equipment to be used
8. After vehicle and equipment pass inspection proceed to area of work
9. To ensure traffic safety use all flashing lights installed on the vacuum truck
10. If necessary set-up traffic control, cones and, signage
11. Choose the proper nozzle for the type and size of pipe, and cleaning to be completed
    - Penetrating nozzle for clearing plugged line
    - Spinning nozzle for removing debris and sediment stuck to the walls of the pipe
    - Hydraulic root cutter for removal of roots
12. Using lid puller, remove access grate or lid and inspect lid, casting, grade rings, cone, barrel sections, and base sections. Note any needed maintenance on the work order.

13. Verify that the water tanks on the truck have enough water to complete the job before starting. If water is needed, fill tanks before starting.
14. Lower the rodder hose with proper nozzle attached into the channel of the manhole with enough slack to allow the hose and nozzle to go inside the pipe when the water jet is turned on. Lower down tigertail hose guard to protect jetter hose from being damaged on the edges of pipe and boxes.
15. Set footage counter to zero before sending hose upstream in the pipe.
16. Continually inspect rodder hose for any cuts or tears and stop immediately if hose maintenance is needed.
17. Engage water pump so hose will travel up the line until it reaches the next manhole. **Never run jetter over 2000 psi**
18. Slowly pull back hose while vacuuming out the debris and water being pulled back with the hose.
19. If the pipe is loaded with a large amount of debris, it may be necessary to clean it in 3 or more stages. Start by cleaning the closest third of pipe or stage, moving upstream one stage at a time.

Street Sweeping

Purpose:
To provide an aesthetically pleasing feel and look for the residents and stakeholders of South Jordan City concerning the cleanliness of the City and its streets, curbing, and gutters. To remove debris and dirt from roadside gutters thus greatly reducing pollutants and sediment from entering the stormdrain system.

Scope and Applicability:
Applies to all City owned streets and properties.

Introduction:
One person crew will perform street sweeping activities following the schedule and route set forth by the Storm Drain Division Manager or Lead worker. An attached map details the sweeper zones and map for reference.

Equipment:
City owned sweeper truck

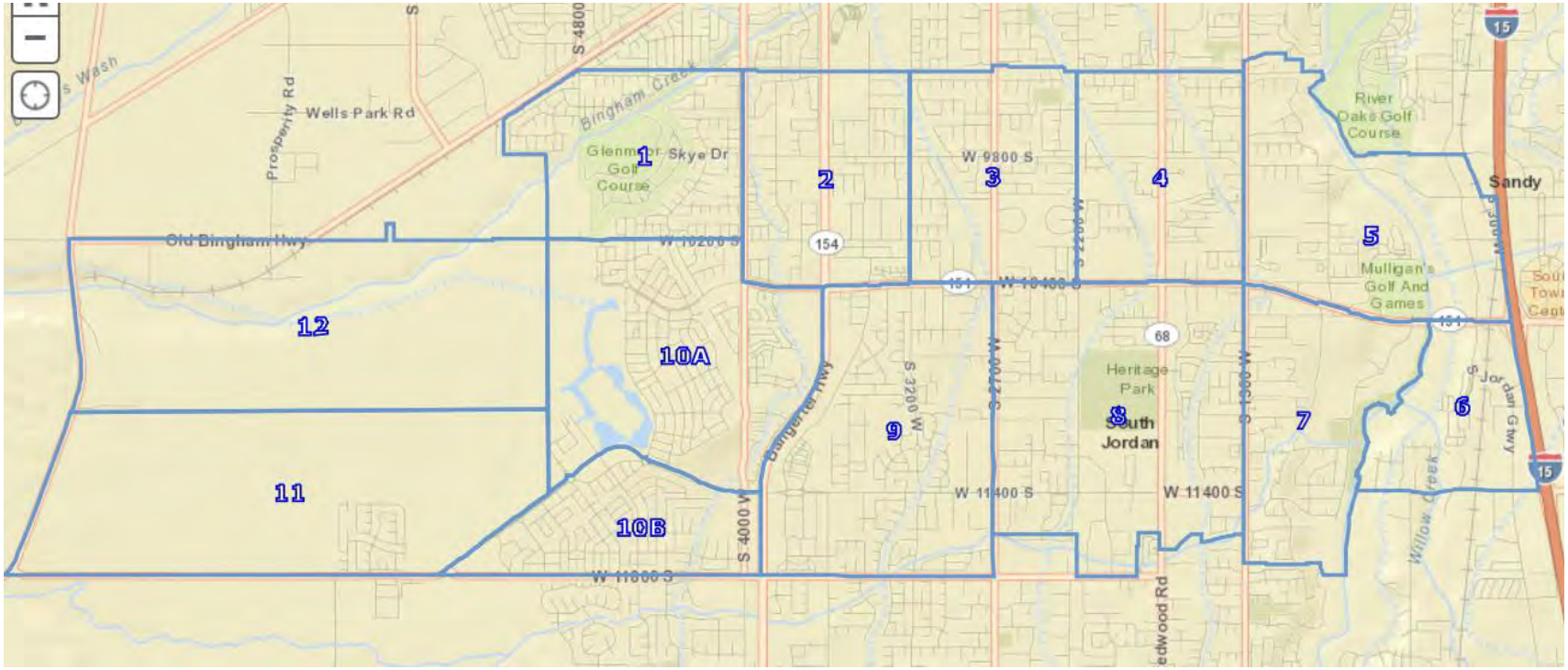
Personnel Qualifications:
Class A CDL with tanker endorsement and current medical card.
Training and proficiency in operating City owned vacuum truck.

Protocol (Procedure):
a. Fill sweeper with water using appropriate hydrant and meter
b. Begin route following the attached schedule and using the attached zone map for reference.

c. At the end of every shift and/or when the Sweeper hopper is full, empty and clean using the following guidelines, de-cant water into drying basin, empty solids in sweeper debris stall in the Public Services Yard, and spray out hopper in the wash bay.
d. Clean out wash bay
e. Document time using Cartegraph work orders on each zone.
f. Document time and routes on main roads with a work order on each in Cartegraph
g. Document any sweeping and routes outside of main roads and zones as separate work orders in Cartegraph (City owned properties, traffic accidents etc.)

Monthly Route Schedule

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday (Mains)**
Week 1	City owned and Zone 2	Zone 1	Zone 1 & 2	Parks Properties and Zone 6	4000 W(94th to 118th), Skye Drive (40th to48th)
Week 2	Zone 3 and Zone 8	Zone 5 and Zone 7	Zone 6 and Zone 7	Zone 4 and Zone 3	3200 W(94th to 118th), 9800 S(40th to 27th)
Week 3	Zone 10 and Zone 11	Zone 9	Zone 9	Zone 10	2700 W(94th to 118th), 2200(94th to 114th), 9800(27th to 22nd)
Week 4	Zone 12	Jordan Gtwy, Riverfront Pkwy,	1300 W(94th to 118th)	Zone 11 and Zone 12	9800 S (22nd to 300w), Public Services Yard,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Prosperity Rd
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Bingham Creek
Glenmoor Golf Course
Skye Dr
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W 10400 S
W 11400 S
W 11800 S
S 4000 W
S 3200 W
S 2700 W
S 1300 W
S 300 W
Bangerter Hwy
Heritage Park
South Jordan
River Oaks Golf Course
Mulligan's Golf And Games
Sandy
S Jordan Gwy
Willow Creek
Redwood Rd
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Street Sweeping Debris Disposal

Purpose:
To ensure that debris collected in street sweeping activities is handled, transported, and disposed of in an environmentally safe manner.

Scope and Applicability:
Any and all debris collected in City street sweeping activities.

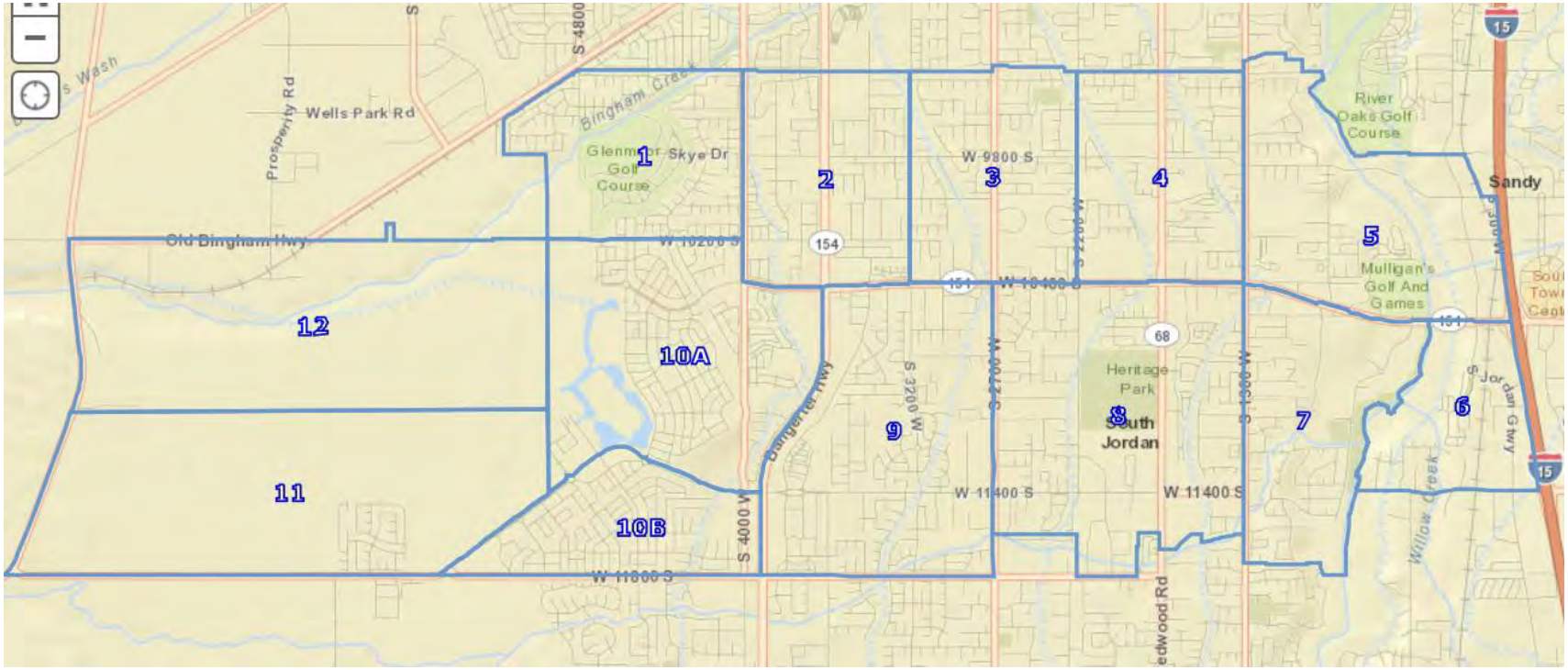
Introduction:
Crew will consist of one or more persons and will follow practices that ensure personal and environmental safety when handling, transporting, and disposing of street sweeping debris.

Equipment:
Street sweeper
Front-end loader and/or backhoe
Dump/or hook trucks
PPE (Orange vest, hardhat, gloves, hearing protection, safety glasses or face shield, steel toe boots, etc.)

Personnel Qualifications:
Class A CDL with tanker endorsement and current medical card.
Proper training on City owned street sweeper, front-end loader, backhoe, dump and hook trucks.

Protocol (Procedure):

a. Follow Street Sweeping S.O.P. # 0000-0000
b. Load debris into dump/hook truck from sweeper debris bin located in the Public Services yard. Avoid loading debris in times of high wind.
c. Cover load before transporting to Trans Jordan Landfill
d. Dump load following Trans Jordan protocol
e. Save landfill ticket, write “sweeper debris” on the ticket, and put the ticket in the Storm Drain Division manger’s box for data tracking.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W 10200 S
Old Bingham Hwy
W 10400 S
W 11400 S
W 11800 S
S 4000 W
S 3200 W
Bangerter Hwy
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Street Sweeping Debris Disposal

Purpose:
To ensure that debris collected in street sweeping activities is handled, transported, and disposed of in an environmentally safe manner.

Scope and Applicability:
Any and all debris collected in City street sweeping activities.

Introduction:
Crew will consist of one or more persons and will follow practices that ensure personal and environmental safety when handling, transporting, and disposing of street sweeping debris.

Equipment:
Street sweeper
Front-end loader and/or backhoe
Dump/or hook trucks
PPE (Orange vest, hardhat, gloves, hearing protection, safety glasses or face shield, steel toe boots, etc.)

Personnel Qualifications:
Class A CDL with tanker endorsement and current medical card.
Proper training on City owned street sweeper, front-end loader, backhoe, dump and hook trucks.

Protocol (Procedure):

a. Follow Street Sweeping S.O.P. # 0000-0000
b. Load debris into dump/hook truck from sweeper debris bin located in the Public Services yard. Avoid loading debris in times of high wind.
c. Cover load before transporting to Trans Jordan Landfill
d. Dump load following Trans Jordan protocol
e. Save landfill ticket, write “sweeper debris” on the ticket, and put the ticket in the Storm Drain Division manger’s box for data tracking.

Policy for Survey and Mapping of the Stormwater System.

Overview:

The City of South Jordan in compliance with its current Storm Water Management Plan (SWMP), has implemented the following policy for the data collection/surveying and mapping for stormwater systems in new developments or changes to the current stormwater system within the city.

Purpose:

The purpose of the policy is to ensure the proper collection of data, and accurately map newly constructed or changed/reconstructed sections of the current stormwater system.

Involvement:

Current departments who will be involved are: Stormwater, Engineering, and Information Systems.

Procedure:
1. Engineering:

A. Within three months after substantial completion of construction activity for a new development, or stormwater system change. The assigned inspector will have the new system or change surveyed per the engineering requirements listed below.

B. Engineering requirements: Survey all surface items- inlets, manholes etc., including all public and private post construction BMP's. Dip all manholes, combo boxes, cleanouts etc., using the approved form to collect data following the Engineering Department SOP.

C. The project survey data and manually collected data will be given to the IS department for processing and mapping per Engineering Department SOP.

2. Information Systems:

A. Collect and process data acquired by the engineering inspector per the IS department SOP.

B. Convert data into a map, and send it to the inspector to review for accuracy.

C. After approval is received from the inspector on map accuracy, send approved map to the Stormwater department and update the STORM DRAIN MAP using ESRI.

3. Stormwater:

A. After the updated map has been received, Stormwater will check the STORM DRAIN MAP using ArcReader to verify and update necessary files for the SWMP.

Appendix C

SOUTH JORDAN
UTAH

Appendix C – General program documentation including inspection forms. Note: all enforcement logs, training logs, annual reports, maintenance records, observation reports, and other general documentation including all reporting data can be accessed or copies acquired from the StormPro database by submitting a written request to the South Jordan Stormwater Department; Request should state specific site and/or reporting data being requested.

STORMWATER MAINTENANCE AGREEMENT INSPECTION FORM

Site Name:	Date of Evaluation	
Site Address:		

Facility Contact Information			
	NAMES	PHONE #'S	E-MAIL
CONTACT:			
CONTACT:			

BUSINESS TYPE: INSTITUTION ☐ COMMERCIAL ☐ INDUSTRIAL ☐

Items Inspected	Checked		Maintenance		Inspector	Observations and Remarks
	Yes	No	Req'd	Not Req'd		
1.Review Stormwater site plan						
2. Dumping Evidence						
3. Spill Evidence						
4. General Site Exposure						
5. Other Pollution Sources						
6.General Maintenance Status						
Inlets						
Conveyance Systems						
Manholes						
Structural Devices						
Stormwater Storage						
Parking/Pavements						
Waste Collection						
Landscaping						
7.Other Site Items						

Notes:

Inspector: Site Contact:

Signature Title Signature Date

*By signing this inspection form the signee Certifies that the inspection and any associated maintenance work is completed.

Dry Weather Screening Examination Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 09:52AM		
Inspection Notes:			

Weather

Has there been any precipitation since the last inspection? No Approximate Amount (in):

Storm Start Date: Storm Duration (hrs): Current Weather:

Are there any discharges at the time of the inspection? No

Do you suspect that discharges may have occured since the last inspection? No

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Did you correctly log the date of the last storm event? http://www.weather.com/weather/monthly/USUT0238?month=0					
2	Is there water present?					
3	Is the Source of the water known (irrigation, subsurface, other allowable discharges etc.)					
4	Color of water.. clear, brown, green, rust, or other.					
5	Clarity- Use the clarity scale to determine the level of clarity (0-4).					
6	Are there Floating Solids?					
7	Is there Foam?					
8	Is there an Odor?					
9	Is there obvious indicators of stormwater pollution?					
10	Probable sources of any observed storm water contamination:					
11	Is maintenance required?					

Dry Weather Screening Examination Report

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Work Reinstatement- Stop Work Order Release

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 12:36PM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Have all conditional items of the Stop Work Order been met?					
2	Has the work reinstatement fee, and any other associated fees/fines been paid?					
3	Has work been reinstated for the project?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

South Jordan City Maintenance Agreement Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:13AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Is there sediment or debris in any of the stormwater infrastructure? (Pipes, boxes, ponds, treatment devices etc.)					
2	Is the stormwater infrastructure in good working condition?					
3	Is the flow of water blocked in any way? If answered "Yes", please specify.					
4	Is there any nearby activities that is or may cause impact to the structure? If answered "Yes", please specify.					
5	Is a follow up inspection required? If answered "Yes", enter when follow up inspection will be performed.					
6	Describe any actions that were taken during the inspection.					

South Jordan City Maintenance Agreement Inspection Report

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Responsible Authority: _____

Date:

"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 gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

UPDES Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 12:36PM		
Inspection Notes:			

Weather

Has there been any precipitation since the last inspection? No Approximate Amount (in):

Storm Start Date: Storm Duration (hrs): Current Weather:

Are there any discharges at the time of the inspection? No

Do you suspect that discharges may have occured since the last inspection? No

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Did you accurately record the storm event? http://www.weather.com/weather/monthly/USUT0238?month=0					
2	Were you unable to collect a sample due to adverse conditions?					
3	What is the color of the water.. clear, brown, green, rust, or other.					
4	Clarity- use the clarity scale to determine the level of clariity (0-4).					
5	Are there Floating Solids?					
6	Is there Foam?					
7	Is there an Odor?					
8	Are there any obvious indicators of stormwater pollution?					
9	Probable sources of any observed stormwater contamination?					
10	Are there settled solids?					
11	Are there suspended solids?					
12	Oil Sheen?					

UPDES Inspection Report

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

STOP WORK ORDER

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 11:00AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Have the items been corrected from the Notice of Violation that has been issued?					
2	Remaining items from Notice of Violation.					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Responsible Authority: _____

Date:

"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 gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

NPDES Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 09:57AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Has the Grading Certification been submitted and reviewed.					
2	Has an NOT been filed.					

Signatures

Inspector: _____

Date: Qualification:

WARNING NOTICE

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:10AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Failure to comply- 16.44.500: DESIGN AND CONSTRUCTION STANDARDS: All land disturbance activities shall be conducted in accordance with the land disturbance design and construction standards, the development processing manual, road design and construction standards, storm drainage and flood control design and construction standards, culinary water design and construction standards and all other applicable ordinances, rules, regulations, standards and specifications of the city.					
2	Failure to Comply with UTRC00000 General Permit for Construction Activities as required by the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated, and Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et. seq.,					
3	Storm Drain Contamination & Replacement of Damaged BMP's – Existing drainage channels, such as storm drain inlets, gutters or ditches, shall be kept free of dirt or other debris (12.08.110).					
4	Debris in Streets – It is unlawful in connection with construction activities for any contractor to place any dirt or other debris on city street or public ways and/or failing to remove such dirt and debris immediately after being requested by the city to do so (12.04.080).					

WARNING NOTICE

5	Failure to Comply with SWPPP as required in UTRC00000 General Permit for Construction Activities as required by the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated, and Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et. seq.,					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

SWMP Quarterly Inspection Report (4.2.6.6.2)

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:08AM		
Inspection Notes:			

Weather

Has there been any precipitation since the last inspection? No Approximate Amount (in):

Storm Start Date: Storm Duration (hrs): Current Weather:

Are there any discharges at the time of the inspection? No

Do you suspect that discharges may have occured since the last inspection? No

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Are the storage yard procedures for proper disposal of materials being followed?					
2	Is the storage yard clean and free of debris and trash?					
3	Is the Concrete Washout in need of clean-out?					
4	Does the storage yard Sealer (GSB 88) clean out area need maintenance?					
5	Have all storm water controls, structural BMP's, and Cleanway BMP's been inspected?					
6	Is maintenance required on any of the structures?					
7	Is there material buildup present?					
8	Is a high waterline visible?					
9	Is salt completely covered?					
10	Are raw materials contained?					
11	Are the Vac Truck spoils/ sweeper debris being contained?					

12	Are the sediment pits/dried spoils being disposed of properly?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

UPDES NOT INSPECTION

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:14AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Has the site been properly stabilized according to permit requirements?					
2	Have all temporary BMPs been removed?					
3	Have post-construction (permanent storm water system) elements been constructed and inspected in accordance with approved project drawings?					
4	Is the site acceptably clean?					
5	Has the maintenance agreement been finalized and setup for initial inspection?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

South Jordan Maintenance Agreement Stormwater Inspection

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:02AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Have the required Stormwater Facilities been inspected, and maintenance items been completed?					
2	Has the inspection report including all documentation from maintenance items been submitted?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Responsible Authority: _____

Date:

"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 gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

South Jordan Maintenance Agreement Stormwater Inspection

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:02AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Have the required Stormwater Facilities been inspected, and maintenance items been completed?					
2	Has the inspection report including all documentation from maintenance items been submitted?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Responsible Authority: _____

Date:

"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 gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

UPDES Common Plan Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 11:07AM		
Inspection Notes:			

Weather

Has there been any precipitation since the last inspection? No Approximate Amount (in):

Storm Start Date: Storm Duration (hrs): Current Weather:

Are there any discharges at the time of the inspection? No

Do you suspect that discharges may have occured since the last inspection? No

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Is the NOI and directions to the SWP3 location properly posted?					
2	Have the inspection logs been updated with corrective actions?					
3	Is the Site Map updated and current?					
4	Construction Entrance/Exit					
5	Are the streets and gutters clean?					
6	Good Housekeeping					
7	Are portable toilets at least 10-12 feet BOC and away from any storm drain?					
8	Wash out areas clearly marked					

UPDES Common Plan Inspection Report

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

IDDE INVESTIGATION REPORT

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 09:54AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Address of Discharge					
2	Name of person discharging					
3	Name and number of person making the call					
4	Is the substance hazardous					
5	Estimate of quantity spilled?					
6	Did the illicit discharge enter a waterbody?					
7	Did the illicit discharge enter the storm drain system? (manhole or inlet?)					
8	Is follow up required .					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

NPDES Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:00AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Are the Good Housekeeping items being maintained?					
2	Is there an need to sweep dirt or debris being tracked off site?					
3	Is there an appropriate washout area?					
4	Does the washout need to be maintained?					
5	Are there any other items on the site that need to be addressed?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Responsible Authority: _____

Date:

"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 gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

UPDES Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:15AM		
Inspection Notes:			

Weather

Has there been any precipitation since the last inspection? No Approximate Amount (in):

Storm Start Date: Storm Duration (hrs): Current Weather:

Are there any discharges at the time of the inspection? No

Do you suspect that discharges may have occured since the last inspection? No

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Is the SWPPP on site and accessible, or is the SWPPP location posted in an obvious place and reasonably accessible (in a short time)?					
2	Are erosion control, sediment control, and good housekeeping BMP's installed on the site as shown in the SWPPP?					
3	Has the SWPPP been updated to reflect the current site conditions (modifications dated & initialed on site map, new BMPs on site map, discontinued BMPs crossed off site map, new BMP details & spec's in SWPPP, SWPPP amendment Log, etc.)?					
4	Are on-site inspections being performed and recorded by a qualified person on a weekly or biweekly basis, reporting items required by permit? (Inspector name &qualifications, weather, problems/repairs, corrective action, new BMPs, removed BMPs, discharges, etc.)					

UPDES Inspection Report

5	Have all corrective action items from previous inspections been addressed and documented within the time frame allotted by the inspector?					
6	Are SW flows entering and leaving the construction site controlled, managed, or diverted around the site? (e.g. perimeter controls, berms, silt fence, upgradient boundary diversion, down gradient boundary sediment control, etc.)					
7	Is there evidence of sediment discharge such as mud flows or soil deposits from the construction site in downstream locations?					
8	Is there evidence of vehicles tracking soil off the construction site?					
9	Is there soil, construction material, landscaping items, or other debris piled on impervious surfaces (roads, drives) that could be washed with SW to a storm drain or water body?					
10	Is there a need to repair, maintain, or improve sediment control BMPs (silt fence, check dams, fiber rolls, sediment trap/basin, inlet protection, waddles, straw bails, curb cut-back, etc?					
11	Is there a need to repair, maintain, or improve good housekeeping controls (clean track out pad, sweeping, construction materials management, litter/trash control, port-o-potties staked down, fueling areas, concrete wash out area, proper curb ramps, spill prevention, etc)?					
12	Are there disturbed areas that have not had construction activities for 14 to 21 days without stabilization? (except snow or frozen ground)?					
13	Are there places where BMPs are needed and should be installed or not needed and should be removed?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

UTAH CGP SWPPP REVIEW

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 09:50AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	7.2.1 Is the stormwater team listed?					
2	7.2.2 Has the nature of construction activities been listed?					
3	7.2.3 Are the activities emergency related?					
4	7.2.4 Are the sequence of, and estimated dates of activities listed?					
5	7.2.5 Have the appropriate site maps been attached?					
6	7.2.6 Have the construction site pollutants been listed?					
7	7.2.7 Have allowable non stormwater discharges, and their controls been listed?					
8	7.2.8 Is a buffer zone required, and the correct documents submitted?					
9	7.2.9 Have the stormwater control measures been listed?					
10	7.2.10 Are the pollution prevention procedures listed?					
11	7.2.11 Are procedures for inspection, maintenance, and corrective action listed?					
12	7.2.12 Is staff training procedure and parties listed?					
13	7.2.13 IS a UIC class 5 injection well permit required, and included?					
14	7.2.14 List impaired waters that receive discharge from the site?					
15	7.2.15 Is the SWPPP certification page signed?					
16	7.2.16 Are the following included; NOI, copy of CGP permit, and inspector qualifications.					

17	If required, has the maintenance agreement been submitted?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Responsible Authority: _____

Date:

"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 gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

Violation Warning Notice

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:11AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Failure to comply: The Owner shall, at its sole cost and expense, inspect the Stormwater Facilities and submit a signed inspection report to the City annually. The purpose of the inspection is to assure safe and proper functioning of the Stormwater Facilities. The annual inspection shall cover all aspects of the Stormwater Facilities, including, but not limited to, the structural improvements, berms, outlet structure, pond areas, etc.					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Responsible Authority: _____

Date:

"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 gathered and evaluated the information contained therein. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information contained 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."

South Jordan City Maintenance Agreement Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 11:06AM		
Inspection Notes:			

Weather

Has there been any precipitation since the last inspection? No Approximate Amount (in):

Storm Start Date: Storm Duration (hrs): Current Weather:

Are there any discharges at the time of the inspection? No

Do you suspect that discharges may have occured since the last inspection? No

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Is there sediment in any of the stormwater infrastructure? (Pipes, boxes, ponds, treatment devices etc.)					
2	Is the stormwater infrastructure is good working condition?					
3	Is the flow of water blocked in any way? If answered "Yes", please specify.					
4	Is there any nearby activities that is or may cause impact to the structure? If answered "Yes", please specify.					
5	Is a follow up inspection required? If answered "Yes", enter when folow up inspection will be performed.					
6	Describe any actions that were taken during the inspection.					

South Jordan City Maintenance Agreement Inspection Report

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Notice of Violation

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:12AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Failure to comply- 16.44.500: DESIGN AND CONSTRUCTION STANDARDS: All land disturbance activities shall be conducted in accordance with the land disturbance design and construction standards, the development processing manual, road design and construction standards, storm drainage and flood control design and construction standards, culinary water design and construction standards and all other applicable ordinances, rules, regulations, standards and specifications of the city.					
2	Failure to Comply with UTRC00000 General Permit for Construction Activities as required by the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated, and Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et. seq.,					
3	Storm Drain Contamination & Replacement of Damaged BMP's – Existing drainage channels, such as storm drain inlets, gutters or ditches, shall be kept free of dirt or other debris (12.08.110).					
4	Debris in Streets – It is unlawful in connection with construction activities for any contractor to place any dirt or other debris on city street or public ways and/or failing to remove such dirt and debris immediately after being requested by the city to do so (12.04.080).					

Notice of Violation

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

SWMP Inspection Report

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 09:53AM		
Inspection Notes:			

Weather

Has there been any precipitation since the last inspection? No Approximate Amount (in):

Storm Start Date: Storm Duration (hrs): Current Weather:

Are there any discharges at the time of the inspection? No

Do you suspect that discharges may have occured since the last inspection? No

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Is the storage yard clean and free of debris and trash?					
2	Are the storage yard procedures for proper disposal of materials being followed?					
3	Is the storage yard Concrete Washout in need of clean-out?					
4	Does the storage yard Sealer (GSB 88) clean out area need maintenance?					
5	Have all structural BMP's been inspected?					
6	Is maintenance required on any of the structures?					
7	Is there material buildup present?					
8	Is a high waterline visible?					
9	Have all inlets with the CleanWay BMP's been maintained in the last month?					
10	Is maintenance required?					
11	Is salt completely covered?					
12	Are raw materials contained?					
13	Are the Vac Truck spoils/ sweeper debris being contained?					

SWMP Inspection Report

14	Are the dried spoils being disposed of properly?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

SWMP ANNUAL INJECTION WELL INSPECTION

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 09:56AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Has the wet well been checked?					
2	Has the dry well been checked?					
3	Does the treatment structure need maintenance?					

Signatures

Inspector: _____

Date: Qualification:

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

LDP Review

Summary

Site Name:	10200 S Pipeline Project	Contractor:	
Inventory Number:	TEST	Inspection Type:	
Inventory Desc:	10200 S Pipeline Project	Inspector:	Jerimie Thorne - Stormwater Inspector jthorne@sjc.utah.gov
Inspection Date:	12/09/2015 10:01AM		
Inspection Notes:			

Previous Inspection - Responsive Actions Due

All items from previous inspection passed or have been corrected.

Inspection Details

#	Question	Status	Comments	Responsive Action	Date	Initials
1	Are the submitted application and required documents complete, and approved?					
2	Has the SWP3 been submitted and reviewed?					
3	Has the Supplemental Development Guide for Water Quality Signature page been submitted?					
4	Has appropriate representative been set-up in SPM?					

Signatures

Inspector: _____

Date: Qualification:

Dry Weather Screening Examination Report

Signatures

Inspector: Cam Browning

Date: 11/12/2015

Qualification: RSI/ Stormwater Guru

The above signature also shall certify that this facility is in compliance with the Stormwater Pollution Prevention Plan and the State Generic Permit for Stormwater Discharge from large and small construction activities if there are not any instances of non-compliance identified above.

Developing Your Stormwater Pollution Prevention Plan

A Guide for Construction Sites

EPA-833-R-06-004
May 2007

Developing Your Stormwater Pollution Prevention Plan

A Guide for Construction Sites

Who?

Construction site operators (generally, the person who has operational control over construction plans and/or the person who has day-to-day supervision and control of activities occurring at the construction site)

Where?

Construction sites required to comply with stormwater discharge requirements

What?

A guide to help you develop a good Stormwater Pollution Prevention Plan (SWPPP)

Why?

Stormwater runoff from construction sites can cause significant harm to our rivers, lakes, and coastal waters

A SWPPP is required (by your construction general permit) and will help you prevent stormwater pollution

A SWPPP is more than just a sediment and erosion control plan.
It describes all the construction site operator's activities to prevent stormwater contamination, control sedimentation and erosion, and comply with the requirements of the Clean Water Act

---

Purpose of this Guidance Document

This document provides guidance to construction site operators that need to prepare a SWPPP in order to receive NPDES permit coverage for their stormwater discharges. The Clean Water Act provisions, EPA regulations and EPA's Construction General Permit described in this document contain legally binding requirements. This document does not substitute for those provisions, regulations or permit, nor is it a regulation or permit itself. It also does not substitute for requirements under State law or construction general permits issued by States. It does not impose legally-binding requirements on EPA, States, or the regulated community, and may not apply to a particular situation based upon the circumstances. EPA and State decisionmakers retain the discretion to adopt approaches on a case-by-case basis that differ from this guidance where appropriate. Any decisions regarding a particular construction site will be made based on the applicable statutes, regulations and/or permit terms. Therefore, interested parties are free to raise questions and objections about the appropriateness of the application of this guidance to a particular situation, and EPA—or the applicable NPDES permitting authority—will consider whether or not the recommendations or interpretations in the guidance are appropriate in that situation based on the law and regulations.

This guidance document occasionally uses language describing mandatory requirements for construction site operators and those covered by a general permit for stormwater discharges from such sites. This language is generally intended to reflect requirements applicable where EPA is the NPDES permitting authority. Although requirements in jurisdictions where EPA is not the permitting authority may resemble these requirements, the reader should not assume that this guidance accurately describes those requirements. Rather, the reader should consult the applicable regulations and any applicable NPDES permit.

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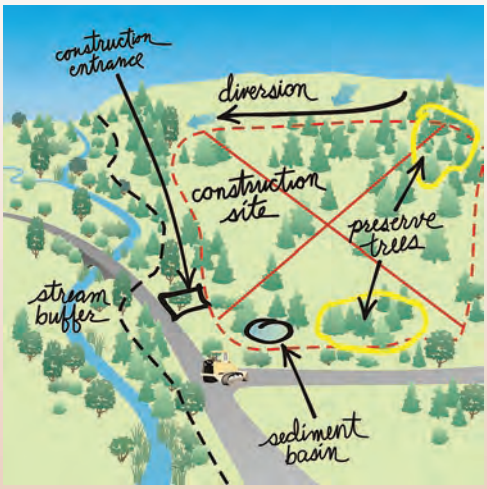
What is a Stormwater Pollution Prevention Plan (SWPPP)?

A SWPPP may be called many things. Your state may use terms like:

- **Construction Best Practices Plan**
- **Sediment and Stormwater Plan**
- **Erosion, Sediment, and Pollution Prevention Plan**
- **Construction Site Best Management Practices Plan**
- **Erosion Control Plan and Best Management Practices**
- **Best Management Practices Plan**
- **Erosion and Sediment Control Plan**

Regardless of the title used in your state, these documents—and the stormwater permits that require them—tend to have many common elements. This guide is intended to help you develop a better SWPPP for your construction site.



Example sketch identifying various points to address in the SWPPP.

How to Use This Guide

- This guide was developed as a helpful reference guide for construction site operators across the country. We have tried to accommodate the wide range of knowledge and experience about stormwater pollution prevention that currently exists among operators—from novice to expert.
  - If you are relatively new to managing stormwater at a construction site, you will probably want to read this entire guide.
  - If you are very experienced and familiar with the requirements in your state, this guide may help you brush up on certain requirements or provide you with ideas to improve your SWPPP. You might want to review the table of contents and skip around. Be sure to take a look at the SWPPP template (Appendix A) to see if you can make improvements in the way you develop and maintain your SWPPP.

- This guide is written in a general format and can be used at most construction sites in any state, territory, or in Indian country. The document assumes that you will obtain discharge authorization under an appropriate National Pollutant Discharge Elimination System (NPDES) construction general permit and use both the permit and this guidance to assist in developing your SWPPP. In this guide, we make some references to the U.S. Environmental Protection Agency's Construction General Permit for illustrative purposes. **You should always consult your applicable NPDES permit for the exact requirements that apply to you**.

- Remember that you are developing your SWPPP for both your use and for review by the regulatory agencies responsible for overseeing your stormwater controls. As such, one of your goals in developing your SWPPP should be to present the information in a way that clearly demonstrates that it meets all the requirements of your NPDES permit.

- You can obtain an electronic copy of this guide (PDF format), the SWPPP template, and inspection form (in Microsoft Word) at **www.epa.gov/npdes/swpppguide**

Chapter 1: **Introduction**

▶ This chapter provides an orientation to this guide and its contents and describes why stormwater controls at construction sites are necessary.

A. Why Should You Use this Guide?

If you are responsible for erosion and sediment control and stormwater management at a permitted construction site, then this guide may be useful to you. This guide is designed to walk you through the steps for developing and implementing an effective stormwater pollution prevention plan (SWPPP). The basic outline of the guide is presented below:

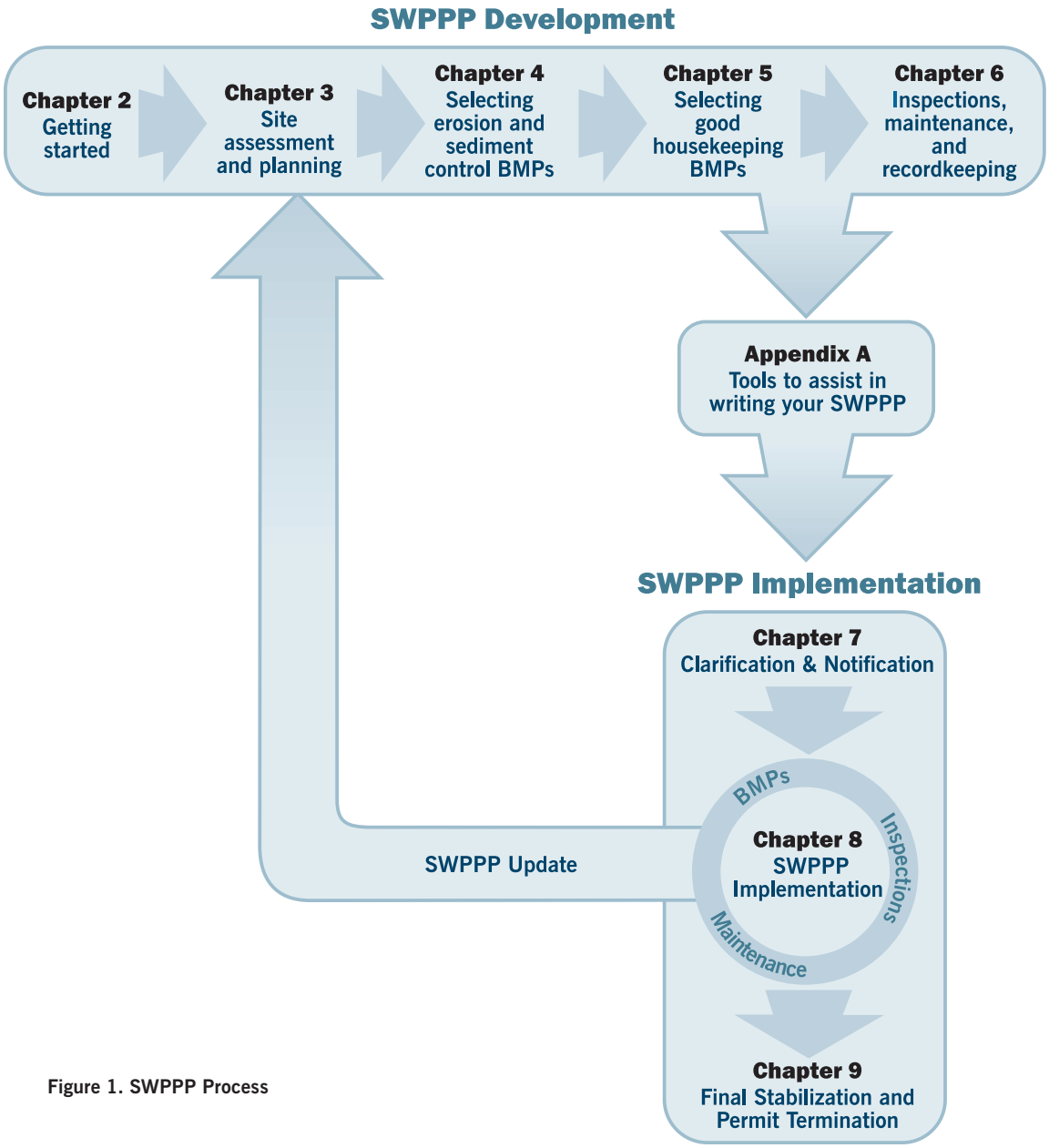


Figure 1. SWPPP Process

Take a Closer Look…

What is a SWPPP?

A SWPPP is a site-specific, written document that:

- Identifies potential sources of stormwater pollution at the construction site
- Describes practices to reduce pollutants in stormwater discharges from the construction site. Reduction of pollutants is often achieved by controlling the volume of stormwater runoff (e.g., taking steps to allow stormwater to infiltrate into the soil).
- Identifies procedures the operator will implement to comply with the terms and conditions of a construction general permit

What does this mean to me?

Failure to implement your SWPPP could result in significant fines from EPA or a state environmental agency. Therefore, it is important that you develop your SWPPP to address the specific conditions at your site, fully implement it, and keep it up-to-date to reflect changes at your site.

B. What Is Stormwater Runoff and What Are Its Impacts?

Stormwater runoff is rain or snowmelt that flows over land and does not percolate into the soil. Stormwater runoff occurs naturally, in small amounts, from almost any type of land surface, especially during larger storm events. Impervious surfaces, such as buildings, homes, roads, sidewalks, and parking lots, can significantly alter the natural hydrology of the land by increasing the volume, velocity, and temperature of runoff and by decreasing its infiltration capacity. Increasing the volume and velocity of stormwater runoff can cause severe stream bank erosion, flooding, and degrade the biological habitat of these streams. Reducing infiltration can lower ground water levels and affect drinking water supplies.

SWPPP Tip!

A SWPPP can have different names

A SWPPP may also be called a *"construction best practices plan," "sediment and stormwater plan," "erosion, sedimentation, and pollution prevention plan,"* or similar term. The SWPPP (or similarly named plan) is generally required to comply with EPA's or the state's stormwater construction general permit.

In addition, as stormwater runoff moves across surfaces, it picks up trash, debris, and pollutants such as sediment, oil and grease, pesticides and other toxics. Changes in ambient water temperature, sediment, and pollutants from stormwater runoff can be detrimental to aquatic life, wildlife, habitat, and human health. Soil exposed by construction activities is especially vulnerable to erosion. Runoff from an unstabilized construction site can result in the loss of approximately 35–45 tons of sediment per acre each year (ASCE and WFF, 1992). Even during a short period of time, construction sites can contribute more sediment to streams than would be deposited naturally over several decades. Excess sediment can cloud the water reducing the amount of sunlight reaching aquatic plants, clog fish gills, smother aquatic habitat and spawning areas, and impede navigation in our waterways.

The primary stormwater pollutant at a construction site is sediment. To control erosion at a construction site, it is important to understand the different types of erosion that can occur. Erosion begins when raindrops break down the soil structure and dislodge soil particles. Runoff carrying the soil particles becomes sheet erosion which eventually forms smaller rills and larger gullies. The best way to stop erosion is to keep the soil in place through vegetation, erosion control blankets, or other methods that prevent the soil from becoming dislodged during rain events.

The erosion process is typically influenced by climate, topography, soils, and vegetative cover. Understanding how these factors influence erosion will help you select and design appropriate controls to minimize erosion from your construction site.

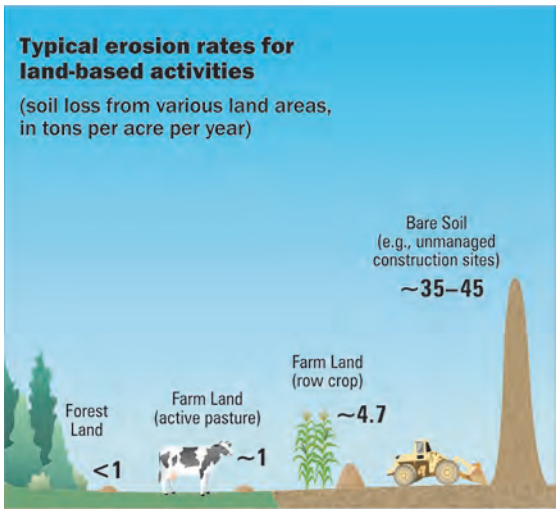


Figure 2. Typical erosion rates from land-based activities. (Dunne, T. and L. Leopold, 1978; NRCS, 2000; NRCS, 2006; ASCE and WEF, 1992)

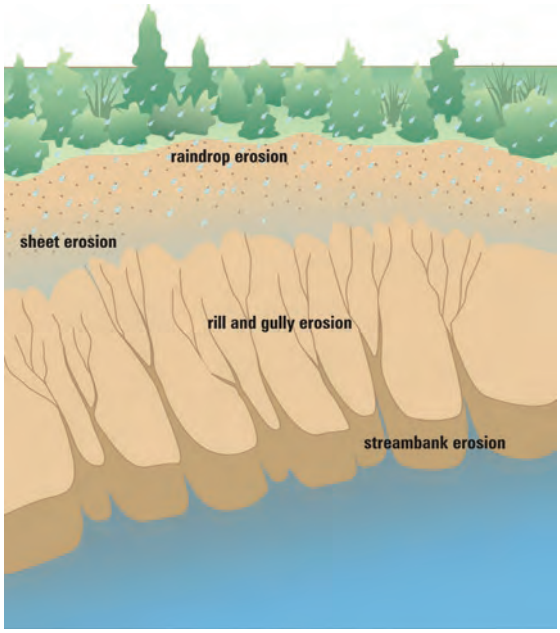


Figure 3. Types of erosion.

Raindrop erosion
Dislodging of soil particles by raindrops

Sheet erosion
The uniform removal of soil without the development of visible water channels

Rill erosion
Soil removal through the formation of concentrated runoff that creates many small channels

Gully erosion
The result of highly concentrated runoff that cuts down into the soil along the line of flow

Streambank erosion
Flowing water that erodes unstable streambanks

Climate. The frequency, intensity, and duration of rainfall are the principal factors influencing erosion from a construction site. Know the weather patterns in your area and, if possible, plan your soil disturbance activities for periods of historically lower rainfall.

Topography. The longer and steeper a slope, the greater the potential there is for erosion from that slope. Use practices such as diversions or fiber rolls to break up long slopes. Consider minimizing soil disturbance activities on steeper slopes.

Soils. Soil type can also impact erosion. Soil texture, structure, organic matter content, compaction, and permeability can all influence erosion rates.

Vegetative cover. Vegetative cover provides a number of critical benefits in preventing erosion—it absorbs the energy of raindrops, slows velocity of runoff, increases infiltration, and helps bind the soil. Soil erosion can be greatly reduced by maximizing vegetative cover at a construction site.

C. How Can Construction Site Operators Prevent Stormwater Pollution?

An effective SWPPP is the key! If sediment and erosion controls and good housekeeping practices are not followed, construction activity can result in the discharge of significant amounts of sediment and other pollutants. The term *Best Management Practices* or BMPs is often used to describe the controls and activities used to prevent stormwater pollution.

SWPPP Tip!

Erosion versus Sedimentation

Erosion is the process by which the land surface is worn away by the action of water or wind. Sedimentation is the movement and settling out of suspension of soil particles. It is usually easier and less expensive to prevent erosion than it is to control sediment from leaving a construction site.

BMPs can be divided into two categories—structural and non-structural BMPs. Structural BMPs include silt fences, sedimentation ponds, erosion control blankets, and temporary or permanent seeding, while non-structural BMPs include picking up trash and debris, sweeping up nearby sidewalks and streets, maintaining equipment, and training site staff on erosion and sediment control practices. In this document, the term "BMPs" is used broadly and includes both structural and non-structural controls and practices.

A SWPPP is more than just a sediment and erosion control plan. Most SWPPPs are written documents that describe the pollution prevention practices and activities that will be implemented on the site. It includes descriptions of the site and of each major phase of the planned activity, the roles and responsibilities of contractors and subcontractors, and the inspection schedules and logs. It is also a place to document changes and modifications to the construction plans and associated stormwater pollution prevention activities.

Chapter 2: **Getting Started**

▶ **This chapter describes some of the basic things you'll want to determine (Do you need permit coverage? What permit applies to you?), as well as some of the materials and information you may need to develop your SWPPP. Collecting this information before you start will help you develop your SWPPP more efficiently. Keep in mind that you may also need to gather this information and develop your SWPPP before you complete your Notice of Intent (NOI) and file for permit coverage (note that filing an NOI is not discussed until Chapter 7).**

A. What Are the Federal Requirements for Stormwater Runoff from Construction Sites?

The Clean Water Act and associated federal regulations (Title 40 of the *Code of Federal Regulations* [CFR] 123.25(a)(9), 122.26(a), 122.26(b)(14)(x) and 122.26(b)(15)) require nearly all construction site operators engaged in clearing, grading, and excavating activities that **disturb one acre or more, including smaller sites in a larger common plan of development or sale**, to obtain coverage under a National Pollutant Discharge Elimination System (NPDES) permit for their stormwater discharges. Under the NPDES program, the U.S. Environmental Protection Agency (EPA) can authorize states to implement the federal requirements and issue stormwater permits. Today, most states are authorized to implement the NPDES program and issue their own permits for stormwater discharges associated with construction activities.

SWPPP Tip!

Don't forget about "common plans of development or sale"

A *common plan of development or sale* includes larger-scale plans for land development to be carried out by one or more entities. Examples include housing developments and subdivisions, industrial parks, and commercial developments.

EPA has described this term in the fact sheet accompanying its Construction General Permit as including: any announcement or piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, permit application, zoning request, computer design, etc.), or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating construction activities may occur on a specific plot. Each permitting authority may review documentation to determine if common plan requirements apply.

Each state (or EPA, in the case of states that are not authorized) issues one or more NPDES construction general permits. These permits, generally, can be thought of as umbrella permits that cover all stormwater discharges associated with construction activity in a given state for a designated time period, usually 5 years. Operators of individual constructions sites then apply for coverage under this permit. *Before applying for permit coverage, you should read and understand all the provisions of the appropriate construction general permit and develop a SWPPP.* **Because authorized states develop their own NPDES requirements, you should carefully read your state's construction general permit and follow the specific instructions it contains.**

Take a Closer Look…

EPA Permits vs. State-Issued Permits

At the time of publication, EPA was the NPDES permitting authority in Massachusetts, New Hampshire, New Mexico, Idaho, Alaska, the District of Columbia, Puerto Rico, the U.S. territories (except the Virgin Islands), most Indian country lands, and for federal facilities in four states. For an up-to-date list of NPDES permitting authorities, visit **www.epa.gov/npdes/stormwater/construction** or **www.cicacenter.org/swrl.html**

What does this mean to me?

Because EPA and state-issued permits can be different, you should make sure you read and apply for the correct permit. Use the links on either of the web sites listed to the left to determine which agency issues NPDES permits where your construction activity will occur.

Most construction general permits contain similar elements:

- Applicability—describes the geographic area covered and who is eligible to apply
- Authorization—describes the types of stormwater (and non-stormwater) discharges that are covered
- SWPPP requirements—outlines the elements that should to be addressed to prevent the contamination of stormwater runoff leaving the construction site
- Application—includes instructions for obtaining permit coverage, usually by filing an application or Notice of Intent (NOI) form
- Implementation—BMP installation, inspection, and maintenance requirements
- Other requirements—may include additional requirements such as spill prevention
- Standard conditions—list of conditions that are applicable to most NPDES permits
- Termination—lists conditions for terminating permit coverage after construction is complete

What Construction Activities Require NPDES Permit Coverage?

In this document, "*construction*" refers to actions that result in a disturbance of the land, including clearing, grading, excavating, and other similar activities. It also includes "*construction-related activities,*" areas that support the construction project such as stockpiles, borrow areas, concrete truck washouts, fueling areas, material storage areas and equipment storage areas.

Construction activities that do not disturb land, such as interior remodeling, generally do not require NPDES permit coverage.

Are There Situations Where a Permit Is Not Needed?

Generally, permit coverage is not required for activities that are considered routine maintenance, such as landscaping, road maintenance, and maintaining stormwater BMPs. Some states and EPA offer the option of a waiver for small sites (disturbing less than 5 acres) in areas and times of the year with low predicted rainfall. To be eligible for the waiver, you would have to meet the requirements specified in the regulations.

Local Requirements

Operators of construction sites should keep in mind that local governments (cities, towns, counties) often have their own requirements for construction sites (e.g., local permits for grading, sediment and erosion, utilities). **Compliance with local requirements does not mean compliance with federal NPDES requirements or vice versa, unless the authorized state agency or EPA has specifically designated the local program a *qualifying local program*.**

Qualifying Local Programs

In some states, the NPDES permitting agency has identified certain local construction stormwater control programs that have requirements that are equivalent or more protective than the state's requirements. If one of these local stormwater programs has been designated by the permitting agency as a *qualifying local program*, the construction site operator may simply read and follow the local requirements. The permitting agency (state or EPA) might choose to waive the requirement to file a Notice of Intent (NOI) or similar application form for small construction sites operating within the jurisdiction of a qualifying local program. If waived, these sites would be covered under the appropriate construction general permit automatically. Check your construction general permit carefully.

The NPDES permitting authority must identify any qualifying local programs in the construction general permit. Violations of the local requirements are also considered violations of the NPDES requirements and may be enforced accordingly.

SWPPP Tip!

Read Your General Permit!

You should thoroughly read and understand the requirements in your general permit. This includes requirements on eligibility (whether your site qualifies for the general permit), application (how to notify EPA or the state that you'd like to be covered by the general permit), SWPPPs, and termination (stabilizing your site and notifying EPA or the state that your project is complete). By applying for coverage under the general permit, you are telling EPA or your state that you will comply with the permit's requirements, so read your permit carefully!

B. Who Is Required to Get NPDES Permit Coverage?

Construction site *operators* are responsible for obtaining NPDES permit coverage for their stormwater discharges. Each state has its own definition of the term *operator*. Operators may include owners (e.g., developers), general contractors, independent subcontractors, government officials, companies, or corporations. This section reflects EPA's understanding of most NPDES permit requirements for stormwater discharges throughout the country. You should, of course, consult your construction general permit for the requirements that apply to you. In some cases, states have defined the operator as a single entity, usually the land owner or easement holder. In other states, several entities may meet the definition of operator. For instance, the owner may control the project's plans and specifications, and the general contractor may control the site's day-to-day operations. In such cases, both may be defined as operators. If a site has multiple operators, they may cooperate on the development and implementation of a single SWPPP. Operators generally obtain coverage under an NPDES permit, often by filing a form called a Notice of Intent (NOI).

Figure 4. Use signage to help educate construction staff.

EPA's Construction General Permit (which applies only where EPA is the permitting authority—see Chapter 2 Section A) defines operator as any party that:

- Has control over the construction plans and specifications

  and/or

- Has day-to-day operational control of the site, including activities necessary to implement the SWPPP

Regardless of whether or not the operator is a corporation or governmental entity, someone must direct the SWPPP's preparation and implementation and apply for NPDES permit coverage for the stormwater discharges. In most cases, this will be a high-level official, such as a corporate officer, manager or elected official, or a principal executive officer. For specific instructions, refer to the appropriate NPDES stormwater permit.

Multiple Operators

In many instances, there may be more than one party at a site performing tasks related to *operational control* and more than one operator may need to submit an NOI. Depending on the site and the relationship between the parties (e.g., owner, developer, general contractor), there can either be a single party acting as site operator and consequently responsible for obtaining permit coverage, or there can be two or more operators all needing permit coverage. Exactly who is considered an operator is largely controlled by how the *owner* of the project chooses to structure the contracts with the *contractors* hired to design and/or build the project. The following are three general operator scenarios (variations on any of these three are possible, especially as the number of owners and contractors increases):

- *Owner as sole permittee*. The property owner designs the structures for the site, develops and implements the SWPPP, and serves as general contractor (or has an on-site representative with full authority to direct day-to-day operations). The owner may be the only party that needs permit coverage under these circumstances. Everyone else on the site may be considered subcontractors and might not need permit coverage.

- *Contractor as sole permittee*. The property owner hires one company (i.e., a contractor) to design the project and oversee all aspects of the construction project, including preparation and implementation of the SWPPP and compliance with the permit (e.g., a *turnkey* project). Here, the contractor would likely be the only party needing a permit. It is under this scenario that an individual having a personal residence built for his own use (e.g., not those to be sold for profit or used as rental property) would not be considered an operator. However, individual property owners would meet the definition of *operator* and may require permit coverage if they perform general contracting duties for construction of their personal residences.
- *Owner and contractor as co-permittees*. The owner retains control over any changes to site plans, SWPPPs, or stormwater conveyance or control designs; but the contractor is responsible for overseeing actual earth disturbing activities and daily implementation of SWPPP and other permit conditions. In this case, which is the most common scenario, both parties may need to apply for permit coverage.

However, you are probably not an operator and subsequently would not need permit coverage if one of the following is true:

- You are a subcontractor hired by, and under the supervision of, the owner or a general contractor (i.e., if the contractor directs your activities on-site, you probably are not an operator)
- The operator of the site has indicated in the SWPPP that someone other than you (or your subcontractor) is reponsible for your activities as they relate to stormwater quality (i.e., another operator has assumed responsibility for the impacts of your construction activities). This is typically the case for many, if not most, utility service line installations.

In addition, *owner* typically refers to the party that owns the structure being built. Ownership of the land where construction is occurring does not necessarily imply the property owner is an operator (e.g., a landowner whose property is being disturbed by construction of a gas pipeline). Likewise, if the erection of a structure has been contracted for, but possession of the title or lease to the land or structure does not to occur until after construction, the would-be owner may not be considered an operator (e.g., having a house built by a residential homebuilder).

Transferring Ownership

In many residential developments, an overall developer applies for the stormwater permit coverage, conducts grading activities, and installs the basic infrastructure (e.g., utilities, roads). Individual lots are then sold to builders who then construct the houses. Unless the developer is still responsible for stormwater on these individual lots (which is typically not the case), it is likely that the builder will need to apply for NPDES permit coverage for stormwater discharges during home construction.

Subcontractors

It is typically a good idea to include specific contract language requiring subcontractors to implement appropriate stormwater controls. Subcontractors should be trained on appropriate BMPs and requirements in the SWPPP and should not disturb or remove BMPs. Some contractors will include specific penalties in subcontractor agreements to ensure subcontractors do not damage or remove BMPs.

Take a Closer Look…

Erosion Control vs. Sediment Control

When developing a SWPPP, it is important to understand the difference between erosion control and sediment control. Erosion control measures (e.g., mulch, blankets, mats, vegetative cover) protect the soil surface and prevent soil particles from being dislodged and carried away by wind or water. Sediment control measures remove soil particles after they have been dislodged (typically through settling or filtration). It is usually easier and less expensive to prevent erosion than it is to control sedimentation.

What does this mean to me?

You should try to use erosion control BMPs as the primary means of preventing stormwater contamination, and sediment control techniques to capture any soil that does get eroded. Because no one technique is 100 percent effective, a good SWPPP will use both kinds of BMPs in combination for the best results.

C. What Elements Are Required in a SWPPP?

The SWPPP lays out the steps and techniques you will use to reduce pollutants in stormwater runoff leaving your construction site. Therefore, proper development and implementation of your SWPPP is crucial. First and foremost, your SWPPP must be developed and implemented consistent with the requirements of the applicable NPDES stormwater construction permit. The following discussion describes requirements that are contained in most of these permits.

Your SWPPP is used to identify all potential pollution sources that could come into contact with stormwater leaving your site. It describes the BMPs you will use to reduce pollutants in your construction site's stormwater discharges, and it includes written records of your site inspections and the follow-up maintenance that is performed.

Your SWPPP should contain the following elements:

- Cover/title page
- Project and SWPPP contact information
- Site and activity description, including a site map
- Identification of potential pollutant sources
- Description of controls to reduce pollutants
- Maintenance/inspection procedures
- Records of inspections and follow-up maintenance of BMPs
- SWPPP amendments
- SWPPP certification

Chapters 3–6 of this guide describe how to develop a SWPPP—from site evaluation and data collection to selecting appropriate BMPs and assigning maintenance and inspection responsibilities.

D. SWPPP Roles and Responsibilities

The operator has the lead for developing and implementing the SWPPP and commiting resources to implement the BMPs. Stormwater pollution control is typically the job of more than a single person; the SWPPP development process provides a good opportunity to define roles and responsibilities of everyone involved. Roles and responsibilities are to be documented clearly in the SWPPP and subcontractor agreements as necessary. Your SWPPP should describe:

- Who is on the stormwater pollution prevention team?
- Who will install structural stormwater controls?
- Who will supervise and implement good housekeeping programs, such as site cleanup and disposal of trash and debris, hazardous material management and disposal, vehicle and equipment maintenance, and so on?
- Who will conduct routine inspections of the site to ensure all BMPs are being implemented and maintained?
- Who will maintain the BMPs?
- Who is responsible for documenting changes to the SWPPP?
- Who is responsible for communicating changes in the SWPPP to people working on the site?

When you apply for your stormwater permit, the application may ask for a SWPPP contact. This could be the construction site operator, but in many cases it's a staff person (e.g., project superintendent, field manager, construction manager, stormwater compliance officer) at the construction site who is responsible for conducting inspections, ensuring BMPs are installed and maintained, and updating the SWPPP when necessary.

SWPPP Tip!

Erosion Control Certification

Several programs promote the training and certification of individuals in erosion and sediment control. Some states have developed certification programs and require construction sites to have a certified individual on-site at all times. The Soil and Water Conservation Society and the International Erosion Control Association sponsor a national certification program, the Certified Professional in Erosion and Sediment Control (**www.cpesc.org**)

E. Common SWPPP Objectives

The SWPPP outlines the steps you will take to comply with the terms and conditions of your construction general permit. Keeping the following objectives in mind as you develop your SWPPP will help guide you in addressing your permit requirements and in protecting water quality.

- *Stabilize the site as soon as possible.* Get your site to final grade and either permanently or temporarily stabilize all bare soil areas as soon as possible. Take into consideration germination times for the grasses or other vegetation selected, and provide additional stabilization (mulches, matrices, blankets, soil binders) on erosion-prone areas such as slopes and drainage ways. Also consider seasonal limitations to plant establishment and growth, such as drought or cold temperatures, and make an effort to ensure that areas that are not showing adequate vegetation establishment are reseeded or mulched immediately. Areas needed for future roads, construction, or other purposes should be temporarily stabilized (see your permit for requirements related to areas of the site not currently under active construction). Establishing a vegetated cover on as much of the site as possible will help to minimize erosion and sediment problems. Perimeter controls should remain in place until final stabilization has been achieved.
- *Protect slopes and channels.* Convey concentrated stormwater runoff around the top of slopes and stabilize slopes as soon as possible. This can be accomplished using pipe slope drains or earthen berms that will convey runoff around the exposed slope. Avoid disturbing natural channels and the vegetation along natural channels, if possible.
- *Reduce impervious surfaces and promote infiltration.* Reducing impervious surfaces will ultimately reduce the amount of runoff leaving your site. Also, divert runoff from rooftops and other impervious surfaces to vegetated areas when possible to promote infiltration.
- *Control the perimeter of your site.* Divert stormwater coming on to your site by conveying it safely around, through, or under your site. Avoid allowing run-on to contact disturbed areas of the construction site. For the runoff from the disturbed areas of the site, install BMPs such as silt fences to capture sediment before it leaves your site. Remember—"Divert the clean water, trap the dirty water."
- *Protect receiving waters adjacent to your site.* Erosion and sediment controls are used around the entire site, but operators should consider additional controls on areas that are adjacent to receiving waters or other environmentally sensitive areas. **Remember, the primary purpose of erosion and sediment controls is to protect surface waters.**
- *Follow pollution prevention measures.* Provide proper containers for waste and garbage at your site. Store hazardous materials and chemicals so that they are not exposed to stormwater.
- *Minimize the area and duration of exposed soils.* Clearing only land that will be under construction in the near future, a practice known as construction phasing, can reduce off-site sediment loads by 36 percent for a typical subdivision (Claytor 2000). Additionally, minimizing the duration of soil exposure by stabilizing soils quickly can reduce erosion dramatically.

Take a Closer Look…

Incentives to preserve open space

It should be the goal of every construction project to, where possible, preserve open space and minimize impervious surfaces through practices such as clustering houses. Open space preservation can provide significant water quality and economic benefits to property owners.

What does this mean to me?

From a marketing perspective, studies have shown that lots abutting forested or other open space are initially valued higher than lots with no adjacent open space, and over time their value appreciates more than lots in conventional subdivisions (Arendt 1996). For example, lots in an open space subdivision in Amherst, Massachusetts, experienced a 13 percent greater appreciation in value over a comparable conventional development after 20 years even though the lots in the conventional development were twice as large (Arendt 1996).

Chapter 3: **SWPPP Development—Site Assessment and Planning**

▶ **The first step in developing a SWPPP is assessing the site and identifying measures to protect natural features.**

This chapter describes a number of steps that will help provide a good foundation for your SWPPP, including:

- Assessing current conditions at the site
- Establishing pollution prevention and water quality protection goals for your project
- Developing a framework to help you meet those goals

A. Assess Your Site and Proposed Project

The first step in developing your SWPPP is to evaluate your proposed construction site. Your SWPPP should describe the undeveloped site and identify features of the land that can be incorporated into the final plan and natural resources that should be protected. Understanding the hydrologic and other natural features of your site will help you develop a better SWPPP and, ultimately, to more effectively prevent stormwater pollution.

SWPPP Tip!

A SWPPP is a detailed plan that:

- Identifies potential sources of stormwater pollution
- Describes the practices that will be used to prevent stormwater pollution. These should include: erosion and sediment control practices, good housekeeping practices, conservation techniques, and infiltration practices (where appropriate), and
- Identifies procedures the operator will implement to comply with all requirements in the construction general permit

Visit the Site

The people responsible for site design and drafting the SWPPP should conduct a thorough walk-through of the entire construction site to assess site-specific conditions such as soil types, drainage patterns, existing vegetation, and topography. Avoid copying SWPPPs from other projects to save time or money. Each construction project and SWPPP is unique, and visiting the site is the only way to create a SWPPP that addresses the unique conditions at that site.

Assess Existing Construction Site Conditions

Assess the existing conditions at the construction site, including topography, drainage, and soil type. This assessment, sometimes called *fingerprinting* (see text box on page 11) is the foundation for building your SWPPP and for developing your final site plan. In this assessment, use or create a topographic drawing that:

- Indicates how stormwater currently drains from the site, and identify the location of discharge points or areas
- Identifies slopes and slope lengths. The topographic features of the site are a major factor affecting erosion from the site
- Identifies soil type(s) and any highly erodible soils and the soil's infiltration capacity
- Identifies any past soil contamination at the site
- Identifies natural features, including trees, streams, wetlands, slopes and other features to be protected

Take a Closer Look…

Fingerprinting Your Site

When you evaluate your construction site, you should clearly identify vegetation, trees, and sensitive areas, such as stream buffers, wetlands, highly erodible soils, and steep slopes at your site. You should protect these areas from disturbance. Inventorying a site's natural features is a technique called fingerprinting. Fingerprinting identifies natural features that you can protect from clearing and heavy equipment by signage or physical barriers.

What does this mean to me?

Fingerprinting your site will help ensure that you don't damage natural features such as waterways or wetlands. Conducting construction activity in a waterway or wetland without the proper permits can result in significant penalties.

In most cases, the site designer can compile all this information on a digitized drawing that can then be adapted to show the planned construction activity, the phases of construction, and the final site plan.

Topographic maps are readily available on the Internet (e.g., **www.terraserver.com** or **www.mapquest.com**) or by contacting the U.S. Geological Survey store (**http://store.usgs.gov**). If you need help determining your soil type, contact your local Natural Resource Conservation Service (NRCS) office or extension service office. To find the NRCS office nearest to your site, visit the U.S. Department of Agriculture's Service Center Locator website (**http://offices.sc.egov.usda.gov/locator/app**). Soil information is also available online from NRCS (**http://soils.usda.gov**).

Identify Receiving Waters, Storm Drains, and Other Stormwater Conveyance Systems

Your SWPPP should clearly identify the receiving waters and stormwater systems through which stormwater from your site could flow. Many states require planning for a specific storm event or storm events. These storm events are referred to by their recurrence interval and duration such as 1-year, 6-hour storm or a 100-year, 24-hour storm. These events then translate into a specific rainfall amount depending on average conditions in your area.

If your site's stormwater flows into a municipal storm drain system, you should determine the ultimate destination of that system's discharge. This may be obvious and easy to document. However, in some systems, you may have to consult with the local agency responsible for the storm drain system to determine the waterbody to which you are discharging.

If your site's stormwater runs off to areas not connected to the storm drain system, you should consider your land's topography and then identify the waterbodies that it could reach. Many sites will discharge some stormwater to a storm drain system and some to other areas not connected to the system. If your site's stormwater could potentially reach two or more waterbodies, note that in your SWPPP. Remember, stormwater can travel long distances over roads, parking lots, down slopes, across fields, and through storm sewers and drainage ditches.

Describe Your Construction Project

Your SWPPP should contain a brief description of the construction activity, including:

- Project type or function (for example, low-density residential, shopping mall, highway)
- Project location, including latitude and longitude
- Estimated project start and end dates
- Sequence and timing of activities that will disturb soils at the site
- Size of the project
- Estimated total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas
- Percentage of impervious area before and after construction

Construction Site Pollutants									
	Primary Pollutant	Other Pollutants							
Areas of Consideration	Sediment	Nutrients	Heavy metals	pH (acids & bases)	Pesticides & herbicides	Oil & grease	Bacteria & viruses	Trash, debris, solids	Other toxic chemicals
Clearing, grading, excavating, and unstabilized areas	✓							✓	
Paving operations	✓							✓	
Concrete washout and waste			✓	✓				✓	
Structure construction/ painting/cleaning		✓		✓				✓	✓
Demolition and debris disposal	✓							✓	
Dewatering operations	✓	✓							
Drilling and blasting operations	✓			✓				✓	
Material delivery and storage	✓	✓	✓	✓	✓	✓		✓	✓
Material use during building process		✓	✓	✓	✓	✓		✓	✓
Solid waste (trash and debris)								✓	✓
Hazardous waste			✓	✓	✓	✓			✓
Contaminated spills		✓	✓	✓	✓	✓			✓
Sanitary/septic waste		✓		✓			✓		✓
Vehicle/equipment fueling and maintenance						✓			✓
Vehicle/equipment use and storage						✓			✓
Landscaping operations	✓	✓						✓	

- Runoff coefficient[1] before and after construction
- Soil types
- Construction site location and any nearby waters or wetlands
- Describe and identify the location of other potential sources of stormwater contamination, such as asphalt and concrete plants, stucco operations, paint and concrete washout, and such

Identify Pollutants and Pollution Sources

Identify the pollutants and sources that are likely to be found on the site. The principle pollutant of concern, of course, is sediment. There are, however, other pollutants that may be found, usually in substantially smaller amounts, in stormwater runoff from construction sites. These can include nutrients, heavy metals, organic compounds, pesticides, oil and grease, bacteria and viruses, trash and debris, and other chemicals. After identifying the pollutants and sources, be as specific as possible in your SWPPP about the BMPs you will use to address them. The table at the left lists the sources of pollutants at construction sites, including sediment, the primary pollutant and other pollutants that may be present at construction sites.

Figure 5. Make sure storm drain inlets are protected.

[1] The runoff coefficient is the partial amount of the total rainfall which will become runoff. Runoff coefficients generally range from 0.95 (highly impervious) to 0.05 (vegetated surface that generates little runoff). For more information on calculating the runoff coefficient for your site, see Appendix C.

Non-Stormwater Discharges

Most permits will require you to identify any non-stormwater discharges in your SWPPP. Certain non-stormwater discharges may be allowed under the terms and conditions of your permit, however, you should make every effort to eliminate these discharges where possible. You should identify these sources in your SWPPP and identify pollution prevention measures to ensure that pollutants are not introduced to these discharges and carried to nearby waterbodies.

EPA's CGP identifies these allowable non-stormwater discharges: discharges from fire-fighting activities, fire hydrant flushings, waters used to wash vehicles, buildings, and pavements where detergents are not used, water used to control dust, potable water (including uncontaminated water line flushings), uncontaminated air conditioning condensate, uncontaminated ground water or spring water, among others. The permit goes on to say that non-stormwater discharges should be eliminated or reduced to the extent feasible and that the SWPPP should identify and ensure the implementation of appropriate pollution prevention measures for these discharges. More discussion of pollution prevention measures for some of these non-stormwater sources can be found in Chapter 5.

Permanent Stormwater Controls (Post-Construction)

The topic of designing, installing, and maintaining permanent or post-construction stormwater controls, although a requirement, is beyond the scope of this SWPPP guide. A SWPPP compiled in support of coverage under EPA's Construction General Permit, however, needs to include a description of all permanent stormwater controls that will be constructed along with the buildings, roads, parking lots, and other structures. You should incorporate sediment and erosion controls into your SWPPP for areas where permanent stormwater controls, such as wet ponds, swales, and bioretention cells are to be constructed.

Effectively managing stormwater over the long-term—long after the actual construction process is over—is a significant challenge. Many communities (and a few states) have or are developing comprehensive requirements to better manage permanent (or post-construction) stormwater runoff. To be most effective, you should consider integrating your design process for your permanent stormwater controls into your overall design for your site. Planning for your permanent stormwater controls could affect your decisions about site design, location of buildings and other structures, grading, and preserving natural features. By preserving natural drainage patterns, trees, native vegetation, riparian buffers, and wetlands, you might need to construct fewer or smaller structural storm-water controls to cope with runoff from your site. Permanent stormwater controls should be designed with two important goals in mind: (1) reduction of the volume and velocity of runoff, and (2) reduction of the pollutants in the stormwater that does leave your site.

Techniques, such as *Low Impact Development*, Better Site Design, or *Conservation Development*, which emphasize addressing stormwater where it falls, infiltrating it, preserving natural drainage patterns, and

Take a Closer Look…

Specimen Trees and Natural Vegetation

Before a site plan is prepared, identify and clearly mark existing trees and vegetation you want to preserve. Some communities have tree preservation ordinances, and local extension service offices and foresters will often provide free advice on tree and plant preservation. Remember to notify all employees and subcontractors about trees and areas you intend to preserve and mark them clearly.

What does this mean to me?

Large trees and other native vegetation can represent significant value in the long term to property owners and the community at large. Many studies document that the presence of trees on residential and commercial sites provide many benefits including improved aesthetics, habitat for birds and other wildlife, and energy savings (shade) that ultimately enhance the economic value of the site. Trees also provide shade and act as windbreaks, which can reduce energy costs over the long term. By protecting existing trees, you can reduce landscaping costs and improve the appearance of a newly developed property. According to the National Arbor Day Foundation, trees around a home can increase its value by 15 percent or more.

preserving natural vegetation offer the best opportunity to protect nearby rivers, lakes, wetlands, and coastal waters. **Incorporating these ideas and concepts into the design for your project before it is built also offers the opportunity to reduce capital infrastructure and long-term maintenance costs**.

At the neighborhood or even at the watershed scale, *Smart Growth* techniques can help us design neighborhoods that minimize impacts on water quality, reduce air pollution, and improve the general quality of life for residents. **In the *Resources* list in Appendix D, you will find a list of suggestions on this topic, including how to incorporate Smart Growth and Low Impact Development techniques into the design of your site.**

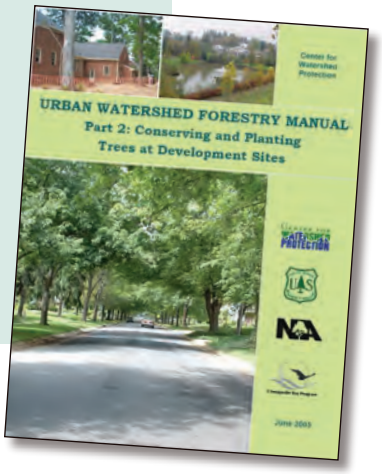
B. Identify Approaches to Protect Natural Resources

Preservation of natural areas, waterbodies, and open space has numerous economic, aesthetic, community, and environmental benefits. Preservation efforts also often increase the value of lots and homes and help to reduce overall expenditures on infrastructure. Specifically, these kinds of conservation efforts can help to significantly reduce the volume and velocity of stormwater runoff and the pollutants that may be carried with it.

SWPPP Tip!

Tree Preservation Resources

For more on tree preservation, contact your local extension service office or forester. Also, American Forests has useful information and tools at their website, **www.americanforests.org/resources/urbanforests**. The Center for Watershed Protection in cooperation with the U.S. Forest Service has developed a series of manuals on urban forestry. Part two, titled Conserving and Planting Trees at Development Sites will be of particular interest. You can find these manuals at **www.cwp.org**



Protect Nearby Waters

Your SWPPP should describe how you will protect and preserve any streams, wetlands, ponds or other waterbodies that are on your property or immediately adjoining it. Riparian areas around headwater streams are especially important to the overall health of the entire river system. Many states and communities have buffer or shoreline protection requirements to preserve sensitive areas around waterbodies.

Many states apply special designations to high-value or high-quality waters. Check with your state water pollution control agency to determine if your project could discharge to *outstanding* or special protection waters (such as wetlands, or salmon and trout streams). You might be subject to additional requirements to protect these waterbodies.

Wetland areas, including bogs, marshes, swamps, and prairie potholes may be found in areas adjacent to rivers, lakes, and coastal waters but may also be found in isolated places far from other surface waters. Many types of wetlands are protected under the Clean Water Act and construction activities in and around these areas may require an additional permit from the Army Corps of Engineers. Construction site operators should make every effort to preserve wetlands and must follow applicable local, state, and federal requirements before disturbing them or the areas around them.

To ensure the protection of natural areas during the construction period, you should use a combination of techniques, including temporary fencing, signage, and educating staff and subcontractors.

Assess Whether Your Project Impacts an Impaired Waterbody

Under the Clean Water Act, states are required to determine if rivers, lakes, and other waters are meeting water quality standards. When a waterbody does not meet water quality standards because of one or more sources of pollution, the state lists the water as impaired. When a water is determined to be impaired, the state or EPA develops a plan for correcting the situation. This plan is called a Total Maximum Daily Load (TMDL). If stormwater from your project could reach an impaired water with or without an approved TMDL (either directly or indirectly through a municipal storm drain system), your permit

may include additional requirements to ensure that your stormwater discharges do not contribute to that impairment and your stormwater controls are consistent with plans to restore that waterbody. Your SWPPP should describe the specific actions you will take to comply with these permit requirements for impaired waters.

You should determine, before you file for permit coverage, if the receiving waters for your project are impaired and if so, whether a TMDL has been developed for this waterbody. Visit EPA's Enviromapper website (**www.epa.gov/waters/enviromapper**) or contact your state environmental agency for more information.

Assess Whether You Have Endangered Plant or Animal Species in Your Area

The federal Endangered Species Act protects endangered and threatened species and their critical habitat areas. (States and tribes may have their own endangered species laws.) In developing the assessment of your site, you should determine whether listed endangered species are on or near your property. Critical habitat areas are often designated to support the continued existence of listed species. You should also determine whether critical habitat areas have been designated in the vicinity of your project. Contact your local offices of the U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service (NMFS), or your state or tribal heritage centers. These organizations often maintain lists of federal and state listed endangered and threatened species on their Internet sites. For more information and to locate lists for your state, visit **www.epa.gov/npdes/endangeredspecies**

Additionally, your state's NPDES stormwater permit may specifically require that you address whether the activities and the stormwater discharged by your construction site have the potential to adversely affect threatened or endangered species or the critical habitat areas. You might need to conduct a biological investigation or assessment and document the results of the assessment in your SWPPP. The state may reference federal, state, or tribal endangered species protection laws or regulations.

EPA's Construction General Permit contains detailed procedures to assist construction site operators in determining the likely impact of their projects on any endangered species or critical habitat. Construction site operators in areas covered by EPA's Construction General Permit are required to assess the impact of their activities and associated stormwater discharges on species and habitat in the "project area" which may extend beyond the site's immediate footprint.

Assess Whether You Have Historic Sites that Require Protection

The National Historic Preservation Act, and any state, local and tribal historic preservation laws, apply to construction activities. As with endangered species, some permits may specifically require you to assess the potential impact of your stormwater discharges on historic properties. However, whether or not this is stated as a condition for permit coverage, the National Historic Preservation Act and any applicable state or tribal laws apply to you. Contact your State Historic Preservation Officer (**www.ncshpo.org/stateinfolist/fulllist.htm**) or your Tribal Historic Preservation Officer (**grants.cr.nps.gov/thpo/tribaloffices.cfm**).

C. Develop Site Maps

The final step in the site evaluation process is to document the results of your site assessment and your planned phases of construction activity on a detailed site map or maps. This includes developing site maps showing planned construction activities and stormwater practices for the various major stages of construction, protected areas, natural features, slopes, erodible soils, nearby waterbodies, permanent stormwater controls, and so on. You must keep your SWPPP and your site maps up-to-date to reflect changes at your site during the construction process.

Location Maps

A general location map is helpful to identify nearby, but not adjacent, waterbodies in proximity to other properties. You can use any easily available maps or mapping software to create a location map.

Site Maps

The detailed construction site maps should show the entire site and identify a number of features at the site related to construction activities and stormwater management practices.

Figure 6. Example site map.

Map of undeveloped or existing site. For many sites, a map of the undeveloped or existing site, noting the features that you identified in Section A of this Chapter, will help you develop your SWPPP and identify current site features that you want to preserve. On this map note current drainage patterns, storm drains, slopes, soil types, waters and other natural features. Also note any existing structures, roads, utilities, and other features.

Map or series of maps for construction plans. Site maps should show the construction activities and stormwater management practices for each major phase of construction (e.g., initial grading, infrastructure, construction, and stabilization). The site maps should legibly identify the following features:

- Stormwater flow and discharges. Indicate flow direction(s) and approximate slopes after grading activities, as well as locations of discharges to surface waters or municipal storm drain systems.
- Areas and features to be protected. Include wetlands, nearby streams, rivers, lakes, and coastal waters, mature trees and natural vegetation, steep slopes, highly erodible soils, etc.
- Disturbed areas. Indicate locations and timing of soil disturbing activities (e.g. grading). Mark clearing limits.
- BMPs. Identify locations of structural and non-structural BMPs identified in the SWPPP, as well as post-construction stormwater BMPs.
- Areas of stabilization. Identify locations where stabilization practices are expected to occur. Mark areas where final stabilization has been accomplished.
- Other areas and roads. Indicate locations of material, waste, borrow, or equipment storage.

You should complete your site maps after reviewing Chapters 4 and 5 and any applicable BMP design manual to select appropriate BMPs for your site.

Use Site Maps to Track Progress

Develop and keep up-to-date site maps showing non-structural BMPs that change frequently in location as the work on a construction site progresses. Your permit requires that you keep your SWPPP up-to-date, so mark up the site map with the location of these BMPs. Indicate the current location of the following:

- Portable toilets
- Material storage areas
- Vehicle and equipment fueling and maintenance areas
- Concrete washouts
- Paint and stucco washouts
- Dumpsters or other trash and debris containers
- Spill kits
- Stockpiles
- Any other non-structural non-stormwater management BMPs
- Any temporarily removed structural BMPs
- Any changes to the structural BMPs

If a marked-up site map is too full to be easily read, you should date and fold it, put it in the SWPPP for documentation, and start a new one. That way, there is a good hard copy record of what has occurred on-site.

Construction sites are dynamic. As conditions change at the construction site, such as the locations of BMPs, your SWPPP must reflect those changes.

Chapter 4: **SWPPP Development—Selecting Erosion and Sediment Control BMPs**

▶ **This chapter presents a brief discussion of erosion and sediment control principles and a discussion of some commonly used BMPs.**

This document is not intended as an engineering or design manual on BMPs. The engineer or other qualified person that develops the details of your sediment and erosion control plan should be using the appropriate state or local specifications. The descriptions below provide a kind of checklist of the things to look for and some helpful installation and maintenance hints.

Erosion and sediment controls are the structural and non-structural practices used during the construction process to keep sediment in place (erosion control) and to capture any sediment that is moved by stormwater before it leaves the site (sediment control). Erosion controls—keeping soil where it is—are the heart of any effective SWPPP. Your SWPPP should rely on erosion controls as the primary means of preventing stormwater pollution. Sediment controls provide a necessary second line of defense to properly designed and installed erosion controls.

The suite of BMPs that you include in your SWPPP should reflect the specific conditions at the site. The information that you collected in the previous steps should help you select the appropriate BMPs for your site. An effective SWPPP includes a combination or suite of BMPs that are designed to work together.

Ten Keys to Effective Erosion and Sediment Control (ESC)

The ultimate goal of any SWPPP is to protect rivers, lakes, wetlands, and coastal waters that could be affected by your construction project. The following principles and tips should help you build an effective SWPPP. **Keep in mind that there are many BMP options available to you. We have selected a few common BMPs to help illustrate the principles discussed in this chapter.**

Erosion Control (keeping the dirt in place) and Minimizing the Impact of Construction

1. **Minimize disturbed area and protect natural features and soil**
2. **Phase construction activity**
3. **Control stormwater flowing onto and through the project**
4. **Stabilize soils promptly**
5. **Protect slopes**

Sediment Controls (the second line of defense)

6. **Protect storm drain inlets**
7. **Establish perimeter controls**
8. **Retain sediment on-site and control dewatering practices**
9. **Establish stabilized construction exits**
10. **Inspect and maintain controls**

Take a Closer Look…

BMPs in Combination

BMPs work much better when they are used in combination. For instance, a silt fence should not be used alone to address a bare slope. An erosion control BMP should be used to stabilize the slope, and the silt fence should serve as the backup BMP.

What does this mean to me?

Wherever possible, rely on erosion controls to keep sediment in place. Back up those erosion controls with sediment controls to ensure that sediment doesn't leave your site. Continually evaluate your BMPs. Are they performing well? Could the addition of a supplemental BMP improve performance? Should you replace a BMP with another one that might work better? Using BMPs in series also gives you some protection in case one BMP should fail.

Erosion Control and Minimizing the Impact of Construction

ESC Principle 1: Minimize disturbed area and protect natural features and soil. As you put together your SWPPP, carefully consider the natural features of the site that you assessed in Chapter 3. By carefully delineating and controlling the area that will be disturbed by grading or construction activities, you can greatly reduce the potential for soil erosion and stormwater pollution problems. Limit disturbed areas to only those necessary for the construction of your project. Natural vegetation is your best and cheapest erosion control BMP.

Figure 7. Protect vegetated buffers by using silt fence or other sediment controls.

Protecting and preserving topsoil is also a good BMP. Removing topsoil exposes underlying layers that are often more prone to erosion and have less infiltration capacity. Keeping topsoil in place preserves the natural structure of the soils and aids the infiltration of stormwater.

ESC Principle 2: Phase construction activity. Another technique for minimizing the duration of exposed soil is phasing. By scheduling or sequencing your construction work and concentrating it in certain areas, you can minimize the amount of soil that is exposed to the elements at any given time. Limiting the area of disturbance to places where construction activities are underway and stabilizing them as quickly as possible can be one of your most effective BMPs.

ESC Principle 3: Control stormwater flowing onto and through your project. Plan for any potential stormwater flows coming onto the project area from upstream locations, and divert (and slow) flows to prevent erosion. Likewise, the volume and velocity of on-site stormwater runoff should be controlled to minimize soil erosion.

Example BMP: Diversion Ditches or Berms

Description: Diversion ditches or berms direct runoff away from unprotected slopes and may also direct sediment-laden runoff to a sediment-trapping structure. A diversion ditch can be located at the upslope side of a construction site to prevent surface runoff from entering the disturbed area. Ditches or berms on slopes need to be designed for erosive velocities. Also, ensure that the diverted water is released through a stable outlet and does not cause downslope or downstream erosion or flooding.

Installation Tips:

- Divert run-on and runoff away from disturbed areas
- Ensure that the diversion is protected from erosion, using vegetation, geotextiles, or other appropriate BMPs
- Divert sediment-laden water to a sediment-trapping structure
- Use practices that encourage infiltration of stormwater runoff wherever possible

Maintenance:

- Inspect diversions and berms, including any outlets, regularly and after each rainfall
- Remove any accumulated sediment

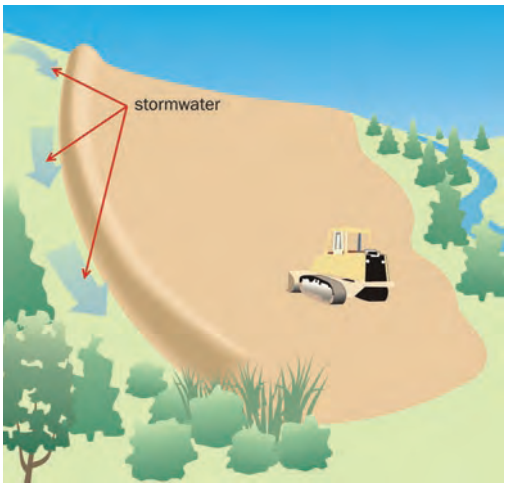


Figure 8. Illustration of a construction berm to divert stormwater away from the disturbed construction area.

ESC Principle 4: Stabilize soils promptly. Where construction activities have temporarily or permanently ceased, you should stabilize exposed soils to minimize erosion. You should have stabilization measures in place after grading activities have ceased (many permits require stabilization within a specified time frame). You can provide either temporary or permanent cover to protect exposed soils. Temporary measures are necessary when an area of a site is disturbed but where activities in that area are not completed or until permanent BMPs are established. Topsoil stockpiles should also be protected to minimize any erosion from these areas. Temporary-cover BMPs include temporary seeding, mulches, matrices, blankets and mats, and the use of soil binders (there may be additional state and local requirements for the use of chemical-based soil binders). Permanent-cover BMPs include permanent seeding and planting, sodding, channel stabilization, and vegetative buffer strips. Silt fence and other sediment control measures are not stabilization measures.

SWPPP Tip!

Final Stabilization

Once construction activity in an area is completed and the area is stabilized (typically by achieving 70 percent permanent vegetative cover), you can mark this area on your SWPPP and discontinue inspections in that area. By bringing areas of your site to final stabilization, you can reduce your workload associated with maintaining and inspecting BMPs. For more information on final stabilization, see Chapter 9.

Example BMP: Temporary Seeding

Description: Temporarily seeding an area to establish vegetative cover is one of the most effective, and least expensive, methods of reducing erosion. This approach, as a single BMP, might not be appropriate on steep slopes, when vegetation cannot be established quickly enough to control erosion during a storm event, or when additional activities might occur soon in the area.

Installation Tips:

- Seed and mulch area (the mulch provides temporary erosion protection by protecting the soil surface, moderating temperature, and retaining moisture while seeds germinate and grow)
- Water regularly, if needed, to ensure quick growth
- Maintain backup BMPs, such as silt fence or settling ponds

SWPPP Tip!

Wind Control BMPs

In areas where dust control is an issue, your SWPPP should include BMPs for wind-erosion control. These consist of mulching, wet suppression (watering), and other practices.

ESC Principle 5: Protect slopes. Protect all slopes with appropriate erosion controls. Steeper slopes, slopes with highly erodible soils, or long slopes require a more complex combination of controls. Erosion control blankets, bonded fiber matrices, or turf reinforcement mats are very effective options. Silt fence or fiber rolls may also be used to help control erosion on moderate slopes and should be installed on level contours spaced at 10- to 20-foot intervals. You can also use diversion channels and berms to keep stormwater off slopes.

Example BMP: Rolled erosion control products

Description: Erosion control products include mats, geotextiles, and erosion control blankets and products that provide temporary stabilization and help to establish vegetation on disturbed soils. Such products help control erosion and help establish vegetation and are often used on slopes, channels, or stream banks.

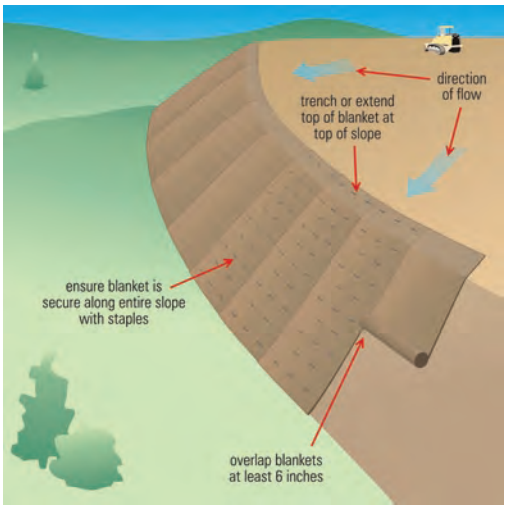


Figure 9. Illustration of erosion control blankets installed on slope.

Installation Tips:

- Use rolled erosion-control products on slopes steeper than 3 to 1 (horizontal to vertical) and in swales or long channels

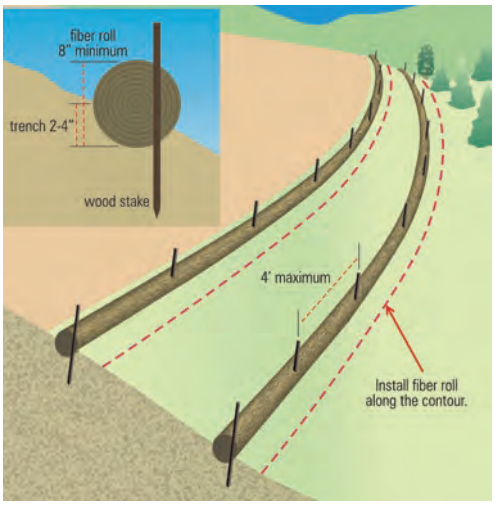


Figure 10. Illustration of a fiber roll installation along a slope.

- Trench the top of the blanket into the ground to prevent runoff from flowing under the blanket
- Overlap the lower end of the top mat over the top of the downslope mat to ensure that runoff stays on top of the blankets and mats
- Staple blankets and mats according to specifications

Maintenance:

- Periodically inspect for signs of erosion or failure
- Repair the blanket or mat if necessary
- Continue inspections until vegetation is established at the level required to qualify as final *stabilization*

ESC Principle 6: Protect storm drain inlets. Protect all inlets that could receive stormwater from the project until final stabilization of the site has been achieved. Install inlet protection before soil-disturbing activities begin. Maintenance throughout the construction process is important. Upon completion of the project, storm drain inlet protection is one of the temporary BMPs that should be removed. Storm drain inlet protection should be used not only for storm drains within the active construction project, but also for storm drains outside the project area that might receive stormwater discharges from the project. If there are storm drains on private property that could receive stormwater runoff from your project, coordinate with the owners of that property to ensure proper inlet protection.

Example BMP: Storm Drain Inlet Protection

Description: Storm drain inlet protection prevents sediment from entering a storm drain by surrounding or covering the inlet with a filtering material. Several types of filters are commonly used for inlet protection: silt fence, rock-filled bags, or block and gravel. The type of filter used depends on the inlet type (for example, curb inlet, drop inlet), slope, and volume of flow. Many different commercial inlet filters are also available. Some commercial inlet filters are placed in front of or on top of an inlet, while others are placed inside the inlet under the grate.

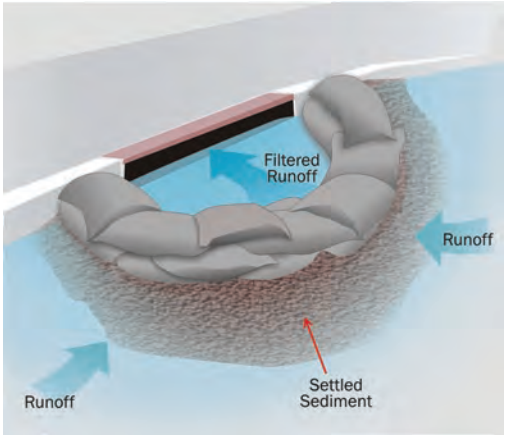


Figure 11. Illustration of a storm drain inlet with rock-filled bags filtering stormwater.

Installation Tips:

- Install inlet protection as soon as storm drain inlets are installed and before land-disturbance activities begin in areas with existing storm drain systems
- Protect all inlets that could receive stormwater from your construction project
- Use in conjunction with other erosion prevention and sediment control BMPs—remember, inlet protection is a secondary BMP!
- Design your inlet protection to handle the volume of water from the area being drained. Ensure that the design is sized appropriately.

Maintenance:

- Inspect inlets frequently and after each rainfall

- Remove accumulated sediment from around the device and check and remove any sediment that might have entered the inlet
- Replace or repair the inlet protection if it becomes damaged
- Sweep streets, sidewalks, and other paved areas regularly

SWPPP Tip!

Storm drain inlet protection should never be used as a primary BMP! Use erosion control techniques such as hydromulching or erosion-control blankets to prevent erosion. Use inlet protection and other sediment control BMPs as a *backup* or last line of defense.

ESC Principle 7: Establish perimeter controls. Maintain natural areas and supplement them with silt fence and fiber rolls around the perimeter of your site to help prevent soil erosion and stop sediment from leaving the site. Install controls on the downslope perimeter of your project (it is often unnecessary to surround the entire site with silt fence). Sediment barriers can be used to protect stream buffers, riparian areas, wetlands, or other waterways. They are effective only in small areas and should not be used in areas of concentrated flow.

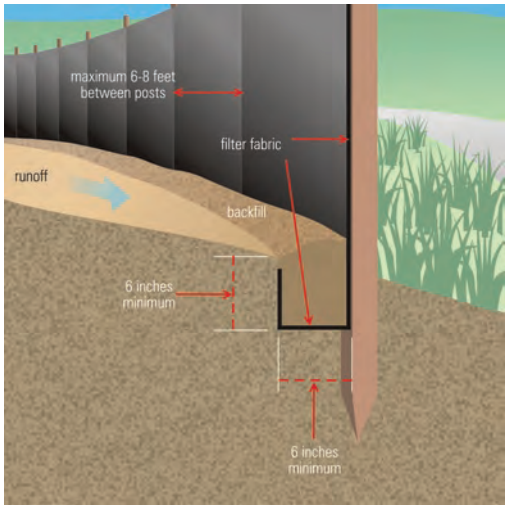


Figure 12. Illustration of proper techniques to use in installing silt fence.

Example BMP: Silt Fence and Fiber Rolls

Description: A silt fence is a temporary sediment barrier consisting of a geotextile attached to supporting posts and trenched into the ground. Silt fencing is intended to retain sediment that has been dislodged by stormwater. It is designed only for runoff from small areas and is not intended to handle flows from large slopes or in areas of concentrated flow. Fiber rolls serve the same purpose and consist of an open mesh tubular sleeve filled with a fibrous material which traps sediment. Fiber rolls are generally staked to the ground.

Installation Tips:

DO:

- Use silt fence or fiber rolls as perimeter controls, particularly at the lower or down slope edge of a disturbed area
- Leave space for maintenance between toe of slope and silt fence or roll
- Trench in the silt fence on the uphill side (6 inches deep by 6 inches wide)
- Install stakes on the downhill side of the fence or roll
- Curve the end of the silt fence or fiber roll up-gradient to help it contain runoff

DON'T:

- Install a silt fence or fiber rolls in ditches, channels, or areas of concentrated flow
- Install it running up and down a slope or hill
- Use silt fencing or fiber rolls alone in areas that drain more than a quarter-acre per 100 feet of fence

Maintenance:

- Remove sediment when it reaches one-third of the height of the fence or one-half the height of the fiber roll
- Replace the silt fence or roll where it is worn, torn, or otherwise damaged
- Retrench or replace any silt fence or roll that is not properly anchored to the ground

ESC Principle 8: Retain sediment on-site and control dewatering practices. Sediment barriers described in ESC Principle 7 can trap sediment from small areas, but when sediment retention from a larger area is required, consider using a temporary sediment trap or sediment basin. These practices detain sediment-laden runoff for a period of time, allowing sediment to settle before the runoff is discharged. Proper design and maintenance are essential to ensure that these practices are effective.

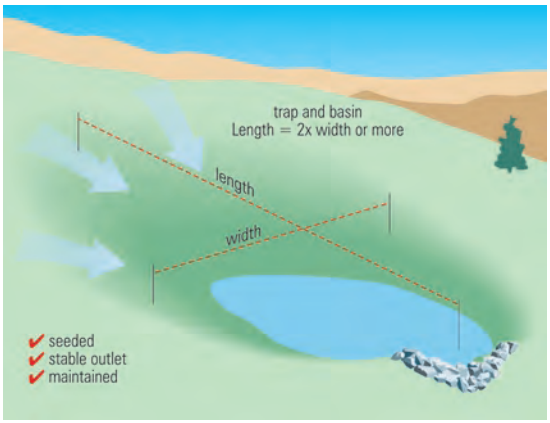


Figure 13. Illustration of a sediment basin.

You should use a sediment basin for common drainage locations that serve an area with 10 or more acres disturbed at any one time. The basin should be designed to provide storage for the volume of runoff from the drainage area for at least a 2-year, 24-hour storm (or 3,600 cubic feet of storage per acre drained, which is enough to contain 1 inch of runoff, if the 2-year, 24-hour calculation has not been performed). Check your permit for exact basin sizing requirements. Sediment basins should be located at low-lying areas of the site and on the down-gradient side of bare soil areas where flows converge. Do not put sediment traps or basins in or immediately adjacent to flowing streams or other waterways.

Where a large sediment basin is not practical, use smaller sediment basins or sediment traps (or both) where feasible. At a minimum, use silt fences, vegetative buffer strips, or equivalent sediment controls for all down-gradient boundaries (and for those side-slope boundaries deemed appropriate for individual site conditions).

Dewatering practices are used to remove ground water or accumulated rain water from excavated areas. Pump muddy water from these areas to a temporary or permanent sedimentation basin or to an area completely enclosed by silt fence in a flat vegetated area where discharges can infiltrate into the ground. Never discharge muddy water into storm drains, streams, lakes, or wetlands unless the sediment has been removed before discharge.

Keep in mind that some states and local jurisdictions require a separate permit for dewatering activities at a site.

ESC Principle 9: Establish stabilized construction exits. Vehicles entering and leaving the site have the potential to track significant amounts of sediment onto streets. Identify and clearly mark one or two locations where vehicles will enter and exit the site and focus stabilizing measures at those locations. Construction entrances are commonly made from large crushed rock. They can be further stabilized using stone pads or concrete. Also, steel wash racks and a hose-down system will remove even more mud and debris from vehicle tires. Divert runoff from wash areas to a sediment trap or basin. No system is perfect, so sweeping the street regularly completes this BMP.

Example BMP: Stabilized Construction Exit

Description: A rock construction exit can reduce the amount of mud transported onto paved roads by vehicles. The construction exit does this by removing mud from vehicle tires before the vehicle enters a public road.

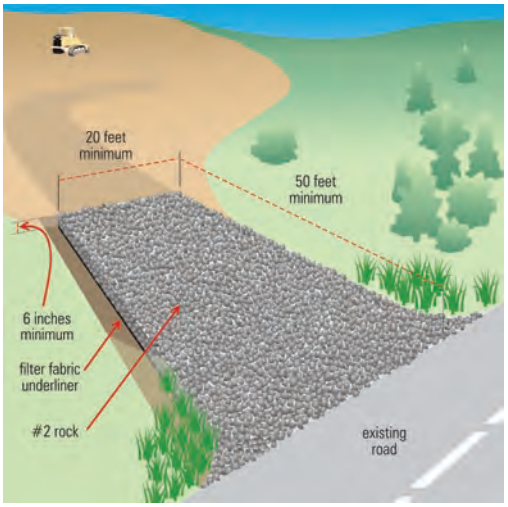


Figure 14. Illustration of a stabilized construction exit.

You might also want to install a wheel wash when mud is especially difficult to remove or space doesn't allow sufficient tire revolutions (four or five are needed) before exiting the site. Direct wash water to a suitable settling area—do not discharge wash water to a stream or storm drain!

Installation tips:

- Ensure that the exit is at least 50 feet long (generally, the length of two dump trucks) and graded so runoff does not enter the adjacent street
- Place a geotextile fabric under a layer of aggregate at least 6–12 inches thick. The stones or aggregate should be 3–6 inches in diameter
- Train employees and subcontractors to use the designated construction exits. Empower your employees to provide directions to subcontractors and others that are not on the site every day

Maintenance:

- Replenish or replace aggregate if it becomes clogged with sediment
- Sweep the street regularly

ESC Principle 10: Inspect and maintain controls. Inspection and maintenance is just as important as proper planning, design, and installation of controls. Without adequate maintenance, erosion and sediment controls will quickly fail, sometimes after just one rainfall, and cause significant water quality problems and potential violations of the NPDES construction general permit. Your permit likely requires you to maintain your BMPs at all times. To do this effectively, you should establish an inspection and maintenance approach or strategy that includes both regular and spot inspections. Inspecting both prior to predicted storm events and after will help ensure that controls are working effectively. Perform maintenance or corrective action as soon as problems are noted. **Inspection and maintenance of BMPs are addressed in more detail in Chapter 6.**

Other Sediment and Erosion Control Techniques

As mentioned at the beginning of this chapter, there are many other erosion and sediment control techniques that can be used effectively. The BMPs highlighted in this chapter are among those more commonly used and highlight many general erosion and sediment control principles for which other BMPs may be used effectively. Check to see if your state or local government has developed a BMP design manual for detailed information on any BMP you are considering. Appendix D lists several good BMP design manuals. You can also find out more about various BMPs by visiting EPA's Menu of BMPs at **www.epa.gov/npdes/menuofbmps**

The following BMPs are also commonly used at construction sites.

Erosion control measures:

- Surface roughening, trackwalking, scarifying, sheepsfoot rolling, imprinting
- Soil bioengineering techniques (e.g., live staking, fascines, brush wattles)
- Composting
- Sodding

Sediment control and runoff management measures:

- Gravel bag barrier
- Compost berm
- Rock or brush filters
- Baffles or skimmers in sediment basins to increase effectiveness
- Lowering soil levels near streets and sidewalks to prevent runoff
- Level spreaders
- Energy dissipaters
- Check dams

Chapter 5: **SWPPP Development—Selecting Good Housekeeping BMPs**

▶ **This chapter presents a brief discussion of good housekeeping principles to consider to ensure your construction site does not contaminate stormwater runoff.**

As noted in Chapter 3, sediment is the principal pollutant of concern in stormwater discharges from construction sites. But, EPA's CGP and many state construction general permits require that the SWPPP describe good housekeeping measures for other pollutants that might be found on construction sites. This chapter discusses these measures.

Six Key Pollution Prevention Principles for Good Housekeeping

Construction projects generate large amounts of building-related waste, which can end up polluting stormwater runoff if not properly managed. The suite of BMPs that are described in your SWPPP must include pollution prevention (P2) or good housekeeping practices that are designed to prevent contamination of stormwater from a wide range of materials and wastes at your site. The six principles described below are designed to help you identify the pollution prevention practices that should be described in your SWPPP and implemented at your site.

1. Provide for waste management
2. Establish proper building material staging areas
3. Designate paint and concrete washout areas
4. Establish proper equipment/vehicle fueling and maintenance practices
5. Control equipment/vehicle washing and allowable non-stormwater discharges
6. Develop a spill prevention and response plan

P2 Principle 1: Provide for waste management. Design proper management procedures and practices to prevent or reduce the discharge of pollutants to stormwater from solid or liquid wastes that will be generated at your site. Practices such as trash disposal, recycling, proper material handling, and cleanup measures can reduce the potential for stormwater runoff to pick up construction site wastes and discharge them to surface waters.

Figure 15. Illustration showing construction materials with secondary containment and overhead cover to prevent stormwater contamination.

Provide convenient, well-maintained, and properly located toilet facilities. Provide for regular inspections, service, and disposal. Locate toilet facilities away from storm drain inlets and waterways to prevent accidental spills and contamination of stormwater. Treat or dispose of sanitary and septic waste in accordance with state or local regulations.

Proper material use, storage, waste disposal, and training of employees and subcontractors can prevent or reduce the discharge of hazardous and toxic wastes to stormwater. Implement a comprehensive set of waste-management practices for hazardous or toxic materials, such as paints, solvents, petroleum products, pesticides, wood preservatives, acids, roofing tar, and other materials. Practices should include storage, handling, inventory, and cleanup procedures, in case of spills (see the following P2 principles).

Waste Management Checklist

Solid or Construction Waste

- ✓ Designate trash and bulk waste-collection areas on-site
- ✓ Recycle materials whenever possible (e.g., paper, wood, concrete, oil)
- ✓ Segregate and provide proper disposal options for hazardous material wastes
- ✓ Clean up litter and debris from the construction site daily
- ✓ Locate waste-collection areas away from streets, gutters, watercourses, and storm drains. Waste-collection areas (dumpsters, and such) are often best located near construction site entrances to minimize traffic on disturbed soils. Consider secondary containment around waste collection areas to further minimize the likelihood of contaminated discharges.

Sanitary and Septic Waste

- ✓ Provide restroom facilities on-site
- ✓ Maintain clean restroom facilities and empty porta-johns regularly
- ✓ Provide secondary containment pans under porta-johns, where possible
- ✓ Provide tie-downs or stake downs for porta-johns in areas of high winds
- ✓ Educate employees, subcontractors, and suppliers on locations of facilities
- ✓ Do not discharge or bury wastewater at the construction site
- ✓ Inspect facilities for leaks, repair or replace immediately

Hazardous Materials and Wastes

- ✓ Develop and implement employee and subcontractor education, as needed, on hazardous and toxic waste handling, storage, disposal, and cleanup
- ✓ Designate hazardous waste-collection areas on-site
- ✓ Place all hazardous and toxic material wastes in secondary containment
- ✓ Hazardous waste containers should be inspected to ensure that all containers are labeled properly and that no leaks are present

P2 Principle 2: Establish proper building material handling and staging areas.
Your SWPPP should include comprehensive handling and management procedures for building materials, especially those that are hazardous or toxic. Paints, solvents, pesticides, fuels and oils, other hazardous materials or any building materials that have the potential to contaminate stormwater should be stored indoors or under cover whenever possible or in areas with secondary containment. Secondary containment prevents a spill from spreading across the site and include dikes, berms, curbing, or other containment methods. Secondary containment techniques should also ensure the protection of ground water. Designate staging areas for activities such as fueling vehicles, mixing paints, plaster, mortar, and so on. Designated staging areas will help you to monitor the use of materials and to clean up any spills. Training employees and subcontractors is essential to the success of this pollution prevention principle.

SWPPP Tip!

Material Staging Area Measures

Your SWPPP should include procedures for storing materials that can contribute pollutants to stormwater. Consider the following:

- Train employees and subcontractors in proper handling and storage practices
- Designate site areas for storage. Provide storage in accordance with secondary containment regulations and provide cover for hazardous materials when necessary. Ensure that storage containers are regularly inspected for leaks, corrosion, support or foundation failure, or any other signs of deterioration and tested for soundness
- Reuse and recycle construction materials when possible

P2 Principle 3: Designate washout areas.
Concrete contractors should be encouraged, where possible, to use the washout facilities at their own plants or dispatch facilities. If it is necessary to provide for concrete washout areas on-site, designate specific washout areas and design facilities to handle anticipated washout water. Washout areas should also be provided for paint and stucco operations. Because washout areas can be a source of pollutants from leaks or spills,

EPA recommends that you locate them at least 50 yards away from storm drains and watercourses whenever possible.

Several companies rent or sell prefabricated washout containers, and some provide disposal of waste solids and liquids along with the containers. These prefabricated containers are sturdy and provide a more reliable option for preventing leaks and spills of wash water than self-constructed washouts. Alternatively, you can construct your own washout area, either by digging a pit and lining it with 10 mil plastic sheeting or creating an aboveground structure from straw bales or sandbags with a plastic liner. If you create your own structure, you should inspect it daily for leaks or tears in the plastic because these structures are prone to failure.

Regular inspection and maintenance are important for the success of this BMP. Both self-constructed and prefabricated washout containers can fill up quickly when concrete, paint, and stucco work are occurring on large portions of the site. You should also inspect for evidence that contractors are using the washout areas and not dumping materials onto the ground or into drainage facilities. If the washout areas are not being used regularly, consider posting additional signage, relocating the facilities to more convenient locations, or providing training to workers and contractors.

SWPPP Tip!

Washout Area Measures

When concrete, paint, or stucco is part of the construction process, consider these practices which will help prevent contamination of stormwater. Include the locations of these areas and your maintenance and inspection procedures in your SWPPP.

- Do not washout concrete trucks or equipment into storm drains, streets, gutters, uncontained areas, or streams
- Establish washout areas and advertise their locations with signs
- Provide adequate containment for the amount of wash water that will be used
- Inspect washout structures daily to detect leaks or tears and to identify when materials need to be removed
- Dispose of materials properly. The preferred method is to allow the water to evaporate and to recycle the hardened concrete. Full service companies may provide dewatering services and should dispose of wastewater properly. Concrete wash water can be highly polluted. It should not be discharged to any surface water, storm sewer system, or allowed to infiltrate into the ground. It should not be discharged to a sanitary sewer system without first receiving written permission from the system operator

P2 Principle 4: Establish proper equipment/vehicle fueling and maintenance practices. Performing equipment/vehicle fueling and maintenance at an off-site facility is preferred over performing these activities on the site, particularly for road vehicles (e.g., trucks, vans). For grading and excavating equipment, this is usually not possible or desirable. Create an on-site fueling and maintenance area that is clean and dry. The on-site fueling area should have a spill kit, and staff should know how to use it. If possible, conduct vehicle fueling and maintenance activities in a covered area; outdoor vehicle fueling and maintenance is a potentially significant source of stormwater pollution. Significant maintenance on vehicles and equipment should be conducted off-site.

SWPPP Tip!

Equipment/Vehicle Fueling and Maintenance Measures

Consider the following practices to help prevent the discharge of pollutants to stormwater from equipment/vehicle fueling and maintenance. Include the locations of these areas and your inspection and maintenance procedures in your SWPPP.

- Train employees and subcontractors in proper fueling procedures (stay with vehicles during fueling, proper use of pumps, emergency shut-off valves, and such)
- Inspect on-site vehicles and equipment daily for leaks, equipment damage, and other service problems
- Clearly designate vehicle/equipment service areas away from drainage facilities and water-courses to prevent stormwater run-on and runoff
- Use drip pans, drip cloths, or absorbent pads when replacing spent fluids
- Collect all spent fluids, store in appropriate labeled containers in the proper storage areas, and recycle fluids whenever possible

P2 Principle 5: Control equipment/vehicle washing and allowable non-stormwater discharges. Environmentally friendly washing practices can be practiced at every construction site to prevent contamination of surface and ground water from wash water. Procedures and practices include using off-site facilities; washing in designated, contained areas only; eliminating discharges to the storm drain by infiltrating the wash water or routing to the sanitary sewer; and training employees and subcontractors in proper cleaning procedures.

Take a Closer Look…

Non-Stormwater Runoff

A construction site might have sources of runoff that are not generated by stormwater. These non-stormwater discharges include fire hydrant flushing, vehicle or equipment wash water (no detergents!), water used to control dust, and landscape irrigation.

What does this mean to me?

Take steps to infiltrate these sources of uncontaminated water into the ground. You can also route these sources of water to sediment ponds or detention basins or otherwise treat them with appropriate BMPs.

SWPPP Tip!

Equipment/Vehicle Washing Measures

The following equipment/vehicle washing measures will help prevent stormwater pollution. Include the location of your washing facilities and your inspection and maintenance procedures in your SWPPP.

- Educate employees and subcontractors on proper washing procedures
- Clearly mark the washing areas and inform workers that all washing must occur in this area
- Contain wash water and treat and infiltrate it whenever possible
- Use high-pressure water spray at vehicle washing facilities without any detergents because water can remove most dirt adequately
- Do not conduct any other activities, such as vehicle repairs, in the wash area

P2 Principle 6: Develop a spill prevention and response plan. Most state and EPA construction general permits require the preparation of spill prevention and response plans. Generally, these plans can be included or incorporated into your SWPPP. The plan should clearly identify ways to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and response. The plan should also specify material handling procedures and storage requirements and ensure that clear and concise spill cleanup procedures are provided and posted for areas in which spills may potentially occur. When developing a spill prevention plan, include, at a minimum, the following:

- Note the locations of chemical storage areas, storm drains, tributary drainage areas, surface waterbodies on or near the site, and measures to stop spills from leaving the site
- Specify how to notify appropriate authorities, such as police and fire departments, hospitals, or municipal sewage treatment facilities to request assistance
- Describe the procedures for immediate cleanup of spills and proper disposal
- Identify personnel responsible for implementing the plan in the event of a spill

SWPPP Tip!

Spill Prevention Measures

Additional spill prevention measures that will help prevent spills and leaks include the following:

- Describe and list all types of equipment to be used to adequately clean up the spill
- Provide proper handling and safety procedures for each type of waste
- Establish an education program for employees and subcontractors on the potential hazards to humans and the environment from spills and leaks
- Update the spill prevention plan and clean up materials as changes occur to the types of chemicals stored and used at the facility

Take a Closer Look…

Spill Prevention, Control and Countermeasure (SPCC) Plan

Construction sites may be subject to 40 CFR Part 112 regulations that require the preparation and implementation of a SPCC Plan to prevent oil spills from aboveground and underground storage tanks. Your facility is subject to this rule if you are a nontransportation-related facility that:

- Has a total storage capacity greater than 1,320 gallons or a completely buried storage capacity greater than 42,000 gallons and
- Could reasonably be expected to discharge oil in quantities that may be harmful to navigable waters of the United States and adjoining shorelines

Furthermore, if your facility is subject to 40 CFR Part 112, your SWPPP should reference the SPCC Plan. To find out more about SPCC Plans, see EPA's website on SPPC at **www.epa.gov/oilspill/spcc.htm**

What does this mean to me?

Reporting Oil Spills

In the event of an oil spill, you should contact the National Response Center toll free at 1-800-424-8802 for assistance, or for more details, visit their website: ***www.nrc.uscg.mil/nrchp.html***

Chapter 6: **SWPPP Development—Inspections, Maintenance, and Recordkeeping**

▶ **This chapter describes the inspection and maintenance procedures your SWPPP should include, as well as recordkeeping requirements.**

A. Describe Your Plans and Procedures for Inspecting BMPs

Earlier discussions in this manual pointed out that the effectiveness of erosion and sediment control BMPs and good housekeeping and pollution prevention measures depend on consistent and continual inspection and maintenance. This step focuses on developing a plan for BMP inspection and maintenance to ensure that a schedule and procedures are in place.

Inspections

Your responsibility does not stop after BMPs are installed. Your BMPs must be maintained in good working order at all times. Further, your permit requires that you conduct regular inspections and document the findings of those inspections in your SWPPP.

Your construction general permit describes the ***minimum*** frequency of inspections, which is typically weekly or bi-weekly and after each rainfall event exceeding one-half inch. To meet the requirement to maintain all BMPs in good working order, EPA recommends that you develop an inspection schedule that goes beyond these minimums and is customized for your site and the conditions affecting it.

In developing your inspection schedule consider the following:

- Consider using *spot* inspections. You may want to inspect certain parts of your site more frequently or even daily. Target places that need extra attention, such as areas around construction site entrances, check nearby streets for dirt, check inlet protection, and so on.
- Consider using informal inspections. Your permit outlines the minimum requirements for formal inspections that must be documented and included in your SWPPP. You can also add informal inspections that wouldn't require documentation, unless of course, a problem is identified. Always document any problems you find and those that are identified by staff.
- Consider adding inspections *before or even during* rain events. Many permits require inspections of BMPs after rain events. You should consider adding inspections ***before or during*** predicted rain events. Consult a local weather source and initiate inspections before predicted storm events as a way to ensure that controls are operational.
- Train staff and subcontractors. Use your staff and subcontractors to help identify any potential problems with your BMPs. Again, document any issues that are confirmed problems.

SWPPP Tip!

Inspection Guide

The State of Minnesota has developed a *Stormwater Construction Inspection Guide* to assist municipal site inspectors in procedures for conducting a compliance inspection at construction sites. This guide can also be useful for construction operators conducting self-inspections. Available at **www.pca.state.mn.us/water/stormwater/stormwatr-c.html**

EPA recommends that you develop an inspection schedule that meets the needs of your site. You'll probably also want to update and refine this schedule based on your experiences, the findings of your inspections, and the changing conditions at your site.

SWPPP Tip!

Selecting BMP Inspectors

A BMP inspection is only as good as the inspector. Therefore, it is important to select qualified personnel to conduct BMP inspections. The SWPPP should identify who has the responsibility for conducting inspections. Personnel selected to conduct inspections should be knowledgeable in the principles and practices of erosion and sediment controls, possess the technical skills to assess conditions at the construction site that could impact stormwater quality, and assess the effectiveness of any sediment and erosion control measures selected.

Several states and other organizations offer training that will help prepare inspectors to accurately evaluate BMPs, decide when maintenance is appropriate, or when a different BMP should be substituted. (Several states require that sites be inspected by someone that the state certifies as a qualified inspector.) One national organization offers two certification programs that would be useful for personnel who are developing and implementing SWPPPs and conducting inspections. These certification programs are called: "*Certified Professional in Erosion and Sediment Control (CPESC)*" and "*Certified Professional in Stormwater Quality (CPSWQ)*." You can find more information on these programs at **www.cpesc.org**

Inspection Reports

Complete an inspection report after each inspection. You should retain copies of all inspection reports and keep them with or in your SWPPP. Generally, the following information is required to be included in your inspection report:

- Inspection date
- Inspector information, including the names, titles, and qualifications of personnel conducting the inspection
- Weather information for the period since the last inspection (or for the first inspection since commencement of construction activity) including a best estimate of the beginning of each storm, its duration, approximate amount of rainfall for each storm (in inches), and whether any discharges occurred. You may create a log to record the basic weather information or you may keep copies of weather information from a reliable local source, such as the internet sites of local newspapers, TV stations, local universities, etc.
- Current weather information and a description of any discharges occurring at the time of the inspection
- Descriptions of evidence of previous or ongoing discharges of sediment or other pollutants from the site
- Location(s) of BMPs that need to be maintained
- Location(s) of BMPs that failed to operate as designed or proved inadequate for a location
- Location(s) where additional BMPs are needed but did not exist at the time of inspection
- Corrective action required, including any necessary changes to the SWPPP and implementation dates
- Reference to past corrective actions documenting follow-up actions taken

Consider taking digital photographs during inspections to document BMPs, problems identified, and progress in implementing the SWPPP.

Appendix B includes an example stormwater inspection report. You should use this report, or a similar report, to document your stormwater construction site inspections. Check to see if your state or local authority has developed an inspection checklist for your use. The inspection report is broken up into two main sections—site-specific BMPs and overall site issues. For the site-specific BMPs, you should number the structural and non-structural BMPs in your SWPPP on a copy of your site map (preferably in the order in which you would inspect them on the site). Then as you conduct your inspections, you can verify whether each BMP has been installed and maintained. If a BMP has not been installed or needs maintenance, describe this in the corrective action section and list a date for when the corrective action will be completed and who will be responsible for completing the action. The overall site issues section describes 11 common issues at construction sites you should inspect for. You can customize this form to meet the needs of your particular situation.

Make sure each inspection report is signed and certified consistent with your permit's requirements.

Chapter 8, Section D contains more information on implementing an inspection program. Also, see the suggested inspection report form in Appendix B.

SWPPP Tip!

Consider More Effective BMPs

During inspections, consider whether the installed BMPs are working effectively. If you find a BMP that is failing or overwhelmed by sediment, you should consider whether it needs to be replaced with a more effective BMP or enhanced by the addition of another, complimentary BMP. Ensure that you record such changes in your SWPPP and on your site map.

B. BMP Maintenance

Implementing a good BMP maintenance program is essential to the success of your SWPPP and to your efforts to protect nearby waterways. You should conduct maintenance of BMPs regularly and whenever an inspection (formal or informal) identifies a problem or potential issue. For instance, trash and debris should be cleaned up, dumpsters should be checked and covered, nearby streets and sidewalks should be swept daily, and so on. Maintenance on erosion and sediment controls should be performed as soon as site conditions allow. Consider the following points when conducting maintenance:

- Follow the designers or manufacturer's recommended maintenance procedures for all BMPs
- Maintenance of BMPs will vary according to the specific area and site conditions
- Remove sediment from BMPs as appropriate and properly dispose of sediment into controlled areas to prevent soil from returning to the BMP during subsequent rain events
- Remove sediment from paved roadways and from around BMPs protecting storm drain inlets
- Ensure that construction support activities, including borrow areas, waste areas, contractor work areas, and material storage areas and dedicated concrete and asphalt batch plants are cleaned and maintained
- Replace damaged BMPs, such as silt fences, that no longer operate effectively

You should keep a record of all maintenance activities, including the date, BMP, location, and maintenance performed in your SWPPP.

C. Recordkeeping

You must keep copies of the SWPPP, inspection records, copies of all reports required by the permit, and records of all data used to complete the NOI to be covered by the permit for a period of at least 3 years from the date that permit coverage expires or is terminated.

Records should include:

- A copy of the SWPPP, with any modifications
- A copy of the NOI and Notice of Termination (NOT) and any stormwater-related correspondence with federal, state, and local regulatory authorities
- Inspection forms, including the date, place, and time of BMP inspections
- Names of inspector(s)
- The date, time, exact location, and a characterization of significant observations, including spills and leaks
- Records of any non-stormwater discharges
- BMP maintenance and corrective actions taken at the site (Corrective Action Log)
- Any documentation and correspondence related to endangered species and historic preservation requirements
- Weather conditions (e.g., temperature, precipitation)
- Date(s) when major land disturbing (e.g. clearing, grading, and excavating) activities occur in an area
- Date(s) when construction activities are either temporarily or permanently ceased in an area
- Date(s) when an area is either temporarily or permanently stabilized

Chapter 7: **Certification and Notification**

▶ **This chapter describes how, after developing your SWPPP, you can obtain permit coverage for your stormwater discharges.**

A. Certification

Signature and Certification

The construction site operator must sign the permit application form, which is often called a *Notice of Intent* or *NOI*. (In some instances, the construction general permit may not require the submission of an NOI or application. Construction activities may be covered automatically.)

All reports, including SWPPPs and inspection reports, generally must be signed by the construction site operator or a duly authorized representative of that person. The authorized representative is typically someone who has direct responsibility for implementing the SWPPP. If the operator chooses to designate an authorized representative, a signed letter or statement to that effect must be included in the SWPPP. Check your permit for exact requirements.

Your SWPPP must include the signature of the construction site operator or authorized representative and the certification statement provided in the general permit. An example of the certification language from EPA's Construction General Permit follows:

> "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 gathered and evaluated 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."

This ensures that the SWPPP was developed and reviewed by a responsible party with the ability to implement the BMPs and other commitments described in the SWPPP.

SWPPP Tip!

Posting a sign at the construction entrance

EPA and many state general permits require that you post a sign or other notice conspicuously near the main entrance of the construction site. EPA's permit requires that the sign contain a copy of the NOI, the location of the SWPPP, and a contact person for viewing the SWPPP.

Copy of Permit Requirements

Most general permits require you to keep a copy of the permit and your NOI with your SWPPP. This allows you to quickly check the permit if a question arises about a permit requirement.

Other State, Tribal, and Local Programs

Include in your SWPPP a description of any other federal, state, tribal, or local requirements for erosion and sediment control and stormwater management that apply to your site. Many local governments also impose erosion and sediment control requirements; your SWPPP should comply with both the general permit and any applicable local requirements.

SWPPP Tip!

Making your SWPPP available

While EPA and most states do not require you to submit a copy of your SWPPP for review, your SWPPP must be available to these and other government agencies for inspection. Your permit may also require you to make your SWPPP available to the public, if requested. If you have the ability, you should consider posting your SWPPP on the Internet and publicizing the URL. Check your permit for exact requirements.

B. Notification

Now that you have developed your SWPPP and before you begin construction, you must begin the process of obtaining permit coverage from your authorized state or EPA. Authorized states and EPA use *general* permits to cover all construction sites. These broadly written general or *umbrella* permits apply to all construction activities in a given state.

Obtaining Coverage Under a General Permit

Important! Before obtaining permit coverage, you should read a copy of the appropriate construction general permit *and* develop your SWPPP.

To obtain coverage under a state or EPA construction general permit, you will typically need to fill out and submit an application form, often called a Notice of Intent or NOI. Submitting this form to the permitting authority indicates your *intent* to be authorized to discharge stormwater under the appropriate general permit for construction activities. Depending on the permit, you may be authorized to discharge immediately or at some later time. In some cases, you are not authorized to discharge until the state has notified you accordingly. EPA's Construction General Permit requires a 7-day waiting period after a complete NOI is received and posted on EPA's website (**www.epa.gov/npdes/noisearch**). The waiting period expires when the permit's status changes from *waiting* to *active*.

Take a Closer Look…

Information on the Application or Notice of Intent (NOI)

The NOI provides the permitting authority with pertinent information about your construction site, such as owner/operator information, site location, estimated project start and completion dates, approximate area to be disturbed, information about your SWPPP, receiving waters, and endangered species review certification. An appropriate person who is authorized to represent your organization must sign and verify that the facts contained in the NOI are true and accurate. For businesses, a certifying official is typically a corporate officer, such as a president, vice president, or manager of operations. For municipalities, it's typically a principal executive officer or ranking elected official. Check your permit for exact signature requirements.

In general, the only information you need to submit to the permitting authority is the NOI. EPA and most authorized state agencies do not require you to submit your SWPPP for approval. However, many local governments review and approve at least the erosion and sediment control component of your SWPPP.

What does this mean to me?

There are significant penalties for failing to obtain authorization to discharge or for submitting inaccurate information. If you are the certifying official, make sure you are authorized to discharge before construction activities begin.

SWPPP Tip!

Deadline for submitting NOIs under EPA's Construction General Permit

For EPA's construction general permit, the fastest and easiest way to obtain permit coverage is to use EPA's electronic permit application system, called "eNOI" at **www.epa.gov/npdes/stormwater/enoi**. Using this approach, you may be authorized to discharge in as little as 7 days after submission of your electronic NOI. If you choose to submit your NOI by mail, EPA recommends that you send it at least one month before you need permit coverage.

Chapter 8: **SWPPP Implementation**

▶ **Your SWPPP is your guide to preventing stormwater pollution. However, it is just a plan. Implementing your SWPPP, maintaining your BMPs, and then constantly reevaluating and revising your BMPs and your SWPPP are the keys to protecting your local waterways.**

A. Train Your Staff and Subcontractors

Your site's construction workers and subcontractors might not be familiar with stormwater BMPs, and they might not understand their role in protecting local rivers, lakes and coastal waters. Training your staff and subcontractors in the basics of erosion control, good housekeeping, and pollution prevention is one of the most effective BMPs you can institute at your site.

Basic training should include

- Spill prevention and cleanup measures, including the prohibition of dumping any material into storm drains or waterways
- An understanding of the basic purpose of stormwater BMPs, including what common BMPs are on-site, what they should look like, and how to avoid damaging them
- Potential penalties associated with stormwater noncompliance

Staff directly responsible for implementing the SWPPP should receive comprehensive stormwater training, including

- The location and type of BMPs being implemented
- The installation requirements and water quality purpose for each BMP
- Maintenance procedures for each of the BMPs being implemented
- Spill prevention and cleanup measures
- Inspection and maintenance recordkeeping requirements

You can train staff and subcontractors in several ways: short training sessions (food and refreshments will help increase attendance), posters and displays explaining your site's various BMPs, written agreements with subcontractors to educate their staff members, signs pointing out BMPs and reminders to keep clear of them. Every construction site operator should try to train staff and subcontractors to avoid damaging BMPs. By doing so, operators can avoid the added expense of repairs.

SWPPP Tip!

Train your staff and subcontractors!

Here are a few key things you will want to cover with each person working on your site:

- Use only designated construction site entrances
- Keep equipment away from silt fences, fiber rolls, and other sediment barriers
- Know the locations of disposal areas, and know the proper practices for trash, concrete and paint washout, hazardous chemicals, and so on
- Keep soil, materials, and liquids away from paved areas and storm drain inlets. Never sweep or wash anything into a storm drain
- Know the location and understand the proper use of spill kits
- Know the locations of your site's designated protection areas. Keep equipment away from stream banks, valuable trees and shrubs, and steep slopes. Clearly mark these areas with signs
- Keep equipment off mulched, seeded, or stabilized areas. Post signs on these areas, too
- Know who to contact when problems are identified!

B. Ensure Responsibility—Subcontractor Agreements

At any given site, there might be multiple parties (developer, general contractor, builders, subcontractors) that have roles and responsibilities for carrying out or maintaining stormwater BMPs at a given site. These roles and responsibilities should be documented clearly in the SWPPP (see Chapter 2, Section D). In some cases (state requirements vary), there may be one entity that has developed the SWPPP and filed for permit coverage and, therefore, is designated as the *operator*. When other parties at a site are not officially designated as operators, many operators are incorporating the roles and responsibilities of these *non-operators* in the agreements and contracts they have with these companies and individuals. This contract language should spell out responsibilities implementing and maintaining stormwater BMPs, for training staff, and for correcting damage to stormwater BMPs on the site. Several states have stormwater regulations that hold other parties liable even if they are not identified as the *operator*.

C. Implement Your SWPPP Before Construction Starts

Once you have obtained permit coverage and you are ready to begin construction, it is time to implement your SWPPP. You must implement appropriate parts of your SWPPP before construction activity begins. This generally involves installing storm drain inlet protection, construction entrances, sediment basins, and perimeter silt fences before clearing, grading, and excavating activities begin.

After construction activities begin, your SWPPP should describe when additional erosion and sediment controls will be installed (generally after initial clearing and grading activities are complete). You should also begin BMP inspections once clearing and grading activities begin.

SWPPP Tip!

Take Photographs During Inspections

Taking photographs can help you document areas that need maintenance and can help identify areas where subcontractors might need to conduct maintenance. Photographs can also help provide documentation to EPA or state inspectors that maintenance is being performed.

SWPPP Tip!

Prepare for the rain and snowmelt!

In some areas of the country, construction site operators are required to develop *weather triggered* action plans that describe additional activities the operator will conduct 48 hours before a predicted storm (at least a 50 percent forecasted chance of rain). It is also a good idea to stockpile additional erosion and sediment control BMPs (such as silt fencing, and fiber rolls) at the site for use when necessary.

D. Conduct Inspections and Maintain BMPs

As mentioned earlier (Chapter 6), EPA recommends that you develop an inspection schedule for your site that considers the size, complexity, and other conditions at your site. This should include regularly scheduled inspections and less formal inspections. EPA recommends that you develop a plan that includes inspections before and after anticipated rain events. You might also want to inspect some BMPs during rain events to see if they are actually keeping sediment on site! Conducting inspections during rain events also allows a construction site operator to address minor problems before they turn into major problems.

Temporarily Removed BMPs

BMPs sometimes need to be temporarily removed to conduct work in an area of the site. These temporarily removed BMPs should be noted on the site plan and replaced as soon as possible after the completion of the activity requiring their removal. If a rain is forecast, the BMPs should be replaced as soon as possible before the rain event.

Recommended Inspection Sequence

You should conduct thorough inspections of your site, making sure to inspect all areas and BMPs. The seven activities listed below are a recommended inspection sequence that will help you conduct a thorough inspection (adapted from MPCA 2004).

1. Plan your inspection

- ☑ Create a checklist to use during the inspection (see Appendix B)
- ☑ Obtain a copy of the site map with BMP locations marked
- ☑ Plan to walk the entire site, including discharge points from the site and any off-site support activities such as concrete batch plants should also be inspected
- ☑ Follow a consistent pattern each time to ensure you inspect all areas (for example, starting at the lowest point and working uphill)

2. Inspect discharge points and downstream, off-site areas

- ☑ Inspect discharge locations to determine whether erosion and sediment control measures are effective
- ☑ Inspect nearby downstream locations, if feasible
- ☑ Walk *down the street* to inspect off-site areas for signs of discharge. This is important in areas with existing curbs and gutters
- ☑ Inspect downslope municipal catch basin inlets to ensure that they are adequately protected

3. Inspect perimeter controls and slopes

- ☑ Inspect perimeter controls such as silt fences to determine if sediment should be removed
- ☑ Check the structural integrity of the BMP to determine if portions of the BMP need to be replaced
- ☑ Inspect slopes and temporary stockpiles to determine if erosion controls are effective

4. Compare BMPs in the site plan with the construction site conditions

- ☑ Determine whether BMPs are in place as required by the site plan
- ☑ Evaluate whether BMPs have been adequately installed and maintained
- ☑ Look for areas where BMPs are needed but are missing and are not in the SWPPP

5. Inspect construction site entrances

- ☑ Inspect the construction exits to determine if there is tracking of sediment from the site onto the street
- ☑ Refresh or replace the rock in designated entrances
- ☑ Look for evidence of additional construction exits being used that are not in the SWPPP or are not stabilized
- ☑ Sweep the street if there is evidence of sediment accumulation

6. Inspect sediment controls

- ☑ Inspect any sediment basins for sediment accumulation
- ☑ Remove sediment when it reduces the capacity of the basin by the specified amount (many permits have specific requirements for sediment basin maintenance. Check the appropriate permit for requirements and include those in your SWPPP)

7. Inspect pollution prevention and good housekeeping practices

- ☑ Inspect trash areas to ensure that waste is properly contained
- ☑ Inspect material storage and staging areas to verify that potential pollutant sources are not exposed to stormwater runoff
- ☑ Verify that concrete, paint, and stucco washouts are being used properly and are correctly sized for the volume of wash water
- ☑ Inspect vehicle/equipment fueling and maintenance areas for signs of stormwater pollutant exposure

Common Compliance Problems During Inspections

The following are problems commonly found at construction sites. As you conduct your inspections, look for these problems on your site (adapted from MPCA 2004).

Problem #1—Not using phased grading or providing temporary or permanent cover (i.e., soil stabilization)

In general, construction sites should phase their grading activities so that only a portion of the site is exposed at any one time. Also, disturbed areas that are not being actively worked should have temporary cover. Areas that are at final grade should receive permanent cover as soon as possible.

Problem #2—No sediment controls on-site

Sediment controls such as silt fences, sediment barriers, sediment traps and basins must be in place before soil-disturbance activities begin. Don't proceed with grading work out-of-phase.

Problem #3—No sediment control for temporary stockpiles

Temporary stockpiles must be seeded, covered, or surrounded by properly installed silt fence. Stockpiles should never be placed on paved surfaces.

Problem #4—No inlet protection

All storm drain inlets that could receive a discharge from the construction site must be protected before construction begins and must be maintained until the site is finally stabilized.

Problem #5—No BMPs to minimize vehicle tracking onto the road

Vehicle exits must use BMPs such as stone pads, concrete or steel wash racks, or equivalent systems to prevent vehicle tracking of sediment.

Problem #6—Improper solid waste or hazardous waste management

Solid waste (including trash and debris) must be disposed of properly, and hazardous materials (including oil, gasoline, and paint) must be properly stored (which includes secondary containment). Properly manage portable sanitary facilities.

Problem #7—Dewatering and other pollutant discharges at the construction site

Construction site dewatering from building footings or other sources should not be discharged without treatment. Turbid water should be filtered or allowed to settle.

Problem #8—Poorly managed washouts (concrete, paint, stucco)

Water from washouts must not enter the storm drain system or a nearby receiving water. Make sure washouts are clearly marked, sized adequately, and frequently maintained.

Problem #9—Inadequate BMP maintenance

BMPs must be frequently inspected and maintained if necessary. Maintenance should occur for BMPs that have reduced capacity to treat stormwater (construction general permits or state design manuals often contain information on when BMPs should be maintained), or BMPs that have been damaged and need to be repaired or replaced (such as storm drain inlet protection that has been damaged by trucks).

Problem #10—Inadequate documentation or training

Failing to develop a SWPPP, keep it up-to-date, or keep it on-site, are permit violations. You should also ensure that SWPPP documentation such as a copy of the NOI, inspection reports and updates to the SWPPP are also kept on-site. Likewise, personnel working on-site must be trained on the basics of stormwater pollution prevention and BMP installation/maintenance.

E. Update and Evaluate Your SWPPP

Like your construction site, your SWPPP is dynamic. It is a document that must be amended to reflect changes occurring at the site. As plans and specifications change, those changes should be reflected in your SWPPP. If you find that a BMP is not working and you decide to replace it with another, you must reflect that change in your SWPPP. Document in your SWPPP transitions from one phase of construction to the next, and make sure you implement new BMPs required for that next phase.

Are Your BMPs Working?

You should evaluate the effectiveness of your BMPs as part of your routine inspection process. An informal analysis of both your inspection's findings and your list of BMP repairs will often reveal an inadequately performing BMP. An inspection immediately after a rain event can indicate whether another approach is needed.

You may decide to remove an existing BMP and replace it with another, or you may add another BMP in that area to lessen the impact of stormwater on the original installation.

When you update your SWPPP, you can simply mark it up, particularly for relatively simple changes and alterations. More significant changes might require a rewriting of portions of the SWPPP. The site map should also be updated as necessary.

Chapter 9: **Final Stabilization and Permit Termination**

▶ **This chapter describes what you must do to stabilize your construction site and end permit coverage.**

Stabilize Disturbed Areas

As your construction project progresses, you must stabilize areas not under construction. EPA and most states have specific requirements and time frames that must be followed. Generally, it is a wise management practice to stabilize areas as quickly as possible to avoid erosion problems that could overwhelm silt fences, sediment basins, and other sediment control devices.

SWPPP Tip!

Stabilize as soon as practicable

EPA's Construction General Permit states that, "stabilization measures must be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased."

Temporary stabilization can be achieved through a variety of BMPs, including mulching, seeding, erosion control blankets, hydroseeding, and other measures.

Permanent or final stabilization of areas on your site is generally accomplished by installing the final landscape requirements (e.g., trees, grass, gardens, or permanent stormwater controls). Once the site has been stabilized, you can terminate your permit coverage.

Sediment controls, such as silt fence, berms, sediment ponds or traps, alone, are not stabilization measures. You should continue to use these kinds of measures (e.g., silt fence around an area that has been seeded) until full stabilization is achieved.

A. Final Stabilization

When you have completed your construction project or an area within the overall project, you must take steps to permanently and finally stabilize it. Check your permit for the specific requirements you must meet. After a project or an area in the project has been fully stabilized, you should remove temporary sediment and erosion control devices (such as silt fences). You might also be able to stop routine inspections in these stabilized areas. However, in some states such as Colorado, inspections are required every 30 days (after the construction has been completed and the site is stabilized) until permit coverage has been terminated. In general, you should be aware that

Figure 16. Seeding is an effective BMP that can be used to temporarily or permanently stabilize disturbed areas.

final stabilization often takes time (weeks or even months), especially during times of low rainfall or during the colder months of the year. You should not discontinue routine inspections until you have met the final stabilization requirements in your permit.

EPA and many states define final stabilization as occurring when a uniform, evenly distributed perennial vegetative cover with a density of 70 percent of the native background cover has been established on all unpaved areas and areas not covered by permanent structures. Some states have a higher percentage of vegetative cover required (e.g., New York requires 80 percent). Please review your state's construction general permit for specific requirements.

Native vegetation must be established uniformly over each disturbed area on the site. Stabilizing seven of ten slopes, or leaving an area equivalent to 30 percent of the disturbed area completely unstabilized will not satisfy the *uniform vegetative cover* standard.

The contractor must establish vegetation over the entire disturbed soil area at a minimum density of 70 percent of the native vegetative coverage. For example, if native vegetation covers 50 percent of the undisturbed ground surface (e.g., in an arid or semi-arid area), the contractor must establish 35 percent vegetative coverage uniformly over the entire disturbed soil area ($0.70 \times 0.50 = 0.35$ or 35 percent). Several states require perennial native vegetative cover that is *self-sustaining* and capable of providing *erosion control equivalent to preexisting conditions* to satisfy the 70 percent coverage requirement.

In lieu of vegetative cover, you can apply alternate measures that provide equivalent soil stabilization to the disturbed soil area. Such equivalent measures include blankets, reinforced channel liners, soil cement, fiber matrices, geotextiles, or other erosion-resistant soil covering or treatments. Your construction general permit might allow all or some of these alternate measures for equivalent soil stabilization for final stabilization; check your general permit.

B. Permit Termination

Once construction activity has been completed and disturbed areas are finally stabilized, review your general permit for specific steps to end your coverage under that permit. EPA and many states require you to submit a form, often called a notice of termination (NOT), to end your coverage under that construction general permit. Before terminating permit coverage, make sure you have accomplished the following:

- Remove any construction debris and trash
- Remove temporary BMPs (such as silt fence). Remove any residual sediment as needed. Seed and mulch any small bare spots. BMPs that will decompose, including some fiber rolls and blankets, may be left in place
- Check areas where erosion-control blankets or matting were installed. Cut away and remove all loose, exposed material, especially in areas where walking or mowing will occur. Reseed all bare soil areas
- Ensure that 70 percent of background native vegetation coverage or equivalent stabilization measures have been applied for final soil stabilization of disturbed areas
- Repair any remaining signs of erosion
- Ensure that post-construction BMPs are in place and operational. Provide written maintenance requirements for all post-construction BMPs to the appropriate party
- Check all drainage conveyances and outlets to ensure they were installed correctly and are operational. Inspect inlet areas to ensure complete stabilization and remove any brush or debris that could clog inlets. Ensure banks and ditch bottoms are well vegetated. Reseed bare areas and replace rock that has become dislodged
- Seed and mulch or otherwise stabilize any areas where runoff flows might converge or high velocity flows are expected
- Remove temporary stream crossings. Grade, seed, or re-plant vegetation damaged or removed
- Ensure subcontractors have repaired their work areas before final closeout

You might also be required to file an NOT if you transfer operational control to another

Take a Closer Look…

Is there a deadline to submit an NOT?

Many states require a Notice of Termination (NOT) or similar form to indicate that the construction phase of a project is completed and that all the terms and conditions have been met. This notification informs the permitting authority that coverage under the construction general permit is no longer needed. If your permitting authority requires such a notification, check to see what conditions must be met in order to submit it and check to see if there is a deadline for submission. EPA's Construction General Permit requires that you submit an NOT when you have met all your permit requirements. The NOT is due no later than 30 days after meeting these requirements.

What does this mean to me?

Check your permit carefully for details and conditions relating to terminating your permit coverage.

party before the project is complete. The new operator would be required to develop and implement a SWPPP and to obtain permit coverage as described above.

EPA and most states allow homebuilders to terminate permit coverage when the property has been transferred to the homeowner with temporary or final stabilization measures in place. If the transfer is made with temporary stabilization measures in place, EPA expects the homeowner to complete the final landscaping. Under these circumstances, EPA and most states do not require homeowners to develop SWPPPs and apply for permit coverage.

C. Record Retention

EPA's regulations specifies that you must retain records and reports required in the permit, including SWPPPs and information used to complete the NOI, for at least 3 years from the termination of coverage or expiration of the permit. You should also keep maintenance and inspection records related to the SWPPP for this same time frame. General permits issued by states may have a longer period for retention.

Figure 17. Make sure inlets, outlets, and slopes are well stabilized before leaving the site and filing your "Notice of Termination" for ending permit coverage.

References

American Society of Civil Engineers (ASCE) and Water Environment Federation (WEF). 1992. *Design and Construction of Urban Stormwater Management Systems*

Arendt, R. 1996. *Conservation Design for Subdivisons: A Practical Guide to Creating Open Space Networks*. American Planning Association Planners Book Service. Chicago, IL.

Claytor, R. 2000. Practical tips for construction site phasing. Article 54 in *The Practice of Watershed Protection*. Center for Watershed Protection, Ellicott City, MD, pp. 317–322.

Dunne, T. and L. Leopold. 1978. *Water and Environmental Planning.*

Environmental Protection Agency (EPA). 1993. *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*. 840-B-92-002. Office of Water. Washington, DC.

Maryland Department of the Environment (MDE). 2000. *Maryland Stormwater Design Manual: Volumes 1 and 2*. Maryland Department of the Environment, Baltimore, MD. <**www.mde.state.md.us/environment/wma/stormwatermanual**>

Minnesota Pollution Control Agency (MPCA). 2004. *Stormwater Construction Inspection Guide*. <**www.pca.state.mn.us/publications/wq-strm2-10.pdf**>

National Arbor Day Foundation. No date. *The Value of Trees to a Community.* <**www.arborday.org/trees/Benefits.cfm**>

Natural Resources Conservation Service (NRCS). 2000. *1997 National Resources Inventory Summary Report.* <**http://www.nrcs.usda.gov/TECHNICAL/NRI/1997/summary_report/**>

Natural Resources Conservation Service (NRCS). 2006. *National Resources Inventory 2003 Annual NRI - Soil Erosion.* <**http://www.nrcs.usda.gov/Technical/land/nri03/SoilErosion-mrb.pdf**>

Robertson, B., R. Pitt, A. Ayyoubi, and R. Field. 1995. A Multi-Chambered Stormwater Treatment Train. In *Proceedings of the Engineering Foundation Conference:*

Stormwater NPDES-Related Monitoring Needs, Mt. Crested Butte, Colorado, August 7–12, 1994, American Society of Civil Engineers, New York, NY.

Terrene Institute. 2001. Landscaped rain gardens offer stormwater control. *Nonpoint Source News-Notes* 66:18–20.

Acknowledgements

The graphics used in this guide were developed by Tetra Tech, Inc. for the Kentucky Divison of Water's Erosion and Sediment Control Field Guide.

Appendix A: **SWPPP Template**

An electronic copy of the SWPPP template is available on EPA's web site at:
http://www.epa.gov/npdes/swpppguide

Appendix B: **Sample Inspection Report**

An electronic copy of the sample inspection report is available on EPA's web site at:
http://www.epa.gov/npdes/swpppguide

Appendix C: **Calculating the Runoff Coefficient**

The following information is largely taken from EPA's 1992 guidance *Stormwater Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices* (EPA 832-R-92-005).

It is important to estimate your development's impact on runoff after construction is complete. This can be done by estimating the runoff coefficient for pre- and post-construction conditions. The runoff coefficient ("C" value) is the partial amount of the total rainfall which will be come runoff. The runoff coefficient is used in the "rational method" which is:

$$Q = CiA,$$

Where Q = the rate of runoff from an area,
i = rainfall intensity, and
A = the area of the drainage basin.

There are many methods which can be used to estimate the amount of runoff from a construction site. You are not required to use the rationale method to design stormwater conveyances or BMPs. Consult your State/local design guides to determine what methods to use for estimating design flow rates from your development.

The less rainfall that is absorbed (infiltrates) into the ground, evaporates, or is otherwise absorbed on site, the higher the "C" value. For example, the "C" value of a lawn area is 0.2, which means that only 20 percent of the rainfall landing on that area will run off, the rest will be absorbed or evaporate. A paved parking area would have a "C" value of 0.9, which means that 90 percent of the rainfall landing on that area will become runoff. You should calculate the runoff coefficient for conditions before construction and after construction is complete. It is suggested that a runoff coefficient be calculated for each drainage basin on the site. The following is an example of how to calculate the "C" value.

The runoff coefficient or "C" value for a variety of land uses may be found in Table C-1 (NOTE: Consult your State/local design guide, if available, to determine if specific "C" values are specified for your area). The "C" values provide an estimate of anticipated runoff for particular land uses. Most sites have more than one type of land use and therefore more than one "C" value will apply. To have a "C" value that represents your site you will need to calculate a "weighted C value."

Calculating a "Weighted C value"

When a drainage area contains more than one type of surface material with more than one runoff coefficient a "weighted C" must be calculated. This "weighted C" will take into account the amount of runoff from all the various parts of the site. A formula used to determine the "weighted C" is as follows:

$$C = \frac{A_1C_1 + A_2C_2 + \ldots + A_xC_x}{(A_1 + A_2 + \ldots + A_x)}$$

Where A = acres and C = coefficient.

Therefore, if a drainage area has 15 acres (ac.) with 5 paved acres ($C = 0.9$), 5 grassed acres ($C = 0.2$), and 5 acres in natural vegetation ($C = 0.1$), a "weighted C" would be calculated as follows:

$$C = \frac{(5\text{ ac} \times 0.9) + (5\text{ ac} \times 0.2) + (5\text{ ac} \times 0.1)}{(5\text{ ac} + 5\text{ ac} + 5\text{ ac})} = 0.4$$

Table C-1. Typical "C" Values

Description of Area	Runoff Coefficients
Business	
Downtown Areas	0.70 – 0.95
Neighborhood Areas	0.50 – 0.70
Residential	
Single-family areas	0.30 – 0.50
Multi-units, detached	0.40 – 0.60
Multi-units, attached	0.60 – 0.75
Residential (suburban)	0.25 – 0.40
Apartment dwelling areas	0.50 – 0.70
Industrial	
Light Areas	0.50 – 0.80
Heavy Areas	0.60 – 0.90
Parks, cemeteries	0.10 – 0.25
Playgrounds	0.20 – 0.35
Railroad yard areas	0.20 – 0.40
Unimproved areas	0.10 – 0.30
Streets	
Asphalt	0.70 – 0.95
Concrete	0.80 – 0.95
Brick	0.70 – 0.85
Drives and Walks	0.75 – 0.85
Roofs	0.75 – 0.95
Lawns – course textured soil (greater than 85% sand)	
Slope: Flat, 2%	0.05 – 0.10
Average, 2-7%	0.10 – 0.15
Steep, 7%	0.15 – 0.20
Lawns – fine textured soil (greater than 40% clay)	
Slope: Flat, 2%	0.13 – 0.17
Average, 2-7%	0.18 – 0.22
Steep, 7%	0.25 – 0.35

Appendix D: **Resources List**

The following are just a few of the many resources available to assist you in developing your SWPPP. The inclusion of these resources does not constitute an endorsement by EPA.

EPA Resources

EPA Stormwater Construction Website
http://www.epa.gov/npdes/stormwater/construction

- EPA's Construction General Permit (**http://www.epa.gov/npdes/stormwater/cgp**)
  EPA's general permit that applies to all construction activity disturbing greater than one acre in the states and territories where EPA is the permitting authority.
- Construction SWPPP Guide, SWPPP Template and inspection form (**www.epa.gov/npdes/swpppguide**)
  A downloadable copy of this guide, the SWPPP template and inspection form.
- Menu of BMPs (**http://www.epa.gov/npdes/stormwater/menuofbmps**)
  Site containing over 40 construction BMP fact sheets. Also contains fact sheets on other stormwater program areas, and case studies organized by program area.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas
http://www.epa.gov/owow/nps/urbanmm/index.html

Managing Your Environmental Responsibilities: A Planning Guide for Construction and Development
http://www.epa.gov/compliance/resources/publications/assistance/sectors/constructmyer/index.html

Expedited Settlement Offer Program for Stormwater (Construction)
http://www.epa.gov/Compliance/resources/policies/civil/cwa/esoprogstormwater.pdf
A supplemental program to ensure consistent EPA enforcement of stormwater requirements at construction sites for relatively minor violations.

Construction Industry Compliance Assistance
http://www.cicacenter.org
Plain language explanations of environmental rules for the construction industry. Links to stormwater permits and technical manuals for all 50 states.

Smart Growth and Low Impact Development Resources

Using Smart Growth Techniques as Stormwater Best Management Practices
http://www.epa.gov/livablecommunities/pdf/sg_stormwater_BMP.pdf

Stormwater Guidelines for Green, Dense Development
http://www.epa.gov/smartgrowth/pdf/Stormwater_Guidelines.pdf

Protecting Water Resources with Smart Growth
http://www.epa.gov/smartgrowth/pdf/waterresources_with_sg.pdf

Parking Spaces / Community Places: Finding the Balance Through Smart Growth Solutions
http://www.epa.gov/smartgrowth/parking.htm

EPA Nonpoint Source Low Impact Development site
http://www.epa.gov/owow/nps/lid/

Better Site Design: A Handbook for Changing Development Rules in Your Community
Available from **http://www.cwp.org**

State BMP/Guidance Manuals

Kentucky Erosion Prevention and Sediment Control Field Guide
http://www.water.ky.gov/permitting/wastewaterpermitting/KPDES/storm/
Easy to read field guide describing erosion and sediment control BMP selection, installation and maintenance.

Minnesota Stormwater Construction Inspection Guide
http://www.pca.state.mn.us/publications/wq-strm2-10.pdf
A manual designed to assist municipal construction inspectors in the procedures for conducting a compliance inspection at construction sites.

California Stormwater Quality Association's Construction Handbook
http://www.cabmphandbooks.org/Construction.asp

Delaware Erosion and Sediment Control Handbook
http://www.dnrec.state.de.us/dnrec2000/Divisions/Soil/Stormwater/StormWater.htm

Western Washington Stormwater Management Manual – Volume II – Construction Stormwater Pollution Prevention
http://www.ecy.wa.gov/programs/wq/stormwater/manual.html

Eastern Washington Stormwater Management Manual
http://www.ecy.wa.gov/biblio/0410076.html
A guidance document addressing stormwater design and management in more arid climates.

Certification Programs

Certified Professional in Erosion and Sediment Control
http://www.cpesc.org

Virginia Erosion and Sediment Control Certification Program
http://www.dcr.virginia.gov/sw/estr&crt2.htm

Florida Stormwater, Erosion and Sedimentation Control Inspector Certification
http://www.dep.state.fl.us/water/nonpoint/erosion.htm

Other Resources

International Erosion Control Association
http://www.ieca.org
A non-profit organization helping members solve the problems caused by erosion and its byproduct—sediment.

Erosion Control Magazine
http://www.erosioncontrol.com
A journal for erosion and sediment control professionals.

Designing for Effective Sediment & Erosion Control on Construction Sites by Jerald S. Fifield, PH.D., CPESC. Available from Forester Press
http://www.foresterpress.com
Book describing proven and practical methods for minimizing erosion and sedimentation on construction sites.

Stormwater Permitting: A Guide for Builders and Developers by National Association of Home Builders (NAHB). Available from NAHB **http://www.nahb.org**

A: SWPPP Template – Utah

Instructions

To help you develop the narrative section of your construction site SWPPP, the DWQ has modified the U.S Environmental Protection Agency (EPA) electronic SWPPP template to fit the needs of NOI applicants in Utah. The template is designed to help guide you through the SWPPP development process and help ensure that your SWPPP addresses all the necessary elements stated in your construction general permit. It may be helpful to use this template with EPA's guidance on *Developing Your Stormwater Pollution Prevention Plan*. Both are available on EPA's website at www.epa.gov/npdes/swpppguide

This template covers most of the SWPPP elements that the Utah construction general permit requires, however, you are strongly encouraged to customize this template. There are two major reasons to customize this template:

- **To reflect the terms and conditions of the State construction general permit; and**
- **To reflect the conditions at your site**

Using the SWPPP Template

This template is ordered in reference to Section 7, Storm Water Pollution Prevention Plan (SWPPP).

Each section of this template includes "instructions" and space for project information. You should read the instructions for each section before you complete that section. This template was developed in Word so that you can easily add tables and additional text. Some sections may require only a brief description while others may require several pages of explanation.

Tips for completing the SWPPP template

- If there is more than one construction operator for your project, consider coordinating development of your SWPPP with the other operators.
- Multiple operators may share the same SWPPP, but make sure that responsibilities are clearly described.
- Modify this SWPPP template so that it addresses the requirements in your construction general permit and meets the needs of your project. Consider adding permit citations in the SWPPP when you address a specific permit requirement.

Stormwater Pollution Prevention Plan

for:

Insert Project Name
Insert Project Site Location/Address
Insert City, State, Zip Code
Insert Project Site Telephone Number (if applicable)

Operator(s):

Insert Company or Organization Name
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

SWPPP Contact(s):

Insert Company or Organization Name
Insert Name
Insert Address
Insert City, State, Zip Code
Insert Telephone Number
Insert Fax/Email

SWPPP Preparation Date:

__ __ / __ __ / __ __ __ __

Estimated Project Dates:

Project Start Date: __ __ / __ __ / __ __ __ __
Project Completion Date: __ __ / __ __ / __ __ __ __

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Appendix J – Training Log
Appendix K – Delegation of Authority
Appendix L – Additional Information (i.e., Endangered Species and Historic Preservation Documentation; other permits such as dewatering, stream alteration, wetland; and out of date SWPPP documents)
Appendix M – BMP Specifications

SECTION 1: CONTACT INFORMATION/ RESPONSIBLE PARTIES

1.1 Owner(s), Operator, Contractors

Instructions:

- List the operator(s), project managers, stormwater contact(s), and person or organization that prepared the SWPPP. Indicate respective responsibilities, where appropriate.
- Also, list subcontractors expected to work on-site. Notify subcontractors of stormwater requirements applicable to their work.
- See *SWPPP Guide*, Chapter 2.B.

Owner(s):

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Repeat as necessary

Operator(s) & Project Manager(s):

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Insert area of control (if more than one for the project):
Repeat as necessary

Site Supervisor(s):

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Insert area of control (if more than one on site) :
Repeat as necessary

SWPPP Contact(s):

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Insert area of control (if more than one operator at site) :
Repeat as necessary

This SWPPP was Prepared by:

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:

Subcontractor(s):

Insert Company or Organization Name:
Insert Name:
Insert Address:
Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:
Repeat as necessary

Emergency 24-Hour Contact:

Insert Company or Organization Name:
Insert Name:
Insert Telephone Number:
Repeat as necessary

1.2 Storm Water Team

Instructions (see CGP Part 7.2.1):

- Identify the staff members (by name or position) that comprise the project's stormwater team as well as their individual responsibilities. At a minimum the stormwater team is comprised of individuals who are responsible for overseeing the development of the SWPPP, any later modifications to it, and for compliance with the requirements in this permit (i.e., installing and maintaining stormwater controls, conducting site inspections, and taking corrective actions where required).
- Each member of the stormwater team must have ready access to either an electronic or paper copy of applicable portions of the 2014 UCGP and your SWPPP.

Insert Role or Responsibility:
Insert Position:
Insert Name:
Insert Telephone Number:
Insert Email:

Insert Role or Responsibility:
Insert Position:
Insert Name:
Insert Telephone Number:
Insert Email:

Insert Role or Responsibility:
Insert Position:
Insert Name:
Insert Telephone Number:
Insert Email:

[Repeat as necessary.]

SECTION 2: SITE EVALUATION, ASSESSMENT, & PLANNING

2.1 Project/Site Information

Instructions:

- In this section, you can gather some basic site information that will be helpful to you later when you file for permit coverage.
- For more information, see *Developing Your Stormwater Pollution Prevention Plan: A SWPPP Guide for Construction Sites* (also known as the *SWPPP Guide*), Chapter 2
- Detailed information on determining your site's latitude and longitude can be found at www.epa.gov/npdes/stormwater/latlong

Project/Site Name: _____

Project Street/Location: _____

City: _____ State: _____ ZIP Code: _____

County or Similar Subdivision: _____

Latitude/Longitude (Use **one** of three possible formats, and specify method)

Latitude:	Longitude:
1. _ _ º _ _ ' _ _" N (degrees, minutes, seconds)	1. _ _ º _ _ ' _ _" W (degrees, minutes, seconds)
2. _ _ º _ _ . _ _' N (degrees, minutes, decimal)	2. _ _ º _ _ . _ _' W (degrees, minutes, decimal)
3. _ _ . _ _ _ _ º N (decimal)	3. _ _ . _ _ _ _ º W (decimal)

Method for determining latitude/longitude:

☐ USGS topographic map (specify scale: _____) ☐ EPA Web site ☐ GPS

☐ Other (please specify): _____

Is the project located in Indian country? ☐ Yes ☐ No

If yes, name of Reservation, or if not part of a Reservation, indicate "not applicable."_____

_____

Is this project considered a federal facility? ☐ Yes ☐ No

UPDES project or permit tracking number*:_____

**(This is the unique identifying number assigned to your project by your permitting authority after you have applied for coverage under the appropriate National Pollutant Discharge Elimination System (UPDES) construction general permit.)*

2.2 Nature of Construction Activity

Instructions:

- Briefly describe the nature of the construction activity and approximate time frames (one or more paragraphs, depending on the nature and complexity of the project).
- For more information, see *SWPPP Guide*, Chapter 3.A.

Describe the general scope of the work for the project, major phases of construction, etc:

INSERT TEXT HERE

What is the function of the construction activity?

☐ Residential ☐ Commercial ☐ Industrial ☐ Road Construction ☐ Linear Utility

☐ Other (please specify):

Estimated Project Start Date: __ __ / __ __ / __ __ __ __

Estimated Project Completion Date: __ __ / __ __ / __ __ __ __

2.3 Construction Site Estimates

Instructions:

- Estimate the area to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas.
- Calculate the percentage of impervious surface area before and after construction
- Calculate the runoff coefficients before and after construction.
- For more information, see *SWPPP Guide*, Chapter 3.A and Appendix C.

The following are estimates of the construction site.

Total project area:	acres
Construction site area to be disturbed:	acres
Percentage impervious area before construction:	%
Runoff coefficient before construction:	
Percentage impervious area after construction:	%
Runoff coefficient after construction	

2.4 Soils, Slopes, Vegetation, and Current Drainage Patterns

Instructions:

- Describe the existing soil conditions at the construction site including soil types, slopes and slope lengths, drainage patterns, and other topographic features that might affect erosion and sediment control.
- Also, note any historic site contamination evident from existing site features and known past usage of the site.
- This information should also be included on your site maps (See *SWPPP Guide*, Chapter 3.C.).
- For more information, see *SWPPP Guide*, Chapter 3.A.

Soil type(s):

Slopes (describe current slopes and note any changes due to grading or fill activities):

Drainage Patterns (describe current drainage patterns and note any changes dues to grading or fill activities):

Vegetation:

Other:

2.5 Emergency Related Projects

Instructions:

- See Part 1.21. in the UCGP. To be an emergency related project is must be considered a public emergency and the cause must be documented along with the description of necessary construction to reestablish effected public services.

Emergency-Related Project? ☐ Yes ☐ No

Response to a public emergency (see Part 1.2.1); natural disaster, extreme flooding conditions, etc.

PROVIDE INFORMATION SUTSTANTIATING ITS OCCURRENCE

INSERT DESCRITPION OF CONSTRUCTION THAT WAS NECESSARY TO REESTABLISH EFFECTED PUBLIC SERVICES

2.6 Phase/Sequence of Construction Activity

Instructions:

- Describe the intended construction sequencing and timing of major activities, including any opportunities for phasing grading and stabilization activities to minimize the overall amount of disturbed soil that will be subject to potential erosion at one time. Also, describe opportunities for timing grading and stabilization so that all or a majority of the soil disturbance occurs during a time of year with less erosion potential (i.e., during the dry or less windy season). (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 2.) It might be useful to develop a separate, detailed site map for each phase of construction.
- See UCGP Section 7.2.4 for detailed information.
- Also, see EPA's *Construction Sequencing BMP Fact Sheet* at http://www.epa.gov/npdes/stormwater/menuofbmps/construction/cons_seq)

Phase I

- Describe phase
- Duration of phase (start date, end date)
- List BMPs associated with this phase
- Describe stabilization methods for this phase (describe any temporary stabilization methods that will be used before final stabilization)

Phase II

- Describe phase
- Duration of phase (start date, end date)
- List BMPs associated with this phase
- Describe stabilization methods for this phase (describe any temporary stabilization methods that will be used before final stabilization)

Repeat as needed

2.7 Site Features and Sensitive Areas to be Protected

Instructions:

- Describe unique site features including streams, stream buffers, wetlands, specimen trees, natural vegetation, steep slopes, or highly erodible soils that are to be preserved.
- Describe measures to protect these features.
- Include these features and areas on your site maps.
- This permit does not diminish from or alter in any way a permittees responsibility under the *Endangered Species Act (EAS)*. This permit does not have any requirements pertaining to the ESA. UTRC00000 CGP 1.1.5.
- This permit does not diminish from or alter in any way a permittees responsibility under the *National Historic Preservation Act (NHPA)*. This permit does not have any requirements pertaining to the NHPA. UTRC00000 CGP 1.1.6.
- For more information, see *SWPPP Guide*, Chapter 3.A and 3.B.

2.8 Maps

Instructions:

- Attach site maps. For most projects, a series of site maps is recommended. The first should show the undeveloped site and its current features. An additional map or maps should be created to show the developed site or for more complicated sites show the major phases of development.

These maps should include the following:

- Direction(s) of stormwater flow and approximate slopes before and after major grading activities;
- Areas and timing of soil disturbance;
- Areas that will not be disturbed;
- Natural features to be preserved;
- Locations of major structural and non-structural BMPs identified in the SWPPP;
- Locations and timing of stabilization measures;
- Locations of off-site material, waste, borrow, or equipment storage areas;
- Locations of all waters of the United States, including wetlands;
- Locations where stormwater discharges to a surface water;
- Locations of storm drain inlets; and
- Areas where final stabilization has been accomplished.
- For more information, see *SWPPP Guide*, Chapter 3.C.

Include the site maps with the SWPPP (Appendix A).

SECTION 3: POLLUTION PREVENTION STANDARDS

Instructions:

- Describe the key good housekeeping and pollution prevention (P2) BMPs that will be implemented to control pollutants in stormwater (UCGP Part 2.3).
- For more information, see *SWPPP Guide*, Chapter 5.
- Consult your states or local jurisdiction's design manual or resources in Appendix D of the *SWPPP Guide*.
- For more information or ideas on BMPs, see EPA's National Menu of BMPs http://www.epa.gov/npdes/stormwater/menuofbmps

3.1 Potential Sources of Pollution

Instructions:

- Identify and list all potential sources of sediment, which may reasonably be expected to affect the quality of stormwater discharges from the construction site.
- Identify and describe all potential sources of pollution or pollutant-generating activity (e.g., paving operations; concrete, paint, and stucco washout and waste disposal; solid waste storage and disposal), other than sediment, which could be exposed to rainfall or snowmelt, and may reasonably be expected to discharges from the construction site.
- For more information, see *SWPPP Guide*, Chapter 3.A.

Potential pollutants and sources, other than sediment, to stormwater runoff:

INSERT TEXT OR USE TABLE BELOW

Activities	Check with an X the activities that apply	Sediment	Nutrients	Heavy Metals	pH (acids and bases)	Pesticides & Herbicides	Oil & Grease	Bacteria & Viruses	Trash, Debris, Solids	Other Pollutants
Clearing, grading, excavating, and un-stabilized areas		√							√	
Paving operations		√					√		√	
Concrete washout, stucco and cement waste				√	√				√	

Structure construction, painting, cleaning				√	√				√	√
Demolition and debris disposal		√							√	
Dewatering operations		√							√	
Waterline flushing		√	√		√				√	√
Material Delivery and storage		√	√	√	√		√		√	√
Material use during building process			√	√	√		√		√	√
Solid waste disposal									√	√
Hazardous Waste, contaminated spills				√	√	√	√			√
Spills				√	√	√	√			√
Sanitary waste			√		√			√		
Vehicle/equipment fueling, maintenance, use and storage							√		√	√
Landscaping operations		√	√			√			√	√
Describe others										

3.2 Non-Stormwater Discharges

Instructions:

- Identify all allowable sources of non-stormwater discharges that are not previously identified. UCGP Part 7.2.9
- The allowable non-stormwater discharges identified might include the following (see your permit for an exact list):
  - ✓ Waters used to wash vehicles where detergents are not used
  - ✓ Water used to control dust
  - ✓ Potable water including uncontaminated water line flushings
  - ✓ Routine external building wash down that does not use detergents
  - ✓ Pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used
  - ✓ Uncontaminated air conditioning or compressor condensate
  - ✓ Uncontaminated ground water or spring water
  - ✓ Foundation or footing drains where flows are not contaminated with process materials such as solvents
  - ✓ Uncontaminated excavation dewatering
  - ✓ Landscape irrigation
- Identify measures used to eliminate or reduce these discharges and the BMPs used to prevent them from becoming contaminated.

List allowable non-stormwater discharges and the measures used to eliminate or reduce them and to prevent them from becoming contaminated:

Authorized Non-Storm Water Discharges	Comments

Include additional rows as necessary.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

3.3 Natural Buffers or Equivalent Sediment Controls

Instructions (see CGP Parts 2.1.2.1 and 7.2.9, and Appendix G):

This section only applies to you if a surface water is located within 50 feet your construction activities. If this is the case, consult CGP Part 2.1.2.a and Appendix D for information on how to comply with the buffer requirements.

- Describe the compliance alternative (CGP Part 2.1.2.a.i, ii, iii, or iv) that was chosen to meet the buffer requirements, and include any required documentation supporting the alternative selected. T he compliance alternative selected must be maintained throughout the duration of permit coverage. However, if you select a different compliance alternative during your period of permit coverage, you must modify your SWPPP to reflect this change.
- If you qualify for one of the exceptions in CGP Part 2.1.2.a.v, include documentation related to your

Buffer Compliance Alternatives

Are there any surface waters within 50 feet of your project's earth disturbances? ☐ YES ☐ NO

(Note: If no, no further documentation is required for the SWPPP Template.)

Check the compliance alternative that you have chosen:

☐ I will provide and maintain a 50-foot undisturbed natural buffer.

(Note (1): You must show the 50-foot boundary line of the natural buffer on your site map.)

(Note (2): You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.)

☐ I will provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by additional erosion and sediment controls, which in combination achieves the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

(Note (1): You must show the boundary line of the natural buffer on your site map.)

(Note (2): You must show on your site map how all discharges from your construction disturbances through the natural buffer area will first be treated by the site's erosion and sediment controls. Also, show on the site map any velocity dissipation devices used to prevent erosion within the natural buffer area.)

- INSERT WIDTH OF NATURAL BUFFER TO BE RETAINED
- INSERT EITHER ONE OF THE FOLLOWING:

  (1) THE ESTIMATED SEDIMENT REMOVAL FROM A 50-FOOT BUFFER USING APPLICABLE INFORMATION IN APP. D, 2.2.2. INCLUDE INFORMATION ABOUT THE BUFFER VEGETATION AND SOIL TYPE THAT PREDOMINATE AT YOUR SITE

  OR

  (2) IF YOU CONDUCTED A SITE-SPECIFIC CALCULATION FOR THE ESTIMATED SEDIMENT REMOVAL OF A 50-FOOT BUFFER, PROVIDE THE SPECIFIC REMOVAL EFFICIENCY, AND INFORMATION YOU RELIED UPON TO MAKE YOUR SITE-SPECIFIC CALCULATION.
- INSERT DESCRIPTION OF ADDITIONAL EROSION AND SEDIMENT CONTROLS TO BE USED IN COMBINATION WITH NATURAL BUFFER AREA
- INSERT THE FOLLOWING INFORMATION:
  - (1) SPECIFY THE MODEL OR OTHER TOOL USED TO ESTIMATE SEDIMENT LOAD REDUCTIONS FROM THE COMBINATION OF THE BUFFER AREA AND ADDITIONAL EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE, AND
  - (2) INCLUDE THE RESULTS OF CALCULATIONS SHOWING THAT THE COMBINATION OF YOUR BUFFER AREA AND THE ADDITIONAL EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE WILL MEET OR EXCEED THE SEDIMENT REMOVAL EFFICIENCY OF A 50-FOOT BUFFER

☐ It is infeasible to provide and maintain an undisturbed natural buffer of any size, therefore I will implement erosion and sediment controls that achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer.

- INSERT RATIONALE FOR CONCLUDING THAT IT IS INFEASIBLE TO PROVIDE AND MAINTAIN A NATURAL BUFFER OF ANY SIZE
- INSERT EITHER ONE OF THE FOLLOWING:

  OR

  (2) IF YOU CONDUCTED A SITE-SPECIFIC CALCULATION FOR THE ESTIMATED SEDIMENT REMOVAL OF A 50-FOOT BUFFER, PROVIDE THE SPECIFIC REMOVAL EFFICIENCY, AND INFORMATION YOU RELIED UPON TO MAKE YOUR SITE-SPECIFIC CALCULATION.
- INSERT DESCRIPTION OF ADDITIONAL EROSION AND SEDIMENT CONTROLS TO BE USED IN COMBINATION WITH NATURAL BUFFER AREA
- INSERT THE FOLLOWING INFORMATION:
  - (1) SPECIFY THE MODEL OR OTHER TOOL USED TO ESTIMATE SEDIMENT LOAD REDUCTIONS FROM THE EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE, AND
  - (2) INCLUDE THE RESULTS OF CALCULATIONS SHOWING THAT THE ADDITIONAL EROSION AND SEDIMENT CONTROLS INSTALLED AT YOUR SITE WILL MEET OR EXCEED THE SEDIMENT REMOVAL EFFICIENCY OF A 50-FOOT BUFFER

☐ I qualify for one of the exceptions in Part 2.1.2.a.v. (If you have checked this box, provide information on the applicable buffer exception that applies, below.)

Buffer Exceptions

Which of the following exceptions to the buffer requirements applies to your site?

☐ There is no discharge of stormwater to the surface water that is located 50 feet from my construction disturbances.

(Note: If this exception applies, no further documentation is required for Section 4.1 of the Template.)

☐ No natural buffer exists due to preexisting development disturbances that occurred prior to the initiation of planning for this project.

(Note (1): If this exception applies, no further documentation is required for Section 2.2 of the Template.)

(Note (2): Where some natural buffer exists but portions of the area within 50 feet of the surface water are occupied by preexisting development disturbances, you must still comply with the one of the CGP Part 2.1.2.a compliance alternatives.)

☐ For a "linear project" (defined in Appendix A), site constraints (e.g., limited right-of-way) make it infeasible for me to meet any of the CGP Part 2.1.2.a.v.3 compliance alternatives. Include documentation here of the following:

(1) Why it is infeasible for you to meet one of the buffer compliance alternative, and (2) Buffer width retained and/or supplemental erosion and sediment contorls to treat discharges to the surface water.

☐ The project qualifies as "small residential lot" construction (defined in Part 2.1.2.a.v.3 and in Appendix D).

For Alternative 1 (see Appendix D, Part 2.3.a):

- INSERT WIDTH OF NATURAL BUFFER TO BE RETAINED
- INSERT APPLICABLE REQUIREMENTS BASED ON TABLE D-1
- INSERT DESCRIPTION OF HOW YOU WILL COMPLY WITH THESE REQUIREMENTS

For Alternative 2 (see Appendix D, Part 2.3.b):

- INSERT (1) THE ASSIGNED RISK LEVEL BASED ON APPLICABLE TABLE IN APP. D, PART 2.3.2.b, AND (2) THE PREDOMINANT SOIL TYPE AND AVERAGE SLOPE AT YOUR SITE
- INSERT APPLICABLE REQUIREMENTS BASED ON APP. D, TABLE D-2
- INSERT DESCRIPTION OF HOW YOU WILL COMPLY WITH THESE REQUIREMENTS

☐ Buffer disturbances are authorized under a CWA Section 404 permit.
INSERT DESCRIPTION OF ANY EARTH DISTURBANCES THAT WILL OCCUR WITHIN THE BUFFER AREA

(Note (1): If this exception applies, no further documentation is required for Section 2.2 of the Template.)

(Note (2): This exception only applies to the limits of disturbance authorized under the Section 404 permit, and does not apply to any upland portion of the construction project.)

☐ Buffer disturbances will occur for the construction of a water-dependent structure or water access area (e.g., pier, boat ramp, and trail). INSERT DESCRIPTION OF ANY EARTH DISTURBANCES THAT WILL OCCUR WITHIN THE BUFFER AREA

(Note (1): If this exception applies, no further documentation is required for Section 2.2 of the Template.)

SECTION 4: EROSION AND SEDIMENT CONTROLS

Instructions:

- See Section 2 in the UCGP. Describe the erosion and sediment controls (BMPs) that will be implemented to control pollutants in stormwater discharges. For each major activity identified, do the following
  - ✓ Clearly describe appropriate control measures.
  - ✓ Describe the general sequence during the construction process in which the measures will be implemented.
  - ✓ Describe the maintenance and inspection procedures that will be used for that specific BMP.
  - ✓ Include protocols, thresholds, and schedules for cleaning, repairing, or replacing damaged or failing BMPs.
  - ✓ Identify staff responsible for maintaining BMPs.
  - ✓ (If your SWPPP is shared by multiple operators, indicate the operator responsible for each BMP.)
- Categorize each BMP under one of the following 10 areas of BMP activity as described below:
  - *2.1 Minimize disturbed area and protect natural features and soil*
  - *2.2 Phase Construction Activity*
  - *2.3 Control Stormwater flowing onto and through the project*
  - *2.4 Stabilize Soils*
  - *2.5 Protect Slopes*
  - *2.6 Protect Storm Drain Inlets*
  - *2.7 Establish Perimeter Controls and Sediment Barriers*
  - *2.8 Retain Sediment On-Site and Control Dewatering Practices*
  - *2.9 Establish Stabilized Construction Exits*
  - *2.10 Any Additional BMPs*
- Note the location of each BMP on your site map(s).
- For any structural BMPs, you should provide design specifications and details and refer to them. Attach them as appendices to the SWPPP or within the text of the SWPPP.
- For more information, see *SWPPP Guide*, Chapter 4.
- Consult your MS4's or other local jurisdiction's design manual or one of those listed in Appendix D of the *SWPPP Guide*.
- For more information or ideas on BMPs, see EPA's National Menu of BMPs http://www.epa.gov/npdes/stormwater/menuofbmps

4.1 Minimize Disturbed Area and Protect Natural Features and Soil

Instructions:

- Describe the areas that will be disturbed with each phase of construction and the methods (e.g., signs, fences) that you will use to protect those areas that should not be disturbed. Describe natural features identified earlier and how each will be protected during construction activity. Also describe how topsoil will be preserved. Include these areas and associated BMPs on your site map(s) also. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 1.)
- Also, see EPA's *Preserving Natural Vegetation BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/perserve_veg

INSERT TEXT or TABLE HERE, include inspection and maintenance schedules as appropriate and staff responsible for maintenance

4.2 Establish Perimeter Controls and Sediment Barriers

Instructions:

- Describe structural practices (e.g., silt fences or fiber rolls) including design specifications and details to filter and trap sediment before it leaves the construction site. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 7.)
- Also see, EPA's *Silt Fence BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/silt_fences, or *Fiber Rolls BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/fiber_rolls

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.3 Retain Sediment On-Site

Instructions:

- Describe sediment control practices (e.g., sediment trap or sediment basin), including design specifications and details (volume, dimensions, outlet structure) that will be implemented at the construction site to retain sediments on-site. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 8.)
- Also, see EPA's *Sediment Basin BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/sediment_basins

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.4 Establish Stabilized Construction Exits

Instructions:

- Describe location(s) of vehicle entrance(s) and exit(s), procedures to remove accumulated sediment off-site (e.g., vehicle tracking), and stabilization practices (e.g., stone pads or wash racks or both) to minimize off-site vehicle tracking of sediments and discharges to stormwater. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 9.)
- Also, see EPA's *Construction Entrances BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/cons_entrance

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.5 Protect Slopes

Instructions:

- Describe controls (e.g., erosion control blankets, tackifiers) including design specifications and details that will be implemented to protect all slopes. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 5.)
- Also, see EPA's *Geotextiles BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/geotextiles

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.6 Stockpiled Sediment or Soil

Instructions:

- Describe stormwater controls and other measures you will take to minimize the discharge of sediment or soil particles from stockpiled sediment or soil. Include a description of structural practices (e.g., diversions, berms, ditches, storage basins), including installation, and maintenance specifications, used to divert flows from stockpiled sediment or soil, retain or detain flows, or otherwise limit exposure and the discharge of pollutants from stockpiled sediment or soil.
- Also, describe any controls or procedures used to minimize exposure resulting from adding to or removing materials from the pile.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.7 Minimize Dust

Instructions:

- Describe controls and procedures you will use at your project/site to minimize the generation of dust.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	

Responsible Staff:	

Repeat as needed

4.8 Topsoil

Instructions:

- Describe how topsoil will be preserved and identify these areas and associated control measures on your site map(s).
- If it is infeasible for you to preserve topsoil on your site, provide an explanation for why this is the case.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.9 Soil Compaction

Instructions:

- In areas where final vegetative stabilization will occur or where infiltration practices will be installed, describe the controls, including design, installation, and maintenance specifications that will be used to restrict vehicle or equipment access or condition the soil for seeding or planting.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	

Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.10 High Altitude/Heavy Snows

Instructions:

- See Part 2.1.2.i of the UCGP. You must attempt to prepare for heavy snows by deploying storm water controls prior to the first heavy snow, and have appropriate storm water control measures designed to handle snow melt before heavy snows occur.
- Stabilization measures should be deployed at the same time (See 2.2.1.c of the UCGP).

Date Snow is Expected	Date of High Altitude/Heavy Snow Conditions BMPs to be Installed	Date of First Heavy Snow
	Scheduled:	
	Actual:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.11 Linear Activities

Instructions:

– See Part 2.1.2.b.i of the UCGP. For linear projects, where you have determined that the use of perimeter controls in portions of the site is impracticable due to rights-of-ways, document why you believe this to be the case.

Description of why perimeter controls are not practicable.

INSERT TEXT or TABLE HERE.

4.12 Chemical Treatment

Instructions (see UCGP Parts 2.1.3.c and 7.2.9.b):

– If you are using treatment chemicals at your site, provide details for each of the items below. This information is required as part of the SWPPP requirements in UCGP Part 7.2.9.b.

Soil Types

List all the soil types (including soil types expected to be found in fill material) that are expected to be exposed during construction and that will be discharged to locations where chemicals will be applied: INSERT TEXT HERE

Treatment Chemicals

List all treatment chemicals that will be used at the site and explain why these chemicals are suited to the soil characteristics: INSERT TEXT HERE

Describe the dosage of all treatment chemicals you will use at the site or the methodology you will use to determine dosage: INSERT TEXT HERE

Provide information from any applicable Material Safety Data Sheets (MSDS): INSERT TEXT HERE

Describe how each of the chemicals will stored: INSERT TEXT HERE

Include references to applicable state or local requirements affecting the use of treatment chemicals, and copies of applicable manufacturer's specifications regarding the use of your specific treatment chemicals and/or chemical treatment systems: INSERT TEXT HERE

Special Controls for Cationic Treatment Chemicals (if applicable)

If you have been authorized by your applicable Regional Office to use cationic treatment chemicals, include the official EPA authorization letter or other communication, and identify the specific controls and implementation procedures you are required to implement to ensure that your use of cationic treatment chemicals will not lead to a violation of water quality standards:

INSERT (1) ANY LETTERS OR OTHER DOCUMENTS SENT FROM THE DWQ OFFICE CONCERNING YOUR USE OF CATIONIC TREATMENT CHEMICALS, AND (2) DESCRIPTION OF ANY SPECIFIC CONTROLS YOU ARE REQUIRED TO IMPLEMENT

Schematic Drawings of Stormwater Controls/Chemical Treatment Systems

Provide schematic drawings of any chemically-enhanced stormwater controls or chemical treatment systems to be used for application of treatment chemicals: INSERT TEXT HERE

Training

Describe the training that personnel who handle and apply chemicals have received prior to permit coverage, or will receive prior to the use of treatment chemicals: INSERT TEXT HERE

4.13 Stabilize Soils

Instructions:

- Describe controls (e.g., interim seeding with native vegetation, hydroseeding) to stabilize exposed soils where construction activities have temporarily or permanently ceased. Also describe measures to control dust generation. Avoid using impervious surfaces for stabilization whenever possible. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 4.)
- Also, see EPA's *Seeding BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/seeding

BMP Description:	
☐ ***Permanent***	☐ ***Temporary***
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
☐ ***Permanent***	☐ ***Temporary***
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

4.14 Final Stabilization

Instructions:

- Describe procedures for final stabilization. If you complete major construction activities on part of your site, you can document your final stabilization efforts for that portion of the site (specific vegetative and/or non-vegetative practices). The UCGP allows you to then discontinue inspection activities in these areas.
- You can amend or add to this section as areas of your project are finally stabilized.
- Update your site plans to indicate areas that have achieved final stabilization.
- Note that dates for areas that have achieved final stabilization should be included in Section 5, Part 5.1 of this SWPPP.
- For more on this topic, see *SWPPP Guide*, Chapter 9.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

SECTION 5: POLLUTION PREVENTION

Instructions:

- Describe the key good housekeeping and pollution prevention (P2) BMPs that will be implemented to control pollutants in stormwater (UCGP Part 2.3).
- For more information, see *SWPPP Guide*, Chapter 5.
- Consult your state's or local jurisdiction's design manual or resources in Appendix D of the *SWPPP Guide*.
- For more information or ideas on BMPs, see EPA's National Menu of BMPs http://www.epa.gov/npdes/stormwater/menuofbmps

5.1 Spill Prevention and Response

Instructions:

- Describe the spill prevention and control plan to include ways to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and control. (For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 6.)
- Some projects/site may be required to develop a Spill Prevention Control and Countermeasure (SPCC) plan under a separate regulatory program (40 CFR 112). If you are required to develop an SPCC plan, or you already have one, you should include references to the relevant requirements from your plan.
- Also, see EPA's *Spill Prevention and Control Plan BMP Fact sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/spill_control

INSERT TEXT HERE or REFERENCE ATTACHMENT

Any discharges in 24 hours equal to or in excess of the reportable quantities listed in 40 CFR 117, 40 CFR 110, and 40 CFR 302 will be reported to the National Response Center and the Division of Water Quality (DWQ) as soon as practical after knowledge of the spill is known to the permittees. The permittee shall submit within 14 calendar days of knowledge of the release a written description of: the release (including the type and estimate of the amount of material released), the date that such release occurred, the circumstances leading to the release, and measures taken and/or planned to be taken to the Division of Water Quality (DWQ), 288 North 1460 West, P.O. Box 144870, Salt Lake City, Utah 84114-4870. The Storm Water Pollution Prevention Plan must be modified within14 calendar days of knowledge of the release to provide a description of the release, the circumstances leading to the release, and the date of the release. In addition, the plan must be reviewed to identify measures to prevent the reoccurrence of such releases and to respond to such releases, and the plan must be modified where appropriate.

Agency	Phone Number
National Response Center	(800) 424-8802
Division of Water Quality (DWQ) 24-Hr Reporting	(801) 538-6146 (801) 536-4123

Utah Department of Health Emergency Response	(801) 580-6681
South Jordan City	(801) 254-3742
Salt Lake County Health Department	(385) 468-3862
Utah Department of Health Emergency Response	(801) 580-6681

Material	Media Released To	Reportable Quantity
Engine oil, fuel, hydraulic & brake fluid	Land	25 gallons
Paints, solvents, thinners	Land	100 lbs (13 gallons)
Engine oil, fuel, hydraulic & brake fluid	Water	Visible Sheen
Antifreeze, battery acid, gasoline, engine degreasers	Air, Land, Water	100 lbs (13 gallons)
Refrigerant	Air	1 lb

5.2 Construction and Domestic Waste

Instructions:

- Describe measures (e.g., trash disposal, sanitary wastes, recycling, and proper material handling) to prevent the discharge of solid materials to receiving waters, except as authorized by a permit issued under section 404 of the CWA (For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 1.)
- Also, see EPA's *General Construction Site Waste Management BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/cons_wasteman

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

5.3 Washing of Applicators and Containers used for Concrete, Paint or Other Materials

Instructions:

- Describe location(s) and controls to eliminate the potential for discharges from washout areas for concrete mixers, concrete washout, paint, stucco, mortar, drywall mud, and so on. (For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 3.)
- Also, see EPA's *Concrete Washout BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/concrete_wash

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

5.4 Establish Proper Building Material Staging Areas

Instructions:

- Describe construction materials expected to be stored on-site and procedures for storage of materials to minimize exposure of the materials to stormwater. (For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 2.)

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

5.5 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Instructions:

- Describe equipment/vehicle fueling and maintenance practices that will be implemented to control pollutants to stormwater (e.g., secondary containment, drip pans, and spill kits). UCGP Part 2.3.3.a
- For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 4.
- Also, see EPA's *Vehicle Maintenance and Washing Areas BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/vehicile_maintain

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	

Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

5.6 Control Equipment/Vehicle Washing

Instructions:

- Describe equipment/vehicle washing practices that will be used to minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other types of washing (e.g., locating activities away from surface waters and stormwater inlets or conveyances and directing wash waters to a sediment basin or sediment trap, using filtration devices, such as filter bags or sand filters, or using other similarly effective controls). (For more information, see *SWPPP Guide*, Chapter 5, P2 Principle 5.)
- Describe how you will prevent the discharge of soaps, detergents, or solvents by providing either (1) cover (*examples: plastic sheeting or temporary roofs*) to prevent these detergents from coming into contact with rainwater, or (2) a similarly effective means designed to prevent the discharge of pollutants from these areas.
- Also, see EPA's *Vehicle Maintenance and Washing Areas BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/vehicle_maintain

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

5.7 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

Instructions:

- Describe how you will comply with the UCGP Part 2.3.5 requirement to "minimize discharges of fertilizers containing nitrogen or phosphorus".

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

5.8 Other Pollution Prevention Practices

Instructions:

- Describe any additional BMPs that do not fit into the above categories. Indicate the problem they are intended to address.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

SECTION 6: INSPECTIONS & CORRECTIVE ACTIONS

6.1 Inspections

Instructions:

- Identify the individual(s) responsible for conducting inspections and ensure they are a "qualified person" per the UCGP Part 4.
- The "qualified person" must meet the requirements of the UCGP, such as but not limited to the following:
  - ✓ Utah Registered Storm Water Inspector (RSI)
  - ✓ Certified Professional in Erosion and Sediment Control (CPESC)
  - ✓ Certified Professional in Storm Water Quality (CPSWQ)
  - ✓ Certified Erosion, Sediment, and Storm Water Inspector (CESSWI)
  - ✓ Certified Inspector of Sediment and Erosion Control (CISEC)
  - ✓ National Institute for Certification in Engineering Technologies, Erosion and Sediment Control, Level 3 (NICET)
  - ✓ Utah Department of Transportation Erosion Control Supervisor (ECS)
- Reference or attach the inspection form that will be used.
- Describe the frequency that inspections will occur at your site including any correlations to storm frequency and intensity.
- Increase in inspection frequency for sites discharging to Sensitive Waters (UCGP 4.1.3).
- Note that inspection details for particular BMPs should be included in Sections 2 and 3.
- You should also document the repairs and maintenance that you undertake as a result of your inspections. These actions can be documented in the corrective action log described in Part 5.3 below.
- For more on this topic, see *SWPPP Guide*, Chapters 6 and 8.
- Also, see suggested inspection form in Appendix B of the *SWPPP Guide*.

1. ***Inspection Personnel:*** Identify the person(s) who will be responsible for conducting inspections and describe their qualifications:
   INSERT TEXT HERE or REFERENCE ATTACHMENT

2. ***Inspection Schedule and Procedures:***

   Describe the inspection schedules and procedures you have developed for your site (include frequency of inspections for each BMP or group of BMPs, indicate when you will inspect, e.g., before/during/and after rain events, spot inspections):
   INSERT TEXT HERE

   Describe the general procedures for correcting problems when they are identified. Include responsible staff and time frames for making corrections:

   Attach a copy of the inspection report you will use for your site.
   REFERENCE ATTACHMENT

Reduction in Inspection Frequency (if applicable)

For the reduction in inspections resulting from stabilization: SPECIFY (1) LOCATIONS WHERE STABILIZATION STEPS HAVE BEEN COMPLETED AND (2) DATE THAT THEY WERE COMPLETED

For the reduction in inspections in arid, semi-arid, or drought-stricken areas: INSERT BEGINNING AND ENDING DATES OF THE SEASONALLY-DEFINED ARID PERIOD FOR YOUR AREA OR THE VALID PERIOD OF DROUGHT

For reduction in inspections due to frozen conditions: INSERT BEGINNING AND ENDING DATES OF FROZEN CONDITIONS ON YOUR SITE

6.2 Corrective Actions

Instructions:

- Create here, or as an attachment, a corrective action log. This log should describe repair, replacement, and maintenance of BMPs undertaken as a result of the inspections and maintenance procedures described above. Actions related to the findings of inspections should reference the specific inspection report.
- This log should describe actions taken, date completed, and note the person that completed the work.

Corrective Action Log:
INSERT LOG HERE or REFERENCE ATTACHMENT

6.3 Delegation of Authority

Instructions:

- Identify the individual(s) or specifically describe the position where the construction site operator has delegated authority for the purposes of signing inspection reports, certifications, or other information.
- Each inspection report must be signed in accordance with Appendix G, Part G.16 of the permit.
- If a delegation letter is necessary, see Appendix K of this template and submit it to the Department and include in the SWPPP in Appendix K.
- For more on this topic, see *SWPPP Guide*, Chapter 7.

Duly Authorized Representative(s) or Position(s):

Insert Company or Organization Name:
Insert Name:
Insert Position:
Insert Address:

Insert City, State, Zip Code:
Insert Telephone Number:
Insert Fax/Email:

Attach a copy of the signed delegation of authority form in Appendix K.

SECTION 7: TRAINING AND RECORDKEEPING

7.1 Training

Instructions:

- Training your staff and subcontractors is an effective BMP. As with the other steps you take to prevent stormwater problems at your site, document that the personnel required to be trained in UCGP Part 6 completed the appropriate training.
- The following personnel, at a m inimum, must receive training, and therefore should be listed out individually in the table below:
  - ✓ Personnel who are responsible for the design, installation, maintenance, and/or repair of stormwater controls (including pollution prevention measures);
  - ✓ Personnel responsible for the application and storage of treatment chemicals (if applicable);
  - ✓ Personnel who are responsible for conducting inspections as required in Part 4.1.1; and
  - ✓ Personnel who are responsible for taking corrective actions as required in Part 5.
- Include dates, number of attendees, subjects covered, and length of training.
- For more on this subject, see *SWPPP Guide*, Chapter 8.

Individual(s) Responsible for Training:
INSERT TEXT HERE

Describe Training Conducted:

- General stormwater and BMP awareness training for staff and subcontractors:
  INSERT TEXT HERE

- Detailed training for staff and subcontractors with specific stormwater responsibilities:
  INSERT TEXT HERE

Training Attendee Name	Title of Training	Duration	Date of Training

Additional training documentation should be included in Appendix J.

7.2 Recordkeeping

Instructions:

- The following is a list of records you should keep at your project site available for inspectors to review:
- Dates of grading, construction activity, and stabilization (which is covered in Sections 2 and 3)
- A copy of the construction general permit (attach)
- The signed and certified NOI form or permit application form (attach)
- A copy of the letter from EPA or/the state notifying you of their receipt of your complete NOI/application (attach)
- Inspection reports (attach)
- Records relating to endangered species and historic preservation (attach)
- Check your permit for additional details
- For more on this subject, see *SWPPP Guide*, Chapter 6.C.

Records will be retained for a minimum period of at least 3 years after the permit is terminated.

Date(s) when major grading activities occur:
INSERT LOG HERE or REFERENCE ATTACHMENT

Date(s) when construction activities temporarily or permanently cease on a portion of the site:
INSERT LOG HERE or REFERENCE ATTACHMENT

Date(s) when an area is either temporarily or permanently stabilized:
INSERT LOG HERE or REFERENCE ATTACHMENT

7.3 Log of Changes to the SWPPP

Instructions:

- Create a log here, or as an attachment, of changes and updates to the SWPPP. You should include additions of new BMPs, replacement of failed BMPs, significant changes in the activities or their timing on the project, changes in personnel, changes in inspection and maintenance procedures, updates to site maps, and so on.

Log of changes and updates to the SWPPP
INSERT LOG HERE or REFERENCE ATTACHMENT

SECTION 8: WATER QUALTIY

Instructions:

- See Section 3 in UCGP. Discharge must be controlled as necessary to meet applicable water quality standards.
- If at any time you, or DWQ/MS4 inspector determined that your discharge is not being controlled as necessary to meet applicable water quality standard, you must take corrective actions as required in Part 5.2.1. The corrective actions must be documented in this SWPPP as required in Part 5.2.2 and 5.4 (may compose an amendment and note in Amendment Log in 6.2 or Appendix G in this SWPPP).
- Additional regulations may be imposed by the DWQ

8.1 UIC Class 5 Injection Wells

Instructions:

- If you are using any of the following storm water controls at your site, as they are described below, you must document any contact you have had with DWQ for implementing the requirements for underground injection wells in the Safe Drinking Water Act and DEQ's implementing regulation at UAC R317-7.
- There may be additional local requirements related to such structures
- Such controls (below) would generally be considered Class V UIC wells and all UIC Class V wells must be reported to DWQ for an inventory:
    - French Drains (if storm water is directed);
    - Commercially manufactured pre-cast or pre-built proprietary subsurface detention vaults, chambers, or other devices designed to capture and infiltrate storm water flow.
    - Drywells, seepage pits, or improved sinkholes (if stormwater is directed).
- For the State UIC Contact at DWQ call (801) 536-4300.

☐ French Drain
☐ Commercially Manufactured pre-cast or pre-built subsurface infiltration system
☐ Drywell(s), seepage pit(s), improved sinkhole(s)

Description of your Class V Injection Well:
INSTERT DESCRIPTION AND/OR INCLUDE SPECIFICATIONS IN APPENDIX G

DWQ contact information:
Name:
Date:
Additional information:

Local Requirements:

8.2 Discharge Information

Instructions:

- For Table 1, list the name of the first surface water(s) that would receive discharges from your site. If your site has discharges to multiple surface waters, describe each as clearly as possible, such as Big Cottonwood Creek, *a tributary to the Jordan River*, and so on.
- For Table 2, if any of the surface waters you listed out in Table 1 are listed as, provide specified information about pollutants causing the impairment and whether or not a Total Maximum Daily Load (TMDL) has been completed for the surface water that is applicable to construction sites. For more information on TMDLs and impaired waters, including a list of TMDL contacts and links by state, visit http://www.waterquality.utah.gov/TMDL/ or www.epa.gov/npdes/stormwater/tmdl. Your SWPPP should specifically include measures to prevent the discharge of these pollutants.
- Your project will be considered to discharge to a Category 1 or 2 water if the first surface water to which you discharge is identified by the state as a Category 1 or 2 water. For discharges that enter a storm sewer system prior to discharge, the first surface water to which you discharge is the water body that receives the storm water discharge from the storm sewer system. Refer to Appendix C.
- For more information, see *SWPPP Guide*, Chapter 3.A and 3.B.
- Indicate the location of all waters, including wetlands, on the site map.
- Note any stream crossings, if applicable.
- List the storm sewer system or drainage system that stormwater from your site could discharge to and the waterbody(s) that it ultimately discharges to.

Does your project/site discharge stormwater into a Municipal Separate Storm Sewer System (MS4)? ☐ Yes ☐ No

List the MS4 that receives the discharge from the construction project: INSERT TEXT HERE

Are there any surface waters that are located within 50 feet of your construction disturbances?
☐ Yes ☐ No

List the water body: INSERT TEXT HERE

8.3 Receiving Waters

Table 1 – Names of Receiving Waters

Name(s) of the first surface water that receives stormwater directly from your site and/or from the MS4. (note: multiple rows provided where your site has more than one point of discharge that flows to different surface waters)
1.
2.
3.

4.	
5.	
6.	

8.4 Impaired Waters

	Is this surface water listed as "impaired"?	If you answered yes, then answer the following:		
		What pollutant(s) are causing the impairment?	Has a TMDL been completed?	Pollutant(s) for which there is a TMDL
1.	☐ Yes ☐ No		☐ Yes ☐ No	
2.	☐ Yes ☐ No		☐ Yes ☐ No	
3.	☐ Yes ☐ No		☐ Yes ☐ No	
4.	☐ Yes ☐ No		☐ Yes ☐ No	
5.	☐ Yes ☐ No		☐ Yes ☐ No	
6.	☐ Yes ☐ No		☐ Yes ☐ No	

8.5 High Water Quality

Table 3 – High Water Quality (Answer the following for each surface water listed in Table 1 above)

	Is this surface water designated as High Water Quality? (see Appendix C)	If you answered yes, specify which category the surface water is designated as?
1.	☐ Yes ☐ No	☐ Category 1 ☐ Category 2
2.	☐ Yes ☐ No	☐ Category 1 ☐ Category 2
3.	☐ Yes ☐ No	☐ Category 1 ☐ Category 2
4.	☐ Yes ☐ No	☐ Category 1 ☐ Category 2
5.	☐ Yes ☐ No	☐ Category 1 ☐ Category 2
6.	☐ Yes ☐ No	☐ Category 1 ☐ Category 2

8.6 Dewatering Practices

Instructions:

- If you will be discharging stormwater that is removed from excavations, trenches, foundations, vaults, or other similar points of accumulation, include design specifications and details of all dewatering practices that are installed and maintained to comply with the UCGP Part 1.3.5.a and 2.1.3.d.
- Construction dewatering is covered under UPDES permit UTG070000. T his applies to construction dewatering of uncontaminated stormwater, groundwater, or surface water sources used in construction activities. T he permit, NOI and other associated information can be found at http://www.waterquality.utah.gov/UPDES/updes_f.htm.

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

8.7 Control Stormwater Flowing onto and through the Project

Instructions:

- Describe structural practices (e.g., diversions, berms, ditches, storage basins) including design specifications and details used to divert flows from exposed soils, retain or detain flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 3.)

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

***BMP Description*:**	
***Installation Schedule*:**	
***Maintenance and Inspection*:**	
***Responsible Staff*:**	

Repeat as needed

8.8 Protect Storm Drain Inlets

Instructions:

- Describe controls (e.g., inserts, rock-filled bags, or block and gravel) including design specifications and details that will be implemented to protect all inlets receiving stormwater from the project during the entire project. (For more information, see *SWPPP Guide*, Chapter 4, ESC Principle 6.)
- Also, see EPA's *Storm Drain Inlet Protection BMP Fact Sheet* at www.epa.gov/npdes/stormwater/menuofbmps/construction/storm_drain

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

SECTION 9: POST-CONSTRUCTION BMPs

Instructions:

- Describe all post-construction stormwater management measures that will be installed during the construction process to control pollutants in stormwater discharges after construction operations have been completed. Examples of post-construction BMPs include the following:
  - ✓ Biofilters
  - ✓ Detention/retention devices
  - ✓ Earth dikes, drainage swales, and lined ditches
  - ✓ Infiltration basins
  - ✓ Porous pavement
  - ✓ Other proprietary permanent structural BMPs
  - ✓ Outlet protection/velocity dissipation devices
  - ✓ Slope protection
  - ✓ Vegetated strips and/or swales
- Identify any applicable federal, state, local, or tribal requirements for design or installation.
- Describe how low-impact designs or smart growth considerations have been incorporated into the design.
- For any structural BMPs, you should have design specifications and details and refer to them. Attach them as appendices to the SWPPP or within the text of the SWPPP.
- For more information on this topic, see your state's stormwater manual.
- You might also want to consult one of the references listed in Appendix D of the *SWPPP Guide*.
- Visit the post-construction section of EPA's Menu of BMPs at: www.epa.gov/npes/menuofbmps

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

BMP Description:	
Installation Schedule:	
Maintenance and Inspection:	
Responsible Staff:	

Repeat as needed

SECTION 10: CERTIFICATION

Instructions:

- The SWPPP should be signed and certified by the construction operator(s). Attach a copy of the NOI and a copy of the General Storm Water Permit for Construction Activity. You can get a copy of the General Storm Water Permit for Construction Activity on the same web page that this template was obtained (www.waterquality.utah.gov/UPDES/stormwatercon.htm)

Professional/SWPPP Author

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 gathered and evaluated 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.

Name: _____ Title: _____

Signature: _____ Date: _____

Repeat as needed for construction operator(s) at the site

SWPPP APPENDICES

Attach the following documentation to the SWPPP:

Appendix A – General Location Map

Appendix B – Site Maps

Appendix C – Construction General Permit

Appendix D – NOI and Acknowledgement Letter from EPA/State/MS4

Appendix E – Inspection Reports

Appendix F – Corrective Action Log (or in Part 5.3)

Appendix G – SWPPP Amendment Log (or in Part 6.2)

Appendix H – Subcontractor Certifications/Agreements

Appendix I – Grading and Stabilization Activities Log (or in Part 6.1)

Appendix J – Training Log

Appendix K – Delegation of Authority

Appendix L – Additional Information (i.e., Endangered Species and Historic Preservation Documentation; other permits such as dewatering, stream alteration, wetland; and out of date swppp documents)

Appendix M – BMP Specifications

Appendix F – *Sample* Corrective Action Log

Project Name:
SWPPP Contact:

Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

Appendix G – *Sample* SWPPP Amendment Log

Project Name:
SWPPP Contact:

Amendment No.	Description of the Amendment	Date of Amendment	Amendment Prepared by [Name(s) and Title]

Appendix H – *Sample* Subcontractor Certifications/Agreements

SUBCONTRACTOR CERTIFICATION
STORMWATER POLLUTION PREVENTION PLAN

Project Number: _____

Project Title: _____

Operator(s): _____

As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.

Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:

I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

This certification is hereby signed in reference to the above named project:

Company: _____

Address: _____

Telephone Number: _____

Type of construction service to be provided: _____

_____

_____

Signature: _____

Title: _____

Date: _____

Appendix I – *Sample* Grading and Stabilization Activities Log

Project Name:
SWPPP Contact:

Date Grading Activity Initiated	Description of Grading Activity	Date Grading Activity Ceased (Indicate Temporary or Permanent)	Date When Stabilization Measures are Initiated	Description of Stabilization Measure and Location

Appendix J – *Sample* SWPPP Training Log

Stormwater Pollution Prevention Training Log

Project Name:

Project Location:

Instructor's Name(s):

Instructor's Title(s):

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

- ❑ Erosion Control BMPs
- ❑ Emergency Procedures
- ❑ Sediment Control BMPs
- ❑ Good Housekeeping BMPs
- ❑ Non-Stormwater BMPs

Specific Training Objective:_____

_____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Appendix K – *Sample* Delegation of Authority Form

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in _____ (Reference State Permit), and that the designee above meets the definition of a "duly authorized representative" as set forth in _____ (Reference State Permit).

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 gathered and evaluated 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.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

When recorded, mail to:

South Jordan City Recorder
1600 Towne Center Drive
South Jordan, Utah 84095

Affects Parcel No(s): _____

Property/Subdivision: _____

SOUTH JORDAN CITY
STORMWATER FACILITIES
MAINTENANCE AGREEMENT

This Stormwater Facilities Maintenance Agreement ("Agreement") is made and entered into this _____ day of _____, 20_____, by and between South Jordan City, a Utah municipal corporation ("City"), and _____, a _____ ("Owner").

RECITALS

WHEREAS, the City is authorized and required to regulate and control the disposition of storm and surface waters within the City, as set forth in the South Jordan City Stormwater Ordinance, as amended ("Ordinance"), adopted pursuant to the Utah Water Quality Act, as set forth in *Utah Code Ann*. §§ 19-5-101, *et seq*., as amended ("Act"); and

WHEREAS, the Owner hereby represents and acknowledges that it is the owner in fee simple of certain real property more particularly described in Exhibit "A," attached hereto and incorporated herein by this reference ("Property"); and

WHEREAS, the Owner desires to build or develop the Property and/or to conduct certain regulated construction activities on the Property which will alter existing storm and surface water conditions on the Property and/or adjacent lands; and

WHEREAS, in order to accommodate and regulate these anticipated changes in existing storm and surface water flow conditions, the Owner desires to build and

maintain at Owner's expense a storm and surface water management facility or improvements ("Stormwater Facilities"); and

WHEREAS, the Stormwater Facilities are more particularly described and shown in the final site plan or subdivision approved for the Property and related engineering drawings, and any amendments thereto, which plans and drawings are on file with the City and are hereby incorporated herein by this reference ("Development Plan"); and

WHEREAS, as a condition of Development Plan approval, and as required as part of the City's Small MS4 UPDES General Permit from the State of Utah, Owner is required to enter into this Agreement addressing the maintenance requirements for the Stormwater Facilities and control measures installed on the Property.

NOW, THEREFORE, in consideration of the benefits received and to be received by the Owner, its successors and assigns, as a result of the City's approval of the Development Plan, and the mutual covenants contained herein, the parties agree as follows:

1. Construction of Stormwater Facilities. The Owner shall, at its sole cost and expense, construct the Stormwater Facilities in strict accordance with the plans and specifications identified in the Development Plan and any amendments thereto, which have been approved by the City.

2. Maintenance of Stormwater Facilities. The Owner shall, at its sole cost and expense, adequately maintain the Stormwater Facilities. Owner's maintenance obligations shall include all pipes and channel built to convey stormwater, as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. Adequate maintenance, for purposes of this Agreement, is defined as good working condition so that the Stormwater Facilities are performing their design functions. The Owner shall, at its sole cost and expense, perform all work necessary to keep the Stormwater Facilities in good working condition. In the event that a maintenance schedule is set forth in the Development Plan, such maintenance schedule shall be followed.

3. Annual Inspection of Stormwater Facilities. The Owner shall, at its sole cost and expense, inspect the Stormwater Facilities and submit an inspection report and certification to the City annually. The purpose of the inspection and certification is to assure safe and proper functioning of the Stormwater Facilities. The annual inspection shall cover all aspects of the Stormwater Facilities, including, but not limited to, the structural improvements, berms, outlet structure, pond areas, access roads, vegetation, landscaping, etc. Deficiencies shall be noted in the inspection report. The report shall also contain a certification as to whether adequate maintenance has been performed and whether the structural controls are operating as designed to protect water quality. The annual inspection report and certification shall be due by July 31st of each year and shall be on forms acceptable to the City.

4. City Oversight Inspection Authority. The Owner hereby grants permission to the City, its authorized agents and employees, to enter upon the Property and to inspect the Stormwater Facilities whenever deemed necessary by the City. Such inspections shall be conducted in a reasonable manner and at reasonable times, as determined appropriate by the City. The purpose of the inspection shall be to determine and ensure that the Stormwater Facilities are being adequately maintained, are continuing to perform in an adequate manner, and are in compliance with the Act, the Ordinance, and the Development Plan.

5. Notice of Deficiencies. If the City finds that the Stormwater Facilities contain any defects or are not being maintained adequately, the City shall send Owner written notice of the defects or deficiencies and provide Owner with a reasonable time to cure such defects or deficiencies. Such notice shall be hand-delivered to the Owner or sent certified mail to the Owner at the Property address.

6. Owner to Make Repairs. The Owner shall, at its sole cost and expense, make such repairs, changes or modifications to the Stormwater Facilities as may be determined as reasonably necessary by the City within the required cure period to ensure that the Stormwater Facilities are adequately maintained and continue to operate as designed and approved.

7. City's Corrective Action Authority. In the event the Owner fails to adequately maintain the Stormwater Facilities in good working condition acceptable to the City, after due notice of deficiencies as provided in Section 5, the City may enter upon the Property and take whatever steps necessary to correct deficiencies and to charge the costs of such repairs to the Owner. It is expressly understood and agreed that the City is under no obligation to maintain or repair the Stormwater Facilities, and in no event shall this Agreement be construed to impose any such obligation on the City. The actions described in this Section are in addition to and not in lieu of any and all legal remedies available to the City as provided by law for Owner's failure to remedy deficiencies or any other failure to perform under the terms and conditions of this Agreement.

8. Reimbursement of Costs. In the event the City, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like, the Owner shall reimburse the City upon demand, within thirty (30) days of receipt thereof for all actual costs incurred by the City. After said thirty (30) days, such amount shall be deemed delinquent and shall be subject to interest at the rate of ten percent (10%) per annum. Owner shall also be liable for any collection costs, including attorneys' fees and court costs, incurred by the City in collection of delinquent payments.

9. Successor and Assigns. This Agreement shall be recorded in the Salt Lake County Recorder's Office and the covenants and agreements contained herein

shall run with the land and whenever the Property shall be held, sold, conveyed or otherwise transferred, it shall be subject to the covenants, stipulations, agreements and provisions of this Agreement which shall apply to, bind and be obligatory upon the Owner hereto, its successors and assigns, and shall bind all present and subsequent owners of the Property described herein.

10. Severability Clause. The provisions of this Agreement shall be severable and if any phrase, clause, sentence or provision is declared unconstitutional, or the applicability thereof to the Owner, its successors and assigns, is held invalid, the remainder of this Covenant shall not be affected thereby.

11. Utah Law and Venue. This Agreement shall be interpreted under the laws of the State of Utah. Any and all suits for any claims or for any and every breach or dispute arising out of this Agreement shall be maintained in the appropriate court of competent jurisdiction in Salt Lake County, Utah.

12. Indemnification. This Agreement imposes no liability of any kind whatsoever on the City and the Owner agrees to hold the City harmless from any liability in the event the Stormwater Facilities fail to operate properly. The Owner shall indemnify and hold the County harmless for any and all damages, accidents, casualties, occurrences, or claims which might arise or be asserted against the City from the construction, presence, existence, or maintenance of the Stormwater Facilities.

13. Amendments. This Agreement shall not be modified except by written instrument executed by the City and the Owner of the Property at the time of modification, and no modification shall be effective until recorded in the Salt Lake County Recorder's Office.

14. Subordination Requirement. If there is a lien, trust deed or other property interest recorded against the Property, the trustee, lien holder, etc., shall be required to execute a subordination agreement or other acceptable recorded document agreeing to subordinate their interest to the Agreement.

[Signature page to follow]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth above.

"City"
South Jordan City

By: _____
Its: _____

"Owner"
_____

By: _____
Print Name: _____
Title: _____

CITY ACKNOWLEDGMENT

STATE OF UTAH)
: ss.
COUNTY OF SALT LAKE)

On the _____ day of _____, 20___, personally appeared before me _____, who being duly sworn, did say that he/she is the _____ of **SOUTH JORDAN CITY**, a municipal corporation of the State of Utah, and that the foregoing instrument was signed in his/her capacity as land use authority on behalf of the City for approval of Stormwater Facilities Maintenance Agreements.

_____
Notary Public

My Commission Expires: Residing at:

_____ _____

OWNER ACKNOWLEDGMENT

Note: If Owner is a corporation, limited liability company, partnership, trust or other legal entity, rather than an individual, a separate applicable acknowledgement must be provided.

STATE OF UTAH)
: ss.
COUNTY OF SALT LAKE)

On the _____ day of _____, 20___, personally appeared before me _____, who being duly sworn, did say that he/she is the legal property owner of record of the property subject to this Maintenance Agreement and that he/she has executed this Agreement with full authority to do so.

_____
Notary Public

My Commission Expires: Residing at:

Exhibit "A"

Property Legal Description

SUPPLEMENTAL CONTACT INFORMATION SHEET
FOR
SOUTH JORDAN CITY
STORMWATER FACILITIES
MAINTENANCE AGREEMENT

CONTACT INFORMATION

Name (Main Contact): _____ **Phone:** _____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Contact Person: _____ **Phone:** _____

Contact Email: _____

SECONDARY CONTACT INFORMATION (ASSIGNED/ OR DEPARTMENT)

Name (Main Contact): _____ **Phone:** _____

Address: _____

City: _____ **State:** _____ **Zip:** _____

Contact Person: _____ **Phone:** _____

Contact Email: _____

SOUTH JORDAN
UTAH

BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES

BMP REFERENCE MANUAL

This manual is intended as guidance for implementing stormwater Best Management Practices at construction sites. It does not represent all BMPs, but rather a presentation of the more common BMP's accepted by South Jordan City.

South Jordan City cannot be held liable for special, collateral, incidental or consequential damages in connection with or arising from using techniques presented in this manual.

STORMWATER AND CONSTRUCTION ACTIVITIES

A landowner or primary contractor who plans or conducts construction activity with a land disturbance of greater than or equal to one acre, **including projects less than one acre that are part of a larger common plan of development or sale** is required to obtain a permit from the Utah Division of Water Quality. The permit may be obtained on-line at www.waterquality.utah.gov/updes/stormwater. Please note that the permit is required **BEFORE** construction starts. The permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that identifies potential sources of stormwater pollutants and Best Management Practices (BMPs) to reduce or eliminate their impacts.

BMPs are practices that control stormwater sediment and erosion to the maximum extent practicable (MEP). These controls include a wide range of structural and non-structural options. This booklet presents BMPs that are recommended by the Utah Division of Water Quality and the Environmental Protection Agency.

Contractors may use this booklet as general guidance related to BMPs; it is up to the contractor to select appropriate BMPs and implement and maintain these BMPs. Selection of BMPs will be site specific and deviation from those presented here may be appropriate given the conditions, contractor experience and new technology. Variations are acceptable provided implemented controls meet the intent of the BMP.

ADDITIONAL INFORMATION

Salt Lake County Stormwater Coalition
http://www.stormwatercoalition.org/

Salt Lake County Department Flood Control Engineering
http://www.pweng.slco.org/flood/index.html

Salt Lake County Public Works Stormwater Management
www.pweng.slco.org/strm/html/guide.html

State Division of Water Quality
http://www.waterquality.utah.gov/UPDES/stormwater.htm

US Environmental Protection Agency
http://cfpub1.epa.gov/npdes/home.cfm?program_id=6

Center for Watershed Protection
http://www.cwp.org/

Low Impact Development
http://www.lid-stormwater.net/

StormCon
http://www.forester.net/sc.html

Water Environment Federation
http://www.wef.org/Home

Stormwater Authority
http://www.stormwaterauthority.org/

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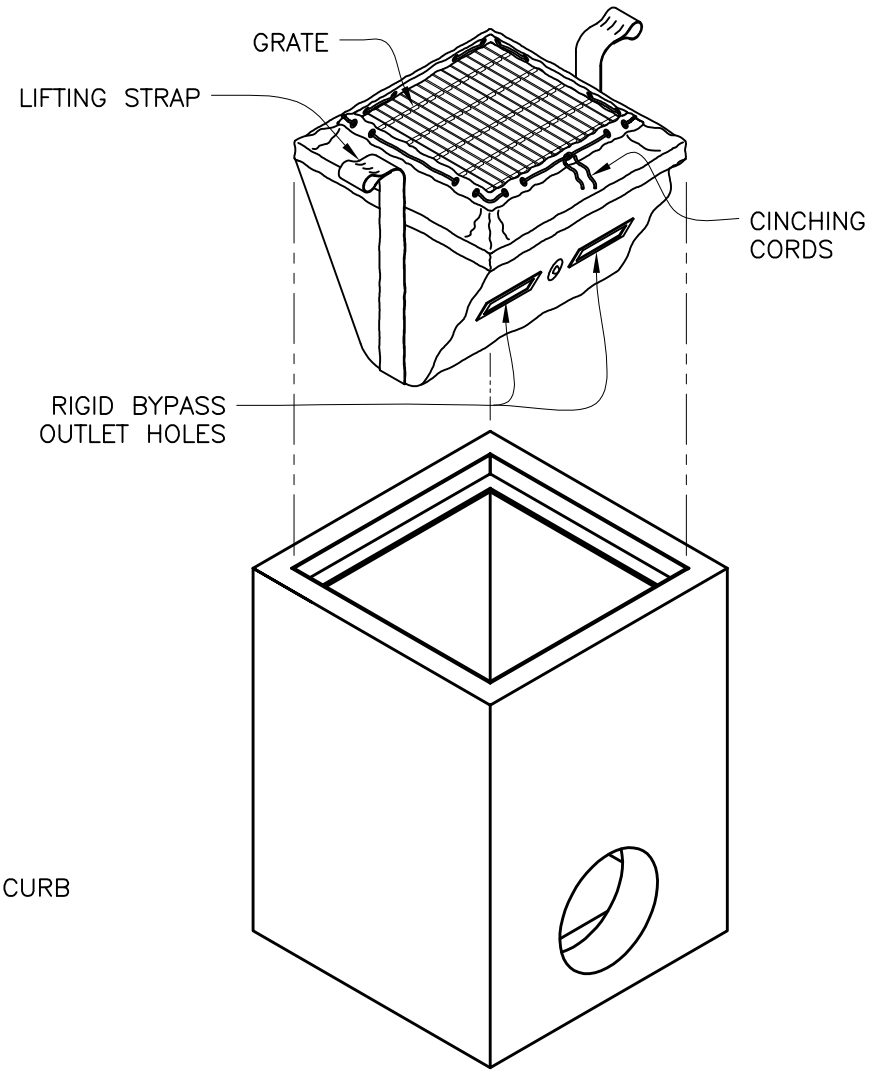
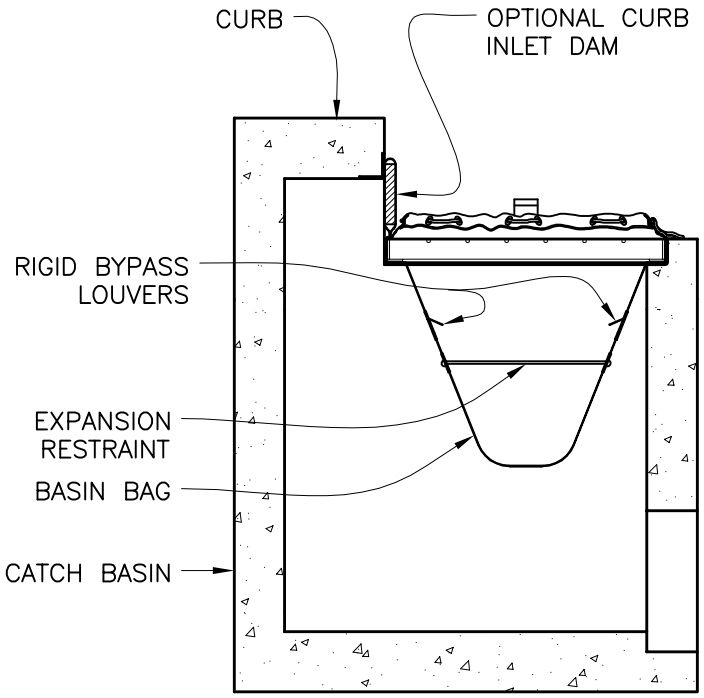
FG-TB-0001



SPECIFIER CHART		
MODEL NO.	CATCH BASIN ID Inside Dimension (inch x inch)	CURB DAM OPTION (YES / NO)
FG-TB24	24 X 24	NO
FG-TB24D	24 X 24	YES
FG-TB2436	24 X 36	NO
FG-TB2436D	24 X 36	YES
FG-TB36	36 X 36	NO
FG-TB36D	36 X 36	YES



SECTION VIEW
-INSTALLED-
WITH OPTIONAL CURB INLET DAM

NOTES:

1. FloGard® T-Bag™ is manufactured from woven monofilament polypropylene fabric. Other materials available upon request.
2. May be ordered with *Fossil Rock* ™ oil absorbent pouches installed.
3. Optional curb inlet dam available upon request.
4. Periodic maintenance is required. FloGard® T-Bag™ should never be allowed to fill beyond the top of the bypass outlet louvers.
5. Appropriate lifting equipment should be used when performing periodic maintenance.

TITLE

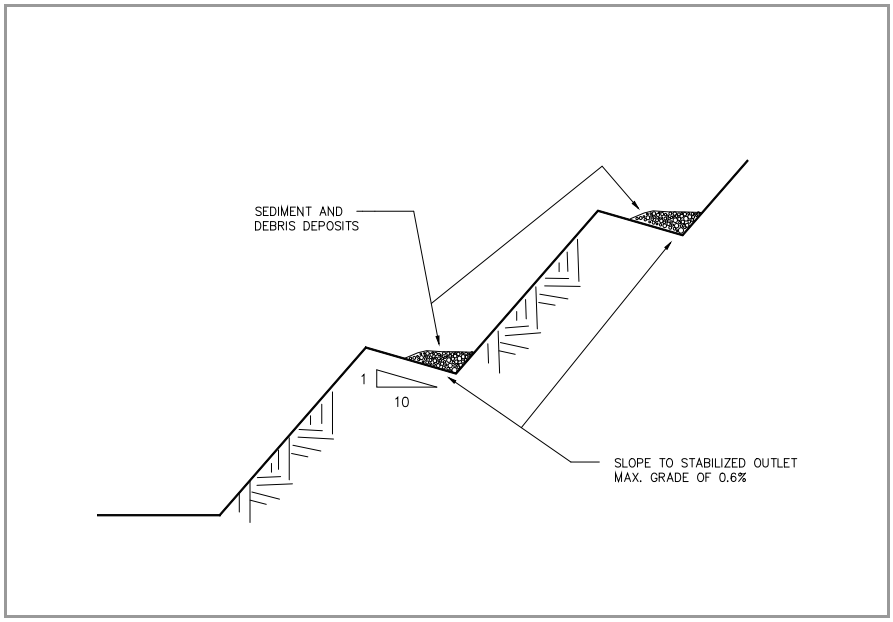
FloGard® T-BAG™

TEMPORARY INLET PROTECTION DEVICE

KriStar Enterprises, Inc.
360 Sutton Place, Santa Rosa, CA 95407
Ph: 800.579.8819, Fax: 707.524.8186, www.kristar.com

DRAWING NO.	REV	ECO	DATE	
FG-TB-0001	A	0059 JPR 12/30/08	JPR 09/01/06	SHEET 1 OF 1

BMP: Benching



DESCRIPTION:

Slope construction with benches spaced at regular intervals perpendicular to the slope which intercept and collect sheet flow and direct it to a stable outfall point.

APPLICATIONS:

- Unstabilized cut and fill slopes
- Large stockpiles
- Existing unstable slopes

INSTALLATION/APPLICATION CRITERIA:

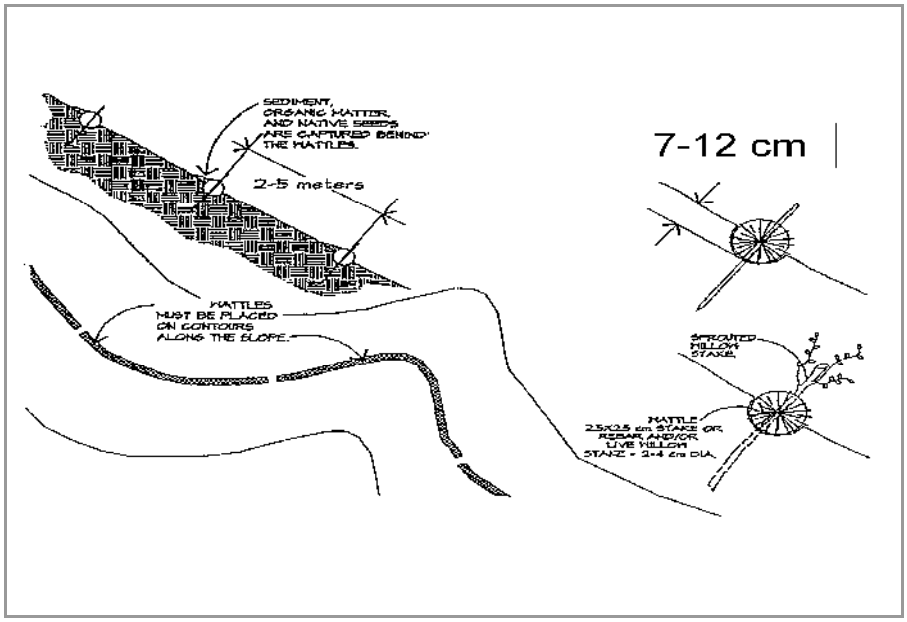
- Benches should be formed as slope is constructed and graded to the outlet point.
- Stabilized outlet with sediment controls should be in place prior to slope construction.

LIMITATIONS:

- Construction slope design must accommodate benching
- Not appropriate for sandy or rocky soil
- Only effective if suitable outlet provided

MAINTENANCE:

- Inspect after major storm events and at least biannually, repair any damaged areas.
- Remove debris blocking water flow.
- Inspect outlet, repair/replace sediment controls and remove sediment build up.



DESCRIPTION:

Bioengineering methods combine vegetative and mechanical techniques to stabilize eroding slopes. Bioengineering methods include sprigging, tubeling and wattling. Sprigging involves planting rhizomes, stolons, shoots or sprouts of a desirable species. Tubelings are forbs, shrubs, or trees commercially available in reusable plastic tubes or sleeves. Wattles are bundles of cuttings from live willows, alders, or similar plants placed and secured in trenches across a slope to aid in slope stabilization.

APPLICATIONS:

- Sprigging may be performed on cut and fill slopes or other areas needing permanent soil stability.
- Tubelings may be placed on any area needing revegetation, but are most useful on slopes or flat areas where poor topsoil conditions inhibit successful seed germination and early plant growth.
- Wattles act to reduce slope length and aid in stabilizing slopes due to surface runoff, frost heaving, needle ice, or other soil movement.

INSTALLATION/APPLICATION CRITERIA:

- Sprigging involves tearing sod apart; planting rhizomes or stolons, or transplanting shoots or sprouts. Sprigs are placed by broadcast, punching-in or with a special sprig planter.
- Tubelings involve drilling holes to the depth necessary to accommodate roots.
- Wattles are best applied to slopes no steeper than 2:1.

LIMITATIONS:

- Availability of plant materials may affect what species can be used.
- May be necessary to arrange for commercially grown tubelings.
- Cannot be used as a substitute for retaining walls or similar devices to stabilize over steepened slopes.

MAINTENANCE:

- Sprigging and tubeling plantings should be checked periodically until they are permanently established.
- Assess the need for replacement plantings or supplemental fertilizer.

DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from building repair, remodeling, and construction by using soil erosion controls, enclosing or covering building material storage areas, using good housekeeping practices, using safer alternative products, and training employees.

APPLICATIONS:

- Use soil erosion control techniques if bare ground is temporarily exposed.
- Use permanent soil erosion control techniques if the remodeling clears buildings from an area that are not to be replaced.

INSTALLATION/APPLICATION CRITERIA:

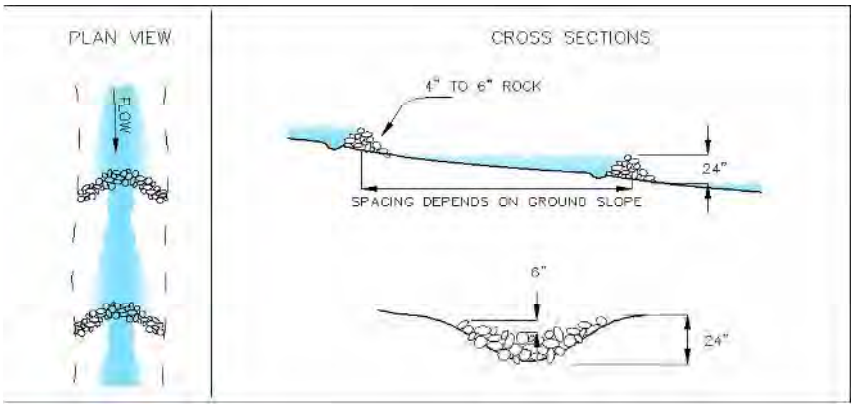
- Enclose painting operations consistent with local air quality regulations and OSHA.
- Properly store materials that are normally used in repair and remodeling such as paints and solvents.
- Properly store and dispose waste materials generated from the activity.
- Maintain good housekeeping practices while work is underway.

LIMITATIONS:

- This BMP is for minor construction only.
- A licensed hazardous waste hauler must dispose of hazardous waste that cannot be re-used or recycled.
- Safer alternative products may not be available, suitable, or effective in every case.
- Be certain that actions to help storm water quality are consistent with OSHA and air quality regulations.

MAINTENANCE:

None



DESCRIPTION:

A small, temporary dam constructed across a drainage ditch to reduce velocity of concentrated storm water flows, thereby reducing the erosion of the ditch.

APPLICATIONS:

- Temporary drainage paths
- Permanent drainage ways not yet stabilized
- Existing drainage paths receiving increased flows due to construction

INSTALLATION/APPLICATION CRITERIA:

- Prepare location of dam by removing any debris and rough grading any irregularities in channel bottom
- Place rocks by hand or with appropriate machinery; do not dump
- Space dams to make the base of the upstream dam the same elevation as the top of the next lower dam
- Construct dam to pass design flows with center lower to create a weir effect
- Construct 50% side slopes on dam

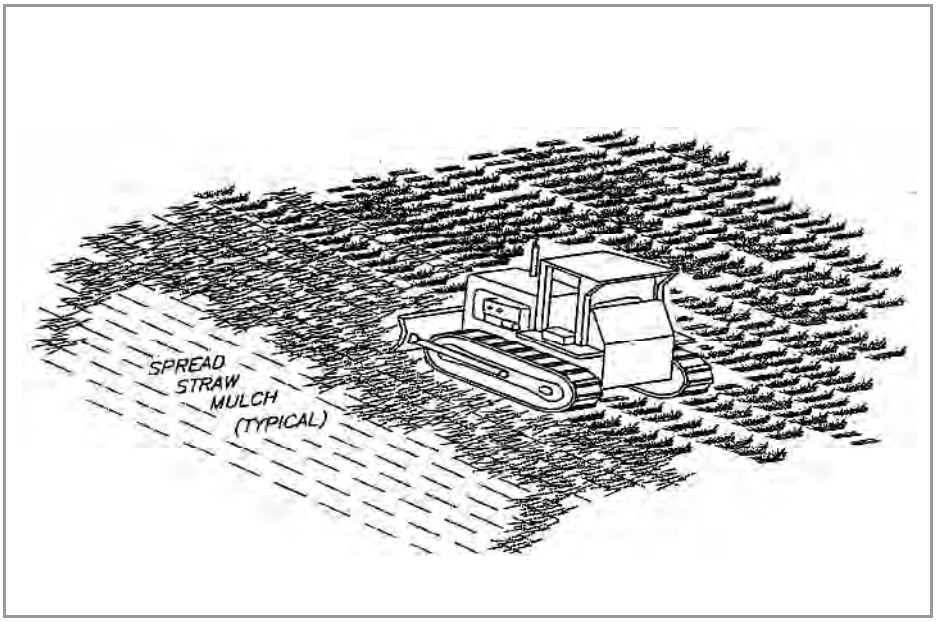
LIMITATIONS:

- Maximum recommended drainage area is 10 acres
- Maximum recommended height is 24"
- Do not use in running stream

MAINTENANCE:

- Inspect dams at a minimum of twice monthly, after each major rain event, and daily during prolonged rainfall.
- Remove any large debris and repair any damage to dam, channel or sideslopes.
- Remove accumulated sediment when it reaches one half the height of the dam.

BMP: Chemical Mulch



DESCRIPTION:

Applying materials such as vinyl, asphalt, plastics, or rubber on an unprotected slope to temporarily stabilize the slope.

APPLICATIONS:

- As a tacking agent to aid the stabilization of mulches (where matting is not used).
- As a short-term alternative in areas where temporary seeding practices cannot be used because of seasonal condition or climate.
- On steep and rocky slopes where neither mechanical methods or mulches and protective netting can be effectively applied.

INSTALLATION/APPLICATION CRITERIA:

- The application rates and procedures recommended by the manufacturer of a chemical stabilization product should be followed to prevent the products from forming ponds and from creating large areas where moisture cannot get through.
- For permanent application, chemical mulches (when used with seed and mulch) should be applied over wood fiber or straw mulch.

LIMITATIONS:

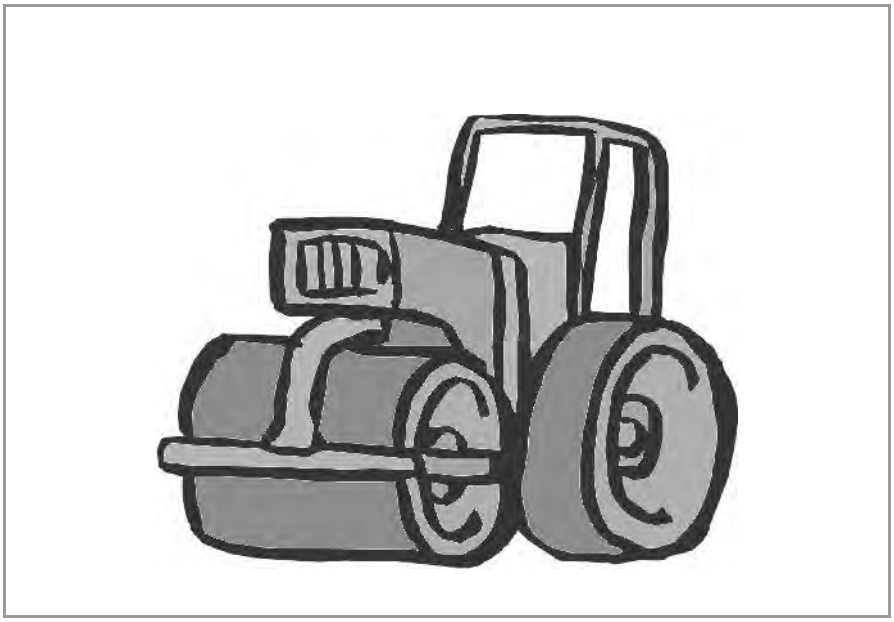
- Chemical mulches can create impervious surfaces and impact water quality if not properly applied.
- Some products may not be suitable for use near live streams.

MAINTENANCE:

- Inspect at regular intervals and after each runoff-producing storm event.
- Replace chemical mulch as needed to ensure adequate level of coverage.

BMP: Compaction

CP
Construction



DESCRIPTION:

Use of rolling, tamping, or vibration to stabilize fill materials and control erosion by increasing the soil density. Increasing the density of soil improves soil strength, reduces long-term soil settlement, and provides resistance to erosion.

APPLICATIONS:

- Stabilize fill material placed around various structures.
- Improve soil in place as foundation support for roads, parking lots, and buildings.

INSTALLATION/APPLICATION CRITERIA:

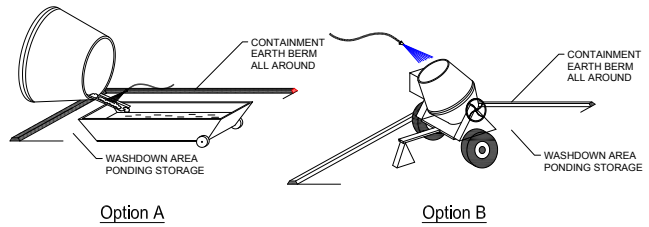
- Make sure soil moisture content is at optimum levels.
- Use proper compaction equipment.
- Install sediment control and storm water management devices below compacted areas and runon interceptor devices above these areas. Drainage from compacted areas must be carefully planned to protect adjacent uncompacted soils.
- The surface of compacted areas should be scarified and seeded or mulched and seeded to increase the effectiveness of compaction.

LIMITATIONS:

- Compaction tends to increase runoff.
- Over-compaction will hamper revegetation efforts.

MAINTENANCE:

- No maintenance required.



Option A Option B

CONCRETE WASTE MANAGEMENT

Locate 50' from nearest inlet structure

DESCRIPTION:

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

APPLICATION:

This technique is applicable to all types of sites.

INSTALLATION/APPLICATION CRITERIA:

- Store dry materials under cover, away from drainage areas.
- Minimize excess mixing of fresh concrete, mortar or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (6” tall by 6” wide).
- Train employees and subcontractors in proper concrete waste management.

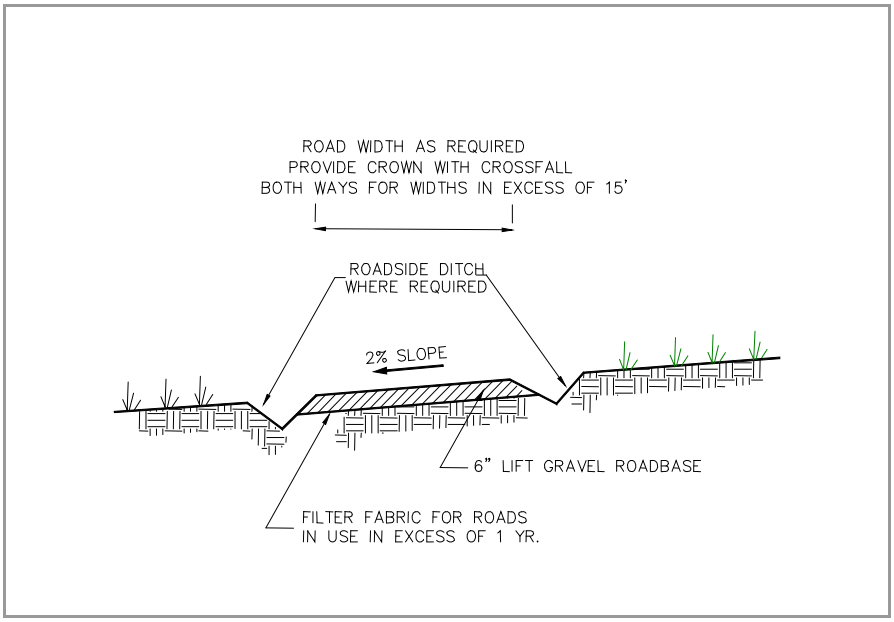
LIMITATIONS:

- Off-site washout of concrete wastes may not always be possible.

MAINTENANCE:

- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.

BMP: Construction Road Stabilization



DESCRIPTION:
Temporary stabilization of on-site roadway by placement of gravel roadbase.

APPLICATION:
- On-site roadways used daily by construction traffic (may not apply to gravelly type soils).
- Parking or staging areas susceptible to erosion due to traffic use.

INSTALLATION/APPLICATION CRITERIA:
- Grade temporary access road with 2% cross fall, for two-way width provide crown.
- Provide roadside ditch and outlet controls where required.
- Place 6 inches of 2-inch to 4-inch crushed rock on driving area.

LIMITATIONS:
- May require removal of gravel roadbase at completion of activities if final cover is not impervious.
- May require controls for surface storm water runoff.

MAINTENANCE:
- Inspect after major rainfall events and at least monthly.
- Place additional gravel as needed and repair any damaged areas.
- Maintain any roadside drainage controls.

DESCRIPTION:

Construction sequencing is a specified work schedule that coordinates the timing of land-disturbing activities and the installation of erosion and sediment control measures. Construction site phasing involves disturbing only part of a site at a time to prevent erosion from dormant parts. Grading activities and construction are completed and soils are effectively stabilized on one part of the site before grading and construction commence at another part.

APPLICATIONS:

Sequencing can be used to plan earthwork and erosion and sediment control activities at sites where land disturbances might affect water quality in a receiving waterbody.

INSTALLATION/APPLICATION CRITERIA:

Sequencing schedules should include the following Design and Installation Criteria:

- The erosion & sediment control practices that are to be installed
- Principal development activities
  - Which measures should be installed before other activities are started
  - Compatibility with the general contract construction schedule

LIMITATIONS:

Weather and other unpredictable variables might affect sequence schedules. However, the erosion and sediment control plan should plainly state the proposed schedule and a protocol of making changes due to unforeseen problems.

MAINTENANCE:

Follow the construction sequence throughout the project and modify the written plan before any changes in construction activities are executed. Update the plan if a site inspection indicates the need for additional erosion and sediment control.

Adapted from EPA – Stormwater Menu of BMPs

BMP: Contaminated or Erodible Surface Areas

DESCRIPTION:

Prevent or reduce the discharge of pollutants to stormwater from contaminated or erodible surface areas by leaving as much vegetation on-site as possible, minimizing soil exposure time, stabilizing exposed soils, and preventing stormwater runon and runoff.

APPLICATIONS:

This BMP addresses soils which are not so contaminated as to exceed criteria but the soil is eroding and carrying pollutants off in the stormwater.

INSTALLATION/APPLICATION CRITERIA:

Contaminated or erodible surface areas can be controlled by:

- Preservation of natural vegetation, re-vegetation, chemical stabilization, removal of contaminated soils or geosynthetics.

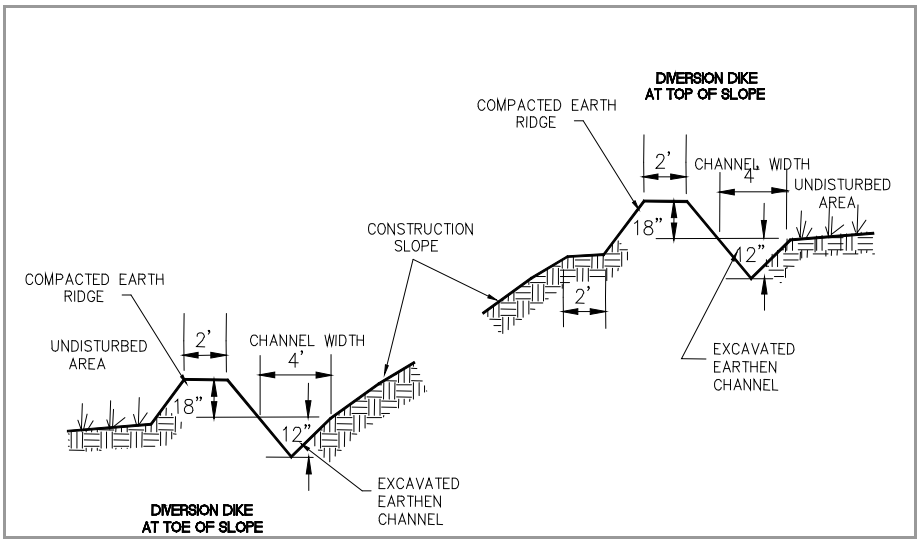
LIMITATIONS:

Disadvantages of preserving natural vegetation or re-vegetating include:

- Requires substantial planning to preserve and maintain the existing vegetation.
- May not be cost-effective with high land costs.
- Lack of rainfall and/or poor soils may limit the success of re-vegetated areas.
- Disadvantages of chemical stabilization include:
  - Creation of impervious surfaces.
  - May cause harmful effects on water quality.
  - Is usually more expensive than vegetative cover.

MAINTENANCE:

Maintenance should be minimal, except possibly if irrigation of vegetation is necessary.



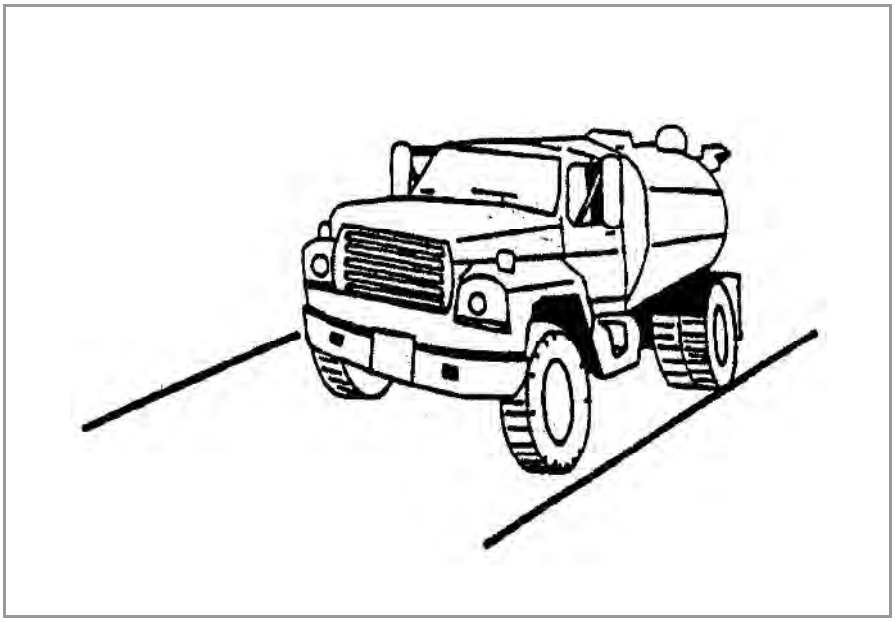
DESCRIPTION:
A temporary sediment barrier and storm runoff conveyance consisting of an excavation channel and compacted earth ridge.

APPLICATION:
- Construct along top of construction slope to intercept upgradient runoff and convey around construction site.
- Construct along toe of construction to divert sediment laden runoff.
- Construct along midpoint of construction slope to intercept runoff and channel to controlled discharge point.
- Construct around base of soil stockpiles to capture sediment.
- Construct around perimeter of disturbed areas to capture sediment.

INSTALLATION/APPLICATION CRITERIA:
- Clear and grub area for dike construction.
- Excavate channel and place soil on downgradient side.
- Shape and machine compact excavated soil to form ridge.
- Place erosion protection (riprap, mulch) at outlet.
- Stabilize channel and ridge as required with mulch, gravel, or vegetative cover.

LIMITATIONS:
- Recommended maximum drainage area of 5 acres.
- Recommended maximum sideslopes of 2h:1v (50%).
- Recommended maximum slope on channel of 1%.

MAINTENANCE:
- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff breaching dike or eroding channel or sideslopes.
- Check discharge point for erosion or bypassing of flows.
- Repair and stabilize as necessary.
- Inspect daily during vehicular activity on slope, check for and repair any traffic damage.



DESCRIPTION:
Dust control measures are used to stabilize soil from wind erosion, and reduce dust by construction activities.

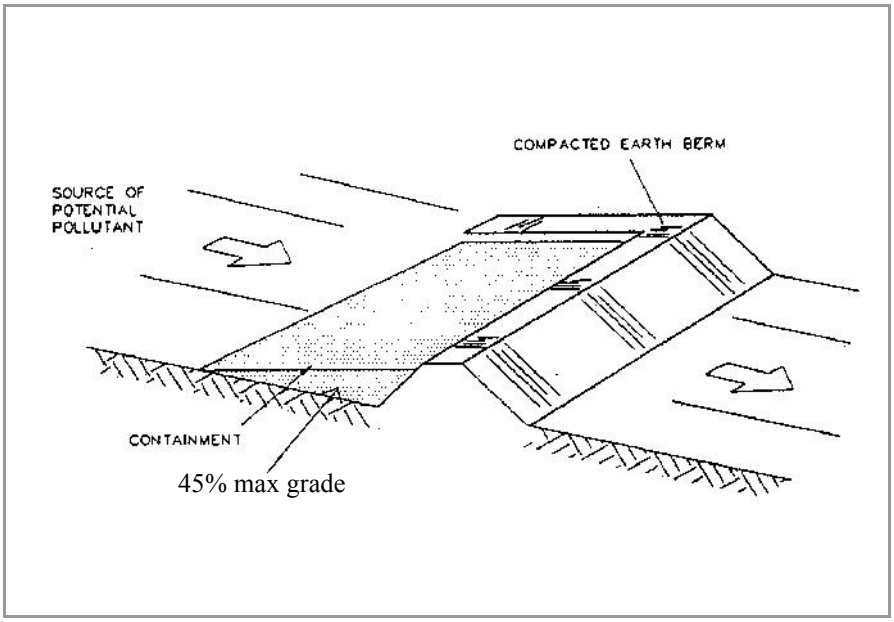
APPLICATION:
Dust control is useful in any process area, loading and unloading area, material handling areas, and transfer areas where dust is generated. Street sweeping is limited to areas that are paved.

INSTALLATION/APPLICATION CRITERIA:
- Mechanical dust collection systems are designed according to the size of dust particles and the amount of air to be processed. Manufacturers' recommendations should be followed for installation (as well as the design of the equipment).
- Two kinds of street weepers are common: brush and vacuum. Vacuum sweepers are more efficient and work best when the area is dry.
- Mechanical equipment should be operated according to the manufacturers' recommendations and should be inspected regularly.

LIMITATIONS:
- Generally more expensive than manual systems.
- May be impossible to maintain by plant personnel (the more elaborate equipment).
- Labor and equipment intensive and may not be effective for all pollutants (street sweepers).

MAINTENANCE:
If water sprayers are used, dust-contaminated waters should be collected and taken for treatment. Areas will probably need to be resprayed to keep dust from spreading.

BMP: Earth Berm Barrier



DESCRIPTION:
A temporary containment control constructed of compacted soil.

APPLICATION:
- Construct around waste and materials storage area.
- Construct around staging and maintenance areas.
- Construct around vehicle parking and servicing areas.

INSTALLATION/APPLICATION CRITERIA:
- Construct an earthen berm down hill of the area to be controlled. The berm should surround fueling facilities and maintenance areas on three sides to provide containment.
- Berm needs to be a minimum of 1 foot tall by 1 foot wide and be compacted by earth moving equipment.

LIMITATIONS:
- Not effective on steep slopes.
- Limits access to controlled area.
- Personnel need to quickly respond to spills with remedial actions.

MAINTENANCE:
- Observe daily for any non-stormwater discharge.
- Look for runoff bypassing ends of berms or undercutting berms.
- Repair or replace damaged areas of the berm and remove accumulated sediment.
- Recompact soil around berm as necessary to prevent piping.

BMP: Employee Training

ET
Construction

DESCRIPTION:
Employee training, like equipment maintenance, is a method by which to implement BMPs. Employee training should be used in conjunction with all other BMPs as part of the facility's SWPPP.

The specific employee training aspects of each of the source controls are highlighted in the individual information sheets. The focus of this information sheet is more general, and includes the overall objectives and approach for assuring employee training in stormwater pollution prevention. Accordingly, the organization of this information sheet differs somewhat from the other information sheets in this chapter.

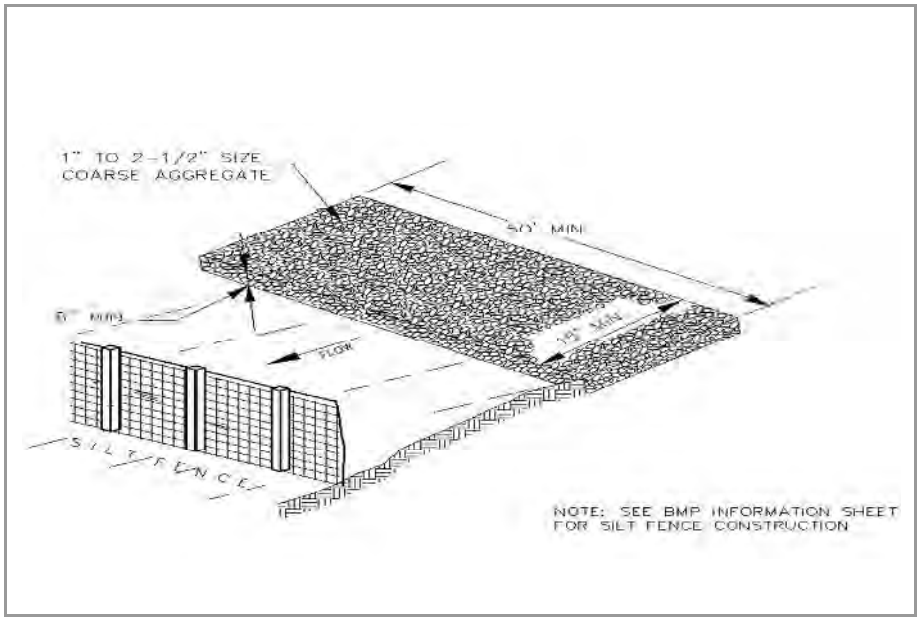
OBJECTIVES:
Employee training should be based on four objectives:

- Promote a clear identification and understanding of the problem, including activities with the potential to pollute stormwater;
- Identify solutions (BMPs);
- Promote employee ownership of the problems and the solutions; and
- Integrate employee feedback into training and BMP implementation.

APPROACH:

- Integrate training regarding stormwater quality management with existing training programs that may be required for your business by other regulations.
- Businesses that are not regulated in Federal, State, or local regulations, may use the information in this handbook to develop a training program to reduce their potential to pollute stormwater.
- Employee training is a vital component of many of the individual source control BMPs included in this manual.

BMP: Equipment and Vehicle Wash Down Area



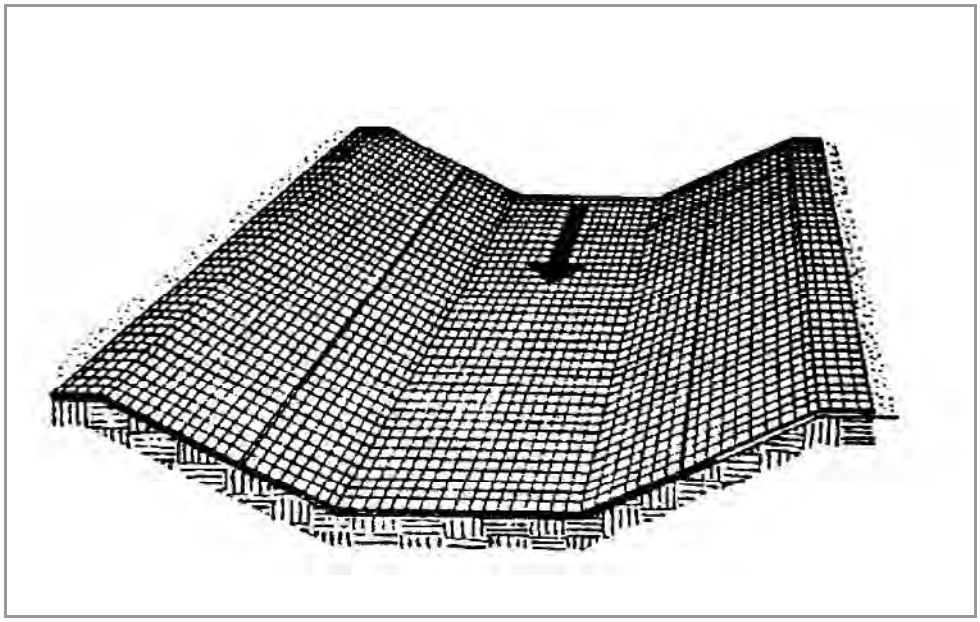
DESCRIPTION:
A stabilized pad of crushed stone for general washing of equipment and construction vehicles.

APPLICATION:
At any site where regular washing of vehicles and equipment will occur. May also be used as a filling point for water trucks limiting erosion caused by overflow or spillage of water.

INSTALLATION:
- Clear and grub area and grade to provide maximum slope of 1%.
- Compact subgrade and place filter fabric if desired (recommended for wash areas to remain in use for more than 3 months.
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8-inches.
- Install silt fence downgradient (see silt fence BMP information sheet).

LIMITATIONS:
Cannot be utilized for washing equipment or vehicles that may cause contamination of runoff such as fertilizer equipment or concrete equipment. Solely used to control sediment in wash water.

MAINTENANCE:
- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent area for sediment deposit and install additional controls as necessary.
- Repair area and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate activities.
- Maintain silt fence as outlined in specific silt fence BMP information sheet.



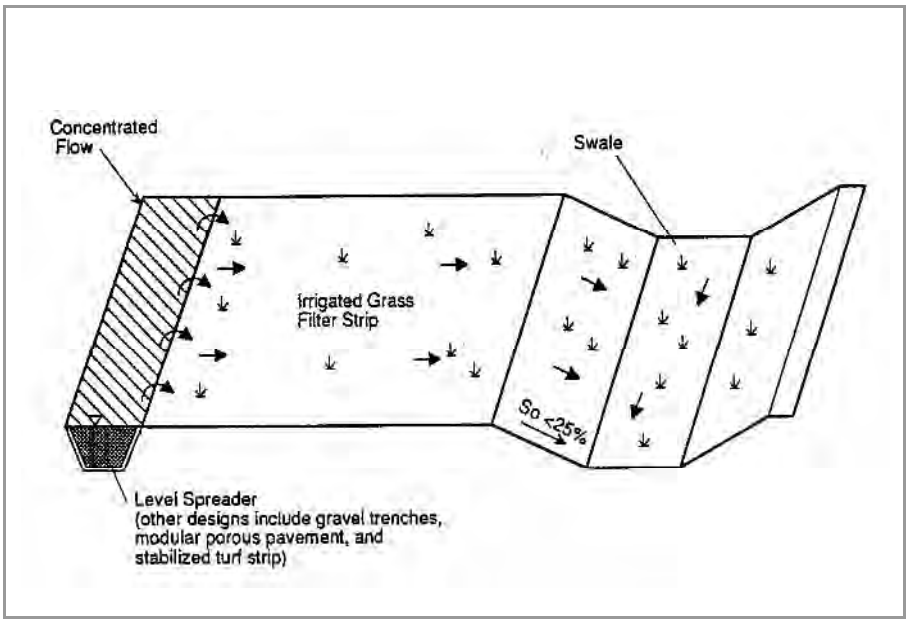
DESCRIPTION:
Erosion control blankets are used in place of mulch on areas of high velocity runoff and/or steep grade, to aid in controlling erosion on critical areas by protecting young vegetation.

APPLICATIONS:
- Where vegetation is likely to grow too slowly to provide adequate cover.
- In areas subject to high winds where mulch would not be effective.

INSTALLATION/APPLICATION CRITERIA:
- Install erosion control blankets parallel to the direction of the slope.
- In ditches, apply in direction of the flow.
- Place erosion control blankets loosely on soil - do not stretch.
- Ends of blankets should be buried no less than six inches deep.
- Staple the edges of the blanket at least every three feet.

LIMITATIONS:
Not recommended in areas which are still under construction.

MAINTENANCE:
- Check for erosion and undermining periodically, particularly after rainstorms.
- Repair dislocations or failures immediately.
- If washouts occur, reinstall after repairing slope damage.
- Monitor until permanently stabilized.



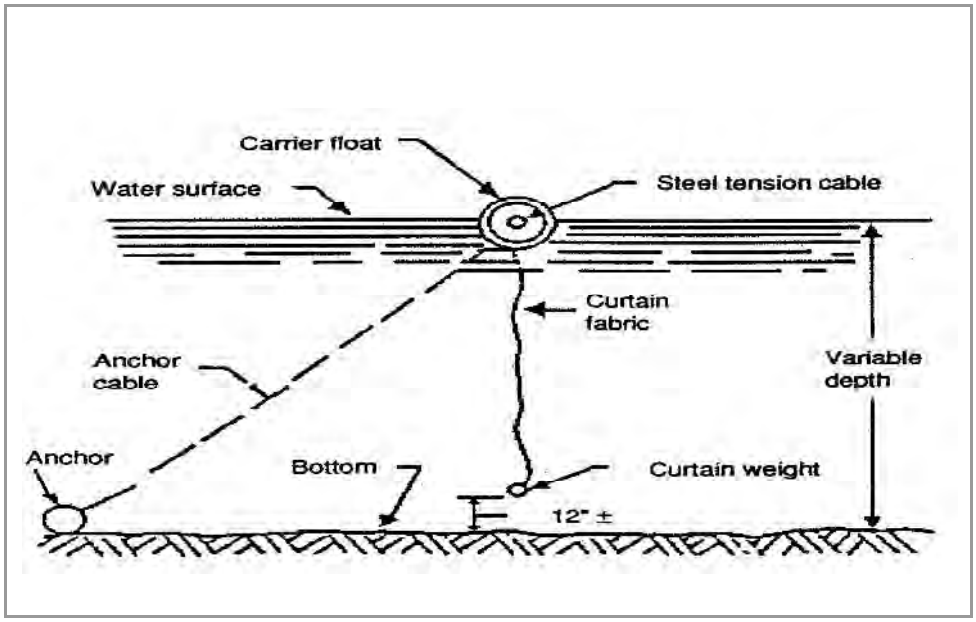
DESCRIPTION:
Filter strips are 20-foot-wide strips of natural or planted vegetation around a construction site. They are designed to cause deposition of sediments within the vegetation layer.

APPLICATIONS:
- Suited for areas where the soils are well drained or moderately well drained.
- Areas where the bedrock and the water table are well below the surface.

INSTALLATION/APPLICATION CRITERIA:
- Make sure the vegetative cover is dense enough to protect underlying soil while causing sediment to settle.
- Filter strip must be approximately 20 feet wide to function well.
- The length should be approximately 50 to 75 feet. Where slopes become steeper the length of the strip must be increased.

LIMITATIONS:
- Only applicable in areas where vegetation is previously established or where sod is added.
- Vegetated filter strips will not function well on steep slopes, in hilly areas, or in highly paved areas.
- Sites with slopes of 15 percent or more may not be suitable for filtering storm water flows.

MAINTENANCE:
- Check for channels and repair.
- Provide rock aprons to aid in slowing flow if necessary.
- Maintain vegetation at optimal height and thickness.



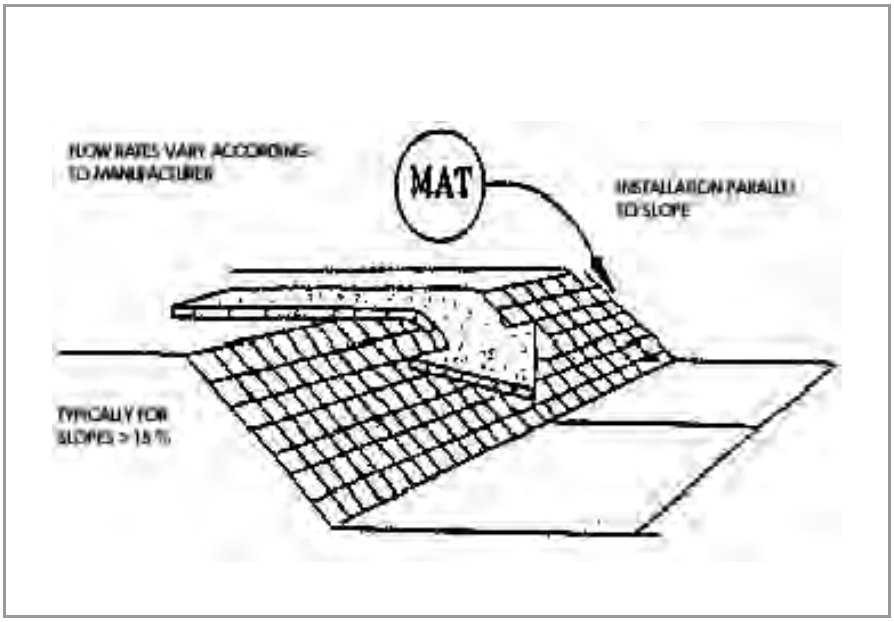
DESCRIPTION:
A flotation silt curtain is a silt barrier for use within a lake or pond. The flotation silt curtain consists of a filter fabric curtain weighted at the bottom and attached to a flotation device at the top. This structure is used to isolate an active construction area within a lake or pond to prevent silt-laden water from migrating out of the construction zone.

APPLICATIONS:
Where construction is conducted within a lake or pond area.

INSTALLATION/APPLICATION CRITERIA:
- The curtain should be constructed of a nylon fabric with a minimum tensile strength of 300 pounds per inch of fabric.
- The top of the curtain should have a flotation carrier consisting of a floating plastic tube (6-inch minimum diameter) filled with marine quality polyethylene foam. The flotation carrier should also have a 5/16" diameter coated steel cable in it to carry loads imposed upon the curtain.
- The bottom edge should be weighted by cable or chain with a minimum weight of 1.1 pounds per foot.
- One 24-pound anchor should be used per 100 feet of curtain.
- Where the curtain is made up of sections, the sections should be joined so that silt cannot permeate through the connection.

LIMITATIONS:
Not recommended in very shallow water bodies.

MAINTENANCE:
The silt curtain should be maintained until the construction area is stabilized and turbidity is reduced to acceptable levels.



DESCRIPTION:
Mattings made of natural or synthetic material which are used to temporarily or permanently stabilize soil.

APPLICATION:
- Typically suited for post-construction site stabilization, but may be used for temporary stabilization of highly erosive soils.
- Channels and streams.
- Steep slopes.

INSTALLATION/APPLICATION CRITERIA:
- Mattings may be applied to disturbed soils and where existing vegetation has been removed.
- The following organic matting materials provide temporary protection until permanent vegetation is established, or when seasonal circumstances dictate the need for temporary stabilization until weather or construction delays are resolved: Jute mattings and straw mattings.
- The following synthetic mattings may be used for either temporary or post-construction stabilization, both with and without vegetation: excelsior matting, glass fiber matting, mulch matting.
- Staples are needed to anchor the matting.

LIMITATIONS:
- Mattings are more costly than other BMP practices, limiting their use to areas where other BMPs are ineffective (e.g., channels, steep slopes).
- May delay seed germination, due to reduction in soil temperature.
- Installation requires experienced contractor to ensure soil stabilization and erosion protection.

MAINTENANCE:
- Inspect monthly and after significant rainfall.
- Re-anchor loosened matting and replace missing matting and staples as required.

DESCRIPTION:
Prevent or reduce the discharge of pollutants to stormwater from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

APPLICATION:
Many of the chemicals used on-site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:

- Paints and solvents;
- Petroleum products such as oils, fuels, and grease;
- Herbicides and pesticides;
- Acids for cleaning masonry; and
- Concrete curing compounds.

In addition, sites with existing structures may contain wastes which must be disposed of in accordance with Federal, State, and local regulations, including:

- Sandblasting grit mixed with lead, cadmium, or chromium-based paints;
- Asbestos; and
- PCBs.

INSTALLATION/APPLICATION CRITERIA:
The following steps will help reduce storm water pollution from hazardous wastes:

- Use all of the product before disposing of the container.
- Do not remove the original product label, it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulations.

LIMITATIONS:
Hazardous waste that cannot be reused or recycled must be disposed of by a licensed hazardous waste hauler.

MAINTENANCE:

- Inspect hazardous waste receptacles and area regularly.
- Arrange for regular hazardous waste collection.

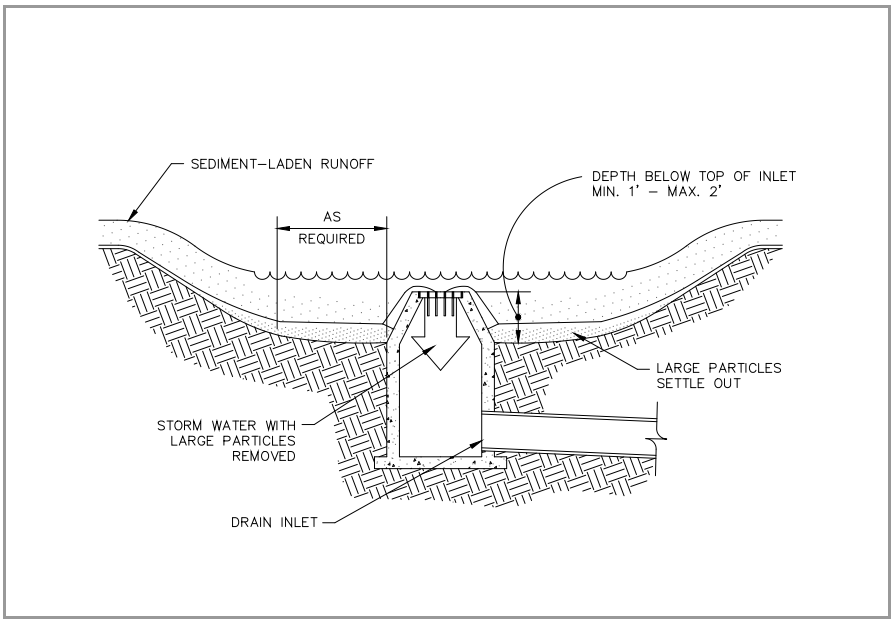
DESCRIPTION:
A combination of wood fiber mulch, processed grass, or hay or straw mulch and a tacking agent. It is made into a slurry, then applied to bare slopes or other bare areas to provide temporary stabilization.

APPLICATIONS:
- Small roadside slopes.
- Large, relatively flat areas.

Installation/Application Criteria:
- Legume seeds should be pellet inoculated with the appropriate bacteria.
- The seed should not remain in the hydromulcher tank for more than 30 minutes.
- Wood fiber may be dyed to aid in uniform application.
- Slurry should be uniformly applied until an adequate coverage is achieved.
- The applicator should not be directed at one location for a long period of time; erosion will occur.

LIMITATIONS:
- Will lose effectiveness after 1 year.
- Can use only on physically stable slopes (at natural angle of repose, or less).

MAINTENANCE:
- Periodically inspect for damage caused by wind, water, or human disturbance.
- Promptly repair damaged areas.



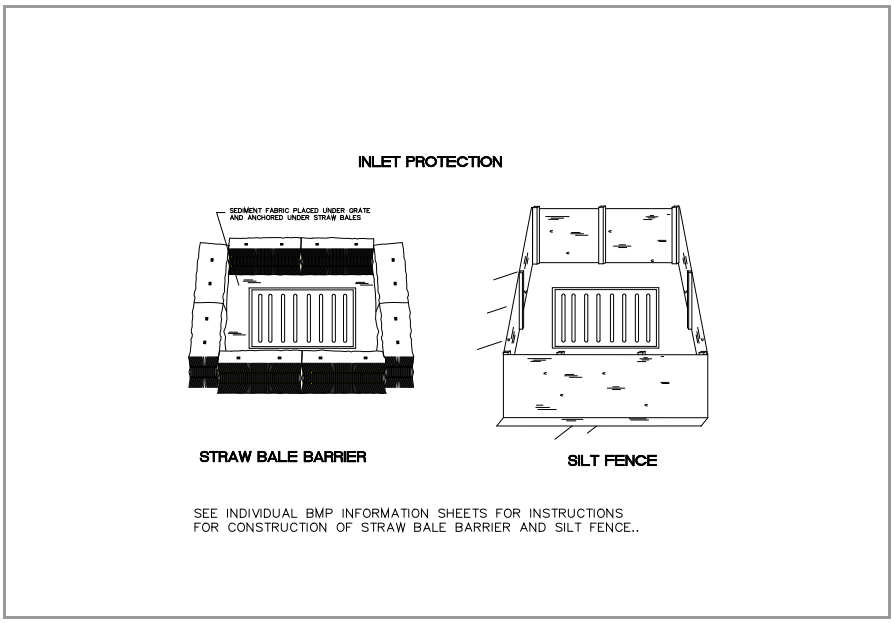
DESCRIPTION:
An area excavated around a storm drain inlet to impound water below the inlet.

APPLICATION:
Construct at storm drainage inlets located downgradient of areas to be disturbed by construction (for inlets in paved areas see other information sheets for inlet protection).

INSTALLATION/APPLICATION CRITERIA:
- Provide upgradient sediment controls, such as silt fence during construction of inlet.
- When construction of inlet is complete, excavate adjacent area 1 to 2 feet lower than the grate elevation. Size of excavated area should be based on soil type and contributing acreage.

LIMITATIONS:
- Recommended maximum contributing drainage area of one acre.
- Limited to inlets located in open unpaved areas.
- Requires flat area adjacent to inlet.

MAINTENANCE:
- Inspect inlet protection following storm event and at a minimum of once monthly.
- Remove accumulated sediment when it reaches one half of the excavated sump below the grate.
- Repair side slopes as required.



DESCRIPTION:
Sediment barrier erected around storm drain inlet.

APPLICATION:
Construct at storm drainage inlets located downgradient of areas to be disturbed by construction (for inlets in paved areas see other information sheets for inlet protection).

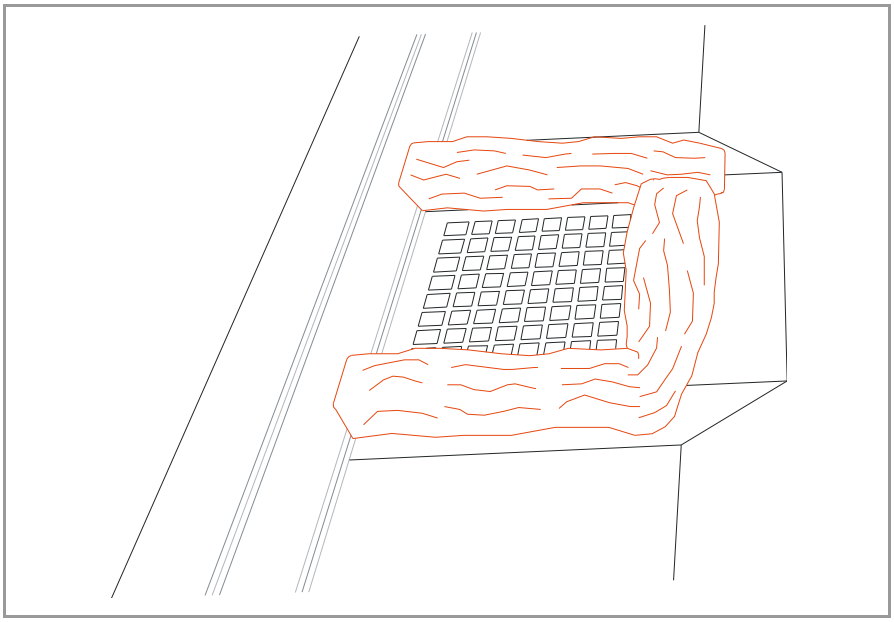
INSTALLATION/APPLICATION CRITERIA:
- Provide upgradient sediment controls, such as silt fence during construction of inlet.
- When construction of inlet is complete, erect straw bale barrier or silt fence surrounding perimeter of inlet. Follow instructions and guidelines on individual BMP information sheets for straw bale barrier and silt fence construction.

LIMITATIONS:
- Recommended maximum contributing drainage area of one acre.
- Limited to inlets located in open unpaved areas.
- Requires shallow slopes adjacent to inlet.

MAINTENANCE:
- Inspect inlet protection following storm event and at a minimum of once monthly.
- Remove accumulated sediment when it reaches 4-inches in depth.
- Repair or realign barrier/fence as needed.
- Look for bypassing or undercutting and recompact soil around barrier/fence as required.

BMP: Inlet Protection – Wattle

IP-W
CONSTRUCTION



DESCRIPTION:

Sediment barrier erected around storm drain inlet.

APPLICATION:

Construct at storm drainage inlets located down-gradient of areas to be disturbed by construction.

INSTALLATION/APPLICATION CRITERIA:

- Provide up-gradient sediment controls, such as silt fence during construction of inlet
- When construction of curb and gutter and roadways is complete, install gravel filled wattles around perimeter of inlet

LIMITATIONS:

- Recommended maximum contributing drainage area of one acre
- Requires shallow slopes adjacent to inlet

MAINTENANCE:

- Inspect inlet protection following storm event and at a minimum of once every 14 days.
- Remove accumulated sediment when it reaches 4 inches in depth.
- Look for bypassing or undercutting and repair or realign as needed.

DESCRIPTION:

Stormwater control BMPs need regular inspections to ensure their effectiveness, and is required by the DWQ construction permit. Routine inspections are required on a bi-weekly basis; before and after anticipated storm events. Proper maintenance is crucial to compliance with the permit and to minimize erosion.

Routine inspections help to ensure the integrity and effectiveness of BMPs; inspections prior to a rain event ensure that BMPs are cleaned out and operating properly; inspections following a rain event serve to prepare the site for the next event. Maintenance should be conducted when problems are identified.

APPLICATIONS:

Inspections and maintenance is required by the DWQ permit at all sites. Maintenance needs are best determined by a self-inspection program.

INSTALLATION/APPLICATION CRITERIA:

The person responsible for the inspections should be trained in the design and operation of the BMPS.

LIMITATIONS:

Construction site operators should allocate adequate time and resources for BMP maintenance and repair.

Adapted from EPA – Stormwater Menu of BMPs

DESCRIPTION:

Land grading involves reshaping the ground surface to planned grades as determined by an engineering survey, evaluation, and layout. Land grading provides more suitable topography for buildings, facilities, and other land uses and helps to control surface runoff, soil erosion, and sedimentation during and after construction.

APPLICATIONS:

Land grading is applicable to sites with uneven or steep topography or easily erodible soils, because it stabilizes slopes and decreases runoff velocity. Grading activities should maintain existing drainage patterns as much as possible.

INSTALLATION/APPLICATION CRITERIA:

Before grading activities begin, a construction site operator must make decisions regarding the steepness of cut-and-fill slopes and how the slopes will be: Protected from runoff, stabilized and maintained.

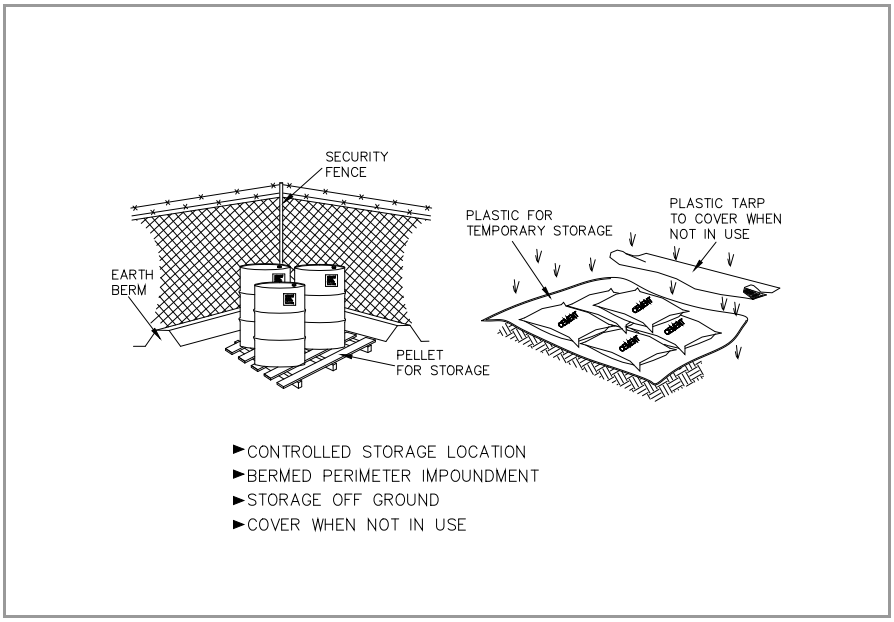
LIMITATIONS:

Improper grading practices that disrupt natural stormwater patterns might lead to poor drainage, high-runoff velocities, and increased peak flows during storm events. Clearing and grading the entire site without vegetated buffers promotes offsite transport of sediments and other pollutants. Design the grading plan with erosion and sediment control and stormwater management goals in mind; to ensure that the plan is implemented as intended, carefully supervise grading crews.

MAINTENANCE:

- Check all graded areas and supporting erosion and sediment control practices periodically, especially after heavy rainfalls.
- Promptly remove all sediment from diversions or other stormwater conveyances, and if washouts or breaks occur, repair them immediately.
- To prevent small-scale eroded areas from becoming significant gullies, maintain them promptly.

Adapted from EPA – Stormwater Menu of BMPs



DESCRIPTION:
Controlled storage of on-site materials.

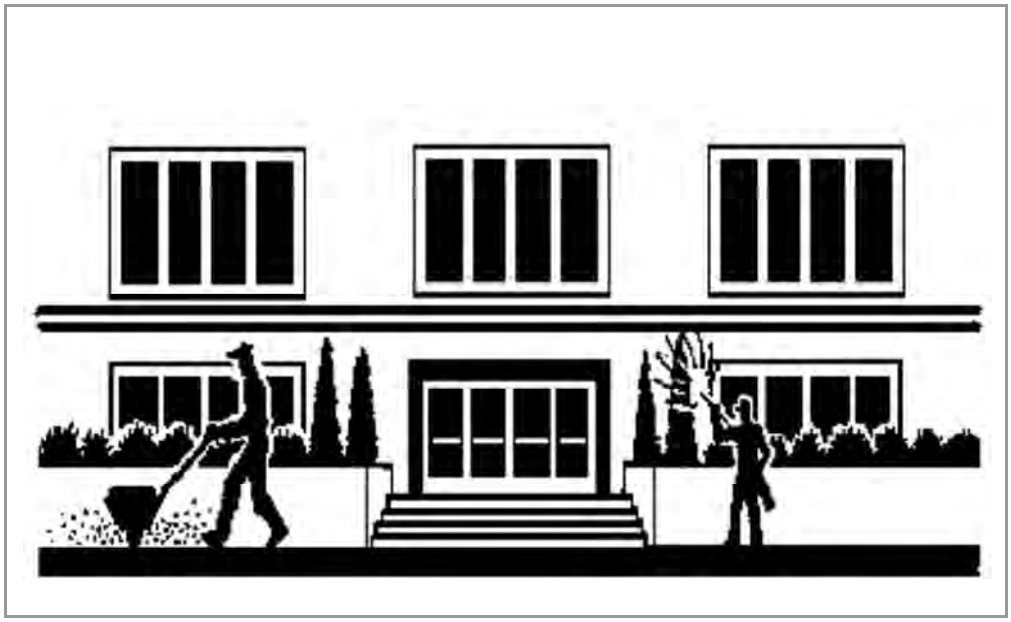
APPLICATION:
- Storage of hazardous, toxic, and all chemical substances.
- Any construction site with outside storage of materials.

INSTALLATION/APPLICATION CRITERIA:
- Designate a secured area with limited access as the storage location. Ensure no waterways or drainage paths are nearby.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around storage location for impoundment in the case of spills.
- Ensure all on-site personnel utilize designated storage area. Do not store excessive amounts of material that will not be utilized on site.
- For active use of materials away from the storage area ensure materials are not set directly on the ground and are covered when not in use. Protect storm drainage during use.

LIMITATIONS:
- Does not prevent contamination due to mishandling of products.
- Spill Prevention and Response Plan still required.
- Only effective if materials are actively stored in controlled location.

MAINTENANCE:
- Inspect daily and repair any damage to perimeter impoundment or security fencing.
- Check materials are being correctly stored (i.e. standing upright, in labeled containers, tightly capped) and that no materials are being stored away from the designated location.

BMP: Material Use



DESCRIPTION:
Prevent or reduce the discharge of pollutants to storm water from material use by using alternative products, minimizing hazardous material use on-site, and training employees and subcontractors.

APPLICATION:
The following materials are commonly used on construction sites:

- Pesticides and herbicides, fertilizers, detergents, plaster and other products, petroleum products such as fuel, oil, and grease.
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

INSTALLATION/APPLICATION CRITERIA:

- Use less hazardous, alternative materials as much as possible.
- Minimize use of hazardous materials on-site.
- Use only materials where and when needed to complete the construction activity.
- Follow manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Personnel who use pesticides should be trained in their use.
- Do not over apply fertilizers, herbicides, and pesticides. Prepare only the amount needed.
- Unless on steep slopes, till fertilizers in to the soil rather than hydroseeding.
- Do not apply these chemicals just before it rains.

LIMITATIONS:
Alternative materials may not be available, suitable, or effective in every case.

MAINTENANCE:
Maintenance of this best management practice is minimal.

DESCRIPTION:
Placement of material such as straw, grass, woodchips, woodfibers or fabricated matting over open area.

APPLICATION:
- Any exposed area to remain untouched longer than 14 days and that will be exposed less than 60 days (seed areas to be exposed in excess of 60 days).
- Areas that have been seeded.
- Stockpiled soil material.

Material	Application	Depth	Comments
Gravel: Washed 1/4" to 1-1/2"	9 cy/1000 sf	3 inches	Good for traffic areas Good for short slopes
Straw: Air-dried, free of seeds and coarse material	2-3 bales /1000 sf	2 inches min.	Subject to wind blowing Tack down or keep moist
Wood Fiber Cellulose: Free from growth inhibitors; dyed green	35 lb/1000 sf	1 inch	For critical areas, double application rate; Limit to slopes < 3% and < 150 feet

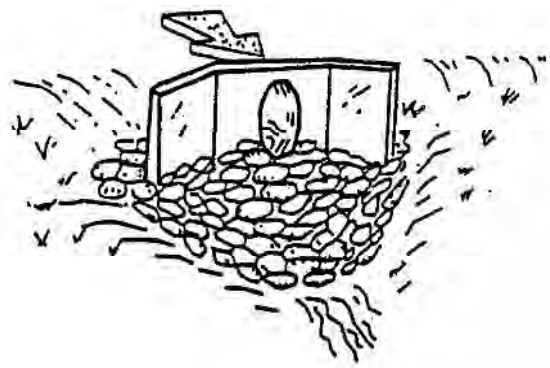
INSTALLATION/APPLICATION CRITERIA:
- Roughen area to receive mulch to create depressions that mulch material can settle into.
- Apply mulch to required thickness and anchor as necessary.
- Ensure material used is weed free and does not contain any constituents that will inhibit plant growth.

LIMITATIONS:
- Anchoring may be required to prevent migration of mulch material.
- Downgradient control may be required to prevent mulch material being transported to storm water system.

MAINTENANCE:
- Inspect mulched areas after every rainfall event and at a minimum of monthly.
- Replace mulch on any bare areas and re-anchor as necessary.
- Clean and replace downgradient controls as necessary.

BMP: Outlet Protection

OP
Construction



DESCRIPTION:
A rock outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble which is placed at the outlet of a pipe to prevent scour of the soil caused by high pipe flow velocities, and to absorb flow energy to produce non-erosive velocities.

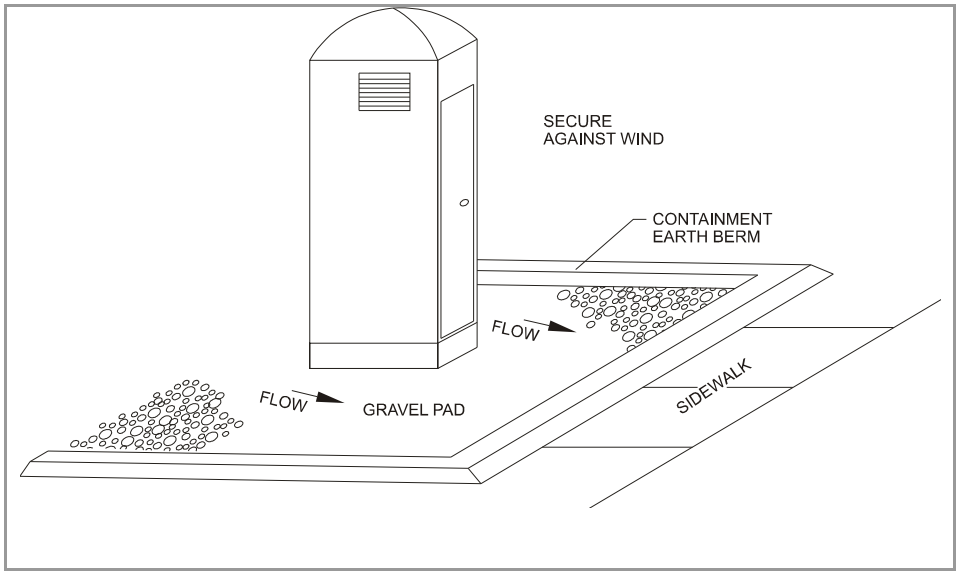
APPLICATIONS:
- Wherever discharge velocities and energies at the outlets of culverts, conduits, or channels are sufficient to erode the next downstream reach.
- Rock outlet protection is best suited for temporary use during construction because it is usually less expensive and easier to install than concrete aprons or energy dissipators.
- A sediment trap below the pipe outlet is recommended if runoff is sediment laden.
- Permanent rock riprap protection should be designed and sized by the engineer as part of the culvert, conduit or channel design.
- Grouted riprap should be avoided in areas of freeze and thaw because the grout will break up.

INSTALLATION/APPLICATION CRITERIA:
Rock outlet protection is effective when the rock is sized and placed properly. When this is accomplished, rock outlets do much to limit erosion at pipe outlets. Rock size should be increased for high velocity flows. Best results are obtained when sound, durable, angular rock is used.

LIMITATIONS:
- Large storms often wash away the rock outlet protection and leave the area susceptible to erosion.
- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Outlet protection may negatively impact the channel habitat.

MAINTENANCE:
- Inspect after each significant rain for erosion and/or disruption of the rock, and repair immediately.
- Grouted or wire-tied rock riprap can minimize maintenance requirements.

BMP: Portable Toilets



DESCRIPTION:

Temporary on-site sanitary facilities for construction personnel.

APPLICATION:

All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

INSTALLATION/APPLICATION CRITERIA:

- Locate portable toilets in convenient locations throughout the site.
- Prepare level, gravel surface and provide clear access to the toilets for servicing and for on-site personnel.
- Construct earth berm perimeter (6” tall by 6” wide), control for spill/protection leak.

LIMITATIONS:

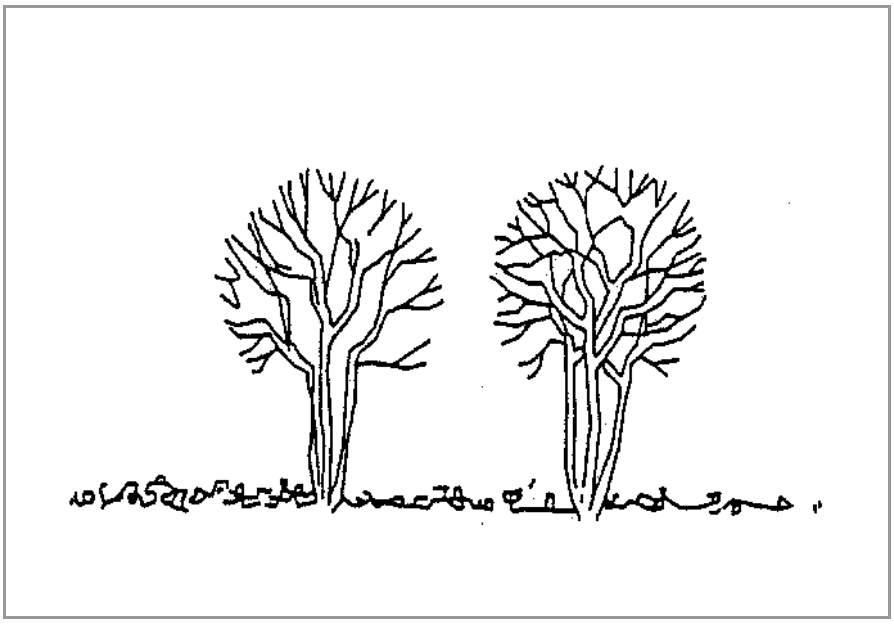
- No limitations.

MAINTENANCE:

- Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- Regular waste collection should be arranged with licensed service.
- All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

BMP: Preservation of Existing Vegetation

PEV
Construction



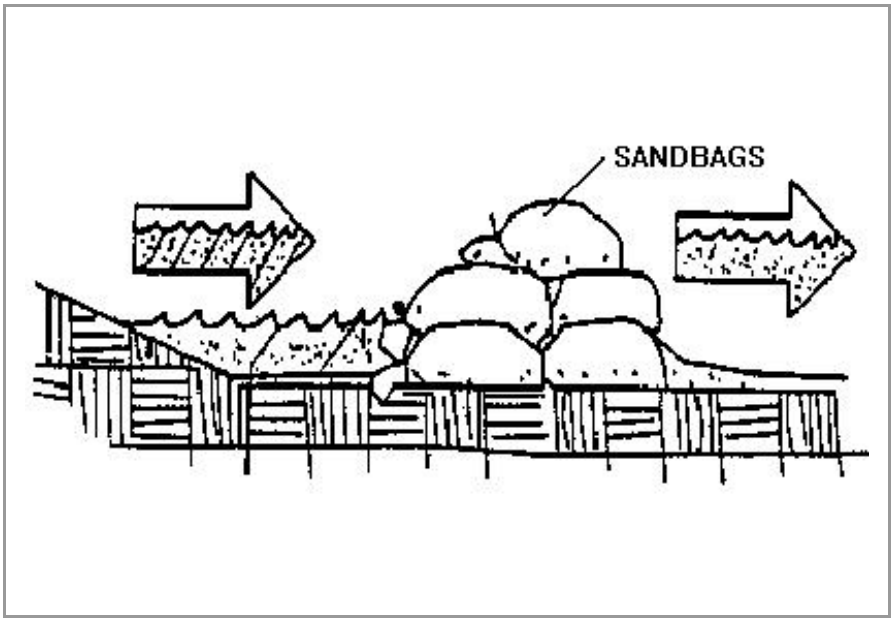
DESCRIPTION:
Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs and/or grasses that serve as erosion controls.

APPLICATIONS:
This technique is applicable to all types of sites. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.

INSTALLATION/APPLICATION CRITERIA:
- Clearly mark, flag or fence vegetation or areas where vegetation should be preserved.
- Prepare landscaping plans which include as much existing vegetation as possible and state proper care during and after construction.
- Define and protect with berms, fencing, signs, etc. a setback area from vegetation to be preserved.
- Propose landscaping plans which do not include plant species that compete with the existing vegetation.
- Do not locate construction traffic routes, spoil piles, etc. where significant adverse impact on existing vegetation may occur.

LIMITATIONS:
- Requires forward planning by the owner/developer, contractor and design staff.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactorily for the planned development.
- May not be cost effective with high land costs.

MAINTENANCE:
- Inspection and maintenance requirements for protection of vegetation are low.
- Maintenance of native trees or vegetation should conform to landscape plan specifications.



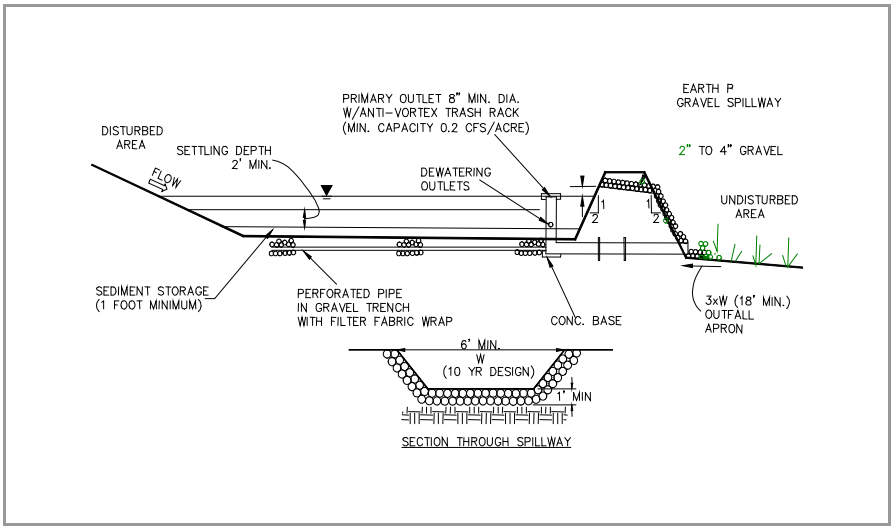
DESCRIPTION:
Stacking sandbags along a level contour creates a barrier which detains sediment-laden water, ponding water upstream of the barrier and promoting sedimentation.

APPLICATION:
- Along the perimeter of the site.
- May be used in drainage areas up to 5 acres.
- Along streams and channels
- Across swales with small catchments.
- Around temporary spoil areas.
- Below the toe of a cleared slope.

INSTALLATION/APPLICATION CRITERIA:
- Install along a level contour.
- Base of sandbag barrier should be at least 48 inches wide.
- Height of sandbag barrier should be at least 18 inches high.
- 4 inch PVC pipe may be installed between the top layer of sand bags to drain large flood flows.
- Provide area behind barrier for runoff to pond and sediment to settle.
- Place below the toe of a slope.

LIMITATIONS:
- Sandbags are more expensive than other barriers, but also more durable.
- Burlap should not be used.

MAINTENANCE:
- Inspect after each rain.
- Reshape or replace damaged sandbags immediately.
- Replace sediment when it reaches six inches in depth.



DESCRIPTION:
A pond created by excavation or construction of an embankment, and designed to retain or detain runoff sufficiently to allow excessive sediment to settle.

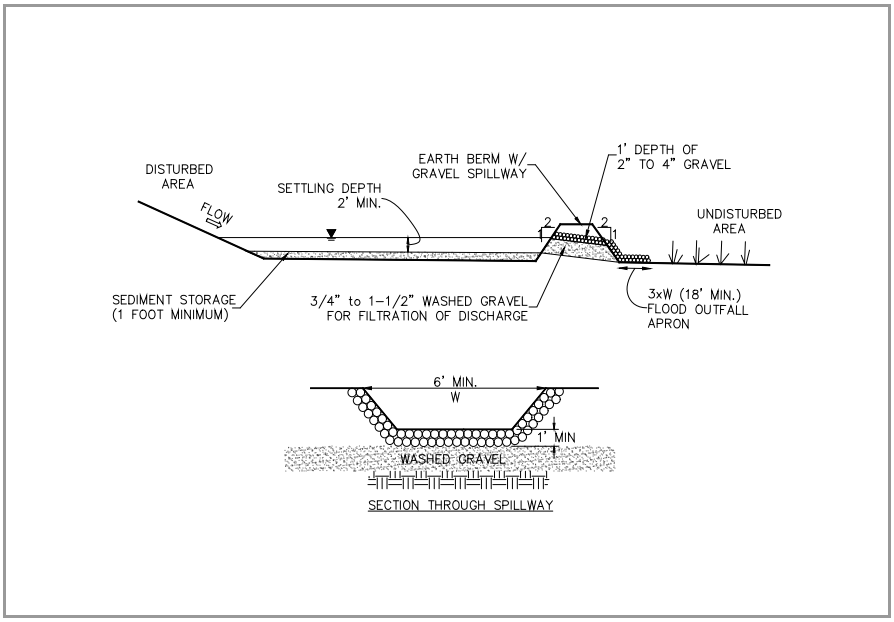
APPLICATION:
- At the outlet of all disturbed watersheds 10 acres or larger.
- At the outlet of smaller disturbed watersheds, as necessary.
- Where post construction detention basins will be located.

INSTALLATION/APPLICATION CRITERIA:
- Design basin for site specific location, maintain effective flow length 2 times width.
- Excavate basin or construct compacted berm containment, ensure no downgradient hazard if failure should occur. (Provide minimum of 67 cy. per acre of drainage area).
- Construct dewatering and outfall structure and emergency spillway with apron.

LIMITATIONS:
- Should be sized based on anticipated runoff, sediment loading and drainage area size.
- May require silt fence at outlet for entrapment of very fine silts and clays.
- May require safety fencing to prevent public access.
- Height restrictions for embankment may be regulated.

MAINTENANCE:
- Inspect after each rainfall event and at a minimum of monthly.
- Repair any damage to berm, spillway or sidewalls.
- Remove accumulated sediment as it reaches 2/3 height of available storage.
- Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.

BMP: Sediment Trap



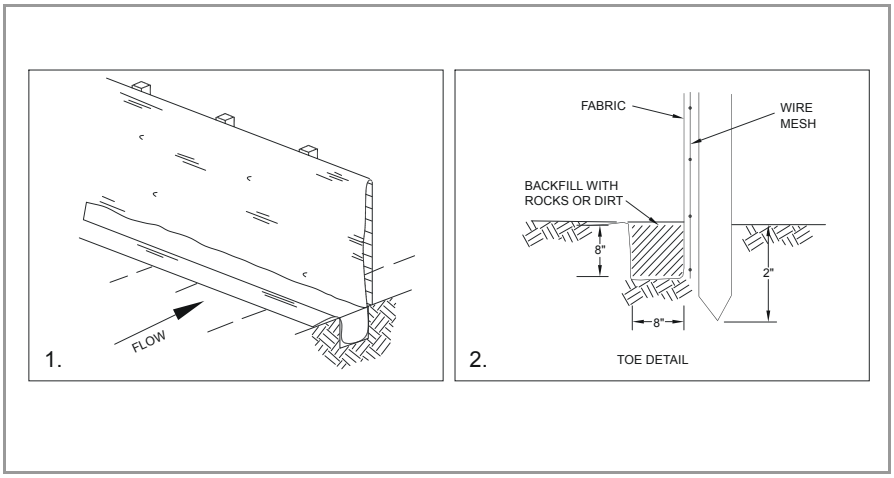
DESCRIPTION:
A sediment trap is a small excavated or bermed area where runoff from small drainage areas is detained and sediment can settle.

APPLICATION:
- Temporary control for runoff from disturbed areas of less than 3 acres.
- Temporary control for discharge from diversion dike, surface benching, or other temporary drainage measures.

INSTALLATION/APPLICATION CRITERIA:
- Design basin for site specific location.
- Excavate basin or construct compacted berm containment.
- Construct outfall spillway with apron.
- Provide downstream silt fence if necessary.

LIMITATIONS:
- Should be sized based on anticipated runoff, sediment loading and drainage area size.
- May require silt fence at outlet for entrapment of very fine silts and clays.

MAINTENANCE:
- Inspect after each rainfall event and at a minimum of monthly.
- Repair any damage to berm, spillway or sidewalls.
- Remove accumulated sediment as it reaches 2/3 height of available storage.
- Check outlet for sedimentation/erosion of downgradient area and remediate as necessary. Install silt fence if sedimentation apparent.



DESCRIPTION:

A temporary sediment barrier consisting of entrenched filter fabric stretched across and secured to supporting posts.

Application:

- Perimeter control: place barrier at down-gradient limits of disturbance
- Sediment barrier: place barrier at toe of slope or soil stockpile
- Protection of existing waterways: place barrier at top of stream bank
- Inlet protection: place fence surrounding catchbasins

INSTALLATION/APPLICATION CRITERIA:

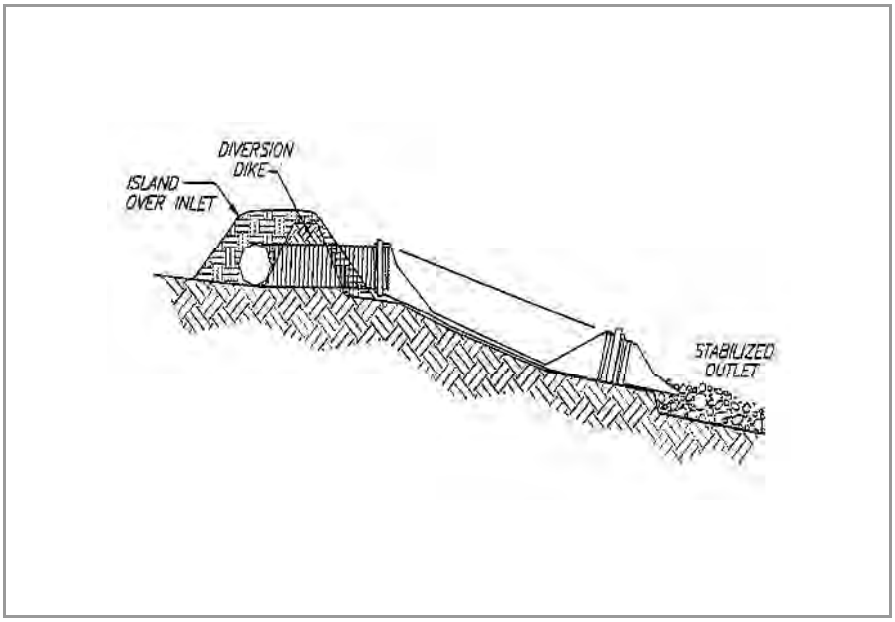
- Place posts 6 feet apart on center along contour (or use preassembled unit) and drive 2 feet minimum into ground. Excavate an anchor trench immediately up-gradient of posts.
- Secure wire mesh (14 gage min. with 6-inch openings) to upslope side of posts. Attach with heavy duty 1 inch long wire staples, tie wires or hog rings.
- Cut fabric to required width, unroll along length of barrier and drape over barrier. Secure fabric to mesh with twine, staples, or similar, with trailing edge extending into anchor trench.
- Backfill trench over filter fabric to anchor.

LIMITATIONS:

- Recommended maximum drainage area of 0.5 acre per 100 feet of fence
- Recommended maximum up-gradient slope length of 150 feet
- Recommended maximum uphill grade of 2:1 (50%)
- Recommended maximum flow rate of 0.5 cfs
- Ponding should not be allowed behind fence

MAINTENANCE:

- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff bypassing ends of barriers or undercutting barriers.
- Repair or replace damaged areas of the barrier and remove accumulated sediment.
- Reanchor fence as necessary to prevent shortcutting.
- Remove accumulated sediment when it reaches ½ the height of the fence.



DESCRIPTION:
A temporary pipe or lined channel that drains the top of a slope to a stable discharge point at the bottom of a slope without causing erosion.

APPLICATIONS:
- Where concentrated flow of surface runoff must be conveyed down a slope in order to prevent erosion.
- Drainage for top slope diversion dikes or swales.
- Emergency spillway for a sediment basin.
- Drainage for top of cut/fill slopes where water can accumulate.

INSTALLATION/APPLICATION CRITERIA:
- Secure inlet and surround with dikes to prevent gully erosion, and anchor pipe to slope.
- Size to convey at least the peak of a 10-year, storm event.
- Stabilize outlet. (See Outlet Protection BMP).

LIMITATIONS:
- Maximum drainage area per slope drain is 5 acres.
- Clogged slope drains will force water around the pipe and cause slope erosion.
- Dissipation of high flow velocities at the pipe outlet is required to avoid downstream erosion.
- Failure can result in flooding and severe erosion.

MAINTENANCE:
- Structure must be inspected weekly and after storms.
- Inlet must be free of undercutting and no water should circumvent the entry.
- Outlet should not produce erosion; velocity dissipators must be maintained.
- Pipe anchors must be checked to ensure that the pipe remains anchored to the slope.

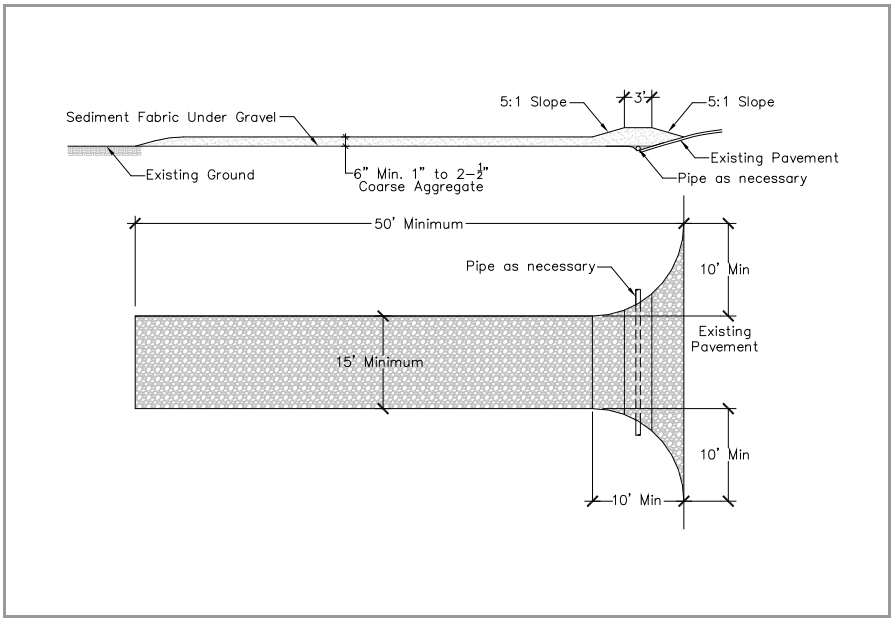
DESCRIPTION:
Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

APPLICATION:
All sites

GENERAL:
- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

METHODS:
- Clean-up spills/leaks immediately and remediate cause.
- Use as little water as possible. NEVER HOSE DOWN OR BURY SPILL CONTAMINATED MATERIAL.
- Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- Document all spills with date, location, substance, volume, actions taken and other pertinent data.
- Contact the Salt Lake County Health Department (313-6700) for any spill of reportable quantity.

BMP: Stabilized Construction Entrance



DESCRIPTION:

A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface.

APPLICATION:

At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

INSTALLATION/APPLICATION CRITERIA:

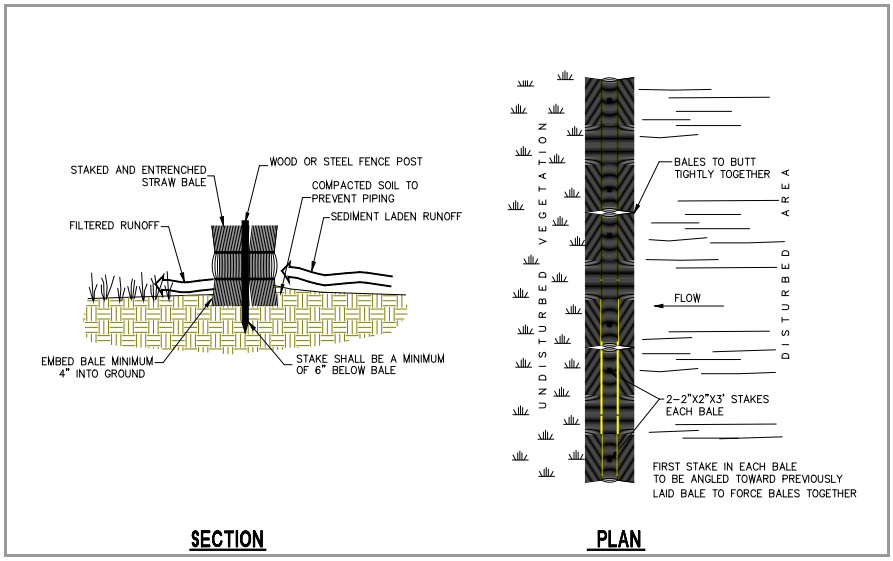
- Clear and grub area and grade to provide maximum slope of 2%.
- Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months.
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.

LIMITATIONS:

- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.

MAINTENANCE:

- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent roadway for sediment deposit and clean by sweeping or shoveling.
- Repair entrance and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.



DESCRIPTION:

Temporary sediment barrier consisting of a row of entrenched and anchored straw bales.

APPLICATIONS:

- Perimeter control: place barrier at down-gradient limits of disturbance.
- Sediment barrier: place barrier at toe of slope or soil stockpile.
- Protection of existing waterways: place barrier at top of stream bank.
- Inlet protection.

INSTALLATION/APPLICATION CRITERIA:

- Excavate a 4-inch minimum deep trench along contour line, i.e. parallel to slope, removing all grass and other material that may allow underflow.
- Place bales in trench with ends tightly abutting, fill any gaps by wedging loose straw into openings.
- Anchor each bale with 2 stakes driven flush with the top of the bale.
- Backfill around bale and compact to prevent piping, backfill on uphill side to be built up 4-inches above ground at the barrier.

LIMITATIONS:

- Recommended maximum area of 0.5 acre per 100 feet of barrier
- Recommended maximum up-gradient slope length of 150 feet
- Recommended maximum uphill grade of 2:1 (50%)

MAINTENANCE:

- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff bypassing ends of barriers or undercutting barriers.
- Repair or replace damaged areas of the barrier and remove accumulated sediment.
- Realign bales as necessary to provide continuous barrier and fill gaps.
- Recompact soil around barrier as necessary to prevent piping.

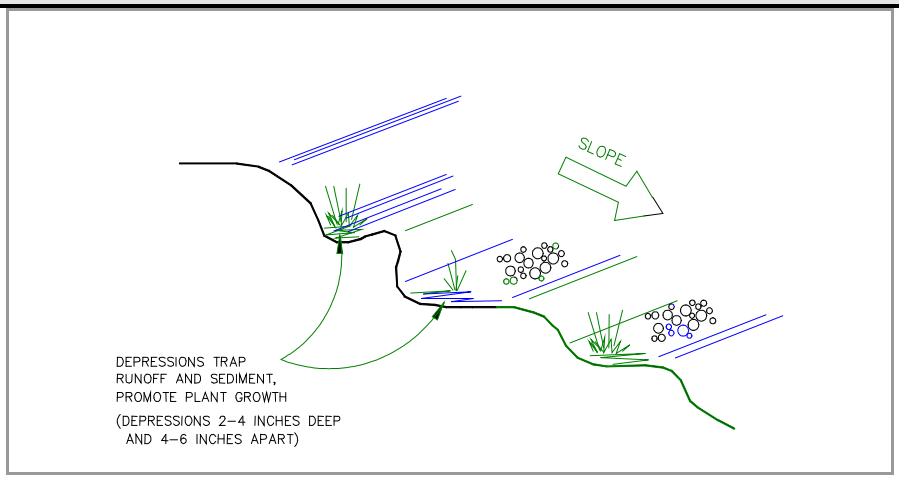
BMP: Street Sweeping

DESCRIPTION:
Reduce the discharges of pollutants to stormwater from street surfaces by conducting street cleaning on a regular basis.

APPROACH:
- Prioritize cleaning to use the most sophisticated sweepers, at the highest frequency, and in areas with the highest pollutant loading.
- Restrict street parking prior to and during sweeping.
- Increase sweeping frequency just before the rainy season.
- Proper maintenance and operation of sweepers greatly increase their efficiency.
- Keep accurate operation logs to track programs.
- Sweepers effective at removing smaller particles (less than 10 microns) may generate dust that would lead to concerns over worker and public safety.
- Equipment selection can be key for this particular BMP. There are two types used, the mechanical broom sweepers (more effective at picking up large debris and cleaning wet streets), and the vacuum sweepers (more effective at removing fine particles and associated heavy metals). Many communities find it useful to have a compliment of both types in their fleet.

LIMITATIONS:
- Conventional sweepers are not able to remove oil and grease.
- Mechanical sweepers are not effective at removing finer sediments.
- Effectiveness may also be limited by street conditions, traffic congestion, presence of construction projects, climatic conditions and condition of curbs.

MAINTENANCE:
- Replace worn parts as necessary.
- Install main and gutter brooms of the appropriate weight.



DESCRIPTION:
Rough preparation of working areas leaving depressions and uneven surface. Depressions should be done parallel to contours.

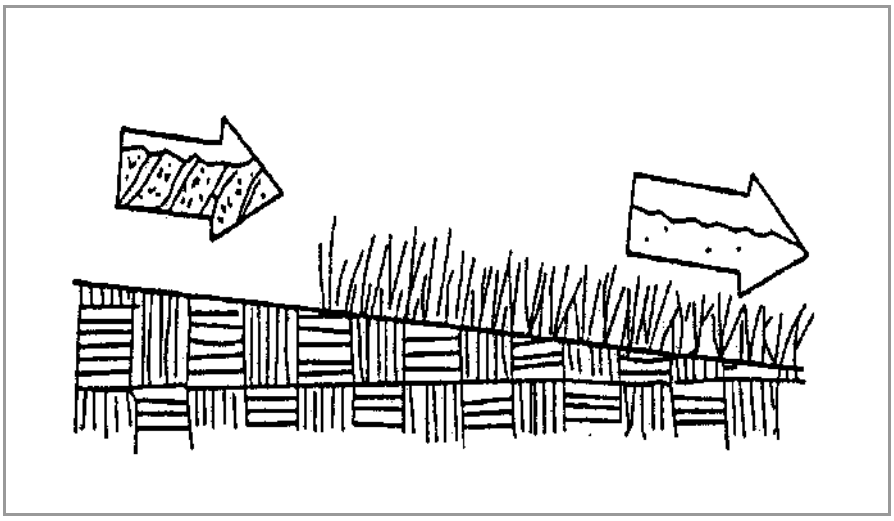
APPLICATION:
Surface roughening is appropriate for all construction that will not be receiving impervious cover within 14 days and that will be exposed less than 60 days (seed areas to be open in excess of 60 days).

INSTALLATION/APPLICATION CRITERIA:
- Surface should be left in rough condition during initial earthwork activity.
- Surfaces that have become smoothed or compacted due to equipment traffic should be roughened by use of disks, spring harrows, teeth on front end loader, or similar, operating along the contours of the slope. Tracking (by crawler tractor driving up and down slope) may also be used to provide depressions parallel to contours.
- Avoid compaction of soils during roughening as this inhibits plant growth and promotes storm water runoff. Limit tracked machinery to sandy soil.
- Seed or mulch areas to be exposed in excess of 60 days.
- Employ dust controls.

LIMITATIONS:
- Will not withstand heavy rainfall.
- Slopes steeper than 2:1 (50%) should be benched.

MAINTENANCE:
- Inspect following any storm event and at a minimum of weekly.
- If erosion in the form of rills (small waterways formed by runoff) is evident, perform machine roughening of area.
- For vegetated slopes reseed areas that are bare or have been reworked.

BMP: Temporary and Permanent Seeding and Planting



DESCRIPTION:
Seeding of grass and plantings of trees, shrubs, vines and ground covers provide long-term stabilization of soil. In some areas, with suitable climates, grasses can be planted for stabilization.

Temporary seeding - establishment of short term cover by application of rapidly germinating seed mix (alternatively hydro-seeding may be utilized).
Permanent seeding - establishment of final term cover by application of perennial seed mix (alternatively sod may be utilized).

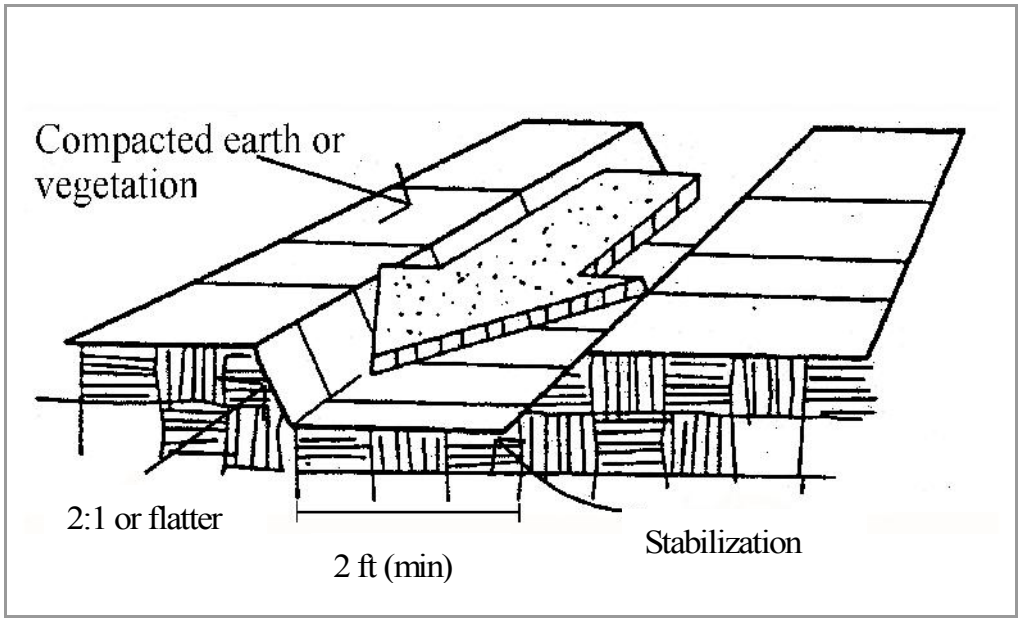
APPLICATION:
- Appropriate for site stabilization both during construction and post-construction.
- Any graded/cleared areas where construction activities have ceased.
- Open space cut and fill areas.
- Steep slopes, spoil piles, vegetated swales, landscape corridors, stream banks.

INSTALLATION/APPLICATION CRITERIA:
Type of vegetation, site and seedbed preparation, planting time, fertilization and water requirements should be considered for each application. The recommended seed mix will be dependent on site specific information such as elevation, exposure, soils, water availability and topography. Appropriate ground preparation and fertilizer must be considered.

LIMITATIONS:
- Permanent and temporary vegetation may not be appropriate in dry periods without irrigation.
- Fertilizer requirements may have potential to create stormwater pollution.

MAINTENANCE:
- Shrubs and trees must be adequately watered and fertilized and if needed pruned.
- Grasses may need to be watered and mowed.
- Provide irrigation as required to establish growth and to maintain plant cover through duration of project.
- Reseed as necessary to provide 75% coverage
- Remediate any areas damaged by erosion or traffic.
- When 75% coverage is achieved inspect monthly for damage and remediate as necessary.

BMP: Temporary Drains And Swales



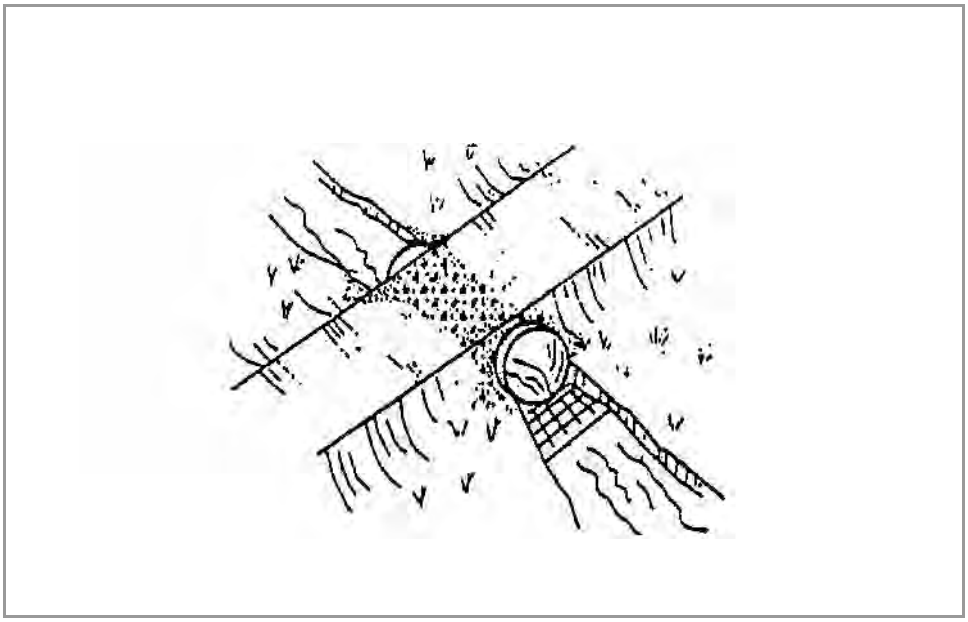
DESCRIPTION:
Temporary drains and swales are used to divert off-site runoff around the construction site, divert runoff from stabilized areas around disturbed areas, and direct runoff into sediment.

APPLICATIONS:
- Temporary drains and swales are appropriate for diverting any upslope runoff around unstabilized or disturbed areas of the construction site.
- Prevent slope failures. Prevent damage to adjacent property. Prevents erosion and transport of sediments into water ways. Increases the potential for infiltration. Diverts sediment-laden runoff into sediment basins or traps.

INSTALLATION/APPLICATION:
- Temporary drainage swales will effectively convey runoff and avoid erosion if built properly:
- Size temporary drainage swales using local drainage design criteria. A permanent drainage channel must be designed by a professional engineer (see the local drainage design criteria for proper design).
- At a minimum, the drain/swale should conform to predevelopment drainage patterns and capacities.
- Construct the drain/swale with an uninterrupted, positive grade to a stabilized outlet. Provide erosion protection or energy dissipation measures if the flow out of the drain or swale can reach an erosive velocity.

LIMITATIONS:
- Temporary drains and swales or any other diversion of runoff should not adversely impact upstream or downstream properties.
- Temporary drains and swales must conform to local floodplain management requirements.

BMP: Temporary Stream Crossing



DESCRIPTION:
A temporary access stream crossing is a temporary culvert, ford or bridge placed across a waterway to provide access for construction purposes for a period of less than one year. Temporary access crossings are not intended to be used to maintain traffic for the general public.

APPLICATIONS:
Temporary stream crossings should be installed at all designated crossings of perennial and intermittent streams on the construction site, as well as for dry channels which may be significantly eroded by construction traffic.

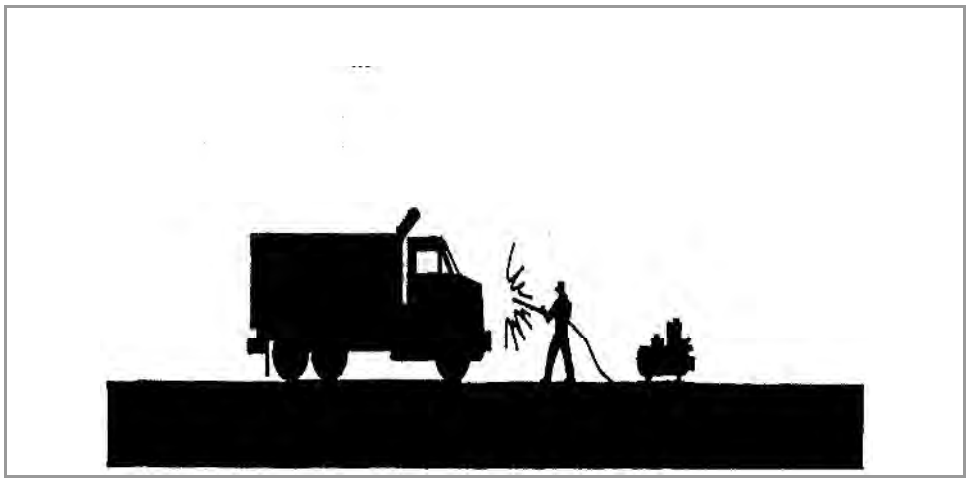
INSTALLATION/APPLICATION:
Requires knowledge of stream flows and soil strength and should be designed under the direction of a Utah registered engineer with knowledge of both hydraulics and construction loading requirements for structures.

LIMITATIONS:
- May be an expensive for a temporary improvement.
- Requires other BMP's to minimize soil disturbance during installation and removal.
- Fords should only be used in dry weather.
- A Stream Alteration Permit may be required, contact the Utah Division of Water Rights before implementation.

MAINTENANCE:
- Inspect weekly and after each significant rainfall, including assessment of foundations.
- Periodically remove silt from crossings.
- Replace lost aggregated from inlets and outlets of culverts.

BMP: Vehicle And Equipment Cleaning

VEC
Construction



DESCRIPTION:
Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment cleaning by washing in designated, contained areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water, and/or training employees and subcontractors.

INSTALLATION/APPLICATION:
- Use designated, bermed wash areas to prevent wash water contact with storm water, creeks, rivers, and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground.
- Use as little water as possible to avoid having to install erosion and sediment controls for the wash area. Use phosphate-free biodegradable soaps. Educate employees and subcontractors on pollution prevention measures. Do not permit steam cleaning on-site. Steam cleaning can generate significant pollutant concentrations.

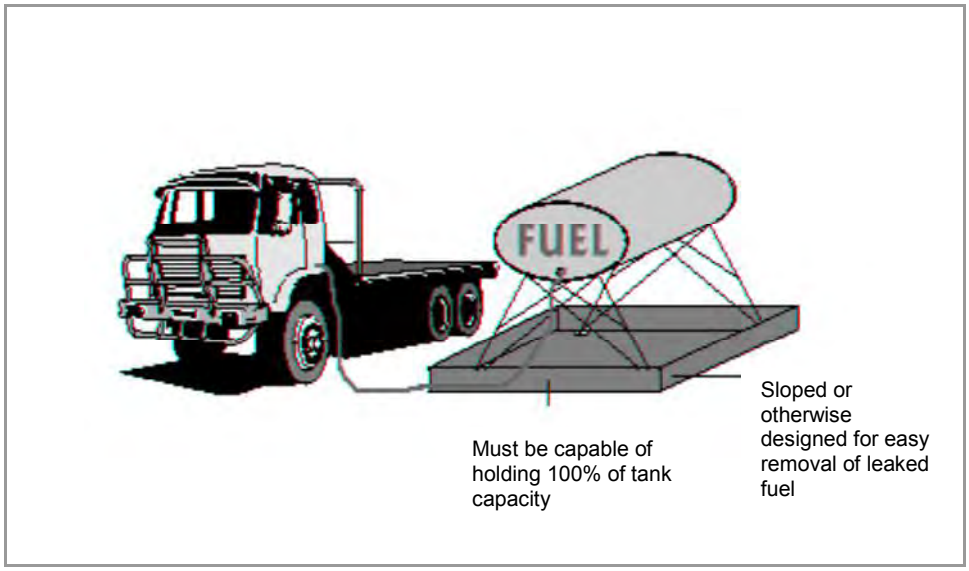
LIMITATIONS:
- Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades.
- Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

MAINTENANCE:
- Minimal, some berm repair may be necessary.

BMP: Vehicle And Equipment Fueling

VEF

Construction



DESCRIPTION:
Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

INSTALLATION/APPLICATION:

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These areas are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runon of storm water and the runoff of spills. Discourage topping-off of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks. Place a stockpile of spill cleanup materials where it will be readily accessible. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks. (40 CF Sub. J) Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time. Train employees and subcontractors in proper fueling and cleanup procedures.

LIMITATIONS:
Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

MAINTENANCE:

- Keep ample supplies of spill cleanup materials on-site.
- Inspect fueling areas and storage tanks on a regular schedule.

BMP: Vegetated Buffers

VB
Construction

DESCRIPTION:

Vegetated buffers are areas of natural or established vegetation maintained to protect the water quality of neighboring areas. Buffer zones slow stormwater runoff, provide an area where runoff can permeate the soil, contribute to ground water recharge, and filter sediment. Slowing runoff also helps to prevent soil erosion and streambank collapse.

APPLICATIONS:

Vegetated buffers can be used in any area able to support vegetation. They are most effective and beneficial on floodplains, near wetlands, along streambanks, and on unstable slopes.

INSTALLATION/APPLICATION CRITERIA:

To establish an effective vegetative buffer, follow these guidelines:

- Make sure soils are not compacted.
- Make sure slopes are less than 5 percent unless temporary erosion control mats are also used.
- Determine buffer widths after carefully considering slope, vegetation, soils, depth to impermeable layers, runoff sediment characteristics, type and amount of pollutants, and annual rainfall.
- Make sure buffer widths increase as slope increases.
- Intermix zones of vegetation (native vegetation in particular), including grasses, deciduous and evergreen shrubs, and understory and overstory trees.
- In areas where flows are concentrated and fast, combine buffer zones with other practices such as level spreaders, infiltration areas, or diversions to prevent erosion and rilling.

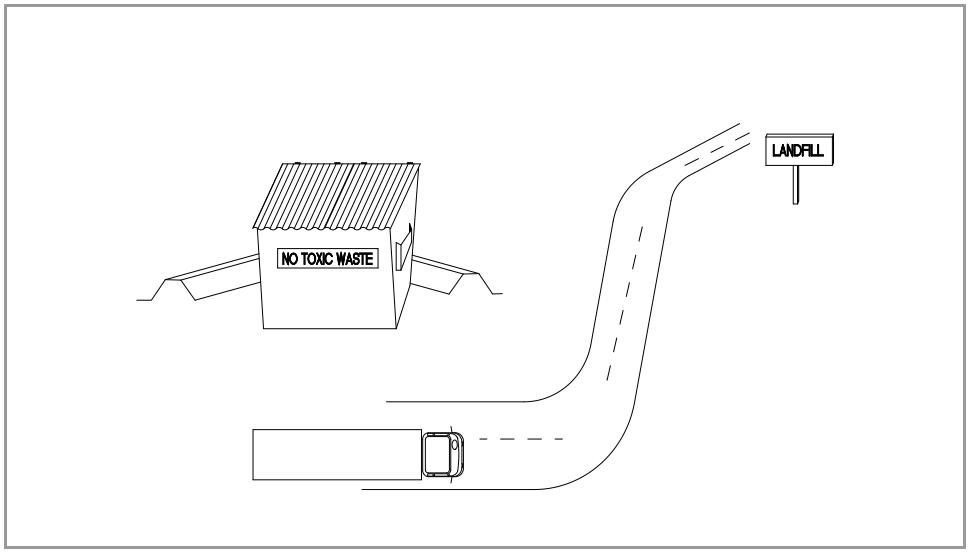
LIMITATIONS:

Adequate land must be available for a vegetated buffer. If land cost is high, buffer zones might not be cost-effective. In addition, adequate vegetative cover must be maintained in the buffer to keep it effective. Vegetated buffers work well with sheet flows, but they are not appropriate for mitigating concentrated stormwater flows.

MAINTENANCE:

Keeping vegetation healthy in vegetated buffers requires routine maintenance. Depending on species, soil types, and climatic conditions, maintenance can include weed and pest control, mowing, fertilizing, liming, irrigating, and pruning.

Adapted from EPA – Stormwater Menu of BMPs



DESCRIPTION:
Controlled storage and disposal of solid waste generated by construction activities.

APPLICATION:
All construction sites.

INSTALLATION:
- Designate one or several waste collection areas with easy access for construction vehicles and personnel. Ensure no waterways or storm drainage inlets are located near the waste collection areas.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around collection area for impoundment in the case of spills and to trap any windblown trash.
- Use watertight containers with covers to remain closed when not in use. Provide separate containers for different waste types where appropriate and label clearly.
- Ensure all on site personnel are aware of and utilize designated waste collection area properly and for intended use only (e.g. all toxic, hazardous, or recyclable materials shall be properly disposed of separately from general construction waste).
- Arrange for periodic pickup, transfer and disposal of collected waste at an authorized disposal location. Include regular Porta-potty service in waste management activities.

LIMITATIONS:
- On-site personnel are responsible for correct disposal of waste.

MAINTENANCE:
- Discuss waste management procedures at progress meetings.
- Collect site trash daily and deposit in covered containers at designated collection areas.
- Check containers for leakage or inadequate covers and replace as needed.
- Randomly check disposed materials for any unauthorized waste (e.g. toxic materials).
- During daily site inspections check that waste is not being incorrectly disposed of on-site (e.g. burial, burning, surface discharge, discharge to storm drain).

Appendix D

- **Appendix D** – Copies of the most current City ordinances applicable to storm water. Note: Complete access to South Jordan City Municipal Code is available at http://www.sjc.utah.gov/municipalcode.asp

12.04.080: PROTECTION OF PUBLIC RIGHTS OF WAY:

It is unlawful for any developer, contractor, permit holder, and/or property owner to track, place or permit to be placed or tracked on or in the sidewalk, curb, gutter, street or any other public way:

A. Any dirt, gravel, road base, asphalt, concrete, oil or other like substances, except as expressly authorized by ordinance, without prior written permission of the city engineer being first obtained.

B. Each developer, contractor, permit holder, or property owner shall be responsible to prevent vehicles used in the process of carrying out construction on a property from placing and/or tracking any mud, dirt or debris of any kind upon any streets or sidewalks within the corporate limits of South Jordan City unless written permission has been obtained from the city engineer for use of a designated portion of the right of way. The permittee or owner shall install or cause to be installed, a suitable process to clean the wheels or tracks of any and all equipment and vehicles belonging to the permittee/owner, subcontractor, supplier or any other visiting vehicle prior to its leaving the job site and/or property line and entering the streets within the South Jordan City limits. The suitable process shall consist of:

1. A cleaning area and crew to clean mud, dirt and debris off the wheels and exterior body surface and undercarriage of the vehicle or equipment;

2. The cleaning area shall be arranged to furnish adequate draining to prevent pooling; the cleaning area shall be kept mud free and may be on a macadam or concrete slab;

3. The cleaning area shall be located on private property within the boundary of the permitted construction site and arranged in such a way that there is no blocking of vehicular or pedestrian traffic on city rights of way except where permission has been granted in writing by the city engineer;

4. The cleaning water or solution and debris, mud, dirt and/or silt shall not be allowed to enter the city streets, gutter, storm drain or sanitary sewer system.

C. All vehicles and equipment that enter upon or operate in the public right of way shall be covered in such a way as to prevent dropping or discharging of materials of any kind onto city streets, sidewalks or other right of way.

D. Ramps constructed over curbs, gutters and sidewalks shall not be constructed or made from dirt or other materials that will erode or deteriorate under adverse weather conditions and shall not interfere with or block the passage of water along the gutter.

E. The permit holder, contractor, or owner shall install or cause to be installed, erosion and water runoff controls sufficient to ensure that no stormwater, surface water, sediments or debris from the construction site shall drain or wash or be tracked into any public rights of way or other adjacent properties, including sidewalk, curb, gutter or storm drain, unless permission has been granted through an erosion control plan approved by the city engineer. These berms shall not be of a material that could cause harm to vehicular traffic.

F. The sidewalk and/or curb and gutter shall not be used for storage of debris, dirt, excavated or other materials. In addition, the sidewalks shall not be removed, blocked or otherwise rendered unusable by either the storage of construction equipment or materials or the construction procedures used, unless a safe, usable alternate walkway along the same side of the street is provided by the contractor, unless the city engineer has issued written permission. All alternative walkways shall be ramped in accordance with Americans with disabilities act, title II.

G. The contractor, permit holder and/or property owner shall be responsible for the immediate cleanup and removal of mud, dirt, or debris deposited upon or in city streets, sidewalks, curbs, gutters and/or storm drains by equipment leaving the site or by the contractor's, owner's, permit holder's construction procedures including subcontractors and suppliers.

H. If agents of the city note any noncompliance with this section the permittee, developer, contractor, and/or property owner shall be cited. The citation shall provide the developer, contractor, permittee and/or property owner twenty four (24) hours to remedy the violation. Should the developer, contractor, permittee and/or property owner fail to comply within the twenty four (24) hour period, the city shall remove or cause to be removed any and all materials in public rights of way and storm drains that violate this section. The city may in lieu of citing the developer, contractor, permittee and/or property owner with a class B misdemeanor, charge a fee of five hundred dollars ($500.00) plus costs for labor, material, and equipment, at such a rate as established by the public services group for each occurrence and any other applicable fees including all engineering costs and legal fees if any as charged by the city attorney. Any damage done to city property or infrastructure shall also be applicable to include fees of all engineering costs, labor, materials, equipment and legal fees. All construction activity shall be halted on the site until such time as payment of all charges is made to the city.

I. City inspectors, the city engineer and/or director of operations or their designees are empowered to suspend any permit and stop all work at the site until the developer, contractor, permit holder and/or property owner installs the necessary cleaning equipment and/or erosion and silt control facilities to ensure that no dust, mud, dirt, or debris is deposited upon or in the streets, sidewalks, curb, gutter, or storm drains of the city of South Jordan. Such facilities shall operate in a manner satisfactory to the city engineer and/or the director of operations.

J. A violation of this section may be punishable as a class B misdemeanor, and the issuance of a criminal complaint shall not excuse the developer, contractor, permit holder and/or property owner of his or her responsibilities to abate the problem within the required time limit. A class B misdemeanor is punishable by fine, imprisonment, or both in addition to fees and expenses incurred by the city if the city is required to mitigate the violation. (Ord. 2005-22, 12-6-2005)

12.24.030: CITIZEN RESPONSIBILITIES:

Citizens/property owners, occupants, and their agents shall have the following responsibilities for the protection of trees in park strips abutting their real property except in those park strips that are maintained by the city.

A. Periodic watering and fertilization of trees as necessary to maintain good health and vigor.

B. Keep any branches that overhang a sidewalk pruned seven feet (7') above the sidewalk and any branch that overhangs a road pruned thirteen feet (13') above the road.

C. Protect trees in park strips from damage caused by lawn mowers, weed trimmers, snow blowers, and similar equipment.

D. Protect trees in park strips from damage caused by attachment of any items such as signs, nails, wires, ropes, and chains.

E. The species of trees planted in the park strips should comply with the street tree list unless otherwise approved by the urban forester. They should also be planted as set forth in the city of South Jordan construction standards and specifications.

F. Remove private trees or limbs that have fallen upon a city street, property, or sidewalk.

G. Maintain ground covers except in those park strips maintained by the city.

H. Notify the urban forester of any hazard tree.

I. Rake, clean up, and properly dispose of leaves that fall from trees so leaf fall does not impede the stormwater system.

J. The city of South Jordan shall have no liability for the failure of any tree or landscaping installed by private parties on other than city maintained property. (Ord. 2011-19, 12-6-2011)

13.08.150: CHARGES DUE:

All secondary water fees and other charges shall be deemed to be due and payable immediately upon billing of the same. The fees and charges shall be due and payable on the first day of the billing period for which the charge is made. Dishonored checks shall not be considered a payment received. If payment is not received within the billing period in which the charge is made, the city shall give written notice to the person of such delinquency and the amount that is past due. If the service charge remains unpaid for two (2) complete billing periods after the initial billing, the city shall have the right to discontinue culinary water service; provided, that notice of discontinuance is given in the manner provided in sections 13.04.140 and 13.04.150 of this title. For amounts that are due for more than one billing cycle, any payment received shall be applied toward the most recent billing for which an amount is due. Service charges may be billed by the city in conjunction with other utility billings. Where joint billings are made by the city for garbage, stormwater utility, cemetery, secondary water and culinary water, all payments received shall be credited: toward fees, taxes, charges, surcharges and fines for garbage, stormwater utility, cemetery, and secondary water prior to being credited toward culinary water. (Ord. 2010-14, 9-7-2010)

13.12.005: PURPOSE:

A. It is the purpose of this chapter to:

1. Protect, maintain, and enhance the environment of South Jordan City.

2. Establish responsibilities for controlling and managing stormwater runoff.

3. Protect the public health, safety and the general welfare of the citizens of the city, by controlling discharges of pollutants to the city's stormwater system and to maintain and improve the quality of the receiving waters into which the stormwater outfalls flow, including, without limitation, lakes, rivers, streams, ponds, wetlands, and groundwater of the city.

4. Enable the city to comply with the national/Utah pollution discharge elimination system permit (NPDES/UPDES) and applicable regulations, 40 CFR section 122.26 for stormwater discharges.

5. Allow the city to exercise the powers granted by Utah code, which provides that, among other powers municipalities have with respect to stormwater facilities, is the power by ordinance or resolution to:

a. Exercise general regulation over the planning, location, construction, and operation and maintenance of stormwater facilities in the city, whether or not owned and operated by the city;

b. Adopt any rules and regulations deemed necessary to accomplish the purposes of this statute, including the adoption of a system of fees for services and permits;

c. Establish standards to regulate the quantity of stormwater discharged and to regulate stormwater contaminants as may be necessary to protect water quality;

d. Review and approve plans and plats for stormwater management in proposed subdivisions or commercial developments;

e. Regulate and prohibit discharges into stormwater facilities of sanitary, industrial, or commercial sewage or waters that have otherwise been contaminated; and

f. Expend funds to remediate or mitigate the detrimental effects of contaminated land or other sources of stormwater contamination, whether public or private.

B. The city engineer for South Jordan City shall administer the provisions of this chapter. Nothing in this chapter shall relieve any person from responsibility for damage to other persons or property, nor impose upon South Jordan City, its officers, agents or employees, any liability for damage to other persons or property. (Ord. 2012-19, 12-4-2012)

13.12.010: DEFINITIONS:

For purposes of this chapter:

BEST MANAGEMENT PRACTICES (BMP) MANUAL: The BMP manual is composed of the following publications: "South Jordan City Standard Plans And Specifications", "South Jordan City Storm Water Master Plan", "South Jordan City Guidance Document For Stormwater Management" and the most current "UPDES Storm Water General Permit For Construction Activities".

BEST MANAGEMENT PRACTICES OR BMPs: Physical, structural, and/or managerial practices that, when used singly or in combination, prevent or reduce pollution of water, that have been approved by the South Jordan City engineer and that have been incorporated by reference into this chapter as if fully set out therein. For purposes of this title, the relevant BMPs are more particularly defined in the BMP manual.

BUILDING PERMIT: All permits issued pursuant to title 15 of this code, except those issued solely for grading, for the purpose of remodeling or repairing any preexisting building or structure, or for construction of an "accessory building", as defined in section 17.08.010 of this code; provided, that no substantial increase in impervious surface on the property results from such permit.

CITY ENGINEER: The city engineer of the city of South Jordan, or the person(s) engaged by the city and authorized to perform the duties assigned to the city engineer, and shall include any deputies, assistants, and representatives.

COUNTY: Refers to Salt Lake County, often with particular applicability to the Salt Lake County department of flood control.

DEVELOPER: Any person owning property on which a development is carried out, or any person (including any corporation, partnership or other entity) which promotes, initiates, manages, operates, owns or seeks approval or a permit for any development.

DEVELOPMENT: Any act of altering or improving real property in any manner which alters or increases the flow of surface water upon any real property in the city to any significant degree. "Development" includes every subdivision for which approval is sought pursuant to title 16 of this code.

DEVELOPMENT FACILITY: A drainage system which drains a development and which may be tributary to an intermediate or major drainage system facility, trunk line, natural tributary or final destination.

HOT SPOT ("PRIORITY AREA"): An area where land use or activities generate highly contaminated runoff, with concentrations of pollutants in excess of those typically found in stormwater.

ILLICIT CONNECTIONS: Illegal and/or unauthorized connections to the municipal separate stormwater system whether or not such connections result in discharges into that system.

ILLICIT DISCHARGE: Any discharge to the municipal separate storm sewer system that is not composed entirely of stormwater and not specifically exempted under section 13.12.145 of this chapter.

INTERMEDIATE FACILITY: A channel, pipeline or other means of connecting one or more development drainage facilities to a major drainage facility.

LAND DISTURBANCE PERMIT: All South Jordan City land disturbance permits issued pursuant to title 16 of this code.

MAINTENANCE AGREEMENT: A document recorded in the land records that acts as a property deed restriction, and which provides for long term maintenance of stormwater management practices.

MAJOR FACILITY: A channel, river, canal, pipeline or other means of connecting an intermediate drainage facility with the Great Salt Lake or tributary thereto.

MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OR MUNICIPAL SEPARATE STORMWATER SYSTEM: The conveyances owned or operated by the city for the collection and transportation of stormwater, including the roads and streets and their drainage systems, catch basins, curbs, gutters, ditches, manmade channels, and storm drains.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT (Or NPDES PERMIT): A permit issued pursuant to 33 USC 1342.

PERSON: Means and includes any individual, corporation, partnership, trust, joint venture, association, or other entity.

RUNOFF: That portion of the precipitation on a drainage area that is discharged from the area into the municipal separate stormwater system.

SYSTEM: The following facilities, wherever located in the city, including open channel sections and any sections in conduit:

A. Jordan River;

B. South Jordan Canal;

C. Utah Salt Lake Canal;

D. Utah Lake Distributing Canal;

E. Jacob Canal;

F. Beckstead Ditch;

G. Midas Creek;

H. Bingham Creek;

I. Dry Creek;

J. All storm drains and subsurface collection systems installed and located in the city.

UPDES: Utah pollution discharge elimination system. (Ord. 2012-19, 12-4-2012)

13.12.050: PREREQUISITES TO DEVELOPMENT:

No subdivision shall be approved or considered for approval, no building permit shall be issued, and no other approval or permit shall be issued or considered by the city for any development, unless said development includes facilities adequate to carry away and properly dispose of runoff, storm and flood water which satisfy all of the following conditions:

A. File Plan: A plan drawn to scale by a licensed professional engineer has been filed with the city which accurately shows the installation and nature of the flood control facilities required by the specifications prepared by the city engineer.

B. Stormwater Discharge Control: Site designs shall control the peak flow rates of stormwater discharge to the amounts specified in the BMP manual. Developer should seek to utilize pervious areas for stormwater treatment and to infiltrate stormwater runoff from driveways, sidewalks, rooftops, parking lots, and landscaped areas to the maximum extent practical. Stormwater discharges to critical areas with sensitive resources (i.e., fisheries, wetland areas, Jordan River, Midas Creek, Bingham Creek, Little Willow Creek, swimming beaches, recharge areas, water supply reservoirs) may be subject to additional performance criteria, or may need to utilize or restrict certain stormwater management practices. Stormwater discharges from "hot spots" may require the application of additional engineered BMPs and pollution prevention practices.

C. Subsurface Water: If the development is located within the city and east of 1700 West Street, then the following requirements apply:

1. Water Table Measurement: The city engineer may require soils testing or water table assessments or measurements as may be reasonably necessary for the health, safety and welfare of the residents of the city in light of the contemplated use of the land;

2. Minimum Requirement for Development: If the water table at any time during the year is six feet (6') or less (measured from the surface), then subsurface drainage facilities shall be installed according to plans prepared by the developer in advance of the installation. Plans must account for disposal of subsurface flows to the satisfaction of the city engineer.

D. Approval: The plans required by the preceding subsections shall be reviewed and approved by the city engineer prior to the installation and found to fully comply with all of the specifications prepared by the city engineer relating to flood control and drainage, or in the case of subsurface facility plans, are found to be satisfactory in the opinion of the engineer.

E. Bond: A cash deposit, escrow contract, surety bond or standby letter of credit has been received by the city to assure complete installation of the required facilities. Such bond shall be in a form substantially similar to that required for subdivision plat approval pursuant to title 16 of this code. Said bond shall be in an amount estimated by the city engineer to equal the cost of the required facilities. Said bond may be incorporated and combined in the bond required for subdivision approval.

F. Installation: The facilities for which plans are required in the development shall be installed in the manner and using the materials required by said specifications. Stormwater discharge during all construction activities shall comply with the terms of the BMP manual and/or applicable requirements set forth by the building code.

G. Inspection: Prior to backfilling any trench enclosing the required facilities or otherwise obscuring them, all such facilities have been inspected and found satisfactory by the city.

H. As Built Drawings: Drawings by a licensed professional engineer showing the required facilities as installed have been furnished to the city.

I. Expenses: The requirements of subsections A, B, C, E, F and H of this section have been met at no expense to the city.

J. Development and Residential Drainage Fee:

1. Stormwater Drainage Fee Required: The developer of a development in the city shall pay to the city a development stormwater drainage fee, which fee shall be applied toward the payment of a portion of the cost of the intermediate or major drainage system facilities constructed or to be constructed within the city.

2. Residential Stormwater Drainage Fee Required: The owner of a lot within a development or other undeveloped parcel of real property within the city shall pay to the city a residential stormwater drainage fee, which fee shall be applied toward the payment of a portion of the cost of the intermediate or major drainage system facilities constructed or to be constructed within the city.

3. Amount of Fees: The amount of said fees may be set by resolution of the city council and may thereafter be amended from time to time by resolution.

4. Accounting: All development stormwater drainage fees and residential stormwater fees collected shall be placed in an account within the capital projects fund under the account heading "flood control". Funds of said account shall be expended and accounted for as provided in this code for accounts in the capital projects fund for the collection, transmission, channeling, retention, handling and/or disposal of surface water, floodwaters and/or runoff. (Ord. 2012-19, 12-4-2012)

13.12.065: PRIVATELY OWNED DEVELOPMENT FACILITIES:

The city shall review and approve drainage calculations related to privately owned development facilities to ensure that stormwater management is consistent with the BMP manual. Property owners to be served by a privately owned development facility must execute an inspection and maintenance agreement that shall operate as a deed restriction binding on the current property owner and all subsequent property owners. The maintenance agreement shall:

A. Assign responsibility for the maintenance and repair of the stormwater facility to the owner of the property upon which the facility is located and be recorded as such on the plat for the property by appropriate notation.

B. Provide for annual inspection by the property owner for the purpose of documenting maintenance and repair needs and ensure compliance with the purpose and requirements of this chapter. The property owner shall arrange for this inspection to be conducted by a qualified/experienced contractor or registered professional engineer licensed to practice in the state of Utah who will submit a sealed report of the inspection to the city engineer. It shall also grant permission to the city to enter the property at reasonable times and to inspect the stormwater facility to ensure that it is being properly maintained.

C. Provide that the minimum maintenance and repair needs include, but are not limited to: the removal of silt, litter and other debris, the cutting of grass, grass cuttings and vegetation removal, and the replacement of landscape vegetation, in detention and retention basins, and inlets and drainage pipes and any other stormwater facilities as required by the property owner and by the city. It shall also provide that the property owner shall be responsible for additional maintenance and repair needs consistent with the needs and standards outlined in the BMP manual.

D. Provide that maintenance needs must be addressed in a timely manner, on a schedule to be determined by the city engineer.

E. Provide that if the property is not maintained or repaired within the prescribed schedule, the city engineer shall perform the maintenance and repair at its expense, and bill the same to the property owner. The maintenance agreement shall also provide that the city engineer's cost of performing the maintenance shall be a lien against the property. (Ord. 2012-19, 12-4-2012)

13.12.090: CONFORMITY WITH BEST MANAGEMENT PRACTICES:

A. South Jordan City adopts as its best management practices (BMP) manual the following publications, which are incorporated by reference in this chapter as if fully set out herein:

1. "South Jordan City Standard Plans and Specifications".

2. "South Jordan City Storm Water Master Plan".

3. "South Jordan City Guidance Document for Stormwater Management".

4. Most current "UPDES Storm Water General Permit for Construction Activities".

B. These manuals include a list of acceptable BMPs and include specific design performance criteria and operation and maintenance requirements for each stormwater practice. The manuals may be updated and expanded from time to time, at the discretion of the city engineer, based on improvements in engineering, science, monitory and local maintenance experience. Stormwater facilities that are designed, constructed and maintained in accordance with these BMP criteria will be presumed to meet the minimum water quality performance standards.

C. Neither the city nor any other owner or developer of land in the city shall construct or operate any facility or improvement to real property for the purpose of disposing of runoff or stormwater unless such facility or improvement conforms with BMP manuals. (Ord. 2012-19, 12-4-2012)

13.12.140: REMEDIES AND ENFORCEMENT POWERS:

A. Enforcement Of Procedures: Nothing herein is intended to limit or prohibit the enforcement of this code or other applicable laws and/or ordinances through civil or criminal process where the city has determined that enforcement of the procedures outlined in these sections will not result in effective redress, where there have been repeated violations of the provisions of this chapter, or where the severity of the violation warrants redress through civil or criminal action.

B. Sanctions: The following sanctions shall be available to redress violations of the provisions of this chapter:

1. Issuance Of A Notice Of Violation: Whenever the city engineer finds that any permittee or any other person discharging stormwater has violated or is violating this chapter or a permit or order issued hereunder, the city engineer may serve upon such person written notice of the violation. Within seven (7) days of this notice, an explanation of the violation and a plan for the satisfactory correction and prevention thereof, to include specific required actions, shall be submitted to the city engineer. Submission of this plan in no way relieves the discharger of liability for any violations occurring before or after receipt of the notice of violation.

2. Revocation Or Suspension Of Permits: Revocation or suspension of land disturbance permits, conditional use land disturbance permits, encroachment permits or plan or other approvals issued by city of South Jordan.

3. Notice To Bonding Agency: Whenever the city engineer finds that a default has occurred in the performance of any term or condition of the permit, written notice thereof may be given to the principal and to the surety on the bond, if there is a surety bond. Such notice shall state the work to be done, the estimated cost thereof, and the period of time deemed by the city engineer to be reasonably necessary for the completion of the work.

4. Withholding Forms: Withholding of permits, certificates or other forms of authorization pertaining to any land where there exists an uncorrected violation of this chapter.

5. Stop Work Order: Issuance of a stop work order.

C. Penalties: Violation of any of the provisions of this chapter shall upon conviction be punishable as a class B misdemeanor. Each day in which the violation continues is a separate offense.

D. Other Remedies: The city shall have such other remedies as are and as may be from time to time provided by state law or city ordinance for the violation of any provision of this chapter. Remedies shall be cumulative.

E. Multiple Violations: Where multiple violations have occurred or are occurring, each violation of the provisions of this chapter or other applicable laws is subject to a separate sanction. The city may take into account the number and severity of violations in determining the type of action to take against the offending party.

F. Conflicting Standards: Whenever there is a conflict between any standard contained in this chapter and in the BMP manual adopted by the city under this chapter, the strictest standard shall prevail. (Ord. 2012-19, 12-4-2012)

13.12.145: ILLICIT DISCHARGES:

A. Scope: This section shall apply to all water generated on developed or undeveloped land entering the city's separate stormwater system.

B. Prohibition Of Illicit Discharges: No person shall introduce or cause to be introduced into the municipal separate storm sewer system any discharge that is not composed entirely of stormwater. The commencement, conduct or continuance of any nonstormwater discharge to the municipal separate storm sewer system is prohibited except as described as follows:

1. Uncontaminated discharges from the following sources:

a. Water line flushing or other potable water sources (if dechlorinated, typically less than 1 ppm chlorine),

b. Landscape irrigation or lawn watering with potable water,

c. Diverted stream flows,

d. Rising groundwater,

e. Groundwater infiltration to storm drains,

f. Uncontaminated pumped groundwater,

g. Discharges from potable water sources,

h. Foundation or footing drains, crawl space pumps,

i. Lawn watering runoff,

j. Individual residential car washing,

k. Air conditioning condensation,

l. Irrigation water,

m. Springs,

n. Natural riparian habitat or wetland flows,

o. Swimming pools (if dechlorinated, typically less than 1 ppm chlorine),

p. Water reservoir discharges (if dechlorinated, typically less than 1 ppm chlorine),

q. Residual street wash water,

r. Firefighting activities, and

s. Any other uncontaminated water source.

t. Discharges specified in writing by the city engineer as being necessary to protect public health and safety.

u. Dye testing is an allowable discharge if the city engineer has so specified in writing.

v. The prohibition shall not apply to any non stormwater discharge permitted under a UPDES permit, waiver, or waste discharge order issued to the discharger and administered under the authority of the state of Utah division of water quality, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the storm drain system.

C. Prohibition Of Illicit Connections:

1. The construction, use, maintenance or continued existence of illicit connections to the separate municipal storm sewer system is prohibited.

2. 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.

D. Reduction Of Stormwater Pollutants By The Use Of Best Management Practices: Any person responsible for a property or premises, which is, or may be, the source of an illicit discharge, may be required to implement, at the person's expense, the BMPs necessary to prevent the further discharge of pollutants to the municipal separate storm sewer system. Compliance with all terms and conditions of a valid NPDES permit authorizing the discharge of stormwater associated with industrial activity, to the extent practicable, shall be deemed compliance with the provisions of this section.

E. Notification Of Spills: Notwithstanding other requirements of law, as soon as any person responsible for a facility or operation, or responsible for emergency response for a facility or operation has information of any known or suspected release of materials which are resulting in, or may result in, illicit discharges or pollutants discharging into stormwater, the municipal separate storm sewer system, the person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release. In the event of such a release of hazardous materials the person shall immediately notify emergency response agencies of the occurrence via emergency dispatch services. In the event of a release of nonhazardous materials, the person shall notify the city engineer in person or by telephone or facsimile no later than the next business day. Notifications in person or by telephone shall be confirmed by written notice addressed and mailed to the city engineer within three (3) business days of the telephone notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least five (5) years. (Ord. 2012-19, 12-4-2012)

13.12.147: INSPECTIONS:

A. Purpose: To be in accordance with the general permit for discharges for small municipal separate storm sewer systems (MS4), permit no. UTR090000, the city will conduct inspections to monitor all discharges to natural water bodies including lakes, rivers, streams and canals, stormwater controls and BMPs.

B. Scope: Inspections relating to the MS4 permit include, but are not limited to, illicit discharges, construction activities and post construction operation and maintenance of stormwater controls, reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and

material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other BMPs either publicly or privately owned.

C. Access:

1. Visual Inspections: Visual inspections of discharges to natural water bodies, spills, stormwater related controls on private property within the city limits of South Jordan City are permitted by the city engineer, or designee at any time.

2. Other Inspections: When a visual inspection is not adequate to determine the extent of discharges to natural water bodies, spills or determine the status of stormwater related controls on private property, the city will give twenty four (24) hours' notice of the inspection to take place and the extent of the inspection. Equipment and manpower necessary to perform the inspection will be allowed to access and work as necessary to determine the state of the situation.

3. Emergency Inspections: During times of emergency including discharges to natural water bodies, spills or potential damage to life or property, the city may access the location of concern as necessary and with the equipment required to determine the status of the situation. Reasonable attempts to contact the property owner prior to the inspection will be made prior to accessing private property.

4. Follow Up Inspections: During initial or routine inspections if problems are identified which require corrective actions then a follow up inspection will be scheduled.

D. Inspection Of Existing Facilities: The city engineer, or designee may, to the extent authorized by state and federal law, establish inspection programs to verify that all stormwater management facilities, including those built before as well as after the adoption of this chapter, are functioning within design limits. These inspection programs may be established on any reasonable basis, including, but not limited to: routine inspections; random inspections; inspections based upon complaints or other notice of possible violations; inspection of drainage basins or areas identified as higher than typical sources of sediment or other contaminants or pollutants; inspections of businesses or industries of a type associated with higher than usual discharges of contaminants or pollutants or with discharges of a type which are more likely than the typical discharge to cause violations of the city's NPDES/UPDES stormwater permit; and joint inspections with other agencies inspecting under environmental or safety laws. Inspections may include, but are not limited to: reviewing maintenance and repair records; sampling discharges, surface water, groundwater, and material or water in drainage control facilities; and evaluating the condition of drainage control facilities and other BMPs.

E. Corrections Of Problems Subject To Appeal: Corrective measures imposed by the city engineer, or designee under this section are subject to appeal as described in this chapter. (Ord. 2012-19, 12-4-2012)

16.04.180: STREETS:

The following requirements pertaining to streets shall be incorporated into subdivision, condominium, SRD and site plan design and implemented by the developer:

A. Standard Street Rights Of Way: Public street rights of way shall be as shown in the city standard plans and specifications for the classification of the street that is to be installed and shall be dedicated to the city. All public street improvements shall be installed according to the city standard plans and specifications as approved by the city engineer. The city engineer may allow or require other public right of way widths and waive or modify requirements for pavement, curb and gutter, sidewalks and park strips.

Streets in PUDs, condominium projects, and other private developments shall be built as follows:

1. a. Public Streets: Public streets are strongly encouraged. Construction of public improvements in PUDs, condominium projects, and other private developments shall be constructed per the city standard plans and specifications for public streets, with standard construction widths, cross section, streetlights, and construction requirements, except as may be modified under this subsection A.

b. Private Streets: Private streets are strongly discouraged. When approved, cross sections shall be built to city standard plans and specifications public street standards except as may be modified as noted under this subsection A, however in all cases, pavement/subbase thickness/depth shall be designed and built as required for public streets, as described in this section. Streetlights within private streets in PUDs shall be private and designed with a meter setting per Rocky Mountain Power standards.

Private streets shall be bonded the same as a public street including, but not limited to, road construction, curb and gutter, sidewalk, streetlights, storm drainage, and water system. At the acceptance of the improvements by the city, one hundred percent (100%) of the bond will be released with no retainage for warranty; except for those improvements that will be publicly maintained and owned.

B. Street Dedication: The developer shall dedicate rights of way and install improvements for proposed streets which are planned to adjoin or traverse the project or which are necessary for the development. The entire proposed right of way shall be dedicated according to the design width specified by the city transportation master plan and the city standard plans and

specifications unless the proposed right of way is planned to traverse other properties not controlled by the developer. In such cases, the planning commission may require a partial right of way width dedication or require adjustments to the alignment so that only the developer's property is required to be dedicated. Street improvements may not be required on other properties which have been dedicated for future road development. In cases where only a partial street is possible, said street shall have a right of way dedication of no less than forty feet (40') and shall have sufficient pavement to accommodate potential traffic as determined by the city engineer.

C. Gated Developments: Unless otherwise approved by the planning commission, gated developments are expressly prohibited.

D. Adjacent Properties: In order to accommodate access to an adjacent parcel which is not a part of a proposed development and not sufficiently wide enough to accommodate its own access, streets or private access shall be planned and constructed adjacent to the project boundary in order to allow future completion of the street or access improvements when the adjacent property is developed. In such cases, the provisions of subsection B of this section shall be implemented. With approval of the planning commission, the developer may, by agreement with the city and according to procedures and conditions recommended by the city attorney, record a minimum one foot (1') wide protection strip between the street and the project boundary or enter into a pioneering/reimbursement agreement, except at the ends of "stub" streets, in order to obtain reimbursement for public road improvements from the future developer of the adjacent parcel. A protection strip may also be established along any partially constructed street with approval of the planning commission.

E. Future Access And Landlocked Properties: Subdivisions and other developments shall be designed so that proposed streets/accesses will be connected to existing streets/accesses, as well as future street systems. Development shall provide future access and utilities (stub streets) built to city standards to adjoining developable parcels, as needed, with the intent that all area properties have the opportunity to be duly developed without being landlocked unnecessarily.

A metal sign shall be required at the end of a public stub street to inform property owners of the eventual connection to future development. Recorded plats shall also be required to indicate future street connections.

F. Block Length: To help promote accessibility and the spreading of traffic, subdivision street design shall include a stub street at least every one thousand two hundred feet (1,200'), unless otherwise recommended by the city engineer and approved by the planning commission.

G. Secondary Access: For public safety reasons, secondary access for specific subdivisions and site plans should be secured. By recommendation of the city engineer and fire code official, the planning commission may require secondary public access for subdivisions with a total of ten (10) or more lots and for sizable nonsingle-family residential developments.

H. Turnaround Access: Where a stub street is provided which accesses more than two (2) lots on each side, a temporary turnaround and public use easement or right of way shall be recorded as determined by the city engineer. The type and size of the turnaround shall be as determined by the city engineer in consultation with the city fire code official and shall be required on the adjoining vacant land or on the subject development until the stub street is opened to adjoining development. The city engineer may require improvements to be installed in temporary turnaround areas as deemed necessary.

I. Cul-De-Sac Streets: Cul-de-sacs, where approved, shall not exceed seven hundred fifty feet (750') in length unless approved by the planning commission upon recommendations of the city engineer and fire code official, as measured from the center of the intersection of a connecting through street to the center of the turnaround area. Cul-de-sac streets shall terminate in turnaround areas as follows:

1. Eighty feet (80') (edge of asphalt to edge of asphalt, not including gutter pan) for cul-de-sac lengths up to one hundred fifty feet (150'). Right of way for dedicated turnarounds shall be a minimum of one hundred seven feet (107') in diameter unless modified as per subsection A of this section.

2. Ninety six feet (96') (edge of asphalt to edge of asphalt, not including gutter pan) for cul-de-sac lengths from one hundred fifty one (151) to seven hundred fifty feet (750'). Right of way for dedicated turnarounds shall be a minimum of one hundred twenty three feet (123') in diameter unless modified as per subsection A of this section.

3. Cul-de-sacs over four hundred feet (400') in length shall require the water line to be tied to two (2) feed sources, or looped, as approved by the city engineer and shall require fire hydrants to be spaced at a maximum of three hundred fifty feet (350') apart. The city engineer working with public works department and the fire code official may modify this requirement as deemed necessary.

4. Cul-de-sacs under four hundred feet (400') in length shall require that fire hydrants be spaced at a maximum distance of four hundred feet (400') apart.

5. Cul-de-sacs over six hundred feet (600') in length shall require houses to be sprinklered beyond six hundred feet (600') from the connector street, as approved by the city fire code

official. Cul-de-sacs shall be designed to allow stormwater to drain to the intersection unless adequate drainage facilities are provided in the turnaround area.

J. Driveways And Subdivision Streets: Driveways and subdivision streets shall approach an arterial or collector street at an angle of eighty five (85) to ninety five degrees (95°), unless otherwise approved by the city engineer. Driveways to dwellings shall drain away from the dwellings. Slopes shall be a minimum of one-half percent (0.5%) and a maximum of ten percent (10%) for all streets, private roads and driveways, except collector or arterial streets, which shall be eight percent (8%) maximum, unless otherwise approved by the city engineer or designee. Driveways which exceed twelve percent (12%) slope shall be equipped with stairs (built in conformance with the international building code) from the street to the house for pedestrian access.

K. Infill Development: If the size and configuration of a proposed development is such that public or private streets are not feasible or practical, a private driveway aisle may be approved, as determined by the city engineer. Such accesses may be required to have aprons/approaches, concrete paving, or other design that connotes a driveway rather than a street. (Ord. 2013-01, 4-16-2013)

16.04.190: PARKS, PARK STRIPS[1], WALKWAYS, TRAILS, AND OPEN SPACE:

The following requirements pertaining to parks, park strips, trails and open space shall be incorporated into development design and implemented by the developer:

A. Plans, Funding, Maintenance: Where parks, open space or trails are master planned by the city, proposed by the developer or required on a parcel or parcels on which a subdivision or other development is proposed, the developer shall incorporate said parks, open space or trails into the design of the project and submit the plan for approval, with suggested improvements and funding and maintenance mechanisms, to the city council. The city council will determine what open spaces, parks, trails, improvements, and funding and maintenance mechanisms are desired and direct the developer concerning the same.

B. Pedestrian And Vehicular Access: All parks approved for public use shall have appropriate pedestrian and vehicular access from public streets. Parks and open space four (4) acres or larger in area shall abut at least one collector or arterial street.

C. Flood Control: Parks and open spaces shall be planned, where appropriate, in conjunction with stormwater detention and retention areas.

D. Trail Location And Access: Trails and linear parkways shall be planned in conjunction with required waterways, along streets or in other locations as determined by the city. Linear parkways or trails which are approved by the city in required flood channels shall be dedicated to Salt Lake County or retained as private property. The developer, upon request of the city, shall grant to the city or other entity permanent access easements designated by the city engineer on and over sidewalks or trails on private property prior to final approval or building permit issuance, which easements may or may not give open. All maintenance of such areas shall be conducted by the owners or the city as determined by city staff. Trails which are required by and dedicated to the city will be under the maintenance control of the city.

E. Single-Family Residential Collector Street Park Strips: Park strips at the rear or side of single-family residential lots shall be improved with sod, trees with up to fifty percent (50%) stamped ashlar slate gray colored concrete. However, stamped concrete shall not be used in sections greater than fifteen (15) linear feet per section.

F. Other Collector Street Park Strips: Collector street park strips along commercial, office, multi-family residential, industrial and institutional developments shall be improved with sod, trees, and/or up to fifty percent (50%) stamped natural earth tone colored concrete. However, stamped concrete shall not be used in sections greater than fifteen (15) linear feet per section.

G. Residential Street Park Strips: Said park strips shall be improved a minimum of fifty percent (50%) with sod, trees, plants, shrubs and/or other live plant material which are low maintenance and commonly found along the Wasatch Front or within similar climates. Mulch and/or medium size bark material, two inches (2") or larger, may be used in combination with live vegetation provided that it is fully contained within the park strip at all times.

A maximum of fifty percent (50%) of the park strip area, per street frontage, may be hardscape, with stamped natural earth tone colored concrete, and/or masonry materials such as stone, pavers, boulders, and/or rock. However, stamped concrete or other materials shall not be used in sections greater than fifteen (15) linear feet per section. All rock and stone materials shall not be less than three inch (3") diameter in size at any point.

H. Park Strip Materials, Colors, And Sizes: All other park strip materials, colors, and sizes shall be viewed by community development director for consideration of approval. The community development director may approve greater than fifty percent (50%) hardscape within the park strip based upon the applicant's street tree planting plan that clearly incorporates tree species, canopy, spacing, and ground covers into a superior green design that reasonably offsets the increased percentage of hardscape materials.

I. Landscaping And Maintenance: The developer shall install all required collector street landscaping improvements and properly maintain said improvements until the one hundred percent (100%) release of the improvement guarantee. After satisfactory installation of landscaping in collector street park strips and the one hundred percent (100%) release of the bond for said landscaping, the city will accept responsibility for maintenance of the park strips along collector streets where collector street fencing has been installed along the rear and side property lines of lots only in single-family residential subdivisions. The owners of property in all other developments shall be responsible for the proper landscaping and maintenance of other public or private park strips.

J. Common Open Space: The developer of a PUD or condominium shall submit plans for landscaping and improvements for the common open space. The developer shall also explain the intended use of the open space and provide detailed provisions of how the improvements thereon are to be financed and maintained.

K. Completion Guarantee: The developer shall file with the city an acceptable bond, in a form satisfactory to the city attorney, guaranteeing completion of park, open space and trail improvements within one year after such filing. Upon completion of the improvements for which a bond or other agreement has been filed, the developer shall call for inspection by the city engineer. If inspection shows that landscaping and construction have been completed in compliance with the approved plans, the bonds or security therefor shall be released except for that amount retained during the warranty period. If the bonds or security are not released, refusal to release and reasons therefor shall be provided to the developer.

L. Open Space Easement: The developer shall, upon the request of the city, grant to the city or other agency or entity an "open space easement" on and over the common open space prior to recording the final plat, site plan or condominium, which easement will not necessarily give the general public the right of access, but will provide that the common open space remains open.

M. Open Space Ownership And Maintenance: All open space or trail improvements in PUDs and other developments not specifically dedicated to the city or accepted for ownership or maintained by the city shall be perpetually owned by the adjacent owners and maintained by the owners or their agents through a special taxing district or owners' association with power to assess and collect fees for maintenance or other assessment and maintenance mechanisms acceptable to the city.

N. Glenmoor Neighborhood: Walkways in the Glenmoor neighborhood are those publicly owned areas that include a sidewalk, that pass between private residential properties. The area between the abutting owner's property and the sidewalk is the property owner's responsibility to maintain.

The property within a walkway which is between the abutting owner's property and the sidewalk shall not include materials, objects, trees, shrubs or plant material that will obstruct travel on the walkway or pose a safety hazard to pedestrians or maintenance personnel.

All walkway landscape shall be improved with suitable ground covers, plants, shrubs, other live plant material which are low maintenance and/or medium size bark material, two inches (2") or larger provided it is fully contained within the area between sidewalk and the abutting owner's property.

The area between the sidewalk and the abutting owner's property may be hardscape with material such as concrete, and/or masonry material such as pavers, or rock not less than three inch (3") diameter in size at any point provided it is fully contained within the area between sidewalk and the abutting owner's property.

Adjoining property owners shall keep walkways free of obstructions and hazards. Shrubs, plants and trees shall be maintained clear of the sidewalk. Mature trees shall be pruned at least seven feet (7') above the sidewalk.

Maintenance activities for walkway areas include: mowing grass; watering grass, shrubs or trees; pruning trees or shrubs; and other generally accepted landscape maintenance activities. All walkway landscape must be maintained and shall not include unimproved areas or areas with weeds which exceed a height of six inches (6") at any time. (Ord. 2013-01, 4-16-2013)

16.04.220: STORM WATER DRAINAGE:

The following requirements pertaining to storm water drainage shall be incorporated into development design and implemented by the developer:

A. The developer shall construct and install a storm water drainage system within the development which shall be constructed of materials and according to city specifications and the requirements of the city's master storm drainage plan.

B. The developer shall dedicate a right of way of fifteen feet (15') in width or greater as required by the city for storm drainage conforming substantially with the lines of any natural watercourse or channel, stream, creek, irrigation ditch or floodplain that enters or traverses the development as determined by Salt Lake County flood control and/or the city engineer. The developer shall also dedicate rights of way for any pipe, conduit, channel and retention or detention area as approved by the city engineer.

C. The storm water drainage system for the development shall be connected to an approved off site storm drain or facility acceptable to the city.

D. Storm drain, cross gutters, dipstone inlets, and other appurtenant structures shall be provided by the developer (within the limits of the project) as required to adequately dispose of storm waters, the 10-year frequency storm flows developed within the limits of the development and the existing flows entering the proposed development from adjacent properties. (Ord. 2007-01, 1-16-2007)

16.44.030: PURPOSE:

The purpose of this chapter is to establish minimum requirements and procedures for conducting land disturbance activities within the city. It is the intent of this chapter to protect the health, safety and welfare of the public against inadequate, unwarranted, or unsafe land disturbance activities during all aspects of land disturbance activities, including, but not limited to, the following:

A. To establish processes, procedures and standards for land disturbance activities such as clearing, grubbing, grading, excavating, filling, dredging, and other land disturbance related activities, to minimize hazards to life and limb, protect against erosion and sedimentation, maintain the natural environment, protect the safety, use, and stability of public rights of way and drainage facilities, and provide for restoration of the land through revegetation and landscaping.

B. To assure that projects approved under this chapter, as well as neighboring and downstream properties, will be free from harmful effects of new land disturbance activities with regard to runoff, including inundation, flooding, erosion, air pollution, and sedimentation.

C. To ensure proper restoration of vegetation and soil systems disturbed by land disturbance activities, to maintain an attractive and healthy landscape, and to control against dust and erosion and their consequent effects on soil structure and air and water quality during and after excavation.

D. To provide processes and standards in compliance with state and federal requirements regarding pollution, environmental quality, and stormwater discharge. (Ord. 2012-18, 12-4-2012)

16.44.040: DEFINITIONS:

As used in this chapter, the following words and phrases shall have the meanings given in this section:

APPLICANT: Any person who submits an application for a permit pursuant to the land disturbance ordinance.

BEST MANAGEMENT PRACTICE (BMP): Practices, procedures or designs used as a standard for a given industry. In this specific case, these practices are for the erosion control industry's best management practices (BMPs) for controlling nonpoint sources of pollution and are the methods, measures, practices, or a combination of practices determined to be the most effective and practicable means (including technological, economic, and institutional considerations) to control nonpoint pollutants at levels compatible with environmental quality goals. As used in the document, BMPs are synonymous with erosion and sediment control measures.

BEST MANAGEMENT PRACTICES (BMP) MANUAL: The BMP manual is composed of the following publications: "South Jordan City Standard Plans And Specifications", "South Jordan City Storm Water Master Plan", "South Jordan City Guidance Document For Stormwater Management" and the most current "UPDES Storm Water General Permit For Construction Activities".

BUILDING ENVELOPE: The area within the lot which will be used to construct the building, landscaped areas, retaining walls, fences, porches, patios, decks, swimming pools, driveways, parking areas, or any other permanent feature which is appurtenant to the building.

BUTTRESS FILL: A designed compacted earth fill used for providing lateral support to an unstabilized earth or rock mass.

CITY: City of South Jordan, Utah.

CITY ENGINEER: The city engineer of the city of South Jordan, or the person(s) engaged by the city and authorized to perform the duties assigned to the city engineer, and shall include any deputies, assistants, and representatives.

CIVIL ENGINEER: A professional engineer in the branch of civil engineering holding a valid

certificate of registration issued by the state of Utah.

CLEARING AND GRUBBING: Moving, removing, displacing, and/or stockpiling, by manual or mechanical means, trees, and other vegetation and/or the top organic layer as described in the geotechnical report. In the absence of a geotechnical report the organic layer shall not be greater than eight inches (8").

COMMUNITY DEVELOPMENT DIRECTOR: That person charged with the responsibility of directing all phases of the community development division and the enforcement of all state statutes and city laws pertaining to this office, or his duly authorized representative.

COMPACTION: The act of compacting or consolidating soil and rock material to a specified density, and the resulting compacted state of the material.

DETENTION: The holding back or delaying of the flow of water, through manmade or natural means.

DREDGING: The practice of deepening a waterway by mechanical means by the removal of sediments.

ENFORCEMENT AUTHORITY: The city engineer, the engineering inspector, and other designated representatives of the city engineer, or any duly appointed code compliance officer or police official charged with the responsibility for enforcement of the provisions of this chapter.

ENGINEERING GEOLOGIST: A professional engineering geologist licensed or registered under the laws of Utah and capable of applying the geological sciences to engineering practices for the purpose of assuring that the geological features affecting the location, design, construction, operation, and maintenance of engineering works are recognized and adequately provided for.

EROSION: The process of detachment of soil particles or other surface material by the action of wind, water, snow, or ice.

EROSION CONTROL MEASURES: The structural and nonstructural best management practices (BMPs) for erosion control that prevents displacement of soil particles by wind or water. BMP erosion control measures may include seeding, mulching, vegetative buffer strips, sod, plastic coverings, riprap, gabions, other channel armoring methods, burlap coverings, watering, and other BMP measures that control the movement of the ground surface or soil.

FARMING AND AGRICULTURAL OPERATIONS: Any activity or process normally performed as part of the farming use of the land which would prepare the soil for planting or harvesting of agriculturally usable products.

FILL: Deposits of soil, rock, or other materials placed by man.

FINISHED GRADE: The final grade or elevation of the building site, slope or terrace (0.1 plus

or minus feet).

GRADE: The elevation of the ground surface as measured from a known vertical control. Existing grade means grade currently on the site. Natural grade means the grade unaltered evidenced by the presence of indigenous plants and grasses.

GRADING: The act or result of digging, excavating, transporting, spreading, depositing, filling, compacting, settling, or shaping of land surfaces and slopes, and other operations or activities involving the physical movement of rock or soil.

LDDCS: Land disturbance design and construction standards.

LAND DISTURBANCE: Any disturbance of native soils, plants, or environment, including, but not limited to, clearing, grubbing, grading, excavation, filling, dredging, construction of earth filled dams, and any other types of earthwork.

LAND DISTURBANCE DESIGN AND CONSTRUCTION STANDARDS: City of South Jordan land disturbance design and construction standards as adopted by the city. Abbreviated herein as LDDCS.

LAND DISTURBANCE PERMIT: The land disturbance permit required by the city in accordance with provisions of this chapter.

LANDMARK TREES: Trees that measure over three inch (3") caliper.

LANDSCAPE ARCHITECT: A professional landscape architect licensed or registered under the laws of Utah.

LOT LEVEL: Design, construction and infrastructure related to construction on a specific lot within an approved subdivision or site plan development.

PLANTING DATE: The date native seed can be applied without temporary irrigation, generally from October 15 through March 1, or as otherwise determined by the city's engineering division.

PROJECT: A defined site that has obtained final subdivision plat or site plan approval from the city.

SEDIMENT: The transport of soil or earth material by wind, water, snow or ice.

SEDIMENT CONTROL MEASURES: The structural and nonstructural BMP that contains the deposited, displaced soil particles caused by erosion. This may include, but not be limited to, dikes, sediment detention traps, sediment detention basins, filters, fences, barriers, swales, berms, drains, check dams, and other measures that control the deposition of soil or earth material.

SITE: A parcel or parcels of real property owned by one or more persons on which activity

regulated by this chapter is occurring or is proposed to occur.

SLOPE: A portion of ground forming a natural or artificial incline, including retaining wall.

SOIL: All earth material, of whatever origin, which overlies bedrock.

SOILS ENGINEER: A professional civil engineer licensed under the laws of Utah who is experienced in soil mechanics and slope stability analysis.

STRUCTURE: Anything constructed or erected which requires location on the ground or is attached to something having location on the ground.

SUBDIVISION LEVEL: Design, construction and infrastructure related to subdivision development and systems such as drainage, culinary water, wastewater systems, etc.

SWALES: Shallow grassed or otherwise protected trenches that are wider than they are deep that provide a specific pathway for drainage water.

WET WEATHER PLAN: A detailed erosion and sediment control plan and construction sequence that clearly shows how construction will be processed during the period of October 31 of each year until March 31 of each year. (Ord. 2012-18, 12-4-2012)

16.44.110: REQUIRED PLANS AND REPORTS:

Unless an application waiver is obtained in accordance with the provisions of this chapter, each application for a land disturbance permit shall include the following plans and reports for the proposed land disturbance activity and site. The grading plan shall be prepared in accordance with the requirements and standards for such plans as set forth in the land disturbance design and construction standards.

A. Grading Plan: Grading plan prepared and signed by a civil engineer.

B. Drainage Plan: Each application for a land disturbance permit shall include a drainage plan for the proposed land disturbance activity and site. The drainage plan shall be prepared by a civil engineer and shall be prepared in accordance with the requirements and standards for such plans as set forth in the LDDCS.

C. Rear And Side Lot Drainage Swales: Swales located in rear and side yards shall be part of the grading and drainage plan and be designed as set forth in the LDDCS.

D. Stormwater Pollution Prevention Plan (SWPPP): Each application for a land disturbance permit shall include an SWPPP for the proposed land disturbance activity and site unless the site or lot is part of common plan of development that already has a UPDES/NOI permit and this permit is referenced on the application. If the site or lot is not part of the common plan of development or the builder of the lot is not the holder of the UPDES/NOI that is in place for the development then an SWPPP shall be prepared in accordance with the requirements and standards for such plans as set forth in the LDDCS and most current UPDES stormwater general permit.

E. Erosion And Sediment Control Plan: Each application for a land disturbance permit shall include an erosion and sediment control plan for the proposed land disturbance activity and site. The erosion and sediment control plan shall be prepared by a civil engineer and shall be prepared in accordance with the requirements and standards for such plans as set forth in the LDDCS.

F. Revegetation Plan: Each application for a land disturbance permit shall include a revegetation plan for the proposed land disturbance activity and site. The revegetation plan shall be prepared by an erosion control specialist or professional of comparable expertise and shall be prepared in accordance with the requirements and standards for such plans as set forth in the LDDCS, section 4.

G. Soils Report: Each application for a land disturbance permit shall include a soils report for the site. The soils report shall be prepared and signed by a soils engineer and shall be prepared in accordance with the requirements and standards for geological reports as set forth in the LDDCS, section 2.

H. Geological Report: When deemed necessary by the city engineer due to the circumstances and conditions of the site, an application for a land disturbance permit shall include a geological report for the site. The geological report, when required, shall be prepared and signed by an engineering geologist and shall be prepared in accordance with the requirements and standards for geological reports as set forth in the LDDCS, section 2.

I. Exploratory Work: Surface and subsurface exploratory work and reports may be required when deemed necessary by the city engineer due to site conditions and/or hazards on the site. When required, such exploratory work and reports shall be performed and prepared by a soils engineer and/or engineering geologist. (Ord. 2012-18, 12-4-2012)

16.44.115: STORMWATER POLLUTION PREVENTION PLAN REQUIREMENTS:

Property owners are responsible to manage stormwater runoff and sediment whether in conduit systems or on the surface that traverse or originate on their property, unless this responsibility is relinquished through the terms and conditions of an easement. In order to manage stormwater, the property owner must develop a stormwater pollution prevention plan and implement the plan. The stormwater pollution prevention plan shall include sufficient information to allow the city engineer to evaluate the environmental and historical characteristics of the project site, the potential impacts of all proposed development of the site, both present and future, on the water resources, and the effectiveness and acceptability of the measures proposed for managing stormwater generated at the project site. To accomplish this goal the stormwater pollution prevention plan shall include the following:

A. Project Description: Briefly describe the intended project and proposed land disturbing activity including number of units and structures to be constructed and infrastructure required.

B. Topographic Base Map: A one inch equals five hundred inches (1" = 500") topographic base map of the site which extends a minimum of one thousand feet (1,000') beyond the limits of the proposed development and indicates:

1. Existing surface water drainage including streams, ponds, culverts, ditches, sinkholes, wetlands; and the type, size, elevation, etc., of nearest upstream and downstream drainage structures;

2. Current land use including all existing structures, locations of utilities, roads, and easements;

3. All other existing significant natural and artificial features including a general description of existing land cover. Individual trees and shrubs do not need to be identified.

C. Proposed Land Use: Proposed land use with tabulation of the percentage of surface area to be adapted to various uses; drainage patterns; locations of utilities, roads and easements; the limits of clearing and grading.

D. BMPs: Proposed structural BMPs.

E. Written Description: A written description of the site plan and justification of proposed changes in natural conditions may also be required.

F. Calculations: Hydrologic and hydraulic design calculations for the predevelopment and postdevelopment conditions for the design storms specified in the BMP manual. These calculations must show that the proposed stormwater management measures are capable of controlling runoff from the site in compliance with this chapter and the guidelines of the BMP manual. Such calculations shall include:

1. A description of the design storm frequency, duration, and intensity where applicable;

2. Time of concentration;

3. Soil curve numbers or runoff coefficients including assumed soil moisture conditions;

4. Peak runoff rates and total runoff volumes for each watershed area;

5. Infiltration rates, where applicable;

6. Culvert, stormwater sewer, ditch and/or other stormwater conveyance capacities;

7. Flow velocities;

8. Data on the increase in rate and volume of runoff for the design storms referenced in the BMP manual; and

9. Documentation of sources for all computation methods and field test results.

G. Soils Information: If a stormwater management control measure depends on the hydrologic properties of soils (e.g., infiltration basins), then a soils report shall be submitted. The soils report shall be based on on site boring logs or soil pit profiles and soil survey reports. The number and location of required soil borings or soil pits shall be determined based on what is needed to determine the suitability and distribution of soil types present at the location of the control measure.

H. Work Sequence: The projected sequence of work represented by the grading, drainage and sedimentation and erosion control plans as related to other major items of construction, beginning with the initiation of excavation and including the construction of any sediment basins or retention facilities or any other structural BMPs.

I. Installation, Maintenance And Repair Plan: The design and planning of all stormwater management facilities shall include detailed installation, maintenance and repair procedures to ensure their continued performance. These plans will identify the parts or components of a stormwater management facility that need to be maintained and the equipment and skills or training necessary. Provisions for the periodic review and evaluation of the effectiveness of the maintenance program and the need for revisions or additional maintenance procedures shall be included in the plan. A permanent elevation benchmark shall be identified in the plans to assist in the periodic inspection of the facility.

J. Landscaping Plan: The applicant must present a detailed plan for management of vegetation at the site after construction is finished, including who will be responsible for the maintenance of vegetation at the site and what practices will be employed to ensure that adequate vegetative cover is preserved where it is required by the BMP.

K. On Site Measures: A description of on site measures to be taken to recharge surface water into the groundwater system through infiltration.

L. Other SWPPP Requirements: Other SWPPP requirements as outlined in the most current stormwater general permit. (Ord. 2012-18, 12-4-2012)

16.44.116: EROSION AND SEDIMENT CONTROL PLANS:

The applicant must prepare a sediment and erosion control plan for all construction activities that complies with the following:

A. The sediment and erosion control plan shall accurately illustrate the measures that are to be taken to control stormwater pollution problems. The length and complexity of the plan is to be commensurate with the size of the project, severity of the site condition, and potential for off site damage. It is recommended the plan shall be sealed by a registered professional engineer licensed in the state of Utah. The plan shall also conform to the requirements found in the BMP manual, and shall include at least the following:

1. A topographic map with contour intervals of five feet (5') or less showing present conditions and proposed contours resulting from land disturbing activity.

2. All existing drainageways, including intermittent and wet weather. Include any designated floodways or floodplains.

3. Stands of existing trees as they are to be preserved upon project completion, specifying their general location on the property. Differentiation shall be made between existing trees to be preserved, trees to be removed and proposed planted trees. Tree protection measures must be identified, and the diameter of the area involved must also be identified on the plan and shown to scale. Information shall be supplied concerning the proposed destruction of exceptional and historic trees in setbacks and buffer strips, where they exist. Complete landscape plans may be submitted separately. The plan must include the sequence of implementation for tree protection measures.

4. Approximate limits of proposed clearing, grading and filling.

5. Location, size and layout of proposed stormwater and sedimentation control improvements.

6. Proposed drainage network.

7. Proposed drain tile or waterway sizes.

8. Specific remediation measures to prevent erosion and sedimentation runoff. Plans shall include detailed drawings of all control measures used; stabilization measures including vegetation and nonvegetation measures, both temporary and permanent, will be detailed. Detailed construction notes for all control measures in the plan.

9. Specific details for: the construction of rock pads, wash down pads, and settling basins for controlling erosion; road access points; eliminating or keeping soil, sediment, and debris on streets and public ways at a level acceptable to the city engineer.

10. Proposed structures; location (to the extent possible) and identification of any proposed additional buildings, structures or development on the site. (Ord. 2012-18, 12-4-2012)

16.44.430: LOTS GRADED TOWARD STREET FOR DRAINAGE:

Except as otherwise provided herein, stormwater runoff from individual lots shall be directed toward the streets. Exceptions may be granted by the city engineer, when deemed appropriate and necessary, in accordance with the provisions of this section. Aesthetic reasons such as the creation of view lots shall not constitute sufficient reason for granting an exception. If the permit holder finds that draining stormwater toward the street is unobtainable, for a portion or all of the lot, the permit holder shall demonstrate to the city engineer that there are no other avenues for drainage of the stormwater. In such cases, the permit holder shall prepare a drainage plan which indicates how the stormwater will be disposed of from the lot, to either a city owned storm drain, a natural stream or channel, a manmade channel, other city approved facility or retained on site. The permit holder is responsible for obtaining the necessary approvals and permits for the discharge or retention of stormwater flows. The city engineer will determine if such alternate drainage is both necessary and appropriate. (Ord. 2012-18, 12-4-2012)

16.44.440: LOTS WHICH CANNOT BE GRADED TOWARD THE STREET:

A. Approval Required: Lots that cannot be drained toward the street may be allowed to drain a portion of their stormwater runoff toward the rear of the yard, after review and approval by the city engineer. Prior to obtaining this approval, the permit holder shall prepare a drainage plan, which indicates how the stormwater will be disposed of from the lot, to either a city owned storm drain, a natural stream or channel, or manmade channel, or other city approved facility or retained on site. Such disposal is to be protected by a drainage easement dedicated for this purpose, and the facilities shall be subject to the bonding provisions set forth in subsection D of this section.

B. Swales: Swales located in rear and side yards shall be of materials as approved by the city that will prevent erosion, and shall be a permanent feature of the lot and shall be shown in a drainage easement on the site plan or final plat for the project. An actual design drawing of the swale system shall be prepared and be included as part of the grading and drainage plan for the project. If slopes exist between lots sufficient space shall be allowed to include a swale at the top of the slope and one at the bottom, all within dedicated storm drainage easements. Where stormwater is transferred from a lot of higher elevation, to a lower lot in elevation, sufficient energy dissipation shall be constructed to reduce the water velocity to an acceptable level. Engineering calculations are to be submitted to the engineering division certifying the proposed design of the energy dissipation facilities as set forth in the LDDCS.

C. Notice: Swales shall be constructed and in place before building permits are issued on subdivision lots. The developer shall notify the homebuilders and homeowners shall be notified of these drainage swale easements and the need to maintain them both during and after construction. Homeowners are to be notified by the developer of the installation of these side and rear yard swales through an acceptable instrument to the city. A notice of these drainage swale easements shall also be recorded on the subdivision plat for the project. After completion of the swales, the homeowners shall be responsible for maintenance of swales.

D. Bonding: In the event these types of swales are used for the project, the developer shall provide sufficient bonding of these swales as part of the city's regular public improvement bonding, to ensure these facilities will be constructed.

E. Underground Facilities: The developer may select the option of designing and constructing underground drainage facilities to replace aboveground drainage swales if these facilities meet certain city requirements. These requirements include the design being approved by the engineering division, inclusion of these facilities within city approved drainage easements, maintenance of the system by a homeowners' association, and other requirements as may be deemed necessary by the city. (Ord. 2012-18, 12-4-2012)

16.44.450: MATERIALS FOR SIDE AND REAR YARD DRAINAGE:

Side and rear yard swales and drainage facilities shall be designed into projects as an integral component of the stormwater system of the project which needs to transfer stormwater runoff from the rear and side yards to the street, or to other rear yard stormwater facilities. These swales or drain facilities shall be designed and constructed in such a way that they become a permanent feature of the side and/or rear yard and shall be constructed of a material as approved by the city which prevents erosion. Inspections of these swales or drain facilities shall be conducted during the subdivision construction phase of the project and during lot level development. Developers are to provide recorded drainage easements wide enough to provide for the possible slight field relocation of rear and side yard drainage swales, or other drainage facilities. At a minimum, the drainage easement shall be for the width of the swale plus two feet (2'). (Ord. 2012-18, 12-4-2012)

16.44.460: FLOW OF WATER FROM ONE LOT TO ANOTHER LIMITED USE:

In the case where stormwater flow is allowed to flow from a higher lot to a lower lot, in elevation, sufficient energy dissipation shall be designed and constructed to reduce the water velocity to an acceptable level to prevent erosion. The design and construction of these energy dissipation structures shall be approved by the engineering division in conjunction with the review and approval of the drainage plan for the project. (Ord. 2012-18, 12-4-2012)

16.44.765: EXISTING LOCATIONS AND DEVELOPMENTS:

A. Requirements For All Existing Locations And Developments: The following requirements shall apply to all locations and developments at which land disturbing activities have occurred previous to the enactment of this chapter:

1. Denuded areas must be vegetated or covered under the standards and guidelines specified in the BMP manual and on a schedule acceptable to the city engineer.

2. Cuts and slopes must be properly covered with appropriate vegetation and/or retaining walls constructed.

3. Drainageways shall be properly covered in vegetation or secured with riprap, channel lining, etc., to prevent erosion.

4. Trash, junk, rubbish, etc., shall be cleared from drainageways.

5. Stormwater runoff shall be controlled to the extent reasonable to prevent pollution of local waters. Such control measures may include, but are not limited to, the following:

a. Ponds:

(1) Detention pond.

(2) Extended detention pond.

(3) Wet pond.

(4) Alternative storage measures.

b. Constructed Wetlands:

(1) Infiltration systems.

(2) Infiltration/percolation trench.

(3) Infiltration basin.

(4) Drainage (recharge) well.

(5) Porous pavement.

c. Filtering Systems:

(1) Catch basin inserts/media filter.

(2) Sand filter.

(3) Filter/absorption bed.

(4) Filter and buffer strips.

d. Open Channel:

(1) Swale.

B. Requirements For Existing Problem Locations: The city engineer shall, in writing, notify the owners of existing locations and developments of specific drainage, erosion or sediment problem affecting such locations and developments, and the specific actions required to correct those problems. The notice shall also specify a reasonable time for compliance. (Ord. 2012-18, 12-4-2012)

16.50.100: ALLOWED, RESTRICTED AND PROHIBITED USES:

A. Allowed Uses: "Allowed uses" are the same as those established before the effective date hereof provided that such use is not in violation of any other ordinance, health regulation nor determined by a court of competent jurisdiction to be a nuisance under the provisions of federal, state and local laws or health regulations. All new land uses, change of uses, or expansion of uses shall comply with this chapter.

B. Restricted Uses: "Restricted uses" (R) are uses associated with a "potential contamination source". A restricted use may be permitted only after review and recommendations are received from the affected public water system and the Salt Lake Valley health department.

C. Prohibited Uses: "Prohibited uses" (X) are identified as neither "permitted" nor "conditional" and shall not be allowed in the zone. Notwithstanding the provisions of this chapter, the use and storage of regulated substances in amounts meeting or exceeding the "reportable quantity" shall be prohibited unless an exemption is granted as set forth herein.

D. Restricted And Prohibited Uses In Water Source Protection Zones:

Legend:		
R	=	Restricted use
X	=	Prohibited use

Use	Zone 1	Zone 2	Zones 3 And 4
Agricultural pesticide, herbicide and fertilizer storage, use, filling and mixing areas	X	R	R
Agriculture experimental station	X	R	R
Airport maintenance and fueling sites	X	R	R
Animal breeding, adoption, or training establishment i.e., dog kennel, pound, or school, etc.	X	R	R
Animal byproduct; offal or dead animal reduction or dumping	X	X	R
Apiary (bee yard)	X	R	R

Appliance repair		X	R	R
Auto operations and fleet vehicle maintenance facilities (commercial):				
	Auto body	X	R	R
	Dealership maintenance departments	X	R	R
	Engine repair	X	R	R
	Oil and lube shops	X	R	R
	Rustproofing	X	R	R
	Tire	X	R	R
	Vehicle rental with maintenance	R	R	R
Aviary		X	R	R
Baby diaper service		X	R	R
Beauty salons and barbershops		X	R	R
Boat building and refinishing		X	R	R
Breweries		X	R	R
Car washes		X	R	R
Carpet, rug, and upholstery cleaning or dyeing		X	X	R
Cemeteries, golf courses, parks and plant nurseries		X	R	R
Chemical reclamation facilities		X	X	R
Chemigation wells		X	X	R
Commercial and private recreation		X	R	R
Concrete, asphalt and tar use, storage, or processing companies		X	R	R
Dairy farms and animal feed lots (more than 10 animal units)		X	X	R
Dry cleaners (with on site chemicals)		X	X	R
Dry cleaners (without on site chemicals)		X	R	R
Embalming services		X	R	R

Equipment storage or rental yards	X	R	R
Farm operations:			
Dump sites	X	R	R
Maintenance garages	X	R	R
Manure piles (less than 500 cubic feet)	R	R	R
Fat rendering processes	X	X	R
Feed, cereal or flour mill	X	R	R
Fertilizer and soil conditioner manufacture, processing and/or sales	X	X	R
Firearms and/or archery range; gun club	X	R	R
Food processing, meatpacking and slaughterhouses	X	X	R
Fuel, oil and heating oil distribution and storage facilities	X	R	R
Fur farm	X	R	R
Furniture stripping, painting and finishing business	X	R	R
Gasoline service stations (including underground storage tanks)	X	R	R
Golf courses	X	X	R
Greenhouse or nursery	X	R	R
Hospitals and medical, dental and veterinary offices	X	R	R
Improperly abandoned wells	X	X	X
Incinerator	X	X	R
Industrial manufacturers of: chemicals, pesticides, herbicides, paper products, leather products, textiles, rubber, plastic, fiberglass, silicone, glass, pharmaceuticals and electrical equipment, etc.	X	R	R
Industrial waste disposal/impoundment areas	X	X	R
Junk and salvage yards	X	R	R
Laboratories which may include scientific research, investigation, testing or experimentation including prototype product development or incidental pilot plants	X	R	R
Landfills and transfer stations	X	R	R

Laundromats		X	R	R
Machine shops, metal plating, heat treating, smelting, annealing and descaling facilities		X	R	R
Mining operations:				
	Radiological	X	R	R
	Sand and gravel excavation and processing	R	R	R
Municipal wastewater treatment plants		X	X	R
Photo processing and print shops		X	R	R
RV waste disposal stations		X	R	R
Railroad yards		X	R	R
Residential pesticide, herbicide and fertilizer storage, use, filling and mixing areas		X	R	R
Residential underground storage tanks		X	R	R
Salt and salt-sand piles		X	R	R
Septic tank drainfield systems		X	R	R
Stormwater detention basin and snow storage sites		X	R	R
Toxic chemical storage and oil pipelines		X	X	X
Wood preservative treatment facilities		X	R	R

(Ord. 2010-15, 7-20-2010)

CITY OF SOUTH JORDAN

Land Disturbance Design & Construction Standards

February 2008

City of South Jordan
1600 West Towne Center Drive
South Jordan, UT 84095

SOUTH JORDAN
UTAH

LAND DISTURBANCE
DESIGN AND CONSTRUCTION STANDARDS

ABBREVIATED
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SECTION 1.0

INTRODUCTION AND GENERAL POLICIES

1.1 SCOPE

The City of South Jordan, Land Disturbance Design and Construction Standards, establishes uniform policies and procedures for the design and construction of City land disturbance, grading, erosion control, re-vegetation of disturbed areas and control of sediments resulting from construction of private development and City projects. It is not the intent of this standard that any standard of conduct or duty toward the public shall be created or imposed by publication of this standard. This standard is not a substitute for engineering knowledge, experience or judgment of professionals in their area of expertise in the agronomy, re-vegetation, conservation, and engineering discipline. This standard is neither designed as, nor does it establish, a legal standard for these functions. The methods and procedures contained herein are to be reviewed by the developer's engineer or designer using them as applicable to site-specific conditions of the project they are working on. Where actual site conditions deem these standards and procedures not applicable, the engineer or designer shall request a variance from these standards or procedures as provided herein.

The design and construction of grading, erosion control, re-vegetation and sedimentation facilities and other appurtenances in City of South Jordan are to comply with these standards herein called "Land Disturbance Design and Construction Standards (LDDCS)", or the permit requirements of various governing bodies, except where specific modifications have been approved, in writing, by the City Engineer. All submitted plans containing engineering principals shall be signed and stamped by a Civil Engineer and other appropriate professionals. Erosion control plans, re-vegetation plans and/or dust control plans are to be signed and stamped by a qualified Civil Engineer or other appropriate professional. All work is to be in accordance with good agronomy, conservation, and engineering practices.

This document sets forth the procedure for designing and preparing plans and specifications and specifications for area of land disturbances throughout the City. Wherever there are differences between these standards and other county, state or federal regulations, the most stringent or highest requirement shall govern. The specifications and standard drawings contained in this document are for all land disturbances throughout the City. The City has also prepared culinary water, road, and storm drain/flood control design and construction standards for those specific areas. The developer/developer's engineer is to obtain the other design and construction standards to determine how to design these other facilities.

1.2 AUTHORITY

Title 16 Chapter 44 of the City of South Jordan Municipal Code, establishes the legal authority for the erosion, sediment control and re-vegetation requirements set forth in this document. Title 16 Chapter 44, Land Disturbance was established partly as a requirement of the State of Utah's Utah Pollution Discharge Elimination System permit (UPDES) which is a federally mandated requirement of the State.

Since the passage of the Clean Water Act (CWA), the quality of our Nation's waters has improved dramatically. Despite the progress, however, degraded water bodies still existed and the federal government moved to improve the water quality in these water bodies. According to the

1996 Nation Water Quality Inventory, a biennial summary of State surveys of water quality, approximately 40- percent of surveyed U.S. water bodies are still impaired by pollution and did not meet water quality standards. A leading source of this impairment was indicated to be polluted runoff. According to the Inventory, 13-percent of impaired rivers, 21-percent of impaired lake acres and 45-percent of impaired estuaries are affected by urban/suburban storm water runoff and 6-percent of impaired rivers, 11- percent of impaired lake acres and 11-percent of impaired estuaries are affected by construction site discharges.

Phase I of the EPA's storm water program was promulgated in 1990 under the CWA. Phase I relies on National Discharge Elimination System (NPDES) permit coverage to address storm water runoff from: (1) "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater, (2) construction activity disturbing 5 acres of land or greater, and (3) ten categories of industrial activity.

The Storm Water Phase II Final Rule is the next step in EPA's effort to preserve, protect, and improve the Nation's water resources from polluted storm water runoff. The Phase II program expands the Phase I program by requiring additional operators of MS4s in urbanized areas and operators of small construction sites, through the use of NPDES permits, to implement programs and practices to control polluted storm water runoff.

Phase II is intended to further reduce adverse impacts to water quality and aquatic habitat by instituting the use of controls on the unregulated sources of storm water discharges that have the greatest likelihood of causing continued environmental degradation. Although the NPDES permit program is a national program, its implementation and permitting is delegated to the states. In the case of Utah, the program then becomes known as the Utah Pollution Discharge Elimination System (UPDES) program. Cities and other governmental entities are then required to receive a permit through the State of Utah under the UPDES permit program.

On March 10, 2003 Phase II of the NPDES became active and all cities smaller than 100,000 are required to submit a NPDES permit and application. In the case of cities in Utah, this became a UPDES permit application that is submitted to the State of Utah, Department of Environmental Quality (DEQ).

The City of South Jordan (City) is subject to Phase II regulations. The City's UPDES permit requires, at a minimum, that the City develop, implement, and enforce a storm water management program designed to reduce to the "maximum extent practicable" the discharge of pollutants from the storm drain system to protect water quality, and to satisfy the requirements of the CWA.

The City's storm water management program must include the minimum control measures included in the General Permit. Implementation of BMP's that comply with permit requirements constitutes compliance with the standard of reducing pollutants to the maximum extent practicable.

In the City's permit application, the City identified and submitted the following information to the State DEQ:

1. The City will implement BMP's for each of the following six minimum control measures:

    a. Public Education and Outreach
    b. Public Involvement/Participation
    c. Illicit Discharges and Improper Disposal

d. Construction Site Storm Water Runoff Control
e. Post-Construction Storm Water Management in New Development and Redevelopment
f. Pollution Prevention/Good Housekeeping for Municipal Operations

2. The measurable goals for each of the BMPs including, as appropriate, the months and years in which the City was to undertake required actions, including interim milestones and the frequency of the action; and

3. The person(s) responsible for implementing or coordinating the City's storm water management program.

1.3 INTERPRETATION

The City Engineer will decide all questions of interpretation of "Best Management Practices" as it applies to good agronomy, re-vegetation, conservation, and engineering practices. The City Engineer may use the future ASTM standards and various standards obtained in published engineering studies and industry publications to guide him or her.

1.4 DEFINITIONS AND TERMS

Whenever in these specifications or in any document or instruments where these specifications govern, the following terms, abbreviations or definitions are used, the intent and meaning shall be interpreted as follows:

ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
A.B.	Aggregate Base
A.S.B.	Aggregate Subbase
A.C.	Asphaltic Concrete Type A
ACI	American Concrete Institute
ADT	Average Daily Traffic in vehicles per 24 hours
ANSI	American National Standards Institute
APWA	American Public Works Association
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
BMP	Best Management Practice
cfs	Cubic feet per second
EP	Edge of pavement
ES	Edge of shoulder
F	Degrees, Fahrenheit
ft.	Foot
gpm	Gallons per minute
L.O.D.	Limits of Disturbance
Max.	Maximum
Min.	Minimum
O&M	Operations and Maintenance

P.C.C.	Portland Cement Concrete Structures Class A (6 sack) Pavement Minimum Class B (5 sack) Curb, gutters, driveways and walks Class B (5 sack) Higher classes shown on plans will govern
PLS	Pure live seed
psi	Pounds per square inch
PUE	Public Utility Easement
TYP	Typical
UBC	Uniform Building Code
UOSHA	Utah Occupational Safety and Health Administration
UPC	Uniform Plumbing Code

Symbols

C	Centerline
ROW	Right of way line
FL	Flow line
PL	Property line
"R"	Value
≥	Equal to or greater than
≤	Equal to or less than

DEFINITIONS

"Actual Restoration and Re-vegetation Costs"	Costs set by City resolution or ordinance. In the absence of City resolution and/or ordinance or the actual restoration and re-vegetation costs will be determined by three competitive re-vegetation bids conforming to this chapter and 10 percent of the excavation portion of the original bid. In the event the actual re-vegetation costs are challenged by the applicant the cost will be determined as stated herein.
"Agricultural activity"	Plowing, disking, and harrowing the ground surface for the purpose of planting and cultivating crops on parcels historically used for this purpose.
"Anchored Mulch"	Mulch which employs netting, staple, or fastener to anchor material to the soil and/or a mulch material that is crimped or tacked to the soil surface by mechanical means.
"Applicant"	Means any person who submits an application for a permit pursuant to Title 16 Chapter 44, "Land Disturbance".
"Approved" by the City Engineer.	Unless specifically otherwise indicated, this shall mean approval
"Bale Dike"	A bale dike is a temporary barrier consisting of bales installed across a slope, at the toe of a slope, and/or around the perimeter of the construction site.

"Bale Sediment Barrier"	A semi-pervious sediment barrier is a temporary barrier consisting of bales and a rock spillway placed across small drainages or gently sloping swales.
"Best Management Practices"	Practices, procedures or designs used as a standard for a given industry. In this specific case, these 'practices' are for the erosion control industry. Best Management Practices (BMP's) for controlling non-point sources of pollution are the methods, measures, practices, or a combination of practices determined to be the most effective and practicable means (including technological, economic, and institutional considerations) to control non-point pollutants at levels compatible with environmental quality goals. As used in this document, BMP's are synonymous with erosion and sediment control measures.
"Biochemical Oxygen Demand (BOD)"	Consumed during a biochemical oxidation of matter over a specified period of time.
"Bioengineering"	Bioengineering is a method of construction using living plants, or plants in combination with non-living or structural materials. The practice brings together biological, ecological, and engineering concepts to produce living, functioning systems to prevent erosion, to stabilize slopes and to enhance wild life habitat. The application of vegetative practices combined with structural practices to provide a system of practices that create a stable site condition.
"Brush-layering"	Cuttings or branches of easily rooted woody species are layered between successive lifts of soil fill to construct a reinforced slope or embankment. Live branch cuttings laid in crisscross fashion on terraces between successive lifts of soil.
"Buffer Setback"	A strip of land that separates land uses for aesthetic reasons or separate incompatible uses, i.e. residential from Industrial.
"Buffer Strip"	An undisturbed strip of land containing grasses, shrubs and trees adjacent to water bodies engineered for the treatment of storm water.
"Buttress Fill"	A buttress fill is a designed compacted earth fill used for providing lateral support to an un-stabilized earth or rock mass.
"Cellular Confinement System"	A three-dimensional, honeycomb earth-retaining structure used to mechanically stabilize the surface of earth and fill slopes.

"Check Dam"	A check dam is a small temporary dam constructed across a swale, gully, or drainage way to collect sediment and slow water velocities.
"City"	City of South Jordan, Utah
"City Engineer"	City Engineer shall mean the City Engineer of City of South Jordan, or the person(s) engaged by the City and authorized to perform the duties assigned to the City Engineer, and shall include any deputies and representatives.
"Civil Engineer"	A professional engineer in the branch of civil engineering holding a valid certificate of registration issued by the State of Utah.
"Class IV Landfill"	A landfill that is to receive only construction/demolition waste, yard waste, inert waste, dead animals, or upon meeting the requirements of Section 26-32a103.5 and section R315-320-3, waste tires and materials derived from waste tires.
"Clearing & Grubbing"	Moving, removing, displacing, and/or stockpiling, by manual or mechanical means, trees, and other vegetation and/or the top organic layer as described in the geotechnical report. In the absence of a geotechnical report the organic layer will not be greater than eight (8") inches.
"Coir Rolls and Coir Mats"	Coir rolls and coir mats are manufactured from coconut fibers and are frequently used as the structural and rooting medium for bioengineering systems.
"Community Development Director"	That person charged with the responsibility of directing all phases of the Community Development Department and the enforcement of all State statutes and City laws pertaining to his/her office, or his/her duly authorized representative.
"Compaction"	The act of compacting or consolidating soil and rock material to a specified density, and the resulting compacted state of the material.
"Construction site"	Any land area on which the activity of clearing and grubbing, grading, excavating, or filling is occurring.
"Continuous Berm"	A continuous berm is a temporary diversion dike or sediment barrier constructed with infill material, either soil, sand or aggregate, encased within geosynthetic fabric.
"Contract Documents"	The documents used in the construction of a given project including: written and drawings. Written documents may include, but not limited to, the 'Bidding and Agreement Forms and Bonds", "Conditions of the Contract" and "Technical

	Specifications". The drawings for the project are also legally considered part of the Contract Documents and are referenced as such in the written portion of the Contract Documents.
"County"	Salt Lake County, Utah
"Crib Structure"	A hollow structure constructed of mutually perpendicular, interlocking beams or logs.
"Curb Inlet Sediment Barrier"	Curb inlet sediment barriers are temporary barriers constructed from concrete block and gravel or gravel filled sandbags.
"Cutting"	A branch or stem pruned from a living plant.
"Day"	Shall be interpreted as a calendar day, unless otherwise specified.
"Dentrification"	A biological process in which nitrate (NO3), a compound of nitrogen often found in sewage or water, is turned into nitrogen gas, which can dissipate into the atmosphere.
"Detention"	The holding back or delaying of the flow of water, through manmade or natural means.
"Detritus"	A loose mass of decaying material
"Developer"	An individual or organized group; partnership, corporation, etc.; proposing to subdivide or improve land which will require culinary water from the City's system.
"Developer's Engineer"	The engineer licensed by the State of Utah as a civil engineer, employed by the developer, under whose direction construction plans, profiles and details of the work are prepared and submitted to the City for review and approval.
"Dredging"	The practice of deepening a waterway by mechanical means by the removal of sediments.
"Drop Inlet Sediment Barrier"	A drop inlet sediment barrier is a temporary barrier placed around a drop inlet. The sediment barrier may be constructed of bales, wattles, and gravel, gravel and stone, block and gravel, or silt fence material.
"Dry Ravel"	Pertains to slopes whose soil materials are of such a consistency that they separate without the action of water, causing rills, gullies and other types of erosion. This would occur in soil materials where there is very little binder material such as clays and finer silts.

"Earthen Berm"	An earth mound used to direct flow of runoff around or through an area.
"Easement"	A recorded document in which the landowner gives the City permanent rights to construct and maintain City facilities across private or other property.
"Emergent Plants"	Aquatic plants that are rooted in the soil but whose leaves are at or above the water surface.
"Energy Dissipator"	An energy dissipator is a structure designed to slow water velocity and control erosion and encourage sediment entrapment at the outlet of a channel or conduit.
"Enforcement Authority"	The City Engineer, the Engineering Inspector and other designated representatives of the City Engineer, or any duly appointed Code Enforcement Officer or police official charged with the responsibility for enforcement of the provisions of the laws and ordinances of the City of South Jordan.
"Engineer"	A professional engineer or firm of professional civil engineers appointed by and acting for the Engineering Department in the case of a City sponsored capital project. In the case of a developer-sponsored project, the term refers to the engineer hired by the developer and may also be referred to as "developer's engineer".
"Engineering Department"	The City department responsible for planning, designing and construction of the City's roadways and bridges, culinary water, sewer, secondary water and storm drainage systems.
"Engineering Geologist"	An engineering geologist registered by the State and capable of applying the geological sciences to engineering practices for the purpose of assuring that the geological features affecting the location, design, construction, operation, and maintenance of engineering works are recognized and adequately provided for.
"Engineering geology"	The application of geologic knowledge and principles in the investigation and evaluation of naturally occurring rock and soil for use in the design of civil works.
"Erosion"	The process of detachment of soil particles or other surface material by the action of wind, water, snow or ice.
"Erosion Control"	Erosion control is any practice that protects the soil surfaces and prevents the soil particles from being detached by rainfall or wind. Erosion control, therefore, is a source control that treats the soil as a resource that has value and should be kept in place.

"Erosion Control Blankets and Mats"	The installation of protective mulch blankets or soil stabilization mats (turf reinforcement mats) to the prepared soil surface of a steep slope, channel or shoreline.
"Erosion Control Hazard"	An area or areas located within the boundaries of the City, which has been identified by the City Engineer and/or the Erosion Control Specialist as an erosion control hazard area due to the existence of steep slope terrain and/or erosive soils.
"Erosion Control Measures"	The structural and nonstructural Best Management Practices (B.M.P) that prevents displacement of soil particles by wind or water. This includes seeding, mulching, vegetative buffer strips, sod, plastic coverings, riprap, gabions, channel armoring methods, and other measures that prevents the displacement of soil particles.
"Erosion Control Plan Preparer"	A person having the qualifications list herein for Erosion Control Specialist.
"Erosion Control Specialist"	A person having at least ten years of professional level experience in the erosion and sediment control field or a civil engineer having at least six years of professional level experience in the erosion and sediment control field or a Soil Scientist having certified by the American Registry of Certified Professionals in Agronomy and having two years of professional level experience.
"Established Vegetation"	Vegetation that has been planted, germinated, and has growth to accomplish the following: (a) provide a ground cover equivalent to an adjacent undisturbed site. (b) a growth of a native community that is representative of an adjacent undisturbed site. (c) the lack of rill and gully erosion
"Expansive Soil"	Soil with an expansion of four-percent or more with a sixty pound per square foot load applied under standard test methods as set forth by the City Engineer.
"Face Planting"	Planting live cuttings and other vegetation in the frontal openings of retaining structures.
"Field Acceptance"	Field acceptance is when the Engineering Department inspector approves the physical installation of the water system, roads, storm water, sewer, etc.
"Fill"	Deposits of soil, rock, or other materials placed by man.
"Filter Fabric"	A geotextile of relatively small mesh or pore size that is used to (a) allow water to pass through while preventing sediment from passing through, (b) preventing the mixing of soils into a B.M.P

"Filter Strips"	Vegetated strips of land designated to filter storm water and encourage the settlings of pollutants. The vegetation is usually comprised of grasses, not trees or shrubs. Filter strips may be considered as a particular kind of buffer, one specifically engineered to reduce pollutant loads.
"Final Acceptance"	The City Engineer acceptance or final acceptance follows field acceptance and is when the City Engineer approves both physical improvements as well as the administrative items associated with development, and the Infrastructure Maintenance and Operations Department accepts ownership and operations and maintenance responsibilities.
"Finished Grade"	The final grade or elevation of the building site, slope or terrace (0.1 plus or minus feet). "Gabion" Rectangular wire baskets filled with stones used as pervious, semi-flexible building blocks. Live rooting branches may be placed between the rock-filled baskets.
"Geotechnical Engineer"	A civil engineer as described herein with experience of at least ten years as a geotechnical engineer.
"Grade"	The elevation of the ground surface as measured from a known vertical control. Existing Grade means grade currently on the site. Natural grade means the grade unaltered evidenced by the presence of indigenous plants and grasses.
"Grade Stabilization"	The maintenance of a gentle, non-eroding gradient on a watercourse of land surface.
"Grading"	Includes the act or result of digging, excavating, transporting, spreading, depositing, filling, compacting, settling, or shaping of land surfaces and slopes, and other operations performed by or controlled by human activity involving the physical movement of rock or soil.
"Grading and Erosion Control Design and Construction Standards"	The City of South Jordan Land Disturbance Design and Construction Standards.
"Gravity Retaining Walls"	Retaining structures that resist lateral earth forces and overturning primarily by their weight.
"Gulley"	A narrow, rocky valley or channel with steep sides, made by a fast flowing stream
"Headcut Structure"	Where a gully grows and lengthens at its upstream end is called the head-cut or 'nick point'. Head-cut structures consist of rocks, sandbags or other erosion resistant materials placed at the gully

	head-cut to prevent erosion. These components may be used with live willow stakes to promote vegetative growth.
"Hydraulic Planting"	Hydraulic planting is a method of applying erosion control materials (mulch) to bare soil and establishing erosion-resistant vegetation on disturbed areas and critical slopes.
"IBC"	International Building Code
"Induced Wetlands"	Those areas that are inundated by seasonal irrigation Page 11 of 22water which is intended for agricultural purpose.
"Public Works Department"	The City department responsible for operations and maintenance of the City's roadway, culinary water, secondary water, sanitary sewer, and storm drainage system.
"Inspector"	An employee or agent of the City engaged to observe and record field compliance with design criteria, plans and construction standards.
"Land Disturbance"	Any disturbance of native soils, plants, or environment, which causes degradation of the environment and makes it more subject to erosion. Such activities include clearing and grubbing, grading excavation, filling, dredging, construction of earth-filled dams and any other types of earthwork.
"Land Disturbance Design and Construction Standards"	The City of South Jordan Land Disturbance Design and Construction Standards which have been prepared by City staff and reviewed, approved by the City Engineer.
"Land Disturbance Permit"	The land disturbance permit required by the City in order to initiate any type of land disturbance including pioneering roads, deposition of fill material, excavation of soil material, general grading, or other activity conducted by man which will disturb natural vegetation or soil.
"Landfill"	A disposal facility where solid waste is placed in or on the land and which is not a land treatment facility or a surface impoundment. The definition of a landfill is as found in the state codes R315-301-2- 37.
"Land Grading for Minimizing Erosion"	Land grading for minimizing erosion is grading that is intended to minimize the impacts of surface erosion and runoff.
"Landscape Architect"	A landscape architect licensed as such under the laws of the State.
"Land-treatment Land-farming"	Land-treatment, land-farming, or landscaping facility, means a facility or a part of a facility where solid waste is applied onto or

	incorporated into the soil surface for the purpose of biodegradation," The definition of a land-treatment facility is found in the state codes R315-301-2- 38
"Lateral Earth Pressure"	The horizontal pressure exerted by soil against a retaining structure.
"Limits of Disturbance (L.O.D.)"	Means the area of total land disturbance including area to be graded, soil stockpile areas, staging areas and additional area required to accomplish the required grading.
"Lined Channels"	Vegetation lining a natural or constructed waterway, swale or dike to protect it from erosion.
"Live Branch Cuttings"	Living, freshly cut branches of woody shrub and tree species that propagate from cuttings embedded in the soil.
"Live Cribwall"	A hollow, structural wall formed out of mutually perpendicular and interlocking members, usually timber, in which live cuttings are inserted through the front face of the wall into the crib fill and or natural soil behind the wall.
"Live Fascines"	Bound, elongated sausage like bundles of live cut branches that are placed in shallow trenches, partly covered with soil, and staked in place to arrest erosion, shallow soil mass movements, and establish vegetation.
"Live Staking"	Live stake planting involves the insertion and tamping of live, vegetative cuttings into the ground in a manner that allows the stake to take root and grow.
"Lot Level"	Design, construction and infrastructure related specifically to a given lot. The comparison of 'lot level' facilities versus 'subdivision level' facilities is the issue of concern.
"Manufacturer's Recommendation"	The published recommendations of the manufacturer of a specific product for a specific application. In some situations additional manufacturer recommendations would be in order to receive and use. These recommendations are to address the site-specific conditions, site-specific recommendations, and be authored by an employee of the manufacturer. All recommendations will not be interpreted by the City as a guarantee or warranty.
"Mass Movement"	The movement of large, relatively intact masses of earth and or rock along a well-defined shearing surface as a result of gravity and seepage.
"Minimize Disturbance	

and Buffer Strip"	Minimizing disturbance and maintaining buffer strips is a planning process which retains natural vegetative cover and also maintains undisturbed vegetative buffer strips near watercourses.
"Mulch Protection"	A verifiable method of protecting the seed prior to, during and after germination, until the vegetation is established enough to prevent erosion for specific site protection. The mulch protection is to last a minimum of three months to a maximum of four years.
"Mulching"	Mulching is the application of a protective layer of virgin wood fiber or other suitable material to the soil surface. Mulch and/or hydromulch are also used in conjunction with seeding and hydroseeding of critical areas for the establishment of temporary or permanent vegetation. Mulching with straw or wood fiber mulch is commonly used as a temporary measure to protect bare or disturbed soil areas that have not been seeded.
"NPDES"	The National Pollution Discharge Elimination System of the U.S. Environmental Protection Agency and its related requirements. Phase I of the NPDES became effective in 1993 and governed large and medium sized municipalities, and construction sites of 5 acres or more. Phase II was approved on October 29, 1999 and will directly affect activities in City of South Jordan, including all construction sites of 1 acre or more.
"Native Planting Window"	The time period during which native planting materials or seeds are most likely to produce live plant material. This usually occurs during the spring and fall of each year when natural moisture may be available in assisting native plant species in germinating.
"Natural Runoff Channel or Stream"	The predevelopment condition of naturally occurring channels or streambeds. Streambeds or channels caused by naturally occurring water flows. Not man-made.
"Normal Inspection Hours"	Services provided pursuant to or in connection with the provisions of this title shall mean from 8:00 a.m. to 5:00 p.m., Monday through Friday, except holidays. Holidays shall be defined as those weekdays (exclusive of Saturday's) shown as nonworking days on the working day calendar of the City.
"Notice of Noncompliance/ Notice to Correct"	The notice issued by the Enforcement Authority for required action to achieve compliance with the provisions of this chapter.
"Notice of Violation"	A notification issued by the City of a violation or alleged violation of the grading, erosion control, or sedimentation control provisions of this chapter, in which is specified the nature of the violation and the degree of sanctions imposed.

"Opacity"	The factor that is used to determine the thickness or density of fugitive dust leaving a site.
"Overland Release"	An area, swale, or structure that provides for the passage of storm water runoff exceeding the design-frequency storm event of the storm water conveyance system.
"Owner"	May be either the City, individual homeowner, or Developer of the project, depending upon the stage the project. Typically the Developer is the Owner up to and including the time the project is accepted by the City. After final acceptance, the City would be typically considered to be the Owner or ownership responsibilities would be passed on to individual homeowners. The City will own public rights-of-way and private property owners will have ownership of the lots.
"Permanent Seeding"	The establishment of a permanent, perennial vegetative cover on disturbed areas from seed.
"Permit"	See land disturbance permit.
"Permit Holder"	The applicant in whose name a valid permit is issued pursuant to this chapter and the applicant's agents, employees, and designated representatives.
"Person"	Any individual, corporation, partnership, association of any type, public agency, or any other legal entity.
"Photodegradable polypropylene"	Material used in conjunction with erosion blankets and turf reinforcement mats which deteriorates with exposure to sunlight. It initially protects the slope or other denuded area from wind and water erosion, provides seed bed protection, and then deteriorates allowing plant materials to grow up through the material.
"Plans"	Drawings of erosion control measures, roadways, bridges, water pipelines, reservoirs or other structural/nonstructural devices.
"Planting Date"	The date native seed can be applied without temporary irrigation, October 15, through May 1, or as determined by the City's Engineering Department.
"Plate No."	Where not specified to the contrary, this refers to plates attached to these standards.
"Project"	A site that has obtained Final Plat approval from City.
"Pure Live Seed (P.L.S.)"	The actual amount of seed applied to a disturbed area to be re-vegetated. To determine P.L.S. multiply the percent of purity

shown on the seed tag by the percent germination shown on the seed tag then by 100.

"Quadrant Frame Method" — The method of random sampling of an area to determine successful re-vegetation. The following items will be compared to an adjacent undisturbed site: (a) on herbaceous canopy cover equivalent to an adjacent undisturbed site to provide protection against drought and erosion from wind or water. (b) a growth of a native vegetative that is representative of a adjacent undisturbed site species abundance. (c) the lack of rill and gully erosion.

"Required" — Unless specifically otherwise indicated, this shall mean a requirement of the City Engineer.

"Restoration and Re-vegetation Costs" — Costs required for the restoration of disturbed areas and which are set by City resolution or ordinance on a subdivision level.

"Retention" — The holding of runoff in an area without release except by means of evaporation, infiltration, or emergency bypass.

"Revetment" — A facing, as of stone or concrete, to sustain an embankment.

"Riparian Area" — A strip of land that borders a stream or river, often coincides with the maximum water surfaces elevation of the 100 year or record storm.

"Riprap" — Riprap is a layer of stone or rock designed to protect and stabilize areas subject to erosion.

"Rock Lined Channel" — Rock-lined channels are channels or roadside ditches lined with rock or riprap.

"Rough Grade" — The approximate elevation of the ground surface conforming to the proposed design (0.5 plus of minus feet).

"Scheduling" — Sequencing the construction project to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking. The construction sequence schedule is an orderly listing of all major land-disturbing activities together with the necessary erosion and sedimentation control measures planned for a project. This type of schedule guides the contractor on work to be done before other work is started so that serious erosion and sedimentation problems can be avoided.

"Sediment" — The transport of soil or earth material by wind, water, snow or ice.

"Sediment Control" — The structural and nonstructural Best Management Practices that contains the deposited, displaced soil particles caused by erosion.

	This may include (but not limited to) dikes, sediment detention traps, sediment detention basins, filters, fences, barriers, swales, berms, drains, check dams, and other measures that control the deposition of soil or earth material.
"Sedimentation"	The deposition of soil or earth material by wind, water, snow or ice.
"Sequence of Construction"	The suggested procedure of land disturbance and land reclamation to accomplish the goals of this chapter within the City.
"Sheet-flow"	A runoff characteristic which water flows over the land as a thin even layer, not concentrated.
"Silt Fence"	A silt fence is a temporary sediment barrier consisting of filter fabric attached to supporting posts and entrenched in the soil.
"Site"	A parcel or parcels of real property owned by one or more than one person on which activity regulated by this chapter is occurring or is proposed to occur.
"Slope"	A portion of ground forming a natural or artificial incline, including a retaining wall.
"Slope Drain"	A temporary slope drain is a flexible tubing, pipe, overside drain, or other conduit extending from the top to the bottom of a cut or fill slope.
"Slope Scaling"	This remedial activity (usually done by manual labor) involves grading the slope to fill in rills and gullies, slumps, and other depressions that concentrate surface runoff. Slope scaling is necessary to repair slopes prior to wattling, brush packing or erosion control blanket installation.
"Solid Waste Landfill"	Solid waste means any garbage, refuse sludge, including sludge from a waste treatment plant, water supply treatment plant, or air pollution control faulty, or other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, or agricultural operations and from community actives but does not include solid or dissolved materials in a domestic sewage or in a irrigation return flows or discharges for which a permit is required under Title 19, Chapter 5, Water Quality Act or under the Water Pollution Control Act, 33 U.S.C., Section 1251, et, seq. The definition of a solid wasteland fill is found in the state statues 19-6- 102-17(a).
"Slough Wall"	A wall designed to retain nuisance earth material and keep it in place.
"Soil"	All earth material, of whatever origin, which overlies bedrock.

"Soils Engineer"	A civil engineer duly registered by the State who is experienced in soil mechanics and slope stability analysis. His primary duties shall encompass the investigation of proposed grading sites and plats as related to the stability of the finished graded product. The soils engineer shall have proper laboratory facilities available in which to perform any and all testing required to properly evaluate materials under consideration.
"Staff Engineer"	A registered civil engineer employed by the City and designated by the City Engineer to act on the City's behalf.
"Standard Drawings"	The City's standard drawings for construction projects contained in this standard in Appendix A. Standard drawings also refers to those drawings contained in other design and construction standards of the City including Culinary Water, Road and Bridge, Storm Drain and Flood Control design and construction standards.
"Step Transect Method"	The method of sampling of an area to determine successful re-vegetation. The following items will be compared to an adjacent undisturbed site: (a) on herbaceous canopy cover equivalent to an adjacent undisturbed site. (b) a growth of native vegetative that is representative of a adjacent undisturbed site species abundance. (c) the lack of rill and gully erosion.
"Structural Streambank Stabilization"	Stabilization of eroding stream-banks with designed structural measures.
"Structure"	Anything constructed or erected which requires location on the ground or is attached to something having location on the ground.
"Subdivision Level"	Design, construction and infrastructure related generally to subdivision systems such as drainage, culinary water, wastewater systems, etc. The comparison of 'subdivision level' facilities versus 'lot level' facilities is the issue of concern.
"Surface Roughening"	A technique for roughening a bare soil surface with furrows running across the slope, stair stepping, or tracking with construction equipment. Tracks must be accomplished with indentations running on the slope contour.
"Swales"	Shallow grassed trenches that are wider than they are deep that provide a specific pathway for incoming flow.
"Technical Specifications"	Sections of the construction specifications in Appendix B of the Land Disturbance Design and Construction Standards
"Temporary Sediment	

Basin"	A pond created by excavation in construction of an embankment and designed to retain or detain runoff sufficiently to allow excess sediment to settle.
"Temporary Seeding"	The establishment of a temporary vegetative cover on disturbed areas by seeding with appropriate and rapidly growing annual grasses and/or forbs.
"Terrace"	A horizontal surface or step in a slope.
"Theoretical Detention Time"	The time for a runoff event is the average time parcels of water reside in the basin over the period of release from the B.M.P.
"Top-soiling"	Top-soiling is the preservation and use of topsoil to enhance final site stabilization with vegetation.
"Vegetated Structures"	A retaining structure in which living plant materials, cuttings, or transplants have been integrated into the structure.
"Vegetative Cuttings"	Live, cut stems and branches of plants that will root when embedded or inserted in the ground.
"Vegetative Measures"	The use of live cuttings, seeding, sodding, and transplanting in order to establish vegetation for erosion control and slope protection work.
"Verifiable Testing Method"	A method or material that has been tested by an independent testing facility under similar conditions. Example, existing site conditions have sandy soil with slope of a slope of 2 feet horizontal to one foot vertical (2:1). An acceptable erosion control material would have published test results in sandy soil with slope of 2:1. (i.e. Texas Transportation Institute, Utah Water Research Lab)
"Water-bars and Rolling Dips"	Ridges or ridge-and-channels constructed diagonally across a sloping road or utility right-of-way that is subject to erosion.
"Water Quality B.M.P"	A B.M.P. specifically designed for pollutant removal
"Watercourse"	A river, stream, creek, canal, basin, lake, pond, waterway, or channel, natural or man-made, having a defined bed and banks. Whenever a watercourse consists of both an ordinary channel and an overflow channel, the watercourse is deemed to include all property lying between the banks of the overflow channel. Watercourse would include both perennial and ephemeral flows situations.
"Wattles"	Wattles or live fascines are live branch cuttings, usually willows, bound together into long, cigar shaped bundles used to stabilize

slopes and stream-banks. Wattles may also be straw materials used for temporary sediment control.

"Wet Weather Plan" — A detailed erosion and sediment control plan and construction sequence that clearly shows how construction will process after October 1 of each year until May 1, of each year.

"Wetlands" — Those areas that are inundated or saturated by surface or ground water at a frequency sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, such as swamps, bogs and marshes. Jurisdictional wetlands are those wetlands regulated by the U.S. Army Corps of Engineers.

"Yard Waste" — Vegetative cover matter resulting from landscaping, land maintenance, and clearing operations including grass clippings, pruning, and other discarded material generated from yards, gardens, parks, and other similar types of facilities. Yard waste does not include garbage, paper, plastic, sludge, septage, or manure.

1.5 APPLICABLE CODES AND POLICY

A. Ordinances, requirements and applicable standards of governmental agencies having jurisdiction within the City's service area shall be observed in the design and construction of roadways. Such requirements include but are not limited to current revisions of the following:

1. Municipal Code of City of South Jordan
2. State of Utah, Department of Environmental Quality, Division of Solid and Hazardous Waste, Solid Waste Permitting and Management Rules, R315-301 through 320
3. State of Utah, Department of Environmental Quality, Division of Air Quality (Dust Control Permit Requirements)
4. State of Utah, Department of Environmental Quality, Division of Water Quality (UPDES Requirements)
5. U.S. Army Corp of Engineers
6. Natural Resources Conservation Service

A complete listing of all reference material is included in the back of these standards.

B. The clearing, grubbing and disposal of vegetative material needs to be in accordance with State and county regulations, which apply to solid waste. This type of material has been determined to meet the requirements of solid waste as defined earlier in this section. Regulations which affect this disposal include:

1. R315-301-4 Prohibition of Illegal Disposal or Incineration of Solid Waste states:

   "No person shall incinerate, burn, or otherwise dispose of solid waste in any place except at a facility which is in compliance with the requirements of Rules 315-301 through 320 and other applicable rules."

2. The regulations dealing with landfills are enforced on the local level by the counties the landfill or alleged violation to landfill regulations is in. In the event, the counties regulations are more restrictive than the State regulations the counties regulations govern. Salt Lake County regulations are more restrictive than the states, so the Salt Lake County's regulations govern.

1.6 ENGINEERING DEPARTMENT JURISDICTION

The Engineering Division is responsible for all land disturbance activities throughout the City until said areas have been stabilized with vegetation, asphalt, or concrete and accepted by the City.

1.7 INFRASTRUCTURE MAINTENANCE AND OPERATIONS DEPARTMENT JURISDICTION

The Public Works Department is responsible for the operation and maintenance of all public roadways, sanitary sewer, storm drainage, secondary water and culinary water systems within the public right-of-way of the City.

1.8 COMMUNITY DEVELOPMENT DEPARTMENT – BUILDING DIVISION

The Building Division is responsible for the residential and commercial building sites after final grade has been reached. The re-vegetated areas outside of the right-of-way and storm water management facilities are the only exceptions.

1.9 DEVELOPER ENGINEER'S RESPONSIBILITY

These standards establish uniform policies and procedures for the design and construction of the City grading, erosion, re-vegetation and sediment control facilities. This standard is not a substitute for the knowledge, experience, or judgment of professionals in their respective area of expertise in the agronomy, re-vegetation, conservation, and engineering discipline. The methods and procedures contained herein shall be reviewed by the developer's engineer or designer using them as applicable to site-specific conditions of the project they are working on. Where actual site conditions deem these standards and procedures not applicable, the engineer or designer shall request a variance from these standards or procedures as provided herein.

It is the developer engineer's responsibility to be aware of the City's ordinance for grading, erosion, re-vegetation, and sedimentation control improvements and to indicate any areas, which requires work in these areas. This responsibility shall include investigating any changes from the Master Plan necessitated by development subsequent to the Master Plan, although the above shall not relieve the developer from the responsibility to provide an approved system consistent with Engineering Department requirements.

All plans, specifications, report or documents pertaining to erosion control, vegetation or re-vegetation shall be prepared or reviewed by certified professionals. Each of these documents shall be signed and stamped with a professional engineer seal, to indicate responsibility for them. A wet stamp is required on all documents except reproducible plans, where a stamp on the original is acceptable.

A "Preliminary Review" and or "Plans Approved for Construction" stamp or signature of the City on the plans does not in any way relieve the developer's engineer of the responsibility to meet all

requirements of the City. The plans shall be revised or supplemented at any time it is determined that the City's requirements have not been met. Generally, plans that are signed as being authorized for construction will not require revisions based upon subsequent revisions to these standards, however, when in the Engineering Department's opinion, a change to the project is necessary, based upon a significant change in the standards, which significantly affects public safety, future maintenance costs, or similar concerns, such a change may be required during construction by the City Engineer. Changes may also be required in the case where a developer does not proceed to construction within the time allowed in the agreement with the City.

1.10 REFERENCED SPECIFICATIONS

References to standards such as AASHTO, APWA or ASTM shall refer to the latest edition or revision of such standards unless otherwise specified.

1.11 CITY ENGINEER ACCEPTANCE

The City Engineer will not accept the land disturbance until all applicable requirements of these Standard's and of the City of South Jordan Municipal Code have been met.

1.12 METRIC UNITS

These standards do not contain metric conversions in some sections because of the extent of numerical data or information.

1.13 CONSTRUCTION SPECIFICATIONS

Nothing contained in the construction specifications in Appendix B, or in any other part of this standard as implying the City will pay for any of these improvements. In addition to the construction specifications being used for defining private development work, they are also used for City capital improvement projects, and therefore contain some language about methods of payment.

SECTION 2.0

DESIGN CRITERIA

2.1 INTRODUCTION

A. **General** - The City boundary includes the region generally east of the Oquirrh Mountains, south of 9400 South, west of the I-15 Freeway, and south to 11800 South. A map showing the City's boundary is contained in the standard drawings at the back of this document.

Within the boundaries of City of South Jordan there are several historical and environmental features, which have contributed to the past and present character of City of South Jordan. The Kennecott Copper Mine, the historical Bonneville Lake shoreline and the wetland areas scattered throughout the City of South Jordan area are just a few of these features.

These features also serve as winter rangeland for deer and elk and the wetland areas support several species of migratory birds. The educational and recreational experiences to be found in these areas are second to none. However, during the development surge in the late 1990's, City of South Jordan experienced several development related items, which appeared to threaten these unique areas, which have concerned City of South Jordan. The City of South Jordan recognizes that the preservation of the mountain ranges, wetlands and other sensitive areas, enhance the natural scenic beauty of the area and also sustains the long-term potential for maintaining property values. This philosophy also encourages quality development while maintaining the original identity and character of the sensitive areas that originally attracted people to the South Jordan area.

The sensitive areas spoken of also include elements, when balanced, provides environmentally sound ecological systems which prevent flooding, erosion and other natural hazards. For these reasons, the City Council has determined that in order to promote and protect health, safety, and welfare of the residents of the City of South Jordan and at the same time recognizing individual rights to develop private property, which will not be prejudicial to the public interest, it has been necessary to enact the standards and procedures contained herein.

The City's Engineering Division is responsible for all studies, design and construction for all land disturbance, grading, erosion control, re-vegetation efforts, and sedimentation facilities and the Public Works Department is responsible for all operations and maintenance once they have been accepted by the City.

B. **Design Professionals Qualifications** – A number of design professionals are involved in the land disturbance design and implementation phase of a project. These include civil engineers, geotechnical engineers, erosion control specialists, and other professionals necessary to properly design and inspect the project. The following are generalized list of work activities which require professional qualifications to perform:

1. Grading – Work under this item is required to be done by a combination of Civil Engineer and Geotechnical Engineer. These specialties are to be registered in the State of Utah. In addition to the design of a portion on the project, the engineer who performed the design is also to perform the inspection and verification of the

work and a certification is to be provided to the City indicating the work performed meets the requirements of the original design. If design changes are contemplated during construction, the design engineer is to approach the City with a proposed revised plan, which is to be reviewed and approved in writing by the City prior to initiating work on the revision.

2. **Drainage** – Work under this item is required to be done by a Civil Engineer. The Civil Engineer is to be registered in the State of Utah. In addition to the design of this portion on the project, the engineer who performed the design is also to perform the inspection and verification of the work and a certification is to be provided to the City indicating the work performed meets the requirements of the original design. If design changes are contemplated during construction, the design engineer is to approach the City with a proposed revised plan, which is to be reviewed and approved in writing by the City prior to initiating work on the revision.

3. **Erosion and Sediment Control, Vegetation and Re-vegetation** – Work under this item is required to be done by a qualified Certified Professional Erosion and Sediment Control Specialist or a person having adequate education and years of experience to indicate the person has sufficient knowledge to properly complete these types of designs and plans. The following general categories of persons may be considered qualified to perform this type of work. If through performance of the work it becomes apparent the individual does not possess the necessary knowledge to properly complete the work, the design firm will be requested to find another individual to complete the work or the City may require another firm be retained to complete the work.

   a. A person having at least ten years of professional level experience in the erosion and sediment control field and has been accepted for testing to become a Certified Professional Erosion and Sediment Control Specialist, or
   b. A Certified Professional Erosion and Sediment Control Specialist who is actively involved in designing, installing, or regulating projects within the erosion control field, or
   c. A Civil Engineer/Landscape Architect having at least six years of professional level experience in the erosion and sediment control field, or
   d. A Soil Scientist having certification by the American Registry of Certified Professionals in Agronomy and having two years of professional level experience in erosion and sediment control, or
   e. A person have a Bachelor of Science* degree plus six years of professional level experience in the erosion and sediment control field.
   f. A person with a Master of Science* degree plus four years of professional level experience in the soil erosion and sediment control field, or
   g. A person with a Ph. D* plus two years of professional level experience in the soil erosion and sediment control field.

   ***Note:** Degree in engineering (agricultural, civil, or environmental), geology, soil science, natural resource science or management, or a related field is acceptable.

Professionals, which are required to be licensed, are to be registered in the State of Utah. In addition to the design of this portion on the project, the professional who performed the design is also to perform the inspection and verification of the work and a certification is to be provided to the City indicating the work performed meets the requirements of the original design. If design changes are contemplated during construction, the design professional is to approach the City with a proposed revised plan, which is to be reviewed and approved in writing by the City prior to initiating work on the revision.

C. **Master Plan Compliance** – In designing facilities within the City, Developers and their engineers shall comply with the City's current master plans, the Land Disturbance Design and Construction Standards, Storm Drainage, Flood Control and Transportation master plans apply specifically, Parks and Trails, along with other master plans, which the City has adopted.

D. **Construction of the Project** – In planning for construction of the project, the Developer needs to take into account the amount of disturbance, which may impact the project and in what order will need to be created to construct the project. Strict controls need to be placed on the Developer's contactor to minimize the amount of disturbed soil and maximize the amount of natural vegetation preserved.

1. Project Phasing – Vegetation cover and associated roots of native plants provide tensile strength to the soil and reduce the potential for excessive erosion. When vegetation can be maintained in an undisturbed state, the amount of sediment coming off the site is minimal and the inclusion of structural/nonstructural Best management Practices (BMP's) is reduced.

   The construction project should be designed, selected and laid out so that it fits into existing land contours. Changing the contours significantly from existing grade will disturb more soil and increase development costs in grading, erosion control measures, sediment control and re-vegetation and will also disturb the atheistic value of the land.

   Clear and grub only those portions of the site where it is necessary for construction. The point to be emphasized is the less soil disturbed relates directly to reduced development costs.

2. Maximize the natural vegetation preserved - Preservation of natural vegetation on a site needs to be planned before the site disturbance begins. Preservation requires good site management to minimize the impact of construction activities on existing vegetation. The following is to be clearly indicated on the construction plans:

   a. Survey and stake the limits of disturbance (LOD) and have the City Inspector or Erosion Control Specialist review staking.
   b. Clearly mark the trees and shrubs not to be disturbed within the LOD.
   c. Create barriers to prevent the ground at the base of the trees and shrubs from being disturbed.
   d. Create natural vegetation buffer filter strips that are adjacent to roads and streams. The buffer filter strip width is to be designed based on

riparian habitat, vegetative growth and pollutants to be removed for the water. Each buffer requires a site-specific design refer to the B.M.P. buffer section for design criteria.

E. **Responsible Agencies** – The following are agencies with which the Developer will, or may need to coordinate during construction of the project:

1. Utah Department of Environmental Quality, Division of Air Quality – The Utah Department of Environmental Quality, Division of Air Quality is responsible for ensuring compliance with its requirements for all areas of the City. The Developer or his contractor is responsible for obtaining an air quality permit from this agency and is responsible for ensuring that operations of the project comply with the permit if the site is over one (1) acre.

2. Utah Department of Environmental Quality, Division of Water Quality – The Utah Department of Environmental Quality, Division of Water Quality is responsible for ensuring compliance with its requirements for all areas of the City under the Utah Pollution Discharge Elimination System (UPDES) requirements. The Developer or his contractor is responsible for obtaining a UPDES permit from this agency and is responsible for ensuring that operations of the project comply with the permit.

3. Utah Department of Environmental Quality, Division of Solid and Hazardous Waste – The Utah Department of Environmental Quality, Division of Solid and Hazardous Waste is responsible for ensuring compliance with its requirements for all areas of the City as it regards green waste or other solid waste. The Developer or his contractor is responsible for obtaining the necessary permits and approvals from this agency for the project and is responsible for ensuring that operations of the project comply with these permits.
4. City of South Jordan – City of South Jordan also has several ordinances and standards, which the Developer and his contractor need to be aware of and comply with. These include:

   a. Title 16, Chapter 44 - Land Disturbance Ordinance
   b. Land Disturbance Design and Construction Standards
   c. South Jordan City Design and Construction Standards

2.2 PRINCIPLES OF EROSION AND SEDIMENT CONTROL

A. **General** - Severe erosion is caused by the action of wind, rainfall, snow and runoff on bare soil. Clearing, grading, and other construction activities remove the vegetation and compact the soil, increasing both runoff and erosion. Excessive runoff causes gully erosion, increased stream bank erosion, poor water quality and results in increased off-site erosion, sedimentation, mudflows and flooding problems. Effective erosion and sediment control can be achieved by careful attention to the following principles:

1. Protect the land surface from erosion.

2. Manage runoff and keep water surface velocities low.

3. Capture sediment on-site.

4. Integrate erosion and sediment control with the construction schedule.

5. Inspect and maintain the erosion and sediment control practices before, during and after construction.

The following are principles for controlling erosion and off-site sedimentation from construction sites:

1. Fit the development to the existing topography, soils, and vegetation as much as is possible.

2. Schedule construction operations in order to minimize soil exposure during the wet season.

3. Minimize disturbance and soil exposure by retaining natural vegetation, adopting phased construction techniques, and using temporary cover.

4. Vegetate and mulch all denuded areas to protect the soil from winter rains. The primary efforts for controlling sediment pollution from construction sites are to minimize raindrop impacts on bare soil.

5. Utilize proper grading, barriers, or ditches to minimize concentrated flows and divert runoff away from denuded slopes or other critical areas.

6. Minimize the steepness of slopes and control the length of slopes by utilizing benches, terraces, contour furrows, wattles or diversion ditches.

7. Utilize riprap, channel linings, or temporary structures in the channel to slow runoff velocities and allow the drainage ways to handle the increased runoff from disturbed and developed areas.

8. Keep the sediment on-site by utilizing sediment basins, traps, or sediment barriers.

9. Monitor and inspect sites frequently to assure the measures are functioning properly and correct problems promptly.

B. Vegetation as a Solution

Dense, healthy vegetation and the associated leaf litter protect the soil from raindrop impact. Raindrop impact is a major force in dislodging soil particles, which then allows them to move down slope or form a crust on the soil surface. When a crust forms on the soil surface the rainfall infiltration rate decreases and runoff increases.

Vegetation also protects the soil from sheet and rill erosion. It shields the soil surface from the transport of soil particles and scour from overland flow (sheet flow) and it decreases the erosive energy of the flowing water by reducing velocity.

The shielding effect of the plant canopy and leaves is augmented by roots and rhizomes that hold the soil in place, improve the soil's physical condition, and increase the rate of

infiltration, further decreasing runoff. Plants also remove water from the soil through transpiration, thus increasing its capacity to absorb water.

Suitable vegetative cover provides excellent erosion protection, and reduces the need for high cost, low efficiency, and high maintenance sediment control measures. Vegetative cover is relatively inexpensive to achieve and tends to be self-healing; it is often the only practical, long-term solution of stabilization and erosion control on most disturbed sites.

Initial investigation of site characteristics and planning for vegetation stabilization reduces its cost, minimizes maintenance and repair, and makes other erosion and sediment control measures more effective and less costly to maintain. Permanent erosion control (post-construction landscaping) is also less costly where soils have not been eroded.

Exposed sub-soils are generally difficult to amend, are infertile, and require more irrigation. Natural, undisturbed areas can provide low-maintenance landscaping, shade, and privacy. Large trees increase property values when they are properly protected during construction.

Besides preventing erosion, healthy vegetative cover provides a stable land surface, reduces heat reflectance and dust, restricts weed growth, and complements architecture. The result is a pleasant environment for employees, tenants and customers, and an attractive site for homes.

Property values can be increased dramatically by small investments in erosion control. The final landscaping represents a small fraction of total construction costs, but can contribute greatly to an increased market value of the development. Healthy vegetation and planned development will reduce concentrated flows and peak discharge, thus reducing channel erosion and flooding. Good, healthy vegetative cover greatly reduces the environmental impacts that poor water quality and habitat reduction is having on rivers and streams.

C. **Scheduling**

1. Purpose: Following a specified work schedule that coordinates the timing of land-disturbing activities and the installation of control measures is perhaps the most cost-effective way of controlling erosion during construction. The removal of surface ground cover leaves a site vulnerable to accelerated erosion. Construction procedures that limit land clearing provide the timely installation of erosion and sedimentation controls, and restore protective cover quickly can significantly reduce the erosion potential of a site.

2. Design Considerations:

   a. Project design considerations: Design project to integrate into existing land contours. Significant re-grading of a site will require more costly erosion and sedimentation control measures and may require installation of on-site drainage and sediment control facilities.
   b. Incorporate existing natural areas: Inventory and evaluate the existing site terrain and vegetation. Disturbance of highly erosive natural areas (e.g., steep, unstable slope areas and watercourses) should be minimized,

while protecting other areas may enhance site aesthetics. Construction should not disturb theses areas

c. Avoid rainy periods: Schedule major grading operations during dry months of April through October. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means or to install temporary sediment trapping devices.

d. Practice erosion and sediment control year round: Erosion may be caused during dry seasons by "freak" rainfall, wind and vehicle tracking. Therefore, keep the site stabilized year-round, and maintain wet season sediment trapping devices. Material which becomes too dry and causes a dust problem will need to be wetted to meet City, County and State requirements.

e. Apply perimeter control practices: Protect the disturbed areas from off-site runoff and prevent sedimentation damage to areas below the development site by applying perimeter control devices.

f. Minimize soil exposed at one time: Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding in order to re-vegetate cut and fill slopes as the work progresses.

g. Trenching: Close and stabilize open trenches as soon as possible. Sequence trenching projects so that most open portions of the trench are closed before new trenching is begun.

h. Maintain erosion and sediment control during construction period, start to finish.

D. Land Grading for Minimizing Erosion

1. Purpose: Where land grading is necessary for road or building construction, these land-grading practices are intended to minimize the erosion potential and facilitate plant establishment.

2. Design Considerations: Design considerations should include the following:

   a. existing contours;
   b. land use;
   c. vegetation;
   d. soil;
   e. drainage;
   f. slope stability;
   g. slope length;
   h. slope angle;
   i. space limitations;
   j. erosion potential of land disturbance; and
   k. erosion and sediment control measure practicality.
   l. Existing or proposed wetlands

   Development should fit existing topography as much as possible so that land disturbance is minimized.

Slope steepness and excessive slope lengths should be kept to a minimum. Benches, steps, or contour furrows can be installed on long slopes to break up the slope length. A bench should be graded back towards the slope and drain with a gentle gradient to a stable outlet. Drainage from upland areas should be diverted away from exposed slopes.

E. **Minimize Disturbance and Buffer Strip**

1. Purpose: Erosion can be reduced ninety-eight (98%) percent by protecting the soil from raindrop impact. Existing native vegetation usually provides the best soil protection. One of the most effective erosion control measures is to only disturb areas immediately needed for construction.

   Water quality and wildlife habitat degradation can be greatly reduced by maintaining streamside buffer strips and riparian corridors. These buffer strips act to filter sediment from the surface runoff before it reaches the watercourse. The small drainage and intermittent streams and channels are the sediment delivery systems to rivers and lakes. If sediment can be kept out of the delivery systems, by maintaining buffer strips, then the sediment will not impact the fisheries or cause other water quality impacts.

2. Planning Considerations:

   a. Existing native vegetation should be incorporated into the final landscaping plan. It is adapted to the site, drought tolerant, and will provide shade and erosion protection. Shrubs or trees can be thinned and pruned for beauty and fire hazard reduction.
   b. Existing trees should be protected as per City ordinances or other development requirements.
   c. If the area is not disturbed then it does not require erosion control and concentrated flows down slope will be greatly reduced.
   d. Buffer strips around the perimeter of a site can reduce or eliminate off-site sedimentation.

3. Design Criteria:

   a. Designate areas of no disturbance. Clearly show on the SWPPP plans, and flag in the field areas of no disturbance and construction vehicle exclusion.
   b. Designate trees and shrubs that are to be preserved.
   c. Designate watercourse buffer-filter strips on the site design plan. See Guide to Small Roads, USDA-SCS for more information.
   d. Maintain and preserve riparian and naturally vegetated buffer strips along watercourses.
   e. The width of a buffer strip between a road and the stream is recommended to be 50 feet plus four times the slope of the land in percent, measured between the road and the top of stream bank. Coordinate with setback requirements for canal and channel setbacks.
   f. Buffer width in feet = 50 + 4(% slope).
      Example: For a 10% slope, buffer length is 50 feet + (4)(10) = 90 feet.

2.3 APPLICATIONS OF EROSION AND SEDIMENT CONTROL PRACTICES

A. **General** – The common reason erosion and sediment control practices are ineffective is that the wrong BMP is implemented for the type of control needed. A sediment control BMP should not be used for erosion control and an erosion control BMP should not be used when a runoff control is needed. When the needed control is treated with the wrong type of BMP, failure normally occurs.

For example, a silt fence is placed a cross a slope to prevent erosion. Maybe the designer wanted to stop sheet and rill erosion. In actual practice the silt fence collected and concentrated water, which was diverted to a low spot where the fence becomes overloaded and failed. An erosion control BMP should have been chosen to treat the erosion problem. Silt fences are intended for sediment control and should, therefore, be installed in relatively flat areas suitable for ponding water and depositing sediment. A good way to avoid confusion when choosing BMPs is to have a clear understanding of what type control is needed and what are the corresponding BMPs.

There are three general categories of controls that have distinct treatments associated with them;

1. erosion control
2. runoff control
3. sediment control.

B. **Erosion Control** - Erosion control is any practice that protects the soil surfaces and prevents the soil particles from being detached by rainfall or wind. Erosion control, therefore, is a source control that treats the soil as a resource that has value and should be kept in place.

What are some erosion control BMP's?

1. Key Point: The most efficient and economical long-term method of controlling sheet, rill and raindrop impact erosion is to establish vegetative cover from seed. Vegetation can reduce erosion by more than ninety (90%) percent by protecting the soil from raindrop impact and sheet erosion.

   When erosion control BMPs are implemented and maintained, the amount of sediment associated with runoff waters can be dramatically reduced. Whenever possible prioritize or design for erosion control first and sediment control second. Some important points to remember:

   a. Exiting or new vegetative cover is the primary erosion control practice.
   b. Retain existing vegetation by minimizing disturbance and scheduling large land disturbances during periods of expected dry weather.
   c. Establishing cover immediately after disturbance (staging) is important.
   d. Temporary erosion control is usually achieved by seeding and watering with fast growing annual grasses and/or protecting the soil with mulch or

erosion blankets. Plant seed mix is to be approved by the Engineering Department and the Parks Department staff.

e. Permanent erosion control usually involves planting perennial grasses, shrubs, and trees.

2. Key Point: The selection of the right plant material for the site, choosing the correct mulching technique and proper seedbed preparation are critical for effective erosion control. Surface roughening, contour furrows, and stepped slopes are essential to establish vegetation. Straw bales are not recommended in the city.

3. Costs - Non-structural erosion control practices are generally more cost-effective than sediment control. For example, the cost of temporary seeding one acre would be comparable to the cost of installing 200 LF of silt fence (for a 1 acre drainage) or equivalent to the cost of constructing a temporary sediment trap designed for a one-acre drainage. However, the practice of temporary seeding would probably be more effective, while the silt fence and sediment trap will require regular and costly maintenance.

4. Key Point**:** Erosion control is, generally, more cost-effective than sediment control and requires less maintenance and repair.

C. **Runoff Control (See Appendix A - 5200)**

1. General - Construction activities usually result in the removal of vegetative cover and increases in impermeable surfaces, both of which increase the volume and velocity of runoff. Increases of storm water volume and velocity lead to increased erosion (gulling) in the sediment transport and off-site delivery (sedimentation). These increases must be addressed when implementing erosion and sediment control.

   Runoff control measures are those practices, which mitigate for the erosive and sediment transport forces of storm water during and after construction activities. Some examples of runoff control might include, outlet protection (energy dissipators), diversion dikes and swales, temporary slope drains, rock lined channels, turf reinforcement mats, grass-lined channels, and temporary stream crossings.

2. Key Point: Runoff control involves the use of structures to reduce velocities and/or safely carry storm water in a manner, which reduces erosion and sediment transport.

   The energy equation, **E = mv2**, where E = erosive Energy, m = unit density of water, and v = the runoff velocity, demonstrates that if you reduce the velocity of running water by 1/2 you will reduce the erosive energy by 4 times. To reduce runoff energy implement practices which use the **4 D's**.

   Decrease - decrease the amount of runoff
   Detain - decrease the velocity
   Divert - divert runoff to less erodable areas
   Dissipate - spread the runoff out

Rill and gully erosion is caused by concentrated runoff. Methods that reduce runoff velocity, such as check dams, vegetated channels or riprap, will also reduce the potential for sediment transport. An alternative to reducing the runoff energy of storm water is to convey that runoff through or along non-erodable surfaces, i.e., culverts and slope drains.

3. Key Point: Temporary check dams, especially straw bale dams, are not recommended for any flowing water conditions. Straw bales and silt fences are sediment control BMP's, not runoff control BMP's and should not be placed in channel flow (runoff) areas.

   What are some runoff control BMP's?

D. **Sediment Control (See Appendix A – 5300)**

1. General - Sedimentation is the deposition of soil particles that have been transported by water or wind. The amount of sediment produced during construction is directly proportional to the degree and effectiveness of erosion control practices implemented. The quantity and size of the particles transported increases with the velocity of the runoff or wind.

   Sediment control is used to keep sediment, the product of erosion, on-site. Sediment control involves the construction of structures that allow sediment to settle out of suspension. Sediment control structures, therefore, require frequent inspection and maintenance. Generally, sediment is retained on-site by two methods: a) slowing runoff velocities, as they flow through an area, sufficiently so that sediment cannot be transported, and b) impounding sediment-laden runoff for a period of time so that the soil particles settle out.

   Sediment controls are not filters. Practices referred to as "sediment filtering" actually works by slowing water velocities and allowing sediment impoundment to de-water in a very slow and controlled manner. For effective sediment control planning and design, materials such as geotextiles, silt fences, straw wattles and straw bales should be considered for their ability to impound water and slow runoff velocities, not for their ability to "filter" sediment.

2. Key Point: Effective sediment control involves ponding sediment-laden runoff long enough for the soil particles to settle out of suspension. Reducing runoff velocities will also reduce sediment transport and thereby help retain sediment on-site.

   What are some effective sediment control BMPs?

3. Key point: Structural sediment control can be divided into three general types; 1) sediment basins, 2) sediment traps, and 3) sediment barriers.

   a. Temporary sediment basins are recommended for the outlet of disturbed drainage areas ranging from 5 ac. to 100 ac. , see Appendix A 5332. Sediment basins should be designed by a qualified professional.

b. Temporary sediment traps are recommended for disturbed drainage areas less than 5 ac. A typical sediment trap designed to handle 0.5-inches of runoff over a 24 hour period would require a settling zone capacity of 67 yd3 / ac. of contributing drainage area and a sediment storage capacity of 33 yd3 / ac. of drainage area.

(1) Excavated sediment traps require less rigorous design work, are smaller in size and they are easier to construct, therefore, a preferable alternative is to sub-divide large projects into smaller sub areas (less than 5 ac) and utilize numerous sediment traps. Multiple traps and / or additional volume may be required to accommodate site specific rainfall and soil conditions. This approach may facilitate phased construction along relatively narrow highway right of way.

(2) Excavated storm drain inlets are small excavated sediment traps located at storm drain inlets are effective as part of phased construction. The design capacity of excavated inlet sediment traps shall be 67 yd3 / acre of contributing drainage area. These excavations are temporary and they are not very effective for trapping small particles (silt and clay) and they should not be used where runoff velocities are high.

c. Sediment barriers are BMP's that are intended to separate sediment from sheet flow runoff. They function by reducing runoff velocity and ponding small quantities of storm water. Sediment barriers are only intended for areas experiencing sheet flow and they must be installed in areas that can pond water and accumulate sediment and, most importantly, the must be accessible for cleanout. Sediment barriers are the most common type of practices used on construction sites. The most common types of sediment barriers are as follows:

(1) Silt fence
(2) Straw bale dike
(3) Continuous berms
(4) Storm drain inlet barriers
(5) Straw wattles

2.4 BIOENGINEERING TECHNIQUES

A. **General:** Bioengineering uses plants and structures to function together in mutually reinforcing or complimenting roles. The structural components initially protect and stabilize the site and create a stable zone for the plants to grow.

Bioengineering techniques are used to prevent erosion on upland slopes, to protect stream banks and channels against wave erosion in the coastal zones, or water quality ponds and these biotechnical earth support methods can also be utilized to provide slope stability.

B. **Conditions Where Practice Applies:** Soil bioengineering techniques are generally appropriate for:

1. Slopes to prevent surface erosion

2. Cut and fill slopes stabilization
3. Shallow mass wasting
4. Gully repair
5. Stream bank stabilization
6. Shoreline stabilization
7. Wetland mitigation
8. Watershed rehabilitation

C. **Planning Considerations:**

1. Soil bioengineering generally requires minimal access for equipment and workers and cause relatively minor site disturbance during installation. These practices are therefore considered appropriate for environmentally sensitive areas, such as parks, woodlands, riparian areas and scenic corridors where aesthetic quality, wildlife habitat and similar values may be critical.

2. Bioengineering systems are often more cost effective than the use of vegetation or structural solutions alone. Using indigenous materials accounts for some of the cost effectiveness because plant costs are limited to labor for harvesting, handling and the direct costs of transporting plant material to the site.

3. In bioengineering, the plant material itself may provide both the structural and vegetative components of the design. For example, in willow wattles, live staking and brush-layering the woody material is used to provide initial structural protection and later, vegetative cover.

4. Bioengineering systems are most effective when installed during the dormant season, usually late fall, winter or early spring. Constraints on planting times or availability of the required quantities of suitable plant materials during allowable planting times may limit the usefulness of bioengineering methods.

5. Bioengineering systems are strong initially and grow stronger with time as the vegetation becomes established. Bioengineering systems may withstand heavy rainfalls immediately after installation. Even if vegetation dies, its plant material and surface residue continues to play an important protective roll during vegetation establishment.

6. Soil bioengineering is useful on small, highly sensitive or steep sites where the use of machinery is not feasible.

7. Bioengineering practices are limited by the available medium for plant growth-rocky or gravelly slopes may lack sufficient fines or moisture to support plant growth or hard pans may prevent the required root growth. Adequate natural precipitation may also limit the applicability of bioengineering techniques.

D. **Design Criteria:** Choose plant materials that are adapted to the site conditions. Local stands of willow or other suitable species are already well suited to the climate, soil conditions and available moisture and they make good candidates for survival on most sites.

When choosing live willow material for bioengineering applications, remember that young (less than 1 year old) wood or suckers will often sprout easier under optimum conditions, but healthy, older wood (1 to 4 years old) has greater vegetative (energy) reserves necessary to consistently sprout and the older wood is much stronger. If possible, mix younger wood with older wood for the bioengineering application such that a majority of the material is 1 to 4 years old.

Research indicates that all cuttings should be soaked for a minimum of 24 hours, whether they are stored or harvested and immediately installed (Hoag 1991; Hoag et al. 1991; Hoag et al. 1992). Some research recommends soaking the cuttings for as much as 10 to 14 days (Briggs and Munda 1992; Frenchel et al. 1988).

E. **Bioengineering Measures:** The following practices have specific construction recommendations in this manual. For more information of these practices refer to the appropriate BMP.

1. Vegetated rock gabion: Is a structure built of metal wire baskets filled with rock and soil. These structures are then inter-planted with woody plant material. See Appendix A - 5405

2. Straw rolls: Are long bags or nets filled with straw or similar material. They are placed along the contour of a slope or stream bank in order to reduce erosion and sedimentation. Commonly uses wood or live stakes to anchor the roll in place. See Appendix A – 5250.

3. Live stake planting: Live stake planting is the planting of live, rootable, vegetative cuttings into the ground. See Appendix A - 5220

4. Branch-packing: Consists of alternative layers of live branch cuttings and compacted backfill to repair small-localized slumps and holes in slopes.

5. Brush-layering: Cuttings or branches are layered between successive lifts of soil fill to construct a reinforced slope. See Appendix A – 5200.

6. Willow Wattles: Are woven bundles of woody branches typically from a species that is very rootable. This bundle is place along the contour of a slope or stream bank in order to reduce the length of the slope and provide vegetation as a buffer zone. They commonly have wood or live stakes to anchor the wattle in place. See Appendix A – 5260.

7. Coir rolls: Fiber filled mesh logs used to stabilize shorelines, stream banks and wetlands. Coir rolls resist stream bank and wave erosion and provide a stable substrate for plant establishment. See Appendix A – 5250.

8. Coir mats: Coir mats are dense, biodegradable mats are usually made of coconut fiber (coir), used to protect stream banks and wetland shores from erosion, trap sediment and provide a stable substrate for wetland plants. See Appendix A – 5210.

F. **Inspection and Maintenance:** Regular inspection and maintenance of bioengineering installations should be conducted, particularly during the first year. Prompt correction of

any failures is essential to prevent major problems from developing. For the first 3 months, weekly inspections need to be made. After the three-month period, inspections can go to every two weeks for tow months, and then every mother thereafter.

2.5 SUBDIVISION AND LOT DESIGN FOR GRADING AND DRAINAGE

A. **General** – The City's basic philosophy of subdivision and lot design for grading and drainage is that the lot is to be so designed that the lot drainage be directed toward the street for disposal by the City's storm drainage system without negatively impacting lots by abrupt changes in grade. It is also the City's philosophy to have each lot graded so as to maximize the amount of infiltration of storm water into the individual lot without increasing the potential for damage to structures constructed on the lot. Designers of subdivisions are also to include features on each lot, which prevent wherever possible, the cross-drainage of one lot to another, except in dedicated drainage easements. Where storm water drainage cannot be directed toward the public street, the designer is to provide for a subdivision level drainage system which is a private drainage system in the side and/or rear yards which provide for cross-lot drainage. Subdivision level storm water is to be disposed of to an approved storm water facility, which is to be approved by the City Engineer.

B. **Preliminary Design Report** - The developer is responsible for preparing a preliminary design report for this portion of the work and submitting it to the Engineering Department for review and approval, prior to proceeding forward with final design. The preliminary design report shall include preliminary information on geological, geotechnical and soils related issues related to the specific project. It shall also include preliminary information regarding the proposed storm drainage system for the project indicating how the applicant intends to grade the lots, streets and other portions of the project to address storm water runoff for the entire project. The intent of the preliminary design report is to provide sufficient information for general approval by the City prior to proceeding to final design. One of the purposes of this report is to streamline the development process by minimizing the need for costly revisions to the designs by involving the City early in design procedures. The applicant is to receive approval of the report prior to proceeding to final design.

C. **Grading and Drainage Report** - The developer shall prepare a grading and drainage report which is to include plans for storm water management, erosion control, and grading describing the methods by which surface water, natural drainages, flooding, erosion and sedimentation loss, and hydrologic hazards will be controlled during and after construction. The plan shall include:

1. Stamps and Signatures of Licensed Professionals – The report is to include the stamps and signatures of the registered professionals who have prepared the report. Their stamps and signatures shall be affixed to the first interior page of the report. The professionals preparing this report are to be licensed professionals in the State of Utah for their respective professions. Those preparing the report shall include: a licensed civil engineer for the grading and drainage portions of the project, a certified erosion control specialist for the erosion and sedimentation loss portions of the work. The City may accept other professionals who have had at least 6 years experience with erosion and sedimentation loss for this portion of the report including landscape architects and civil engineers. The City reserves

the right to accept or reject qualifications of professionals proposed to prepare the report.

2. Grading Plan – The report is to include a grading plan for the project. This plan is to show present and proposed topography to include elevations, lines and grades including the location and depth of all proposed fills and cuts of the finished earth surfaces using a contour interval of one or two feet.

3. Graded Area – The report is to include the proposed area to be graded, which is to be clearly delineated on the plan. Identify depths of cuts and fills. Also, identify finish floor elevations of all structures and show those elevations on the plans.

4. Drainage and Erosion Calculations and Details; Hydrologic Hazards – The report is to include all assumptions, information, calculations and proposed details used for design and construction of debris basins, impoundments, diversions, dikes, waterways, drains, culverts and other water management or soil erosion control measures shall be shown. Drainage calculations shall determine runoff volume and peak discharge using the "Rational Method",

   "SCS Curve Number Method", or appropriate equivalent. Data provided is to include:

   a. Rainfall depth, duration and distribution
   b. Watershed slope and drainage area delineation
   c. Land condition or watershed surface
   d. Existing and proposed topography of the drainage area
   e. Description of soil conditions of watershed. Erosion calculations are to employ predictions of soil loss sheet erosion using the Universal Soil Loss Equation or appropriate equivalent. Data to be provided should include factors of:

      (1) Rainfall intensity and duration. See South Jordan City Standards.
      (2) Soil erodibility
      (3) Land slope and length of slope or topography
      (4) Condition of the soil surface and land management practices in use
      (5) Surface cover, grass, woodland crops, pavements, etc.

5. Erosion Control During Construction – The grading and drainage report will be prepared by the developers engineer in which he will describe the methods intended to be employed to control the erosion and sedimentation increase while in construction.

6. Interim Stabilization during Construction – The developer/builder is responsible for interim stabilization of all disturbed areas during the period of construction to prevent erosion offsite effects and for final stabilization once construction is completed. The report prepared will address these issues.

7. Limit of Watershed/100-Year Flood Plain Maps – The report is to include maps of the development site (1"=200'), which define the boundaries of any 100-year flood plain and the limits of the watershed.

8. Existing Drainage Channels/Permits – The report shall include a separate map, which indicates the historic drainage channels associated with the project. Existing drainage channels shall remain as historically located except that roads and utilities may be installed across such channels as approved by the Planning Commission. Where these channels must be modified, permits must be obtained from Salt Lake County Flood Control, applicable canal companies, the Utah Division of Water Rights, as appropriate, and the US Corps of Engineers, as applicable. The developer shall provide copies of approval letters to the City. Structures and or lots shall be arranged so as to insure adequate setbacks from all drainage channels based upon the100-year storm.

9. Storm Water Collection Facilities – The report shall show any existing and proposed storm water collection facilities associated with the project. Storm water and sediment collection facilities shall be required to be constructed on development sites in accordance with the following:

   a. Such facilities shall be the first improvements or facilities constructed on the development site.
   b. Such facilities shall be designed to detain the storm water flows, including sediment loads, of a 10-year storm while allowing offsite discharge not to exceed 0.2 cubic feet per second per acre.
   c. Such facilities shall be so designed as to divert surface water away from cut faces or sloping surfaces of a fill.
   d. The existing natural drainage system will be improved as required by the City.
   e. Where drainage channels are required, wide shallow swales lined with appropriate vegetation, rock, or other approved material are to be used instead of cutting narrow, deep drainage ditches.
   f. Flow retarding devices, such as detention ponds, check dams and recharge berms are to be used where practical to minimize increases in runoff volumes and peak flow rates due to development.

10. Minimize Disturbance of Vegetation Cover – The Developer is to indicate in the report how he intends to minimize the disturbance of vegetative cover within the project. Construction of the development shall be such that it minimizes the disturbance of vegetation cover.

11. Erosion Control Measures to Reduce Suspended Solids – The report to be prepared is to indicate the erosion control measures, which will be employed at the site, during construction and for the long-term. Erosion control measures on the development site shall be required to minimize the increased suspended solids loading in runoff from such areas. A drainage system shall be designed to control storm water erosion during and after construction.

12. The report shall indicate that no grading or stripping is to be permitted unless the appropriate equipment is used and except as part of a development plan approved by Engineering and the Planning Commission

13. Hydrologic Hazards - A description of any hydrologic hazards associated with the proposed site and adjacent area is required and are to be discussed in the report. Hydrologic hazards might include high water table, surface water impoundments, gradient of the property, flood plains, etc.

D. **Final Design Report** - The developer is responsible for preparing a final design report for this portion of the work and submitting it to the City for review and approval, prior to the approval of the land disturbance permit. The final design report shall include the preliminary design report, the geotechnical report, the grading and drainage report and the final grading design and design of the subdivision drainage facilities related to the erosion and sediment report indicating the BMP's to be used for a specific project. The intent of the final design report is to provide sufficient information to the City to obtain their approval prior to proceeding with the preparation of plans and specifications.

E. **Subdivision Design for Grading and Drainage** – Each subdivision is to be designed to provide a subdivision level drainage system. This subdivision level drainage system is to be composed of both public and private drainage facilities. The public drainage systems are to be located within the City's street right-of-ways and other fee parcels and the private systems are to be located within easements which are to be controlled by easement restrictions and covenants, codes and restrictions (CC&R's), and enforced by private agreements or through neighborhood associations. Drainage facilities located within private easements are not being considered as City responsibilities unless approved by the City Engineer.

In cases where lots cannot be graded to allow for the total amount of storm drainage to go to the streets, the designer shall provide for side yard and rear yard drainage facilities, which will convey individual lot drainage from each, lot and dispose of it properly. All attempts are to be made to drain individual lot storm water to the street.

F. **Lot Design for Grading and Drainage** – Each lot is to be designed to provide for drainage into the subdivision level drainage system. This lot level drainage system is to be composed of private drainage facilities, i.e. grass-line swales, grading to allow drainage toward the street, rear yard storm water drainage facilities to pass water from one lot to another, etc. The private drainage systems are to be located within dedicated easements, which are to be administered and controlled by private parties. Drainage facilities located within private easements are not to be considered as the City's responsibility.

In cases where lots can not be graded to allow for the total amount of storm drainage to go to the streets, the designer shall provide for side yard and rear yard drainage facilities which will convey individual lot drainage to the subdivision level storm water drainage system. All attempts are to be made to drain individual lot storm water to the street.

No streets with cul-de-sacs are allowed unless measures are approved by the City Engineer. The facilities must meet minimum standards of the building codes as well.

G. **Structure Design for Drainage** – All attempts need to be made to divert lot level storm drainage to he public right-of-way. This includes all impervious surface areas on each lot including roof drains, driveways, and other impervious surfaces. In the case of roof drains, the designer of the subdivision and lot are to provide for roof drainage discharge

to the public street, wherever possible. The lot designer must provide for facilities to convey this type of storm water from the downspout to the curb and gutter by overland flow. The City will not allow the boring or cutting of curb and gutter to installation of piping systems for this purpose. The Engineering Department and Building and Safety Division are to review and approved these measures.

2.6 CLEARING, GRUBBING AND STRIPPING (See Appendix B – Section 02112)

A. **General** – All clearing, grubbing and stripping work to be completed shall first be designed by a registered Geotechnical engineer and approved by the City. It consists of clearing of all structures, trees, brush and other organic and deleterious materials from the project site so that excavation and grading can begin. In preparing for this phase of work, the Developer needs to know that only certain options are open for disposing of material cleared from the site. The Developer or his contractor must obtain prior approval of the process requested.

During the clearing, grubbing and stripping work if the soils and/or vegetation indicate the area is a wetland, all work will cease at no cost to the City, until mitigation plan can be reviewed by the Army Corp of Engineers or the Natural Resource Conservation Service (NRCS).

B. **Vegetative Material Disposal** - For trees, brush and other vegetative materials only the following disposal options are approved:

1. Burn the material – This is an option but a number of agencies will need to be consulted and permits obtained prior to using this method. Permits/approvals will need to be received from:

   a. South Jordan Fire Department (WJFD).
   b. State of Utah, Department of Environmental Quality, Division of Air Quality (DEA)
   c. State of Utah, Department of Environmental Quality, Division of Water Quality
   d. City of South Jordan, Community Development and Engineering departments
   e. Other agencies as needed.

2. Haul material to an approved landfill – This option will require that the Developer collect all vegetative material and haul it to a City approved landfill. The Developer will need to provide evidence that a landfill will accept the material and then evidence must also be provided which indicates the material was actually deposited at said landfill. The City must approve this method and destination prior to the Developer proceeding with this work.

3. Chip and shred the material – If the Developer selects this disposal option, all vegetative materials will need to be disposed of through a mechanical chipping/shredding process. The machine to be used shall be a tub grinder through which all material shall be processed. Once the vegetative material has been processed through the tub grinder, the material will be evening distributed across the topsoil it is to be mixed into and thoroughly mixed. See Appendix B – Section 02112.

The Developer and his contractor are hereby put on notice that any deviations from these three processes will result in the Developer and his contractor removing the material from where it has been deposited and properly disposing of the material. Disposal of the material by cutting it, running a tracked bulldozer over it to crush it and then mixing it with soil and disposing of the material on site is illegal and unacceptable. The use of such unapproved methods will be reported to the State of Utah, Department of Environmental Quality, Division of Solid and Hazardous Waste who also has jurisdiction of illegal landfills.

C. **Man-made Materials Disposal** - For all man-made materials, such as processed wood, concrete, dry wall, adhesives, etc., only disposal at an approved landfill site is acceptable. The Engineer shall design the work covered under subsection 2.2 to meet the following technical specification section:

1. Section 02112. – Clearing, Grubbing and Stripping

D. **Topsoil** – The topsoil contains valuable native seeds that commonly are not available to include in a native re-vegetation seed mix; an example is the State's native flower Sego Lily. Therefore, the construction plans should clearly identify the locations of the topsoil stockpile areas.

The Developer's engineer should use the project geotechnical report to determine the area required to stockpile the topsoil. To minimize the handling of the topsoil, construction sequencing should also be used in determining the topsoil stockpile locations. The construction should be clearly indicated.

1. Stockpile locations indicate by drawing a line around the area and adding a distinctive pattern within the area.

2. Sediment controls used to keep the topsoil from contaminating the surrounding areas.

3. Erosion controls to prevent wind, water, snow and ice erosion.

2.7 DUST CONTROL

A. **General** – The Developer is responsible for controlling the dust produced at his project and shall provide the necessary mitigation to keep the dust to the acceptable limits identified in the air quality permit obtained from the State of Utah, Department of Environmental Quality, and Division of Air Quality. Ignorance of these codes and statutes is not an acceptable reason for not complying with these requirements.

2.8 GRADING AND EXCAVATION

A. **General** – All grading work shall be done under the City's supervision, which shall include an engineering geotechnical consultant, retained and paid by the City and reimbursed by the Developer. The consultant shall be answerable to the City only.

B. **Grading** – All grading work to be completed shall first be designed by a registered geotechnical engineer and approved by the City. As part of the approval process, the

Developer shall prepare plans and specifications for the project, which identify existing topography and geology and indicate methods and processes to be used in doing the grading. Once the City has approved the work, a geotechnical engineer shall have a representative on site at all times grading is being done and must oversee grading. The geotechnical engineer shall be retained and paid by the City and reimbursed by the Developer to the City. Once work has been completed, the Developer engineer shall prepare record drawings indicating the 'as-constructed' condition of the work.

The Engineer shall design the work covered under subsection 2.8 to meet the following technical specification sections:

1. Section 02200 – Earthwork

2. Section 02210 – Site Grading

C. **Excavation** – Excavation shall be performed to the lines and grades indicated on the Contract Documents. During excavation, material satisfactory for backfilling shall be stockpiled in a safe manner. Excavated material not required or not satisfactory for backfill shall be removed from the site. Excavation shall be braced and supported as need to prevent the ground, adjacent to the excavation, from sliding or settling. Localized slides or settlements shall be promptly removed and corrected by the Contractor.

1. Requirements. All land disturbance related construction, that a Land Disturbance Permit is required, or work shall have the land disturbance permit available on-site and shall be subject to inspections by authorized employees of the City, and certain types of work to be determined by the City Engineer shall have either continuous or constant inspection and supervision by a registered civil engineer, and/or other appropriate consultants, soils engineer, and engineering geologist as a condition of the issuance of the land disturbance permit. Prior to issuing a stamped and signed grading certificate by the civil engineer responsible for the grading operation, a final inspection shall be made of all construction or work for which a land disturbance permit has been issued.

2. Exposure of work. Whenever any work on which inspections are required, as specified in this section, is covered or concealed by additional work without having first been inspected, the Construction Manager may require, by written notice, that such work be exposed for examination. The work of exposing and recovering shall not entail expense to the City.

3. Notices. The land disturbance permit holder or his agent shall notify the Construction Manager twenty-four (24) hours in advance of the time when the grading operation is ready for each of the following inspections:

   a. Initial inspections. When the land disturbance permit holder is ready to begin work but before any clearing and grubbing is started;
   b. Toe inspections. After the natural ground is exposed and prepared to receive fill but prior to the placing of any fill. Approval for placing fill shall not be made until all debris and unsuitable material has been removed from the site to an approved location;
   c. Sub-drain inspections. Inspections shall be required on all sub-drains after the installation but prior to the placement of any fill;

d. Excavation inspections. After the excavation is started but before the vertical depth of the excavation exceeds ten (10') feet;

e. Fill inspections. After the fill emplacement is started but before the combined vertical height of the lift exceeds ten (10') feet;

f. Drainage device inspections. After the forms, steel reinforcement, and pipe are in place but before any concrete is placed;

g. Rough grading. When all the rough grading has been completed. This inspection may be called for at the completion of the rough grading without the necessity of the City Engineer having previously reviewed and approved applicable reports;

h. Rough grading certification. A conditional interim certificate may be issued to the City Engineer to allow the issuance of building permits. This certificate shall in no way exonerate the applicant from completing the grading;

i. Final certification. When all work, including the installation of all drainage structures, other protective devices, the compaction of trench backfill, and planting and slope stabilization, has been completed and the "as built" plan and required reports have been submitted;

j. Other inspections. In addition to the called inspections provided by this section, the City Engineer may make any other inspections of any work to ascertain compliance with the provisions of this chapter and other laws; and

k. Interrupted grading. When the land disturbance permit holder is ready to resume work, but before any grading or brushing is started, the land disturbance permit holder or his agent shall notify the Construction Manager twenty-four (24) hours in advance of the time when the grading operation is ready.

4. Certification. The Developer's Engineer shall certify to the City Engineer, upon the completion of the grading work, that all grading work has been done in compliance with all approved grading plans and reports and that all applicable Building Code regulations shall be administered by the office of the Building Official thereafter.

5. Issuance of certificates. Upon the final inspection when it is found that the work authorized by the land disturbance permit, including the installation of all drainage structures, has been satisfactorily completed in accordance with the requirements of this chapter, a grading certificate covering such work shall be issued by the Developer's Engineer to the City Engineer.

6. Final reports. Upon the completion of the work, the City Engineer may require the following reports and information:

a. A report from a registered civil engineer certifying that all grading, lot drainage, and drainage facilities have been completed in conformance with the approved plans and the provisions of this chapter and that the graded site will support residential or commercial type structures, whichever is applicable;

b. A soils engineering report including, but not limited to, certification of the soil bearing capacity, summaries of field and laboratory tests, locations of tests, expansive soil classification lot by lot, and slope tests

taken in the fills showing the limits of compacted fill on an "as built" grading plan;

c. An engineering geology report by the engineering geologist, based on the final contour map, including specific approval of the grading as affected by geological factors. Where necessary, a revised geologic map, cross sections, and any recommendations necessary shall be included; and

d. When "as built" grading plans are required, as determined by the City Engineer, such plans shall be signed by the supervising civil engineer, the soils engineer, and the engineering geologist, when applicable, for their portions of the work.

e. Electronic copy of detention basins with volumes and calculations.

The Engineer shall design the work covered under subsection 2.4 to meet the following technical specification section:

1. Section 02222 – Excavation and Backfill for Structures

D. **Fills** – All work performed under this item shall be under the direct supervision of a registered geotechnical engineer. The Developer shall be responsible for design and obtaining approval of the design from the City, prior to proceeding with construction. A geotechnical engineer shall also have a representative at the site during all times work is being performed on this work. The geotechnical engineer and his staff shall be retained by the City and directly paid for by the City from a deposit for this work from the Developer. The Contractor shall comply with these design and construction standards and the Contract Documents for the project in constructing the work.

1. Height. No finished fill slope shall exceed a vertical height of twenty-five (25') feet unless approved by the City Engineer and Planning Commission. If a fill slope is permitted above such height, a horizontal terrace with a minimum width of twenty-five (25') feet may be required to be installed at each one hundred (100') feet of vertical height, and intervening terraces also may be required.

2. Slope. No fill shall be made which creates any exposed surface steeper in slope than three (3) horizontal to one vertical. Exceptions are:

a. The City Engineer may authorize a fill slope which is steeper in slope than two (2) horizontal to one vertical and is less than six (6') feet in height, if:

(i) The applicant can demonstrate that because of special circumstances applicable to the property, including size, shape, topography, location, or surroundings, the strict application of this section would deprive such property of the ability to be reasonably developed; and

(ii) The applicant produces sufficient data from a soils engineer, an engineering geologist, and a landscape architect to demonstrate that the material of which the slope is composed and that the material underlying the slope is capable of permanent stability on a steeper slope, and that the required slope planting can be adequately maintained.

3. Unstable material. The City Engineer may require that the fill be constructed with an exposed surface less than three (3) horizontal to one (1) vertical if, under particular conditions, such flatter surface is necessary for stability or safety.

4. Fill slope limits. Toes of fill slopes shall not be made nearer to a project property boundary line than one-half (1/2) of the height of the fill but need not exceed a horizontal distance of twenty (20') feet. Fill slopes shall not be divided horizontally by property lines, and fill slopes occurring on a side or rear lot line shall be made a part of the downhill lot. If the City Engineer determines such requirement is unnecessary because of special conditions, he may make adjustments as a condition of the land disturbance permit.

5. Intervening terraces. Terraces shall be paved (reinforced concrete or gunite) terraces, shall have a minimum width of six (6') feet, shall be extensively landscaped in accordance with an approved landscaping plan, and shall be spaced at vertical intervals of twenty-five (25') feet; provided, however, for slopes less than forty (40') feet in vertical height, the terraces shall be approximately at mid-height. For slopes less than three (3) horizontal to one vertical, or where soil conditions require additional intervening terraces may be required.

6. Compaction. All fills shall be placed, compacted, inspected, and tested in accordance with the provisions of this subsection. If the strict enforcement of the provisions of this subsection is determined by the City Engineer to be unnecessary because of the proposed or probable use of the land, he may waive the requirements. The requirements of this subsection shall not be waived when structures are to be supported by the fill, or if the fills are being placed in areas to be designated as hillside, or where they are necessary as a safety measure to aid in preventing the saturation, settling, slipping, or erosion of the fill.

   a. The natural ground surface shall be prepared to receive fill by removing vegetation, non-complying fill, topsoil, and/or porous, compressible soil. Where natural slopes are five (5) horizontal to one (1) vertical or steeper, and the height of the fill is twenty (20') feet or greater, benching into sound bedrock or other competent material shall be required. Fill slopes, which toe on natural slopes, shall be provided with adequate drainage.
   b. No deleterious material shall be permitted in fills. Except as otherwise permitted by the City Engineer, no rock or similar irreducible material with a maximum dimension greater than eight (8") inches shall be buried or placed in fills.
   c. Upon recommendations made by a soils engineer and approved by the City Engineer prior to the grading of any project, rock with dimensions from eight (8") inches to thirty-six (36") inches may be placed in compacted fill. Such oversized rocks shall not be in the upper ten (10') feet of compacted fill or nearer than twenty (20') feet to the surface of any fill slope. Such rock areas shall be shown on "as built" plans and certified to be compacted by the soils engineer.
   d. The fill shall be spread in a series of layers, each not exceeding eight (8") inches in thickness, and shall be compacted by an approved method after each layer is spread.

e. The moisture content of the fill material shall be controlled at the time of spreading and compacting to obtain the required relative compaction and avoid excessive pore pressure as the fill increases in depth.

f. All fills shall be compacted to a minimum of ninety (90%) percent (unless under roadways) of the maximum density as determined by ASTM D 1557-66T, Method A or C, modified to three (3) layers. If the required degree of relative compaction cannot be attained on sloped surfaces, the slope shall be cut back until the compacted inner core is exposed.

g. The field density shall be measured in accordance with the procedure specified in ASTM D 1556-58T, or a later revision, using the optional base plate and making a suitable adjustment for volumes of rocks in the test hole or other approved testing methods giving equivalent test results.

h. A field density test, as set forth in this subsection, shall be taken for each eighteen (18") inches of fill, or portion thereof, measured vertically from the lowest point of the area to be filled, or for each one thousand (1,000) cubic yards of fill placed. In addition, in the case of subdivisions, at least one field density test shall be taken on each lot, which receives fill.

i. All fills regulated by the provisions of this chapter shall be tested for relative compaction by the soils engineer. A certificate of compliance with the terms of this section and the land disturbance permit, setting forth densities, relative compaction, the expansive soil report, allowable bearing value, and other soil characteristics, shall be prepared and signed by the soils engineer. The Developer is responsible for paying for these tests. Such report shall be submitted to, and be approved by, the City Engineer before any final approval of the fill is given and before any foundation construction begins.

j. If building is not commenced within one year following the final certification and approval by the City Engineer, a reevaluation as to the adequacy of the intended use and a report shall be filed with the City Engineer for approval. Such report shall contain data on compaction, stabilization, and expansive soils.

7. Fills toeing out on natural slopes. Fills toeing out on natural slopes, which are steeper than three (3) horizontal to one vertical, shall not be permitted.

8. Combined cut and fill slopes. Combined cut and fill slopes shall meet the requirements of subsections (a), (b), (c), and (d) of this section insofar as steepness, height, and benching are concerned except that, where the slope exceeds twenty-five (25') feet in height, the required drainage bench shall be placed at the top of the cut slope. Fill placed on or above the top of an existing or proposed cut or natural slope steeper than three (3) horizontal to one vertical shall be set back from the top of the slope a minimum distance of six (6') feet.

9. Existing fills. All existing man-made fills on any and all sites shall be properly evaluated, and, if deficiencies exist, recommendations and design criteria for corrective measures shall be included within the soils engineering report.

10. Progress reports.

a. Periodic soils reports by a soils engineer certifying the compaction or acceptability of all fills may be required. Such reports shall include, but need not be limited to, the inspection of cleared areas and benches prepared to receive fill and the removal of all soil and unsuitable materials, the bearing capacity of the fill to support structures, the placement and compaction of fill materials, and the inspection of buttress fills, sub-drains, and similar devices. The frequency of such reports shall be at the discretion of the City Engineer and shall be a condition of the land disturbance permit. If the report is not submitted in a timely manner, the City Engineer may temporarily revoke or put on hold the Land Disturbance permit and all work should cease until such time as the report is submitted.

b. The City Engineer may require sufficient inspections by an engineering geologist to ensure that all geologic conditions have been adequately considered. Where geologic conditions warrant, the City Engineer may require periodic geologic reports. Such inspections and reports may be required to include, but need not be limited to, the inspection of cut slopes, canyons during clearing, operations for groundwater and earth material conditions, benches or keys prior to the placement of fill, and possible underground water spring locations.

11. Measure of settlement. On fills of forty (40') feet or more, if recommended by the soils engineer, the City Engineer or the Building Official may require the determination of the settlement characteristics of such fills to establish that any movements have substantially ceased.

12. In such cases, a system of bench marks shall be installed by a civil engineer or land surveyor at critical points on the fill, and accurate measurements of both horizontal and vertical movements shall be taken and evaluated by the soils engineer for a period of time sufficient to define the settlement behavior. The evaluation period shall in all cases include the period from October 15 through March 15.

The Engineer shall design the work covered under subsection 2.4 to meet the following technical specification sections:

1. Section 02291 – Embankment
2. Section 02292 – Dam Embankment Construction

E. **Buttress Fills**

1. General. A buttress fill is a designed compacted earth fill used for providing lateral support to an un-stabilized earth or rock mass. All buttress fills shall be designed in accordance with the recommendations and design criteria, including the sub-drain system, submitted by the soils engineer or engineering geologist with the approval of the City Engineer.

2. Foundation. The ability of the foundation soil to support the buttress shall be investigated, and additional benching shall be required to what is otherwise specified for ordinary fills. The soils engineer shall provide specifications for keying the base of the buttress and for bonding the buttress to the natural ground.

3. Sub-drains. Sub-drains which blanket the entire back face of the buttress or which occur at intervals shall be provided to prevent the buildup of hydrostatic pressure. The details of sub-drains shall be provided by the soils engineer.

4. Safety factor. The buttress fill shall be designed for a minimum safety factor of 1.50 based upon the smaller value of yield or ultimate shear strength of the fill material.

F. **Topsoil** – The Developer shall design the project to retain the topsoil on-site and not export it to an off-site location. Topsoil shall be stripped, processed and stockpiled or live hauled to an adjacent reclaim area in accordance with the requirements of the Contract Documents and Section 3.0 of these standards

G. **Slope Preparation** – Care must be taken to properly prepare the slopes for acceptance of seed erosion control blankets or other approved erosion control material. Clods, rock, tree, brush and other plant material and other obstructions shall be removed from the slope so that direct contact of the soil erosion blanket can be maintained for the entire blanket.

The Engineer shall design the work covered under subsection 2.4 to meet the following technical specification section:

1. Section 02293 – Slope Contouring

H. **Building Lots Requiring Additional Fill** – Lots requiring additional fill dirt in excess of 12-inches shall submit the following information for review, prior to construction. The International Building Code, Appendix 33 and City Ordinances are to be followed in the event a conflict exists than the more restrictive ordinance shall govern.

1. Geotechnical report addressing the following:

   a. Is existing soil able to receive the proposed additional fill?
   b. Is proposed fill material to be used correct for such usage?
   c. Procedure of placing additional fill

      (1) Maximum lift eight inches
      (2) Compaction to be 95% minimum, unless landscaped area and then the top 18" shall be at 90% compaction
      (3) Correct moisture

   d. Surface treatment to prevent erosion
   e. Maximum finish slope to be no greater than two (horizontal) to one (vertical)
   f. Slope setbacks to be as per International Building Code Appendix, Chapter 33, Excavation and Grading section 3314-Setbacks

      (1) Top of Slope: Height of slope divide by five (H/5); minimum of two feet and maximum of ten feet with additional setback for drainage surface waters.

(2) Toe of Slope: Height of slope divided by two (H/2) minimum of two feet and maximum of ten feet.

2. Final report from Geotechnical Engineer.

a. The conditions and procedure in the original geotechnical report was followed. Final report shall be written by author of original Geotechnical report.

2.9 EROSION CONTROL AND DRAINAGE DEVICES

A. **Intervening Terraces** - Paved (reinforced concrete or gunite) intervening terraces shall have a minimum width of six (6') feet and may be installed on the face of all cut and fill slopes at intervals not to exceed twenty-five (25') feet measured along a vertical plane.

The longitudinal slope of intervening terraces shall not be less than two (2%) percent or more than twelve (12%) percent, and any change in the rate of grade within these allowable slopes shall increase the grade in the direction of the flow.

A single run of an intervening terrace shall not exceed two hundred (200') feet to a down-drain. If soil in paved terrace areas is termed "expansive", the paved terraces shall be designed by a registered civil engineer to resist the expansive characteristics of the area.

B. **Diverter Terraces** - Where recommended by a soils engineer, paved (concrete or gunite) diverter terraces, a minimum of thirty (30") inches in width and one (1') foot in depth, shall be installed at the top of all cut slopes where the tributary drainage area above has a slope exceeding ten (10) horizontal to one vertical and a horizontal projection greater than fifty (50') feet. The diverter terrace design shall be shown on each plan for City approval, based on the recommendations of the soils engineer and engineering geologist to the satisfaction of the City Engineer.

C. **Vee Channels** - Where a slough wall is required at the toe of the slope, the City Engineer may require a vee channel to be constructed behind the wall to carry off the slope waters.

D. **Inlet Structures, Down-drains, and Outlet Structures**.

1. Inlet structures. Inlet structures shall be of concrete and galvanized metal. The inlet shall be grated or grilled or of such entry shape as to prevent the entry of objects of greater than four (4") inches dimension and permit objects of a maximum of two (2") inches dimension. Inlet structures shall be placed on the bench and shall be so shaped as to provide small entry losses. An overflow structure into the "vee" down-drains shall be provided.

2. Down-drains. Down-drains shall be of concrete, corrugated galvanized iron hot-dipped in asphalt, or equivalent. Pipe down-drains shall have a diameter of a size required by runoff calculations but not less than twelve (15") inches. Open channel down-drains shall be designed by a civil engineer and shall have a minimum capacity equal to four (4) times the capacity of the required pipe size. The alignment of down-drains shall be such as to maintain a constant velocity head.

3. Cleanouts. Cleanouts shall be provided at all points of severe change in grade and at points of entry to public rights-of-way.

4. Outlet structures. Outlet structures shall be of concrete, galvanized iron hot-dipped in asphalt, or equivalent. Where out-letting into streets, the structure shall be of City standards or a design approved by the City Engineer. Where out-letting into natural watercourses or other approved locations, the structure shall be provided with adequate velocity reducers, diversion walls, riprap, concrete aprons, or any similar energy dissipator. All slope drainage shall be collected and disposed of in the drainage device.

E. **Runoff Computations** - Runoff shall be based upon the proper fifty (50) year isohyetal map, and the runoff calculation shall be based upon the latest methods adopted by the City Engineer.

F. **Drainage Dispersal Walls** - A drainage dispersal device shall be constructed whenever it is necessary to convert channel flow to sheet flow, and the structure shall be of a design approved by the City Engineer.

G. **Sub-drains** – Sub-drains shall be installed to collect any active or potential springs or seeps, which will be covered by the fill. Sub-drains shall be installed after any watercourse has been excavated to firm material in preparation for receiving the fill. Individual design shall be shown on each plan for the City Engineer's approval. Upon the recommendation of the soils engineer and engineering geologist, and upon the approval of the City Engineer, the installation of sub-drains may be eliminated.

H. **Site Drainage** - All building pads with cut or fill shall be constructed to carry surface waters to the nearest practical street, storm drain, or natural watercourse approved by the City Engineer and/or appropriate governmental agency as a safe place to deposit such waters. At least a two (2%) percent grade toward the approval disposal area shall be required for building pads. Where recommended by the soils engineer, eave or ground gutters shall be provided to receive all roof water and deliver it through a non-erosive device to a street or watercourse. Compacted fill berms shall be required to be constructed at the top of all slopes where diverter terraces are not required by the City Engineer.

2.10 SLOPE EROSION PROTECTION

A. **General** – Storm water from construction sites can cause a great deal of damage to a construction project, as well as the existing City maintained storm drain system. To repair these damages, additional funds are required from Developers and other to repair these damages, which costs can be avoided. This section provides the Developer with a few "Best Management Practices" (BMP) accepted nation wide, by the international erosion control industry and the City of South Jordan. The purpose of this section is to indicate BMP's approved by the City and does not attempt to make an exclusive list of approved BMP's. Should the Developer wish to use BMP's not indicated here, the proposed BMP will be submitted to the City for approval, seven days before the preconstruction meeting is held with the City before implementing proposed BMP. It is unacceptable to use an unapproved BMP, and is the basis of a work stop order being placed on the project. The work stop will remain in force until said BMP is approved by the City or removed and replaced with an approved BMP.

B. **Sediment and Erosion Control BMP** – For the convenience of the Developer, engineer and builder, the City has prepared several tables, which indicate the BMP required for various situations and conditions. The situations include construction sites, slopes, soil types and then indicate the sediment control and erosion control BMP's approved by the City. Please refer to the following tables. If there is a conflict between the tables and the written description of the Sediment and Erosion Control BMP, the written description will control. The table is not an inclusive list of all approved BMP and actual site conditions may mandate the use of additional BMP not listed.

The difference between sediment control and erosion control is that sediment control contains the soil that has been eroded from the area of disturbance to the lowest point of the drainage, on or offsite. Due to re-grading, sediment removed for streets and maintenance of the sediment control BMP, sediment control is more expensive to pay for than properly designed and installed erosion control.

Erosion control is based on the principal that the soil stays in the location of final grading. Erosion control BMP's are designed so the soil remains stable and does not become displaced during rainfall or other source of water events.

SEDIMENT AND EROSION CONTROL BEST MANAGEMENT PRACTICES				
Area	***Soil Type***	***Slope***	***Type of Protection***	
			Sediment Control	**Erosion Control**
Construction Site	Clay	>4:1 (25%)	Silt fence, silt barriers, construction entrance, inlet protection, wattles, sediment basins	Construction phasing temporary and permanent seeding/mulch, mulch, riprap, surface roughing

		>3:1 (33.3%)	Silt fence, silt barriers, construction entrance, inlet protection, wattles, sediment basins	Construction phasing temporary and permanent seeding/mulch, riprap, or mulch/tackifier, anchored straw, soil retention blankets, surface roughing
		>2:1 (50%)	Silt fence, silt barriers, construction entrance, inlet protection	Construction phasing with temporary or permanent seeding/mulch (anchored), riprap, or anchored mulch, soil retention blankets, or anchored straw
Construction Site	Sand	>4:1 (25%)	Silt fence, silt barriers, construction entrance, inlet protection, sediment basins	Construction phasing with surface roughing or temporary or permanent seeding/mulch (tackifier), or mulch with tackifier, anchored straw
		>3:1 (33.3%)	Silt fence, silt barriers, construction entrance, inlet protection, sediment basins	Construction phasing with temporary or permanent seeding/anchored mulch, mulch, riprap or anchored mulch, soil retention blankets
		>2:1 (50%)	Silt fence, silt barriers, construction entrance, inlet protection, sediment basins	Construction phasing, temporary and permanent seeding/mulch, mulch, riprap mulch, soil retention blankets, reinforced turf mats

C. **Erosion Control BMP** – The Developer shall design and provide temporary erosion control measures as part of the project. Erosion control measures are to be used for disturbed areas, which will remain, untouched for more than 14 day but less than 21 days. These measures may include mulch and temporary seeding for interior slope stabilization and are discussed more thoroughly in Section 3.0 of these standards.

D. **Erosion Control** – The Developer shall design the project to provide erosion control measures. Erosion control measures are those, which will be constructed to provide for long-term (2-5 year) protection of soils on the project. Erosion control measures are those that prevent the displacement of soil particles. Examples of erosion controls include bonded fiber matrix mulches, tackifiers, erosion control or soil retention blankets. The

majority of these measures are discussed more thoroughly in Section 3.0 of these standards, except for the interceptor, roadway and toe ditches which are discussed below.

E. **Interceptor, Roadway and Toe Ditch** – The Engineer shall design the facility to include interceptor, roadway and/or toe ditches where it is deemed necessary to collect storm water and direct it to a discharge location. These ditches shall receive an increased amount of armoring in the way of soil erosion blankets, turf reinforced mats, energy dissipaters and riprap as determined by hydraulic design 'The Tractive Force Theory' as indicated in the Federal Highway Administration Hydraulic Engineering Circular No. 15 Design of Roadside Channels with Flexible linings is the method acceptable to the City. The design will be the determining factor of channel material used.

The Engineer shall design the work covered under subsection 2.5 to meet the following technical specification section:

1. Section 02273 – Interceptor, Roadway and Toe Ditch

F. **Brush-layering See Appendix A - 5200**

1. Purpose: This technique is used to stabilize slopes, particularly road fill slopes where construction has or will result in unstable soil conditions. A modified brush-layering technique often referred to as 'trench-packing' or 'branch-packing' can be installed with hard labor to repair existing rills and gullies or steep fill slopes. Both 'brush-layering' and 'branch packing' place live branches horizontally in successive layers up the face of the slope. The brush-layer branches, especially after rooting, reinforce slopes by serving as tensile inclusions, which provide frictional resistance to sliding or other types of displacement. The protruding brush retards runoff and reduces surface erosion.

2. Conditions Where Practice Applies: Brush-layering is best used concurrently with construction of fill slopes or embankments. Cuttings are placed by hand while heavy equipment is used to fill and compact each successive lift of soil fill. Brush-layering is similar in principle to other reinforced earth practices except that the reinforcing material is live branches. This practice is also a good remedial action intended to repair gullies or existing slopes, but may have limited applications in arid areas unless irrigated. Brush-layering performs several functions for erosion control, earth reinforcement and slope stability:

    a. Breaking up the slope length into a series of shorter slopes separated by rows of brush-layer.
    b. Reinforcing the soil with the unrooted branch stems.
    c. Reinforcing the soil as roots develop, adding significant resistance to sliding or shear displacement.
    d. Providing slope stability and allowing vegetative cover to become established.
    e. Trapping debris on the slope.
    f. Aiding infiltration on dry sites.
    g. Drying excessively wet sites.
    h. Adjusting the site's microclimate, thus aiding seed germination and natural regeneration.

i. Redirecting and mitigating adverse slope seepage by acting as horizontal drains.

3. Planning Consideration:

a. Plant material harvest and installation should be performed during its dormant season, late fall to early spring.

b. Use site reconnaissance to identify willow species, growth form, and soil and site conditions on adjacent sites and compare their conditions to the construction site. Planting will be more successful as the soil, site conditions and species selected match stable and vegetated nearby sites.

c. The ideal plant materials for wattling are those that: 1) root easily; 2) are long, straight and flexible; and 3) are in plentiful supply near the job site. Willow (Salix spp.) makes ideal wattling material. Some species of Baccharis, Cornus, and Populus also have very good rooting ability.

d. Choose plant material adapted to the site conditions and confirm the availability of plant material that will be used on site before construction begins.

e. When choosing live willow material for bioengineering applications, remember that young (less than 1 year old) wood or suckers will often sprout easier under optimum conditions but healthy, older wood (1 to 4 years old) has greater vegetative (energy) reserves necessary to consistently sprout and the older wood is much stronger. If possible, mix younger wood with older wood for the bioengineering application such that a majority of the material is 1 to 4 years old.

f. Research indicates that all cuttings should be soaked for a minimum of 24 hours, whether they are stored or harvested and immediately installed (Hoag 1991; Hoag et al. 1991; Hoag et al. 1992). Some research recommends soaking the cuttings for as much as 10 to 14 days

g. Willows have several different growth forms, from shrubs to large trees. Small to medium sized shrub-type and rhizomatous or creeping-type willows are used for planting channel banks. Upland willow species are found in relatively dry areas and should be used on similar sites. Tree-type willows are selected for the upper bank and flood plain area.

h. If branch cuttings are not pre-soaked then they shall be harvested no earlier than 48 hours prior to installation. Cuttings must be kept moist and cool at all times between cutting and installation therefore, all cuttings need to be thoroughly wet and covered with moistened wrapping before being transported.

i. Construction personnel shall be made aware that brush-layering uses live plant material and must be treated as such.

j. Spacing between the brush-layers is determined by the erosion potential of the slope (i.e., soil type, rainfall, and length and steepness of the slope). Spacing may be from 3-8 feet (1-2.5 m). On long slopes, brush-layer spacing should be closer at the bottom and spacing may increase near the top of the slope. Steep slopes (2:1) should not exceed, approximately, 30 feet in slope length. Reinforced earth design guidelines suggest that the slope height should not exceed 3 times the width of the reinforced volume. Therefore, for brush-layering with 6-8 foot long cuttings, the slope height should not exceed 8-24 feet.

G. **Cellular Confinement System for Slope Stabilization (See Appendix A – 5205)**

1. Purpose: Cellular Confinement System (CCS) is a permanent erosion control practice intended to stabilize steep slopes. The expandable panels create a cellular system that confines topsoil infill, protect and reinforce the plant's root zone, and permits natural subsurface drainage. The honeycomb shaped cells encapsulate and prevent erosion of the infill material. The cellular confinement systems are used for:

   a. Revetments - filling the cells with rock, gravel, or topsoil can provide an alternative to hard armor revetment systems.
   b. Erosion control on steep slopes - cells can be in-filled with soil and vegetated or in-filled with granular materials for sterile arid regions. Slopes as steep as 1:1 can be treated with cellular confinement systems.
   c. Flexible channel lining systems, either vegetated or rock filled.
   d. Framework for earth retaining structures.
   e. Road stabilization - cells confine and reinforce select fill materials, thereby increasing load-bearing capacities.
   f. Temporary low-water stream crossings.

H. **Erosion Blankets and Turf Reinforcement Mats Slope Installation (See Appendix A – 5210)**

1. Purpose: Erosion control blankets are used to temporarily stabilize and protect disturbed soil from raindrop impact and surface erosion, to increase infiltration, decrease compaction and soil crusting, and to conserve soil moisture. Mulching with erosion control blankets will increase the germination rates for grasses and forbs and promote vegetation establishment. Erosion control blankets also protect seeds from predators, reduce desiccation and evaporation by insulating the soil and seed environment.

   Some types of erosion control blankets and turf reinforcement mats are specifically designed to stabilize channelized flow areas. These blankets and mats can aide the establishment of vegetation in waterways and increase the maximum permissible velocity of the given channel by reinforcing the soil and vegetation to resist the forces of erosion during runoff events. Stems, roots and rhizomes of the vegetation become intertwined with the mat, reinforcing the vegetation and anchoring the mat.

2. Conditions Where Practice Applies: Establishing vegetation in channels or on slopes may require additional measures beyond seeding and straw mulching. Conditions where erosion control blankets and mats are appropriate may include:

   a. Slopes and disturbed soils where mulch must be anchored and other methods such as, crimping or tackifying are neither feasible nor adequate.
   b. Steep slopes, generally steeper than 3:1.
   c. Slopes where erosion hazard is high.
   d. Critical slopes adjacent to sensitive areas such as streams and wetlands.
   e. Disturbed soil areas where planting is likely to be slow in providing adequate protective cover.

f. Channels with flow exceeding 2-4 ft./sec.

g. In channels intended to be vegetated and where the design flow exceeds the permissible velocity. Allowable velocity, with turf reinforcement mats after vegetative establishment, is up to 10 ft/sec.

3. Specifications: Erosion control blankets are generally a machine produced mat of organic, biodegradable mulch such as straw, curled wood fiber (excelsior), coconut fiber or a combination thereof, evenly distributed on or between photodegradable polypropylene or biodegradable natural fiber netting. Synthetic erosion control blankets are a machineproduced mat of ultraviolet stabilized synthetic fibers and filaments. The nettings and mulch material are stitched to ensure integrity and the blankets are provided in rolls for ease of handling and installation.

   Soil stabilization and turf reinforcement mats are high strength, flexible, machine produced, three-dimensional matrix of nylon, polyethylene, polypropylene or polyvinyl chloride that have ultra violet (UV) stabilizers added to the compounds to ensure endurance and provide 'permanent vegetation stabilization'.

4. Planning Considerations: Erosion control blankets and turf reinforcement matting can be applied to problem areas to supplement nature's erosion control system (vegetation) in its initial establishment and in providing a safe and 'natural' conveyance for high velocity storm water runoff. These products are being used today in many applications where previously a structural lining or armoring would have been required. Care must be taken to choose the type of blanket or matting which is more appropriate for the specific needs of a project. There are many soil stabilization products available today and it is very difficult to cover all the advantages, disadvantages and specifications of all the manufactured blankets and mats. therefore, as with many erosion control type products, there is no substitute for a thorough understanding of manufacture's instructions and recommendations and a site visit by a designer or plan reviewer to verify a product's appropriateness.

I. Live Staking (See Appendix A – 5220)

1. Purpose: Using a system of live stakes creates a root mat that stabilizes the soil by reinforcing and binding soil particles together and by extracting excess soil moisture. The practice is commonly used in conjunction with other practices to provide for a more stable site conditions (i.e., used to anchor blankets, coir mats, turf reinforcement mats, straw rolls, etc.).

2. Planning Consideration:

   a. Live stake harvest and installation should be performed during its dormant season, late fall to early spring.

   b. Use site reconnaissance to identify willow species, growth form, and soil and site conditions on adjacent sites and compare their conditions to the construction site. Planting will be more successful as soil, site and species selected match stable, vegetated nearby sites. Live staking may have limited applications and success in arid environments unless irrigated.

c. If native willows or cottonwood are not found in the vicinity, live staking may not be a good option.
d. Choose plant material adapted to the site conditions and confirm the availability of plant material that will be used on site before construction begins.
e. Planting willows, in some cases, can adversely interact with other natural forces; such as water hydraulics.

Willows have several different growth forms, from shrubs to large trees. Small to medium sized shrub-type and rhizomatous or creeping-type willows are used for planting channel banks. Upland willow species are found in relatively dry areas and should be used on similar sites. Tree-type willows are selected for the upper bank and flood plain area.

J. **Water-bars and Rolling Dips (See Appendix A – 5230)**

1. Purpose: To limit the accumulation of erosive volumes of water on roads by diverting surface runoff at pre-designed intervals.

2. Planning Considerations: Construction of access roads, power lines, pipelines, and other similar installations often requires clearing long narrow right-of-ways over sloping terrain. Roads concentrate runoff. Gully formation may be especially severe in tire tracks and ruts. To prevent gully erosion, runoff can often be diverted across the width of the right-of-way to undisturbed areas by using waterbars or rolling dips.

3. A waterbar is a berm and excavation built diagonally across the road. Water-bars generally become less effective if driven over during wet weather, and are difficult to cross with low clearance vehicles. Rolling dips are gently sloping excavations running diagonally across the road surface, and are more appropriate for winter use. Rolling dips are more difficult to construct, but are much easier to traverse and require less maintenance.

4. Frequent rolling dips are often preferable, both economically and hydrologically, to improperly spaced cross road drains such as culverts.

5. Give special consideration to each individual outlet area, as well as to the cumulative effect of added diversions. Never outlet water-bars or rolling dips onto unprotected fill slopes. Use gravel to stabilize the diversion where significant vehicular traffic is anticipated.

6. Design Criteria: (See Appendix A – 5230)

   a. Water-bars Height: 18-inch minimum measured from the channel bottom to the ridge top.
   b. Side Slope: 2:1 or flatter; 3:1 or flatter where vehicles cross.
   c. Base width of ridge: 6-foot minimum.
   d. Spacing of water-bars/rolling dips is shown in the Table below.

Table 1.

Slope (%)	Spacing (ft)	Spacing High Erodable (ft)
<5	125	100
5 to 10	100	75
10 to 20	75	50
20 to 25	50	25
>35	25	25

e. An additional check for appropriate spacing is the distance it takes for the un-rocked, unprotected running surface of a nearby road to develop a 1-inch rill is a rough measure of the appropriate spacing distance.

f. Grade and angle: Positive grade not to exceed 2%. A crossing angle of approximately 60 degrees is preferred.

g. Outlet: Diversions should have stable outlets, either natural or constructed. Site spacing may need to be adjusted for field conditions to use the most suitable areas for water disposal - into brush, onto a ridgeline, or onto an energy dissipator.

K. **Slope Drain (See Appendix A – 5235)**

1. Purpose: To convey concentrated runoff down the face of a cut or fill slope without causing erosion.

2. Conditions Where Practice Applies: This practice applies to construction areas where storm water runoff above a cut or fill slope will cause erosion if allowed to flow over the slope. Temporary slope drains are generally used in conjunction with diversions to convey runoff down a slope until permanent water disposal measures can be installed.

3. Planning Considerations: Constructed slopes are often exposed to erosion between the time they are graded and permanently stabilized. During this period, the slope is very vulnerable to erosion, and temporary slope drains together with temporary diversions can provide valuable protection.

   It is very important that these temporary structures be sized, installed, and maintained properly, because their failure will usually result in severe erosion of the slope. The entrance section to the drain should be well entrenched and stable so that surface water can enter freely. The drain should extend downslope beyond the toe of the slope to a stable area or appropriately stabilized outlet. Appropriate TRM or rock lining should be installed to ensure stable drains.

Other points of concern are failure from overtopping from inadequate pipe inlet capacity and lack of maintenance of diversion channel capacity and ridge height.

4. Design Criteria:

a. Capacity: Peak runoff from the 10-year storm. See reference material for determining the peak runoff.

b. Pipe size: Unless they are individually designed, size drains according to the Table below:

Maximum Drainage Area per pipe	Pipe Diameter inches
0.50 ac.	12
0.75 ac.	15
1.00 ac.	18
>1.00 ac.*	As designed

*Inlet design becomes more complex beyond this size

c. Conduit: Construct the slope drain from heavy-duty, flexible materials such as non-perforated, corrugated plastic pipe, or open top over-side drains with tapered inlets. Install reinforced, hold-down grommets or stakes to anchor the conduit at intervals not to exceed 10 feet (3 m) with the outlet end securely fastened in place. Corrugated plastic pipe must have one (1) anchor assembly for every 20 feet of slope drain. The conduit must extend beyond the toe of the slope.

d. Entrance: Construct the entrance to the slope drain of a standard flared-inlet section of pipe with a minimum 6-inch. Make all fittings watertight. A standard T-section fitting may also be used at the inlet. An open top flared inlet for over-side drain may also be used.

e. Temporary Diversion: Generally, use an earthen diversion with a dike ridge or berm to direct surface runoff into the temporary slope drain. Make the height of the ridge over the drain conduit a minimum of 1.5 feet and at least 6 inches higher than the adjoining ridge on either side. The lowest point of the diversion ridge should be a minimum of 1-foot above the top of the drain so that design flow can freely enter the pipe.

f. Outlet Protection: Protect the outlet of the slope drain from erosion with an energy dissipator.

L. Biolog/Straw Rolls (See Appendix A – 5250 Biolog Rolls)

1. Definition: Straw rolls are manufactured from straw that is wrapped in tubular black plastic netting. They are approximately 9-inches in diameter by 25-30-feet long. Rolls are placed and staked along the contour of newly constructed or disturbed slopes.

2. Purpose: Straw rolls are intended to capture and keep sediment on the slopes. Straw rolls are useful to temporarily stabilize slopes by reducing soil creep and sheet and rill erosion until permanent vegetation can get established. Installed, straw rolls shorten the slope length, thereby interrupting the raveling and rilling processes, and reduce the slope steepness. They catch soil material that moves down the slope by the freeze/thaw processes. Organic matter and native seeds are trapped behind the rolls, which provide a stable medium for germination. Rolls trap fertile topsoil and retain moisture from rainfall, which aids in growth of tree seedlings planted along the upslope side of the rolls.

3. Design Considerations: Sites appropriate for straw rolls are:

   a. Slopes susceptible to sheet and rill erosion;
   b. Slopes producing dry ravel;
   c. Slopes susceptible to freeze/thaw activity; or slopes difficult to vegetate because of soil movement. Straw rolls are not intended for use in concentrated flow situations.
   d. Spacing of biolog/straw rolls – spacing is to be calculated using the soil loss tolerance factor of "1".

   It is imperative, especially on steeper slopes, that a sufficient trench is constructed to place the roll in. Without it, the roll will not function properly, runoff will scour underneath it, and trees or shrubs planted behind the roll will not have a stable environment in which to become established.

Straw rolls will last an average of one to two years. This is an important factor when planning the optimum length of time the slope will need mechanical stabilization. Straw rolls can be staked with willow stakes if site conditions warrant and the moisture retained by the straw roll will encourage willow establishment.

a. Advantages:

   (1) Straw rolls are a relatively low-cost solution to sheet and rill erosion problems.
   (2) They can replace silt fences or straw bales on steep slopes.
   (3) Rolls are a short-term solution to help establish native vegetation.
   (4) Rolls store moisture for vegetation planted immediately upslope.
   (5) Plastic netting will eventually photo degrade, eliminating the need for retrieval of materials after the straw has broken down.
   (6) Straw becomes incorporated into the soil with time, adding organic material to the soil and retaining moisture for vegetation.
   (7) Depending on slope steepness, straw rolls are installed at 25-50-foot intervals on the slope.

b. Disadvantages:

   (1) Rolls only function for one or two seasons.
   (2) Pilot holes through the rolls must be pre-driven with a metal rod.
   (3) If not installed properly with a sufficient trench, rolls may fail during the first rain event.

Straw rolls may require maintenance to ensure that the stakes are holding and the rolls are still in contact with the soil. This is especially true on steep slopes in sandy soil.

M. **Surface Roughening (See Appendix A – 5255)**

1. Definition: Roughening is a technique for roughening a bare soil surface with furrows running across the slope, stair stepping (5215), or tracking with construction equipment.

2. Purpose: Surface Roughening is intended to aid the establishment of vegetative cover from seed, to reduce runoff velocity and increase infiltration, and to reduce erosion and provide for sediment trapping.

3. Conditions Where Practice Applies: All construction slopes require surface roughening to facilitate long-term stabilization with vegetation, particularly slopes steeper than 3:1.

4. Planning Considerations: Rough slope surfaces are preferred because they aid the establishment of vegetation, improve water infiltration, and decrease runoff velocity. Graded areas with smooth, hard surfaces may be initially attractive, but such surfaces increase the potential for erosion. A rough, loose soil surface gives a mulching effect that provides more favorable moisture conditions than hard, smooth surfaces; this aids seed germination.

There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include grooved or serrated slope grading, furrowing, and tracking. Factors to be considered in choosing a method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling

N. Wattles (See Appendix A – 5260)

1. Purpose: Wattling functions to reduce erosion and stabilize slopes in several ways:

   a. The wattle bundles, binding rope and stakes are all structural components, which combine to stabilize the surface layers of the slopes by resisting hydraulic and gravitational forces.
   b. Wattling prevents rills and gullies by reducing the effective slope length and thereby dissipating the energy of water moving downslope. Wattles immediately reduce surface erosion.
   c. The terraces formed by a series of wattles trap sediment and detritus. Infiltration is increased as runoff is slowed and on dry sites this increases the available water for plant establishment.
   d. Vegetation establishment is enhanced because wattling provides a suitable microsite for plants by reducing surface erosion, increasing infiltration rates and by forming a series of terraces with shallower slope angles.

2. Conditions Where Practice Applies: Wattling may be used for road fills, road cuts, gullies or slumped areas, eroded slopes or eroding stream banks.

a. Repair of small earth slips and slumps or to protect slopes from shallow slides 1-2 feet deep.
b. Wattling may be used to stabilize entire cut or fill slopes or localized gully areas of slopes.
c. Wattling may be installed during construction (dormant season) or as a remedial action on existing slopes.
d. Wattling is useful on slopes requiring other planting materials such as, woody vegetation, transplants, grasses, and forbs. Wattling also enhances conditions for natural invasion and the establishment of other plants from the surrounding plant community.

3. Planning Consideration:

a. Plant material harvest and installation should be performed during its dormant season, late fall to early spring.
b. Use site reconnaissance to identify willow species, growth form, and soil and site conditions on adjacent sites and compare their conditions to the construction site. Planting will be more successful as the soil, site conditions, and species selected match stable and vegetated nearby sites.
c. The ideal plant materials for wattling are those that: 1) root easily; 2) are long, straight and flexible; and 3) are in plentiful supply near the job site. Willow (Salix spp.) makes ideal wattling material. Some species of Baccharis, Cornus, and Populus also have very good rooting ability.
d. Choose plant material adapted to the site conditions and confirm the availability of plant material that will be used on site before construction begins. Wattling may have limited applications and success in arid environments unless irrigated.
e. When choosing live willow material for bioengineering applications, remember that young (less than 1 year old) wood or suckers will often sprout easier under optimum conditions but healthy, older wood (1 to 4 years old) has greater vegetative (energy) reserves necessary to consistently sprout and the older wood is much stronger. If possible, mix younger wood with older wood for the bioengineering application such that a majority of the material is 1 to 4 years old.
f. Research indicates that all cuttings should be soaked for a minimum of 24 hours, whether they are stored or harvested and immediately installed (Hoag 1991; Hoag et al. 1991; Hoag et al. 1992). Some research recommends soaking the cuttings for as much as 10 to 14 days.
g. Planting willows, in some cases, can adversely interact with other natural forces; such as water hydraulics to cause increased drainage to willows can partially block or deflect currents adversely. Willows have several different growth forms, from shrubs to large trees. Small to medium sized shrub-type and rhizomatous or creeping-type willows are used for planting channel banks. Upland willow species are found in relatively dry areas and should be used on similar sites. Tree-type willows are selected for the upper bank and flood plain area.

O. **Retaining Walls** – The Developer shall design and include retaining walls where necessary. These measures are discussed more thoroughly in Section 3.7 of these standards.

P. **Temporary Landscape Irrigation System** – In cases where soil erosion control measures are selected by the Developer to meet his project needs, a landscape irrigation system will need to be designed and constructed. The design of such systems shall be done by a licensed Landscape Architect, registered in the State of Utah and shall be reviewed and approved by the City prior to construction. These measures are discussed more thoroughly in Section 3.8 of these standards.

2.11 CHANNEL EROSION PROTECTION

A. **General** – Protection of channels used in storm water transmission is an important feature in the transmission of storm water flows from their place or origin to either a sedimentation basin, storm water detention basin, or other storm water facility. Since the storm water flows are concentrated in these channels, special care must be taken to ensure that sufficient protection is provided within the channel cross-section to eliminate excessive erosion. The following information is to be considered when designing facilities associated with storm water channels.

B. **Energy Dissipators (See Appendix A – 5000)** – The need for energy dissipaters for reduce water velocities/scour shall be identified through the preparation of a scour and sediment transport study to be prepared for projects which discharge their storm waters into an existing and/or natural runoff channel or stream.

The Developer's engineer is to submit design calculations for each energy dissipater in the scour and sediment transport study.

Energy dissipaters designed with the design procedure as shown in HEC 14 Material and include the following:

1. The sedimentation basin stabilized with vegetation and mulch protections as required by these standards.

2. All material used within the energy dissipater shall be capable of allowing vegetative growth in, around or through the structure.

3. Temporary irrigation system if vegetation is planted outside the native planting window.

C. **Grass-Lined Channel (See Appendix A – 5010 and 5015)**

1. Purpose: Lined protection of drainage ways reduces erosion by lowering water velocity over the soil surface and by binding soil particles with roots. The drainage way is any ground surface over which concentrated runoff travels. It is typically a manmade waterway, swale or ditch. It may also be the upslope flow of water and directs the concentrated flow along the surface of the barrier. Lined channels should be used where:

   a. A vegetative lining can provide sufficient stability for the channel grade by increasing maximum permissible velocity;
   b. Slopes are generally less than five (5%) percent;

c. Site conditions required to establish vegetation i.e., climate, soils and topography are present.

2. Design Considerations:

a. Grass-lined channels resemble natural systems and are usually preferred where design velocities are suitable. Select appropriate vegetation and construct channels early in the construction schedule before grading and paving increase runoff rates.

b. Generally, grass-lined channels are constructed in stable, low areas to conform to the natural drainage system, but they may also be needed along roadways or property boundary. To reduce erosion potential, design the channel to avoid sharp bends and steep grades. Meandering channels are preferred as they replicate natural systems and assist in slowing velocities.

The channel cross section should be wide and shallow with relatively flat side slopes so surface water can enter over the vegetated banks without erosion. Riprap may be needed to protect the channel banks at intersections where flow velocities approach allowable limits and turbulence may occur. Cross-section designs include:

a. Vee-shaped channels are generally used where the quantity of water is relatively small, such as roadside ditches. The V-shaped cross section is desirable because of difficulty stabilizing the bottom, where velocities may be high. A grass or sod lining will suffice where velocities are low or rock or riprap lining may be necessary in higher velocities.

b. Parabolic grass channels are preferred and often used where larger flows are expected and sufficient space is available. The shape is pleasing and may best fit site conditions. Riprap should be used where higher velocities are expected and where some dissipation of energy (velocity) is desired. Combinations of grass with riprap centers or turf reinforcement mat centers are useful where there is a continuous low flow in the channel.

c. Trapezoidal grass channels are used where runoff volumes are large and slope is low so that velocities are non-erosive to vegetated linings. Trapezoidal channels generally have concrete or riprap lined center for low flow.

(1) Grass-lined channels must not be subject to sedimentation from disturbed areas.

(2) An established grass-lined channel resembles natural drainage systems and is usually preferred if design velocities are below 5 ft/sec.

(3) Outlets should function with a minimum of erosion. See Appendix A – 5000 Energy Dissipator BMP.

(4) Channels with design velocities greater than 2 ft/sec. will require that turf reinforcement mats, erosion control blankets, fiberglass roving or straw and netting be installed at the time of seeding to provide stability until the vegetation is fully established. It may also be necessary to divert water from the channel until vegetation is established or to line the channel with sod.

(5) Whenever design velocities exceed 4 ft/sec. a permanent turf reinforcement mat or rock lining will be necessary.

(6) Sediment traps may be needed at channel inlets and outlets to prevent sedimentation.

3. Additional Design Criteria:

a. Capacity: Sufficient to convey 100 year – 24 hour storm.

b. Velocity: The allowable design velocity for grass-lined channels is based on soil conditions, type of vegetation, and method of establishment. If design velocity of a channel to be vegetated exceeds 2-4 ft./sec. a channel liner is required.

c. Depth: The design water surface elevation or a channel receiving water from diversions or other tributary channels shall be equal to or less than the design water surface elevation of the diversion or other tributary channel at the point of intersection. The top width of parabolic and vee-shaped, grass-lined channels shall not exceed 30 feet, and the bottom width of trapezoidal, grass-lined channels shall not exceed 15 feet unless multiple or divided waterways, riprap center, or other means are provided to control meandering of low flows.

d. Cross-section: The channel shape may be parabolic, trapezoidal, or V-shaped, depending on need and site conditions.

e. Side slopes: Grassed channel side slopes generally are constructed 3:1 or flatter to aid in the establishment of vegetation and for maintenance.

f. Grade: Generally restricted to slopes 5% or less. Either a uniform or gradually increasing grade is preferred to avoid sedimentation.

D. **Log Check Dam (See Appendix A – 5020)** – In order to reduce erosion in gullies and other drainage ways, log check dams may be required to be installed as indicated in drawing no. 5020. Logs are to be 4 to 6-inches in diameter which are to be placed vertically into the drainage way soils, adjacent to one another. The purpose of the dams is to slow the flow down the drainage, reduce the centerline slope, thereby reducing the velocity of the water and eventually create a more stable environment and reduce erosion.

E. **Riprap (See Appendix A – 5030)** – The Developer shall provide designed riprap where necessary to protect against soil erosion. Riprap is a layer(s) of stone or rock designed to protect and stabilize the surface of the soil from erosion from water or wind. Riprap may be use to stabilize cut and fill slopes, channel slopes and bottoms, inlets and outlets for culverts, bridges, slopes drains and shorelines to due wave action. These measures are discussed more thoroughly in Section 3.0 of these standards. The design of the riprap for channels or similar structures will be performed in accordance HEC 14, Design of Roadside Channels with flexible linings.

1. Purpose: To protect the soil surface from erosive forces and/or improve stability of soil slopes that are subject to seepage or have poor soil structure.

2. Conditions Where Practice Applies: Riprap is used for the following applications:

a. Cut-and-fill slopes subject to seepage or weathering, particularly where conditions prohibit establishment of vegetation,

b. Channel side slopes and bottoms,
c. Inlets and outlets for culverts, bridges, slope drains, grade stabilization structures, and storm drains,
d. Stream bank and stream grades,
e. Shorelines subject to wave action.

3. Planning Considerations: Riprap is a versatile, highly erosion-resistant material that can be used effectively in many locations and in a variety of ways to control erosion on construction sites.

Graded Versus Uniform Riprap: Riprap is classed as either graded or uniform. Graded riprap includes a wide mixture of stone sizes. Uniform riprap consists of stones nearly all the same size.

Graded riprap is preferred to uniform riprap in most applications because it forms a dense, flexible cover. Uniform riprap is more open and cannot adjust as effectively to movement of the stones. Graded riprap is also cheaper to install requiring less handwork for installation than uniform riprap, which must be placed in a uniform pattern. Uniform riprap may give a more pleasing appearance.

Riprap sizes are designated by either the mean diameter or the weight of the stones. The diameter specification is often misleading since the stones are usually angular. However, common practice is to specify stone size by the diameter of an equivalent size of spherical stone. Table 1 lists some typical stones by weight, spherical diameter, and the corresponding rectangular dimensions. These stone sizes are based upon an assumed specific weight of 165 lbs/ft^3 (2600 kg/m^3).

Table 1

Weight (lbs.)	Spherical Dia. (ft.)	Length (ft.)	Width/Height (ft.)
50	0.6	1.4	0.5
100	1.1	1.8	0.5
150	1.3	2.0	0.7
300	1.6	2.6	0.9
500	1.9	3.0	1.0
1000	2.2	3.7	1.3
2000	2.8	5.4	1.8
4000	3.6	6.0	2.0

A method commonly used for specifying the range of stone sizes in graded riprap is to designate a diameter for which some percentage, by weight, will be smaller. For example "d_{85}" specifies a mixture of stones in which 85% of the stone by weight would be smaller than the diameter specified. Most designs are based on "d_{50}", size stones.

When considering riprap for surface stabilization, it is important to anticipate visual impacts, including weed control, hazards from snakes and other animals, danger of slides and hazards to areas below steep riprap slopes, damage and possible slides from children moving stones, and general safety.

Proper slope selection and surface preparation are essential for successful long term functioning of riprap. Adequate compaction of fill areas and proper use of filter blankets or aggregate foundation is necessary.

Sequence of Construction: Schedule disturbance of areas that require riprap protection so the placement of riprap can follow immediately after grading. When riprap is used for outlet protection, place the riprap before, or in conjunction with the installation of the structure so that it is in place before the first runoff event.

4. Design Criteria:

a. Gradation: Riprap should be a well-graded mixture with fifty (50%) percent by weight larger than the specified design size. The diameter of the largest stone size in such a mixture should be 1.5 times the d_{50} size with smaller sizes grading down to 1-inch.

b. Size: The designer should determine the riprap size that will be stable for site conditions. Having determined the design stone size, the designer should then select the size or sizes that equal or exceed riprap gradation commercially available in the area. For more design criteria see references; Association of Bay Area Governments, Manual of Standards for Erosion and Sediment Control Measures; HEC 11 – Use of Riprap for Bank Protection.

c. Thickness: Construction techniques, dimensions of the area to be protected, size and gradation of the riprap, the frequency and duration of flow, difficulty and cost of maintenance, and consequence of failure should be considered when determining the thickness of riprap linings. The minimum thickness should be 1.5 times the maximum stone diameter, but in no case less than 6 inches.

d. Quality of stone: Stone for riprap may consist of fieldstone or quarry stone. The stone should be hard, angular, of such quality that it will not break down on exposure to water or weathering, and suitable in all other respects for the purpose intended. The specific gravity of the individual stones should be at least 2.5.

e. Size of Stone: The sizes of stone used for riprap protection are determined by purpose and specific site conditions.

f. Slope Stabilization: Riprap stone for slope stabilization not subject to flowing water or wave action should be sized for stability for the proposed grade. The gradient of the slope to be stabilized should be less than the natural angle of repose of the stone selected. Riprap used for surface stabilization of slopes does not add significant resistance to sliding or slope failure and should not be considered a retaining wall. The inherent stability of the soil must be satisfactory before riprap is used for surface stabilization. Slopes approaching 1.5:1 may require special stability analysis.

g. Outlet protection: Design criteria for sizing stone and determining the dimensions of riprap pads at channel or conduit outlets are presented in: USDA, SCS Field Design Manual; Manual of Standards for Erosion and Sediment Control Measures-Association of Bay Area Governments and other engineering design manuals.

h. Filter Blanket: A filter blanket is a layer of material placed between the riprap and the underlying soil to prevent soil movement into or through the riprap.

A suitable filter may consist of a well-graded gravel or sand-gravel layer or a synthetic filter fabric manufactured for this purpose. The design of a gravel filter blanket is based on the ratio of particle size in the overlying filter material to that of the base material in accordance with the criteria below. The designed gravel filter blanket may consist of several layers of increasingly large particles from sand to erosion control stone.

A gravel filter blanket should have the following relationship for a stable design:

$$\frac{d_{15}\,filter}{d_{85}\,base} < 5$$

$$5 < \frac{d_{15}\,filter}{d_{15}\,base} < 40$$

$$\frac{d_{50}\,filter}{d_{50}\,base} < 40$$

In these relationships, filter refers to the overlying material and base refers to the underlying material. These relationships must hold between the filter material and the base material (soil foundation) and between the riprap and the filter. More than one layer of filter material may be needed. Each layer of filter material should be at least 6 inches thick.

A synthetic filter fabric may be used with or in place of gravel filters. The following particle size relationships should exist:

(1) Filter fabric covering a base with granular particles containing fifty (50%) percent or less (by weight) of fine particles (less than U.S. Standard Sieve No. 200:

$$\frac{d_{85}\,base\ (mm)}{EOS * filterfabric} > 1$$

• total open area of filter should not exceed 36%

(2) Filter fabric covering other soils:

- EOS is no larger than U.S. standard sieve no. 70
- total open area of filter should not exceed 10%

*EOS - Equivalent Opening Size compared to a U.S. standard sieve size.

No filter fabric should have less than 4% open area or an EOS less than U.S. Standard Sieve No. 100. The permeability of the fabric must be greater than that of the soil. The fabric may be made of woven or non-woven monofilament yarns and should meet the following minimum requirements:

(1) Thickness 20-60 mils,
(2) Grab strength 90-120 lbs,
(3) Conform to ASTM D-1682 or ASTM D-177.

Filter blankets should always be provided where seepage is significant or where flow velocity and duration of flow or turbulence may cause the underlying soil particles to move through the riprap.

F. **Rock-Lined Channel (See Appendix A – 5040)**

1. Purpose: To convey concentrated surface runoff without erosion.

2. Conditions Where Practice Applies: This practice applies where design flow exceeds 2 ft./sec such that channel lining is required, but conditions are not suitable for vegetative protection. Specific conditions include:

   a. All roadside ditches or drainage channels greater than two (2%) percent and located in highly erodable soils that have a low maximum permissible velocity.
   b. The channel design velocity exceeds that allowable for a grass-lined channel.
   c. The channel will continue to down-cut without protection because it is adjusting to increased flow or a new base line (outlet elevation).

3. Design Criteria:

   a. Capacity: peak runoff from 100-year storm.
   b. Side slopes: 2:1 or flatter.
   c. Stone size: d= 2 inch minimum. Use engineering design procedures for sizing riprap for large or critical drainage channels. See reference material, Association of Bay Area Governments, North Carolina Erosion and Sediment Control Planning and Design Manual, or for the design of stable channels.
   d. Riprap thickness: T= 1.5 times the stone diameter or as shown on the plans; 6 inch thick minimum.
   e. Foundation: Extra-strength filter fabric or an aggregate filter layer, if required.
   f. Use a foundation for decomposed granite sands or other highly erodable soils.
   g. Channel cross section should conform as shown on plans for design high flow.
   h. Outlet must be stable.

G. **Straw Bale Sediment Barrier Check Dam (See Appendix A – 5055)**

1. Purpose: Straw bale sediment barriers are intended to intercept and detain small amounts of sediment. These barriers are suited for small channel flow situations; however, they may require significant maintenance to ensure their function. Areas where straw bale barriers could apply include:

a. The drainage area is 1 acre or less;
b. The maximum slope gradient for the swale above the barrier is 2:1;
c. The maximum slope length above the barrier is 100 ft.;
d. The flow is less than 2 ft 3/sec. flow.

2. Design Considerations: The straw bales are either wire-bound or nylon string tied. Wire-bound bales may deteriorate rapidly if the wire is placed in contact with the soil. Straw bales have a useful life of less than 6 months; however the life is extended when used with filter fabric. If used, the filter fabric should cover the bales, be enveloped in the rock at the spillway in order to better filter out fine soil particles, and extend beyond the spillway to act as an energy dissipater.

Design considerations should include the following:

a. Drainage area;
b. Runoff velocities;
c. Secure installation;
d. Compatibility with existing topography;
e. Spillways or energy dissipators;
f. Use of extraneous materials such as rocks, and/or filter fabric;
g. Accessibility for maintenance, repairs, and cleaning.

H. Straw Bale Dike (See Appendix A – 5060)

1. Purpose: A straw bale dike intercepts and detains small amounts of sediment transported by sheet type runoff. The dikes detain sediment by ponding water and allowing sediment to settle out. Straw bale dikes also slow runoff velocities, thus reducing sheet and rill erosion. Straw bale dikes are also useful for erosion and sediment control around the perimeter of a construction site. Straw bale dikes may be used where the following conditions apply:

a. The placement area is not a slope nor likely to receive concentrated runoff;
b. The maximum slope gradient above the barrier is 2:1;
c. The maximum slope length above the barrier is 100 feet;
d. The placement area is suitable for ponding of sheet runoff and sedimentation can occur.

2. Design Considerations:

a. The bales are to be placed along the slope contour or at the toe of the slope.
b. The principal mode of action is to pond water and allow particles to settle. Straw bale dikes are not designed to withstand high heads of water, therefore they should be located where shallow pools can form.
c. Straw bale dikes are suitable for sheet flow only. Straw bales have a useful life of less than 6 months; however, the life is extended when used with filter fabric. When installed straw bale dikes must be trenched in and appropriately butted and anchored. Loose straw debris must be cleaned up on a regular basis.

I. Temporary Diversion Dike (See Appendix A – 5065)

1. Purposes:

   a. To divert storm runoff from upslope drainage areas away from unprotected disturbed areas and slopes to a stabilized outlet.
   b. To divert sediment-laden runoff from a disturbed area to a sediment-trapping facility such as a sediment trap or sediment basin.
   c. The upslope dike can improve working conditions at the construction site and prevent erosion. The down-slope dike assures that sediment-laden runoff will not leave the site without treatment.

2. Planning Considerations:

   a. It is very important that a temporary diversion dike be stabilized immediately following installation with temporary or permanent vegetation to prevent erosion of the dike itself. The gradient must have a positive grade to assure drainage, but if the gradient is too great, precautions must be taken to prevent erosion due to high velocity channel flow behind the dike.
   b. This practice can use material available on the site and can usually be constructed with equipment needed for site grading. Stabilizing the dike with vegetation can extend the useful life of the practice. Diversion dikes are sometimes preferable to silt fence because they are more durable, less expensive, and require much less maintenance when constructed properly. When used with sediment trap or sediment basin they become a logical choice for a control measure once the control limits of the silt fence or straw bale barrier have been exceeded.
   c. Temporary diversion dikes are often used as a perimeter control in association with a sediment trap or a sediment basin, or a series of sediment-trapping facilities, on moderate to large construction sites. If installed properly and in the first phase of grading, maintenance costs are very low.

3. Design Considerations:

   a. Drainage Area: 5 acres or less
   b. Velocity: maximum permissible velocity
   c. Recommended Dike Design:

side slope:	2:1 or flatter
width:	2 foot (top width)
height:	1.5 feet
Freeboard:	0.5 feet

   d. Channel Design:

shape:	parabolic or trapezoidal recommended

side slope: 2:1 or flatter

Stabilization: vegetation or riprap

e. Grade: The channel behind the dike shall have a positive grade to a stabilized outlet. If the channel slope is less than or equal to two (2%) percent, no stabilization is required. If the slope is greater than two (2%) percent, the channel shall be stabilized.

f. Outlet: Divert sediment-laden water into a temporary sediment trap or sediment basin. Runoff form undisturbed areas should empty into an outlet protection unless well stabilized natural outlets exist.

2.12 STORM DRAINAGE SYSTEM

A. **General** – The storm drain and flood control system is more specifically discussed in the Storm Drainage and Flood Control Design and Construction Standards. The following information is very general in nature and the Developer in designing and constructing these facilities shall use the above-mentioned standards.

1. Master Plan Compliance – Developers shall be familiar with the City's current Master Drainage Plan and other storm drainage and flood control reports and master plans. Developer shall contact the City's Engineering Department for information regarding these reports prior to beginning design of these types of facilities.

2. Design Criteria - Developers shall use the design criteria specified in the City's current Storm Drainage and Flood Control Design and Construction Standards. These standards are available from the City's Engineering Department.

B. **Retention/Detention Basins** – The Developer shall design and include regional (master planned) and on-site retention/detention basins as part of the project. The design of regional and on-site retention/detention basins shall be performed in accordance with the City's current Storm Drainage and Flood Control Design and Construction Standards, Master Drainage Plan and other pertinent master plans and studies. The design will also fulfill the requirements of Phase II of the UPDES. These measures are discussed more thoroughly in Section 3.11 of these standards.

C. **Storm Drain System** – The Developer shall design and include master planned and local storm drainage pipeline and other appurtenances as part of the project. The design of storm drainage facilities, including pipelines, shall be performed in accordance with the City's current Storm Drainage and Flood Control Design and Construction Standards, Master Drainage Plan and other pertinent master plans and studies. These measures are discussed more thoroughly in Section 3.12 of these standards.

D. **Storm Drain Sediment Protection**

1. Drop Inlet Sediment Barriers (See Appendix A – 5300 and 5330)

a. Purpose: Drop Inlet sediment barriers are intended to prevent sediment from entering the storm drains during construction operations. This

practice allows early use of the storm drain system and is applicable for the phased construction schedule of a wet weather plan. Sediment-laden runoff is ponded before entering the storm drain, thus allowing some sediment to fall out of suspension.

b. Design Considerations: A straw bale drop inlet sediment barrier can be used where the inlet is intended to drain a relatively flat disturbed area (slopes less than 5%) in which runoff velocity is low¾ less than 0.5 ft^3/sec. Barriers of this type should not be placed around inlets receiving concentrated flows such as those along major streets or highways. This practice must not be used near the edge of fill material and must not divert water over cuts or fills.

The contributing drainage area should be one acre maximum. The ponding area shall be relatively flat (less than 1%) with sediment storage of 35 yds^3 per disturbed acre. As an optional design, the straw bales may be omitted and the entire structure made of gravel and stone, see Appendix A – 5300 and 5330. A structure made entirely of stone is commonly called a "gravel doughnut." The top elevation of the sediment structure must be at least 6 inches lower than the surrounding ground elevation down-slope from the inlet. It is important that all storm flows pass over the structure and into the storm drain, and not past the structure. Temporary diking below the structure may be necessary to prevent bypass flow. Material may be excavated from inside the sediment pool for this purpose.

2. <u>Continuous Berm (See Appendix A – 5305)</u>

a. Purpose: A continuous berm is used to divert and intercept sheet type runoff. Continuous berms are useful for erosion and sediment control around the perimeter of a construction site. The berms can be used to detain and pond sediment-laden storm water and allow the sediment to settle out. The continuous berms may be constructed as filter berms; with aggregate and permeable filter fabric to facilitate the accumulation of sediment and the drainage of storm water.

b. Conditions Where Practice Applies:

(1) Whenever storm water runoff must be temporarily diverted to protect disturbed areas or sediment must be retained on site during construction.
(2) Continuous berms can be used in conjunction with or instead of silt fence and straw bale dike for perimeter type sediment control.
(3) Continuous berms, for sediment control, may be used where:
(4) sheet and rill flows would occur;
(5) the area drains to the barrier 1 acre or less;
(6) the maximum slope gradient above the barrier is 2:1;
(7) and the slope length above the barrier is 100 feet maximum.

c. Design Considerations:

(1) Continuous berms require a Continuous Berm Machine (CBM). The CBM is a material feeding (hopper) and fabric-rolling system that creates the continuous berm by 'wrapping' geosynthetic material around sand, aggregate, or soil.

(2) Trenching is not necessary. Continuous berms should be applied to relatively smooth surfaces to form a tight seal between barrier and the ground.

(3) Staking is not necessary since the density of the berm is approximately 100 lbs/ft3. The fabric is flexible so the barrier can stretch and curve and allow the berm to conform tightly to ground surface irregularities.

(4) The CBM requires a source of filler materials, either sand, aggregate or local soils. When used in conjunction with a transit mixer discharging sand and/or aggregates it is possible to produce berm at a rate of approximately 50 ft/min. Using local soils can reduce that rate by 2/3.

Continuous berms can be used to pond water and allow sediment to settle out. Continuous berms can be constructed as filter berms, with aggregate and permeable geosynthetic materials intended to facilitate its drainage of the ponded water. Segments of the continuous berm may be filled with aggregate to produce "drainage chambers" and/or drainage pipes with or without risers may be used with the berms.

3. Curb Inlet and Drop Inlet Sediment Barriers (See Appendix A – 5315, 5320, 5325 and 5330)

a. Purpose: Curb inlet and drop inlet sediment barriers are intended to reduce the sediment discharged into storm drains by ponding the runoff and allowing the sediment to settle out. The structures allow for overflow from high runoff events and the gravel allows the ponds to dewater rapidly.

b. Design Considerations: The gavel filled sandbag curb inlet and block and gravel sediment barrier can be used at curb inlets on gently sloping, paved streets where:

(1) water can pond and allow sediment to separate out of suspension; and

(2) runoff is relatively low, less than 0.5 ft3/sec.

Once the small catchment areas behind the sandbags or block and gravel fill with sediment, future sediment-laden runoff will enter the storm drain without being de-silted. Therefore, sediment must be removed from these structures during or after each storm. Additional storage can be obtained by constructing a series of sandbag barriers along the gutter so that each barrier traps small amounts of sediment.

2.13 STREAMBANK EROSION PROTECTION

A. **General** – Protection of channels used in storm water transmission is an important feature in the transmission of storm water flows from their place or origin to either a sedimentation basin, storm water detention basin, or other storm water facility. Since the

storm water flows are concentrated in these channels, special care must be taken to ensure that sufficient protection is provided within the channel cross-section to eliminate erosion. Any work performed in streams under the jurisdiction of the Corp of Army Engineers (COE) are to meet their requirements. The following information is to be considered when designing facilities associated with storm water channels.

B. **Coir Roll and Coir Mats (See Appendix A – 5400)**

1. Purpose: Coir rolls and coir mats are commonly used for stream bank stabilization and shoreline protection. These bioengineering components provide immediate erosion control while also providing a stable medium to support the growth and development of plants. The coir (coconut fiber) material is natural, long lasting, and has high tensile strength. The fiber material can replace commonly used structural components such as rocks, riprap or logs. The coir rolls and mats can then be planted with appropriate vegetation. The fiber rolls and mats accumulate sediment while the plants grow and the plants roots develop. Eventually the coir material biodegrades and the cohesive strength of the root systems and flexible nature of the plants become the primary stabilizing element.

2. Conditions Where Practice Applies: Soil bioengineering techniques utilizing coir rolls and coir mats are generally appropriate for:

   a. Stream bank stabilization;
   b. Shoreline stabilization;
   c. Wetland mitigation or restoration; and
   d. Other riparian areas where immediate erosion control is needed while also creating hospitable conditions for plant establishments.

   Where perennial flows of water occur, coir rolls are generally placed offshore to break waves or applied at the toe of stream bank as a type of soft armor. Coir rolls provide a substrate for plant growth and facilitate sedimentation behind the roll by capturing sediment, mineral and organic materials.

2. Design Considerations: Bioengineering techniques utilizing coir rolls mats and vegetation should be considered as an alternative to stone revetments or other structural measures. Bioengineering techniques address aesthetic and ecological concerns by encouraging vegetation and wildlife habitat. Bioengineering techniques rely on plants and structures to function together in mutually reinforcing and complimentary rolls. With coir rolls and coir mats, the high tensile strength coconut fibers, fiber netting and the wooden stakes used to anchor the material all comprise the structural components of the system.

   Coir rolls, coir netting and coir mats also have high moisture retention properties and will generally last from 4-12 years. However, coir fiber's strength, longevity and ability to hold moisture depend on the type, density and grade of coir material chosen.

   Traditional processing of coconut fibers result in several different grades of coir. During processing, the initially separated fiber is called mattress

fiber coir, which is very short, thin and flimsy. The next grade of coir separated from the husk is called omat fiber coir. Once the mattress and omat fiber coir are separated, the remaining coir is called bristle fiber coir. Bristle fiber coir is longer, thicker, heavier and stronger compared to the other types.

Coir rolls are commonly available in 12-inch, 16-inch, and 20-inch diameters. The density of the coir logs and coir mats depends on the type of fibers used in construction and how tightly the fibers are compacted. Tensile strength, unit weight, open area, thickness and coir type are important properties to consider when woven coir blankets, and coir netting or coir rolls are specified. For instance, high density coir rolls, 9 lbs/ft3, might be more appropriate for high wave or high stream energy situations when low density rolls, 6 lbs/ft3, would be perfectly acceptable for wetland mitigation. Use light density coir if plant establishment is the only goal. Use high-density coir if protection from high wave or high stream energy, longevity and plant establishment is the project goals.

C. **Gabions (See Appendix A – 5400)**

1. Purpose: To protect stream banks from the erosive forces of moving water. Rock-filled gabions can be used to armor the bed and/or banks of channels or used to divert flow away from eroding channel sections.

2. Conditions Where Practice Applies: Rock-filled or vegetated rock gabions are applicable to stream bank sections which are subject to excessive erosion due to increased flows or disturbance during construction. This practice is applicable where flow velocities exceed 6 ft/sec. and where vegetative stream bank protection alone is not sufficient. Gabions can be used to construct deflectors or groins intended to divert flow away from eroding stream bank sections. Gabions are also used to construct retaining walls and grade control structures.

   a. Gabion Mattresses, also referred to as Reno mattresses or revet mattresses are not as thick as standard gabions, usually 0.5, .75, 1-foot. Gabion mattresses are used to line channels, armor stream banks and slopes, and used with gabions for grade control structures (spillways or aprons).

      Gabions and gabion mattresses are often preferable to rock riprap alone. For any given hydraulic condition, the gabion or gabion mattress revetment thickness is one third (1/3) of an equivalent riprap design.

      Gabions and gabion mattresses are flexible and free draining thus allowing some soil settling. They can be used in unstable streambeds and stream banks. Gabions can provide an important component to a 'bioengineering' solution for stream bank or slope erosion because they allow the growth and establishment of natural vegetation.

      Gabions containers are generally fabricated from a double-twist, hexagonal mesh of heavily zinc coated wire. Some gabions use welded wire. As an option the wire can be coated with PVC. Wire diameter is

0.086 inches for the double twisted gabion mattress and 0.106-0.120-inches for the double twisted gabion. The welded wire gabion use wire diameters of 0.120-inches or greater.

The rectangular gabion is divided into cells with diaphragms of equal capacity. The compartments add strength and assure that the full material remains evenly distributed. Gabions and gabion mattresses come in various sizes. Choose the dimensions of the gabions or combination of gabions to meet the design requirement site conditions.

Table 1. Typical gabions sizes

Letter Code	Length Ft	Width Ft	Depth Ft	# of Cells	Capacity in CY
A	6	3	3	1	2
B	9	3	3	2	3
C	12	3	3	3	4
D	6	3	1.5	1	1
E	9	3	1.5	2	1.5
F	12	3	1.5	3	2
G	6	3	1	1	0.666
H	9	3	1	2	1
I	12	3	1	3	1.33
T	9	6	.75	3	2
U	12	6	.75	4	1.33
Q	9	6	.5	3	1.33
S	9	6	.5	2	1

The mesh opening for gabions is typically or nominally 3.25 x 4.5 inches (TYPE 8 x 10). Some gabion mattresses have mesh openings of approximately 2.5 x 3.25 inches (TYPE 6 x 8). Both styles perform hydraulically equivalent.

3. Site Considerations: All of the general stream bank stabilization considerations are to be followed. The following are specific considerations for gabion structures. Gabion walls are appropriate where:

   a. The vertical integrity of a soil bank needs a higher tensile strength to reduce sloughing of the stream bank.
   b. There is moderate to excessive sub-surface water movements that may be creating erosion and damage other types of non-permeable structures.
   c. An excessively steep stream bank must be stabilized and vegetative or extreme mechanical means of stabilization (i.e., pulling back bank) are not feasible due to site conditions.
   d. Where slope must be modified while heavy machinery is unavailable to the site.
   e. Fill must be disposed of along an eroding stream bank (fill can be placed behind gabion to modify slope).
   f. A retaining or toe wall is needed to stabilize the slope.

g. Rock riprap is an appropriate practice but the available or desired rock size (smaller) is not sufficient alone to resist the expected shear stress exerted on the revetment.

4. Types of Gabion Structures:

a. Gabion Wall - a gabion wall is basically a gravity wall, which relies on their own weight and frictional resistance to resist sliding and overturning from lateral earth pressure.
b. Vegetated Rock Gabion - a rock-filled gabion earth-retaining structure, which has live branches, placed between each consecutive layer of rock-filled baskets. The live branches will take root inside the gabion and into the soil behind the structure. The vegetation will consolidate the structures and bind it to the slope.
c. Gabion Deflector - deflector or groins project into the streams and divert flows away from eroding stream bank sections.
d. Gabion Aprons - rock filled gabions or gabions mattress used as outlet protection, energy dissipators or spillways. These semi-flexible gabions are designed to settle without fracture and adhere to the ground if scour occurs.
e. Grade Control - drop structures or weirs. Gabion baskets and mattresses can be combined to construct check dams or weirs.
f. Channel Lining - gabion mattresses can be used to line channels. The lining thickness depends on many factors such as the type of rock, design flow velocity, sediment and bed-load, and channel gradient.

D. **Structural Stream Bank Stabilization (See Appendix A – 5410)**

1. Purpose: To protect stream banks from the erosive forces of moving water, where vegetative or bioengineered methods are insufficient or infeasible.

2. Conditions Where Practice Applies: Applicable to stream bank sections, which are subject to excessive erosion due to increased flows or disturbance during construction. Generally applicable where flow velocities exceed 6 ft/sec. or where vegetative stream bank protection is inappropriate.

3. Planning Consideration:

a. Stream channel erosion problems vary widely in type and scale and there is no one measure that works in all cases. Stabilization structures should be planned and designed by an engineer with experience in this field.
b. The purpose of this specification is merely to point out some of the practices, which are available, and to establish some broad guidelines for their selection and design.
c. Before selecting a structural stabilization technique, the designer should carefully evaluate the possibility of using vegetative stabilization alone or in conjunction with structural measures, to achieve the desired protection. Vegetative techniques are, generally, less costly and more compatible with natural stream characteristics.

4. Design Criteria: Since each channel segment requiring protection is unique, measures for structural stream bank protection should be installed according to a plan based on specific site conditions. Develop designs according to the following principles:

   a. Make protective measures compatible with other channel modifications planned or being carried out in other channel reaches.
   b. Use the minimum design velocity of the peak discharge of the 10-year storm. Structural measures must be effective for this design flow and must be capable of withstanding greater flows without serious damage. Riprap, gabions or other suitable materials should be used to stabilize the stream banks to the 10-year flood level or the top, whichever is lower.
   c. Ensure that the channel bottom is stable or stabilized by structural means before installing any permanent bank protection.
   d. Ensure that stream bank protection extends between stabilized or controlled points along the stream.
   e. Do not change channel alignment without a complete evaluation of the anticipated effect on the rest of the stream channel, especially downstream.
   f. Give special attention to maintaining and improving habitat for fish and wildlife.

   The upper portion of the bank should be covered with topsoil suitable for growing grasses, shrubs, and trees.

2.14 MISCELLANEOUS EROSION/SEDIMENT CONTROL BEST MANAGEMENT PRACTICES

A. **General** – By the use of sediment control on the project, the Developer/Builder needs to acknowledge the following

   1. Maintenance of the sediment controls will be performed on a weekly basis or as directed by the City.

   2. Re-grading will occur on a regular basis as necessary to eliminate concentrated flows.

   3. Sediment Control Inspections forms are to be filled out on a weekly basis and provided to the City. Sediment controls contained herein, cover the period of time of first land disturbance through and including final stabilization of the soil by vegetation, concrete, pavement or other City approved material. Failure to maintain sediment controls or to submit completed inspection forms will be the basis for a Work Stop being placed on the project and a Class C Misdemeanor issued. The sediment controls discussed herein are required on all projects without exception, other approved sediment controls are discussed in section 3.

   4. Mud tracking – Each construction site is required to have facilities and practices in place which eliminate the tracking of mud from the construction site onto City roadways. This shall mean that each construction site shall have in place, at least one construction entrance equipped with wash-down equipment to wash off vehicles and their tires so that mud is not tracked onto City streets.

B. **Construction Entrances (See Appendix A – 5105)** – A pad of crushed stone, aggregate, and gravel located where the construction traffic enters or leaves a construction site. The purpose of the construction entrance is to reduce the potential for vehicles tracking sediment, dirt or debris from the construction site onto City streets. In the event of a storm, water event the stone or gravel will act as a check dam retention structure to control flows. It is the intent of this requirement that the adjacent paved surfaces will remain free of materials tracked off of the site. The developer is required to maintain clean streets at all times.

At any point of ingress or egress at a construction site, where adjacent traveled way is paved, a stabilized construction entrance will be installed. The following shall be taken into account in design of such an entrance:

1. Native soils will not be allowed as part of construction of the construction entrance.

2. The construction entrance shall not extend more than 3-feet into the paved area.

3. 2 to 3-inch course aggregate shall be used.

4. The course aggregate shall be place to a sufficient depth to protect the street, sidewalk and curbing but shall not be less than 8-inches in depth.

5. The construction entrance is to extend a minimum of 50-feet behind the curb and gutter.

6. Geotextile fabric shall be used for entrances.

7. All ingress and egress to the construction site is limited to the use of this entrance unless otherwise approved. More than one entrance is allowed, however, the perimeter protection shall not deteriorate.

At a point of ingress or egress at a construction site, where the area is unapproved, the following conditions will apply:

1. Clear, grub and grade the area to provide a slope of 2-percent, minimum.

2. Compact the sub-grade as required.

3. Place a designed geotextile separation fabric as part of the construction entrance.

4. Place coarse aggregate, 2 to 3-inches in size to a depth of 8-inches minimum.

The Developer is responsible for maintaining the construction entrance as follows:

1. Inspect the entrance daily for loss of gravel and/or sediment buildup.

2. Inspect adjacent roads daily for gravel or sediment deposits.

3. Clean areas by sweeping or shoveling not by washing down the area with water.

4. Repair the entrance and replace gravel as required to maintain entrance in good working order.

5. Expand entrance area as required to accommodate traffic, prevent damage to concrete structures and avoid sediment being wash away in a storm water event.

The construction entrance shall be removed once the project has received final inspection approval and the front of the lot has been landscaped to the approval of the erosion control specialist.

The Engineer shall design the work covered under subsection 2.5 to meet the following technical specification section:

1. Section 02276 – Stabilized Construction Entrance

C. **Sedimentation Basins (See Appendix A – 5110)** – The need for sediment basins shall be identified through the preparation of a scour and sediment transport study to be prepared for projects which discharge their storm waters into a natural runoff channel or stream. The study shall be prepared by a registered civil engineer experienced in sediment transport and scour analysis and shall be approved by the City prior to the Developer retaining the consultant. An outline of the report shall be submitted to the City for approval prior to initiating the study. The draft of the report shall be submitted to the City for review and comment and the City's comments shall be incorporated into the report prior to finalizing the report. The final report shall indicate recommendations to eliminate/reduce scour and sediment transport in the existing natural discharge channel and shall also identify the size, location and proposed generalized design of any sedimentation basins needed for the project to include.

1. Energy dissipaters designed with the design procedure as shown in HEC 14.

2. The sedimentation basin stabilized with vegetation and the mulch protection as required by the City's Effective Planting Plan.

3. All materials used within the sedimentation basin shall be capable of allowing vegetative growth in around or through the structure. Concrete energy dissipaters are discouraged.

4. Temporary irrigation system if vegetation is planted outside the native planting window.

5. If the basin is also used as a detention basin or has a flow outlet demonstrate the flow path length is sufficient enough to have sediment drop.

6. Complies with the UPDES Phase II requirements.

The preliminary and final design of the sedimentation basin shall be reviewed and approved by the City prior to proceeding.

D. **Concrete Structures** – The design of concrete structures related to grading, erosion and sedimentation control and re-vegetation shall be performed by a registered civil engineer.

The developer's engineer shall submit a comparison of structures indicating concrete structures are the only stable structures to use. The design shall take into account the requirements of Section 3.9 of these standards

E. **Limits of Disturbance (LOD) Control** – The Developer shall design the project to provide for LOD control. LOD is considered to be a minimum protection when erosion control methods are not used. These measures are discussed more thoroughly in Section 3.5 of these standards.

2.15 VEGETATION AND REVEGATATION

A. **General** – The purpose of this effort is to establish native and other appropriate plant species on disturbed areas, which will assist in the stabilizing of these disturbed areas, and reduce the possibility of erosion. Other support efforts associated with vegetation and re-vegetation will include seedbed preparation, topsoil, appropriate mulch protection, energy dissipaters and other areas which will assist in allowing cut and fill slopes and other disturbed areas in being re-vegetated.

B. **Planting and Irrigation of Cut and Fill Slopes** - All cut and fill slopes greater than three (3') feet in height shall be planted and irrigated with a sprinkler system in accordance with the provisions of this chapter.

1. The land disturbance permit holder, or his authorized representatives, shall be responsible for installing all landscaping in accordance with an approved landscape planting plan, for a sprinkler system, and for maintaining all cut and fill slopes. The installation of the landscaping and of the required sprinkler system shall be complete within six (6) months after the date of the termination of the grading. Deviations from the requirements of this section may be permitted in exceptional circumstances or where unavoidable hardship would result from a strict application of these requirements when a waiver has first been obtained from the City Engineer. A separate bond or cash deposit shall be posted with the City Engineer to guarantee such landscaping, sprinkler system, and the maintenance thereof, and such bond or cash deposit, or portions thereof, shall not be released until the landscaping has been established for at least one hundred, twenty (120) days after planting and permanent responsibility for the landscape maintenance has been established.

2. Landscaping planting plan. A landscaping planting plan shall be prepared and submitted for approval by the City Engineer and the Community Development Director prior to obtaining a land disturbance permit. A soil test shall be made to determine the plant materials which are suitable for the slopes, and the plant materials utilized on the slopes shall be compatible with the soils report and in accordance with the approved planting schedule or as required by a condition of a site plan or final plat map. There shall be a variety of ground covers, trees, and shrubs incorporated into the landscaping plan and utilizing plants from the "Approved Planting Schedule" set forth in subsection (d) of this section. Other plant materials may be substituted for the "Approved Planting Schedule" if submitted and recommended by a registered landscape architect and approved by the City Engineer.

3. Irrigation plan. An irrigation plan for the sprinkler system to be installed on all cut and fill slopes shall be submitted to and approved by the City Engineer prior to the issuance of the land disturbance permit.

4. Approved planting schedule. All plants required by the provisions of this section shall select from Section 2.15.C. Vegetation and Revegetation Development Standards and 2.15.D. Effective Planting Plan of these standards.

C. **Vegetation and Re-vegetation Development Standards**

1. Native vegetation shall be removed only when absolutely necessary; e.g. for the construction of buildings, roads and fill areas, as approved by the City Planning Commission. When removal of vegetation is required see Tree Removal Application Standard and information contained herein:

LIMITS OF DISTURBANCE TABLE	
Area	Maximum Limits of Disturbance
Roads	The catch line of road, plus two feet
Buildings	The foot print of the building plus 10 ft. (total 5 ft. in each direction)
Fill Areas	The toe of slope plus 2 ft.
Cut Slopes	Top of Slope

a. The Developer or Contractor shall provide a barrier of protection at the limits of disturbance to prevent additional areas from being disturbed.

2. Re-vegetation of areas within the area of disturbance will be as required within 3 weeks of reaching final grade. Temporary irrigation will be required during the initial establishment of the vegetation unless waved by the Erosion Control Specialist. Temporary irrigation is defined as aboveground water dispersion system. The Developer shall remove the temporary irrigation system after approval of the Cit Engineer.

3. The Developer shall submit the proposed seed mix to the City and provide the following for each bag of seed used 30 day before starting the re-vegetation.

   a. Labeling and identifying the contents of the seed mixture by scientific and common name).
   b. Quantity of seed as a function of pure live seed (PLS).
      PLS = purity x germination.
   c. Date of the germination or tetrezolium tests
   d. The date of analysis shown on each bag shall be within nine months of the time of use.
   e. The City reserves the right to request a sample of the seed mixture for the purpose of analysis and testing. The Developer shall pay for said testing.

4. Seedlings and shrubs are to be indigenous to the area being revegetated. The seedlings and shrubs should:

a. Be from a reputable dealer
b. Identified with scientific and common name
c. Temporary irrigation, as defined above, shall be required during the initial establishment of the seedlings or vegetation.

5. All seeds, seedlings, shrubs and trees shall be protected with a mulch material that has been designed for site-specific conditions. The mulch material shall meet the following criteria:

   a. The City's Effective Planting Plan will be used in determining mulch protection required for the seed.
   b. Test results from an independent testing agency (i.e. TTI, UWRL) will be submitted to the City, indicating that the mulch material proposed is appropriate for the specific conditions of the site, including that the mulch material is compatible with the proposed seed mix.
   c. Submit to the Engineering Department, acceptable results from the Universal Soil Loss Calculations (USLE) or the Revised Universal Soil Loss Calculations (RUSLE), indicating that the soil loss does not exceed 15 times the baseline calculated soil loss. This analysis is to be performed by one of the following individuals; soil conservationist, agronomist, certified professional erosion and sediment control specialist.
   d. The mulch material application guidelines that indicate site specific conditions.

6. The re-vegetation work shall be performed by persons or firms, having expertise in re-vegetation of similar site-specific site conditions on the proposed re-vegetation site. The re-vegetation contractors, erosion control specialist and landscape architects are acceptable providing they can demonstrate their expertise in re-vegetation of similar site-specific conditions.

7. At the request of the Developer and/or at the end of the warranty period, which is three years, of the re-vegetation bond, the City will perform an inspection to determine if the vegetation has been established enough to prevent future erosion. The technical procedure in determining if the vegetation has been established enough to stabilize the soil against either rill or gully erosion is the quadrant frame method or the step transect method. Both methods suffice in comparing plant cover, species richness and acceptable soil loss and shall be covered on re-vegetated area and adjacent undisturbed and/or native site. Either method will be performed at several randomly selected locations. A reclaimed herbaceous natural plant community having 80% of the cover and species abundance of adjacent undisturbed perennial vegetation will be deemed successful.

8. Re-vegetation Bond and Re-vegetation Agreement: A re-vegetation bond shall be established in accordance with City policy and standards as approved by the City attorney. A fully executed re-vegetation agreement shall accompany the bond.

D. **Effective Planting Plan** – To satisfy the re-vegetation requirements of the City ordinances and the International Building Code, IBC, this effective planting plan has been compiled. The proper and recommended installation of the material state herein, is a requirement to satisfy the re-vegetation bond release periods.

1. Temporary Seeding – Subdivisions and other developments may benefit from temporary seeding. The intent of this seeding is to temporarily control dust, control weeds, and reduce the possibility of erosion on vacant lots until permanent-stabilizing measures can be implemented. Care should be taken to use a seed mixture that will not compete with establishing permanent seeding. Temporary seeding requires the same irrigation requirements and mulch protection requirements, as does permanent seeding. The use of temporary seeding does not satisfy the requirements of the Re-vegetation Bond and used in areas with slopes less than 5 H.: 1 H. Seed suppliers should be contacted for the most current seed available before specifying the seed mix, the seed mix should use these seeds within the seed mix:

   a. Sterile Annual Ryegrass
   b. Rye, winter or spring
   c. Barley, spring
   d. Oats, spring
   e. Wheat, winter or spring
   f. Slender Wheatgrass

2. Slopes – Erosion is reduced by the root zone matrix of grasses, therefore the use of grasses is one of the essential elements for the requirements to satisfy the re-vegetation bond release requirements.

   The use of wildflowers are atheistically pleasing and is encouraged by the City, however, the wildflower portion of the seed mix should be minor. The use of shrub or tree seedling may be required based on the native condition of the land prior to disturbance.

   The seed mixture applied to the slopes should be at approximately 40 lbs. per acre with upland dry seed mix. The following grasses should be included the seed mix specified:

Common Name	Scientific Name
Sodar Streambank Wheatgrass	Agropyron, riparium
Nezpar Indian Ricegrass	Oryzopsis hymenoides
Western Wheatgrass	Agropyron smithi
Blue Bunch Wheatgrass	Agropyron spicatum

3. Seed/Seedling – The vegetation community in the native areas of the City has several shrub species along with native grass and flowers. Prior to any land disturbance a field inventory of the native vegetation community, including cover estimates, is to be submitted to the City for review. This inventory will establish the replace species and percentage of cover on the project, this is to ensure the re-vegetation of area to pre-disturbance conditions, the cost of the seedlings is to be included in the re-vegetation bond.

4. Hillside Regions – Seed/Seedlings to be planted shall be primarily perennial natives. The vegetation inventory will determine actual specie types. The listed seedlings should be among the mixture of seedlings used.

Common Name	Scientific Name
Squawbush	Rhus trilobata
Wyoming Sagebrush	Artemisia tridentata wyomingensis
Gambel Oak	Quercus gambelli
Antelopebrush	Purshia tridentata
Rabbitbrush	Chrysothamnus nauseosus
Winterfat	Eorotia lanata
Mountain Sagebrush	Artemisia tridentate

5. Wetland and Riparian Areas – To ensure protection the native habitat, filtration of water and bank protection from erosion. A plant inventory will determine the existing specie and coverage of wetland vegetation and will be the basis to determining the re-vegetation specie. In areas containing the Russian Black Olive tree the developer will substitute the Russian Black Olive tree with an acceptable native woody plant. The City and Corp of Army Engineers will determine the acceptability of the replacement seedlings.

6. Channels, Swales, Toe Ditches, Inceptor Ditches and Concentrated Flows – The flow characteristics of channels, interceptor ditches or toe ditches used in urban storm drainage may require the use of a turf reinforced mat. A qualified professional shall design and specify the appropriate matting based on Federal Highway Administration requirements. The following grasses should be used in the seed mixes and applied at a minimum rate of 30 lbs./acre:

Common Name	Scientific Name
Ephraim Crested Wheatgrass	Agropyrona cristation
Sodar Streambank Wheatgrass	Agropyrona riparium
Western Wheatgrass	Agropyrona smithii
Covar Sheep Fescue	Festucia ovina
Perennial Ryegrass	Lolium perenne

7. Mulch Protection – The mulch is to provide a biomass that will promote germination, protect against erosion, and provide moisture during the dry seasons, for at least two years to three years depending on the elevation of the land disturbance.

Area Elevation	Years
Valley and Foothills	Two Years
Mountains above the 5,200 foot elevation	Three Years

8. Materials and Methods

Slope	Acceptable Products	Anchors (b)

(Horiz:Vert)		(per sq. yd)
40:1 to 10:1	Hydro mulch and seeding (a) Drill seeding with native soil cover (a) Land Imprinting (a) Straw crimping (a,b)	N/A
10:1 to 3:1	Mechanically Anchored Straw (a,b) Manufactured straw or excelsior blanket with netting one side (e) Land Imprinting (a,e)	c per manufacturer's recommendation
3:1 to 2:1	Manufactured straw/coconut mat, straw mats with netting on both sides, Wood excelsior blanket with netting on both sides (e)	d As per manufacturer's recommendations

Notes:

a. A temporary irrigation system will be required for the early days of germination.

b. To be used only in a wind protected area, as approved by the City.

c. Slope length not to exceed 50 feet unless manufacturer can demonstrate by the R.U.S.L.E. or other appropriate the material BMP will work. Empirical information will not be acceptable.

d. This is a minimum standard only. Anchors are to keep the matting in direct contact with the soil. Additional staples may be required at the direction of the City.

e. The soil to be at optimum moisture within the top six inches of soil. Optimum moisture to be determined by geotechnical report.

9. Irrigation – The developer/builder is responsible for providing reasonable amount of moisture to promote growing conditions of the revegetation project. The City recommends temporary irrigation to be used a minimum of 60 days year round. However, the City requires temporary irrigation to be used for a minimum of 60 days between May 1 and October 15.

E. **Erosion Control / Re-vegetation Plan** – The Developer is responsible for preparing a re-vegetation plan for the project which identifies seedbed preparation, erosion control BMP to be used, temporary seeding efforts, permanent seeding, mulching, inlet sediment barriers and other items related to re-vegetation and erosion control.

The re-vegetation plan shall include the following:

1. A field evaluation of the existing vegetation to include herbaceous plant cover, overall species abundance, and plant litter.

2. An evaluation of noxious or prohibited restricted weeds.

3. A list of target native perennial species to be included in the seed mixture.

4. Preliminary soils information based on published soil surveys.

5. Routine soil sample to evaluate fertility requirements for reclaimed areas.

6. A follow-up vegetation inventory during the second growing season on reclaimed land to evaluate the successful establishment of target perennial vegetation.

7. A final vegetation inventory prior to bond release evaluating vegetative cover and species abundance to ensure 80% establishment of adjacent undisturbed areas.

The Engineer shall design the work covered under subsection 2.5 to meet the following technical specification section:

1. Section 02902 – Re-vegetation Plan
   Also in Section 4 or these Standards

F. **Permanent Seeding** – The Developer is to provide for the design and installation of permanent seeding and related items for the project. This practice will establish perennial and permanent plantings for a site within 21 days of final grade being reached. These measures are discussed more thoroughly in Section 3.13 of these standards.

SECTION 3.0

MATERIALS

3.1 GENERAL REQUIREMENTS

This section discusses the materials involved in grading, erosion, sedimentation control and re-vegetation efforts and associated construction activities. Design and construction related to storm drainage facilities is subject to the design and construction standard for that specific type of facility. Separate design and construction standards are available from the City's Engineering Department for culinary water, sewer, secondary water road and bridge construction and storm drainage and flood control facilities. This standard is in addition to previously mentioned standards, in the event a conflict arises the more restrictive standard will govern. The materials selected have been chosen for their strength, durability and ease of maintenance. All materials, unless specifically approved otherwise, shall be new and unused.

Where applicable, American Pubic Works Association (APWA), American Society of Testing Materials (ASTM), American Association of State Highway Transportation Officials (AASHTO) or other standards have been referenced and it shall be the responsibility of the developer/engineer /contractor to be familiar with those standards to insure compliance. This standard will govern in the event of a conflict. Titles corresponding to the specific numbers are given in the reference section of the standards.

In some instances, particular manufacturers and product names have been mentioned as being approved. Other products may also meet the requirements, but must be first approved in writing by the Engineering Department. Two factors that are considered by the Engineering Department and the City Engineer in products as approved:

1. Products performance of the Texas Transportation Institute (TTI), Manufacturer's Literature or Utah Water Research Lab.

2. The calculation results of the USLE or RUSLE on a site specific design.

Manufacture's literature not based on results from an independent testing facility will not be considered. Manufactures will be required to submit the complete report from the independent testing facility to the Engineering Department for a complete review on alternate products.

If at any time the Engineering Department believes that the use of a specific product must either be halted or changed, the City Engineer has the authority to make the change providing the decision is based upon an engineering, performance or maintenance evaluation. A copy of all technical specifications is contained in Appendix B.

3.2 TESTING AND FINAL ACCEPTABILITY OF MATERIAL

The Engineering Department will require such tests and certifications as deemed necessary to show that the specified materials have been employed. Notwithstanding prior factory or yard inspections, the City Engineer will have the right to reject any damaged or defective materials found on the job and order its removal from the site. Further information on testing is contained in Section 9.0 – Testing, of this manual.

3.3 TOPSOIL

A. **General** – Topsoil shall be stripped, stockpiled, or live hauled in accordance with the requirements of these standards and the Contract Documents. The Contractor shall, where possible, keep the height and size of topsoil piles to a minimum. Topsoil is to be used only to stockpile and replace for re-vegetation, excess handling of the topsoil should be avoided. Stockpiles are not to exceed 25 feet in height and the amount of time the topsoil piles kept in a stockpile is also to be kept to a minimum. The intent of topsoil stockpiling is to retain the soil structure, preserve pore space essential for microorganisms and provide an environment that will retain the soil fertility to promote the restoration of native seeds indigenous to the area.

Stockpiles are to be setback at least 100-ft away from native undisturbed areas and live bodies of waters, including seasonal drainage channels. The developer may propose BMP to prevent the stockpile from eroding from wind or water. The intent of the topsoil setbacks is to preserve native vegetation, preserve drainage channels and satisfy the UPDES regulations

The Developer may also propose other methods and locations of stockpiling topsoil for review and approval by the City. Satisfying the intent of stockpiling topsoil and the setbacks indicated herein, for reviewing any proposed stockpile location.

The Engineer shall design the work covered under subsection 2.6 to meet the following technical specification section:

1. Section 02925 – Topsoil

3.4 EROSION CONTROL

A. **General** – Interim measures could be used in the areas that have been graded and left exposed and not brought to final grade within 21 days of initial disturbance. The measures discussed below include the use of mulch, organic tackifiers and temporary seeding for interior slope stabilization.

1. Interior Slope Stabilization, Mulch – The placement of material to stabilize the soil against the forces of wind and water as an interim measure could include tackifiers, sediment controls, temporary seeding, wood mulches, water, manufactured mulch blankets made from excelsior or straw.

   Interim soil stabilization, measures are to be applied to the soil from the day of initial disturbance until the soil has received approved erosion control and re-vegetation measures as per the Re-vegetation Bond.

   Site-specific conditions will determine the recommended seed mix. Check with the project's Development guidelines, City of South Jordan, local seed suppliers or County Extension Service for recommended mixes for site-specific conditions.

The Effective Planting Plan will determine the actual mulch material used to protect the seed. Provisions for temporary irrigation is required throughout the year.

The re-vegetation project approval will be based on the Re-vegetation Bond reductions procedures. It is the responsibility of the developer to select, install, irrigate and maintain the project in such a manner as to qualify for the bond reductions.

2. Slope Stabilization, Temporary Seeding – Temporary seeding means the growing of a short term perennial or annual cover (plants) on a disturbed construction site that is disturbed and the use of temporary seeding is to control erosion from wind or water. The use of temporary seeding is recommended for areas that have been disturbed and requires stabilizations and the City deems it not appropriate for a re-vegetation bonds. An example of this would be a residential subdivision that has been massed graded and the City agrees with the developer, residential home construction will invalidate the re-vegetation bond.

   Temporary seeding is subject to the same seed protection requirements as outlined in the effective planting plan. This practice is to use fast growing grasses whose root system hold down the soils so they are less apt to be carried offsite by water or wind. Another advantage of temporary seeding is it reduces the problems associated with mud and dust from bare soil during construction.

   Whereas temporary seeding requires temporary irrigation and the same mulch protection as permanent seeding, it could be more cost effective to evaluate chemical stabilizers.

The Engineer shall design the work covered under Section 2.0 and Appendix B to meet the following technical specification section:

1. Section 02271 – Erosion Control

3.5 LIMITS OF DISTURBANCE (LOD)

A. **General** – Limits of disturbance (LOD) barriers are to be placed, reviewed and approved in writing by the Engineering Department prior to any land disturbance. Approved minimum barrier are described below.

   1. Fabric: Design for site specific conditions

   2. Posts: 2 x 2, 6.0-ft long to be approved by the Engineering Department.

   3. Wire Mesh: 14 gage min. with 6 inch minimum openings

   4. Wire Stables: 1-inch long, hog rings or wire ties are acceptable when approved by the City Engineer.

   5. Straw Bales: Not acceptable

   6. Pre-manufactured barriers are acceptable when approved in writing by the Engineering Department.

   7. Straw wattles

The LOD boundary control is to be installed by placing posts on 6-foot centers with a minimum 2- foot of bury and 3-feet exposed above grade. The Contractor is to excavate the anchor trench on the uphill side of the posts. The wire mesh shall be secured to posts on the up-hill side of the posts from the bottom of the trench to the top of the posts. The

Contractor is to install the fabric as required to encase trench and drape over top of fence by 1-foot minimum. The fabric is to be secured to the posts and wire mesh a minimum of every 6-inches vertically and one foot horizontally. The Contractor is to then backfill the trench over the geotextile fabric to anchor it in place.

The Contractor is to maintain the fence by inspecting it after each rainfall and\or during a heavy or prolonged rainfall or as required by the Erosion Control Specialist. The Contractor shall make adjustments or repairs to the fence to prevent runoff from bypassing the ends of the fence, or by under cutting the trench in which the fabric has been installed. When LOD barrier also functions as a sediment control BMP, the Contractor is to remove the accumulated sediment before it reaches ½ the height of fence. The LOD barrier will be reported on the erosion control and sediment control inspection as required by the City.

The site boundary control may be removed after construction has received its final inspection approval or as approved by the Engineering Department.

The Engineer shall design the work covered under subsection 2.3 to meet the following technical specification section:

1. Section 02279 – Silt Fences

3.6 EROSION CONTROL

A. **General** – Permanent erosion control measures are those, which will be constructed to provide for long-term (2-5 year) protection of soils on the project. These differ from sediment control BMP. These measures include the following:

1. Mulch – When used with out vegetation, mulch is a temporary erosion control practice where materials such as grass, woodchips, wood fibers, straw, or gravel are placed on the soil surface. When used without biodegradable netting these materials act independently and are also very erode able. Therefore, the depth of mulch criteria is as indicated in the chart. The LS factor in the USLE or the RULSE dictate when the slope length increase so does the depth of the mulch. The advantages of using mulch are:

    a. Mulch slows the water down, thus increasing the time of concentration for storm water calculations.
    b. Provides protection for the germination and survival rate of seeds and seedlings.
    c. When used with a biodegradable netting a matt effect can be accomplished.

MULCH APPLICATION RATES			
Type of Mulch	Mulch Rate (tons/acre)	Land Slope (percent)	Slope Length Limit (Feet)
Straw	1.0	1-5	200
	1.0	6-10	100
	1.5	1-5	300
	1.5	6-10	150
	2.0	1-5	400
	2.0	6-10	200
	2.0	11-15	150
	2.0	16-20	100
	2.0	21-25	75
	2.0	26-33	50
	2.0	34-50	35

MULCH APPLICATION RATES			
Type of Mulch	Mulch Rate (tons)	Land Slope (%)	Slope length limit (feet)
Crushed Stone ¼ to 1-1/2 inch	135	< 16	200
	135	16-20	150
	135	21-33	100
	135	34-50	75
	240	< 21	300
	240	21-33	200
	240	34-50	150
Wood Chips	7	< 16	75
	7	16-20	50
	12	< 16	150
	12	16-20	100
	12	21-33	75
	25	< 16	200
	25	16-20	150
	25	21-33	100
	25	34-50	75

*Note: Slope length limit specified is the length of slope for which the mulch rate specified is effective slope length. Mulch is to be anchored by the use of a photodegradable extruded plastic netting and stakes to anchored mulch to ground or with an appropriate tackifier.

2. Hydro Mulch – May be used when specified by the Effective Planting Plan. The Contractor shall follow written recommendation of the Hydro-seeder and the hydro-mulch recommendations are to be on site at all times and available to the Engineering Department at all times. The recommendations shall address the following:

a. Type of soil on slope to be protected
b. Percentage of slope
c. Application rate
d. Maximum wind speed

3. Tackifiers – Tackifiers are defined as being chemical stabilization practices, often referred to as a chemical mulch, soil binder, soil palliative. Chemical stabilization can be used as an identified by the effective Planting Plan. Asphaltic tackifiers are not allowed. The application rates and procedures recommended by the manufacturer of a chemical stabilization product shall be followed to prevent the products from forming ponds and from creating large areas where moisture cannot get through.

4. Blankets - Manufactured blankets have made the process of mulching convenient and cost effective for the developer or builder. Commonly referred to as erosion control blankets, mulch blankets or soil retention blankets, their function is the same.

   a. To provide a convenient and inexpensive method of proving protection to the soil against erosion.
   b. Provide a growing environment for the revegetation process from germination to established growth.

   Due to the wide range of products, erosion and vegetation characteristics the blankets are allowed to be installed when the following conditions are met:

   a. Blankets are used within the parameters of manufacturer recommendations.
   b. Produces a site specific staking or stapling pattern.
   c. Produces acceptable soil loss results based on the Revised Universal Soil Loss Equation for their blanket.
   d. The seed supplier's written recommendation that this is the protection they recommend for the vegetation that is proposed on the site.
   e. The LS factor is satisfied when used on slopes greater than 50 feet.

   The Engineer shall design the work covered under subsection 2.5 to meet the following technical specification section:

   1. Section 02272 – Fabric, Erosion Control Mats and Geotextiles

5. Straw Mulch - Straw mulch is anchored or punched in by using a tracked construction vehicle. Straw mulch is to be applied at a rate of 2 ½ tons per acre.

   The Engineer shall design the work covered under subsection 2.5 and Appendix B to meet the following technical specification section:

   1. Section 02935 – Crimped Straw

3.7 RETAINING WALLS

A. **General** – Where insufficient space is available for construction of a complete slope or where obstacles are in the way, retaining walls may need to be constructed to retain the earth and limit the amount of erosion, which might be experienced. If the wall is 48-inches or greater, the wall is governed by the International Building Code (IBC). Such wall will need to be designed by a licensed civil engineer, registered in the State of Utah.

The Engineer shall design the work covered under subsection 2.5 to meet the following technical specification section:

1. Section 02277 – Segmental Block Retaining Wall
2. Section 04220 – Concrete Unit Masonry

3.8 LANDSCAPE IRRIGATION SYSTEM

A. **General** – In cases where soil erosion control measures are selected by the Developer to meet his project needs, a landscape irrigation system will need to be designed and constructed. The design of such systems shall be done by a licensed landscape architect, registered in the State of Utah and shall be reviewed and approved by the City prior to construction.

The Engineer shall design the work covered under subsection 2.15 and Appendix B to meet the following technical specification section:

1. Section 02811 – Landscape Irrigation System

3.9 CONCRETE STRUCTURES

A. **General** – The design of concrete structures related to grading, erosion and sedimentation control and revegetation shall be performed by a registered civil engineer. The design shall take into account the following technical specifications. Preliminary design and final design shall be reviewed and approved by the City prior to finalizing the projects for construction.

The Engineer shall design the work covered under subsection 2.5 and Appendix B to meet the following technical specification section:

1. Section 03100 A – Concrete Formwork
2. Section 03102 – General Concrete Construction
3. Section 03200 – Reinforcement Steel
4. Section 03300 – Cast-in-Place Concrete
5. Section 03303 – General Concrete
6. Section 03304 – Minor Concrete

3.10 RIPRAP

A. **General** – Riprap is a layer of stone or rock designed to protect and stabilize the surface of the soil from erosion from water or wind. Riprap may be use to stabilize cut and fill slopes, channel slopes and bottoms, inlets and outlets for culverts, bridges, slopes drains and shorelines to due wave action. The thickness of the riprap for slope protection shall be in accordance of section 3.6 Erosion Control.

Riprap is classified as either graded or uniform. Graded riprap includes a wide range of stone or rock sizes. Uniform riprap consists of stone or rocks approximately the same size. Graded riprap is preferred since it provides a dense, flexible cover. Riprap sizes are designed by either the mean diameter or the weight of the stones.

Proper slope selection and surface preparation are essential for successful long-term functioning riprap. Adequate compaction of fill areas and proper use of filter blankets are necessary.

The Engineer shall design the work covered under subsection 2.5 and Appendix B to meet the following technical specification section:

1. Section 02275 – Riprap

3.11 RETENTION/DETENSION BASINS

A. **General** – The design of regional and on-site retention/detention basins shall be performed in accordance with the City's current Storm Drainage and Flood Control Design and Construction Standards, Master Drainage Plan and other pertinent master plans and studies.

The Engineer shall design the work covered under subsection 2.5 and Appendix B to meet the following technical specification section:

1. Section 02292 – Dam Embankment Construction
2. Section 02274 – Clay Liner
3. Section 02710 – Toe Drain
4. Section 11232 – Slide/Stop Gates
5. Section 00000 - Low Flow Pipe

3.12 STORM DRAIN SYSTEM

A. **General** – The design of storm drainage facilities, including pipelines, shall be performed in accordance with the City's current Storm Drainage and Flood Control Design and Construction Standards, master storm water management plan and other pertinent master plans and studies.

The Engineer shall design the work covered under subsection 2.5 and Appendix B to meet the following technical specification section:

1. Section 02712 – Storm Drainage System
2. Section 02750 – Storm Drainage System Testing
3. Section 02606 – Manholes
4. Section 02617 – Reinforced Concrete Pipe
5. Section 02618 – Reinforced Concrete Pressure Pipe
6. Section 11231 – Flap Gates

3.13 PERMANENT SEEDING

A. **General** - This practice will establish perennial and permanent seeding for a site where development is complete or will have no further disturbance. This practice is for an area

that has been brought to final grade within 21 days of initial disturbance and satisfies one of the conditions of the re-vegetation bond.

1. Installation Specifications

   a. Install berms or swells to prevent concentrated flows from adjacent properties.
   b. Prepare seed bed should be granular, loose, uniform grades to 2-4 inches in depth.
   c. Surface Roughing if the rainfall causes the soil surface to become sealed or crusted, loosen it just prior to seeding by discing, harrowing, raking or other suitable methods.
   d. Apply fertilizer as required by existing soil evaluations.
   e. Mulch: The Contractor will obtain a written statement and recommendations from the seed supplier or other knowledgeable entity, comparing the types of vegetation and the type of mulch being used. The seed supplier written statement will specifically address the analysis of the denseness of the blanket with growing characteristics of the proposed seed, i.e. as the seed germinates, the broadleaf plant will cause tenting due to the denseness of the mulch.

2. Seed Mix - The following seeds will be included in the proposed seed mix.

   Sodar Streambank Wheatgrass — Agropyron, riparium

   This a native sod grass of the Northern Great Plains plant growth region and the western intermountain area. It tolerates drought and spreads rapidly to form a good ground cover. It appears early and resembles thick spike wheatgrass. It is used widely as a low-growing, low maintenance cover. This is useful for roadside seeding, recreation areas, disturbed areas, and other sites where a low maintenance turf is desired.

   Nezpar, Indian Ricegrass — Oryzopsis hymenoides

   This grass is dense tufted perennial with upright stems. It is widely distributed over the west where it is one of the most drought-enduring native range grasses. It grows on semi deserts, sand dunes, sandy plains, canyons, hillsides, foothills, exposed ridges, and dry, sandy, rocky, or granulated shale sites. It is one of the first species to become established on disturbed sandy sites. This species has excellent seedling vigor and is easily established. Birds, especially mourning dove and pheasant, and small rodents relish the plump nutritious seeds.

   This is an important bunch grass of the intermountain region. However, the seed is generally available in limited quantities.

   The Engineer shall design the work covered under subsection 2.5 and Appendix B to meet the following technical specification section:

   1. Section 02933 – Seeding

SECTION 4.0

PLAN PREPARATION

4.1 GENERAL

The Engineering Department has established procedures, which must be followed in the preparation of engineering drawings and other plans. Deviations from these requirements, unless specifically authorized, will be cause for rejection by the Engineering Department. All engineers preparing plans should have in their possession a complete set of these Standards. All work shall be in ink on mylar sheets and digital copies of this work will be provided to the Engineering Department upon completion of the project. All projects constructed in the City will conform to these Standards.

The engineer has a distinct responsibility to follow the progress of the work and to submit change orders to the drawings and to incorporate "as-built" information on the drawings.

It should be understood that the responsibility for accuracy and completeness of the drawings rests with the developer's engineer. By signing the drawings, the City Engineer attests to the fact that they have been reviewed by the City and that the Planning Commission has authorized construction. By signing the drawings the City Engineer does not replace the professional liability of the professional engineer who prepared the drawings. The professional engineer who has prepared the studies, design, and drawings associated with this work is to sign and stamp these documents as required by State law.

4.2 PLAN PREPARATION RESPONSIBILITY

Refer to subsection 1-1 and 2.1.B. Design Professionals Qualifications for this information.

4.3 SHEET SIZE AND MARGINS

Overall dimensions of each sheet are 24x36-inches. Margins are to be 2-inches on left, all others ½ - inch.

4.4 SIGNATURE BLOCKS

All sheets of the drawings shall have a approved signature blocks. The approval blocks shall be signed before any construction occurs. Any changes to the plans after initial approval shall be shown as revisions and are required to be approved by the City Engineer.

4.5 COVER SHEET

This shall be the first sheet in the set and shall contain:

A. **Index Map**. An index map with an overall plan at a scale of one inch = 300 feet showing general layout of work, named streets, subdivision boundaries, lot boundaries and numbers, a sheet index and other pertinent information. Care must be exercised to make sure scale and orientation are correct since these index maps are used in the City's geographical information system for other purposes.

B. **Vicinity Map**. A vicinity map with a scale of one inch = 1,000 feet showing subdivision boundary, streets, adjacent subdivisions, major streets outside of subdivision boundaries and the location of the bench mark.

C. **Bench Marks**. All bench marks used in the project shall be graphically shown on this sheet and the elevations, descriptions, locations, etc., spelled out as illustrated below:

B.M. No._____ Elev. _____F.B. _____Page_____

Type of Marker_____

Location_____

All elevations used in preparation of standard plans shall be based on Salt Lake County Surveyor's Office information.

D. **General Notes.** The general notes shall be shown on the cover sheet and need not be shown on the other sheets. The general notes shall include a note requiring compliance with these standards and 5 day notice prior to a preconstruction meeting and before beginning construction (see Section 4.11). Land disturbance notes are to appear on the grading plan. In some instances the land disturbance general notes may appear on a separate sheet. In these instances the grading plan will reference the general notes with lettering not less than 18 points and the sheets will have similar and consecutive numbering, starting with "G" i.e. For general notes refer to Sheet G-1 of G-4

E. **As-built Materials List** - On the cover sheet shall be a block to be used for as-built information. It shall be as follows:

MATERIAL LIST

Item	Supplier and/or Manufacturer	Model/ Type No.	No.

Prior to submittal of as-built drawings, the developer's engineer shall complete the pertinent information.

"As-built" certification is also required. The wording shall be as follows:

"AS-BUILT" CERTIFICATE

I hereby certify that the work shown on Drawing Number _____Sheet _____ through _____inclusive, marked "as-built" has been constructed in conformance with lines and grades as shown on said plans and referred specifications.

_____ _____

Registered Civil Engineer RCE No. Date

G. **City Engineer's Certification for Approval to Construct.** Appropriate designation for City Engineer approval to construct, located above title block (number and date to be completed by the Engineering Department).

Approved for Construction _____ Date_____

City Engineer

4.6 GRADING AND SEDIMENT CONTROL PLAN

A. **General** – Grading plans are to be submitted for review, prior to disturbance of land or vegetation. The City will issue a letter to proceed when the plans conform to the specifications herein. Specifications herein are to be considered minimum. During the review process the City could require additional information prior to issuing the letter to proceed.

The minimum submittal will consist of:

1. A plan review of the site.
2. Two sections through the grading project on the X and Y axis with details as required.
3. The dust control plan as required by the State of Utah, Department of Environmental Quality, Division of Air Quality is to be submitted as a separate drawings meeting the state's requirements.
4. A wet weather plan is required showing additional BMP's that will mitigate the affects of the wet weather on/to adjacent facilities. The intent is to keep streets, storm drains, and existing waterways free of sediment.
5. Detail sheets contain the proposed BMP's on the site. The details are to provide specific and detailed installation instructions to the Contractor to install said BMP's. The general description per manufacturer recommendations is not adequate or acceptable. The BMP's selection is to be flexible and addressed as the project proceeds and site conditions change.

B. **Plan View** – Show and identify the following:

1. The layout of the subdivision including streets, lot line easement lines, drainage channels, and under ground drainage systems. The layout is to be seen as a background (50%).
2. Existing contours including topographic features including but not limited to existing drainage channels, roads, and structures. Contours to be labeled with numeric elevations on a maximum of ten-foot intervals and shown as dashed lines. The City Engineer may change the required interval based on the slope of the property.

3. Finished contours of all proposed topographic features. Finished contours are to be more distinct than existing elevations. Contours to be labeled with numeric elevations on ten-foot intervals and shown as solid lines. The City Engineer may change the required interval based on the slope of the property.
4. Show area Limits of disturbance (LOD).
5. Indicated LOD barrier material, i.e. concrete Jersey barrier or silt fence.
6. Show construction phasing limits.
7. Show timetable construction phasing. Chart form is acceptable.

Example:

Phase	Start	Finish
1	May 15, 2006	September 2006
2	August 22, 2006	December 2006
3	March 1, 2007	September 2007

8. Identify areas in which the majority of the lot has been created with fill dirt.
9. Topsoil storage area(s), containment, and erosion control methods.
10. Retaining walls
11. Sediment BMPs satisfying the intent of retaining soil on the site and out of the streets, existing waterways, storm drain, including dust control 24 hours and seven days per week. Identify type and location of sediment control BMPs in two locations.

    a. The plan view
    b. In a chart on the same sheet as the plan view

Example:

Sediment Control BMP	Identification	Location of BMP	Site Condition
Silt Fence	SF – 1	South side of property	Bottom of Slope
Construction Entrance	CE – 1	North end of property	Adjacent

12. Show locations and direction of flows of existing and proposed swales, water courses, canals, ditches, springs, wells, culverts, storm drains, and storm water facilities. BMP are to be shown in the plan view and in chart form.
13. Show existing and proposed easements and ownership of said easements on residential lots.
14. Show location of any designated flood plains and/or wetland boundaries.
15. Show the staging area and BMP to control chemical and fuel spills.
16. Provide a minimum of two sections through property, one through the x-axis and one through the y-axis. Additional sections are required when:

    a. Cuts or fills over six feet.
    b. Identify locations of sensitive areas, i.e. wetlands or natural drainage courses that will be affected by the proposed grading.

17. Identify the dust control to be used 24 hours a day, seven days per week.
18. Location of concrete vehicle wash out area.
19. The calculation of amount of soil is being moved. This calculation is inclusive of imported, exported, or material used to balance the site. If the soil is being moved, dug, excavated, imported or exported, the calculation should reflect the same.
20. The existing and finish grades expressed in percent to be shown in the respective areas. Existing or finished grades over 30% will be distinctively shaded.
21. Survey Section indicators shown with corresponding sheet numbers.
22. General Notes to appear on Grading Plan.

    a. Contractor should perform earthwork in accordance with the City of South Jordan Land Disturbance Ordinance, the City's Standard Specifications, City of South Jordan Land Disturbance Design and Construction Standards, erosion, sediment, re-vegetation requirements, and the dust control plan as required by the State of Utah, Department of Environmental Quality, Division of Air Quality.
    b. The Contractor will perform earthwork in accordance with technical specifications outlined in the Land Disturbance Design and Construction Standards and the recommended earthwork specifications found in the report of geotechnical engineer, and the geotechnical investigation. In the event there is a conflict between the documents mentioned herein and City of South Jordan's erosion and sediment control requirements or the dust control plan as required by the State of Utah Department of Environmental Quality, Division of Air Quality, City of South Jordan's requirements and the State requirements will control.
    c. The sequence of construction is to be followed.
    d. Sedimentation BMP's shown on the erosion control and sediment control plans to be installed within the same working day the land disturbance occurs.
    e. Dust control BMP's are to be on site and implemented as soon as land disturbance occurs. The dust control as required by the State of Utah air quality plan is to be submitted with the grading plan as a separate drawing.
    f. All areas to be re-vegetated are to receive re-vegetation BMP's within 21 days of disturbance.
    g. If the existing grade is different from what is shown on this grading plan, stop work and contact the City of South Jordan, Engineering Department. Work is to remain stopped until the City's Engineering Department provides a written notice to resume work.
    h. The project owner is responsible for maintaining the streets, storm drains, and channels, ditches and swales free from debris, soil, mud, or other material that would cause a public safety concern, violate the City's UPDES permit, state or federal laws, or prevent the facility from operating.
    i. All concrete trucks are to use the designated washout area(s). Failure to comply will result in a work stop and the offender could be guilty of a Class C misdemeanor.

j. L.O.D. barriers are to be in place and maintained until written notification is received from the Engineering Department. The owner is responsible for maintaining L.O.D. barriers.

k. If disturbance occurs outside the L.O.D. work will stop and remain stopped until the written response is received from the City.

l. The owner is to be responsible for additional grading information as required throughout the remainder of the project.

C. **Grading Plan Sections**

1. Sections to be drawn to the scales indicated see Section 4.7. The profile to be displayed on an X and Y grid background.
2. Section to show existing grades, finished grade, property lines and drainage features.

4.7 EROSION CONTROL AND REVEGETATION PLAN

A. **General** - An erosion control plan is required for all land disturbances including but not limited to pioneering roads, residential subdivisions, commercial projects/subdivisions, temporary and permanent construction, roads and utilities.

The erosion control plan must be prepared and approved before final approval and before construction begins. The erosion control plan shall be submitted with the grading plan as required by local ordinances or be prepared as part of the storm water pollution prevention plan (SWPPP).

If the grading permit allows work to be done during the wet weather season, the permit may require a wet weather operating and erosion control plan. This plan must be approved prior to the commencement of any work and include all necessary temporary and permanent erosion control measures, including those to be followed should the work stop at any time during the wet weather season.

If the site or portion of the site is planned to be idle for more than 45-days, then vegetative stabilization must be accomplished within 7-days. The wet weather plan must include a plan for the immediate (within 24-hours of the first forecast of a storm front) installation of emergency erosion control measures.

B. **Guidelines for Erosion Control Plans** - The plan will consist of three parts:

1. A narrative, containing:

a. A brief description of the proposed land-disturbing activities, existing site conditions, and adjacent areas (such as creeks and buildings) that might be affected by the proposed clearing and grading;

b. A description of critical areas on the site - areas that have a potential for serious erosion problems, including the name, location and aerial extent of moderate and highly erodible soils and slopes on the project site;

c. The date grading will begin and the expected date of stabilization;

d. A brief description of the measures that will be used to control erosion and sedimentation on the site;

e. When these measures will be implemented;

f. A description of an inspection and maintenance program, with provisions for frequency of inspection, reseeding, repair and reconstruction of damaged structures, cleanout and disposal of trapped sediment, duration of maintenance program, and final disposition of the measures when site work is complete.

2. A map showing:

   a. Existing site contours at an interval and scale sufficient for distinguishing runoff patterns before and after disturbance;
   b. Final contours;
   c. A legend, if necessary;
   d. Limits of clearing and grading;
   e. Existing vegetation, such as grassy areas or vegetative buffers, that may reduce erosion or off-site sedimentation;
   f. Critical areas within or near the project site, such as streams, lakes, wetlands, or the aerial extent of erodible soils;
   g. The location and types of erosion and sediment control measures, including vegetative treatment used.

3. Plan details, including:

   a. Detailed drawings of erosion and sediment control structures and measures, showing dimensions, materials, and other important details;
   b. Design criteria and calculations such as design particle size for sediment basins and peak discharge for channel design and outlets;
   c. Seeding or vegetative specifications;
   d. Inspection and maintenance notes.
   e. Specification for surface roughing.

   The narrative and details should be placed on the erosion control plan map if possible.

C. **Plan Check** - The following items provide a general approach and guidelines that a review agency or plan checker might find useful:

1. Responsibility: It is not the responsibility of the plan reviewer to ensure that the plan is appropriate for the level of work suggested by the proposed project. The reviewer can only ensure that the plan meets the minimum standards set by the reviewing agency and its authorizing ordinance.
2. Communications: Encourage informal communications between the plan reviewer and the plan preparer. This will enable the reviewer to make informal suggestions that may save the developer money and the preparer time, and it may result in a better, more effective plan. It will also enable the preparer to explain and justify the plan.
3. Incomplete Plans: Do not review seriously incomplete plans. Send them back with a request for the missing information.
4. Required Information: Make sure all the required information has been submitted. A checklist can be used by both plan reviewers and plan preparers, however, checklists can encourage laziness. Having everything checked off does not necessarily mean that everything is in order.

5. Plan Concept: The concept should be examined first, starting with the general and moving to the specific. Does the plan make sense?
6. Schedule: Examine the construction schedule. Will grading be completed before the wet weather season or before the summer thunderstorm months? When will storm drainage facilities, paving, and utilities be installed in reference to the wet weather season? If grading will take place during months when there is a high probability of heavy rains, what extra precautions will be taken to protect against erosion, sedimentation, and changing drainage patterns (Is a wet weather plan necessary)?
7. Minimize Disturbance: Does the plan show areas that are not to be disturbed? If possible, native vegetation should be retained and stream buffer areas should be designated on the plan and flagged in the field. A well-conceived erosion control plan will minimize erosion by attempting to minimize disturbance and retain natural vegetation. A phased approach to development can assure that the extent and timing of grading does not exceed the contractors ability to perform erosion and sediment control.
8. Site Drainage: Make sure you understand where all drainage comes from on and above the site, where it goes, and how it traverses the site. For large sites, require or prepare a drainage area map. If drainage patterns are unclear, ask for clarification.
9. Sediment Basins and Traps: Locate all sediment basins and traps and define their tributary areas.
10. Erosion Control: Check the method used to prevent erosion. Hydraulic seeding and mulching may adequately stabilize some areas, but other areas, because of their proximity to sensitive features such as watercourses, or their steepness and erosive soil, may need far more intensive re-vegetation efforts. On steep and critical slopes, a reliable backup system for hydraulic planting, such as punched straw, bonded fiber matrix, or erosion control blankets is strongly recommended.
11. Channels and Outlets: Examine all drainage-ways where concentrated flows will occur. Be sure adequate erosion protection is provided both along channels and at channel and pipe outlets. Check the sources of runoff to be sure that all the runoff comes from undisturbed or stabilized areas or has been desilted by sediment basins or other sediment retention devices.
12. Miscellaneous: Look for haul roads, stockpile areas, and borrow areas. They are often overlooked and can have a substantial effect on drainage patterns. Have construction or access roads been surfaced with rock, as a minimum treatment, before the rainy season? Look at all points of vehicle access to the site and be sure mud and soil will not be tracked onto paved streets and that sediment-laden runoff will not escape from the site at these points. Pay particular attention to watercourses and their protection.
13. Plan Details: Once the plan concept has been shown to be adequate, check the details to be sure the concept is adequately described in the plans.
14. Structural Details: Be sure that sufficiently detailed drawings of each structure (sediment basin, dike, ditch, silt fence, etc.) are included so there is no doubt about location, dimensions, or method of construction.
15. Calculations: Determine if calculations have been submitted to support the capacity and structural integrity of all structures. Were the calculations made correctly? Non-engineered structures, such as straw bale barriers, do not generally need hydrologic calculations, however, supporting information such as drainage area and peak flow should be available if requested.

16. Vegetation: Review seed, fertilizer, and mulch specifications. Check quantities and methods of application to be sure they are appropriate and consistent with local guidelines. Are there stipulations so that ineffective re-vegetation and/or damage can be remedied immediately?
17. Maintenance: Be sure that general maintenance requirements and, where necessary, specific maintenance criteria, such as the frequency of sediment basin cleaning, are included. Are there stockpiles of spare materials (filter fabric, straw bales, stakes, gravel, etc.) to repair damaged control measures? Routine maintenance inspections should be part of the plans.
18. Contingencies: The plan must provide for unforeseen field conditions, scheduling delays, and other situations that may affect the assumed conditions. For example, straw mulch may need to be installed as an emergency measure during severe summer thunderstorms, or sediment basins may need to be cleaned more frequently.
19. Technical Review: Where applicable, the erosion and sediment control plan should be reviewed by the soils, certified professional in erosion and sediment control (CPESC), or geotechnical consultant for the project.
20. Signature: Where applicable, the erosion and sediment control plan should be signed by the preparer who shall be a qualified professional.

4.8 GRAPHIC SCALES AND NORTH ARROW

All plan and profile sheets shall contain:

A. A graphic scale, horizontal as well as vertical, illustrated such that a true representation is produced when the plans are reduced in size, and they shall be as follows:

Horizontal 1inch = 40 feet
Vertical 1inch = 10 feet *

*Double scale drawings (i.e., 1inch = 8 feet) may only be submitted where the predominant slope of the existing ground surface or any one sheet exceeds 15 percent. In such cases, the words "Double Scale" shall be boldly shown.

B. A north arrow oriented toward the top or to the right only, or as approved. Generally, north shall be oriented towards the top or right hand side of the sheet.

4.9 PROCEDURE FOR APPROVAL

Approval for improvement plans consists of two phases. Each phase consists of a series of requirements, which must be met before final acceptance.

A. Requirements for authorization of construction (see Section 5 of these Standards).

B. Requirements for final acceptance (see Section 11 of these Standards).

4.10 PLAN CHECKING LIST

The following list is intended as a guideline to assist the preparer; it is not represented to be a complete list of requirements.

Check List
Plan Checking and Project Requirements
Grading

Cover Sheet.

- Standard size, title block, signature block. Revision and engineer's block
- Key and vicinity map
- Include lot numbers and lot lines. Sheet index
- Adjacent subdivisions and street layout
- Bench mark
- Design and as-built certificates
- General notes
- Blue stake alert note.
- Engineer's stamp and expiration date

General Design

- Conform to master plans
- Check for right of way and easements
- Compliance with other utility company requirements
- Check for existing irrigation canals
- Check for compliance with City's surveying monumentation

Grading and Sediment Control Plan Submittal

- A plan view of the site
- Screened background layout of project
- Existing contours (screened)
- Finished contours shown and labeled
- L.O.D. shown, material identified and labeled
- Indicate construction phase lines
- Time table chart of phasing
- Areas with fills over four feet
- Topsoil storage areas shown and identified
- Sediment BMP shown on plan view sheet and in chart
- Existing drainage features
- Existing wetlands identified
- Show staging area and provide details
- Two sections through the grading project on the x and y axis details
- Dust control plan on separate sheet
- Wet weather plan using BMP
- Concrete washout area

Plan & Profile Sheets

- Graphic scales
- North arrows
- Roadway stationing left to right

- Elevations of centerline of roadway, curb and gutter on each side
- Proper burial
- Curve data if there are curves
- Street, curb dimensions, street names
- Lot boundaries
- Easements including line bearings
- Angle points - show deflection angle right or left moving up station

Administrative Before Construction of Main(s)

- Cost estimate
- Inspection and engineering review fee. Bonds and insurance.
- SWPP & Notice of Intent

Administrative During or After Construction to Main(s)

- Change Order Fee
- Meter installation requests

Check List
Plan Checking and Project Requirements
Erosion, Revegetation and Sedimentation

The following checklist is provided to help the plan preparer and reviewer make sure that all the necessary elements of a comprehensive plan have been addressed.

Narrative

Project description: A brief description of the nature and purpose of the land-disturbing activity and the amount of grading involved.
Existing site conditions: A description of the existing topography, vegetation, and drainage.

Adjacent areas: A description of neighboring areas, such as streams, lakes, residential areas, and roads that might be affected by the land disturbance.
Soils: A brief description of the soils on the site including erodibility and particle size distribution (texture).
Critical areas: A description of areas within the developed site that have potential for serious erosion or sediment problems.
Erosion and sediment control measures: A description of the methods that will be used to control erosion and sediment on the site. Temporary erosion control, and temporary sediment control measures. Who will be responsible for implementation? Financial guarantees may be required to assure proper implementation
Permanent stabilization: A brief description of how the site will be stabilized after construction is completed.
Maintenance: A schedule of regular inspections and repairs of erosion and sediment control structures, and the person responsible for maintenance.

Maps

The following information should appear on one or more maps:

Existing contours: Existing elevation contours of the site at an interval sufficient to determine drainage patterns.
Preliminary and final contours: Proposed changes in the existing elevation contours for each stage of grading.
Soils: Boundaries of the different soil types within the proposed development.
Existing vegetation: Locations of trees, shrubs, grass, and unique vegetation.
North arrow
Vicinity Map
Critical areas: Areas within or near the proposed development with potential for serious erosion or sediment problems.
Existing and final drainage patterns: A map showing the dividing lines and the direction of flow for the different drainage areas before and after development, and how well off-site water passes through the site without contamination.
Limits of clearing and grading: A line showing the areas to be disturbed, and proposed buffer-strips.
Erosion and sediment control measures: Locations, names, and dimensions of the proposed temporary and permanent erosion and sediment control measures.
Storm drainage system: Location of permanent storm drain inlets, pipes, outlets, and other permanent drainage facilities (swales, waterways, etc.), and sizes of pipes and channels.

Details

Detailed drawings: Enlarged, dimensioned, and typical drawings of Best Management Practices such as erosion control blankets, energy dissipators, grass-lined channels, and sediment barriers.
Seeding and mulching specifications: Seeding dates, seeding and mulching rates in pounds per acre, and application procedures.
Maintenance program: Inspection schedule, spare materials needed, stockpile locations, and instructions for sediment removal and disposal and for repair of damaged structures.
Master Plans – Check master plans to ensure compliance of project with the City's most current master plan(s).

Calculations

Calculations and assumptions: Data for design storm used to size pipes and channels and sediment basins and traps, design particle size for sediment trap efficiencies, basin discharge rates, size and strength characteristics for filter fabric, wire mesh, fence posts, etc., and other calculations necessary to support drainage, erosion, and sediment control systems.
Attachments: The erosion control plan should accompany the grading plan.

4.11 STANDARD LANGUAGE FOR DEDICATION OF FACILITIES TO CITY

Please refer to current city's policy and standards with the approval of the City Engineer and the City Attorney.

4.12 STANDARD NOTES

The standard notes shown on the following page(s) should be included on the cover sheet as applicable. They are subject to change to suit the needs of the Engineering Department.

GENERAL GRADING NOTES

1. Contractor shall notify City of South Jordan Engineering Department at (801) 254-3742 five business days prior to commencing construction so that a preconstruction meeting can be scheduled.

2. All construction shall conform to City of South Jordan's Land Disturbance Design and Construction Standards as adopted and amended.

3. The contractor shall contact Blue Stakes (801.208-2100) or (811) for marking of existing utilities prior to performing any excavation. Call for underground locating two working days prior to any excavation.

4. Contractor shall perform earthwork in accordance with City of South Jordan Standard Specifications, Land Disturbance Design and Construction Standards and the recommended earthwork specifications found in the report of geotechnical investigation dated
_____, 20____ by _____.

5. The existing topography shown on these plans is based on aerial topographic mapping performed by _____ for _____ dated _____, 20 _____.

6. The Owner shall provide an erosion control plan and obtain all permits required by the City of South Jordan, Salt Lake County, and the State of Utah for erosion control. The Contactor shall be solely responsible to provide all temporary erosion control and maintenance, and shall provide erosion and sediment control forms to the City. For additional erosion control information, see 'Erosion Control/Re-vegetation Plan' sheets. See section 4.7.
7. Subsurface investigations have been conducted at the site of the work. Copies of the soils report may be obtained at the office of _____. Soils investigations were conducted for design purposes only and the data shown in the reports are for subsurface conditions found at the time of the investigation. The Owner and Engineer disclaim responsibility for the interpretation by the Contractor of data, such as projection or soil bearing values and profiles, soil stability and the presence, level and extent of underground water for subsurface conditions during construction operations.

4. CAUTION: Only City of South Jordan Public Works Department personnel are to operate any valves on the culinary water system.

GENERAL EROSION, REVEGETATION AND SEDIMENTATION NOTES

1. Contractor shall notify City of South Jordan Engineering Department at (801) 254-3742 five days prior to commencing construction so that a preconstruction meeting can be scheduled.

2. All construction shall conform to City of South Jordan's Land Disturbance Ordinance and Land Disturbance Design & Construction Standards as adopted and amended.

3. The contractor shall contact Blue Stakes (801.208-2100) or 811 for marking of existing utilities prior to performing any excavation. Call for underground locating two working days prior to any excavation.

SECTION 5.0

FEES, CHARGES AND REQUIREMENTS FOR AUTHORIZATION OF CONSTRUCTION

5.1 GENERAL

The authority for fees/charges is generally established in the City of South Jordan Municipal Code. Specific fee/charge amounts are adopted by City Council Resolution and are generally updated by resolution on a yearly basis. All fee/charge amounts are adopted following the conducting of public hearings by the City Council as required by law. Copies of the current documents are available from the City Recorders Office.

5.2 SUBMITTAL OF PRINTS (PLAN CHECK)

The Developer is responsible for submitting two sets of the prints of the proposed roadway improvements and one copy of the final subdivision plat, where appropriate to the Engineering Department. Plans illustrating an incomplete design and drafting detail may not meet minimum standards and may be just cause for a rejection of the first plan check. The developer or developer's engineer shall submit preliminary plans completed in accordance with these standards. The developer and the developer's engineer should be aware that most projects involve several plan check/ submittals before the drawings are deemed to be in satisfactory condition.

5.3 LAND DISTURBANCE PERMIT APPLICATION FEE

Land disturbance activities, which require a Land Disturbance permit as defined in Title 16.44 – Land Disturbance Ordinance are required to file and pay the fee associated with this permit.

5.4 SPECIAL PROVISIONS

If there are unusual conditions which would require substantial deviation from the City's Land Disturbance Design and Construction Standards, particularly with respect to other sensitive lands, such deviations are to be submitted in writing prior to preliminary plat review and/or development project approval, or in any case prior to submittal of the first plan check.

5.5 EASEMENTS

Any easements necessary must have deeds submitted for checking at this time or must be shown on the subdivision plat before recordation

5.6 AGREEMENTS, BONDS, AND INSURANCE CERTIFICATES

City staff will provide the developer with the proper forms and developer shall submit the following:

A. **Insurance Policy Certificates.** Insurance certificate with limits as stated in the "Agreement". Attention is particularly called to the City's requirements concerning submittal of an "Accord" form. The insurance certificate shall include general liability, auto liability and worker's compensation insurance in amounts as required by the Engineering Department or City Attorney. The City, its officers, employees and agents,

shall be named as additional insureds. The notice of cancellation period must be no less than 60 days. Any reference in the cancellation clause to "endeavor to" or "but failure to mail such notice shall impose no obligation or liability of any kind upon the company" must be deleted. Also, the words "This certificate is issued as a matter of information only and confers no rights on the certificate hold" must be deleted. If disclaimers cannot be deleted from the Accord form, then a signed warranty letter must be attached to the certificate.

B. **City's Accord Form.** The City reserves the right to request that the City's Accord form be utilized.

C. **Performance Bond.** Security is required to pay for stabilization of the site should work be abandoned or stopped before construction is completed. The Engineering Department and City Attorney's office will determine the amount and form of the security and of the form approved by the City Attorney's office. When an agency of the State, federal, or local government provides at least 20-percent of the financing for the project, an instrument of credit from that agency is acceptable.

1. Form – The security can be one of the following:

   a. Bond by a duly authorized corporate surety, or
   b. Letter of credit
   c. Escrow
   d. Cash

2. Amount – The amount of security shall be the full cost of erosion and sedimentation control measures for the project. The estimate of this cost shall be prepared by the developer, and reviewed and approved by the Engineering Department. The City reserves the right to change the estimated amount required.

3. Release – The security will be released upon issuance of a certificate of completion or upon voluntary relinquishment of the permit, provided provisions of the Land Disturbance Ordinance have been complied with and no administrative or legal action against such security has commenced.

D. **Payment Bond**. A Payment Bond (Labor and Materials) in triplicate and notarized, equivalent to the estimated cost based upon the City's most current Resolution.

5.7 APPROVAL FOR CONSTRUCTION

In any Land Use Zone, except Planned Community Zone, upon receipt of all documents, bonds, fees and checking for all documents, bonds and fees, the staff shall prepare a memorandum to the City's Planning indicating the Engineering Division's concerns have been addressed and the project is ready for City Council or Planning Commission action, from an Engineering Department perspective. City Engineer or designee may waive the requirement of obtaining final site plan or final subdivision plat approval as is deemed appropriate for a particular project. City Engineer may require a letter of indemnification as part of that approval.

In any Land Use Zone, except Planned Community Zone, prior to approval by the Planning Commission, the developer/developer's engineer will submit four (4) sets of final drawings (blue line prints) to the Engineering Department to be stamped "Approved for Construction", once the

Planning Commission approves the project. The Engineering Department will sign the original plans only after approval by the Planning Commission, and will notify the developer's engineer that the plans are signed and available. These prints will be stamped "Approved for Construction" on each sheet and one set will be returned to the developer, which must be kept by the contractor on the project site at all times. The other three sets will be distributed to: one (1) to the Engineering inspector, one (1) to the City's project engineer, and one (1) to the permanent Engineering Department file. No work is permitted which is not shown on these approved plans, except minor field changes approved by the Engineering inspector, until a change order has been processed by the Engineering Department and new "Approved for Construction" sheet(s) is (are) issued. The original drawings will be returned to the developer's engineer until they are "as-built", at which time the originals become the City's property. City Engineer or designee may waive the requirement of obtaining final site plan or final subdivision plat approval as is deemed appropriate for a particular project. City Engineer may require a letter of indemnification as part of that approval.

No person, developer, builder, contractor in a Planned Community Zone shall cause to be commenced or commence land disturbance, grading, relocation, or any other land disturbance activity. No person shall import or export any earth materials to or from any site or within the site, without first obtaining a land disturbance permit. No land disturbance permit shall be issued for any site or project within a Planned Community Zone without City approved land disturbance or grading plans. the developer/developer's engineer will submit four (4) sets of final drawings (blue line prints) to the Engineering Department to be stamped "Approved for Construction", once the Planning Commission approves the project. The Engineering Department will sign the original plans only after approval by the Planning Commission, and will notify the developer's engineer that the plans are signed and available. These prints will be stamped "Approved for Construction" on each sheet and one set will be returned to the developer, which must be kept by the contractor on the project site at all times. The other three sets will be distributed to: one (1) to the Engineering inspector, one (1) to the City's project engineer, and one (1) to the permanent Engineering Department file. No work is permitted which is not shown on these approved plans, except minor field changes approved by the Engineering inspector, until a change order has been processed by the Engineering Department and new "Approved for Construction" sheet(s) is (are) issued. The original drawings will be returned to the developer's engineer until they are "as-built", at which time the originals become the City's property.

No construction is to occur before the plans are signed and before the proper five day Engineering Department notification has been given. This notification will allow time for a preconstruction meeting with all interested parties.

The Engineering Department and the developer have a direct relationship via the documents outlined above. Therefore, to the extent possible, correspondence and verbal communication are to be between these parties rather than between the Engineering Department and the contractor or subcontractors where the developer is excluded. In some instances, when the developer or his representative is not available, a work stop order could be placed on the project until the developer; makes himself available.

5.8 SPECIAL CHARGES

If there are items requiring special approval, the Engineering Department may require deposition of funds or agreements for funds in the future, to provide for operation and maintenance of an

extended re-vegetation plan i.e., the planting of seedlings in a deep fill area. Review of this work by the Engineering Department will be charged per Council Resolution.

SECTION 6.0

CONSTRUCTION STAKING

6.1 GENERAL REQUIREMENTS

Construction staking is the responsibility of the developer, his engineer or contractor. When the term 'construction staking' is used, it should be remembered that it encompasses construction roadway, pioneering roads, limits of disturbance, which may not involve any staking, such as survey flagging to be used in heavy vegetated areas. Stakes or marks will be set at no greater interval than 50-feet on straight alignments, in 3o-percent and greater slope areas, staking or flagging will be based on the principle of line-of-site as required by the Engineering Department.

The actual installation of construction stakes or flagging is to be preformed to minimize the disturbance of vegetation, existing grade and other sensitive geological and environmental features.

The information contained on the construction stake shall clearly indicated station, station description, existing grade, finished grade, amount of cut or fill, offsets, and setbacks.

6.2 PRESERVATION OF STAKES

Construction stakes or construction markings shall be carefully preserved by the contractor until after the staking or flagging can be reviewed and approved by the City. If two or more consecutive stakes are knocked out during construction, new stakes shall be set at the contractor's expense.

6.3 "AS-BUILT DRAWINGS"

The stationing and staking adjustments due to field conditions should be shown on as built drawings.

SECTION 7.0

CONSTRUCTION

7.1 GENERAL REQUIREMENTS

This section describes the use of materials and workmanship to be employed in any land disturbance including but not limited to residential building sites, commercial site, parks, subdivisions, as well as City projects. The developer/ engineer shall prepare such general and special specifications as are necessary to define the nature and location of the work, contractual arrangements, payment for work and any other matters concerning the owner or his contractor; these items are not discussed within the standards presented here.

A. **Use of this Section** - The construction section is intended to highlight the features of construction, which are deemed to be most significant. In any construction activity, when there is a conflict between the recommendations of the manufacturer of a product, and the specifications herein and/or county, state or federal regulations the more stringent, should apply.

   Finally, Section 3.0 of these Standards contains material descriptions and the developer/contractor should use that section along with this section and the respective plates as a reference. Section 9.0 describes testing procedures and requirements.

B. **Quality of Materials** - Materials and equipment to be incorporated into the work shall be new and meet quality control standards of the manufacturer, no seconds allowed on the project. In case a reference is not clear as to which of several available grades is desired, the highest quality material shall be used. When construction bids are received directly by the City such bids shall show the proposed pipe material and the manufacturer's name, if more than one type is allowed.

   The Contractor shall have at the job site certified copies of factory or laboratory test reports showing the strength characteristics of any materials used in the work. For all reinforced concrete work, the contractor shall furnish in advance of pouring concrete and, if requested, the mix design and calculated concrete strength as prepared by the concrete supplier.

C. **Substitutions** - Where articles or materials are specified by brand or trade name, alternate materials or articles equal to those specified may be approved provided the request for approval is in writing accompanied by supporting data, in ample time to permit investigations without delaying the work, based on the following:

   1. The alternate product documentation performance typical of the site-specific design parameters. Documentation of similar products will not be accepted. The intent is to have the design parameters be the controlling factors in specifying a product. It is the sole responsibility of the manufacturer to work with the design engineer and/or to determine the design parameters.

   2. On projects that the City has a financial interest, all alternate product submittals shall include a value engineering cost analysis.

Unless substitutions have received prior to approval, no deviation from the Standards will be allowed.

D. **Quality of Workmanship** - All work will be done by persons experienced in the specific work, under competent supervision and in a first class manner to the City's complete satisfaction. When work is being done directly for the City, the contractor in the proposal shall name each subcontractor and no substitutions will be permitted without prior approval.

E. **Defective Work**

- Site Work - Any defective materials or workmanship, which shall become evident within one year after field acceptance of completed work shall be replaced or repaired without cost to the City. Refusal of the contractor to correct defective work, which is clearly his responsibility, will be considered just cause for exclusion from performing future work for the City. Such exclusion does not impair the City's right to bring legal action to correct the deficiencies as well as to withhold release/exoneration of cash/letter of credit bond and payment bond.
- Sediment Controls – Any defective materials or workmanship, which shall become evident, is to be replaced or repaired without cost to the City immediately. Refusal of the contractor to correct defective work, which is clearly his responsibility, will be considered just cause for exclusion form performing future work for and/or in the City. Such exclusion does not impair the City's right to bring legal action to correct the deficiencies as will as to withhold release/exoneration of cash/letter or credit bond and payment bond.
- Re-vegetation – Defective work shall be governed by the prescheduled release dates of the re-vegetation bond as described in Resolution 97-73. All damage resulting from the contractor's refusal to repair the defective work will be the sole responsibility of the contractor of the owner.

F. **City Inspection, Field Acceptance and Guarantee** Period - The developer's engineer is responsible for the daily inspections and submitting inspection forms, compaction data and other City required information. The developer's engineer is to notify the Engineering Department a minimum of 24 hours before final inspection is requested. The Engineering Department has the responsibility to respond in a timely manner, which is considered fair and responsible, but within five working days or request.

The Engineering Department is responsible for all final acceptance inspections of all grading, sediment control, erosion control and revegetation work. All such work shall be available for City observations and comments at all times. It will be the contractor's responsibility to provide a working day's notice to the Engineering Department prior to the start of any work. Scheduling a preconstruction meeting requires a minimum of five working days. Failure to provide proper notification may delay the preconstruction meeting and the starting date of the project since the Engineering Department may not be able to inspect the work and cannot accept any work for which a preconstruction meeting and/or inspection has not been arranged. It must be emphasized that the primary responsibility for compliance with all City requirements and standards rests with the developer. Any acceptance of a portion of the work by a construction inspector does not relieve the developer of this basic responsibility.

Field acceptance is made by the inspector; however, the 18-month guarantee period for all work shall begin as of City Engineer acceptance. As mentioned in Section 7.I.E., any deflective site work or grading work discovered during this period shall be repaired or replaced but a new 18-month period will not begin for the corrected work.

All holiday or weekend inspection will be subject to additional charges as detailed in the City's standard rates for such work.

G. **Public Relations** - The contractor shall conduct its affairs in a manner that will lessen the disturbance to residents in the vicinity of the work. In this regard, standard working hours as specified in the Municipal shall be observed unless prior approval is received, which also includes City observed holidays. The job site shall be maintained in a condition, which shall bring no discredit to the City or its personnel, and all affected private improvements shall be restored to at least their original condition. Saturday work may be provided for only by approval of the Engineering Department and the contractor will be responsible for payment of all overtime and other charges associated with having City staff available for inspection and other coordination. Special care must be taken in regards to school zones, including sidewalks. These zones must be maintained open at all times and any alterations to existing shall be coordinated with the School District and the City's Engineering Department.

7.2 CONSTRUCTION SEQUENCE – EROSION /SEDIMENT CONTROL

A. This portion of the document is to familiarize the permit holder/contractors and subcontractors with the general erosion/sediment controls required of all projects. Site-specific requirements contained on the City approved construction plan are in addition to these requirements. These requirements are as follows:

1. Read and follow the sequence of construction shown on the approved plans. Any modifications must be obtained from the Engineering Department prior to deviating from the sequence of construction.

2. The limits of disturbance must be field marked prior to any land disturbance.

3. Within a working day of disturbance, the erosion/sediment control measures must have been installed.

4. Provisions to control dust are to be on site and operational prior to any land disturbance and are to meet the State's permit requirements. The State's dust control permit is to be available at the construction trailer at the site.

5. An erosion/sediment control preconstruction meeting is required prior to any land disturbance.

6. At the erosion/sediment control preconstruction meeting, a review of the area of disturbance and the proposed vegetation removal will be reviewed and approved by the Engineering Department.

7. The permit holder must obtain written approval from the Engineering Department, certifying that the limits of disturbance, dust control measures and

tree protection are correctly marked and installed or ready to implement prior to commencing any clearing.

8. Erosion/sedimentation control best management practices will remain in good working order through the entire project and until all disturbed soil has been stabilized to prevent erosion. Written approval must be obtained by the Engineering Department certifying all disturbed areas.

9. All disturbed areas will be reestablished as per these standards within 21 days of reaching the final grade.

10. Erosion/sedimentation control facilities require mandatory, periodic inspections throughout the construction and until all disturbed areas have been stabilized.

11. Erosion/sedimentation control facilities require regular, frequent inspection of not less than seven days or within 24 hours of a storm event or a snowmelt. Inspection will be documented by submitted the required information contained in the erosion and sediment control plan. Failure to fill out and submit said inspection forms to the Engineering Department would result in the issuance of a work stop order. Work stop order will not be released unless a special erosion and sediment control meeting is held.

12. Keep streets clean at all times. Written permission by the Engineering Department is required prior to washing streets.

13. A copy of these erosion/sediment control notes is to be posted at the site at all times. Failure to post said notes might result in a work stop order.

7.3 PERMITS

The following permits may be required of the contractor:

A. **Excavation Permit** – Where construction will encroach into the public right-of-way or easements, the contractor shall obtain all necessary excavation permits. Within City of South Jordan right-of-way, the permit is secured from the Public Works Department. Within the County areas, a similar permit is required from the County. State roads require a permit from UDOT. Particular attention is called to Section 7.15 and the appropriate standard drawings.

B. **Explosives Permit** – Where the contractor anticipates the use of explosives in conjunction with the water construction, a blasting permit shall be first obtained from the City County and State agencies, and all nearby property owners shall be notified. These permits are discretionary and may not be given for a particular circumstance.

C. **Land Disturbance Permit** – The Contractor is responsible for obtaining a land disturbance permit from the Engineering Department and paying the applicable fees. The Developer shall prepare the necessary grading plans and drawings and submit the necessary reports from a registered geotechnical engineer prior to the permit being issued.

D. **Dust Control Permit** – The contractor is responsible for obtaining a Dust Control Permit from the Department of Environmental Quality Division of Air Quality and paying the applicable fees. The developer shall prepare the necessary Dust Control Permit and necessary drawings and submit the necessary plan and reports from an erosion control specialist prior to the permit being issued. The developer is hereby notified that the possession of a 404 permit does not constitute compliance until all details and BMP's have been reviewed by the City.

E. **Storm Water Pollution Prevention Permit (SWPP)** - The contractor is responsible for obtaining a SWPP Permit from the Department of Environmental Quality Division of Water Quality and paying the applicable fees.

F. **Salt Lake County Development and Construction Permit** - The Developer is to obtain and submit this permit to the City if the subdivision is within 100 feet of a critical flood area as defined by Salt Lake County. If the project is not within 100 feet of a critical flood area as defined by Salt Lake County, the Developer is to submit a letter from Salt Lake County to the City so indicating.

G. **Corps of Army Engineer 404 Permit** – The contractor is responsible for obtaining a grading permit from the Corp of Army Engineer or the Natural Resource Conservation Service and paying the applicable fees. The developer shall prepare the necessary plans, drawings, and reports. That will specify detail all erosion control, sediment control, re-vegetation and urban drainage BMP and submit said items to the City from a qualified professional in their respective field, prior to the permit being issued. The developer is here by notified that the possession of 404 permit does not constitute compliance until all details and BMP have been reviewed by the City.

H. **Utah Department of Transportation (UDOT) Access Permit** – The developer/contractor is responsible for obtaining a UDOT access permit for any work, which will require a connection to a UDOT owned and maintained roadway.

I. **Utah Department of Transportation (UDOT) Encroachment Permit** - The developer/contractor is responsible for obtaining a UDOT encroachment permit for any work, which will impact UDOT, owned property.

J. **Canal Company Discharge Permit** – The discharge of any surface water to an irrigation canal will require that the developer/contractor obtain a storm water discharge permit from that canal company.

K. **Other Permits** - Other permits may also be required by other agencies, which must be applied for and obtained by the developer or his contractor. Certain permits are also required as part of the development conditioning process which must be provided prior to beginning construction of the project. Please refer to the City's 'Development Processing Manual' for additional information.

7.4 INSPECTION

A. **General Excavating and Grading Requirements**

1. Supervision. The land disturbance permit holder shall provide sufficient supervisory control during the grading operations to insure compliance with the

approved plans and with the provisions of this Code. The land disturbance permit holder shall avail himself of geological and/or soils engineering services to implement the supervisory control of the land disturbance permit holder's registered civil engineer. The engineering geologist and/or soils engineer shall be properly qualified, in accordance with the provisions of this chapter, and qualified to perform such services within the City. Periodic reports as required by the City Engineer shall be submitted by the soils engineer and/or engineering geologist.

1. Safety precautions during grading. If, at any stage of work on an excavation or fill, the City Engineer determines by inspection that further work as authorized by an existing land disturbance permit is likely to endanger any property or public way, the City Engineer may require that plans for such affected area be amended to include adequate safety precautions as a condition to allow the work to continue. The City Engineer may cause the work on the affected area to be halted and may require that plans be amended to include adequate safety precautions as a condition to allow the work to continue.

   Safety precautions may include, but shall not be limited to, specifying a flatter exposed slope or construction of additional drainage facilities, berms, terracing, compaction, cribbing, retaining walls or buttress fills, slough walls, desilting basins, check dams, benching, wire mesh and guniting, rock fences, revetments, or diversion walls.

3. Supervised grading. Where necessary, the City Engineer shall require the land disturbance permit holder to employ:

   a. A registered civil engineer to supervise all grading;
   b. A soils engineer to provide either constant or continuous soils inspections: and
   c. An engineering geologist to provide either constant or continuous geological inspections as suit the job.

   The employment of such persons shall not be deemed to render unnecessary inspections described in this chapter, except that on any work requiring the continuous supervision and inspection of a registered civil engineer, the inspections required by this section may be delegated to the registered civil engineer by the City Engineer.

   If the registered civil engineer, soils engineer, or engineering geologist, fulfilling his responsibility pursuant to the provisions of this section, finds that work is not being done in conformance with the provisions of this chapter or the plans and specifications approved by the City Engineer, the registered civil engineer, soils engineer, or engineering geologist shall immediately notify the person in charge of the grading work, and if the nonconformity is not corrected, the City Engineer shall be notified in writing of the nonconformity and of the corrective measures to be taken. Such notice shall be delivered to the office of the City Engineer within twenty-four (24) hours except in the case of mass grading, which is more than 10,000 cubic yards per day, when the time limit shall be eight (8) hours.

If, for any reason, the services of any of the three (3) professional persons are terminated during the progress of the grading work, such professional person and the land disturbance permit holder shall immediately notify the City Engineer in writing. Such termination may result in temporary delays in the grading operations until satisfactory arrangements are made to assure the City Engineer that competent professional supervision is provided. When the services of one or all three (3) of the professionals of record are terminated, the professional whose services have been terminated shall submit to the City Engineer certification of work performed under his supervision, along with deficiencies to be corrected. The new professional shall submit to the City Engineer a letter of certification that the previous professional's design, reports, and recommendations have been reviewed, that all provisions the City Engineer required as conditions of the land disturbance permit will be complied with during the course of the work, and that he shall review the detailed grading plans and thus assume his responsibility as set forth in this chapter for all future grading on the project. The letters shall be referenced to the approved grading plans prepared by the design civil engineer.

The certification shall state that the job was constructed as indicated by the "as built" plan, that the soils engineer and engineering geologist's reports and certifications have been submitted, that they have provided their services in accordance with good practices, and that all drainage provisions and safety features have been incorporated in the grading of the site.

B. **Inspections of Excavations and Fills**

1. Requirements. All construction or work for which a land disturbance permit is required shall be subject to inspections by authorized employees of the City, and certain types of work to be determined by the City Engineer shall have either continuous or constant inspection and supervision by a registered civil engineer, and/or other appropriate consultants, soils engineer, and engineering geologist as a condition of the issuance of the land disturbance permit. Prior to issuing a grading certificate, a final inspection shall be made of all construction or work for which a land disturbance permit has been issued.

2. Exposure of work. Whenever any work on which called inspections are required, as specified in this section, is covered or concealed by additional work without having first been inspected, the City Engineer may require, by written notice, that such work be exposed for examination. The work of exposing and recovering shall not entail expense to the City.

3. Notices. The land disturbance permit holder or his agent shall notify the City Engineer twenty-four (24) hours in advance of the time when the grading operation is ready for each of the following inspections:

   a. Initial inspections. When the land disturbance permit holder is ready to begin work but before any grading or brushing is started;
   b. Toe inspections. After the natural ground is exposed and prepared to receive fill but prior to the placing of any fill. Approval for placing fill shall not be made until all debris and unsuitable material has been removed from the site to an approved location;

c. Sub-drain inspections. Inspections shall be required on all sub-drains after the installation but prior to the placement of any fill;

d. Excavation inspections. After the excavation is started but before the vertical depth of the excavation exceeds ten (10') feet;

e. Fill inspections. After the fill emplacement is started but before the combined vertical height of the lift exceeds ten (10') feet;

f. Drainage device inspections. After the forms, steel reinforcement, and pipe are in place but before any concrete is placed;

g. Rough grading. When all the rough grading has been completed. This inspection may be called for at the completion of the rough grading without the necessity of the City Engineer having previously reviewed and approved applicable reports;

h. Rough grading certification. A conditional interim certificate may be issued to the City Engineer to allow the issuance of building land disturbance permits. This certificate shall in no way exonerate the applicant from completing the grading;

i. Final certification. When all work, including the installation of all drainage structures, other protective devices, the compaction of trench backfill, and planting and slope stabilization, has been completed and the "as built" plan and required reports have been submitted;

j. Other inspections. In addition to the called inspections provided by this section, the City Engineer may make any other inspections of any work to ascertain compliance with the provisions of this chapter and other laws; and

k. Interrupted grading. When the land disturbance permit holder is ready to resume work, but before any grading or brushing is started, the land disturbance permit holder or his agent shall notify the City Engineer twenty-four (24) hours in advance of the time when the grading operation is ready.

4. Certification. The Developer's engineer shall certify to the Building Official, upon the completion of the grading work, that all grading work has been done in compliance with all approved grading plans and reports and that all applicable Building Code regulations shall be administered by the office of the Building Official thereafter.

5. Issuance of certificates. Upon the final inspection when it is found that the work authorized by the land disturbance permit, including the installation of all drainage structures, has been satisfactorily completed in accordance with the requirements of this chapter, a grading certificate covering such work shall be issued to the land disturbance permit holder by the City Engineer.

6. Final reports. Upon the completion of the work, the City Engineer may require the following reports and information:

a. A report from a registered civil engineer certifying that all grading, lot drainage, and drainage facilities have been completed in conformance with the approved plans and the provisions of this chapter and that the graded site will support residential or commercial type structures, whichever is applicable;

b. A soils engineering report including, but not limited to, certification of the soil bearing capacity, summaries of field and laboratory tests, locations of tests, expansive soil classification lot by lot, and slope tests taken in the fills showing the limits of compacted fill on an "as built" grading plan;

c. An engineering geology report by the engineering geologist, based on the final contour map, including specific approval of the grading as affected by geological factors. Where necessary, a revised geologic map, cross sections, and any recommendations necessary shall be included; and

d. When "as built" grading plans are required, as determined by the City Engineer, such plans shall be signed by the supervising civil engineer, the soils engineer, and the engineering geologist, when applicable, for their portions of the work.

C. **Additional Inspections or Testing** - The City Engineer may require additional inspection and testing by an approved testing when deemed necessary. The testing agency's responsibility may include, but need not be limited to, certification concerning the inspection of cleared areas and benches to receive fill, and determination of the compaction density of fills. Any such additional testing or inspections shall be at the land disturbance permit holder's expense.

D. **Final Inspection** - The developer's engineer shall inspect and certify that the site is ready for final inspection and shall request a final inspection of the City Engineer in writing.

The City Engineer is not give final approval until all work has been completed in accordance with the final approved plans and specifications, including, but not limited to, installation of all drainage facilities and their protection devices, all required re-vegetation, all required erosion and sediment control measures, and an approved post-construction maintenance schedule is established. The acceptability of re-vegetation stabilization will be determined by the City using the criteria set forth in the Land Disturbance Design and Construction Standards.

E. **Inspection of Individual Lots** - The construction of buildings and other structures on individual lots shall not begin until after all improvements required as part of the final plat map or site plan have been completed.

As part of the subdivision improvements' inspections, the Engineering Department will provide inspection for all 'subdivision level' related improvements. This will include all improvements within the City's dedicated right-of-way and receipt of certification that the Grading and Drainage Plan and grading and drainage drawings have been complied with (from the design engineer) and the original erosion control measures are in place as required.

Once the subdivision level improvements are in placed and approved, the Building Division will then become responsible for the project on a lot-by-lot basis and is responsible for the 'Lot Level' designs and inspections. This would include receiving certification from the design engineer that the Grading and Drainage Plan, grading and drainage drawings are still being complied with, that the requirements of the lot's 'site plan' are being complied with which would include such items as locations of driveways, their grades, setbacks of the house, retaining walls, etc.

7.5 TRAFFIC REGULATION

A. **General** - The Contractor shall submit a traffic control plan to the City for review and approval. The traffic control plan shall include the times the work shall be ongoing, streets affected, the proposed plan for dealing with traffic as well as a schedule for work to be performed. This work shall be done in accordance with the following technical specification:

1. Section 02010 – Traffic Regulation

7.6 CLEARING AND GRUBBING

A. **General** - Clearing and grubbing which consists of removal of objectionable material from the right-of-way and project shall be done with caution such that existing wastewater improvements, adjacent property and trees and shrubbery that are not to be removed shall be protected from injury or damage. In areas of excessive deep organic layer the clearing and grubbing shall be defined as a depth not to exceed 12 inches. The sequence of construction will be followed by the contractor and have the sediment and dust control BMP in place as the clearing and grubbing proceeds. At no time will the contractor leave the site at the end of the day without providing for sediment and dust controls.

Within public utility easements or rights-of-way, trees, shrubs, fences and all other improvements that have to be removed to permit construction and which are intended for replacement, shall be replaced in kind or size (excluding native trees under 2-inch diameter or native brush) or with approved substitutes unless permission to exclude such replacement is obtained from the owner/agency or granted by the Engineering Department. Replacement trees shall have a minimum diameter caliber, above graft, as recommended by the American Association of Nurserymen, but shall be larger if so required. This work shall be done in accordance with the following technical specification:

1. Section 02112 – Clearing, Grubbing and Stripping

B. **Removal and Disposal of Material** – The contractor shall be responsible for leaving the site in a neat and finished appearance, free from debris and/or inflammable material. Debris to be legally transported to a legal disclosed landfill. Under no condition will debris be buried, including vegetation.

7.7 UTILITIES, EXISTING FACILITIES AND CONCRETE REMOVAL

A. **Abandonment** - Refer to Section 8.0 regarding abandonment of roadways and/or structures.

B. **Utilities and Existing Facilities** - The existing utilities and/or facilities shown on the drawings or the location of which is made known to the contractor prior to excavation, by contacting Blue Stakes 2 working days or as required by the involved utility companies, shall be protected from damage during the excavation and backfilling of trenches and, if damaged, shall be repaired by and at the contractor's expense. Any existing utility or facility not shown on the drawings or the location of which is not shown to the contractor in sufficient time to avoid damage, if inadvertently damaged during excavation, shall be

repaired by the contractor; and adjustment in payment, if any, is subject to negotiation between the contractor and the developer without any City liability, unless it is a City sponsored project.

Whether expressly indicated on the drawings or not, all contractors shall call Blue Stakes prior to any clearing, grubbing, or excavating. Failure to do so shall not relieve the contractor of any liability associated with disturbance/ breakage of existing utilities. This work shall be done in accordance with the following technical specification:

1. Section 02223 – Protecting Existing Underground Utilities

In case it shall be necessary to remove any such utilities, facilities or any portions thereof, the contractor shall notify the Engineering Department and the owner of the structure. The contractor shall not interfere with said utility and/or facility structures until disposition of the obstruction to the work has been determined and/or notice to relocate or remove has been given by the Engineering Department or authorized agent of the owner of the utility and/or facility so affected.

The fact that any underground utility and/or facility is not shown on plans shall not relieve the contractor's responsibility to comply with these standards. It shall be the contractor's responsibility to ascertain prior to commencing work the existence of any underground utilities or facilities that may be subject to damage by reason of operations performed by the contractor.

C. **Concrete, Masonry or Mortared Construction Removal** - At locations shown on plans, portions of existing concrete pavement, curbs, gutters, sidewalks, foundations and other concrete or mortared structures shall be removed to the lines and elevations specified. Concrete structures or objects not shown or noted on the plans shall be removed where necessary and disposed of by the contractor.

Concrete removal operations in connection with the reconstruction of existing structures shall be performed without damage to any portion of the structure that is to remain in place. If damage occurs, the contractor shall repair any such damage at his own expense, to the satisfaction of the Engineering Department. Repair/replacement of any sidewalks, curbs and/or gutters shall be to the satisfaction of the Engineering Department, as appropriate. Where existing reinforcement is to be incorporated in new work, such reinforcement shall be protected from damage and shall be thoroughly cleaned of all adhering material before being embedded in new concrete.

7.8 EXCAVATION AND TRENCHING

A. **General** - Trench excavation shall consist of all excavation involved in the grading and construction of water lines, and other utilities and facilities as shown on plans. The contractor shall perform all excavation of every description and of whatever substances encountered, to depths indicated on the drawings or otherwise specified or required. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. The material piles shall also not obstruct existing sidewalks, roadways, or driveways unless approved in writing by the Engineering Department. All excavated materials not required or unsuitable for backfill shall be removed. Such grading shall be done as may be necessary to prevent surface water from flowing into trenches or other

excavations, and any water from any source accumulating therein shall be removed by pumping or by other approved methods. Such sheeting and shoring shall be done as may be necessary for the protection of the work and for the safety of personnel.

Unless otherwise indicated, excavation shall be by open cut except that short sections of a trench may be tunneled if, in the opinion of the Engineering Department, the pipe or duct can be safely and properly installed and backfill can be properly tamped in such tunnel sections. If blasting is necessary, the contractor shall notify the City of his blasting schedule and procedures and obtain a blasting permit, and shall observe all reasonable precautions in protecting life and property. This work shall be done in accordance with the following technical specification:

1. Section 02200 - Earthwork
2. Section 02201 – Earthwork (For Roads and Highways Only)
3. Section 02211 - Rough Grading

B. **Excavation** - Excavation for water lines shall be made only after pipe and other necessary materials are delivered on the work site. After such delivery, trench excavation shall proceed as rapidly as possible, and the pipe installed and the trench backfilled without undue delay.

C. **Shoring** - All shoring for open excavations shall conform to the State of Utah, Department of Industrial Relations, and Division of Industrial Safety "Construction Safety orders (O.S.H.A)." The contractor shall be responsible for adequately shored and braced excavations so that the earth will not slide, move or settle, and so that all-existing improvements of any kind will be fully protected from damage.

No shoring once installed shall be removed until the trench has been approved for backfill operations. Removal of shoring shall only be accomplished during backfill operations and in such a manner as to prevent any movement of the ground or damage to the pipe or other structures.

The contractor shall obtain and pay for all permits for any excavations over 5 feet (1.5m) in depth into which a person is required to descend or any excavation less than 5 feet (1.5m) in depth in soils where hazardous ground movement may be expected and into which a person is required to descend.

7.9 BACKFILL AND COMPACTION

A. **General** - There are several distinct zones to be considered in the backfilling procedure as follows:

1. Pipe Zone. This area is from the trench bottom to 12 inches (300 mm) above the pipe. This zone is to be backfilled under the strict jurisdiction of the Engineering Department.

2. Above pipe zone but below pavement sub-grade plus the zone including the sub-grade and pavement Backfill and compaction in existing streets and in the area above the pipe zone shall be in full accordance with the City excavation permit issued for the specific work, and with the City land development specifications. In both cases, the filling of trenches shall be subject to approval by the City or

Engineering inspector who shall have full authority to order compaction tests to demonstrate the actual backfill density.

7.10 CONSTRUCTION WATER

A. **General** - The developer/contractor shall not take unmetered water from the City's or any other culinary water system. Instead, he or she should sign up at the Public Works Department for one or more construction meters after receipt of a deposit amount. The developer/contractor is not to move the construction meters. Charges for construction water are covered by City Council Resolution. The developer/contractor is put on notice that unpaid invoices will result in removal of the construction meter. This work shall be done in accordance with the following technical specification:

1. Section 02161 - Care of Water

7.11 SUBGRAGE PREPARATION AND PLACEMENT OF BASE MATERIALS

A. **General** – This work shall provide for the preparation of natural, filled, or excavated roadbed material prior to the placement of subbase or base material, pavement, curbs and gutters, driveways, sidewalks, or other roadway structures.

B. **Subgrade Preparation** – This work shall be done in accordance with the following technical specification:

1. Section 02227 - Sand-Cement Slurry
2. Section 02280 - Soil Treatment
3. Section 02514 - Soil Cement Base

C. **Untreated Base** – This work provides for untreated base for pavement, curb, gutter and similar types of improvements that shall be constructed according to their technical specification sections.

7.12 CONCRETE AND MASONRY CONSTRUCTION

A. **General** – This work provides for construction of concrete structures, curbs & gutter, sidewalks, cross gutters and driveways connected to grading, erosion, revegetation and sedimentation control projects. This work shall be done in accordance with the following technical specification:

1. Section 03100 - Concrete Formwork
2. Section 03102 – General Concrete Construction
3. Section 03200 - Concrete Reinforcement Steel
4. Section 03300 - Cast-in-Place Concrete
5. Section 03304 – Minor Concrete

B. **Concrete Structures** – Concrete bridges, culverts, catch basins, retaining walls, abutments, piers, footings foundations, and similar structures shall be constructed in conformity with the plans and specifications. Retaining walls are to be inspected by the Developer's engineer with reports being submitted to the City for review.

C. **Concrete Curbs & Gutters, Sidewalks, Cross Gutters, and Driveways** – Concrete curbs, walks, gutters cross gutters, alley intersections, access ramps, and driveways shall be constructed of Portland cement concrete of the class and other requirements prescribed in the plans and specifications. The finish coat to be applied to curbs shall consist of Class "B" mortar.

7.13 LANDSCAPE AND IRRIGATION SYSTEMS

A. **General** – This section shall govern the preparation, planting, and irrigation system construction for landscape areas required by the City.

Existing utilities and improvements not designated for removal shall be protected in place. Unless otherwise provided, walls, curbs, planter boxes, walks, irrigation systems, and similar improvements required by the City shall be constructed following rough grading and before landscaping.

B. **Testing** - All work on the irrigation system, including hydrostatic and coverage tests, preliminary operational tests of the automatic control system, and the backfill and densification of trenches, and other excavations shall be performed after topsoil work and before planting. This work shall be done in accordance with the following technical specification:

1. Section 02811 - Landscape Irrigation System

SECTION 8.0

ABANDONMENT

8.1 GENERAL

The developer's engineer shall indicate all existing roadways, water or storm drain lines or structures, which are to be abandoned, on the drawings. In general, abandoned lines, which are in service, will be replaced with a parallel line of equal or larger size, and the engineer shall demonstrate in any case that the abandonment does not adversely affect the operation of the system.

All abandonment of property and abandonment and construction of underground pipelines shall be discussed with the Engineering Department and approved prior to any such work.

8.2 UNDERGROUND UTILITY LINES

Underground utility lines to be abandoned shall be entirely filled by pumping concrete into them. The pump mix shall be a mixture sufficiently workable for the purpose intended and shall be a concrete mix of 200-psi minimum. The engineer shall show on the drawings the approximate number of cubic yards of concrete, which will be required for any particular reach.

8.3 STRUCTURES

Structures associated with lines to be abandoned shall be removed by the contractor/developer and given to the City, if salvageable.

8.4 EASEMENTS OR RIGHT-OF-WAY

All easement and right-of-way abandonments shall be provided for as part of the development processing, not during construction. If it is determined that easements or property must be abandoned during construction, the project will be put on hold until the property issues are resolved to the satisfaction of the City, and/or the Salt Lake County Recorder's office.

SECTION 9.0

TESTING

9.1 GENERAL

This section applies to grading and soils materials testing, erosion control materials and storm drain system materials testing, concrete and other miscellaneous materials tested associated with this standard. The references made here are for general information only and the individual construction specifications need to be referenced for additional details on testing for that specific item. The testing of culinary water, storm drainage facilities, wastewater, parks and trails, and road and bridge facilities are addressed in other design and construction standards.

9.2 CONCRETE TESTING

A. The following references apply to concrete related items including concrete mix design, testing of aggregates and cement, reinforcing steel, concrete unit masonry, and others:

ACI 214-77	Recommended Practice for Evaluation of Strength Test Results of Concrete.
ACI 301-79	Specifications for Structural Concrete for Buildings.
ACI 304	Specifications for Site Mixed Concrete
ACI 308	Specifications for Curing Concrete
ACI 315-80	Details and Detailing of Concrete Reinforcement.
ACI 318-77	Building Code Requirements for Reinforced Concrete. WRI Manual of Standard Practice for Welded Wire Fabric
ACI 347-78	Recommended Practice for Concrete Formwork.
ASTM A82-79	Specification for Steel Wire, Plain, for Concrete Reinforcement.
ASTM A185-79	Specification for Welded Steel Wire Fabric for Concrete Reinforcement.
ASTM A478	Specification for Precast Reinforced Concrete Manhole Sections
ASTM A615-82	Specification for Deformed and Plain Billet-Steel Bards for Concrete Reinforcement
ASTM A775	Test Methods for Epoxy Coatings
ASTM C31-84	Methods of Making and Curing Concrete Test Specimens in the Field.
ASTM C33-84	Specification for Concrete Aggregates.
ASTM C34	Testing of Concrete Specimens
ASTM C39-83b	Test Method for Compressive Strength of Cylindrical Concret Specimens.
ASTM C76	Specification for Reinforced Concrete Culvert Storm Drain and Sewer Pipe
ASTM C90	Specifications for Concrete Masonry Units
ASTM C94-83	Specification for Ready-Mixed Concrete.
ASTM C114-83b	Method for Chemical Analysis of Hydraulic Cement.
ASTM C127	Method of Sieve Analysis of Course Aggregate
ASTM C136-84a	Method for Sieve Analysis of Fine and Coarse Aggregate.
ASTM C143-78	Test Method for Slump of Portland Cement Concrete.
ASTM C144	Specifications for Masonry Mortar
ASTM C150-84	Specification for Portland Cement.

ASTM C156-80a	Test Method for Water Retention by Concrete Curing Materials.
ASTM C157-80	Test Method for Length Change of hardened Cement Mortar and Concrete.
ASTM C192-81	Method of Making and Curing Concrete Test Specimens in the Laboratory.
ASTM C207	Specifications for Hydrated Lime
ASTM C231	Specifications for Concrete Mix Air Content
ASTM C260-77	Specification for Air-Entraining Admixtures for Concrete.
ASTM C309	Specifications for Concrete Curing Compound
ASTM C311-85	Method for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland Cement Concrete.
ASTM C404	Specifications for Concrete Unit Masonry Aggregate
ASTM C443	Specifications for Rubber Gaskets
ASTM C478	Pre-cast Concrete Manholes
ASTM C494-82	Specification for Chemical Admixtures for Concrete.
ASTM C578	Specifications for Rigid Insulation for Concrete
ASTM C615	Specifications for Reinforcing Steel
ASTM C618-85	Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
ASTM D173	Specifications for Saturated Cotton Fabric
ASTM D1751-83	Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).
ASTM D1752	Specifications for Expansion Joint Material
ASTM E119-83	Method for Fire Tests of Building Construction and Materials.
AWS Dl.4-79	Structural Welding Code - Reinforcing Steel.
PS 1-74	U.S. Product Standard for Concrete Forms, Class I.

9.3 SOILS TESTING

A. The following references apply to soils, excavation, grading and recompaction efforts related items. They are as follows:

ASTM D 422-63(1972)	Method for Particle-Size Analysis of Soils.
ASTM D 698-78	Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures, Using 5.5lb (2.49kg) Rammer and 12-in (304.8 mm) Drop.
ASTM D 1140-54(1971)	Test Method for Amount of Material in Soils Finer than the No. 200 (75 mm) Sieve.
ASTM D 1556-82	Test Method for Density of Soil in Place by the Sand-Cone Method.
ASTM D 1557-78	Test Methods for Moisture-Density Relations of Soils and Soils-Aggregate Mixtures using 10-lb. (4.54 kg.) Rammer and 18-in. (457mm.) Drop.
ASTM D 1663-84	Test Method for Compressive Strength of Molded Soil-Cement Cylinders.
ASTM D 2419-74(1979)	Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
ASTM D 2487-83	Classification of Soils for Engineering Purposes.
ASTM D 2901-82	Test Method of Cement Content of Freshly-mixed Soil Cement.

ASTM D 2922-81	Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
ASTM D 4318-84	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

9.4 STORM DRAINAGE SYSTEM TESTING

A. The following references apply to storm drainage system related items including piping, trench backfill and compaction and storm drainage appurtenances.

AASHTO M 252	Corrugated Polyethylene Drainage Tubing
ASTM C76 (1989)	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM D422	Particle-Size Analysis of Soils
ASTM D698	Test Method of Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb (2.5-kg) Rammer and 12-inch (305mm) Drop
ASTM D2321	Recommended Practice for Installation of Corrugated Polyethylene Pipe
ASTM D2487	Classification of Soils for Engineering Purposes
ASTM D2922	Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D3017	Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D	3034 Standard Specifications for Sewer Pipe and Fittings

9.4 MISCELLANEOUS TESTING

A. The following references apply to miscellaneous item including PVC piping, testing methods for plastic sheeting and film, gaskets, etc.

AWWA M 23	Manual of Water Supply Practices – PVC Pipe – Design and Installation
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D746	Standard Test Method for Brittleness Temperature of Plastics and Elastomers By Impact
ASTM D792	Standard Test Method for Specific Gravity and Density of Plastics by Displacement
ASTM D1004	Test Method for Initial Tear Resistance of Plastic Film and Sheeting
ASTM D1204	Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature
ASTM D1238	Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastomer
ASTM D1505	Test Method for Density of Plastic by the Density-Gradient Technique
ASTM D1593	Specification for Nonrigid Vinyl Chloride Plastic Sheeting
ASTM D1603	Test Method for Carbon Black in Olefin Plastics
ASTM D1693	Test Method for Environmental Stress-Cracking of Ethylene Plastics
ASTM D2564-80	Test Method for PVC Solvent Cement

ASTM D3015	Standard Practice for Microscopical Examination of Pigment Dispersion in Plastic Compounds
ASTM D4437	Practice for Determining Integrity of Field Seams Using Joining Flexible Polymeric Sheet Geomembranes

Federal Specification

SS-S-00210	Plastic Sealing Gasket

SECTION 10.0

WORK AREA CLEAN-UP

10.1 FINAL PROJECT CLEAN-UP

During construction the Contractor must take care to not track dirt, mud or other debris from the construction site onto adjacent City streets or private property. Vehicles must be washed down prior to leaving the construction site, if mud is present, an/or the Contractor must employ a sweeper to clean the streets daily. In all cases the contractors are required to adhere to the Inspector requirements. The details, penalties, etc. are contained in the City's Municipal Code.

Once all roadway work has been completed and can be field accepted, the Contractor shall clean the streets, curbs, gutters and nearby affected areas to the satisfaction of the City. All structures including fire hydrants shall be properly painted, where required, and free from dirt, concrete or other spattered materials. Also, the work site will be cleaned of construction debris by the contractor. All private improvements damaged during construction shall be restored to at least the original condition of said improvements including but not limited to trees, shrubs, curbs, gutters, sidewalks, fences, grass, etc. Filled excavations in private property shall be neatly finished in a manner to facilitate natural drainage and eliminate hazards to persons or property. Also, all requirements of the Engineering Department, Community Development Department, and other requirements shall be met. The project shall be left in a final condition that brings no discredit to the City.

APPENDIX A
STANDARD DRAWINGS

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5030	Rip Rap Protection
5035	Rock Check Dam
5040	Rock Lined Channel
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5055	Temporary Straw Bale Check Dam
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5210	Erosion Blankets & Turf Reinforcement Mats Slope Installation
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5230	Rolling Dip and Waterbar
5235	Slope Drain
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5245	Straw Anchoring
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5260	Slope Wattle (Live Fascine)

	<u>Storm Drain Sediment Protection</u>
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5305	Continuous Berm
5315	Curb Inlet Sediment Barrier (Block & Gravel)
5320	Curb Inlet Sediment Barrier (SandBags)
5325	Silt Fence Drop Inlet Sediment Barrier
5330	Straw Bale/ Gravel Drop Inlet Sediment Barrier
	<u>Streambank Erosion Protection</u>
5400	Coir Roll/ Coir Mats
5405	Gabions

SYMBOLS	DEFINITIONS
	CENTER LINE
15+00	CONSTRUCTION CENTER LINE
	PROPERTY OR R/W LINE
	EASEMENT LINE
	MONUMENT LINE
X—X	FENCE
4250	CONTOUR LINE (FG)
4250.0	CONTOUR ELEVATION (FG)
	BANK SLOPES
SD	STORM DRAIN LINE
CW	CULINARY WATER LINE
SW	SECONDARY WATER LINE
G	GAS LINE
T	TELEPHONE CABLE
E	ELECTRIC CABLE
SS	SANITARY SEWER LINE
	ASPHALT PAVING
	FIRE HYDRANT
	WATER VALVE
WM	WATER METER
MH	MANHOLE
CB	CATCH BASIN
COB	CLEAN OUT BOX
	POLE & ANCHOR
	STREET LIGHT
	UNDISTURBED EARTH
	STRUCTURE

SYMBOLS	DEFINITIONS
	CURB & GUTTER
	SIDEWALK
	RAILROAD TRACKS
	GUARD RAIL
	OPEN DITCH, CANAL
	CULVERT
	SECTION CORNER
	SOIL BORING
	MONUMENT
BM NO. 46 ELEV. 4256.50	BENCH MARK
	SIGN
PP	POWER POLE
TP	TELEPHONE POLE
	DECIDUOUS TREE
	CONIFEROUS TREE
	P.I.
	P.C. OR P.T.

	PROFILE
	GROUND PROFILE
ROUND ARCH BOX	CULVERT
	P.V.I.
	P.V.C. OR P.V.T.
	GROUNDWATER ELEVATION

City of South Jordan, Utah

SOUTH JORDAN

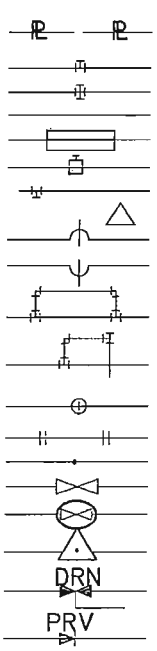
ABBREVIATIONS AND SYMBOLS

PLAN 1005

ABBREVIATIONS

C.I.P. = CAST IRON PIPE
D.I.P. = DUCTILE IRON PIPE
PVC = POLYVINYL CHLORIDE
MJ = MECHANICAL JOINT
T.J. = TYTON JOINT
O.B. = OPEN BELL
L.B. = LARGE BELL
WOV = WASH OUT VALVE
VAL. = VALVE
HYD. = HYDRANT
REG. = REGULATOR
BD. = BEND
EXT. = EXTEND
RED. = REDUCER
FLG. = FLANGED
ASSY. = ASSEMBLY
M.W. = MANWAY
MH = MANHOLE
SPIG. = SPIGOT
ADPT. = ADAPTOR
TBC. = TOP BACK OF CURB
F.C. = FACE OF CURB
P.C.C.P. = PRE STRESSED CONCRETE CYLINDER PIPE
C.M.P. CAS. = CORRUGATED METAL PIPE CASING
A.A.V.V. = AUTOMATIC AIR RELEASE VALVE
A.C.A.R.V. = AUTOMATIC COMBINATION AIR RELEASE VALVE
ASPH. = ASPHALT
A.C. = ASPHALTIC CONCRETE
CONC. = CONCRETE
GALV. = GALVINIZED IRON
COP. = COPPER
PRV. = PRESSURE REDUCING VALVE
GV. = GATE VALVE
BFV. = BUTTERFLY VALVE
WOV. = WASH OUT VALVE

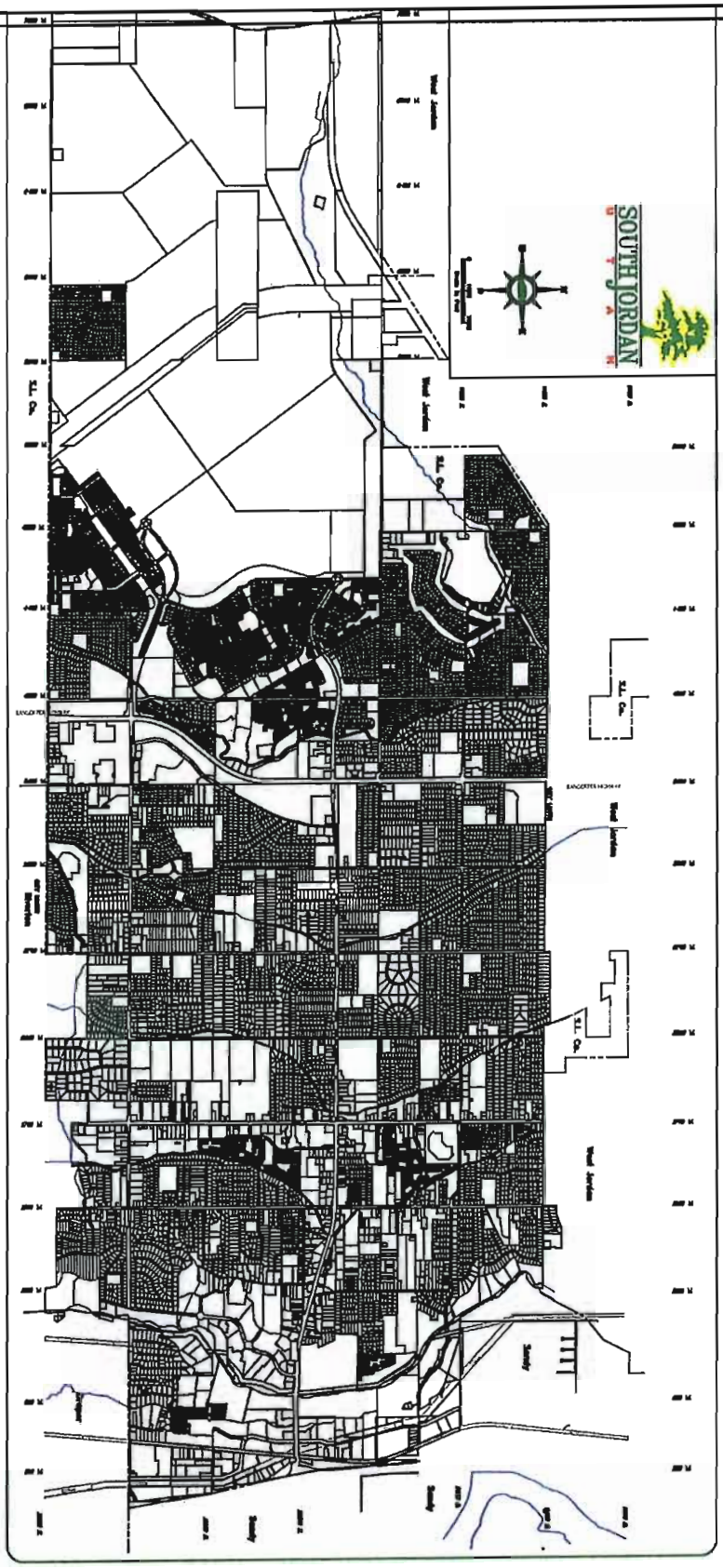
SYMBOLS DEFINITIONS



PROPERTY LINES (100' MAP, DESIGN DRAWINGS)
WATER MAIN TEE
WATER MAIN CROSS
REDUCER
REGULATOR
TAPPING SLEEVE AND VALVE
PLUG AND CLAMP
CONCRETE THRUST BLOCK
PIPE OVER
PIPE UNDER
BYPASS
RUN-AROUND
CIRCLED VALVE (SYSTEM NORMALLY CLOSED)
OFFSET OR VERTICAL BENDS
WASH OUT VALVE
GATE VALVE
BUTTERFLY VALVE
AIR RELEASE VALVES
MANUAL DRAIN VALVE
PRESSURE REDUCING VALVE

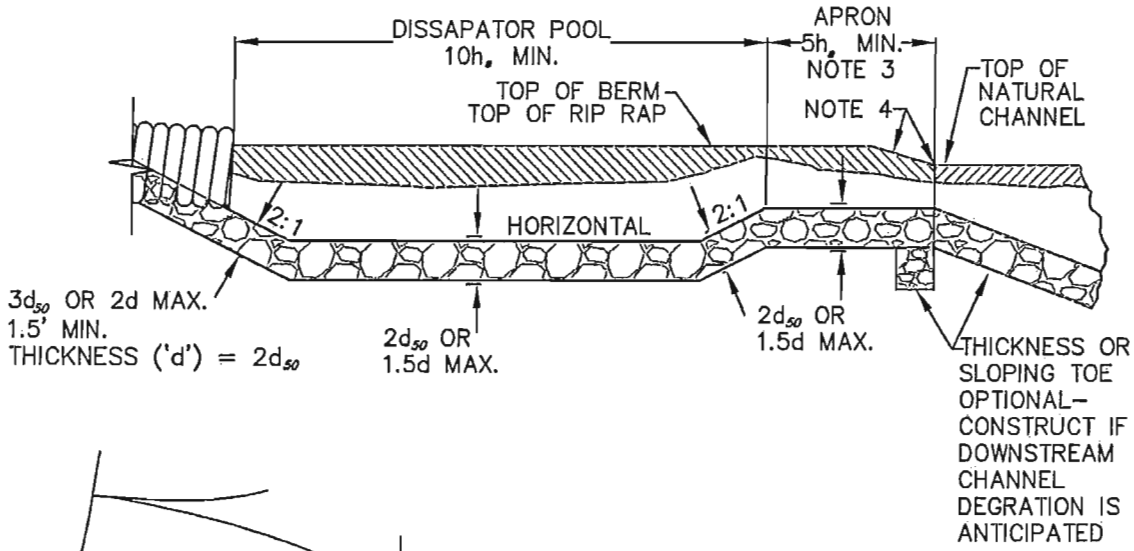
City of South Jordan, Utah

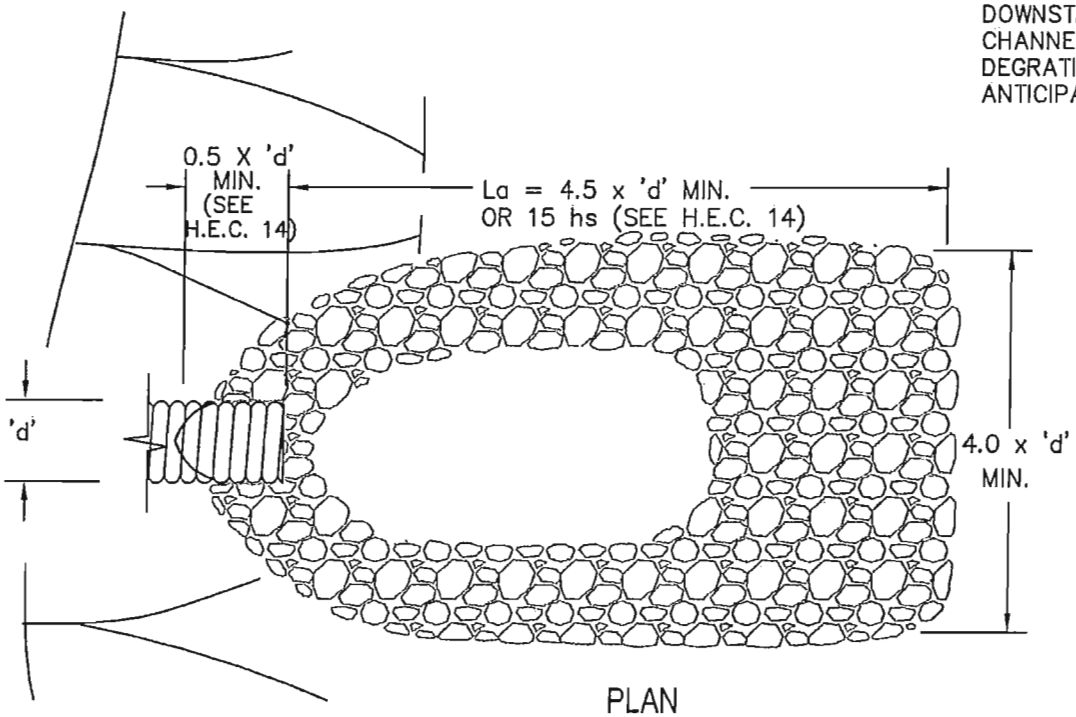
SOUTH JORDAN	ABBREVIATIONS AND SYMBOLS ROADWAYS	PLAN 1010



City of South Jordan, Utah

SOUTH JORDAN	SOUTH JORDAN CITY MAP	PLAN 1015

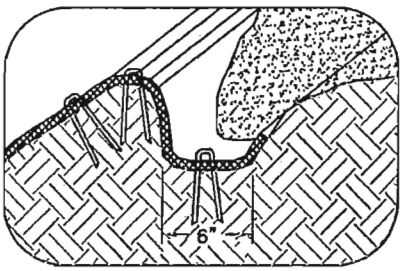




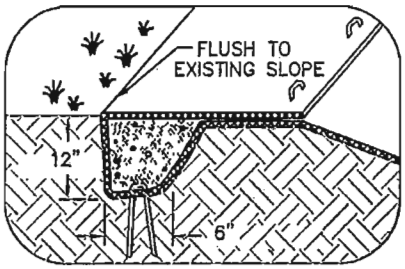
PLAN

NOTES:

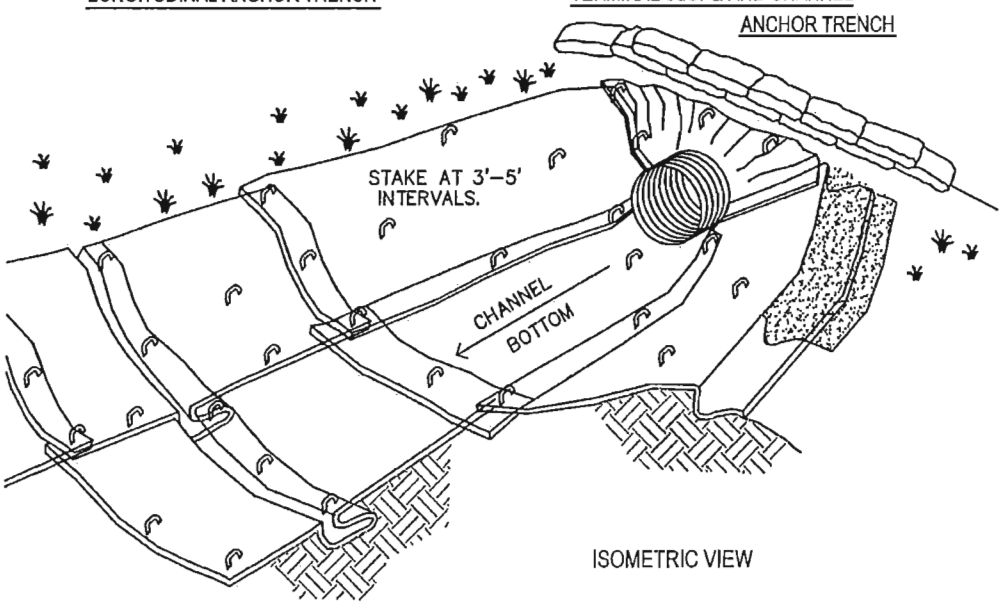
1. TO BE DESIGNED PER H.E.C. 14
2. ROCK SIZE TO BE DESIGNED PER H.E.C. 11
3. IF EXIT VELOCITY OF BASIN IS SPECIFIED. EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS–SECTIONAL AREA.
4. WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIPRAP IN FLOOR OF BASIN SHOULD BE AT THE SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM.
5. PLACE RIP–RAP BEFORE OR IN CONJUNCTION WITH THE INSTALLATION OF THE STRUCTURE SO THAT IT IS IN PLACE BEFORE THE FIRST RUNOF EVENT. (AS PER PAGE 2–44)



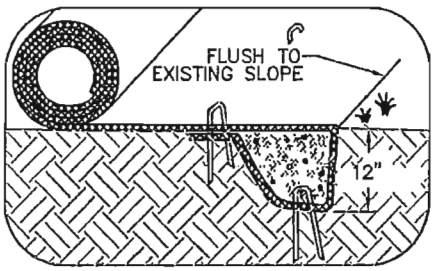
LONGITUDINAL ANCHOR TRENCH



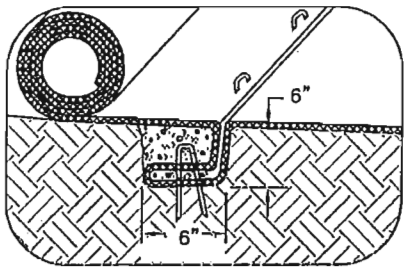
TERMINAL SLOPE AND CHANNEL ANCHOR TRENCH



ISOMETRIC VIEW



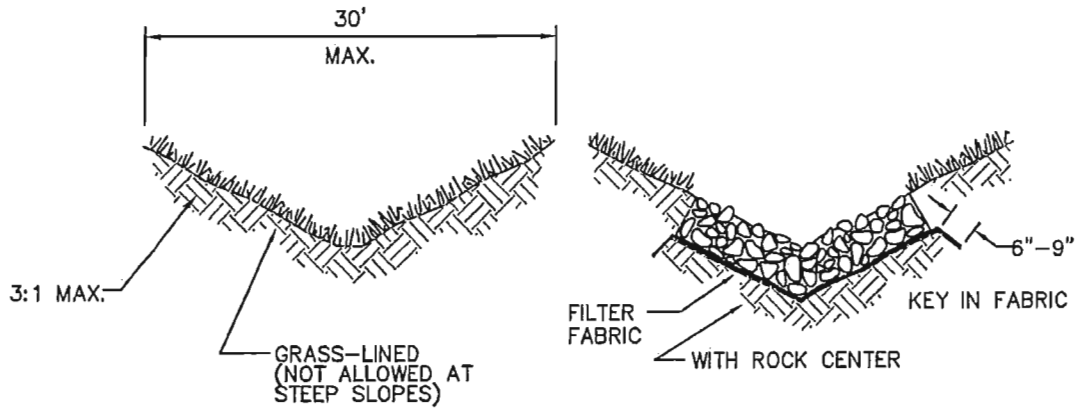
INITIAL CHANNEL ANCHOR TRENCH



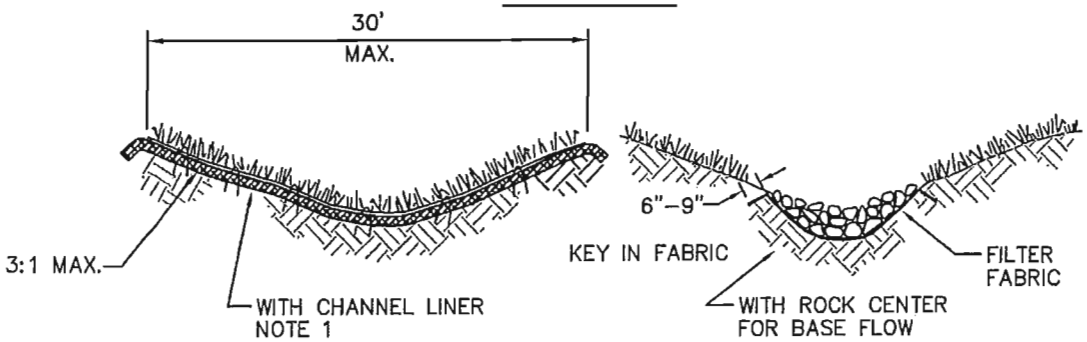
INTERMITTENT CHECK SLOT

NOTES:

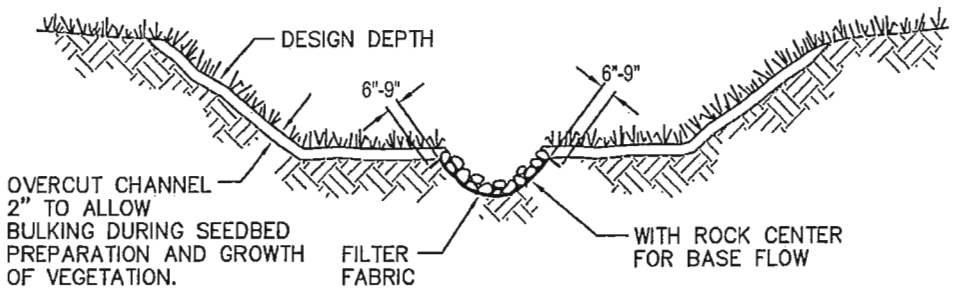
1. CHECK SLOTS TO BE CONSTRUCTED PER MANUFACTURERS SPECIFICATIONS.
2. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.



TYPICAL V-SHAPED CHANNEL
CROSS-SECTION



TYPICAL PARABOLIC CHANNEL
CROSS-SECTION



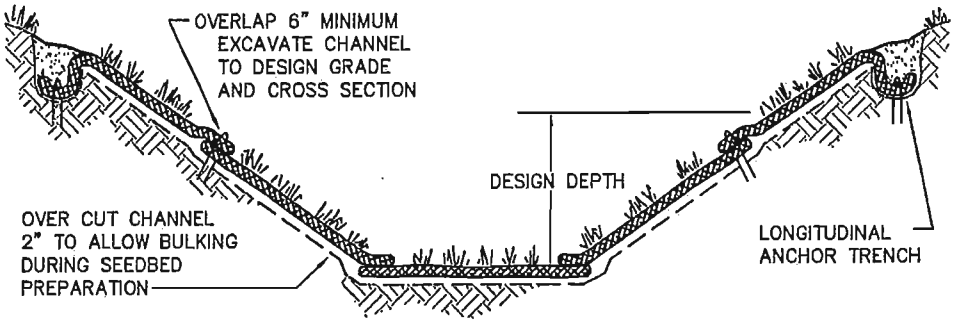
TYPICAL TRAPEZOIDAL CHANNEL
CROSS-SECTION

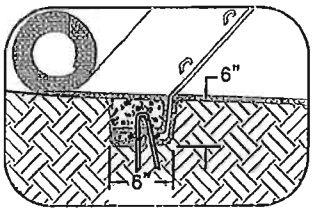
NOTES:

1. TO BE DESIGNED AS PER H.E.C. 15–FLEXIBLE CHANNEL
2. FABRIC THICKNESS 20–60 MILS.
3. FABRIC GRAB STRENGTH 90–120 LBS
4. FILTER FABRIC TO CONFORM TO ASTM D–1682 OR ASTM D–177

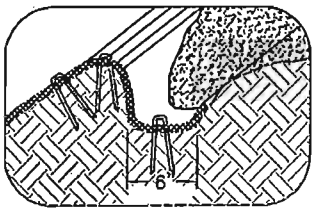
City of South Jordan, Utah

SOUTH JORDAN	GRASS-LINED CHANNEL TYPICAL CROSS SECTIONS	PLAN 5010



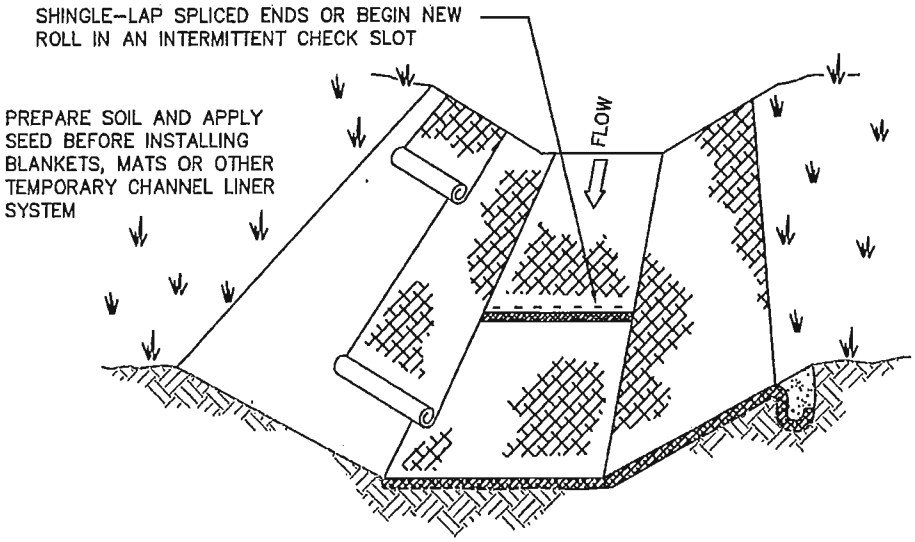


TYPICAL INSTALLATION
WITH EROSION CONTROL
BLANKETS OR TURF
REINFORCEMENT MATS



INTERMITTENT CHECK SLOT

LONGITUDINAL ANCHOR TRENCH

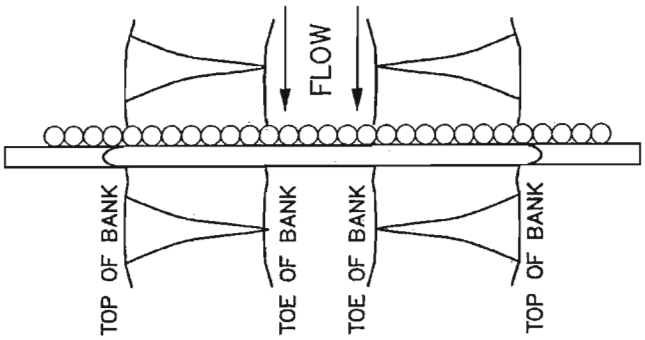


NOT TO SCALE

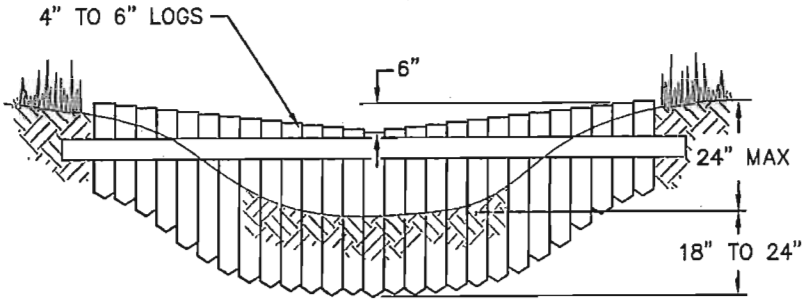
NOTES:
1. TO BE DESIGNED AS PER H.E.C. 15

City of South Jordan, Utah

SOUTH JORDAN	GRASS-LINED CHANNEL TYPICAL INSTALLATION	PLAN 5015

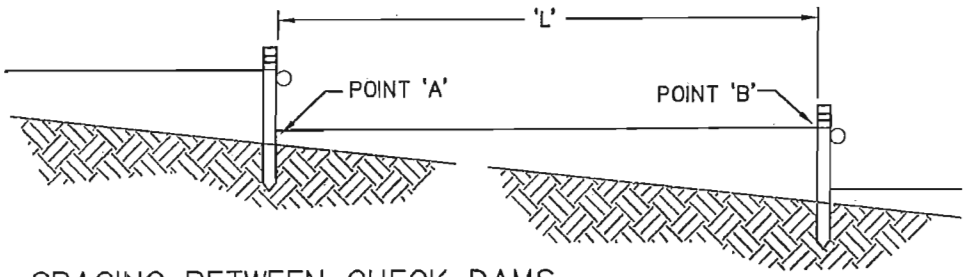


PLAN VIEW



VIEW LOOKING UPSTREAM

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION



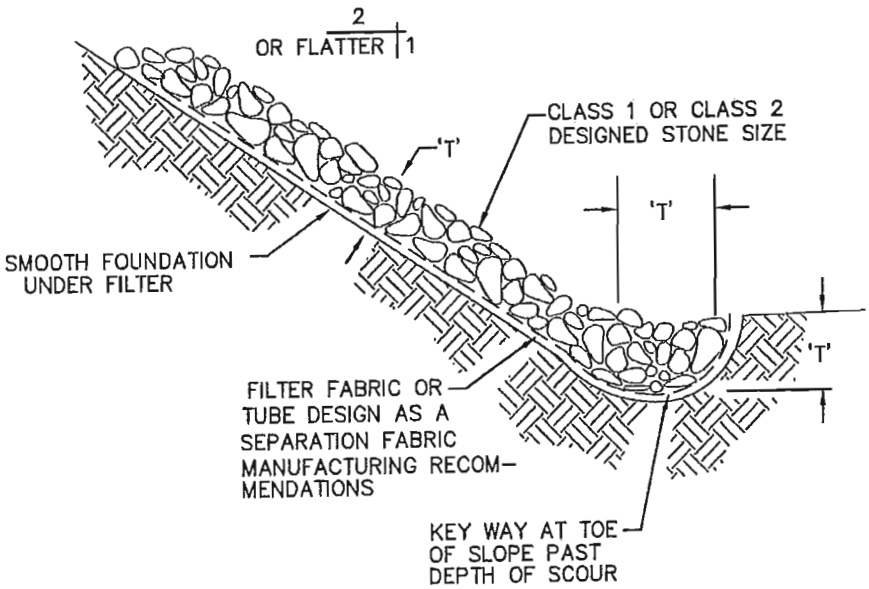
SPACING BETWEEN CHECK DAMS

NOT TO SCALE

NOTE:
KEY THE ENDS OF THE CHECK DAM INTO THE CHANNEL BANK. LOGS SHALL BE PRESSURE TREATED IF GRADE STABILIZATION STRUCTURE IS INTENDED TO BE PERMANENT.

City of South Jordan, Utah

SOUTH JORDAN	LOG CHECK DAM	PLAN 5020



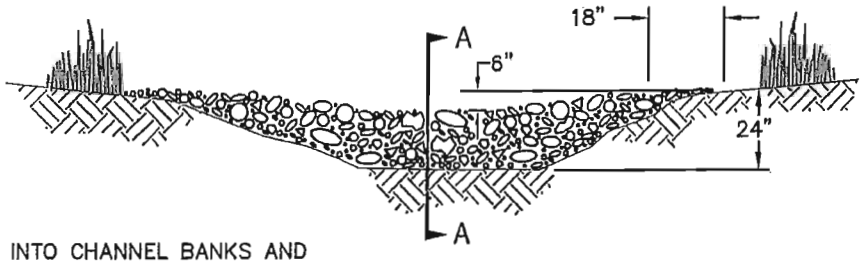
$T=2d_{50}$

TYPICAL SECTION

NOTE:
1. TO BE DESIGNED PER H.E.C. 15–
   FLEXIBLE CHANNEL
2. ROCK SIZE TO BE DESIGNED PER H.E.C. 11

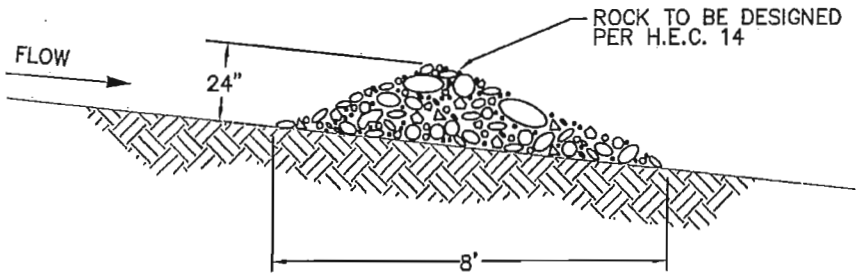
City of South Jordan, Utah

SOUTH JORDAN	RIP RAP PROTECTION	PLAN 5030



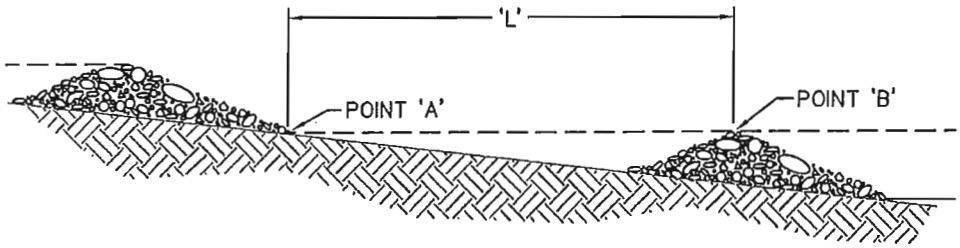
NOTE:
KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND DAM.

VIEW LOOKING UPSTREAM



SECTION A - A

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND 'B' ARE OF EQUAL ELEVATION.



SPACING BETWEEN CHECK DAMS

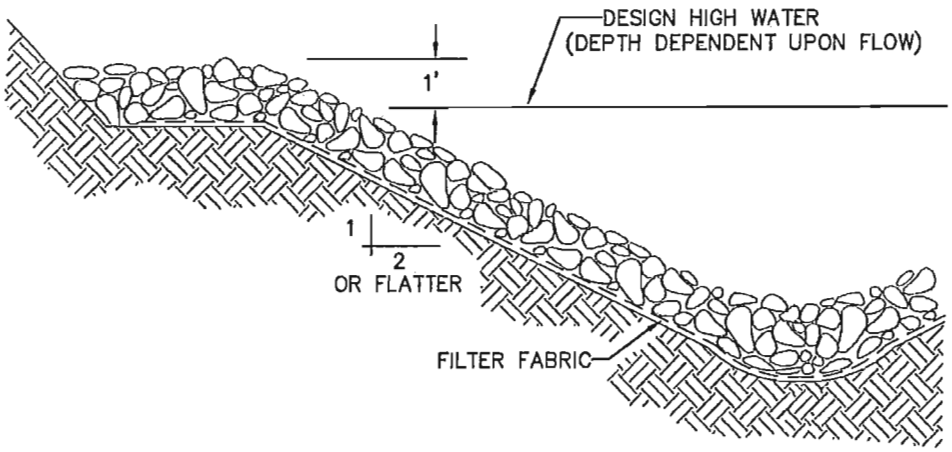
NOTES:
1. DESIGN PER H.E.C. 14

NOT TO SCALE

City of South Jordan, Utah

SOUTH JORDAN	ROCK CHECK DAM	PLAN 5035

DESIGN HEIGHT (H), WIDTH AND STONE SIZE SHALL
BE DETERMINED BY THE ENGINEER



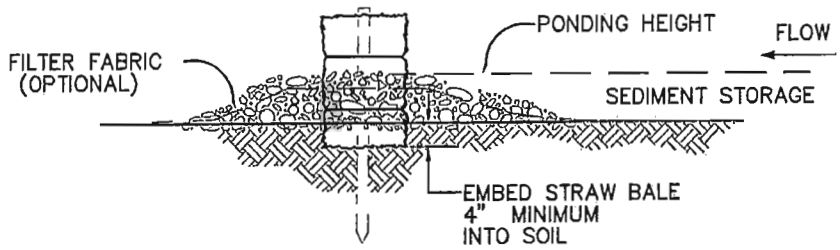
TYPICAL SECTION

NOTES:

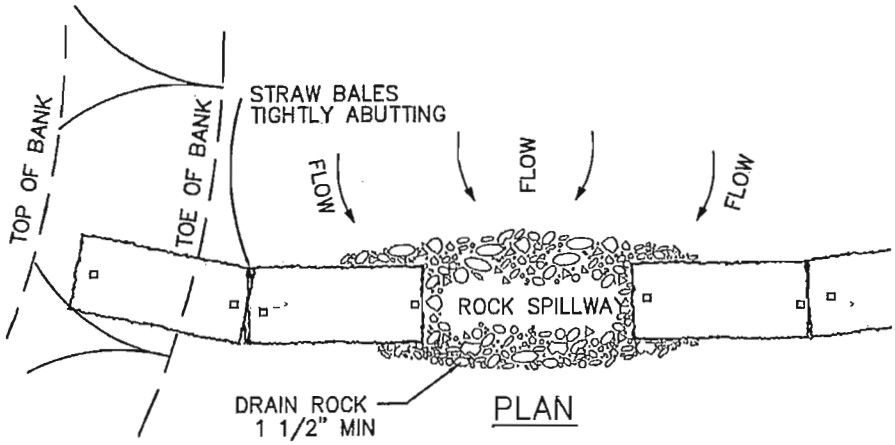
1. ROCK SIZE TO BE DESIGNED PER H.E.C. 11
2. TO BE DESIGNED PER H.E.C. 15–
   FLEXIBLE CHANNELS

City of South Jordan, Utah

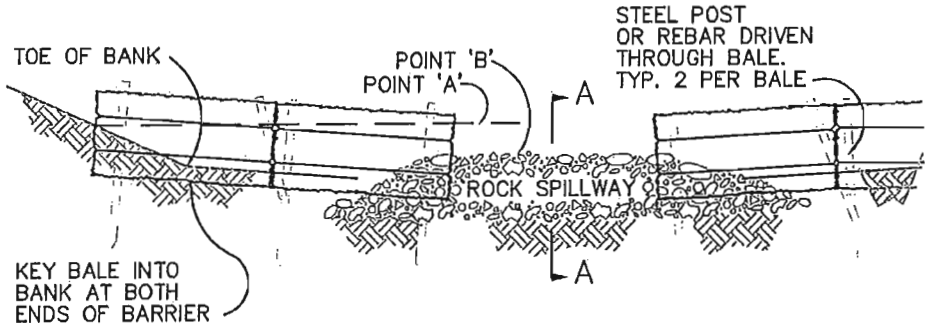
SOUTH JORDAN	ROCK LINED CHANNEL	PLAN 5040



SECTION A – A



PLAN



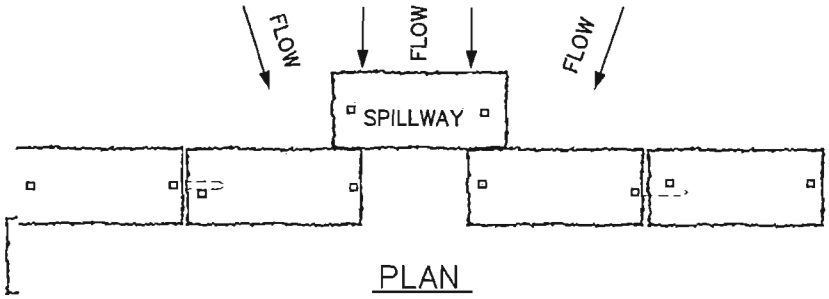
VIEW LOOKING UPSTREAM

NOTES:

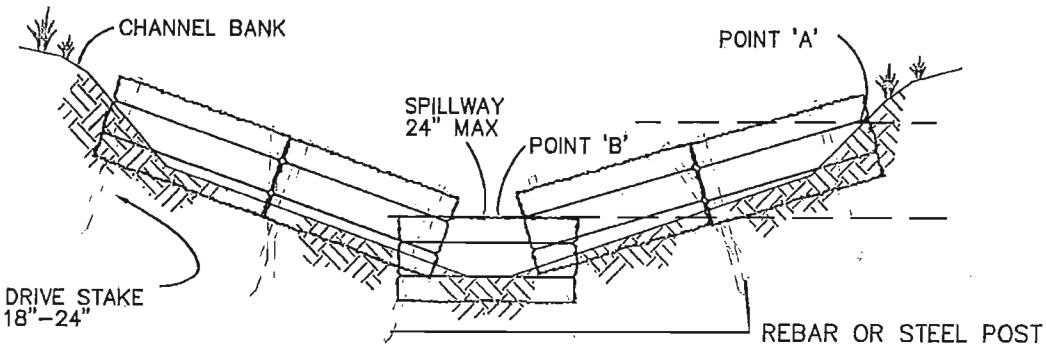
1. PLACE BALES PERPENDICULAR TO FLOW.
2. EMBED THE BALE 4" INTO THE SOIL AND "KEY" THE END BALES INTO THE CHANNEL BANKS TO PREVENT FLOW AROUND THE BALES.
3. BALES PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING.
4. POINT "A" SHALL BE HIGHER THAN POINT "B".
5. SPILLWAY HEIGHT SHALL NOT EXCEED 24" .

City of South Jordan, Utah

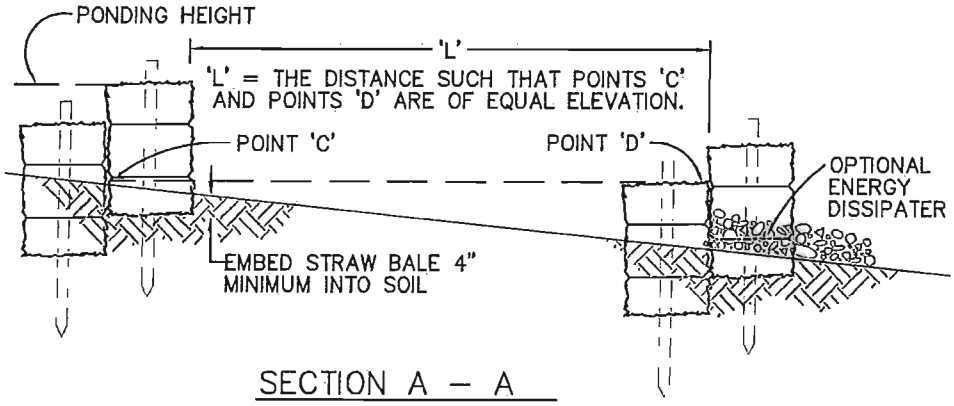
SOUTH JORDAN	TEMPORARY SEMI-PERVIOUS STRAW BALE SEDIMENT BARRIER	PLAN 5050



PLAN



VIEW LOOKING UPSTREAM



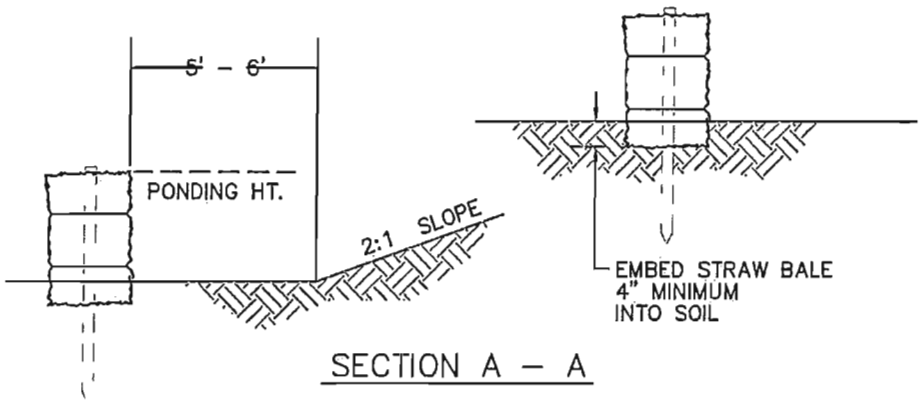
SECTION A – A

SPACING BETWEEN CHECK DAMS

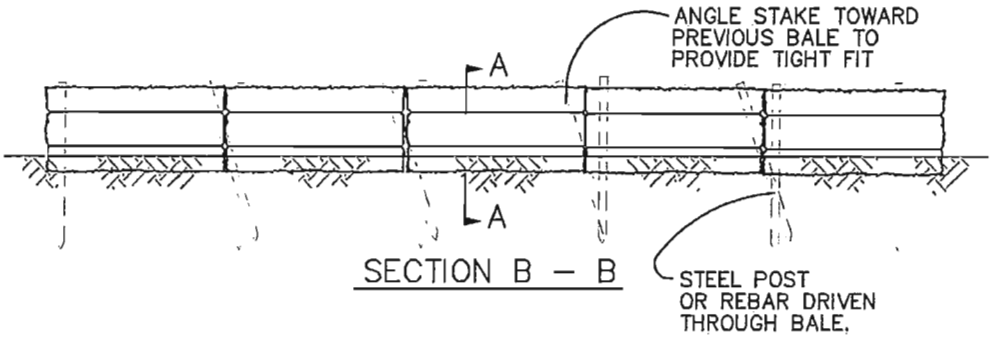
NOT TO SCALE

NOTES:

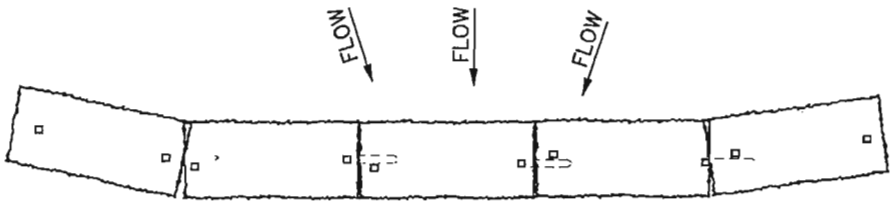
1. EMBED BALES 4" INTO THE SOIL AND 'KEY' BALES INTO THE CHANNEL BANKS.
2. POINT 'A' MUST BE HIGHER THAN POINT 'B'. (SPILLWAY HEIGHT)
3. PLACE BALES PERPENDICULAR TO THE FLOW WITH ENDS TIGHTLY ABUTTING.
4. SPILLWAY HEIGHT SHALL NOT EXCEED 24" .
5. INSPECT AFTER EACH SIGNIFICANT STORM, MAINTAIN AND REPAIR PROMPTLY.



SECTION A – A



SECTION B – B



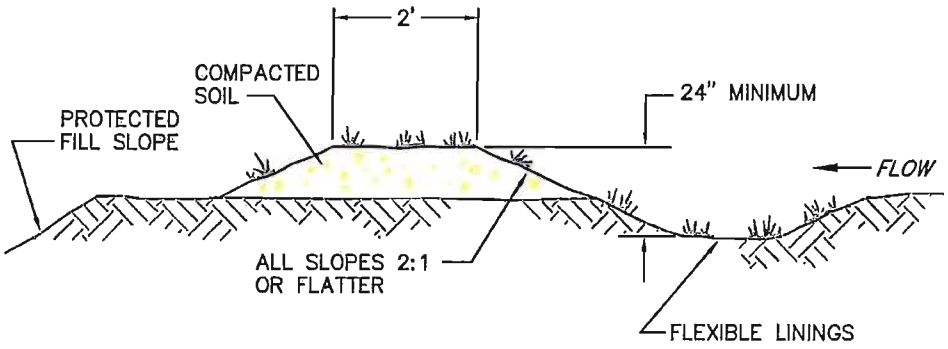
PLAN

NOTES:

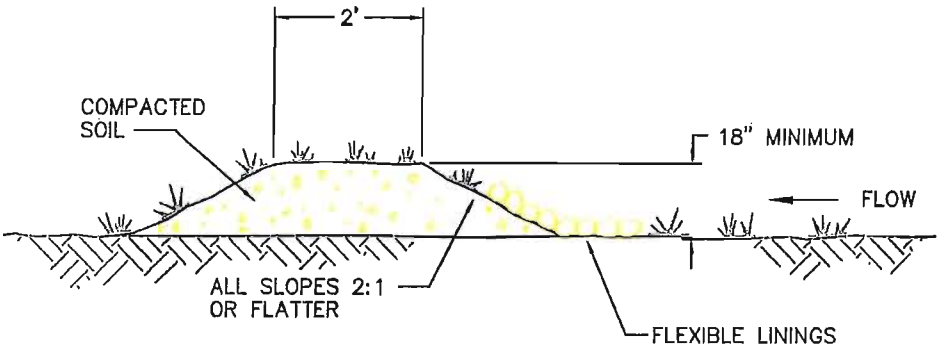
1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING.
3. KEY IN BALES TO PREVENT EROSION OR FLOW UNDER BALES.

City of South Jordan, Utah

SOUTH JORDAN	TEMPORARY STRAW BALE DIKE	PLAN 5060



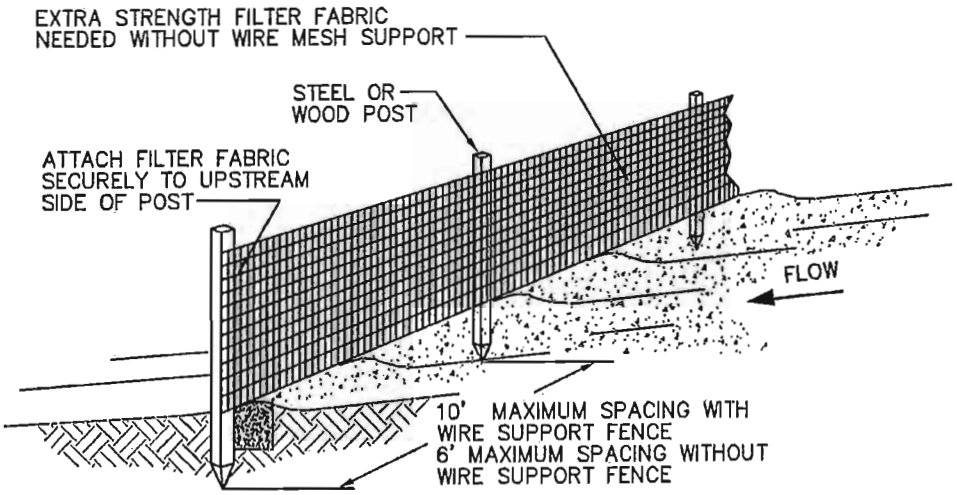
TYPICAL FILL DIVERSION

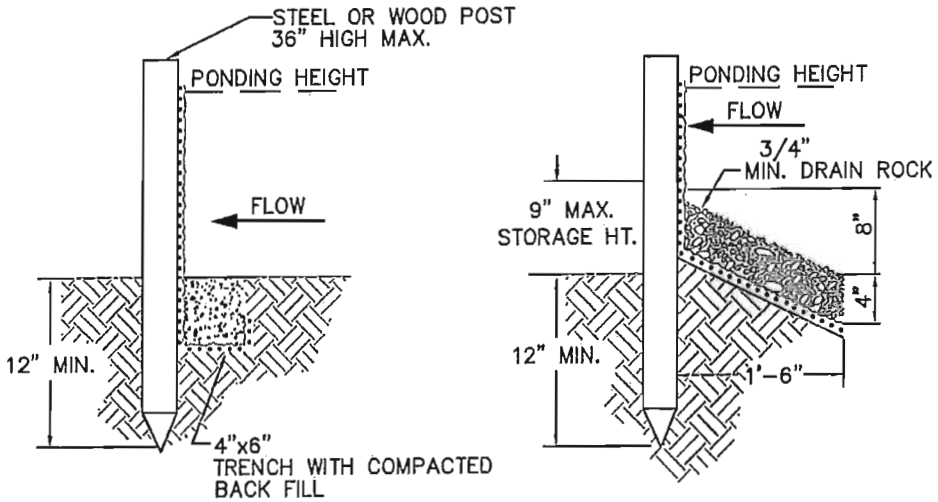


TYPICAL TEMPORARY DIVERSION DIKE

NOTES:

1. THE CHANNEL BEHIND THE DIKE SHALL HAVE POSITIVE GRADE TO A STABILIZED OUTLET.
2. THE DIKE SHALL BE ADEQUATELY COMPACTED TO PREVENT FAILURE.
3. THE DIKE SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT SEEDING OR RIPRAP.





TRENCH DETAIL

INSTALLATION WITHOUT TRENCHING

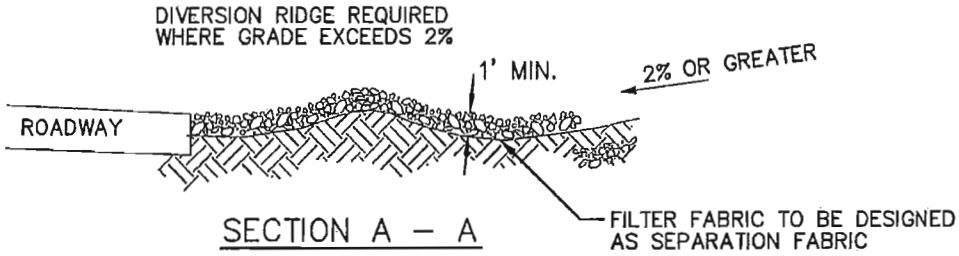
NOTES:

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" (225mm) MAXIMUM RECOMMENDED STORAGE HEIGHT.
3. REMOVED SEDIMENT SHALL BE DEPOSITED TO DESIGNATED STORAGE AREAS.

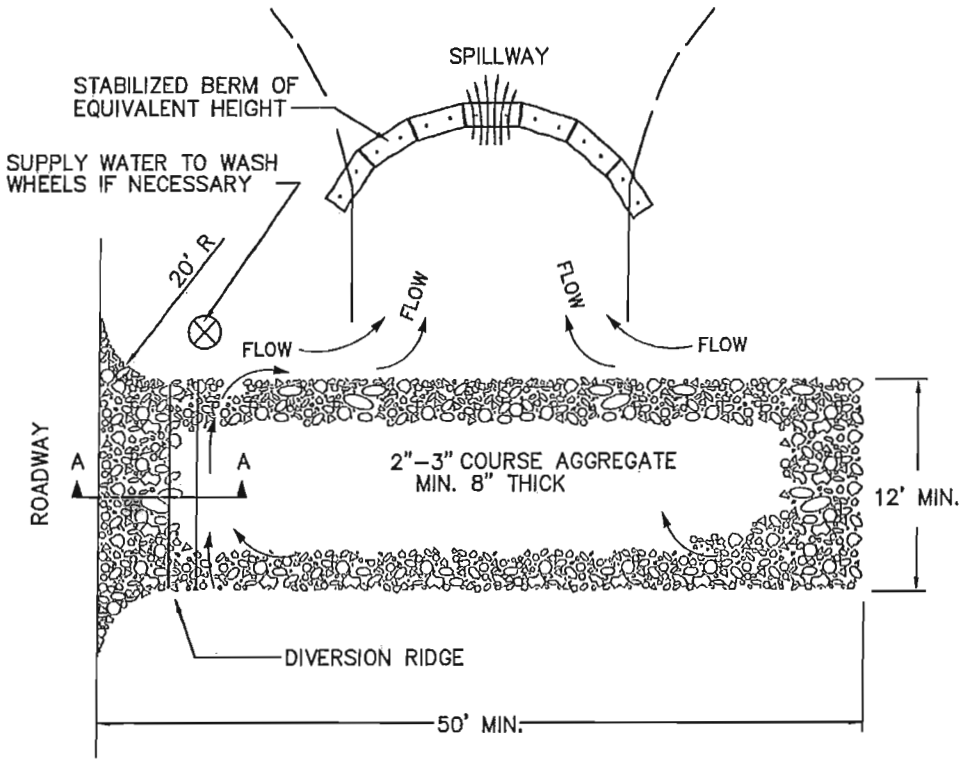
NOT TO SCALE

City of South Jordan, Utah

SOUTH JORDAN	SILT FENCE	PLAN 5100



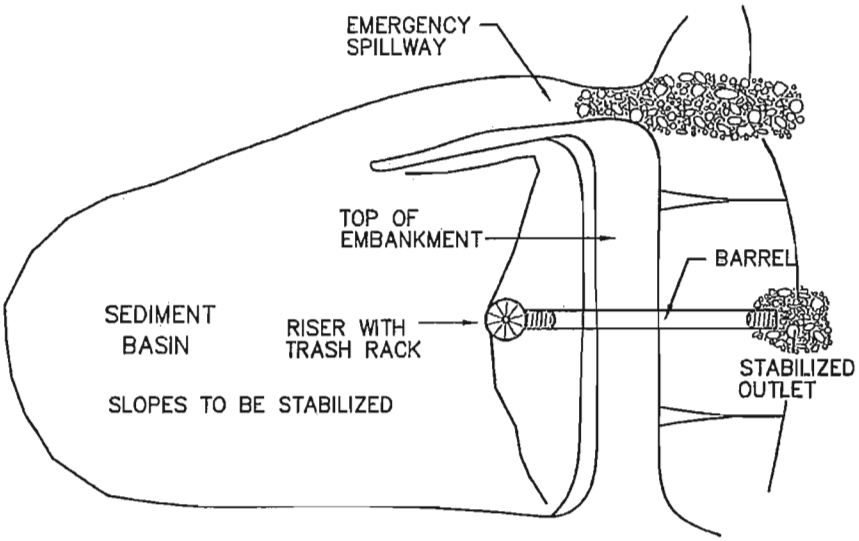
SECTION A – A



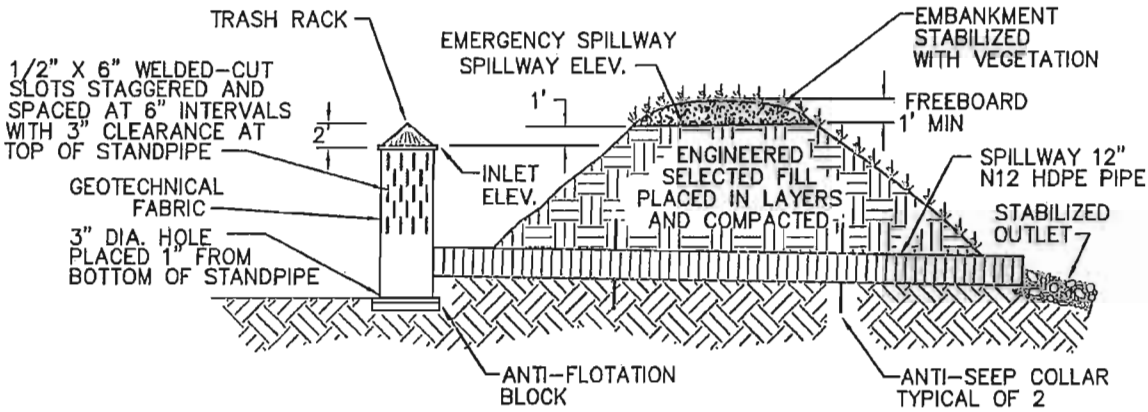
PLAN

NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. THE INTENT OF THIS IS TO KEEP THE STREETS FREE FROM DIRT AND OR SEDIMENT
5. DEPTH OF AGGREGATE WILL BE DETERMINED BY DESIGN ENGINEER BASED ON EXISTING SOIL TYPE.
6. GEOTEXTILE FABRIC SHALL BE USED FOR ENTRANCE



PLAN



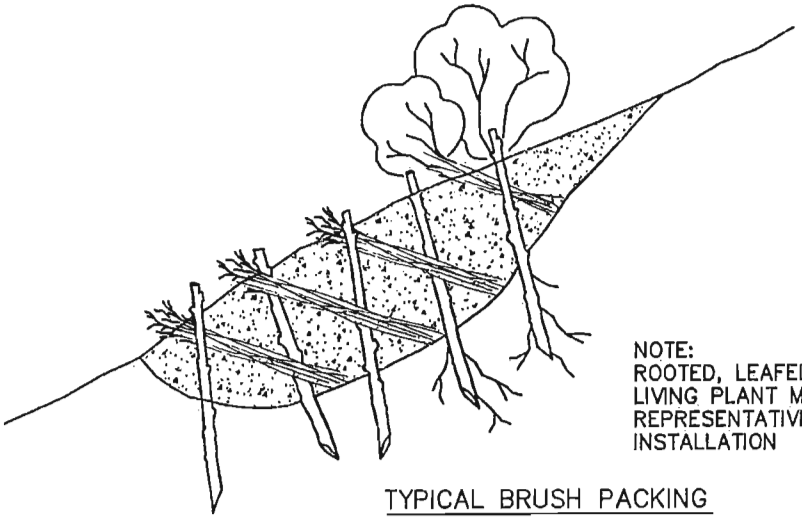
SECTION

NOTES:

1. SEDIMENT BASIN TO BE SIZED PER SEDIMENT LOAD CALCULATIONS.

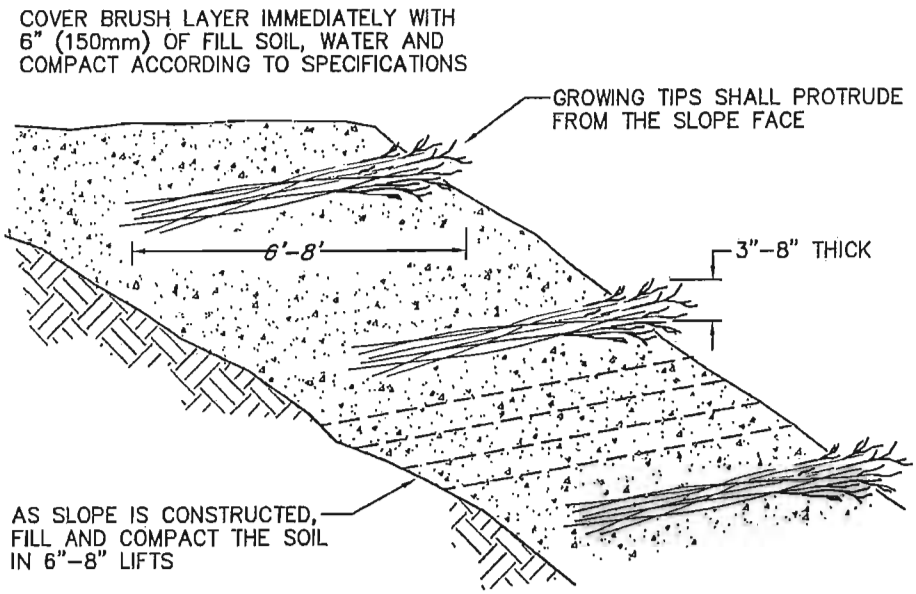
City of South Jordan, Utah

SOUTH JORDAN	TYPICAL SEDIMENT BASIN	PLAN 5110



NOTE:
ROOTED, LEAFED CONDITION OF THE LIVING PLANT MATERIAL IS NOT REPRESENTATIVE OF THE TIME OF INSTALLATION

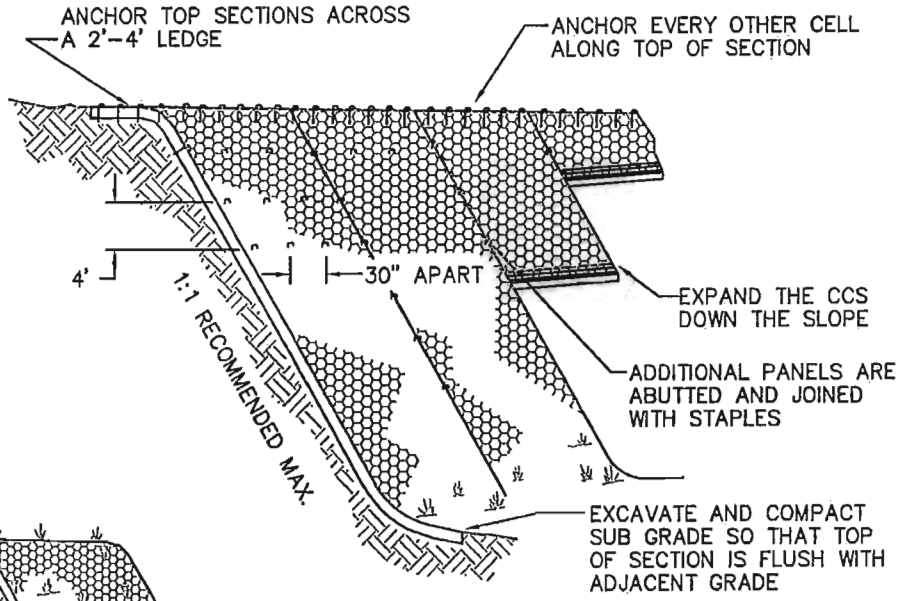
TYPICAL BRUSH PACKING



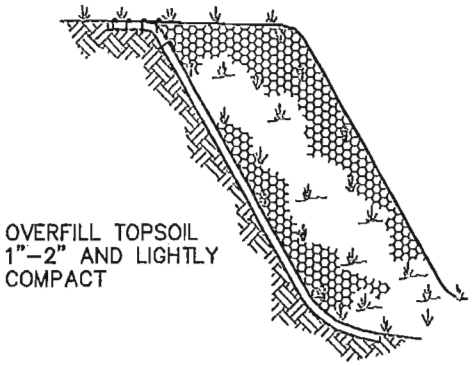
BIO TECHNICAL STABILIZATION

NOTES:

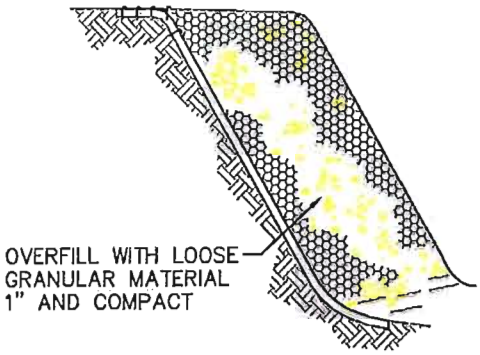
1. REPAIR OR FILLING OF SMALL SLUMPS, SLIPOUTS, AND HEADOUTS.
2. PLANT MATERIAL HARVEST & INSTALLATION SHOULD BE PERFORMED SURRING IT'S DORMANT SEASON.
3. USE SITE APPROPRIATE PLANTS.
4. ALL CUTTINGS SHOULD BE SOAKED FOR A MINIMUM OF 24 HOURS.
5. BRUSHLAYERING USES LIVE PLANT MATERIAL AND MUST BE TREATED AS SUCH.



CCS INFILLED WITH AGGREGATE



CCS INFILLED WITH TOPSOIL AND VEGETATED WITH GRASS



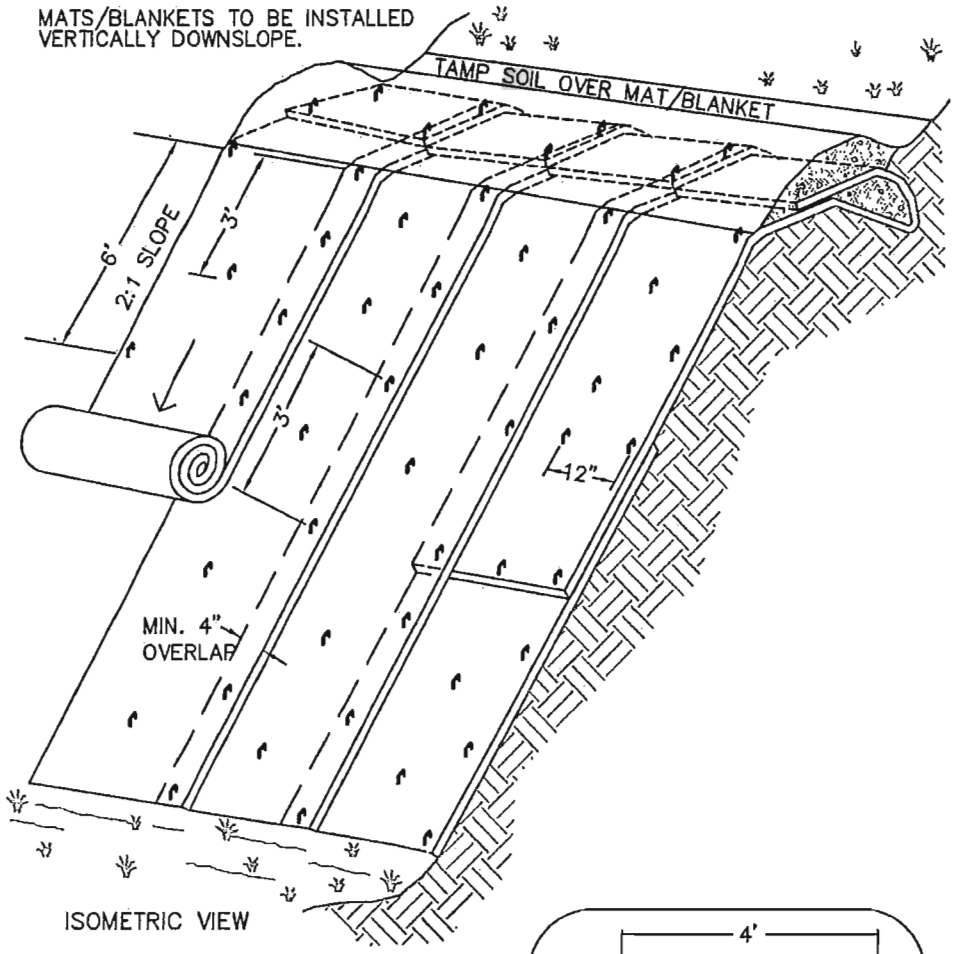
NOTES:

1. SURFACE OF SLOPE SHALL BE LEVELED WITH GULLIES FILLED AND WELL COMPACTED.
2. SHAPE AND COMPACT SUB GRADE SURFACES TO DESIGN ELEVATIONS AND GRADES.
3. THE CELLS SHALL BE ANCHORED SECURELY TO PREVENT DISPLACEMENT AND DEFORMATION OF PANELS WHEN BACKFILLING.
4. INFILL FROM CREST OF THE SLOPE TO TOE TO PREVENT DISPLACEMENT. LIMIT DROP HEIGHT TO 3' .

NOT TO SCALE

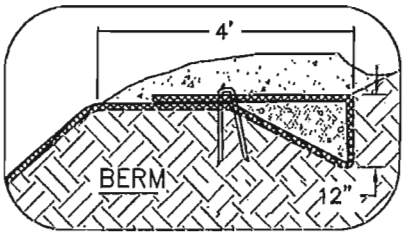
City of South Jordan, Utah

SOUTH JORDAN	CELLULAR CONFINEMENT SYSTEM FOR SLOPE STABILIZATION	PLAN 5205



ISOMETRIC VIEW

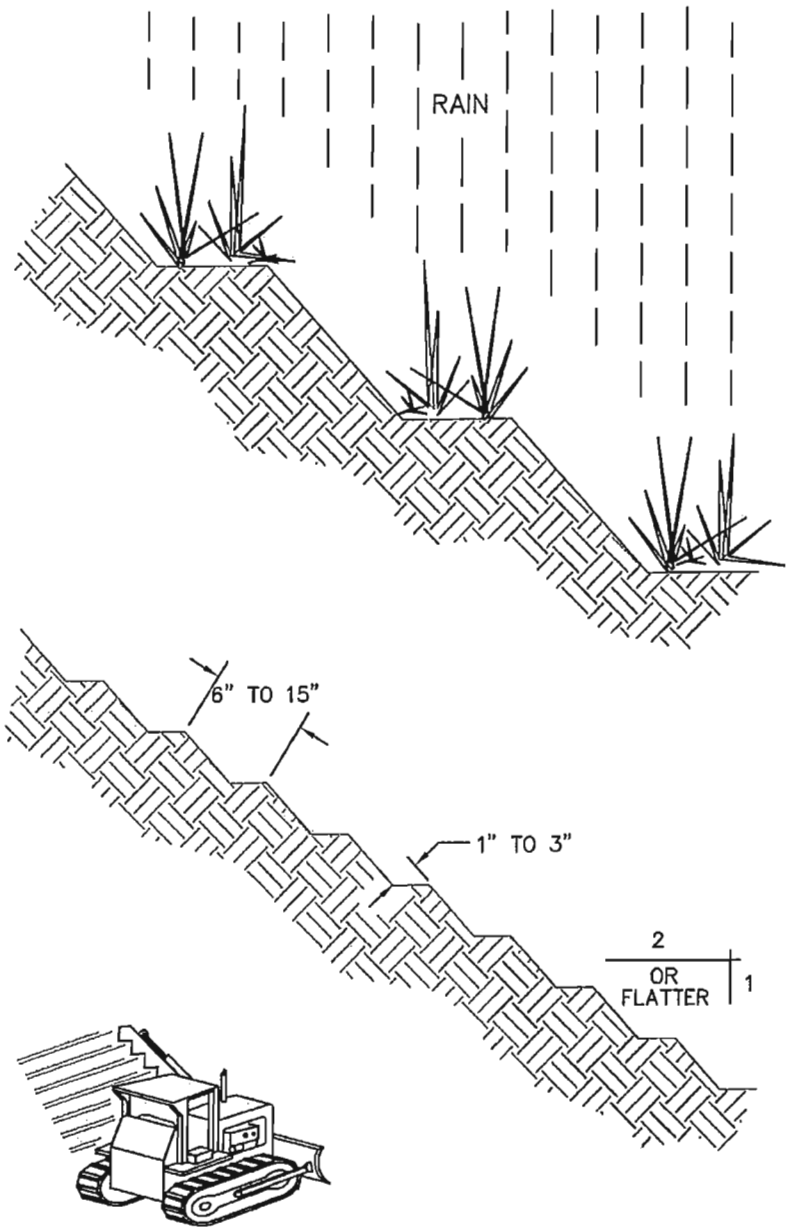
TYPICAL SLOPE
SOIL STABLIZATION



NOT TO SCALE

NOTES:

1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, SNOW, AND GRASS. MATS/ BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAPLES LENGTH TO BE LONG ENOUGH TO BE EMBEDDED INTO UNDISTURBED SOIL.



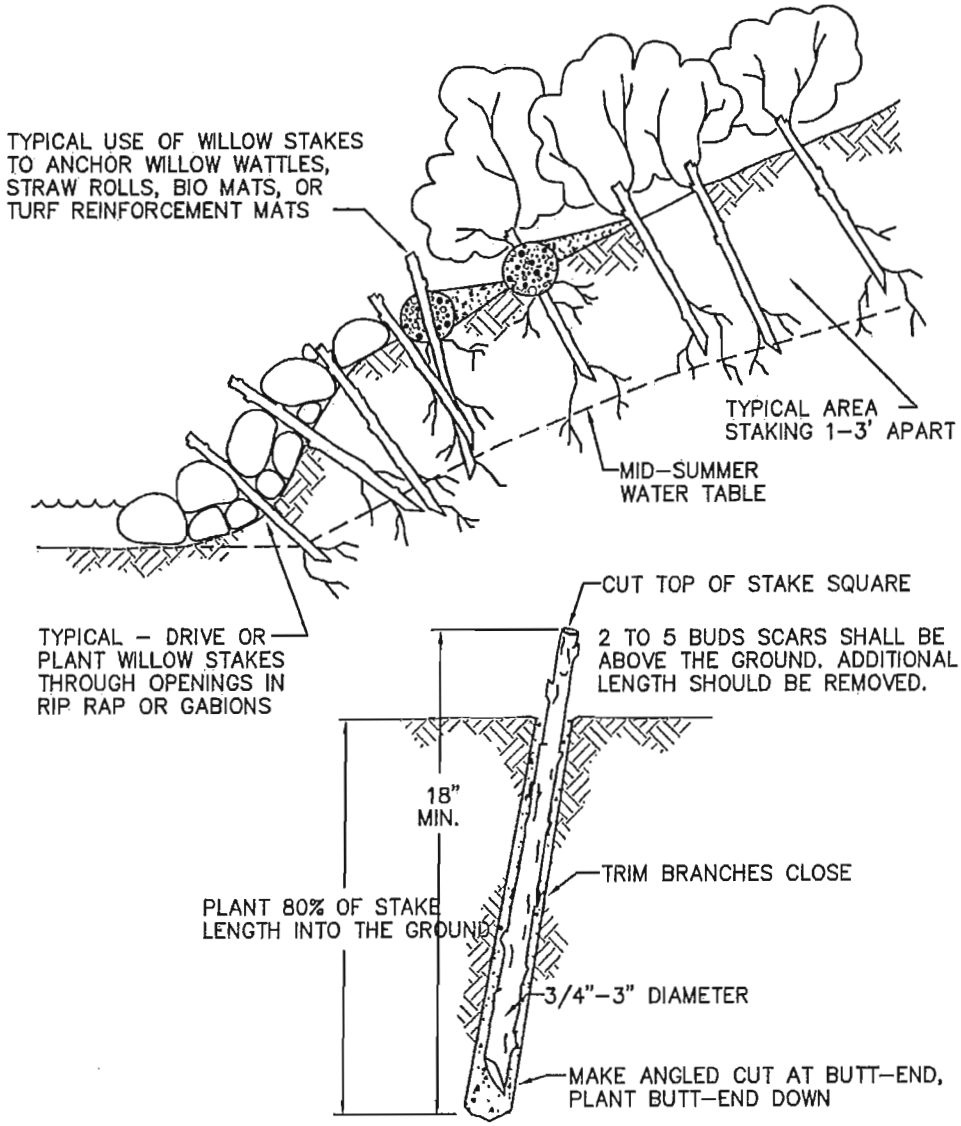
NOTE:

TO BE USED ON
SLOPE 4:1 & GREATER

NOT TO SCALE

City of South Jordan, Utah

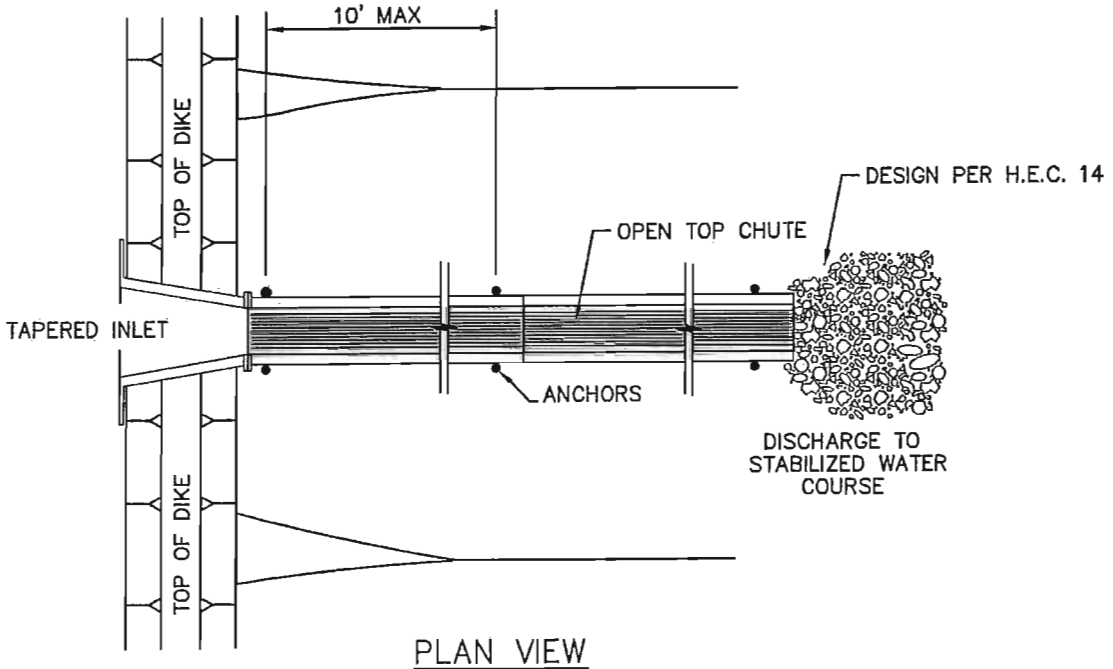
SOUTH JORDAN	GROOVED OR SERRATED SLOPE	PLAN 5215



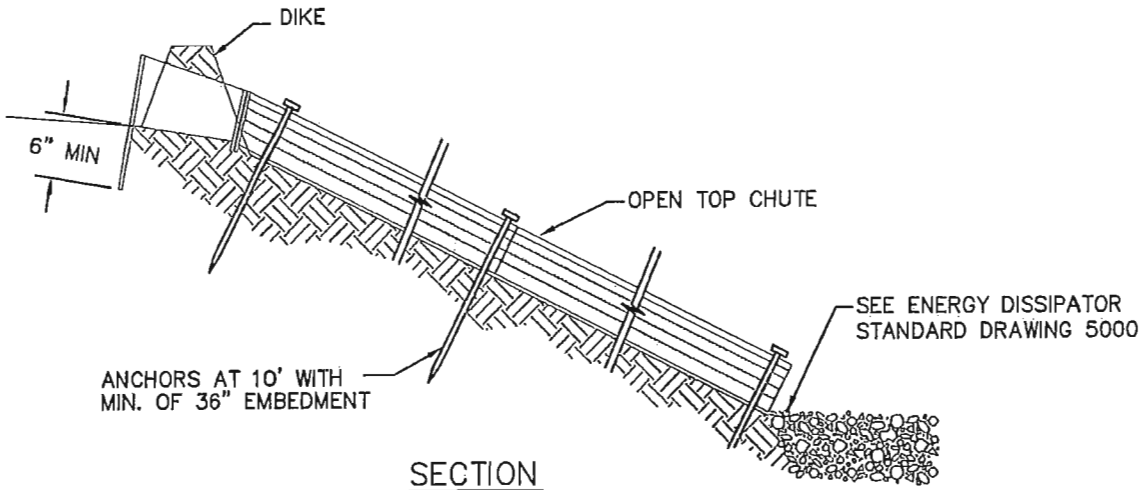
NOTES:

1. HARVEST AND PLANT STAKES DURING THE DORMANT SEASON.
2. USE HEALTHY, STRAIGHT AND LIVE WOOD AT LEAST 1 YEAR OLD.
3. MAKE CLEAN CUTS AND DO NOT DAMAGE STAKES OR SPLIT ENDS DURING INSTALLATION, USE A PILOT BAR IN FIRM SOILS.
4. SOAK CUTTINGS FOR 24 HOURS (MIN.) PRIOR TO INSTALLATION.
5. TAMP THE SOIL AROUND THE STAKE.
6. PLANTING MATERIAL SHOULD BE APPROPRIATE TO THE SITE AND TO BE APPROVED BY THE CITY OF WEST JORDAN
7. STREAM BANK ONLY

NOT TO SCALE



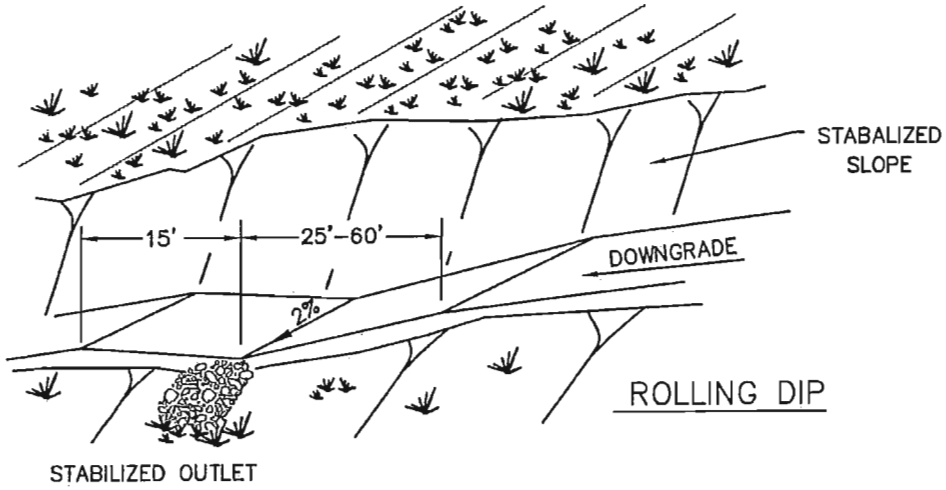
PLAN VIEW



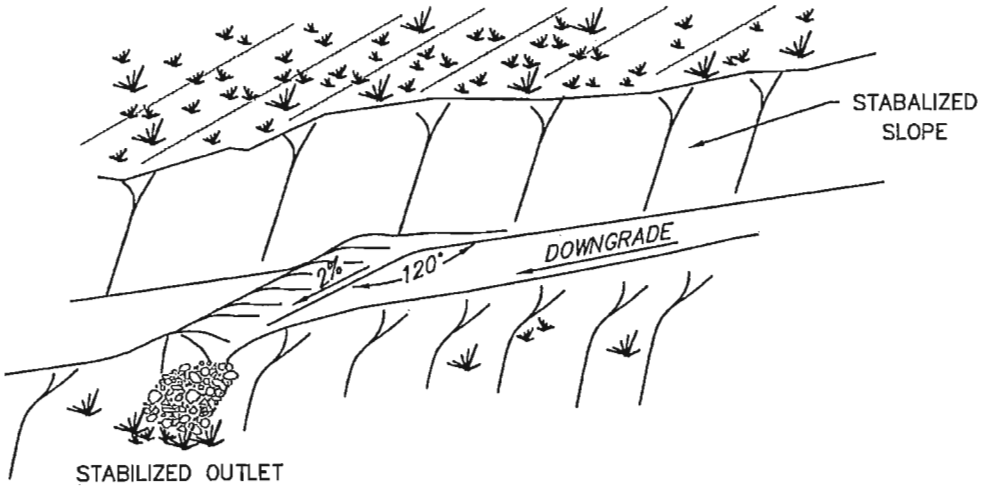
SECTION

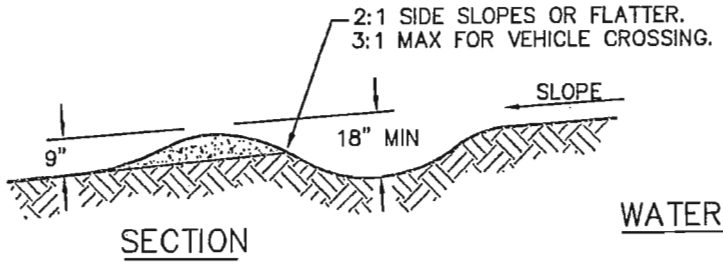
City of South Jordan, Utah

SOUTH JORDAN	OVER SIDEDRAIN	PLAN 5225



ROLLING DIP



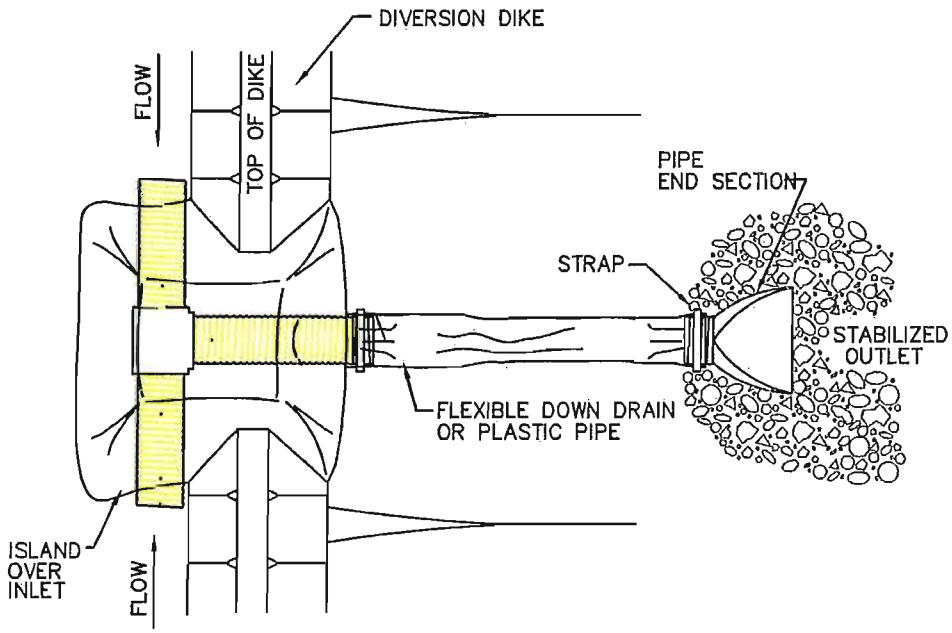


SECTION

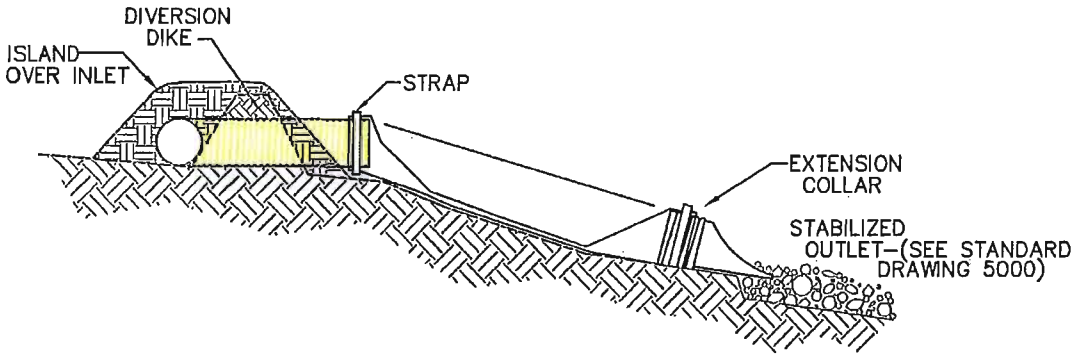
WATER BAR

NOTES:

1. SPACING TO BE CALCULATED BASED ON CONTRIBUTING AREA.
2. STABALIZE GRADE SURFACE SUCH THAT RUNOFF WILL REMAIN ON GRADE SURFACE.
3. SOIL TO BE STABALIZED WITH APPROVED VEGETATION.
4. NEVER OUTLET WATER BARS OR ROLLING DIPS ONTO UNPROTECTED FILL SLOPES



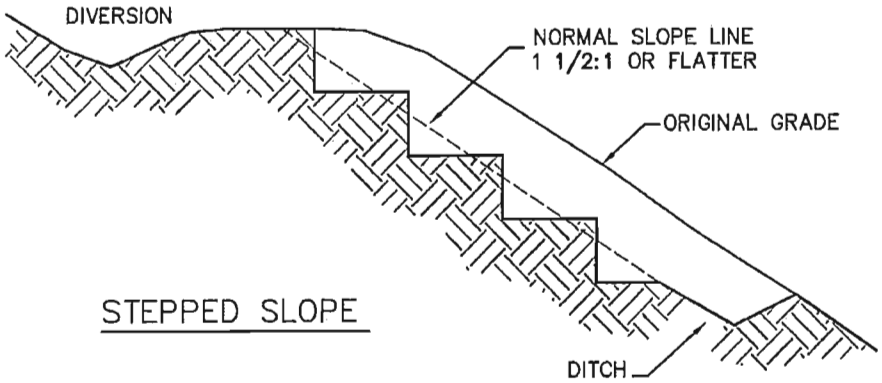
PLAN VIEW



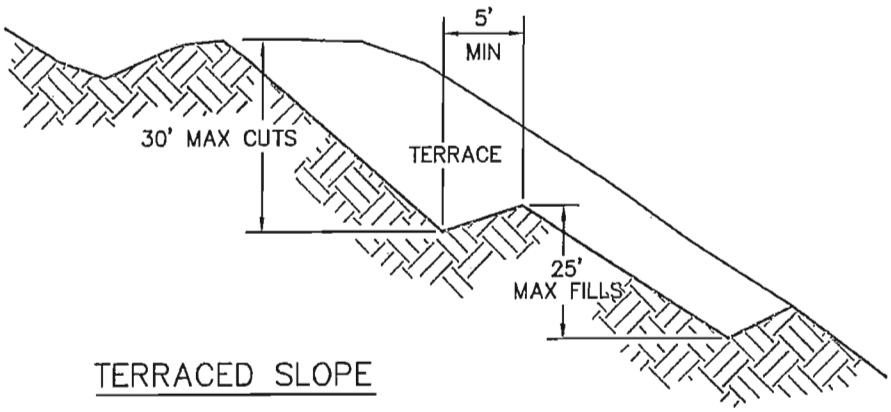
SECTION

NOTES:

1. ENTRANCE SECTION SHALL BE WELL ENTRENCHED AND STABLE
2. DRAIN SHOULD EXTEND DOWNSLOPE BEYOND THE TOE OF THE SLOPE TO A STABLE AREA OR APPROPRIATELY STABILIZED OUTLET.



STEPPED SLOPE

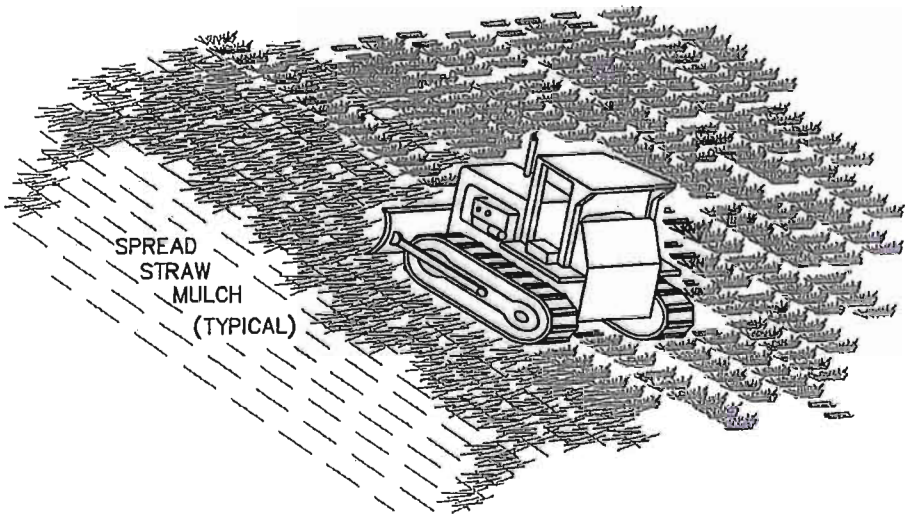


TERRACED SLOPE

NOT TO SCALE

NOTES:

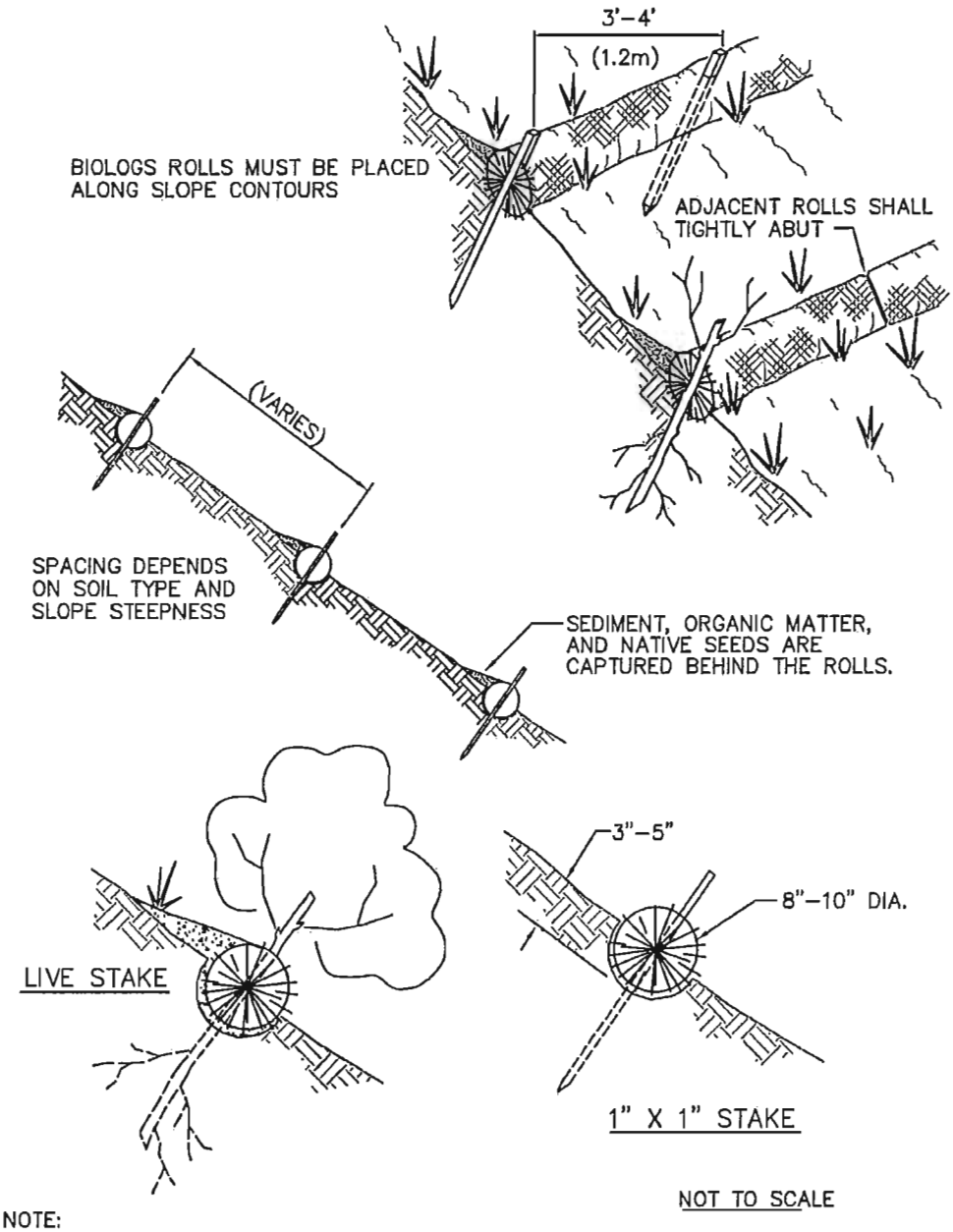
1. VERTICAL CUT DISTANCE SHALL BE LESS THAN HORIZONTAL DISTANCE.
2. VERTICAL CUT SHALL NOT EXCEED 2 FT. IN SOFT MATERIAL AND 3 FT. IN ROCKY MATERIAL.



STRAW ANCHORING

NOTES:

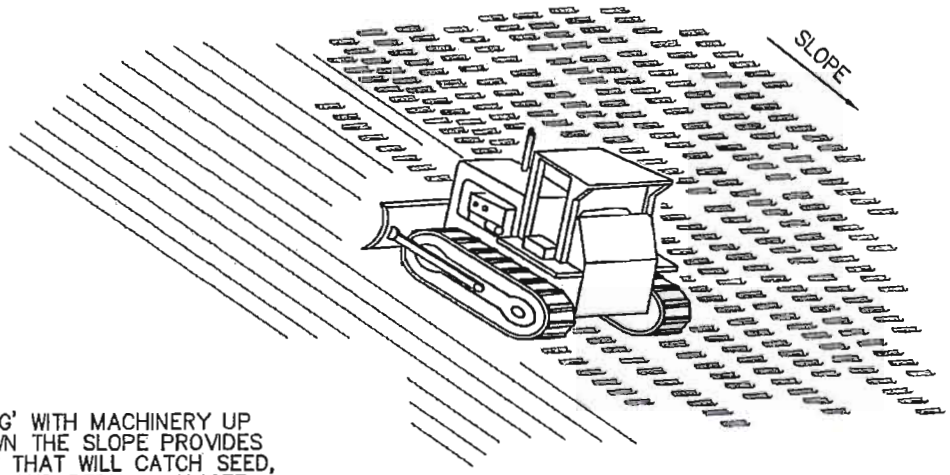
1. ROUGHEN SLOPE WITH BULLDOZER
2. BROADCAST SEED AND FERTILIZER.
3. SPREAD STRAW TO COVER SOIL WITH APPROXIMATELY 30% COVERAGE
4. APPLY STRAW TO SLOPE SUCH THAT COVERAGE CAN NOT BE REDUCED BY NATURAL ELEMENTS SUCH AS PRECIPITATION OR WIND.
5. CRIMP STRAW WITH AN APPROVED CRIMPER IN STAGES TO COVER APPROXIMATELY 30% COVERAGE.
6. REPEAT STEPS 3 & 4 UNTIL TOTAL STRAW TONAGE IS APPLIED



NOT TO SCALE

NOTE:

1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"-5" DEEP, DUG ON CONTOUR. RUNOFF RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
2. SPACING TO BE CALCULATED USING THE SOIL TOLERANCE FACTOR "T"

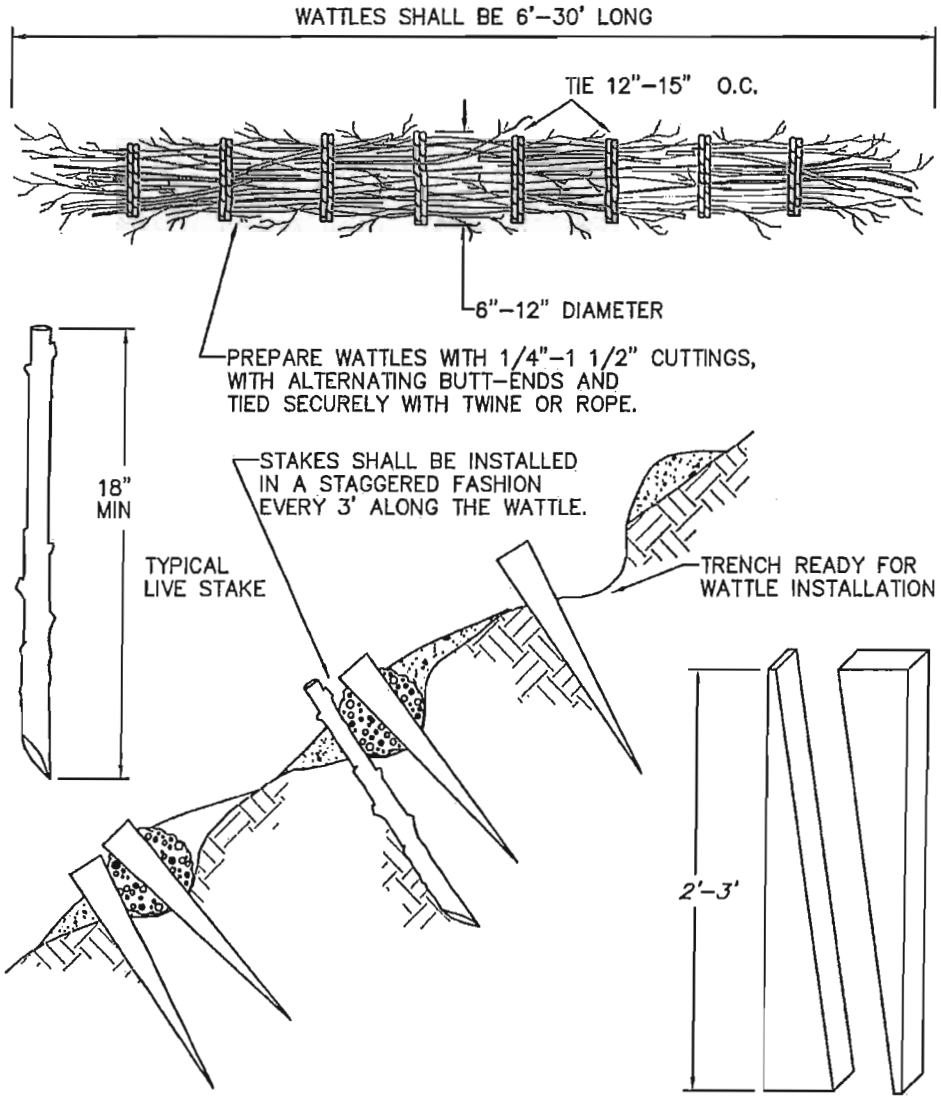


'TRACKING' WITH MACHINERY UP AND DOWN THE SLOPE PROVIDES GROOVES THAT WILL CATCH SEED, RAINFALL AND REDUCE RUNOFF.

TRACKING

City of South Jordan, Utah

SOUTH JORDAN	SURFACE ROUGHENING	PLAN 5255

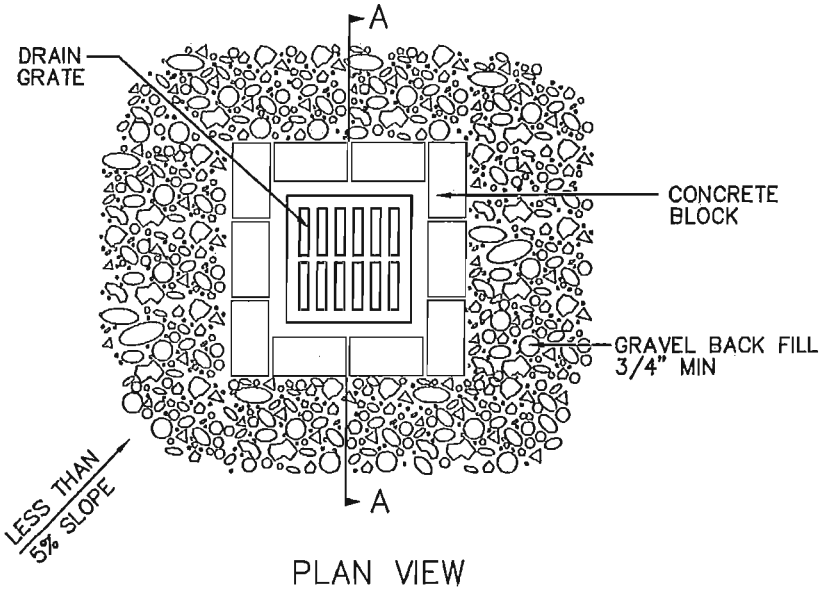


TYPICAL CONSTRUCTION STAKE
SAW 2X4 LUMBER ON DIAGONAL

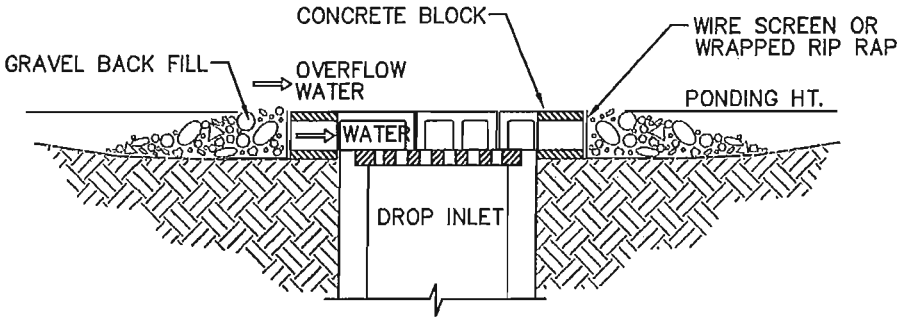
NOT TO SCALE

NOTES:

1. HARVEST AND INSTALL WATTLES DURING DORMANT SEASON.
2. INSTALL WATTLES ON SLOPE CONTOURS.
3. ALL WORK PROCEEDS FROM THE BOTTOM OF THE SLOPE TO THE TOP.
4. FILL OR PARTIALLY COVER WATTLE WITH SOIL FROM SLOPE OR TRENCH ABOVE.
5. COMPACT AND WORK SOIL INTO COMPLETED WATTLES.
6. CHOOSE PLANT MATERIALS APPROPRIATE FOR THE SITE
7. ALL CUTTINGS SHOULD BE SOADKED FOR A MINIMUM OF 24 HOURS.



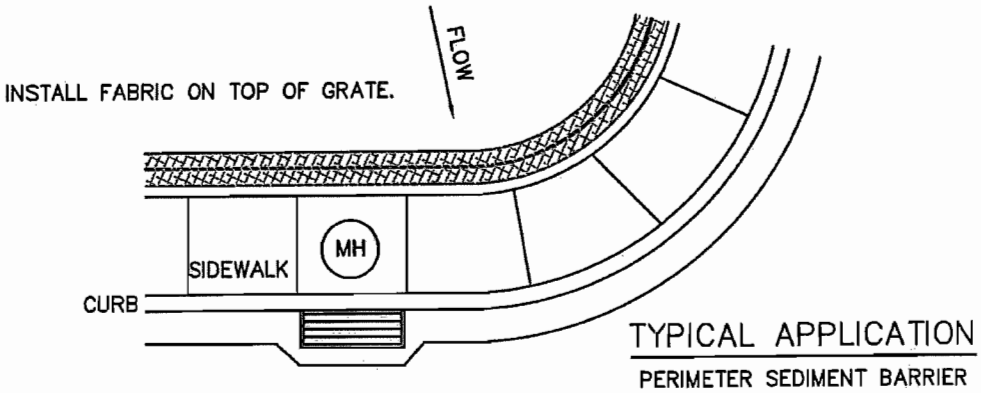
PLAN VIEW

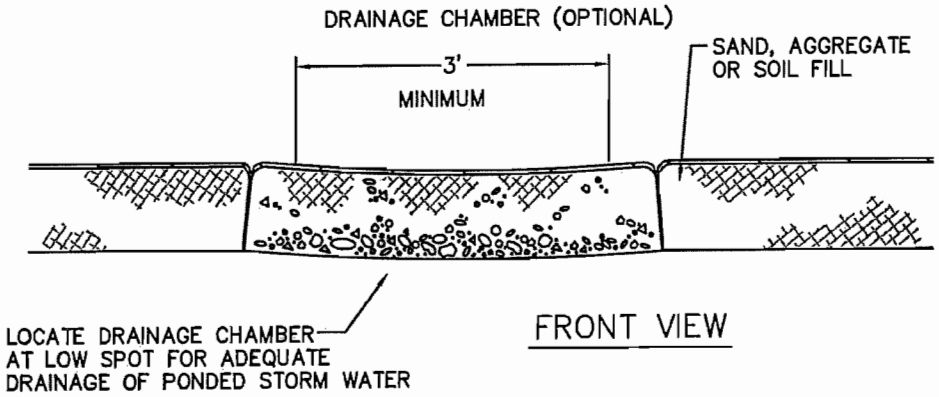


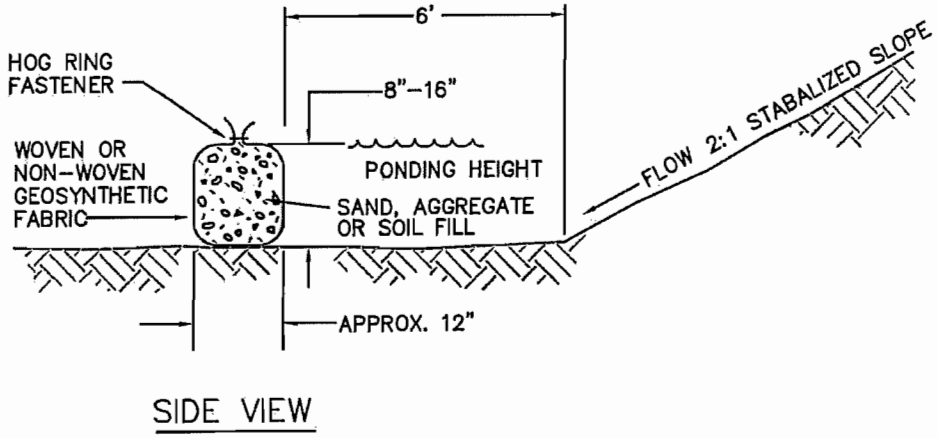
SECTION A – A

NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. EXCAVATE A BASIN OF SUFFICIENT SIZE ADJACENT TO THE DROP INLET.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWN SLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWN SLOPE SIDE OF THE STRUCTURE.
4. INSTALL FABRIC ON TOP OF GRATE.

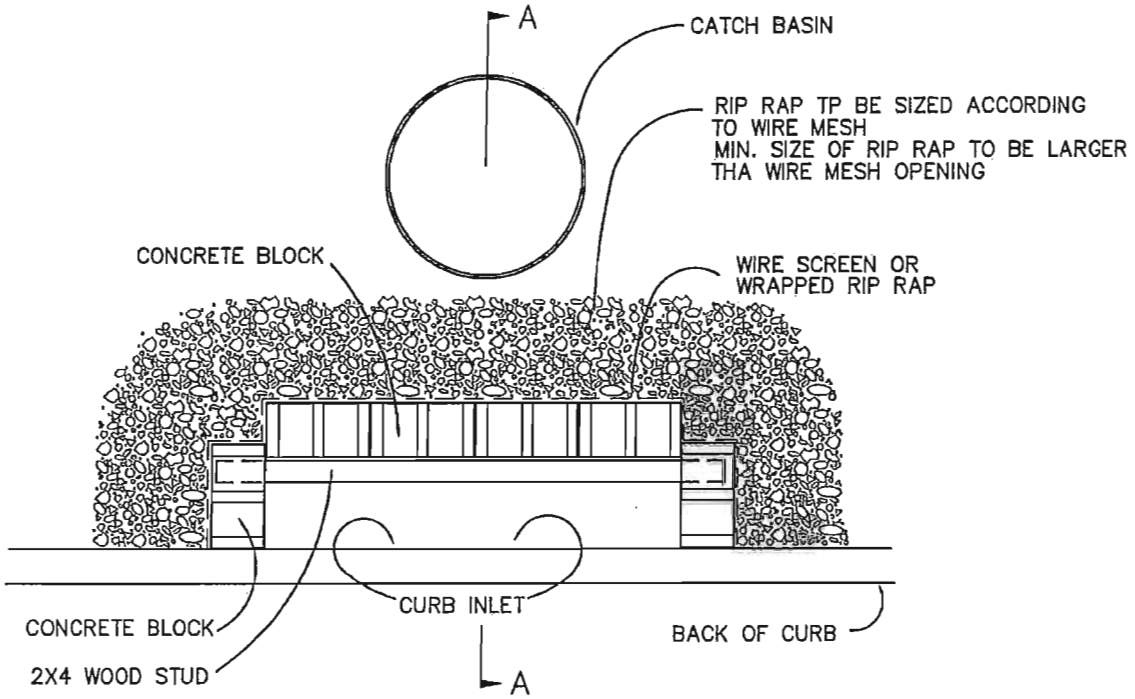




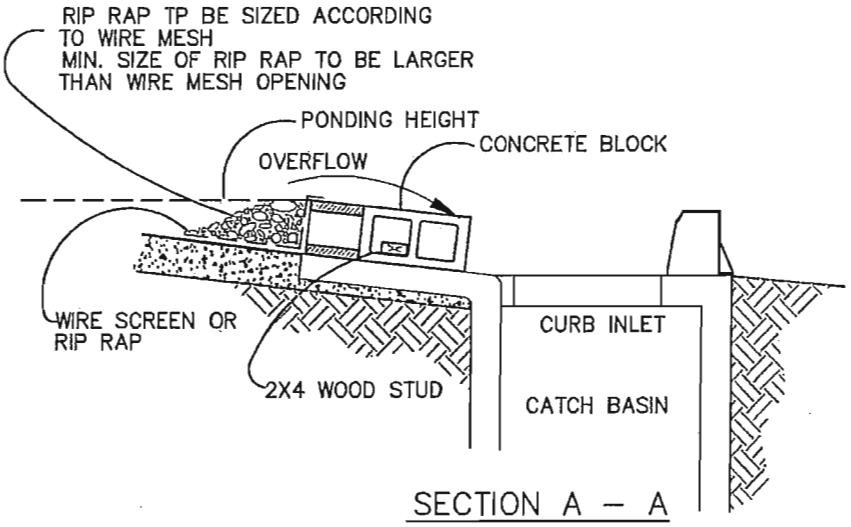


City of South Jordan, Utah

SOUTH JORDAN	CONTINOUS BERM	PLAN 5305



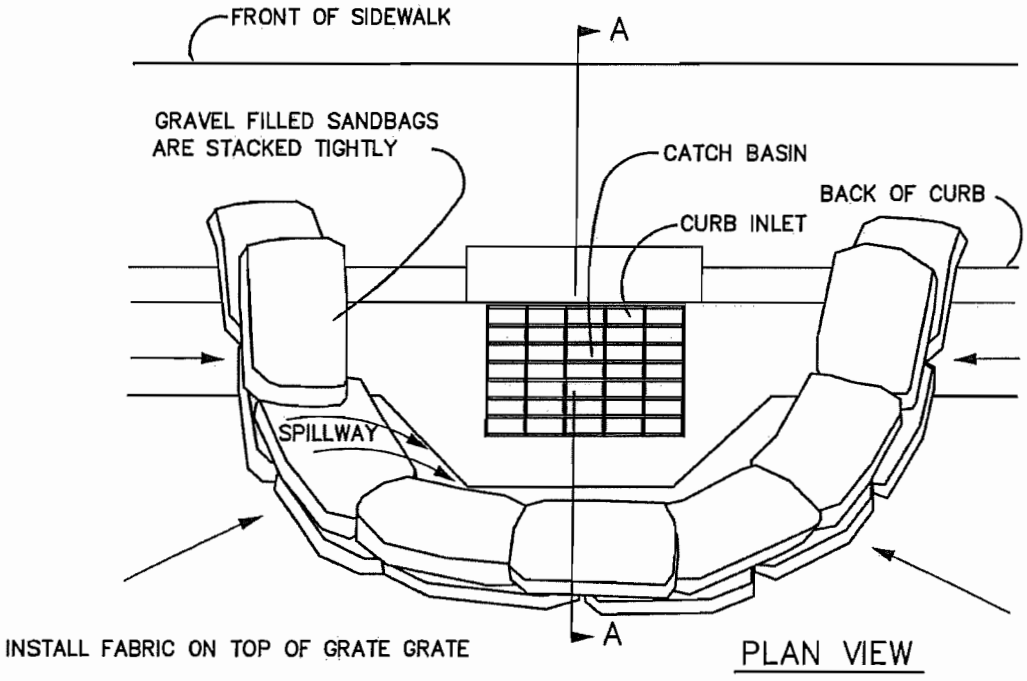
PLAN VIEW

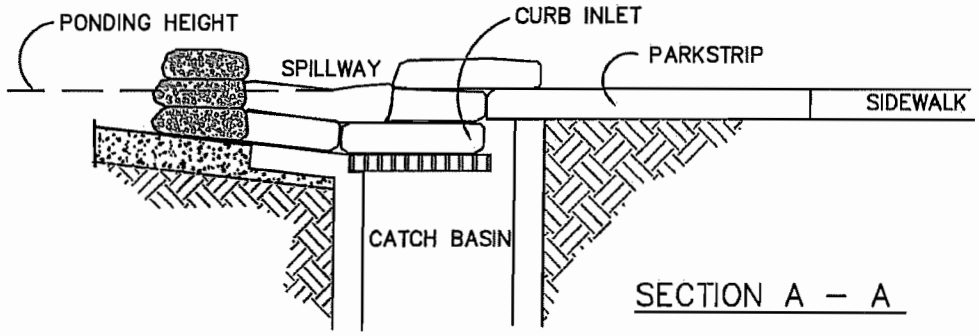


SECTION A – A

NOTES:

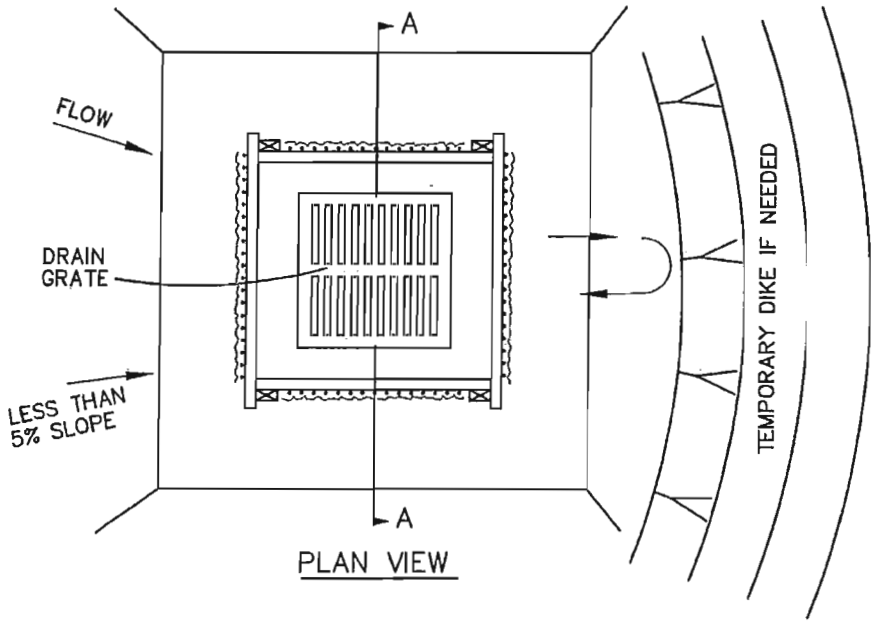
1. USE BLOCK AND GRAVEL TYPE SEDIMENT BARRIER WHEN CURB INLET IS LOCATED IN GENTLY SLOPING STREET SEGMENT, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. BARRIER SHALL ALLOW FOR OVERFLOW FROM SEVERE STORM EVENT.
3. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.



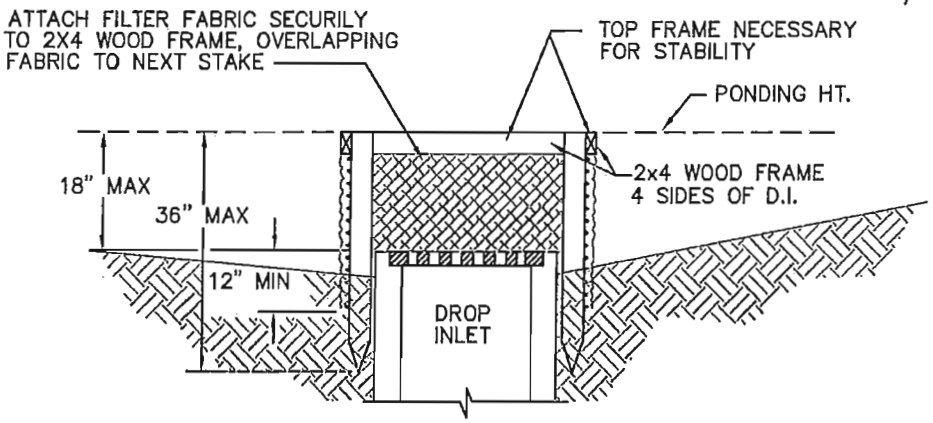


NOTES:

1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEGMENTS WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS, OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC, ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
3. LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.
4. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.



PLAN VIEW



SECTION A–A

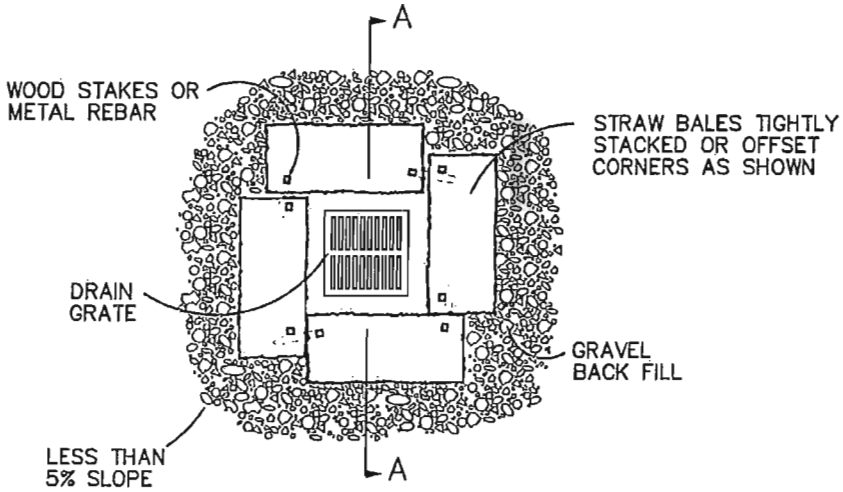
NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. USE 2"X4" WOOD OR EQUIVALENT METAL STAKES, 3' MINIMUM LENGTH.
3. INSTALL 2"X4" WOOD TOP FRAME TO INSURE STABILITY.
4. THE TOP OF THE FRAME (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWN SLOPE TO PREVENT RUNOFF FROM BY-PASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWN SLOPE SIDE OF THE STRUCTURE.

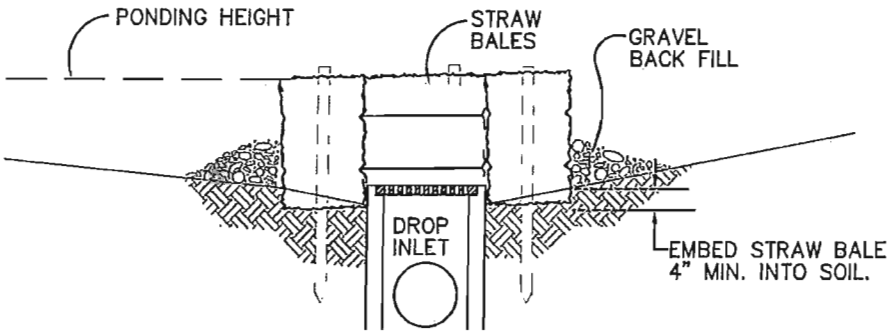
NOT TO SCALE

City of South Jordan, Utah

SOUTH JORDAN	SILT FENCE DROP INLET SEDIMENT BARRIER	PLAN 5325



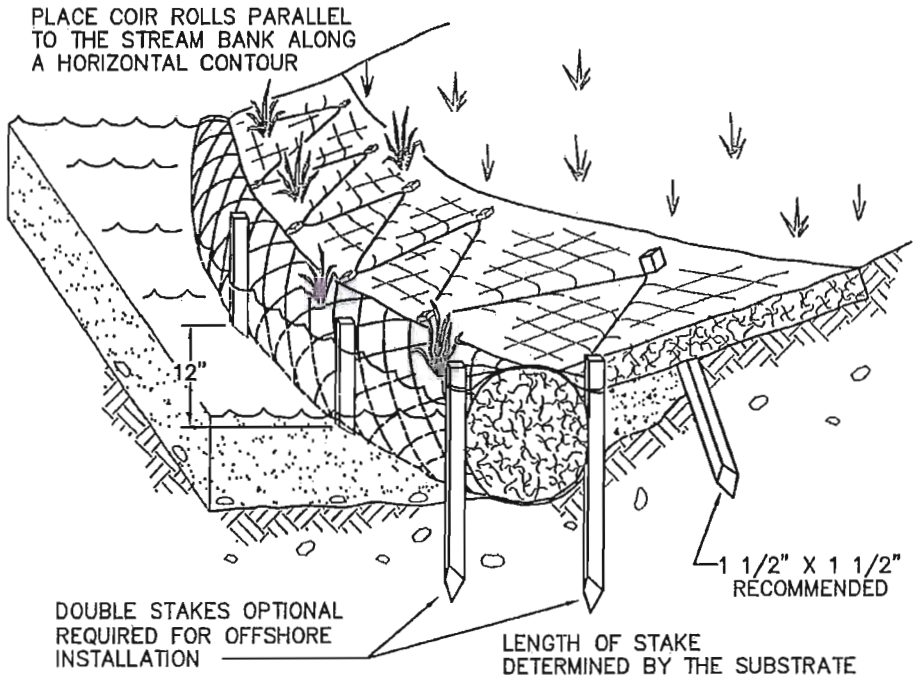
PLAN VIEW

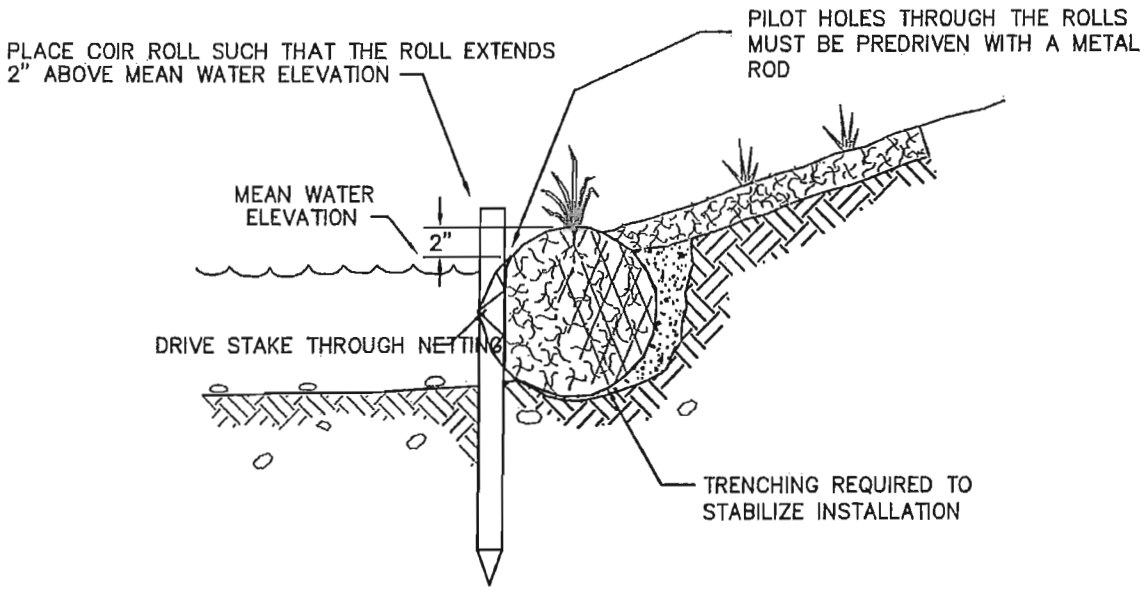


SECTION A–A

NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. EMBED THE BALES 4" INTO THE SOIL AND OFFSET CORNERS OR PLACE BALES WITH ENDS TIGHTLY ABUTING. GRAVEL BACK FILL WILL PREVENT EROSION OR FLOW AROUND THE BALES.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWN SLOPE TO PREVENT RUNOFF FROM BYPASSING THE INLET. EXCAVATION OF A BASIN ADJACENT TO THE DROP INLET OR A TEMPORARY DIKE ON THE DOWN SLOPE OF THE STRUCTURE MAY BE NECESSARY.
4. ALL LOOSE STRAW DEBRIS MUST BE CLEARNED UP ON A REGULAR BASIS

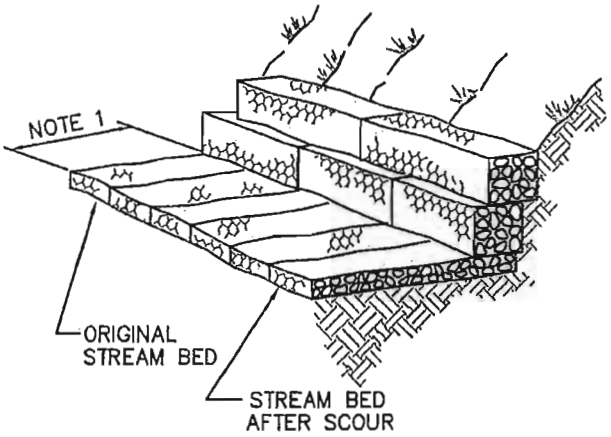




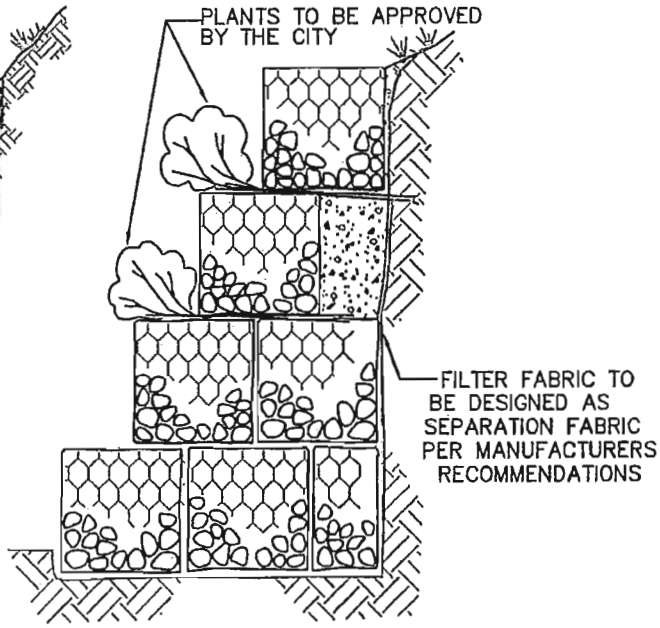
NOT TO SCALE

City of South Jordan, Utah

SOUTH JORDAN	COIR ROLL / COIR MATS	PLAN 5400

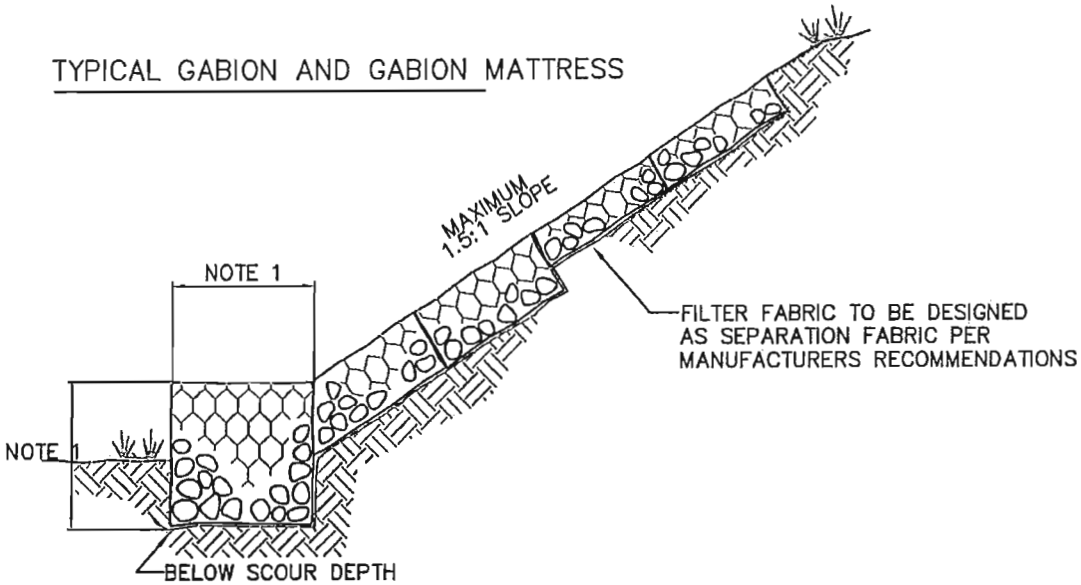


1/2 GABION CHANNEL



TYPICAL VEGETATED ROCK GABION

TYPICAL GABION AND GABION MATTRESS



NOTES:

1. TO BE DESIGNED PER H.E.C. 11
2. BASKET FASTENERS & BASKET MATERIAL TO BE APPROVED BY THE CITY

City of South Jordan, Utah

SOUTH JORDAN	GABIONS	PLAN 5405

ORDINANCE NO. 2008-01

AN ORDINANCE AMENDING THE DEVELOPMENT CODE, ADDING SECTION 16.44 OF THE SOUTH JORDAN MUNICIPAL CODE, PERTAINING TO LAND DISTURBANCE.

WHEREAS, the City of South Jordan may enact rules and regulations relating to development of land with in City limits pursuant to Utah Code Ann.§ 10-9a (2007) as the City deems necessary to achieve the purpose of the statute (UCA § 10-9a-102); and

WHEREAS, the City has enacted and published ordinances regulating development that are codified as Title 16 "Development Code" in the South Jordan Municipal Code ("SJMC"); and

WHEREAS, land throughout the City is being developed under the requirements of SJMC Title 16; and

WHEREAS, SJMC Title 16 does not address Land Disturbance or grading requirements for development of property; and

WHEREAS, SJMC Title 16 does not clearly address the requirements and enforcement of the State mandated Utah Pollution Discharge Elimination System (UPDES) ; and

WHEREAS, developers regularly grade and otherwise change the natural grade of the land in a manner that complies with current City standards and regulations but creates complaints from neighbors mainly in infill projects; and

WHEREAS, the South Jordan City Council has found and determined that the proposed addition of Title 16.44 to the South Jordan Municipal Code will support the best interests of the City and will promote the public health, safety, and welfare..

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF SOUTH JORDAN CITY, UTAH AS FOLLOWS:

SECTION 1. Enactment. Title 16 Chapter 44, "Land Disturbance" is hereby enacted as follows:

CHAPTER 16.44

LAND DISTURBANCE

Sec. 16.44.010 Short Title.
Sec. 16.44.020 Authorization to Adopt Standards.
Sec. 16.44.030 Purpose.
Sec. 16.44.040 Definitions.
Sec. 16.44.050 Administration
Sec. 16.44.060 Conflict.
Sec. 16.44.070 Land Disturbance Permit Required.

Sec. 16.44.080 Exemptions.
Sec. 16.44.090 Application.
Sec. 16.44.100 Plans and Specifications.
Sec. 16.44.110 Required Plans and Reports.
Sec. 16.44.120 Slope Length.
Sec. 16.44.130 Application Waiver.
Sec. 16.44.140 Fees.
Sec. 16.44.150 Review and Approval.
Sec. 16.44.160 Issuance.
Sec. 16.44.170 Conditions of Approval.
Sec. 16.44.180 Denial of Land Disturbance Permits.
Sec. 16.44.190 Approved Plans.
Sec. 16.44.200 Modification of Plans.
Sec. 16.44.210 Correction of Errors.
Sec. 16.44.220 Term of Land Disturbance Permits.
Sec. 16.44.230 Extension of Term.
Sec. 16.44.240 Suspended or Abandoned Work.
Sec. 16.44.250 Renewal of Expired Land Disturbance Permit.
Sec. 16.44.260 Suspension or Revocation of Permit.
Sec. 16.44.270 No Transfer or Assignment of Permit.
Sec. 16.44.280 Validity of Permit.
Sec. 16.44.290 Additional Permits.
Sec. 16.44.300 Emergencies.
Sec. 16.44.310 Compliance With Permit.
Sec. 16.44.320 Protective Devices.
Sec. 16.44.330 Maintenance of Site.
Sec. 16.44.340 Access and Haul Routes.
Sec. 16.44.350 Consent of Adjacent Property Owners.
Sec. 16.44.360 Cuts and Fills.
Sec. 16.44.370 Erosion Control and Drainage Devices.
Sec. 16.44.380 Areas Subject to Slides and Unstable Soils.
Sec. 16.44.390 Planting and Irrigation of Cut and Fill Slopes.
Sec. 16.44.400 Property Line and Corner Markers
Sec. 16.44.410 Reserved
Sec. 16.44.420 Slope Protection Easements.
Sec. 16.44.430 Lots Graded Toward Street for Drainage.
Sec. 16.44.440 Lots Which Cannot be Graded Toward the Street Easements for Drainage.
Sec. 16.44.450 Materials for Side and Rear Yard Drainage.
Sec. 16.44.460 Flow of Water from One Lot to Another Limited Use.
Sec. 16.44.470 Landscaping of Certain Lots for Erosion Control.
Sec. 16.44.480 Erosion Control and Revegetation.
Sec. 16.44.490 Wet Weather Plan.
Sec. 16.44.500 Land Disturbance Design and Construction Standards.
Sec. 16.44.510 Lot Impervious Surface Area Drainage.
Sec. 16.44.520 Land Disturbance Activities and Improvements Bond.
Sec. 16.44.530 Revegetation Bond.
Sec. 16.44.550 Permit Holder Supervision and Inspection.
Sec. 16.44.560 City Inspections.
Sec. 16.44.570 Additional Inspections or Testing.
Sec. 16.44.580 Inspection Requests.
Sec. 16.44.590 Duty to Keep Work Accessible and Exposed.
Sec. 16.44.600 Entry Onto Premises.
Sec. 16.44.610 Certification or Approval.
Sec. 16.44.620 Transfer of Responsibility for Certification.
Sec. 16.44.630 Final Inspection.

Sec. 16.44.640 Building Permits.
Sec. 16.44.650 Validity of Inspection.
Sec. 16.44.660 Enforcement.
Sec. 16.44.670 Violations.
Sec. 16.44.680 Remedies and Enforcement Powers.
Sec. 16.44.690 Notice of Violation.
Sec. 16.44.700 Suspension or Revocation of Land Disturbance Permit.
Sec. 16.44.710 Notice of Suspension or Revocation.
Sec. 16.44.720 Cessation of Work.
Sec. 16.44.730 Decision of Suspension or Revocation.
Sec. 16.44.740 Right of Entry.
Sec. 16.44.750 Appeals.
Sec. 16.44.760 Liability.
Sec. 16.44.770 Right to Stop Work.
Sec. 16.44.780 Parking Lots.

16.44.010 Short Title.

This Chapter is to be known as the "Land Disturbance Ordinance" of the City and may be so
cited.

16.44.020 Authorization to Implement Standards

The City Engineer or designee is hereby authorized to implement these standards pursuant to this Chapter.

16.44.030 Purpose.

The purpose of this Chapter is to establish minimum requirements and procedures for conducting land disturbance activities within the City. It is the intent of this Chapter to protect the health, safety and welfare of the public against inadequate, unwarranted, or unsafe land disturbance activities during all aspects of land disturbance activities, including, but not limited to the following:

(a) To establish processes, procedures and standards for land disturbance activities such as clearing, grubbing, grading, excavating, filling, dredging, and other land disturbance related activities, to minimize hazards to life and limb, protect against erosion and sedimentation, maintain the natural environment, protect the safety, use, and stability of public rights-of-way and drainage facilities, and provide for restoration of the land through re-vegetation and landscaping.

(b) To assure that projects approved under this Chapter, as well as neighboring and downstream properties, will be free from harmful effects of new land disturbance activities with regard to runoff, including inundation, flooding, erosion, air pollution, and sedimentation.

(c) To ensure proper restoration of vegetation and soil systems disturbed by land disturbance activities, to maintain an attractive and healthy landscape, and to control against dust and erosion and their consequent effects on soil structure and air and water quality during and after excavation.

(d) To provide processes and standards in compliance with State and Federal requirements regarding pollution, environmental quality, and storm water discharge.

16.44.040 Definitions.

As used in this Chapter, the following words and phrases shall have the meanings given in this Section:

(a) **Applicant:** Any person who submits an application for a permit pursuant to the Land Disturbance Ordinance.

(b) **Best Management Practice (BMP):** Practices, procedures or designs used as a standard for a given industry. In this specific case, these practices are for the erosion control industry's Best Management Practices (BMP's) for controlling non-point sources of pollution and are the methods, measures, practices, or a combination of practices determined to be the most effective and practicable means (including technological, economic, and institutional considerations) to control non-point pollutants at levels compatible with environmental quality goals. As used in the document, BMP's are synonymous with erosion and sediment control measures.

(c) **Building Envelope:** The area within the lot which will be used to construct the building, landscaped areas, retaining walls, fences, porches, patios, decks, swimming pools, driveways, parking areas, or any other permanent feature which is appurtenant to the building.

(d) **Buttress Fill:** A buttress fill is a designed compacted earth fill used for providing lateral support to an un-stabilized earth or rock mass.

(e) **City:** City of South Jordan, Utah.

(f) **City Engineer:** City Engineer shall mean the City Engineer of City of South Jordan, or the person(s) engaged by the City and authorized to perform the duties assigned to the City Engineer, and shall include any deputies, assistants, and representatives.

(g) **Civil Engineer:** A professional engineer in the branch of civil engineering holding a valid certificate of registration issued by the State of Utah.

(h) **Clearing and Grubbing:** Moving, removing, displacing, and/or stockpiling, by manual or mechanical means, trees, and other vegetation and/or the top organic layer as described in the geotechnical report. In the absence of a geotechnical report the organic layer shall not be greater than eight (8) inches.

(i) **Community Development Director:** That person charged with the responsibility of directing all phases of the Community Development Division and the enforcement of all State statutes and City laws pertaining to this office, or his duly authorized representative.

(j) **Compaction:** The act of compacting or consolidating soil and rock material to a specified density, and the resulting compacted state of the material.

(k) **Detention:** The holding back or delaying of the flow of water, through manmade or natural means.

(l) **Dredging:** The practice of deepening a waterway by mechanical means by the removal of sediments.

(m) **Enforcement Authority:** The City Engineer, the Engineering Inspector, and other designated representatives of the City Engineer, or any duly appointed Code Compliance

Officer or police official charged with the responsibility for enforcement of the provisions of this Chapter.

(n) **Engineering Geologist:** A professional engineering geologist licensed or registered under the laws of Utah and capable of applying the geological sciences to engineering practices for the purpose of assuring that the geological features affecting the location, design, construction, operation, and maintenance of engineering works are recognized and adequately provided for.

(o) **Erosion:** The process of detachment of soil particles or other surface material by the action of wind, water, snow, or ice.

(p) **Erosion Control Measures:** The structural and nonstructural Best Management Practices (BMP's) for erosion control that prevents displacement of soil particles by wind or water. BMP Erosion control measures may include seeding, mulching, vegetative buffer strips, sod, plastic coverings, rip rap, gabions, other channel armoring methods, burlap coverings, watering, and other BMP measures that control the movement of the ground surface or soil.

(q) **Farming and Agricultural Operations:** Any activity or process normally performed as part of the farming use of the land which would prepare the soil for planting or harvesting of agriculturally usable products.

(r) **Fill:** Deposits of soil, rock, or other materials placed by man.

(s) **Finished Grade:** The final grade or elevation of the building site, slope or terrace (0.1 plus or minus feet).

(t) **Grade:** The elevation of the ground surface as measured from a known vertical control. Existing grade means grade currently on the site. Natural grade means the grade unaltered evidenced by the presence of indigenous plants and grasses.

(u) **Grading:** The act or result of digging, excavating, transporting, spreading, depositing, filling, compacting, settling, or shaping of land surfaces and slopes, and other operations or activities involving the physical movement of rock or soil.

(v) **LDDCS:** Land Disturbance Design and Construction Standards.

(w) **Land Disturbance:** Any disturbance of native soils, plants, or environment, including, but not limited to, clearing, grubbing, grading, excavation, filling, dredging, construction of earth-filled dams, and any other types of earthwork.

(x) **Land Disturbance Design and Construction Standards:** City of South Jordan Land Disturbance Design and Construction Standards as adopted by the City. Abbreviated herein as LDDCS.

(y) **Land Disturbance Permit:** The land disturbance permit required by the City in accordance with provisions of this Chapter.

(z) **Landmark Trees:** Trees that measure over three inch (3) caliper.

(aa) **Landscape Architect:** A professional landscape architect licensed or registered under the laws of Utah.

(bb) **Lot Level:** Design, construction and infrastructure related to construction on a specific lot within an approved subdivision or site plan development.

(cc) **Planting Date:** The date native seed can be applied without temporary irrigation, generally from October 15 through March 1, or as otherwise determined by the City's Engineering Division.

(dd) **Project:** A defined site that has obtained final subdivision plat or site plan approval from the City.

(ee) **Sediment:** The transport of soil or earth material by wind, water, snow or ice.

(ff) **Sediment Control Measures:** The structural and nonstructural BMP that contains the deposited, displaced soil particles caused by erosion. This may include (but not limited to) dikes, sediment detention traps, sediment detention basins, filters, fences, barriers, swales, berms, drains, check dams, and other measures that control the deposition of soil or earth material.

(gg) **Site:** A parcel or parcels of real property owed by one or more persons on which activity regulated by this Chapter is occurring or is proposed to occur.

(hh) **Slope:** A portion of ground forming a natural or artificial incline, including retaining wall.

(ii) **Soil:** All earth material, of whatever origin, which overlies bedrock.

(jj) **Soils Engineer:** A professional civil engineer licensed under the laws of Utah who is experienced in soil mechanics and slope stability analysis.

(kk) **Structure:** Anything constructed or erected which requires location on the ground or is attached to something having location on the ground.

(ll) **Subdivision Level:** Design, construction and infrastructure related to subdivision development and systems such as drainage, culinary water, wastewater systems, etc.

(mm) **Swales:** Shallow grassed or otherwise protected trenches that are wider than they are deep that provide a specific pathway for drainage water.

(nn) **Wet Weather Plan:** A detailed erosion and sediment control plan and construction sequence that clearly shows how construction will be processed during the period of October 31 of each year until March 31 of each year.

16.44.050 Administration.

The Engineering Division is designated as the responsible division, with the City Engineer as the official responsible for the administration of this Chapter. The City Engineer may delegate any or all administrative duties provided herein as deemed necessary.

16.44.060 Conflict.

In the event of a conflict between the terms of this Chapter or any other law, ordinance or rule, the more restrictive provision shall apply.

16.44.070 Land Disturbance Permit Required.

No person, developer, builder, contractor, or other entity in any Land Use Zone except for Planned Community Zone shall cause to be commenced or perform any land disturbance,

grading, relocation of earth, or any other land disturbance activity, and no person shall import or export any earth materials to or from any site, without first obtaining a land disturbance permit. No land disturbance permit shall be issued for any site or project requiring site plan approval until and unless a final site plan has been approved by the City Engineer, for the site or project, and no land disturbance permit shall be issued for any site or project requiring subdivision approval until and unless the final subdivision plat has been approved by the City Engineer for the site or project. City Engineer or designee may waive the requirement of obtaining final site plan or final subdivision plat approval as is deemed appropriate for a particular project. City Engineer may require a letter of indemnification as part of that approval

No person, developer, builder, contractor in a Planned Community Zone shall cause to be commenced or commence land disturbance, grading, relocation, or any other land disturbance activity and no person shall import or export any earth materials to or from any site or within the site, without first obtaining a land disturbance permit. No land disturbance permit shall be issued for any site or project within a Planned Community Zone without City approved land disturbance or grading plans.

16.44.080 Exemptions.

The following activities do not require a land disturbance permit. Activities exempted from the land disturbance permit requirements set forth herein are subject to and shall be performed in accordance with the Land Disturbance Design and Construction Standards, and all other applicable ordinances, rules, regulations, standards and specifications of the City.

(a) An excavation which does not exceed fifty (50) cubic yards; or affects an area that is less than three-thousand (3,000) square feet; or does not create a cut slope greater than five feet (5) in height or steeper than two horizontal to one vertical (2:1); provided, however, any excavation which is made in an area of adverse geological conditions or which alters a drainage course must obtain a permit.

(b) A fill which is less than one foot (1) in depth and placed on natural terrain with a slope flatter than five horizontal to one vertical (5:1); affects an area that is less than three-thousand (3,000) square feet; is less than three feet (3) in depth and is not intended to support structures; provided, any fill over fifty (50) cubic yards or which affects a drainage course must obtain a permit.

(c) Excavations below the finished grade for basements and footings of buildings, retaining walls, swimming pools, or other structures authorized by a valid building permit. This shall not exempt any fill made of materials from such excavations or exempt any excavation having an unsupported height greater than five feet (5) after the completion of such structures.

(d) Mining and quarrying operations conducted under a valid special use permit issued by the City pursuant to applicable zoning regulations.

(e) The depositing of rubbish or other materials at any dump or sanitary fill conducted under a valid permit and/or applicable zoning ordinances. Such exemption shall not extend to surrounding berms, permanent access roads, building sites, or protective drainage works.

(f) Farming, agricultural operations, and residential gardening conducted under a valid use permit or applicable zoning ordinances.

(g) Soil and water conservation work under the direct control of the United States Natural Resources Conservation Service; provided, the construction of water impounding structures of earth shall require a permit where the maximum depth to which water is or may be impounded is five feet (5) or greater.

(h) Grading operations conducted by the City for approved capital improvement projects.

(i) Exploratory Work made in preparation of completing a Geological and or Soils report.

16.44.090 Application.

Application for a land disturbance permit shall be filed with the City Engineer on forms furnished by the City for such purpose. Applications shall include all the plans, specifications, reports, documentation and information required herein. Three (3) sets of all required plans, specifications and reports shall be submitted with each application. All such plans, specifications and reports shall be prepared and signed by a civil engineer, soils engineer, engineering geologist and/or landscape architect, as required by this Chapter and the LDDCS. Additional experts in applicable field should be utilized for preparation of such documents and reports as appropriate. No application shall be processed until all required plans, specifications, reports, documentation and information have been received by the City in accordance with the provisions and requirements of this Chapter.

16.44.100 Plans and Specifications.

Each application for a land disturbance permit shall include the following plans, specifications, reports, documentation and information:

(a) A vicinity sketch or other data adequately indicating the site location;

(b) The property lines and dimensions and bearings of the property on which the work is to be performed;

(c) The location of any existing buildings or structures on the property where the work is to be performed and the location of any building or structure on the land of adjacent property owners, which building or structure is within fifty feet (50) of the property boundary;

(d) The location of landmark trees as indicated by the designation of the location of the center of the trunk;

(e) Accurate topography showing suitable contours of the existing and proposed ground elevations. The contours shall be extended past the boundary lines of any project for a minimum of one hundred feet (100). The City Engineer may require the contours to be extended to include watershed areas and all other areas influencing the proposed project or site

(f) The elevations, dimensions, locations, extent, and slopes of all proposed land disturbance activities shown by contours or other means;

(g) A certification, by a soils engineer, of the quantity and type of material of any proposed excavation and fill;

(h) The estimated starting and completion dates for the proposed land disturbance activities and proposed land disturbance activities schedule and permit term;

(i) Detailed plans of all drainage devices, walls, cribbing, dams, or other protective devices to be constructed in connection with, or as a part of, the proposed work, together with a map showing the drainage area and estimated runoff of the area served by the drains. All hydrologic and hydraulic calculations shall be signed by a civil engineer;

(j) Temporary construction entrance and exit plan as indicated in the LDDCS;

(k) An indication as to the type of structure(s) to be constructed or the proposed use of the site, such as single -family residence, multiple -family development, commercial, or industrial; and

(l) Any additional plans, drawings, or calculations required herein or by the City Engineer.

16.44.110 Required Plans and Reports.

Unless an application waiver is obtained in accordance with the provisions of this Chapter, each application for a land disturbance permit shall include the following plans and reports for the proposed land disturbance activity and site. The grading plan shall be prepared in accordance with the requirements and standards for such plans as set forth in the Land Disturbance Design and Construction Standards.

(a) Grading plan prepared and signed by a civil engineer

(b) Drainage Plan -Each application for a land disturbance permit shall include a drainage plan for the proposed land disturbance activity and site. The drainage plan shall be prepared by a civil engineer and shall be prepared in accordance with the requirements and standards for such plans as set forth in the LDDCS.

(c) Rear and Side Lot Drainage Swales. Swales located in rear and side yards shall part of the grading and drainage plan and be designed as set forth in the LDDCS.

(d) Erosion and Sediment Control Plan -Each application for a land disturbance permit shall include an erosion and sediment control plan for the proposed land disturbance activity and site. The erosion and sediment control plan shall be prepared by a civil engineer and shall be prepared in accordance with the requirements and standards for such plans as set forth in the LDDCS.

(e) Re-vegetation Plan -Each application for a land disturbance permit shall include a re-vegetation plan for the proposed land disturbance activity and site. The re-vegetation plan shall be prepared by an erosion control specialist or professional of comparable expertise and shall be prepared in accordance with the requirements and standards for such plans as set forth in the LDDCS, Section 4.

(f) Soils Report - Each application for a land disturbance permit shall include a soils report for the site. The soils report be prepared and signed by a soils engineer and shall be prepared in accordance with the requirements and standards for geological reports as set forth in the LDDCS, Section 2

(g) Geological Report - When deemed necessary by the City Engineer due to the circumstances and conditions of the site, an application for a land disturbance permit shall include a geological report for the site. The geological report, when required, shall be

prepared and signed by a engineering geologist and shall be prepared in accordance with the requirements and standards for geological reports as set forth in the LDDCS, Section 2.

(h) Exploratory Work -Surface and subsurface exploratory work and reports may be required when deemed necessary by the City Engineer due to site conditions and/or hazards on the site. When required, such exploratory work and reports shall be performed and prepared by a soils engineer and/or engineering geologist.

16.44.120 Slope Length.

All applications for land disturbance activities involving or proposing cut and/or fill slopes shall include a report prepared and signed by an erosion control specialist or professional of comparable expertise (i.e. Professional Civil Engineer, Landscape Architect, etc.) addressing the design, safety, stability of the proposed slope lengths. Such report shall indicate how the applicant will address the issue of length of slope using the Revised Uniform Soils Loss Equation (RUSLE). The report shall indicate the method and/or materials to be used.

16.44.130 Application Waiver.

The City Engineer may waive any application requirement, plan, specification or report when deemed unnecessary for the proposed application and for good cause showing. A request for an application waiver shall be submitted by the applicant in writing setting forth the grounds and reasons for the waiver. An application shall not be deemed complete for purposes of the filing of a completed application until the City Engineer has approved the application waiver request. Failure of the City Engineer to approve the request within 60 days shall be deemed a denial.

16.44.140 Fees.

All applicable fees shall be paid by applicant with the filing of an application for a land disturbance permit. An application will not be deemed complete until the required fees have been received by the City. The fee amount shall be as adopted by City Council.

16.44.150 Review and Approval.

The City Engineer shall review the application, plans, and specifications, reports, documentation and information filed by an applicant for a land disturbance permit. If the City Engineer determines that the application is incomplete, or that additional information is needed from the applicant regarding the proposed land disturbance activities, the City Engineer shall notify the applicant in writing of such deficiencies or the need for additional information. The City Engineer may also request review of the application, plans and specifications by other departments and divisions of the City for compliance with the laws and ordinances under their jurisdiction.

Once satisfied that the work described in an application for land disturbance permit and the plans and specifications filed with the application conform to the requirements of this Chapter and other pertinent laws and ordinances, all applicable fees have been paid, and all required bonds have been provided in accordance with the provisions of this Chapter, the City Engineer may issue a land disturbance permit to the applicant.

16.44.160 Issuance.

The City Engineer shall provide the applicant with a written decision, within 30 days, regarding the approval or denial of the application for land disturbance permit and related plans and shall provide the applicant with a copy of such decision. If the application is approved, a copy of the land disturbance permit will be provided to the applicant.

16.44.170 Conditions of Approval.

In granting any land disturbance permit pursuant to the provisions of this Chapter, the City Engineer or his or her authorized representative may attach such conditions as may be reasonably necessary to protect public health and safety. Such conditions may include, but will not be limited to:

(a) The improvement of any existing site condition to conform with the standards of this Chapter; and
(b) Requirements for fencing excavations or fills which would otherwise be hazardous, and
(c) Requirements for access and haul routes. The City Engineer may impose conditions to the land disturbance permit with respect to access or haul routes to and from land disturbance activity sites, the hours of work, methods of controlling dust, and safety precautions involving pedestrian or vehicular traffic as determined required in the interest of the public health, safety and welfare.

16.44.180 Denial of Land Disturbance Permits.

(a) A land disturbance permit shall not be issued in any case where it is determined by the City Engineer that the work proposed by the applicant is hazardous, or is likely to endanger any private property, result in the deposit of debris on any public way, or interfere with any existing drainage course.

(b) A land disturbance permit shall not be issued if the land area for which grading is proposed is subject to geological or flood hazard to the extent that no reasonable amount of corrective work can eliminate or sufficiently reduce the hazard to human life or property as determined by the City Engineer.

(c) A land disturbance permit shall not be issued if the proposed land disturbance activity would not comply with the requirements of an approved site plan, subdivision plat, or any provisions of law, including the provisions of this Chapter.

16.44.190 Approved Plans

Prior to issuance of the land disturbance permit, the applicant shall provide the City with three (3) sets of the final plans, specifications and computations (full-size) and two (2) sets of 11x17-inch plans. Upon issuance of the land disturbance permit, the City Engineer shall endorse in writing, or stamp Approved for Construction on all required sets of plans and specifications. The City Engineer shall retain two (2) sets of the plans and specifications during the period of construction and as thereafter required by the Government Records Access and Management Act (GRAMA). Upon Approval, the City Engineer shall return one set of the final plans and specifications, stamped Approved, to the applicant. The applicant shall retain the approved set of plans and specifications at the site covered by the land disturbance permit at all times during which the work authorized thereby is in progress.

16.44.200 Modification of Plans.

No approved grading/Land Disturbance plans or specifications shall be changed, modified, altered or amended, without approval of the City Engineer in accordance with the procedures and requirements set forth herein for original approval of such plans and specifications. Modification of plans will require additional City review and will be subject to additional fees.

16.44.210 Correction of Errors.

The issuance of a land disturbance permit based upon submitted plans, specifications and documents shall not prevent or preclude the right of the City from thereafter requiring the correction of errors which may be later discovered in such plans, specifications and documents.

16.44.220 Term of Land Disturbance Permits.

Each land disturbance permit shall contain a specified term as determined by the City. The date the land disturbance permit expires shall be noted on the land disturbance permit. No person shall perform land disturbance, grading, relocation of earth, or any other land disturbance activity beyond the expiration date, unless an extension of term is granted or a new land disturbance permit is obtained in accordance with this Chapter.

16.44.230 Extension of Term.

Prior to expiration of the land disturbance permit, the land disturbance permit holder may apply for an extension of time in which to complete the work in a reasonable and expeditious manner. The City Engineer may grant an extension of time, upon a showing of good cause, for a period or periods not exceeding a total of one (1) year. Denial of an extension of time does not preclude the right of the land disturbance permit holder to apply for a new land disturbance permit for the remaining balance of the work. Adequate security or written consent from the surety must be provided for any extension of time before approval of the extension is granted or becomes effective. If the extension is denied, the Cit y will make a demand on the bond and complete the work.

16.44.240 Suspended or Abandoned Work.

Every land disturbance permit issued by the City Engineer under the provisions of this Chapter expires by limitation and becomes null and void if the land disturbance permit holder suspends or abandons the construction or work authorized by such land disturbance permit, at any time after the work is commenced, for a period of thirty days (30) or longer. After construction or work under a land disturbance permit has been suspended or abandoned for a period of thirty (30) days or longer, a new or renewed permit must be obtained prior to recommencing work.

16.44.250 Renewal of Expired Land Disturbance Permit.

If a land disturbance permit has expired, a new land disturbance permit shall be obtained before any work can be recommenced. If no changes have been made or will be made to the original plans and specifications for such work, and any suspension or abandonment has not exceeded one (1) year, the fee for the new land disturbance permit will be one-half the amount ordinarily required for a new land disturbance permit. If changes have been made or will be made in the original plans or specifications for the land disturbance activity, or the suspension or abandonment has exceeded one (1) year, the fee for a new permit shall be required for a new permit for the proposed land disturbance activity.

16.44.260 Suspension or Revocation of Permit.

The City may, in writing, suspend or revoke a permit when the permit is issued in error, or on the basis of incorrect information supplied, or when work conducted there under is in violation of the terms of the permit or the provisions of this Chapter or other applicable City Ordinances, rules, regulations, standards and specifications, or pertinent laws.

16.44.270 No Transfer or Assignment of Permit.

Land disturbance permits shall not be transferable or assignable and work shall not be performed under a land disturbance permit in any place other than that specified in the permit. Nothing herein shall prevent a permit holder from subcontracting the work to be performed under a land disturbance permit; provided, however, the permit holder shall be and remain responsible and liable for the performance of the work and land disturbance activities under the permit and for all bonding and other requirements of this Chapter and the applicable permit.

16.44.280 Validity of Permit.

The issuance of a land disturbance permit shall not be construed to be a permit for violation of any of the provisions of this Chapter or any other City Ordinances, rules, regulations, standards or specifications or other pertinent laws. Permits presuming to give such authority shall be deemed invalid.

16.44.290 Additional Permits.

The issuance of a land disturbance permit shall not relieve the owner, applicant, permit holder, or developer from obtaining any and all other permits or approvals required by the City or any other applicable agency having jurisdiction over the work or property affected by the proposed land disturbance activity.

16.44.300 Emergencies.

The provisions of this Chapter shall not apply to any land disturbance activity which is conducted during a period of emergency or disaster, as declared and defined by the City, and which is directly connected with or related to the relief of conditions caused by such emergency or disaster.

16.44.310 Compliance With Permit.

The land disturbance permit holder and contractor and their agents shall carry out the proposed land disturbance activities in accordance with the approved plans and specifications, the conditions of the land disturbance permit, and the requirements of this Chapter and all other applicable ordinances, rules, regulations and standards of the City.

16.44.320 Protective Devices.

The land disturbance permit holder and contractor and their agents shall maintain all required protective devices and temporary drainage during the progress of the land disturbance activities and shall be responsible for the observance of the hours of work, mud tracking, dust control, methods of hauling, and other applicable regulations.

16.44.330 Maintenance of Site.

The land disturbance permit holder and contractor and their agents shall be responsible for the maintenance of the site and the removal of all debris during the term of the permit.

16.44.340 Access and Haul Routes.

Temporary construction entrance and exit routes shall be provided by the permit holder in accordance with the approved plans and permit access at key points to the site or project to eliminate the problem of tracking mud and debris from the construction site onto private or public streets.

16.44.350 Consent of Adjacent Property Owners.

Whenever any land disturbance activity requires entry onto adjacent property for any reason, the land disturbance permit applicant shall obtain the written consent of the adjacent property owner or their authorized representative and shall file a copy of such consent with the City Engineer before a land disturbance permit may be issued.

16.44.360 Cuts and Fills.

(a) Height. Except as otherwise provided herein, no finished fill slope shall exceed a vertical height of twenty-five feet (25). The City Engineer may approve a fill slope in excess of twenty-five feet (25) as deemed appropriate in his or her sole discretion based upon the circumstances and conditions of the proposed site and fill. Any fill slope proposed in excess of twenty-five feet (25) shall be supported by documentation and a report prepared and signed by a professional engineering geologist and soils engineer attesting to the appropriateness, safety and stability of the proposed fill slope. Such documentation and report shall be prepared at the applicants expense and shall address the need for and design of necessary measures to provide for the safety and stability of the proposed slope in accordance with the LDDCS.

(b) Slope. Except as otherwise provided herein, no cut or fill shall exceed a slope of two horizontal to one vertical (2:1). The City Engineer may approve a cut or fill slope in excess of two horizontal to one vertical (2:1) as deemed appropriate in his or her sole discretion based upon the circumstances and conditions of the proposed site and the cut or fill in accordance with the LDDCS. Any cut or fill slope proposed in excess of two horizontal to one vertical (2:1) shall be supported by documentation and a report prepared and signed by a professional engineering geologist and soils engineer attesting to the appropriateness, safety and stability of the proposed cut or fill slope. Such documentation and report shall be prepared at the applicants expense and shall address the need for and design of necessary measures to provide for the safety and stability of the proposed cut or fill slope.

(c) Unstable Material. The City Engineer may require any cut or fill to be constructed with an exposed surface flatter than two horizontal to one vertical (2:1) when, in the City Engineers discretion, under the particular conditions, such flatter surface is deemed necessary for stability or safety.

(d) Fill Slope Limits. Toes of fill slopes shall not be made nearer to a property boundary line than one-half (1/2) of the height of the fill, or twenty feet (20), whichever is less. Fill slopes shall not be divided horizontally by property lines. Fill slopes occurring on a side or rear lot line shall be made a part of the downhill lot.

(e) Intervening Terraces. When intervening terraces are used, terraces shall be paved using materials as approved by the City and shall have a minimum width of six feet (6).

Terraces shall be extensively landscaped in accordance with an approved landscaping plan. Terraces shall be spaced at vertical intervals of twenty-five feet (25); provided, however, for slopes less than forty feet (40') in vertical height, terraces shall be approximately at mid-height. For slopes flatter than two horizontal to one vertical (2:1), or where soil conditions require, additional intervening terraces may be required.

(f) Compaction. All fills shall be placed, compacted, inspected, and tested in accordance with the provisions of this Chapter and the Land Disturbance Design and Construction Standards. If the strict enforcement of the compaction provisions of this Section is determined by the City Engineer to be unnecessary because of the proposed or probable use of the land, the City Engineer may waive the requirements. The requirements of this Section shall not be waived when structures are to be supported by the fill, the fills are being placed in areas to be designated as hillside, or where the fills are necessary as a safety measure to aid in preventing the saturation, settling, slipping, or erosion of the fill.

(g) Fills Toeing Out on Natural Slopes. Except as otherwise provided herein, no fills toeing out on natural slopes, which are steeper than two horizontal to one vertical (2:1) shall be permitted. The City Engineer may approve such fills toeing out on natural slopes which are steeper than two horizontal to one vertical (2:1) as deemed appropriate in his or her sole discretion based upon the circumstances and conditions of the proposed site and fill. Any fill slope proposed to toe out on natural slopes which are steeper than two horizontal to one vertical (2:1) shall be supported by documentation and a report prepared and signed by a professional engineering geologist and soils engineer attesting to the appropriateness, safety and stability of the proposed fill. Such documentation and report shall be prepared at the applicants expense and shall address the need for and design of necessary measures to provide for the safety and stability of the proposed fill.

(h) Combined Cut and Fill Slopes. Combined cut and fill slopes shall meet the requirements of this section insofar as steepness, height, and terracing are concerned except that, where the slope exceeds twenty-five feet (25') in height, the required drainage bench shall be placed at the top of the cut slope.

(i) Setback. Fill placed on or above the top of an existing or proposed cut or natural slope steeper than three horizontal to one vertical (3:1) shall be set back from the top of the slope a minimum distance as required by the International Building Code, as adopted by the City, or such greater distance as approved by the City Engineer based upon submitted reports and documentation for the project.

(j) Existing Fills. All existing man-made fills on any and all sites shall be properly evaluated by a soils engineer. If deficiencies exist, recommendations and design criteria for corrective measures shall be included within the soils engineering report.

(k) Measure of Settlement. The City Engineer or the Building Official may require the determination of the settlement characteristics of any fills to establish that any movements have substantially ceased. In such cases, a system of bench marks shall be installed by a civil engineer or land surveyor at critical points on the fill, and accurate measurements of both horizontal and vertical movements shall be taken and evaluated by the soils engineer for a period of time sufficient to define the settlement behavior. The evaluation period shall be monitored in accordance with the approved geotechnical report for the project.

(l) Buttress Fills. All buttress fills shall be designed in accordance with the Land Disturbance Design and Construction Standards and the recommendations and design criteria, including the sub-drain system, submitted by the soils engineer or engineering geologist with the approval of the City Engineer.

16.44.370 Erosion Control and Drainage Devices.

BMP's, such as, but not limited to, intervening terraces, diverter terraces, "v" channels, runoff computations, drainage dispersal walls, sub-drains and site drainage, are to be provided and designed as indicated in the LDDCS.

16.44.380 Areas Subject to Slides and Unstable Soil.

A detailed evaluation shall be completed for all areas subject to slides or unstable soils by a soils engineer and/or engineering geologist including design criteria for corrective measures. Exploratory work and/or reports may be required by the City Engineer for such conditions in accordance with permit requirements set forth in Chapter 2 of this Chapter.

16.44.390 Planting and Irrigation of Cut and Fill Slopes.

All manufactured cut and fill slopes shall be planted and maintained until established. Temporary irrigation may be required in accordance with the provisions of this Chapter and the LDDCS. The permit holder is responsible for operating and maintaining the irrigation system.

16.44.400 Property Line and Corner Markers.

The permit holder shall ensure that property lines and corner survey markers are installed for the site or project. These markers are to include rebar placed at the back corners of each lot and markers placed on the curb for locating the side property lines. If curb and gutter do not exist, the front markers are to be placed in the road pavement.

16.44.410 Reserved

16.44.420 Slope Protection Easements.

The permit holder shall provide slope protection easements for all slopes constructed as part of the project. Slope protection easements shall be provided either through indicating them on the final plat or by separate recordable easement acceptable to the City.

16.44.430 Lots Graded Toward Street for Drainage.

Except as otherwise provided herein, storm water runoff from individual lots shall be directed toward the streets. Exceptions may be granted by the City Engineer, when deemed appropriate and necessary, in accordance with the provisions of this Section. Aesthetics reasons such as the creation of view lots shall not constitute sufficient reason for granting an exception. If the permit holder finds that draining storm water toward the street is unobtainable, for a portion or all of the lot, the permit holder shall demonstrate to the City Engineer that there are no other avenues for drainage of the storm water. In such cases, the permit holder shall prepare a drainage plan which indicates how the storm water will be disposed of from the lot, to either a City owned storm drain, a natural stream or channel, a manmade channel, other City-approved facility or retained on-site. The permit holder is responsible for obtaining the necessary approvals and permits for the discharge or retention of storm water flows. The City Engineer will determine if such alternate drainage is both necessary and appropriate.

16.44.440 Lots Which Cannot Be Graded Toward the Street.

(a) Approval Required. Lots that cannot be drained toward the street may be allowed to drain a portion of their storm water runoff toward the rear of the yard, after review and approval by the City Engineer. Prior to obtaining this approval, the permit

holder shall prepare a drainage plan, which indicates how the storm water will be disposed of from the lot, to either a City owned storm drain, a natural stream or channel, or manmade channel, or other City approved facility or retained on-site. Such disposal is to be protected by a drainage easement dedicated for this purpose, and the facilities shall be subject to the bonding provisions set forth in Chapter 16.

(b) Swales. Swales located in rear and side yards shall be of materials as approved by the City that will prevent erosion, and shall be a permanent feature of the lot and shall be shown in a drainage easement on the site plan or final plat for the project. An actual design drawing of the swale system shall be prepared and be included as part of the grading and drainage plan for the project. If slopes exist between lots sufficient space shall be allowed to include a swale at the top of the slope and one at the bottom, all within dedicated storm drainage easements. Where storm water is transferred from a lot of higher elevation, to a lower lot in elevation, sufficient energy dissipation shall be constructed to reduce the water velocity to an acceptable level. Engineering calculations are to be submitted to the Engineering Division certifying the proposed design of the energy dissipation facilities as set forth in the LDDCS.

(c) Notice. Swales shall be constructed and in place before building permits are issued on subdivision lots. The developer shall notify the homebuilders and homeowners shall be notified of these drainage swale easements and the need to maintain them both during and after construction. Homeowners are to be notified by the developer of the installation of these side and rear yard swales through an acceptable instrument to the City. A notice of these drainage swale easements shall also be recorded on the subdivision plat for the project. After completion of the swales, the homeowners shall be responsible for maintenance of swales.

(d) Bonding. In the event these types of swales are used for the project, the Developer shall provide sufficient bonding of these swales as part of the City's regular public improvement bonding, to ensure these facilities will be constructed.

(e) Underground Facilities. The Developer may select the option of designing and constructing underground drainage facilities to replace aboveground drainage swales if these facilities meet certain City requirements. These requirements include the design being approved by the Engineering Division, inclusion of these facilities within City approved drainage easements, maintenance of the system by a Homeowners Association, and other requirements as may be deemed necessary by the City.

16.44.450 Materials for Side and Rear Yard Drainage.

Side and rear yard swales and drainage facilities shall be designed into projects as an integral component of the storm water system of the project which needs to transfer storm water runoff from the rear and side yards to the street, or to other rear yard storm water facilities. These swales or drain facilities shall be designed and constructed in such a way that they become a permanent feature of the side and/or rear yard and shall be constructed of a material as approved by the City which prevents erosion. Inspections of these swales or drain facilities shall be conducted during the subdivision construction phase of the project and during lot level development. Developers are to provide recorded drainage easements wide enough to provide for the possible slight field relocation of rear and side yard drainage swales, or other drainage facilities. At a minimum, the drainage easement shall be for the width of the swale plus two feet (2).

16.44.460 Flow of Water from One Lot to Another Limited Use.

In the case where storm water flow is allowed to flow from a higher lot to a lower lot, in

elevation, sufficient energy dissipation shall be designed and constructed to reduce the water velocity to an acceptable level to prevent erosion. The design and construction of these energy dissipation structures shall be approved by the Engineering Division in conjunction with the review and approval of the drainage plan for the project.

16.44.470 Landscaping of Certain Lots for Erosion Control.

The City reserves the right to require that the lots be re-vegetated or stabilized prior to issuance of building permits or that lots be fully landscaped prior to the issuance of a Certificate of Occupancy, as part of the requirements of the project. The purpose of this requirement is to ensure that, for certain areas in the City, which have soils susceptible to severe erosion, that erosion is controlled. The criteria to be used by the City are the size of the lot and sizes of adjacent lots, elevation differences between lots, and the type of soils in the project, along with other factors. A landscaping plan shall be submitted to the Engineering Division for approval prior to commencement of landscaping improvements required hereunder.

16.44.480 Erosion Control and Revegetation.

The developer is to indicate erosion control and re-vegetation BMP's to be used for the project on the project drawings and as part of the project descriptions included with the application in accordance with the City's LDDCS. Erosion and sedimentation control measures will be inspected upon completion, during construction of the subdivision, and once the subdivision construction is complete. The Engineering Division will be responsible for these inspections. Once the subdivision level construction is complete and improvement work begins on individual lots, erosion and sedimentation control BMP will be inspected prior to any disturbance, during construction and once lot level construction is complete. The Building Division will be responsible for these inspections.

16.44.490 Wet Weather Plan.

The City Engineer may require that land disturbance activities and erosion control or re-vegetation plans be modified, if unforeseen delays occur due to weather generated problems not considered at the time the land disturbance permit was issued, including submission and approval of a wet weather plan.

16.44.500 Land Disturbance Design and Construction Standards.

All land disturbance activities shall be conducted in accordance with the Land Disturbance Design and Construction Standards, the Development Processing Manual, Road Design and Construction Standards, Storm Drainage and Flood Control Design and Construction Standards, Culinary Water Design and Construction Standards and all other applicable ordinances, rules, regulations, standards and specifications of the City.

16.44.510 Lot Impervious Surface Area Drainage.

All impervious surface areas on lots, including roofs and their drains, driveway pads and other such areas, are to be drained toward the street unless otherwise approved by the City Engineer.

16.44.520 Land Disturbance Activities and Improvements Bond.

Prior to issuance of a land disturbance permit, the applicant shall be required to enter into a bond agreement in a form acceptable to the City providing security to insure completion of the land disturbance activities and improvements required to be installed and/or provided pursuant to the provisions of this Chapter and the land disturbance permit. The applicant shall be required to complete all land disturbance activities and improvements in accordance with the terms and conditions of the land disturbance permit, the bond agreement, and all applicable ordinances, resolutions, standards, specifications, and plans. The bond shall be equal to 100% of the engineers estimated cost, and approved by the City Engineer, of the land disturbance activities and improvements to be installed and/or provided. Except as otherwise provided in this Section, the bond shall be administered and processed in accordance with the bond provisions set forth in the City's Subdivision Ordinance regarding bonds and security for subdivision public improvements.

16.44.530 Re-vegetation Bond

Prior to issuance of a land disturbance permit, the applicant shall be required to enter into a re-vegetation bond agreement in a form acceptable to the City providing security to insure installation and completion of re-vegetation improvements required to be installed and/or provided pursuant to the provisions of this Chapter and the land disturbance permit. The applicant shall be required to install and complete all re-vegetation improvements in accordance with the terms and conditions of the land disturbance permit, the bond agreement, and all applicable ordinances, resolutions, standards, specifications and plans. The bond shall be equal to 100% of the engineers estimated cost, and approved by the City Engineer, of the re-vegetation improvements required to be installed and/or provided. Except as otherwise provided in this Section, the re-vegetation bond shall be administered and processed in accordance with the bond provisions set forth in the City's Subdivision Ordinance regarding bonds and security for subdivision public improvements.

16.44.550 Permit Holder Supervision and Inspection.

The land disturbance permit holder shall provide, at the permit holders sole cost and expense, all required supervision, inspection and safety precautions before, during and after all land disturbance activities in accordance with the LDDCS and other applicable City Ordinances, rules, regulations, standards and specifications regarding such activities. The land disturbance permit holder shall be required, at the permit holders sole cost and expense, to design, inspect and certify all land disturbance activities at such intervals and in accordance with such design, inspection and certification standards and requirements provided in the Land Disturbance Design and Construction Standards and other applicable City Ordinances, rules, regulations, standards and specifications. Certain land disturbance activities may require continuous or constant inspection and supervision by a civil engineer or other authorized inspector, as a condition of the land disturbance permit or when deemed necessary by the City Engineer, in accordance with the terms and conditions of this Chapter and the LDDCS.

16.44.560 City Inspections.

In addition to permit holder inspections and certifications, all land disturbance activities shall be subject to City inspection as specified and required in the LDDCS, and other applicable City Ordinances, rules, regulations, standards and specifications. The City may also make or require other inspections of land disturbance activities to ascertain compliance of such work with the land disturbance permit and applicable City Ordinances, rules, regulations, standards and specifications, when deemed necessary by the City Engineer, in accordance with the terms and conditions of this Chapter and the LDDCS.

16.44.570 Additional Inspections or Testing.

The City Engineer may require additional inspections and/or testing of land disturbance activities by an approved testing agency when deemed necessary by the City Engineer in accordance with the terms and conditions of this Chapter and the LDDCS. Any such additional inspections and/or testing shall be at the permit holders expense.

16.44.580 Inspection Requests.

When inspections are required to be conducted by the City, the permit holder, or authorized agent of the permit holder, shall notify the City Engineer or designated Engineering Inspector that such work is ready for inspection at least one (1) business day before the inspection desired.

16.44.590 Duty to Keep Work Accessible and Exposed.

The permit holder shall cause the land disturbance activities and work to be accessible and exposed for inspection by the applicable required inspector until such inspection has been conducted and approved or certified, as applicable. The City, its officers, agents and employees, shall not be liable for any expense incurred by the permit holder in removing or replacing any materials or improvements required to allow inspection.

16.44.600 Entry Onto Premises.

The City, and its authorized representatives, shall have access to the premises described in the land disturbance permit for the purpose of inspecting the progress of the work.

16.44.610 Certification or Approval.

Inspections and certifications required to be made by the permit holders engineer shall be conducted and certification of the same submitted to the City prior to further construction or land disturbance activities. Inspections required to be made by the City shall be conducted and approved by the City prior to further construction or land disturbance activities.

16.44.620 Transfer of Responsibility for Certification.

If the land disturbance permit holder changes the civil engineer, the soils engineer, the engineering geologist, the contractor, or the testing agency of record during the course of permitted work, the land disturbance permit holder shall file an assignment and assumption agreement of the new engineer, contractor or testing agency responsible for certification of the site or project. Such assignment and assumption agreement shall be filed with and approved by the City Engineer.

16.44.630 Final Inspection.

Final inspection of the permitted land disturbance activities shall be conducted by the City. No final inspection of permitted land disturbance activities shall be scheduled or conducted until and unless all work has been completed in accordance with the land disturbance permit, the final approved plans and specifications, and all applicable City Ordinances, rules, regulations, standards and specifications, including, but not limited to, installation of all drainage facilities and protection devices, all required re-vegetation, and all required erosion and sediment control measures. No final inspection shall be scheduled or conducted until the permit holder has submitted, and the City has approved, a post-construction maintenance schedule for the re-vegetation, erosion control and other required improvements.

16.44.640 Building Permits.

No building permit or other development approval shall be given for any property, parcel, site or project for which a land disturbance permit has been issued until final inspection and approval has been given under the land disturbance permit, unless this requirement is waived in writing by the City Engineer.

16.44.650 Validity of Inspection.

Any inspection approval or certification shall not be construed to be an approval of a violation of any of the provisions of this Chapter or any other applicable law, ordinance, rule, regulation, standard or specification. Inspections presuming to give such authority shall be deemed invalid.

16.44.660 Enforcement.

This Chapter is to be enforced pursuant to the provisions set forth herein as applicable. The City Engineer and other Enforcement Authorities are responsible for the enforcement of the provisions of this Chapter.

16.44.670 Violations.

(a) Violations Enumerated. No person shall fail, refuse, or neglect to comply with the following:

(1) Provisions of this Chapter and land disturbance permits issued in accordance with this Chapter

(2) Orders issued by the City Engineer or the Building Official pursuant to the provisions of this Chapter;

(3) Conditions imposed on land disturbance permits pursuant to the provisions of this Chapter; and

(4) Rules and regulations of the office of the City Engineer with respect to grading, which were in effect at the time the land disturbance permit was issued.

(b) Continuing Violation. Each and every day, or portion thereof, during which any violation of any of the provisions of this Chapter is committed, continued, or land disturbance permitted, shall be considered a separate offense.

16.44.680 Remedies and Enforcement Powers.

(a) Nothing herein is intended to limit or prohibit the enforcement of the City of South Jordan Municipal Code or other applicable lawsand /or ordinances through civil or criminal process where the City has determined that enforcement of the procedures outlined in these sections will not result in effective redress, where there have been repeated violations of the provisions of this Chapter, or where the severity of the violation warrants redress through civil or criminal action.

(b) The following sanctions shall be available to redress violations of the provisions of this Chapter:

(1) Issuance of a Notice of Violation;

(2) Revocation or suspension of land disturbance permits, conditional use land disturbance permits or plan or other approvals issued by City of South Jordan;

(3) The placement of requirements for corrective action on land disturbance permits, licenses, or other entitlements issued by City of South Jordan as a condition of the land disturbance permit, license, or entitlement;

(4) Requiring the responsible permit holder to post a bond, irrevocable letter of credit, or other adequate security to ensure compliance with the provisions of this Chapter or other applicable laws;

(5) Withholding of permits, certificates or other forms of authorization pertaining to any land where there exists an uncorrected violation of this Chapter;

(6) Issuance of a stop work order;

(c) Penalties. Violation of any of the provisions of this Chapter shall upon conviction be punishable as a class C misdemeanor.

(d) Other remedies; remedies cumulative. The City shall have such other remedies as are and as may be from time to time provided by State law or City ordinance for the violation of any provision of this Chapter. Remedies shall be cumulative.

(e) At the time of issuance of a notice of violation, the Enforcement Authority will determine the appropriate level of sanction and will provide written notice to the responsible person of the proposed level of sanction and the reasons therefore as outlined herein.

(f) Where multiple violations have occurred or are occurring, each violation of the provisions of this Chapter or other applicable laws is subject to a separate sanction. The City may take into account the number and severity of violations in determining the type of action to take against the offending party.

16.44.690 Notice of Violation.

(a) When a violation is discovered, and the responsible permit holder has not been issued a previous Notice of Violation for the same violation within the past twelve (12) months, the Enforcement Authority shall issue a Notice of Violation in order to notify the responsible person of the violation and to order that the violation be corrected within fourteen (14) calendar days. The notice may include a stop work order that orders the responsible person to immediately cease all work on the project until the violation is corrected. The issuance of a Notice of Violation shall not be a prerequisite for the issuance of a stop work order by the City.

(b) The Notice of Violation shall be in writing and set forth the facts constituting the violation, the specific provisions of the law which have been violated, the proposed sanctions for the violation, and shall require that the City Engineer be contacted within five calendar days if the responsible person disputes the Notice of Violation.

(c) Failure to correct the violation within the amount of time specified in the Notice of Violation may result in issuance of a citation, a stop work order, a notice of intent to suspend or revoke, or other enforcement action as deemed appropriate by the City.

(d) In the case of a violation involving: continuing construction or development, an emergency situation (as reasonably determined by the City), or a violation for which a previous Notice of violation was issued within the past twelve (12) months, the City may use the enforcement powers and remedies available to it under this chapter without prior notice. In such case, notice shall be sent simultaneously with the beginning of enforcement action.

16.44.700 Suspension or Revocation of Land Disturbance Permit.

The City Engineer may suspend or revoke a land disturbance permit and/or suspend any land disturbance activity if:

(a) Conditions at the site vary from those shown on the approved plans;

(b) Construction does not conform to the approved plans, time schedules, or conditions of the land disturbance permit;

(c) The work does not comply with applicable ordinances, rules, regulations and standards;

(d) The site is left in a condition hazardous to the public or to the adjacent properties, and the land disturbance permit holder does not comply with reasonable requirements to correct said conditions;

(e) The land disturbance permit holder does not comply with reasonable requirements to safeguard the workers, the public, or other persons acting in a lawful manner;

(f) The land disturbance permit holder, in connection with the operations for which the land disturbance permit was issued, fails to operate equipment properly on public roads; allows material to encroach into, obstruct, or be deposited within a public road right-of-way or within a drainage channel in a manner not authorized by said land disturbance permit; or causes unauthorized obstruction or diversion of drainage channels;

(g) The land disturbance permit holder fails to have a qualified, City-approved

inspector working under the supervision of a civil engineer on the site during operations, when so required by the land disturbance permit, or fails to have the work under proper supervision;

(h) Emergency conditions exist on the site, which constitute a threat to health, safety or public welfare, whether or not caused by the actions of the land disturbance permit holder; or

(i) The land disturbance permit holder has been issued a Notice of Violation and has failed to correct the violation within the time specified.

16.44.710 Notice of Suspension or Revocation.

Prior to the suspension or revocation of a land disturbance permit, the City Engineer shall give the land disturbance permit holder written notice of intention to suspend or revoke the land disturbance permit, the notice shall specify the grounds for such intended action and the time and place for the holding of a conference between the City Engineer and the land disturbance permit holder, or its authorized representatives, to review the grounds for the proposed action. Notice of the proposed action shall be given to the land disturbance permit holder at least forty-eight (48) hours, before the time set for the conference, if given by personal service, and at least ninety-six (96) hours, before the time set for the conference, if given by first-class mail. Weekends and holidays are not counted in determining the time for the giving of notice and the holding of the conference. With the consent of the land disturbance permit holder, the time periods provided for herein may be shortened or extended.

In the case of an emergency, and only where an unacceptable level of risk to public health, safety and welfare would incur from any delay, the notification deadlines may be disregarded and the City Engineer may act decisively to reduce or eliminate the hazard. In such a situation, the City Engineer will then make every reasonable effort to confer with the land disturbance permit holder in a timely manner to resolve the concerns, which resulted in the suspension. Costs, including additional City staff time and equipment, shall be borne by the land disturbance permit holder.

16.44.720 Cessation of Work.

Upon receipt of the notice of intended suspension or revocation, the land disturbance permit holder is to cease all work in connection with the land disturbance permit, with the exception of work necessary to correct any condition cited in the notice of proposed action as a ground for suspension or revocation, and work of an emergency nature. The time necessary for completion of these emergency corrections will be determined by the City Engineer.

16.44.730 Decision of Suspension or Revocation.

(a) Within twenty-four (24) hours following the conclusion of the conference, the City Engineer or designee is to render a written decision, either revoking the land disturbance permit, suspending the land disturbance permit, or authorizing the land disturbance permit holder to proceed with the work. Such action may be with or without conditions. The decision is to be served upon the land disturbance permit holder by personal service or by first-class mail, postage prepaid, within twenty-four (24) hours after the rendition of the decision.

(b) If the land disturbance permit holder fails to correct the objectionable or emergency conditions causing the revocation or suspension, the City may cause the work

necessary to correct said conditions to be done, and the City may take action against the land disturbance permit holder's security to cover the cost of performing the work.

(c) The City Engineer may either reinstate or revoke any land disturbance permit that has been suspended.

16.44.740 Right of Entry.

In the administration and enforcement of this Chapter, any duly authorized official or employee of the City shall have authority to enter upon the premises of the permitted site for the purposes of investigation and inspection; provided however, that such right of entry shall be exercised at reasonable times. The land disturbance permit constitutes written authority for entry by the City. No land disturbance permit holder shall refuse to allow such inspection. In the case where the responsible person is not a land disturbance permit holder, the Enforcement Authority is to provide twenty-four (24) hours written notice of the intent to inspect, except in emergency situations or when consent has been obtained of the owner and/or occupant of the site to be inspected. The notice shall state that the property owner has the right to refuse entry and that, in the event such entry is refused, inspection may be made only upon issuance of a search warrant as allowed by law.

16.44.750 Appeals.

Any person aggrieved of a final determination of the City Engineer in the issuance, denial, suspension or revocation of a land disturbance permit may appeal such decision of the City Engineer to the City Manager by filing a written appeal with the City Recorder within thirty (30) days from the date of the City Engineers decision. The City Manager will give written notice to the City Engineer, the appellant, and all other persons requesting the same, specifying the place, date, and time of hearing the appeal.

16.44.760 Liability.

Neither issuance of grading approval under the provisions of this Chapter, nor compliance with the provisions this Chapter, or with any conditions imposed in a land disturbance permit issued under the provisions of this Chapter, is to relieve any person from responsibility for damage to any person or property or impose any liability upon the City for damage to any person or property.

16.44.770 Right to Stop Work.

Nothing herein is to be construed as indicating that the City cannot immediately stop the work being performed if, in the opinion of the City Engineer, the damage being done is of such a nature that it requires immediate cessation of the work. This could result in the bypassing of the normal processes of notices and increasing levels of enforcement, which will typically be followed.

16.44.780 Parking Lots

(a) Minimum parking lot grades for asphalt concrete shall be one (1%) percent.
(b) Minimum grade for concrete ribbon drains shall be one-half (1/2%) percent.
(c) Plan Check and Inspection of the parking lot grading, construction of curbs, gutters, drainage or other appurtenant structures, and the paving shall be performed by the Engineering Division. A Land Disturbance Permit shall be obtained from the Engineering Division and inspection fee paid. The City Engineer shall have the authority to request changes to the plan as deemed necessary for drainage and/or circulation.

(d) The contractor shall be responsible for the clearing of the proposed work area, and relocation costs of all utilities. The City will be informed twenty-four (24) hours prior to the beginning of construction.
(e) A compaction report by a soils engineer shall certify ninety (90%) percent sub-base and ninety-five (95%) percent of base prior to calling for second inspection and placement of asphalt paving.
(f) If no preliminary soils report is provided specifying the paving section, the structural section shall be four (4") inches asphalt concrete and eight (8") inches Class II aggregate base.

SECTION 3. Severability. If any section, part or provision of this Ordinance is held invalid or unenforceable, such invalidity or unenforceability shall not affect any other portion of this Ordinance and all sections, parts, provisions and words of this Ordinance shall be severable.

SECTION 4. Effective Date. This Ordinance shall become effective immediately upon publication or posting as required by law.

PASSED AND ADOPTED BY THE CITY COUNCIL OF SOUTH JORDAN CITY, STATE OF UTAH, ON THIS_____DAY OF_____, 2007 BY THE FOLLOWING VOTE:

	YES	NO	ABSTAIN	ABSENT
Kathie L. Johnson	____	____	____	____
Larry Short	____	____	____	____
Aleta A. Taylor	____	____	____	____
Brian C. Butters	____	____	____	____
Leona Winger	____	____	____	____

_____
W. Kent Money, Mayor

ATTEST: _____
Anna M. West, City Recorder

Mayor-William Kent Money
Council Member-Brian C. Butters
Council Member-David W. Colton
Council Member-Bradley G. Marlor
Council Member-Larry Short
Council Member-Leona Winger

City Manager-Ricky A. Horst

SOUTH JORDAN
UTAH

1600 West Towne Center Drive / South Jordan, UT 84095/ Telephone (801) 254-3742 / Fax (801) 254-3393
e-mail: info@sjc.utah.gov http://sjc.utah.gov

LAND DISTURBANCE PERMIT
APPLICATION AND AGREEMENT
Application Fee - $50.00

Date: _____

Name of Applicant: _____

Mailing Address: _____

Phone # (24 Hrs) _____ Fax: _____

Please Check One:
- ☐ Subdivision
- ☐ Site Plan
- ☐ Other Specify _____

Location of Land Disturbance: _____

_____

Purpose of Land Disturbance: _____

_____

Cubic Yards _____ Square Feet _____

Please provide the following:
- ☐ Permit Fee as adopted by the South Jordan City Council ($50.00)
- ☐ Vicinity Map showing the site location
- ☐ Property line, dimensions and bearing of the property
- ☐ Location of existing buildings or structures on the property and adjacent property within 50 feet of property boundary.
- ☐ Accurate topography showing contours of the existing and proposed ground elevations.
- ☐ The elevations, dimensions, locations, extent, and slopes of all proposed land disturbance activities shown by contours.
- ☐ A certification of the quantity and type of material of proposed excavation or fill.
- ☐ The estimated starting and completion dates
- ☐ Detailed plans of all drainage devices, walls, cribbing, dams, or other protective devices to be constructed with or as a part of the proposed work

Mayor-William Kent Money
Council Member-Brian C. Butters
Council Member-David W. Colton
Council Member-Bradley G. Marlor
Council Member-Larry Short
Council Member-Leona Winger

City Manager-Ricky A. Horst

SOUTH JORDAN
UTAH

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e-mail: info@sjc.utah.gov http://sjc.utah.gov

- ☐ Finish Floor Elevation of any proposed structures
- ☐ Temporary construction entrance and exit plan
- ☐ Type of structure to be constructed on site
- ☐ Erosion Control Plan
- ☐ Re-vegetation Plan
- ☐ Copy of notice of intent (NOI) from the State of Utah, "Division of Water Quality"

Conditions of Approval:

1. Applicant shall apply appropriate tackifier to dirt stockpile if requested by the City of South Jordan
2. Applicant shall be responsive to adjacent property owners and will address all concerns expressed in a timely manner.
3. Applicant shall maintain all erosion control measures.
4. The applicant must notify the City Engineer or the Engineering Inspector twenty four (24) hours in advance before any work is started.
5. All public roadway signage shall be in accordance with the Manual of Uniform Traffic Control Devices (MUTCD).

Applicant is required to consult utility companies operating in this area before excavation. In granting this permit the City of South Jordan makes no representation as to the location of utility facilities in the area to be excavated or the affect of the permitted excavation on said utilities.

Prior to beginning any land disturbance activities, property must be protected by barriers which indicate which tree can and cannot be removed and must be inspected by and Engineering Division Inspector.

In consideration for granting of a Land Disturbance Permit by the City of South Jordan, the above-named applicant herby commits to: (1) to perform the excavation applied for in a professional manner and in conformity, with ordinances of the City of South Jordan and; (2) to hold harmless the City of South Jordan, its officers, agents, employees or servants from any and all costs, damages and liabilities that which may accrue or be claimed to accrue by reason of any work performed under a permit issued pursuant to this application.

_____ _____/_____/_____
Signature of Applicant Date

_____ _____/_____/_____
Director of Community Development/City Engineer or designee Date

Engineering Division – Community Development Department
1600 West Towne Center Drive / South Jordan, UT 84095/ Telephone (801) 254-3742 / Fax (801) 254-3393
e-mail: info@sjc.utah.gov http://sjc.utah.gov

Land Disturbance Permit No. LDP-200__- _____

Issuance Date: _____
Project Name: _____
Location: _____
Parcel No.: _____
Applicant Name: _____
Address: _____
Phone #: _____

This permit shall become null and void if work is not commenced with 180 days of the date of issuance, or if work is suspended or abandoned for a period of 30 days or more at any time after the work has commenced. Commencement or continuation of work shall be verified only by inspection reports from the City of South Jordan Engineering Inspectors. Inspections are required before any work is covered. Please call if you need further information about when an inspection is required.

Conditions of approval:

1. Applicant shall apply appropriate tackifier to dirt stockpile if requested by the City of South Jordan
2. Applicant shall be responsive to adjacent property owners and will address all concerns expressed in a timely manner.
3. Applicant shall maintain all erosion control measures.
4. Applicant shall be familiar with the Land Disturbance Ordinance and Land Disturbance Design and Construction Standards.
5. Applicant shall post erosion Control Plan, Notice of Intent (NOI, and Land Disturbance Permit onsite.
6. Applicant shall inspect BMP's every 14 days or after any storm event and record inspection in Inspection Log. Inspection Lof shal be posted and maintained onsite with the erosion control plan.

An additional fee shall be charged for weekend work or after hours as determined by the City Engineer or his designee.

Applicant shall also be advised that any work performed in the public right of way shall require a separate right of way or encroachment permit.

The applicant must notify the City Engineer or the Engineering Inspector twenty four (24) hours in advance before any work is started. Weekend or after hours work requires the Engineering Inspector to be present.

All public roadway signage shall be in accordance with the Manual of Uniform Traffic Control Devices (MUTCD).

Applicant is required to consult utility companies operating in this area before excavation. In granting this permit the City of South Jordan makes no representation as to the location of utility facilities in the area to be excavated or the affect of the permitted excavation on said utilities.

Prior to beginning any land disturbance activities, property must be protected by barriers which indicate which tree can and cannot be removed and must be inspected by and Engineering Division Inspector.

Engineering Division – Community Development Department
1600 West Towne Center Drive / South Jordan, UT 84095/ Telephone (801) 254-3742 / Fax (801) 254-3393
e-mail: info@sjc.utah.gov http://sjc.utah.gov

In consideration for granting of a Land Disturbance Permit by the City of South Jordan, the above-named applicant herby commits to: (1) to perform the excavation applied for in a professional manner and in conformity, with ordinances of the City of South Jordan and; (2) to save harmless the City of South Jordan, its officers, agents, employees or servants from any and all costs, damages and liabilities that which may accrue or be claimed to accrue by reason of any work performed under a permit issued pursuant to this application.

I hereby certify that I have read and examined this permit, the Land Disturbance Ordinance, and the Construction Standards and that the information provided by me is true and correct. All provisions of laws and ordinances governing this type of work will be complied with whether specified herein or not. The granting of a permit does not presume to give authority to violate change the provisions of any other state or local law regulating construction or performance of construction

Signature of Applicant	Date	Please Print Name
Signature of City Engineer or designee	Date	Please Print Name

THIS PERMIT MUST BE POSTED AT THE JOB SITE AT ALL TIMES

Appendix E

SOUTH JORDAN
UTAH

STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

Authorization to Discharge Municipal Storm Water Under the Utah Pollutant Discharge Elimination System (UPDES)

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 2004, as amended (the "Act"), the Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et. seq., as amended to date), and the rules and regulations made pursuant to those statutes, the

JORDAN VALLEY MUNICIPALITIES, specifically,

SALT LAKE COUNTY, BLUFFDALE CITY, COTTONWOOD HEIGHTS, DRAPER CITY, HERRIMAN CITY, HOLLADAY CITY, MIDVALE CITY, MURRAY CITY, RIVERTON CITY, SANDY CITY, SOUTH JORDAN CITY, SOUTH SALT LAKE CITY, TAYLORSVILLE CITY, WEST JORDAN CITY, AND WEST VALLEY CITY

This Permit shall become effective on September 5, 2013.

This Permit and the authorization to discharge shall expire at midnight, September 4, 2018, except as described in Part 6.3 of this Permit.

Signed this 3 day of September, 2013.

Walter L. Baker, P.E.
Director

UPDES PERMIT FOR DISCHARGES FROM MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)

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1.0 Coverage Under this Permit

1.1. Authority to Discharge

This Permit authorizes the discharge, to Waters of the State of Utah, of storm water from Co-Permittees defined in Part 1.2. of this Permit. This authorization is subject to all of the terms and conditions of this Permit. This Permit does not authorize discharges prohibited under Part 1.4. of this Permit.

1.2. Permit Area and Eligibility

1.2.1. This Permit covers all the following separate jurisdictional areas located within Greater Salt Lake County as follows:

1.2.1.1. Areas covered under "Phase I" provisions in this Permit which includes unincorporated Salt Lake County. This permitted area covers all areas within the unincorporated boundary of Salt Lake County served by, or otherwise contributing to discharges from, the municipal separate storm sewer(s) owned or operated by Salt Lake County and also includes all Salt Lake County owned and operated storm drainage facilities ("countywide facilities"); and

1.2.1.2. Areas covered under "Phase II" provisions in this Permit which includes:

1.2.1.2.1 Salt Lake County "countywide" facilities owned and maintained by Salt Lake County that are within Greater Salt Lake County, but outside of the boundaries of Salt Lake City and unincorporated Salt Lake County; and

1.2.1.2.2 Incorporated areas within Salt Lake County, which are defined as small municipal separate storm sewer systems as defined in *Utah Administrative Code* (UAC) R317-8-3.9 and listed below:

- Bluffdale City
- Cottonwood Heights
- Draper City
- Herriman City
- Holladay City
- Midvale City
- Murray City
- Riverton City
- Sandy City
- South Jordan City
- South Salt Lake City
- Taylorsville City
- West Jordan City
- West Valley City

1.2.1.2.3 Additional operators of small municipal separate storm sewers within the boundaries of Salt Lake County, which submit application and are approved for inclusion under the Permit during the course of this Permit cycle.

1.2.1.3. No operator of a Small MS4 described in 40 CFR 122.32 may discharge from that system without authorization from the Executive Secretary. (See Utah Administrative Code Section R317-8-3.9(1)(h)(1)(a), which sets forth the Permitting requirement, and R317-8-1.10(13), which incorporates 40 CFR 122.32 by reference). Authorization to discharge under the terms and conditions of this Permit is granted if:

1.2.1.4. The operator submits a Notice of Intent (NOI) in accordance with Part 2.0 of this Permit;

1.2.1.5. The MS4 is located fully or partially within an urbanized area as determined by the latest Decennial Census by the Bureau of Census;

1.2.1.6. The operator is ordered by the Executive Secretary to obtain coverage under this Permit, as provided in the UPDES rules, R317-8.

1.2.2. The following are types of authorized discharges:

1.2.2.1. *Storm water discharges.* This Permit authorizes storm water discharges to waters of the State from the Small MS4s identified in 1.2.1., except as excluded in Part 1.4.

1.2.2.2. *Non-storm water discharges.* The following non-storm water discharges do not need to be addressed unless the Co-Permittee or the Executive Secretary identifies these discharges as significant sources of pollutants to Waters of the State or as causing or contributing to a violation of water quality standards:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers
- Uncontaminated pumped ground water
- Discharges from potable water sources
- Uncontaminated footing/foundation drains
- Air conditioning condensate
- Irrigation water
- Springs
- Uncontaminated water from crawl space pumps
- Individual residential car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Residual street wash water
- Dechlorinated water reservoir discharges
- Discharges or flows from emergency firefighting activity

1.3. Local Agency Authority

This Permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict, or control discharges to storm drain systems or other water courses within their jurisdiction.

1.4. Limitations on Coverage

This Permit does not authorize:

1.4.1. Discharges that are mixed with sources of non-storm water unless such non-storm water discharges are in compliance with a separate UPDES Permit or are determined not to be a substantial contributor of pollutants to Waters of the State.

1.4.2. Storm water discharges associated with industrial activity as defined in *Utah Administrative Code (UAC) R317-8-3.9(6)(c).*

1.4.3. Storm water discharges associated with construction activity as defined in *UAC R317-8-3.9(6)(d)(10)* and *R317-8-3.9(6)(d)(11).*

1.4.4. Storm water discharges currently covered under another Permit.

1.4.5. Discharges that would cause or contribute to in-stream exceedances of water quality standards as contained in *UAC R317-2.*

1.4.6. Discharges of any pollutant into any Waters of the State for which a Total Maximum Daily Load (TMDL) has been approved by EPA unless the discharge is consistent with the TMDL. This consistency determination applies at the time a Notice of Intent is submitted. If conditions change after coverage is issued, the coverage may remain active provided the conditions and requirements of Part 3.1. of this Permit are complied with.

1.4.7. Discharges or discharge-related activities that are likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA. More information regarding endangered species in the State of Utah is available at http://www.fws.gov/mountain-prairie/.

1.4.8. Discharge from an MS4 if the operator has been ordered by the Executive Secretary, as provided in Part 6.15 that it may no longer be covered under this General Permit, and the period established by the Executive Secretary for applying for a UPDES Permit has passed.

1.5. Co-Permittee(s) and Co-Permitee Accountability

1.5.1. The following entities are Co-Permittees covered in this Permit:

1.5.1.1 All entities listed in Permit Parts 1.2.1.1., 1.2.1.2.1, and 1.2.1.2.2, and;

1.5.1.2. Additional operators of small municipal separate storm sewers within the boundaries of Salt Lake County, which submit application and are approved for inclusion under the Permit during the course of this Permit cycle.

Each Co-Permittee is individually accountable for:

1.5.2. Permit compliance for discharges from portions of the MS4 where it is the operator and for areas within its legal jurisdiction, unless another Co-Permittee has agreed in writing to assume that responsibility within the jurisdiction of the Co-Permittee as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.3. Development of a Storm Water Management Program (SWMP) as further described in Part 4.0., in the MS4 area of their jurisdiction, unless another Co-Permittee has agreed to assume that responsibility within the jurisdiction of the Co-Permittee as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.4. Implementation of a SWMP and ensuring that the six minimum control measures described in Part 4.2. are implemented for portions of the MS4 where it is the operator and in areas within its legal jurisdiction, unless another Co-Permittee has agreed to assume that responsibility within the jurisdiction of the Co-Permittee as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.5. Permit compliance (all or part), development of a SWMP (all or part), and implementation of the SWMP (all or part) in an area outside of the Co-Permittees legal municipal jurisdiction if the Co-Permittee has agreed to the added responsibility as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.6. Cooperation in compiling any shared portions of the annual reporting requirements listed in Part 5.6., except that a Co-Permittee is individually liable for any parts of the annual report that relate exclusively to portions of the MS4 where it is the operator as specified in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.7. Phase I Co-Permittee, Salt Lake County, shall provide wet weather monitoring as described in Appendix III.

1.5.8. Phase I Co-Permittee, Salt Lake County shall comply with the additional Industrial and High Risk Runoff Permit requirements contained in Part 4.3.

1.6 Documents the Co-Permittees Shall Develop to Append the Permit

The following documents shall be developed and signed (in accordance with Part 6.8. *Signatory Requirements)* by the Co-Permittees, and will append the Permit as enforceable Permit conditions binding on the Co-Permittees:

1.6.1. Appendix I: *Co-Permittee Identification and Accountability* shall contain:

1.6.1.1. A list of all Co-Permittees covered by this Permit, a description of the legal jurisdiction of the Co-Permittees, MS4 boundaries, and the date the Co-Permittee is officially included as a Co-Permittee under this Permit (the Permit shall be modified as a minor modification, not requiring public notice, pursuant to *UAC R317-8-5.6(3)(d)* to officially include additional Co-Permittees);

1.6.1.2. Where Permit compliance and SWMP development and implementation accountability is transferred, all or part, to another Co-Permittee, a description of where (on which Co-Permittee) the accountability falls. The description shall assign clear and distinct accountability to the Co-Permittees involved as to who is responsible for what Permit compliance issues, who is to develop what portions of a SWMP, and who is to implement what portions of the SWMP;

1.6.1.3. Any necessary agreements, contracts, or memorandum of understanding (MOUs) between Co-Permittees and/or other municipal (or non-municipal) entities that affect the implementation and operation of SWMP.

1.6.2. Timing for Development & Inclusions or Exclusions of Co-Permittees:

1.6.2.1. The *Co-Permittee Identification and Accountability* document shall be updated within 30 days of issuance of this Permit;

1.6.2.2. The *Co-Permittee Identification and Accountability* document shall be updated immediately for each new inclusion or exclusion of a Co-Permittee.

1.6.3. Appendix II: *Storm Water Management Program* (for each MS4 listed in *Appendix I*):

1.6.3.1. The purposes, objectives, and the required contents of Appendix II are listed in Part 4.0 of this Permit.

1.6.4. Appendix III: *Storm Water Wet and Dry Weather Monitoring Plans*:

1.6.4.1. The purposes, objectives, and the required contents for Appendix III are listed in Part 5.2 of this Permit.

1.6.4.2. Modifications to this document shall be approved with a signature by the *Division*.

1.6.5. Modification and Maintenance of Appendices:

1.6.5.1. Co-Permittees shall keep the documents in the appendices current and up to date and attempt to achieve the purpose and objectives of the required document;

1.6.5.2. All modifications to the appendix documents shall show proof that it was submitted to the *Division* (a received date stamp from the Division of Water Quality, or verification e-mail from DWQ would be sufficient), and if required, it shall show that it was approved by the *Division* (a signature by the *Division* by an approval statement on the document, a separate letter signed by the *Division* approving of the modification, or similar is sufficient);

1.6.5.3. Each Appendix shall maintain a record of the original document, each modification, and the date the modification was made;

1.6.5.4. The *Division* may at any time make a written determination that parts or all of the appendix documents are unacceptable, wherein the Co-Permittee(s) shall make modifications to the unacceptable parts within 30 days, or within a time frame specified by the *Division*.

2.0 Notice of Intent and Storm Water Management Program Requirements

2.1. New Applicants

The requirements of this Part apply only to Co-Permittees **not** covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001, i.e. **New Applicants**. Co-Permittees that were covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001, i.e. Renewal Applicants, and have submitted a notice of intent (NOI) at least 180 days prior to the expiration date of the previous Permit, shall instead follow the requirements of Part 2.3.

2.1.1. New applicants shall meet the following application requirements. The Notice of Intent (NOI) shall include submittal of the Storm Water Management Program (SWMP) document. Detailed information on SWMP requirements can be found in Part 4.0 of this Permit.

2.1.2. Within 180 days of notification from the Executive Secretary, the operator of the MS4 shall submit a NOI form as provided by the Division at http://www.waterquality.utah.gov/UPDES/stormwatermun.htm. (The Executive Secretary retains the right to grant permission for a later submission date upon good cause shown). One original completed NOI shall be submitted, by mail or hand delivery to:

Attention: UPDES IES
Department of Environmental Quality
Division of Water Quality
195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

2.1.3. Late submittal of an NOI is prohibited (unless permission has been granted by the Executive Secretary). If a late NOI is submitted, authorization is only for discharges

that occur after Permit coverage is granted. The Executive Secretary reserves the right to take appropriate enforcement actions for any unpermitted discharges.

2.1.4. Where application is made by a new applicant that has assumed operational control of an MS4 for which coverage under this Permit was previously held by a separate entity, the Division may determine that the new applicant shall comply with the Permit requirements in this Permit, as directed for Renewal Permittees. Notification shall be made by the Executive Secretary of this requirement in writing to the New Applicant prior to issuance of Permit coverage

2.1.5. Implementation of the Co-Permittee's SWMP shall include the six minimum control areas, including Measurable Goals, described in Part 4.2. Measurable Goals for each of the program areas shall include, as appropriate, the year by which the Co-Permittee will undertake required actions, including interim milestones and the frequency of the action if applicable.

2.1.6. Implementation of the Co-Permittee's SWMP as described in the Co-Permittee's application is required to begin within 30 days after the completed application is submitted. The Co-Permittee shall fully develop and implement the SWMP as discussed in Part 4.0 of the Permit by the end of the Permit term unless a more restrictive timeframe is indicated.

2.1.7. If an Operator is designated by the Executive Secretary as requiring Permit coverage later than one year after the effective date of this General Permit, the Executive Secretary may approve alternative deadlines that would allow the Co-Permittee to have its program areas implemented.

2.2. Contents of the Notice of Intent

The Notice of Intent requires, at a minimum, the following information:

2.2.1. Name, address, and telephone number of the principal executive officer, ranking elected official or other duly authorized employee in charge of municipal resources used for implementation of the SWMP;

2.2.2. Name(s)/ identification of Waters of the State as defined by UAC R317-1-1.32 that receive discharges from the Co-Permittee's MS4;

2.2.3. Name of the person responsible for overseeing implementation and coordination of the SWMP;

2.2.4. Summary description of the overall water quality concerns, priorities, and measurable goals specific to the Co-Permittee that were considered in the development of the SWMP;

2.2.5. The SWMP document shall consist of, at a minimum, a description of the program elements that will be implemented (or already exist) for each of the SWMP minimum control measures. The plan shall be detailed enough for the Division to determine the Co-Permittee's general strategy for complying with the required items in each of the six minimum control measures in the SWMP document (see Part 4.2 of this Permit);

2.2.6. Information on the chosen Best Management Practices (BMPs) and the measurable goals for each of the storm water minimum control measures in Part 4.2 of this Permit and, as appropriate, the timeframe by which the Co-Permittee will achieve required actions, including interim milestones;

2.2.7. Co-Permittees shall each submit an NOI and individual SWMP document which will clearly identify the areas of the MS4 for which each of the Co-Permittees are responsible. Co-Permittees which are relying on another entity(ies) to satisfy one or more of their Permit obligations shall include with the NOI, a summary of the Permit obligations that will be carried out by the other entity(ies). During the term of the Permit, Co-Permittees may terminate or amend shared responsibility arrangements by notifying the Executive Secretary, provided this does not alter implementation deadlines.

2.2.8. Certification and signature requirements in accordance with Part 6.8.

2.3. Storm Water Management Program Plan Description for Renewal Co-Permittees

2.3.1. The requirements of this part apply only to **Renewal Co-Permittees** that were covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001. New applicants are not required to meet the requirements of this Part and instead shall follow the requirements of Part 2.0.

2.3.2. Renewal Co-Permittees shall submit a **revised SWMP document** to the Division within 120 days of the effective date of this Permit, which includes at a minimum, the following information:

2.3.2.1. Permit number;

2.3.2.2. MS4 location description and map;

2.3.2.3. Information regarding the overall water quality concerns, priorities, and measurable goals specific to the Co-Permittee that were considered in the development and/or revisions to the SWMP document. Each Co-Permittee shall provide measurable goals for each minimum control measure described in Permit Part 4.2. Measurable goals should be based on:

- Improvements in reducing annual loadings of pollutants to the watershed;
- Improvements to "receiving stream" water quality, hydrology, geomorphology, habitat, or biology;
- Quantifiable improvements in the MS4s discharged storm water quality;
- Improvements in meeting the objectives of the SWMP;
- Progress in BMP implementation or performance; and
- At a minimum, a measure of specific actions, the frequency of those actions, and dates.

2.3.3. A description of the program elements that will be implemented (or are already being implemented) in each of the six minimum control measures (see Part 4.0);

2.3.3.1. A description of any modifications to ordinances or long-term/ongoing processes implemented in accordance with the previous MS4 general Permit for each of the six minimum control measures;

2.3.3.2. A description of how the Co-Permittee intends to meet the Permit requirements as described in Part 4.0 by either referencing existing program areas that already meet the Permit requirements or a description and relevant measurable goals that include, as appropriate, the year by which the Co-Permittee will achieve required actions, including interim milestones.

2.3.3.3. Indicate the joint submittal (s) of Co-Permittees (if applicable) and the associated responsibility (ies) in meeting requirements of the SWMP.

2.3.3.4. Certification and signature requirements in accordance with Part 6.8.

2.3.4. The revised SWMP document shall contain specific details for complying with the required items in each of the six minimum control measures contained within the SWMP document (See Part 4.2.).

3.0. Special Conditions

3.1. Discharges to Water Quality Impaired Waters

3.1.1. Applicability: Co-Permittees shall:

3.1.1.1. Determine whether storm water discharge from any part of the MS4 contributes to a 303(d) listed (i.e., impaired) waterbody. A 303(d) list of impaired waterbodies is available at http://www.waterquality.utah.gov/TMDL/index.htm. Water quality impaired waters means any segment of surface waters that has been identified by the Division as failing to support classified uses. If the Co-Permittee has discharges meeting these criteria, the Co-Permittee shall comply with Part 3.1.2. below and if no such discharges exist, the remainder of this Part 3.1 does not apply.

3.1.1.2. If the Co-Permittee has "303(d)" discharges described above, the Co-Permittee shall also determine whether a Total Maximum Daily Load (TMDL) has been developed by the Division and approved by EPA for the listed waterbody. If there is an approved TMDL, the Permittee shall comply with all requirements associated with the TMDL as well as the requirements of Part 3.1.2. below. If no TMDL has been approved, the Co-Permittee shall comply with Part 3.1.2. below and any TMDL requirements once it has been approved. TMDL requirements may be put into effect at any time during this Permit term.

3.1.2. Water Quality Controls for Discharges to Impaired Waterbodies. If the Co-Permittee discharges to an impaired waterbody, the Co-Permittee shall include in its SWMP document a description of how the Co-Permittee will control the discharge of the pollutants of concern. This description shall identify the measures and BMPs that will collectively control the discharge of the pollutants of concern. The measures should be presented in the order of priority with respect to controlling the pollutants of concern.

3.1.3. Where a discharge is already authorized under this Permit and is later determined to cause or have the reasonable potential to cause or contribute to the violation of an applicable water quality standard, the Division will notify the Co-Permittee of such violation(s). The Co-Permittee shall take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard and document these actions as required by the Division. If violations remain or re-occur, coverage under this Permit may be terminated by the Division and an alternative general Permit or individual Permit may be issued. Compliance with this requirement does not preclude any enforcement activity as provided by the Utah Water Quality Act for the underlying violation.

3.2. Threatened or Endangered Species and Historic Properties

This Permit does not relieve the Co-Permittee from compliance with Federal or State laws pertaining to threatened or endangered species or historic properties. Where applicable, compliance efforts to these laws shall be reflected in the SWMP document.

4.0 Storm Water Management Program

4.1. Requirements

4.1.1. All Co-Permittees shall develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from the MS4, protect water quality, and satisfy the appropriate water quality requirements of the *Utah Water Quality Act.* The SWMP shall include the six minimum control measures described in Part 4.2 of this Permit.

4.1.1.1. The SWMP shall be developed and implemented in accordance with the schedules contained in Part 4.0. of this Permit.

4.1.2. Within **90 days** after the coverage from this Permit is granted, each Co-Permittee shall have an ongoing documentation process for gathering, maintaining, and using information to conduct planning, set priorities, track the development and implementation of the SWMP, evaluate Permit compliance/non-compliance, and evaluate the effectiveness of the SWMP implementation.

4.1.2.1. Each Co-Permittee shall track the number of inspections performed, official enforcement actions taken, and types of public education activities implemented as required for each SWMP component. This information shall be provided to the Division upon request and used by the Division to determine compliance with this Permit.

4.1.2.2. Each Co-Permittee shall secure the resources necessary to meet all requirements of this Permit. Each Co-Permittee shall conduct an annual analysis of the capital and operation and maintenance expenditures needed, allocated, and spent as well as the necessary staff resources needed and allocated to meet the requirements of this Permit, including any development, implementation, and enforcement activities required. Each Co-Permittee shall submit a summary of its fiscal analysis with each annual report.

4.1.3. The SWMP document shall include BMPs that the Co-Permittee or another entity will implement for each of the storm water minimum control measures.

4.1.3.1. The measurable goals for each of the BMPs shall include, as appropriate, the months and years in which the Co-Permittee will undertake required actions, including interim milestones and the frequency of the actions.

4.1.3.2. The SWMP document shall indicate the person or persons responsible for implementing or coordinating the BMPs contained within the SWMP document.

4.1.3.3. Failure to meet these requirements with a good faith effort and within the timeframes set forth may result in an enforcement action by the *Executive Secretary*.

4.2. Minimum Control Measures

Co-Permittees covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001, i.e. **Renewal Co-Permittees**, are expected to have fully implemented Storm Water Management Programs (SWMPs) that reflect the permit requirements of the previous permit cycle. A Renewal Co-Permittee shall continue to implement its SWMP as described in the application and submittals provided in accordance with the previous Jordan Valley Municipalities MS4 Permit, while updating its SWMP document pursuant to this renewal Permit. This Permit does not extend the compliance expectations set forth in the previous MS4 general Permit or any corrective action plans and associated schedules unless specifically noted.

The six minimum control measures that shall be included in the storm water management program are:

4.2.1. Public Education and Outreach on Storm Water Impacts

The Co-Permittee shall implement a public education and outreach program to promote behavior change by the public to reduce water quality impacts associated with pollutants in storm water runoff and illicit discharges. Outreach and educational efforts shall include a multimedia approach and shall be targeted and presented to specific audiences for increased effectiveness. The educational program shall include documented education and outreach efforts for the following four audiences: (1) residents, (2) businesses, institutions, and commercial facilities, (3) developers and contractors (construction), and (4) MS4 industrial facilities. The minimum performance measures which should be based on the land uses and target audiences found within the community include:

4.2.1.1. Target specific pollutants and pollutant sources determined by the Co-Permittee to be impacting, or have the potential to impact, the beneficial uses of receiving water. This includes providing information which describe the potential impacts from storm water discharges; methods for avoiding, minimizing, reducing and /or eliminating the adverse impacts of storm water discharges; and the actions individuals can take to improve water quality, including encouraging participation in local environmental stewardship activities, based on the land uses and target audiences found within the community;

4.2.1.2. Provide and document information given to the general public of the Co-Permittee's prohibitions against and the water quality impacts associated with illicit discharges and improper disposal of waste. The Co-Permittee shall at a minimum consider the following topics. These topics are not inclusive and the Co-Permittee shall focus on those topics most relevant to the community: maintenance of septic systems; effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers); benefits of on-site infiltration of storm water; effects of automotive work and car washing on water quality; proper disposal of swimming pool water; and proper management of pet waste.

4.2.1.3. Provide and document information given to businesses and institutions of the Co-Permittee's prohibition against and the water quality impacts associated with illicit discharges and improper disposal of waste. The Co-Permittee shall at a minimum consider the following topics. These topics are not inclusive and the Co-Permittee shall focus on those topics most relevant to the community: proper lawn

maintenance (use of pesticides, herbicides and fertilizer); benefits of appropriate on-site infiltration of storm water; building and equipment maintenance (proper management of waste water); use of salt or other deicing materials (cover/prevent runoff to storm system and contamination to ground water); proper storage of materials (emphasize pollution prevention); proper management of waste materials and dumpsters (cover and pollution prevention); and proper management of parking lot surfaces (sweeping). This education can also be a part of the Illicit Discharge Detection and Elimination measure detailed in Part 4.2.3.

4.2.1.4. Provide and document information given to engineers, construction contractors, developers, development review staff, and land use planners concerning the development of storm water pollution prevention plans (SWPPPs) and BMPs for reducing adverse impacts from storm water runoff from development sites. This education can also be a part of the Construction Site Storm Water Runoff minimum control measure detailed in Part 4.2.4.

4.2.1.5. Provide annually, at a minimum, training given to employees, of Co-Permittee-owned or operated facilities concerning the Co-Permittee's prohibition against and the water quality impacts associated with illicit discharges and improper disposal of waste. The Co-Permittee shall at a minimum consider the following topics: equipment inspection to ensure timely maintenance; proper storage of industrial materials (emphasize pollution prevention); proper management and disposal of wastes; proper management of dumpsters; minimization of use of salt and other de-icing materials (cover/prevent runoff to MS4 and ground water contamination); benefits of appropriate on-site infiltration (areas with low exposure to industrial materials such as roofs or employee parking); and proper maintenance of parking lot surfaces (sweeping). The Co-Permittee shall document and maintain records of the training provided and the staff in attendance.

4.2.1.6. Provide and document information and training given to MS4 engineers, development and plan review staff, land use planners, and other parties as applicable to learn about Low Impact Development (LID) practices, green infrastructure practices, and to communicate the specific requirements for post-construction control and the associated Best Management Practices (BMPs) chosen within the SWMP.

4.2.1.7. An effective program shall show evidence of focused messages and audiences as well as demonstration that the defined goal of the program has been achieved. The Co-Permittee shall define the specific messages for each audience. The Co-Permittee shall identify methods that will be used to evaluate the effectiveness of the educational messages and the overall education program. Any methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of changes in behavior and knowledge. One method of evaluation of the program may be an evaluation of audience knowledge prior to commencement of the educational message followed by an evaluation after delivery of the message, such as a survey.

4.2.1.8. The Co-Permittee shall include written documentation or rationale as to why particular BMPs were chosen for its public education and outreach program.

4.2.2. Public Involvement/Participation

The Co-Permittee shall implement a program that complies with applicable State and Local public notice requirements. The SWMP shall include ongoing opportunities for public involvement and participation such as advisory panels, public hearings, watershed committees, stewardship programs, environmental activities, other volunteer opportunities, or other similar activities. The Co-Permittee should involve potentially affected stakeholder groups, which include but is not limited to, commercial and industrial businesses, trade associations, environmental groups, homeowners associations, and education organizations. The minimum performance measures are:

4.2.2.1. Co-Permittees shall adopt a program or policy directive to create opportunities for the public to provide input during the decision making processes involving the development, implementation and update of the SWMP document including development and adoption of all required ordinances or regulatory mechanisms.

4.2.2.2. Renewal Co-Permittees shall make the revised SWMP document available to the public for review and input within 120 days from the effective date of this Permit. New Applicants shall make the SWMP document available to the public for review and input within 180 days of receiving notification from the Executive Secretary of the requirement for Permit coverage.

4.2.2.3. A current version of the SWMP document shall remain available for public review and input for the life of the Permit. If the Co-Permittee maintains a website, the latest version of the SWMP document shall be posted on the website to allow the public to review and provide input.

4.2.2.4. The Co-Permittee shall at a minimum comply with State and Local public notice requirements when implementing a public involvement/participation program.

4.2.3. Illicit Discharge Detection and Elimination (IDDE)

All Co-Permittees shall develop, implement and enforce an IDDE program to systematically find and eliminate sources of non-storm water discharges from the MS4 and to implement defined procedures to prevent illicit connections and discharges according to the minimum performance measures listed below within 18 months of receiving coverage under this Permit unless a different timeframe is indicated. The IDDE program shall be described in writing, incorporated as part of the Co-Permittee's SWMP document, and contain the elements detailed in this part of the Permit. The minimum performance measures are:

4.2.3.1. Maintain a current storm sewer system map of the MS4, showing the location of all municipal storm sewer outfalls with the names and location of all State waters that receive discharges from those outfalls, storm drain pipe and other storm water conveyance structures within the MS4.

4.2.3.2. Effectively prohibit, through ordinance or other regulatory mechanism, non-storm water discharges to the MS4, including spills, illicit connections, illegal dumping and sanitary sewer overflows ("SSOs") into the storm sewer system, require removal of

such discharges consistent with Part 4.2.3.6. of this Permit, and implement appropriate enforcement procedures and actions. The Co-Permittee shall have a variety of enforcement options in order to apply escalating enforcement procedures as necessary for the severity of violation and/or the recalcitrance of the violator. The Co-Permittee shall include in its SWMP document a description of the types of escalating enforcement options which would be used in response to all anticipated types of noncompliance including repeat and continued violations. These descriptions shall identify by title the official(s) responsible for each type of enforcement response. Exceptions are discharges pursuant to a separate UPDES Permit (other than the UPDES Permit for discharges from the MS4) and non-storm water discharges listed in Part 1.2.2.2. An SSO is a discharge of untreated sanitary wastewater. SSOs are illegal and shall be eliminated. All SSOs shall be reported to the Division of Water Quality and to the Co-Permittee's local wastewater treatment plant.

4.2.3.2.1 The IDDE program shall have adequate legal authority to detect, investigate, eliminate and enforce against non-storm water discharges, including illegal dumping, into the MS4. Adequate legal authority consists of an effective ordinance, by-law, or other regulatory mechanism. The documented IDDE program that is included in the Co-Permittee's SWMP shall include a reference or citation of the authority the Co-Permittee will use to implement all aspects of the IDDE program.

4.2.3.3. Develop, implement and prepare in writing a plan to detect and address non-storm water discharges to the MS4, including spills, illicit connections, sanitary sewer overflows and illegal dumping. The plan shall include:

4.2.3.3.1 Develop and implement written systematic procedures for locating and listing the following priority areas likely to have illicit discharges (if applicable to the jurisdiction):

- Areas with older infrastructure that are more likely to have illicit connections;
- Industrial, commercial, or mixed use areas;
- Areas with a history of past illicit discharges;
- Areas with a history of illegal dumping;
- Areas with onsite sewage disposal systems;
- Areas with older sewer lines or with a history of sewer overflows or cross-connections; and
- Areas upstream of sensitive waterbodies.

The Co-Permittee shall document the basis for its selection of each priority area and create a list of all priority areas identified in the system. This priority area list shall be updated annually to reflect changing priorities.

4.2.3.3.2 Field assessment activities for the purpose of verifying outfall locations and detecting illicit discharges, including dry weather screening of outfalls or facilities serving priority areas identified in Part 4.2.3.3.1 as well as routine dry weather screening of all outfalls that discharge within the Co-Permittee's jurisdiction to a receiving water. Compliance with this provision shall be achieved by: prioritizing receiving waters for visual inspection to identify previously unknown outfalls and field assessing at

least 20 percent of the priority areas identified in Part 4.2.3.3.1 to detect illicit discharges within one year of receiving coverage from this Permit, and field assessing an additional 20 percent of the identified high priority water bodies or other high priority area each year thereafter. Field assessment activities shall utilize an inspection form to document findings.

4.2.3.4. Develop and implement standard operating procedures (SOPs) or similar type of documents for tracing the source of an illicit discharge; including visual inspections, and when necessary, opening manholes, using mobile cameras, using field tests of selected chemical parameters as indicators of discharge sources, collecting and analyzing water samples for the purpose of determining sanctions or penalties, and/or other detailed inspection procedures.

4.2.3.5. Develop and implement standard operating procedures (SOPs) or similar type of documents for characterizing the nature of, and the potential public or environmental threat posed by, any illicit discharges found by or reported to the Co-Permittee by the hotline or other telephone number described in 4.2.3.9. These procedures shall include detailed instructions for evaluating how the discharge shall be immediately contained and steps to be taken for containment of the discharge. Compliance with this provision will be achieved by initiating an investigation immediately upon being alerted of a potential illicit discharge.

4.2.3.5.1 When the source of a non-storm water discharge is identified and confirmed, the Co-Permittee shall record the following information in an inspection report: the date the Co-Permittee became aware of the non-storm water discharge, the date the Co-Permittee initiated an investigation of the discharge, the date the discharge was observed, the location of the discharge, a description of the discharge, the method of discovery, date of removal, repair, or enforcement action; date, and method of removal verification. Analytical monitoring may be necessary to aid in the identification of potential sources of an illicit discharge and to characterize the nature of the illicit discharge. The decision process for utilizing analytical monitoring shall be fully documented in the inspection report.

4.2.3.6. Develop and implement standard operating procedures (SOPs) or similar type of documents for ceasing the illicit discharge, including notification of appropriate authorities; notification of the property owner; technical assistance for removing the source of the discharge or otherwise eliminating the discharge; follow-up inspections; and escalating enforcement and legal actions if the discharge is not eliminated. Illicit discharges to the MS4 are prohibited and any such discharges violate this Permit and remain in violation until they are eliminated. Upon detection, the Co-Permittee shall require immediate cessation of improper disposal practices upon confirmation of responsible parties in accordance with its enforceable legal authorities established pursuant to Part 4.2.3.2.1. of this Permit.

4.2.3.6.1 All IDDE investigations shall be thoroughly documented and may be requested at any time by the *Division.* If a Co-Permittee is unable to meet the minimum performance measures outlined in Parts 4.2.3.5. or 4.2.3.6., the Co-Permittee shall immediately submit to the Division written documentation or rationale describing the circumstances why compliance with the minimum performance measures was not possible. All IDDE documentation shall be included in the SWMP document.

4.2.3.7. Co-Permittees shall inform public employees, businesses, and the general public of hazards associated with illicit discharges and improper disposal of waste.

4.2.3.8. Co-Permittees shall promote or provide services for the collection of household hazardous waste.

4.2.3.9. Co-Permittees shall publicly list and publicize a hotline or other local telephone number for public reporting of spills and other illicit discharges. A written record shall be kept of all calls received, all follow-up actions taken, and any feedback received from public education efforts.

4.2.3.9.1 The Co-Permittee shall develop a written spill/dumping response procedure, and a flow chart for internal use, that shows the procedures for responding to public referrals of illicit discharges, the various responsible agencies and their contacts, and who would be involved in illicit discharge incidence response, even if it is a different entity other than the Co-Permittee. The procedure and list shall be incorporated as part of the IDDE program and incorporated into the Co-Permittee's SWMP document. The list shall be maintained and updated as changes occur.

4.2.3.10. Co-Permittees shall adopt and implement procedures for program evaluation and assessment which includes maintaining a database for mapping, tracking of the number and type of spills or illicit discharges identified; and inspections conducted.

4.2.3.11. Co-Permittees shall at a minimum, annually train employees about the IDDE program including identification, investigation, termination, cleanup, and reporting of illicit discharges including spills, improper disposal, and illicit connections. Co-Permittees shall provide training to all field staff that as part of their normal job responsibilities might come into contact with or otherwise observe an illicit discharge or illicit connection to the MS4. Co-Permittees shall also train office personnel who might receive initial reports of illicit discharges. Training shall include how to identify a spill, an improper disposal, or an illicit connection to the MS4 and proper procedures for reporting the illicit discharge. Co-Permittees shall document and maintain records of the training provided and the staff in attendance.

4.2.3.12. The Division reserves the right to request documentation or further study of a particular non-storm water discharge of concern, to require a reasonable basis for allowing the non-storm water discharge and excluding the discharge from the Co-Permittee's program, and to require inclusion of the discharge in the Co-Permittee's program, if water quality concerns can not otherwise be reasonably satisfied.

4.2.4. Construction Site Storm Water Runoff Control

All Co-Permittees shall develop, implement and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale according to the minimum performance measures listed below within **18 months** of receiving coverage under this Permit. Public and private projects, including projects proposed by the Co-Permittee's own departments and agencies, shall comply with these requirements. The minimum performance measures are:

4.2.4.1. Develop and adopt an ordinance or other regulatory mechanism that requires the use of erosion and sediment control practices at construction sites. The ordinance or other regulatory mechanism shall, at a minimum, be equivalent with the technical requirements set forth in the UPDES Storm Water General Permit for Construction Activities, UTR300000 which can be found at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm. The ordinance or other regulatory mechanism shall include sanctions to ensure compliance. The ordinance or other regulatory mechanism shall apply, at a minimum, to construction projects disturbing greater than or equal to one acre and to construction projects of less than one acre that are part of a larger common plan of development or sale. Existing local requirements to apply storm water controls at smaller sites shall be retained.

4.2.4.1.1 The ordinance or other regulatory mechanism shall, at a minimum, require construction operators to prepare a Storm Water Pollution Prevention Plan (SWPPP) and apply sediment and erosion control BMPs as necessary to protect water quality, reduce the discharge of pollutants, and control waste such as, but not limited to, discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality. The SWPPP requirements shall be, at a minimum, equivalent with the SWPPP requirement set forth in the UPDES Storm Water General Permit for Construction Activities, UTR300000.

4.2.4.1.2. The ordinance or other regulatory mechanism shall include a provision for access by qualified personnel to inspect construction sites as well as storm water BMPs on private properties that discharge to the MS4.

4.2.4.1.3. The ordinance or other regulatory mechanism shall require that all construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, obtain a Utah Pollutant Discharge Elimination System UPDES Storm Water Permit (UPDES General Permit No. UTR300000) prior to local permit approval and issuance.

4.2.4.2. Develop a written enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism which shall include:

4.2.4.2.1. Standard operating procedures (SOPs) or similar type of documents that include specific processes and sanctions to minimize the occurrence of, and obtain compliance from violators which shall include appropriate, escalating enforcement procedures and actions.

4.2.4.2.2. Documentation and tracking of all enforcement actions.

4.2.4.3. Develop and implement SOPs or similar type of documents for pre-construction Storm Water Pollution Prevention Plan (SWPPP) review and keep records for, at a minimum, all construction sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, to ensure plans are complete and in compliance with State and Local regulations. Co-Permittees shall keep records of these projects for five years

or until construction is completed, whichever is longer. Prior to construction, the Co-Permittee shall:

4.2.4.3.1 Conduct a pre-construction SWPPP review which includes a review of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development.

4.2.4.3.2 Incorporate into the SWPPP review procedures the consideration of potential water quality impacts and procedures for pre-construction review which shall include the use of a checklist.

4.2.4.3.3 Incorporate into the SWPPP review procedures for an evaluation of opportunities for use of low impact design (LID) and green infrastructure and when the opportunity exists, encourage such BMPs to be incorporated into the site design.

4.2.4.3.4 Identify priority construction sites, including at a minimum those construction sites discharging directly into or immediately upstream of waters that the State recognizes as impaired (for sediment) or high quality;

4.2.4.4. All Co-Permittees shall develop and implement SOPs or similar type of documents for construction site inspection and enforcement of construction storm water pollution control measures. The procedures shall clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The Co-Permittee shall have the authority to the extent authorized by law to impose sanctions to ensure compliance with the local program. These procedures and regulatory authorities shall be written and documented in the SWMP. The construction site storm water runoff control inspection program shall provide:

4.2.4.4.1 Inspections of all new construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale at least monthly by qualified personnel using the Construction Storm Water Inspection Form (Checklist) found on the Division's website at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm.

4.2.4.4.2 The Co-Permittee shall inspect all phases of construction: prior to land disturbance, during active construction, and following active construction. The Co-Permittee shall include in its SWMP document a procedure for being notified by construction operators/owners of their completion of active construction so that verification of final stabilization and removal of all temporary control measures may be conducted.

4.2.4.4.3 Inspections by the MS4 of priority construction sites defined in Part 7.36. shall be conducted at least biweekly using the Construction Storm Water Inspection Form (Checklist) found on the Division's website at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm.

4.2.4.4.4 Based on site inspection findings, the Co-Permittee shall take all necessary follow-up actions (i.e., reinspection, enforcement) to ensure compliance in accordance with the Co-Permittee's enforcement strategy. These follow-up and enforcement actions shall be tracked and documented.

4.2.4.5 The Co-Permittee shall ensure that all staff whose primary job duties are related to implementing the construction storm water program, including permitting, plan review, construction site inspections, and enforcement, are trained at a minimum annually, to conduct these activities. The training can be conducted by the MS4 or outside training can be attended. Such training shall extend to third-party inspectors and plan reviewers as well. The Co-Permittee shall document and maintain records of the training provided and the staff in attendance.

4.2.4.6. All Co-Permittees shall adopt and implement a procedure to maintain records of all projects disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. All Co-Permittees must keep a list or inventory of construction sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. Co-Permittees shall keep records which include but are not limited to, site plan reviews, SWPPPs, inspections and enforcement actions including verbal warnings, stop work orders, warning letters, notices of violation, and other enforcement records. Co-Permittees shall keep records of these projects for five years or until construction is completed, whichever is longer.

4.2.5. Long-Term Storm Water Management in New Development and Redevelopment (Post-Construction Storm Water Management)

All Co-Permittees shall develop, implement and enforce a program to address post-construction storm water runoff to the MS4 from new development and redevelopment construction sites disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, according to the minimum performance measures listed below within 18 months of receiving coverage under this Permit. The objective of this control measure is for the hydrology associated with new development to mirror the pre-development hydrology of the previously undeveloped site or to improve the hydrology of a redeveloped site and reduce the discharge of storm water. The water quality considerations of this minimum control measure do not replace or substitute for water quantity or flood management requirements implemented on the local level for new developments. The water quality controls may be incorporated into the design of structures intended for flow control; or water quality control may be achieved with separate control measures. The program shall apply to private and public development sites, including roads.

The minimum performance measures are:

4.2.5.1. Develop and adopt an ordinance or other regulatory mechanism that requires long-term post-construction storm water controls at new development and redevelopment sites. The ordinance or other regulatory mechanism shall apply, at a minimum, to new development and redevelopment sites that discharge to the MS4 and that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The ordinance or other regulatory mechanism shall, at a minimum, be equivalent with the technical requirements set forth in the UPDES Storm Water General Permit for Construction Activities, UTR300000 which can be found at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm. Existing local

requirements to apply storm water controls at smaller sites shall be retained. The ordinance or other regulatory mechanism shall require BMP selection, design, installation, operation and maintenance standards necessary to protect water quality and reduce the discharge of pollutants to the MS4.

4.2.5.2. Develop an enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism. Procedures for enforcement of BMPs include:

4.2.5.2.1 Procedures that include specific processes and sanctions to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators which shall include appropriate, escalating enforcement procedures and actions.

4.2.5.2.2 Documentation on how the requirements of the ordinance or other regulatory mechanism will protect water quality and reduce the discharge of pollutants to the MS4. Documentation shall include:

- How long-term storm water BMPs were selected;
- The pollutant removal expected from the selected BMPs; and
- The technical basis which supports the performance claims for the selected BMPs.

4.2.5.3. The Co-Permittee's new development/redevelopment program shall have requirements or standards to ensure that any storm water controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality.

4.2.5.3.1 The Co-Permittee's new development/redevelopment program should include non-structural BMPs such as requirements and standards to minimize development in areas susceptible to erosion and sediment loss; to minimize the disturbance of native soils and vegetation; to preserve areas in the municipality that provide important water quality benefits; to implement measures for flood control; and to protect the integrity of natural resources and sensitive areas.

4.2.5.3.2 For new development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, the program shall include a process to evaluate and encourage a Low Impact Development (LID) approach which encourages the implementation of structural BMPs, where practicable, that infiltrate, evapotranspire or harvest and use storm water from the site to protect water quality. Structural controls may include green infrastructure practices such as rainwater harvesting, rain gardens, permeable pavement, and vegetated swales. The selection and design of post-construction controls shall take into consideration clogging or obstruction issues, freeze-thaw problems, effect on slope stability and groundwater, and the ability to effectively maintain the control.

4.2.5.3.3 The Co-Permittee shall develop a plan to retrofit existing developed sites that are adversely impacting water quality. The retrofit plan shall be developed to emphasize controls that infiltrate, evapotranspire or harvest and use storm water discharges. The plan shall include a ranking of control measures to determine those best suited for retrofitting as well as those that could later be considered for retrofitting. The Co-

Permittee shall include the following when developing the criteria for the retrofit plan:

- Proximity to waterbody
- Status of waterbody to improve impaired waterbodies and protect unimpaired waterbodies
- Hydrologic condition of the receiving waterbody
- Proximity to sensitive ecosystem or protected area
- Any upcoming sites that could be further enhanced by retrofitting storm water controls

4.2.5.3.4 Each Co-Permittee shall develop and define specific hydrologic method or methods for calculating runoff volumes and flow rates to ensure consistent sizing of structural BMPs in their jurisdiction and to facilitate plan review. Specific criteria which require that Best Management Practices (BMPs) are designed to treat the water from a specific design storm (e.g., the 2-year, 24-hour event) shall be incorporated into the Co-Permittee's post-construction minimum control measure and documented in the SWMP. Co-Permittees may allow other unique or complex methodologies.

4.2.5.4. All Co-Permittees shall adopt and implement procedures for site plan review which incorporate consideration of water quality impacts. Prior to construction, Co-Permittees shall:

4.2.5.4.1 Review Storm Water Pollution Prevention Plans (SWPPPs) for, at a minimum, all new development and redevelopment sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, to ensure that the plans include long-term storm water management measures that meet the requirements of this minimum control measure.

4.2.5.4.2 Co-Permittees shall provide developers and contractors with preferred design specifications to more effectively treat storm water for different development types such as industrial parks, commercial strip malls, retail gasoline outlets, restaurants, parking lots, automotive service facilities, street and road construction, and projects located in, adjacent to, or discharging to environmentally sensitive areas.

4.2.5.4.3 Co-Permittees shall keep a representative copy of information that is provided to design professionals; and if information is distributed to a large number of design professionals at once, the dates of the mailings and lists of recipients.

4.2.5.5. All Co-Permittees shall adopt and implement SOPs or similar type of documents for site inspection and enforcement of post-construction storm water control measures. These procedures shall ensure adequate ongoing long-term operation and maintenance of approved storm water control measures.

4.2.5.5.1 The ordinance or other regulatory mechanism shall include provisions for both construction-phase and post-construction access for Co-Permittees to inspect storm water control measures on private properties that discharge to the MS4 to ensure that adequate maintenance is being performed. The ordinance or other regulatory mechanism may, in lieu of requiring that the Co-Permittee's staff inspect and maintain storm water controls on private property, instead require private property

owner/operators or qualified third parties to conduct maintenance and provide annual certification that adequate maintenance has been performed and the structural controls are operating as designed to protect water quality. In this case, the Co-Permittee shall require a maintenance agreement addressing maintenance requirements for any control measures installed on site. The agreement shall allow the Co-Permittee to conduct oversight inspections of the storm water control measures and also account for transfer of responsibility in leases and/or deeds. The agreement shall also allow the Co-Permittee to perform necessary maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from the property owner/operator as needed.

4.2.5.5.2 Permanent structural BMPs shall be inspected at least once during installation by qualified personnel.

4.2.5.5.3 Inspections and any necessary maintenance shall be conducted annually by either the Co-Permittee or through a maintenance agreement, the property owner/operator. On sites where the property owner/operator is conducting maintenance, the Co-Permittee shall inspect those storm water control measures at least once every five years, or more frequently as determined by the Co-Permittee to verify and ensure that adequate maintenance is being performed. The Co-Permittee shall document its findings in an inspection report which includes the following:

- Inspection date;
- Name and signature of inspector;
- Project location
- Current ownership information
- A description of the condition of the storm water control measure including the quality of: vegetation and soils; inlet and outlet channels and structures; catch basins; spillways; weirs, and other control structures; and sediment and debris accumulation in storage as well as in and around inlet and outlet structures;
- Specific maintenance issues or violations found that need to be corrected by the property owner or operator along with deadlines and reinspection dates.

4.2.5.6. Co-Permittees shall provide adequate training for all staff involved in post-construction storm water management, planning and review, and inspections and enforcement. Training shall be provided or made available for staff annually, at a minimum, in the fundamentals of long-term storm water management through the use of structural and non-structural control methods. The Co-Permittees shall document and maintain records of the training provided and the staff in attendance.

4.2.5.7. The Co-Permittee shall maintain an inventory of all post-construction structural storm water control measures installed and implemented at new development and redeveloped sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. This inventory shall include both public and private sector sites located within the Co-Permittee's service area.

4.2.5.7.1 Each entry to the inventory shall include basic information on each project, such as project's name, owner's name and contact information, location, start/end date, etc. In addition, inventory entries shall include the following for each project:

- Short description of each storm water control measure (type, number, design or performance specifications);
- Short description of maintenance requirements (frequency of required maintenance and inspections); and
- Inspection information (date, findings, follow up activities, prioritization of follow-up activities, compliance status).

4.2.5.7.2 Based on inspections conducted pursuant to Part 4.2.5.5., the Co-Permittee shall update the inventory as appropriate where changes occur in property ownership or the specific control measures implemented at the site.

4.2.6. Pollution Prevention and Good Housekeeping for Municipal Operations

All Co-Permittees shall develop and implement an operations and maintenance (O & M) program for Co-Permittee-owned or operated facilities, operations and structural storm water controls that includes standard operating procedures (SOPs) or similar type of documents and a training component that have the ultimate goal of preventing or reducing pollutant runoff from all Co-Permittee-owned or operated facilities and operations. All components of an O & M program shall be included in the SWMP document and shall identify the department (and where appropriate, the specific staff) responsible for performing each activity described in this section. The Co-Permittee shall develop an inventory of all such Co-Permittee-owned or operated facilities. The Co-Permittee shall review this inventory annually and update as necessary. The minimum performance measures are:

4.2.6.1. Permitees shall develop and keep current a written inventory of Co-Permittee-owned or operated facilities and storm water controls that may include but is not limited to:

- Composting facilities
- Equipment storage and maintenance facilities
- Fuel farms
- Hazardous waste disposal facilities
- Hazardous waste handling and transfer facilities
- Incinerators
- Landfills
- Landscape maintenance on municipal property
- Materials storage yards
- Pesticide storage facilities
- Public buildings, including libraries, police stations, fire stations, municipal buildings, and similar Co-Permittee-owned or operated buildings
- Public parking lots
- Public golf courses
- Public swimming pools
- Public works yards

- Recycling facilities
- Salt storage facilities
- Solid waste handling and transfer facilities
- Street repair and maintenance sites
- Vehicle storage and maintenance yards
- Co-Permittee-owned and/or maintained structural storm water controls

Facilities covered under the General UPDES Permit for Storm Water Discharges Associated with Industrial Activities do not need to develop an O & M program but shall instead maintain the Storm Water Pollution Prevention Plan (SWPPP) required by that Permit.

4.2.6.2. All Co-Permittees shall initially assess the written inventory of Co-Permittee-owned or operated facilities, operations and storm water controls identified in Part 4.2.6.1. for their potential to discharge to storm water the following typical urban pollutants: sediment, nutrients, metals, hydrocarbons (e.g., benzene, toluene, ethylbenzene and xylene), pesticides, chlorides, and trash. Other pollutants may be associated with, but not generated directly from, the municipally-owned or operated facilities, such as bacteria, chlorine, organic matter, etc. Therefore, the Co-Permittee shall determine additional pollutants associated with its facilities that could be found in storm water discharges. A description of the assessment process and findings shall be included in the SWMP document.

4.2.6.3. Based on the assessment required in Part 4.2.6.2., the Co-Permittee shall identify as "high-priority" those facilities or operations that have a high potential to generate storm water pollutants. Among the factors that shall be considered in giving a facility a high priority ranking is the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that shall be performed outside (e.g., changing automotive fluids), proximity to waterbodies, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s).

4.2.6.4. Each "high priority" facility identified in Part 4.2.6.3. shall develop facility-specific standard operating procedures (SOPs) or similar type of documents. The SOPs shall include BMPs that, when applied to the municipal operation, facility or storm water control will protect water quality and reduce the discharge of pollutants to the MS4. Low impact development (LID) techniques should be considered for all new and redeveloped Co-Permittee-owned or operated facilities. The SOPs shall include appropriate pollution prevention and good housekeeping procedures for all of the following types of facilities and/or activities listed below:

4.2.6.4.1 Buildings and facilities: The O & M program shall address, but is not limited to: Co-Permittee-owned or operated offices, police and fire stations, pools, parking garages, and other Co-Permittee-owned or operated buildings or utilities. The SOPs shall address the use, storage and disposal of chemicals and ensure through employee training, that those responsible for handling these products understand and implement the SOPs. All Co-Permittee-owned or operated facilities shall develop and ensure that spill prevention plans are in place, if applicable, and coordinate with the local fire department as necessary. The SOPs shall address dumpsters and other waste management which includes, but is not limited to, cleaning, washing, painting and

other maintenance activities. The O & M program shall include schedules and SOPs for sweeping parking lots and keeping the area surrounding the facilities clean to minimize runoff of pollutants. Within 180 days of receiving coverage from this Permit, all Co-Permittees shall develop an inventory of all floor drains inside all Co-Permittee-owned or operated buildings. The inventory shall be kept current. The Co-Permittee shall ensure that all floor drains discharge to appropriate locations. Within 180 days of receiving coverage from this Permit, all Co-Permittees shall develop an inventory including a map of all storm drains located on the property of all Co-Permittee-owned or operated buildings and facilities. The Co-Permittee shall ensure that only storm water is allowed into these drains and that the appropriate BMPs are in place to minimize pollutants from entering the MS4.

4.2.6.4.2 Material storage areas, heavy equipment storage areas and maintenance areas. Co-Permittees shall develop and implement SOPs to protect water quality at each of these facilities owned or operated by the Co-Permittee and not covered under the General UPDES Permit for Storm Water Discharges Associated with Industrial Activities.

4.2.6.4.3 Parks and open space. The O & M program shall address, but is not limited to: SOPs for the proper application, storage, and disposal of fertilizer, pesticides, and herbicides including minimizing the use of these products and using only in accordance with manufacturer's instruction; sediment and erosion control; evaluation of lawn maintenance and landscaping activities to ensure practices are protective of water quality such as, proper disposal of lawn clippings and vegetation, and use of alternative landscaping materials such as drought tolerant plants. The SOPs shall address the management of trash containers at parks and other open spaces which include scheduled cleanings and establishing a sufficient number of containers, and for placing signage in areas concerning the proper disposal of pet wastes. The SOPs shall also address the proper cleaning of maintenance equipment, building exterior, trash containers and the disposal of the associated waste and wastewater. Co-Permittees shall implement park and open space maintenance pollution prevention/good housekeeping practices at all park areas, and other open spaces owned or operated by the Co-Permittee.

4.2.6.4.4 Vehicle and Equipment. The O & M program shall address, but it not limited to: SOPs that address vehicle maintenance and repair activities that occur on Co-Permittee-owned or operated vehicles. BMPs should include using drip pans and absorbents under or around leaky vehicles and equipment or storing indoors where feasible. Fueling areas for Co-Permittee-owned or operated vehicles shall be evaluated. If possible, place fueling areas under cover in order to minimize exposure. The O & M program shall include SOPs to ensure that vehicle wash waters are not discharged to the MS4 or surface waters. This Permit strictly prohibits such discharges.

4.2.6.4.5 Roads, highways, and parking lots. The O & M program shall address, but it not limited to: SOPs and schedule for sweeping streets and Co-Permittee-owned or operated parking lots and any other BMPs designed to reduce road and parking lot debris and other pollutants from entering the MS4; road and parking lot maintenance, including pothole repair, pavement marking, sealing and repaving; cold weather operations, including plowing, sanding, and application of deicing compounds and maintenance of snow disposal areas; right-of-way maintenance, including mowing,

herbicide and pesticide application; and municipally-sponsored events such as large outdoor festivals, parades or street fairs. The Co-Permittee shall ensure that areas used for snow disposal will not result in discharges to receiving waters.

4.2.6.4.6 Storm water collection and conveyance system. The O & M program shall address, but is not limited to: SOPs and schedule for the regular inspection, cleaning, and repair of catch basins, storm water conveyance pipes, ditches and irrigation canals, culverts, structural storm water controls, and structural runoff treatment and/or flow control facilities. Co-Permittees shall implement catch basin cleaning, storm water system maintenance, scheduled structural BMP inspections and maintenance, and pollution prevention/good housekeeping practices. Co-Permittees should prioritize storm sewer system maintenance, with the highest priority areas being maintained at the greatest frequency. Priorities should be driven by water quality concerns, the condition of the receiving water, the amount and type of material that typically accumulates in an area, or other location-specific factors. All Co-Permittee-owned or operated storm water structural BMPs including but not limited to, swales, retention/detention basins or other structures shall be inspected annually to ensure that they are properly maintained to reduce the discharge of pollutants into receiving waters. Co-Permittees shall develop, ensure, and document proper disposal methods of all waste and wastewater removed from the storm water conveyance system. These disposal methods apply to, but are not limited to, street sweeping and catch basin cleaning. Materials removed from the MS4 should be dewatered in a contained area and discharged to the local sanitary sewer (with approval of local authorities) where feasible. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Any other treatment and disposal measures shall be reviewed and approved by the Division. Some materials removed from storm drains and open channels may require special handling and disposal, and may not be authorized to be disposed of in a landfill.

4.2.6.4.7. Other facilities and operations Co-Permittees shall identify any facilities and operations not listed above that would reasonably be expected to discharge contaminated runoff, and develop, implement, and document the appropriate BMPs to protect water quality from discharges from these sites in the O & M program.

4.2.6.5. If a Co-Permittee contracts with a third-party to conduct municipal maintenance or allows private developments to conduct their own maintenance, the contractor shall be held to the same standards as the Co-Permittee. This expectation shall be defined in contracts between the Co-Permittee and its contractors or the contractors of private developments. The Co-Permittee shall be responsible for ensuring, through contractually-required documentation or periodic site visits that contractors are using appropriate storm water controls and following the standard operating procedures, storm water control measures, and good housekeeping practices of the Co-Permittee.

4.2.6.6 An O & M program designed for Co-Permittee-owned or operated facilities shall include the following inspections:

4.2.6.6.1 Weekly visual inspections: The Co-Permittee shall perform weekly visual inspections of "high priority" facilities in accordance with the developed SOPs to minimize the potential for pollutant discharge. The Co-Permittee shall look for evidence of spills and immediately clean them up to prevent contact with precipitation or runoff. The weekly inspections shall be tracked in a log for every facility and records kept with

the SWMP document. The inspection log should also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

4.2.6.6.2 Quarterly comprehensive inspections: At least once per quarter, a comprehensive inspection of "high priority" facilities, including all storm water controls, shall be performed, with specific attention paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar pollutant-generating areas. The quarterly inspection results shall be documented and records kept with the SWMP document. This inspection shall be done in accordance with the developed SOPs. An inspection report shall also include any identified deficiencies and the corrective actions taken to remedy the deficiencies.

4.2.6.6.3 Quarterly visual observation of storm water discharges: At least once per quarter, the Co-Permittee shall visually observe the quality of the storm water discharges from the "high priority" facilities (unless climate conditions preclude doing so, in which case the Co-Permittee shall attempt to evaluate the discharges four times during the wet season). Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls shall be remedied to prevent discharge to the storm drain system. Visual observations shall be documented and records kept with the SWMP document. This inspection shall be done in accordance with the developed SOPs. The inspection report shall also include any identified deficiencies and the corrective actions taken to remedy the deficiencies.

4.2.6.7. The Co-Permittee shall develop and implement a process to assess the water quality impacts in the design of all new flood management structural controls that are associated with the Co-Permittee or that discharge to the MS4. This process shall include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while still meeting project objectives. A description of this process shall be included in the SWMP document

4.2.6.7.1 Existing flood management structural controls shall be assessed to determine whether changes or additions should be made to improve water quality. A description of this process and determinations should be included in the SWMP document.

4.2.6.8. Construction Projects. Public construction projects shall comply with the requirements applied to private projects. All construction projects disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, owned or operated by the Co-Permittee are required to be covered under the General UPDES Permit for Storm Water Discharges Associated with Construction Activities. All public projects approved after the effective date of this Permit shall include construction and post-construction controls selected and implemented pursuant to the requirements in Parts 4.2.4. and 4.2.5.

4.2.6.9. Co-Permittees shall provide training for all employees who have primary construction, operation, or maintenance job functions that are likely to impact storm water quality. The Co-Permittee shall identify target employees to participate in the training sessions. Training shall be conducted annually, at a minimum, and shall address the importance of protecting water quality, the requirements of this Permit, operation and maintenance requirements, inspection procedures, ways to perform their job activities to prevent or minimize impacts to water quality, SOPs for the various Co-Permittee-owned or operated facilities and procedures for reporting water

quality concerns, including potential illicit discharges. Follow-up training shall be provided as needed to address changes in procedures, methods or staffing. Co-Permittees shall document and maintain records of the training provided and the staff in attendance.

4.3. Industrial and High Risk Runoff (Phase I Co-Permittee Only)

Phase I Co-Permittee (Salt Lake County) shall continue to develop and implement an inspection and oversight program to monitor and control pollutants in storm water discharges to the MS4 from industrial facilities. Phase I regulations specify that several key elements shall be included in Phase I storm water management programs. These elements include: adequate legal authority to require compliance and inspect sites, inspection of priority industrial and commercial facilities, establishing control measure requirements for facilities that may pose a threat to water quality, and enforcing storm water requirements. The following permit requirements apply to only Phase I Co-Permittee (Salt Lake County):

4.3.1. The Phase I Co-Permittee shall maintain an inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could discharge pollutants in storm water to the MS4. The inventory shall be updated annually, at a minimum, and made available for review by the Division upon request.

4.3.1.1. The inventory shall include the following minimum information for each industrial and commercial site/source:

- Name
- Address
- Physical location of storm drains and other conveyance structures receiving discharge
- Name of receiving water
- Pollutants potentially generated by the site/source
- Identification of whether the site/source is (1) tributary to an impaired water body segment (i.e., whether it is listed under Section 303(d) of the Clean Water Act) and (2) whether it generates pollutants for which the water body segment is impaired.
- A narrative description including the standard industrial classification (SIC) codes, which best reflects the principal products or services provided by each facility.

4.3.1.2. At a minimum, the following sites/sources shall be included in the inventory:

Commercial Sites/Sources:

- Automobile and other vehicle body repair or painting
- Automobile (or other vehicle) parking lots and storage facilities
- Automobile repair, maintenance, fueling, or cleaning
- Building material retailers and storage
- Cement mixing or cutting
- Eating or drinking establishments (e.g., restaurants), including food markets
- Equipment repair, maintenance, fueling, or cleaning
- Golf courses, parks and other recreational areas/facilities
- Landscaping
- Masonry

- Mobile automobile or other vehicle washing
- Mobile carpet, drape or furniture cleaning
- Nurseries and greenhouses
- Painting and coating
- Pest control services
- Pool and fountain cleaning
- Portable sanitary services
- Power washing services
- Retail or wholesale fueling

Industrial Sites/Sources

- Industrial Facilities, as defined at 40 CFR 122.26(b)(14), including those subject to the Multi Sector General Permit or individual UPDES permit
- Facilities subject to Title III of the Superfund Amendments and Reauthorization Act (SARA)
- Hazardous waste treatment, disposal, storage and recovery facilities

4.3.1.3. All other commercial or industrial sites/sources tributary to an impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired.

4.3.1.4. All other commercial or industrial sites/sources that the Co-Permittee determines may contribute a significant pollutant load to the MS4 including those that the Co-Permittee may have a history of past water quality problems.

4.3.2. The Co-Permittee shall require industrial and commercial facilities listed in the inventory included in Part 4.3.1.2. to select, install, implement, and maintain storm water control measures as necessary to minimize storm water pollution.

4.3.2.1. The Co-Permittee is required to notify industrial and commercial sites of any control measure requirements pertaining to their site and their responsibility to implement and comply with the requirements.

4.3.2.2. The Co-Permittee may need to require industrial and commercial facilities that discharge into impaired waterbodies to implement additional controls as necessary to prevent the discharge of pollutants of concern.

4.3.3. The Co-Permittee shall prioritize all facilities on the basis of the potential for water quality impact using criteria such as pollutant sources on site, pollutants of concern, proximity to a water body, and violation history of the facility.

4.3.3.1. The Co-Permittee shall describe in its SWMP document the process for prioritizing facilities.

4.3.4. The Co-Permittee is required to conduct inspections of all industrial and commercial facilities at least once during this Permit term with the highest priority facilities receiving more frequent inspections.

4.3.4.1. For facilities with no exposure of commercial or industrial activities to storm water, no inspections are required. However, the Co-Permittee shall continue to track these facilities for significant change in the exposure of their operations to storm water.

4.3.4.2. All industrial and commercial facility inspections shall at a minimum:

- Evaluate the facility's compliance with this permit's Part 4.3.2. requirement to select, design, install, and implement storm water control measures;
- Conduct a visual observation for evidence of unauthorized discharges, illicit connections, and potential discharge of pollutants to storm water;
- Verify whether the facility is required to be authorized under the UPDES Multi-Sector General Permit (MSGP) for Storm Water Discharges Associated with Industrial Activities and whether the facility has in fact obtained such permit coverage;
- Evaluate the facility's compliance with any other relevant local storm water requirements;

4.3.4.3. At a minimum, the Co-Permittee shall document the following for each inspection:

- The inspection date and time;
- The name(s) and signature(s) of the inspectors;
- Weather information and a description of any discharges occurring at the time of the inspection;
- Any previously unidentified discharges of pollutants from the site;
- Any control measures needing maintenance or repairs;
- Any failed control measures that need replacement;
- Any incidents of noncompliance observed; and
- Any additional control measures needed to comply with this permit's requirements.

4.3.4.4. Inspection findings shall be tracked to ensure inspections are conducted at a frequency consistent with the prioritization process required in Part 4.3.3.1.

4.3.5. The Co-Permittee shall ensure that all necessary follow up inspections and enforcement activities are conducted as necessary to require implementation and maintenance of all storm water control measures.

4.3.6. The Co-Permittee shall ensure that all staff whose primary job duties are implementing the industrial storm water program is trained annually, at a minimum, to conduct facility inspections. The training shall cover what is required under this permit in terms of storm water control measures, the requirements of the Multi-Sector General Permit for Discharges Associated with Industrial Activities or other related local requirements, the Co-Permittee's site inspection and documentation protocols, and enforcement procedures. Co-Permittees shall document and maintain records of the training provided and the staff the staff in attendance.

4.4. Sharing Responsibility

4.4.1. Implementation of one or more of the six minimum measures may be shared with another entity, or the entity may fully take over the measure. A Co-Permittee may rely on another entity only if:

4.4.2. The other entity, in fact, implements the control measure;

4.4.3. The particular control measure, or component of that measure, is at least as stringent as the corresponding Permit requirement; and

4.4.4. The other entity agrees to implement the control measure through a written agreement. This obligation shall be maintained as part of the description given in the Co-Permittee's SWMP document. If the other entity agrees to report on the minimum control measure, the Co-Permittee shall supply the other entity with the reporting requirements contained in Part 5.6. of this Permit. If the other entity fails to implement the control measure, then the Co-Permittee remains liable for any discharges due to that failure to implement.

4.5. Reviewing and Updating Storm Water Management Programs

4.5.1. Storm Water Management Program Review*:* All Co-Permittees shall conduct, at a minimum, an annual review of the SWMP document in conjunction with preparation of the annual report required in Part 5.6. This annual review shall include:

4.5.1.1. A review of the status of program implementation and compliance (or non-compliance) with the schedule of compliance contained in the SWMP;

4.5.1.2. A review of any revision or change of BMPs in the reporting year and assessment of the change or revision for effectiveness;

4.5.1.3. An overall assessment of the goals and direction of the SWMP and effectiveness of BMPs including an assessment of any SWMP modifications needed to comply with the Clean Water Act section 402(p)(3)(B)(iii) requirement to reduce the discharge of pollutants to the maximum extent practicable (MEP);

4.5.1.4. For Phase I Co-Permittee, Salt Lake County, a review of monitoring data, any changes in monitoring methods and parameters, considerations for how to change monitoring to improve information gathered from data, considerations about what kind of information is most useful for assessing storm water, and another look at what or how assessments can be made to track water quality as impacted by storm water.

4.5.2. *Storm Water Management Program Update:* A Co-Permittee may change the SWMP document during the life of the Permit in accordance with the following procedures:

4.5.2.1. Changes to the SWMP document may be made at any time provided written notification is submitted to the Division and subsequently approved by the Division.

4.5.2.2. Changes replacing an ineffective or unfeasible BMP specifically identified in the SWMP document with an alternate BMP may be adopted at any time, provided the analysis is clearly outlined and subsequently approved by the Division. An analysis shall include:

4.5.2.2.1 An explanation of why the BMP is ineffective or infeasible,

4.5.2.2.2 Expectations or report on the effectiveness of the replacement BMP, and

4.5.2.2.3 An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced, or has achieved those goals.

4.5.3. Change requests or notifications shall be made in writing and signed in accordance with Part 6.8.

4.5.4. Change requests or notifications will receive confirmation and approval or denial in writing from the Division.

4.5.5. Storm Water Management Program Updates required by the Division: The Division may require changes to the SWMP as needed to:

4.5.5.1. Address impacts on receiving water quality caused, or contributed to, by discharges from the MS4;

4.5.5.2. Include more stringent requirements necessary to comply with new Federal regulatory requirements; or

4.5.5.3. Include such other conditions deemed necessary by the Division to comply with the goals and requirements of the Clean Water Act.

5.0 Narrative Standard, Monitoring, Recordkeeping and Reporting

5.1. Narrative Standard

It shall be unlawful, and a violation of this Permit, for the Co-Permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste, or conditions which produce undesirable aquatic life or which produces objectionable tastes in edible aquatic organisms; or concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.

5.2. General Monitoring and Sampling Requirements

5.2.1. **Wet Weather Monitoring**: Co-Permittees with jurisdictions within Phase I areas shall implement a wet weather monitoring program that is appended to this Permit in Appendix III. The program may be modified provided the modification (s) meets the requirements of this section and Part 1.6.4. The Co-Permittee shall meet the objectives of the monitoring program as listed below:

5.2.1.1. Assess storm water impacts to in-stream water quality, hydrology, geomorphology, habitat, and biology;

5.2.1.2. Provide data to estimate annual cumulative pollutant loadings from the MS4;

5.2.1.3. Estimate event mean concentrations and pollutants in discharges from major outfalls;

5.2.1.4. Identify and prioritize portions of the MS4 requiring additional controls, and;

5.2.1.5. Identify water quality improvements or degradation.

5.2.2. Phase I Co-Permittee, Salt Lake County, shall select at least four monitoring locations. The four locations should serve to best characterize the purpose of the objective listed above and be representative of the area covered by the Permit and be within the Co-Permittee's jurisdiction.

5.2.2.1. The latest version of Salt Lake County's *Sampling Plan for Representative Storm Monitoring ("the sampling plan")* shall be placed in Appendix III within 90 days of issuance of this Permit. The *Sampling Plan for Representative Storm Monitoring* shall attempt to address monitoring of a representative storm for the area.

5.2.2.2. Phase I Co-Permittee, Salt Lake County, may modify the sampling plan and submit the modified plan for approval by the *Executive Secretary*. All modifications to the sampling plan shall be approved by the *Executive Secretary*.

5.2.2.3. The minimum monitoring to be conducted each year shall be a planned wet weather monitoring frequency of twice a year, subject to the occurrence of appropriate storm events. If the Co-Permittee is not able to accomplish the planned monitoring frequency the Co-Permittee shall submit detailed reasons and weather data showing why it was not possible.

5.2.2. **Dry Weather Screening:** Phase I Co-Permittee, Salt Lake County, shall continue its dry weather screening efforts and include the latest version of its *Sampling Plan for Dry Weather Screening* in Appendix III and submitted to the *Executive Secretary* within 90 days of issuance of this Permit.

5.2.2.1. The *Sampling Plan for Dry Weather Screening* shall include the screening methodology used for screening all outfalls of the MS4 at least once during the permit term. The inventory of outfalls and associated maps shall be kept current. Phase I Co-Permittee, Salt Lake County, must also comply with the requirements of Part 4.2.3.3.2 of this Permit and address priority areas identified in Part 4.2.3.3.1 to detect illicit discharges within one year of receiving coverage from this Permit, and

field assessing an additional 20 percent of the identified high priority water bodies or other high priority area each year thereafter.

5.2.3. Phase I Co-Permittee, Salt Lake County, shall at a minimum, annually train all staff involved with Wet Weather Monitoring and Dry Weather Screening. The Co-Permittee shall document and maintain records of the training provided and the staff in attendance.

5.3. Analytical Monitoring

Phase II Co-Permittees are not required to conduct analytical monitoring (see definition in Part 7.3) during the effective term of this Permit, with the following exceptions:

5.3.1. Water quality sampling may be required for compliance with TMDLs, pursuant to Part 3.1. of this Permit.

5.3.2. Sampling or testing may be required for characterizing illicit discharges pursuant to Parts 4.2.3.4., 4.2.3.5., and 4.2.3.5.1 of this Permit.

5.3.3. In the event that the Phase II MS4 elects to conduct analytical monitoring as part of its Storm Water Management Program, the Co-Permittee is required to comply with Part 6.18. of this Permit.

5.4. Non-analytical Monitoring

5.4.1. Non-analytical monitoring (see definition in Part 7.32.) such as visual dry weather screening is required to comply with Part 4.2.3.3.2 of this Permit.

5.5. Record keeping

5.5.1. Co-Permittees shall keep all supplementary documents associated with this Permit (e.g., Storm Water Management Program (SWMP) document, SWMP Implementation Schedule) current and up to date to achieve the purpose and objectives of the required document.

5.5.2. All modifications to supplementary documents shall be submitted to the *Division* in accordance with Parts 4.5. and 6.8.

5.5.3. The *Division* may at any time make a written determination that parts or all of the supplementary documents are not in compliance with this Permit, wherein the Co-Permittee shall make modifications to these parts within a time frame specified by the *Division*.

5.5.4. The Co-Permittee shall retain all required plans, records of all programs, records of all monitoring information, copies of all reports required by this Permit, and records of all other data required by or used to demonstrate compliance with this Permit, for at least five years from the date of the record. This period may be explicitly modified

by alternative provisions of this Permit or extended by request of the *Division* at any time.

5.5.5. The Co-Permittee shall make records, including the Notice of Intent (NOI) and the SWMP document, available to the public if requested.

5.6. Reporting

5.6.1. Each Co-Permittee shall submit an annual report to the Division by October 1 of each year of the Permit term using the report form provided on the Division's website.

5.6.2. In addition to the annual report forms, the following information shall also be included:

- Appendix I: Co-Permittee Identification and Accountability
- Appendix II: Current Storm Water Management Program (for each MS4 listed in Appendix I) which reflects any modifications as a result of the minimal annual review required in Part 4.5.1.).
- Appendix III: Storm Water Wet and Dry Weather Monitoring Plans as applicable
- The status and assessment of BMP implementation as stated in the SWMP and the assessment of effectiveness of BMPs.
- A summary of data collected for both wet weather and dry weather monitoring that is accumulated throughout the reporting year. The summary must include conclusions concerning what is shown by the data and how objectives of the permit are being or are not being met.

5.6.2.1. The Phase I Co-Permittee, Salt Lake County shall continue to submit a summary of five years of wet weather monitoring and assess trends and make conclusions (This timeframe takes into account the previous Permit conditions and reporting requirements, some of the data was required by the previous Permit term).

5.6.3. Each Co-Permittee shall sign and certify the annual report in accordance with Part 6.8.

5.6.4. Signed copies of the Annual Report and all other reports required herein, shall be submitted to:

Department of Environmental Quality
Division of Water Quality
PO Box 144870
195 North 1950 West
Salt Lake City, UT 84114-4870

5.7. Legal Authority

Each Co-Permittee shall insure legal authority exists to control discharges to and from those portions the MS4 over which it has jurisdiction. This legal authority may be a combination of

statute, ordinance, Permit, contract, order or inter-jurisdictional agreements with co-applicants with existing legal authority to:

5.7.1. Control the contribution of pollutants to the MS4 by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity (including construction activity);

5.7.2. Effectively prohibit illicit and non-storm water discharges through ordinance, or other regulatory mechanism, into the MS4 and shall be able to implement appropriate enforcement procedures and actions;

5.7.3. Control the discharge of spills and the dumping or disposal of materials other than storm water into the MS4;

5.7.4. Control through interagency agreements among Co-Permittees the contribution of pollutants from one portion of the MS4 to another;

5.7.5. Require compliance with conditions in ordinances, permits, contract or orders; and

5.7.6. Conduct all inspection, surveillance and monitoring activities and procedures necessary to determine compliance with conditions in this Permit.

6.0 Standard Permit Conditions

6.1. Duty to Comply

The Permittee shall comply with all conditions of this Permit. Any Permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. The Permittee shall give advance notice to the Division of any planned changes in the Permitted facility or activity, which may result in noncompliance with Permit requirements.

6.2. Penalties for Violations of Permit Conditions

The *Act* provides that any person who violates a Permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates Permit conditions or the Act is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day.

6.3. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee shall apply for and obtain a new Permit. The application shall be submitted at least 180 days before the expiration date of this Permit. Continuation of expiring Permits shall be governed by regulations promulgated at *UAC R317-8-5* and any subsequent amendments.

6.4. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit.

6.5. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

6.6. Duty to Provide Information

The Permittee shall furnish to the Division, within a time specified by the Division, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Division, upon request, copies of records required to be kept by this Permit.

6.7. Other Information

When the Permittee becomes aware that it failed to submit any relevant facts in a Permit application, or submitted incorrect information in a Permit application or any report to the Division, it shall promptly submit such facts or information.

6.8. Signatory Requirements

All notices of intent, storm water management programs, storm water pollution prevention plans, reports, certifications or information either submitted to the *Division* or that this Permit requires to be maintained by the Permittee, shall be signed, dated and certified as follows:

6.8.1. All Permit applications shall be signed by either a principal executive officer or ranking elected official.

6.8.2. All reports required by the Permit and other information requested by the Division shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

6.8.2.1. The authorization is made in writing by a person described above and submitted to the Division, and,

6.8.2.2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

6.8.2.3. Changes to authorization. If an authorization under *Part 6.8.2.* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *Part 6.8.2.* shall be submitted to the Division prior to or together with any reports, information, or applications to be signed by an authorized representative.

6.8.3. *Certification.* Any person signing documents under this Part shall make the following certification:

"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 gathered and evaluated 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."

6.9 Availability of Reports

Except for data determined to be confidential under the Government Records Access and Management Act (*see* particularly Utah Code Ann. § 63-2-309) and Utah Code Ann. § 19-1-3-6, all reports prepared in accordance with the terms of this Permit shall be available for public inspection at the office of the Division. As required by the *Act*, Permit applications, Permits and effluent data shall not be considered confidential.

6.10. Penalties for Falsification of Reports

The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both. Utah Code Ann. § 19-5-115(4)

6.11. Penalties for Tampering

The *Act* provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this Permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

6.12. Oil and Hazardous Substance Liability

Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under the "*Act*".

6.13. Property Rights

The issuance of this Permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or Local laws or regulations.

6.14. Severability

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Permit shall not be affected thereby.

6.15. Requiring a Different Permit

The *Division* may require the Permittee authorized by this Permit to obtain an individual *UPDES* Permit. Any interested person may petition the *Division* to take action under this paragraph. The *Division* may require the Permittee authorized to discharge under this Permit to apply for an individual *UPDES* Permit only if the Permittee has been notified in writing that a Permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form (as necessary), a statement setting a deadline for the Permittee to file the application, and a statement that on the effective date of the municipal *UPDES* Permit, coverage under this Permit shall automatically terminate. Permit applications shall be submitted to the address of the *Division of Water Quality* shown in *Part 5.5.* of this Permit. The *Division* may grant additional time to submit the application upon request of the applicant. If the municipality fails to submit in a timely manner a municipal *UPDES* Permit application as required by the *Division*, then the applicability of this Permit to the Permittee is automatically terminated at the end of the day specified for application submittal.

6.16. State/Federal Laws

Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Clean Water Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.

6.17. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit and with the requirements of the SWMP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by the Permittee only when necessary to achieve compliance with the conditions of the Permit.

6.18. Monitoring and Records

6.18.1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

6.18.2. The Permittee shall retain records of all monitoring information including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of the reports required by this Permit, and records of all data used to complete the application for this Permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the *Division* at any time.

6.18.3. Records of monitoring information shall include:

6.18.3.1 The date, exact place, and time of sampling or measurements;

6.18.3.2 The name(s) of the individual(s) who performed the sampling or measurements;

6.18.3.3 The date(s) and time(s) analyses were performed;

6.18.3.4 The name(s) of the individual(s) who performed the analyses;

6.18.3.5 The analytical techniques or methods used; and

6.18.3.6 The results of such analyses.

6.19. Monitoring Procedures

Monitoring shall be conducted according to test procedures approved under *40 CFR Part 136*, unless other test procedures have been specified in this Permit.

6.20. Inspection and Entry

The Permittee shall allow the *Division* or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

6.20.1. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted or where records shall be kept under the conditions of this Permit;

6.20.2. Have access to and copy at reasonable times, any records that shall be kept under the conditions of this Permit; and

6.20.3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

6.20.4. Sample or monitor at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by law, any substances or parameters at any location.

6.21. Permit Actions

This Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Permit modification, revocation and re-issuance, or termination, or

a notification of planned changes or anticipated noncompliance does not stay any Permit condition.

6.22. Storm Water-Reopener Provision

At any time during the duration (life) of this Permit, this Permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "Waters-of-State".

7.0 Definitions

Definitions related to this Permit and small municipal separate storm sewers (MS4s).

7.1. "40 CFR" refers to Title 40 of the Code of Federal Regulations, which is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal government.

7.2. "Act" means the *Utah Water Quality Act*.

7.3. "Analytical monitoring" refers to monitoring of waterbodies (streams, ponds, lakes, etc.) or of storm water, according to UAC R317-2-10 and 40 CFR 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants," or to State or Federally established protocols for biomonitoring or stream bioassessments.

7.4. "Beneficial Uses" means uses of the Waters of the State, which include but are not limited to: domestic, agricultural, industrial, recreational, and other legitimate beneficial uses.

7.5. "Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

7.6. "CWA" means *The Clean Water Act of 1987*, formerly referred to as the Federal Water Pollution Control Act.

7.7. "Co-Permittee" means any operator of a regulated Small MS4 that is applying jointly with another applicant for coverage under this Permit. A Co-Permittee owns or operates a regulated Small MS4 located within or adjacent to another regulated MS4. A Co- Permittee is only responsible for complying with the conditions of this Permit relating to discharges from the MS4 the Co-Permittee owns or operates. See also 40 CFR 122.26(b)(1).

7.8. "Control Measure" refers to any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to Waters of the State.

7.9. "Common plan of development or sale" means one plan for development or sale, separate parts of which are related by any announcement, piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, plat, blueprint, contract, Permit application, zoning request, computer design, etc.), physical demarcation (including contracts) that identify the scope of the project. A plan may still be a common plan of development or sale even if it is taking place in separate stages or phases, is planned in combination with other construction activities, or is implemented by different owners or operators.

7.10. "Director" means the director of the Utah Division of Water Quality, otherwise known as the Executive Secretary of the Utah Water Quality Board.

7.11. "Division" means the Utah Division of Water Quality.

7.12. "Discharge" for the purpose of this Permit, unless indicated otherwise, refers to discharges from the Municipal Separate Storm Sewer System (MS4).

7.13. "Dry weather screening" is monitoring done in the absence of storm events to discharges representing, as much as possible, the entire storm drainage system for the purpose of obtaining information about illicit connections and improper dumping.

7.14. "Escalating enforcement procedures" refers to a variety of enforcement actions in order to apply as necessary for the severity of the violation and/or the recalcitrance of the violator.

7.15. "Entity" means a governmental body or a public or private organization.

7.16. "EPA" means the United States Environmental Protection Agency.

7.17. "General Permit" means a Permit which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual Permits being issued to each discharger.

7.18. "Ground water" means water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

7.19. "High quality waters" means any water, where, for a particular pollutant or pollutant parameter, the water quality exceeds that quality necessary to support the existing or designated uses, or which supports an exceptional use.

7.20. "Illicit connection" means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

7.21. "Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a UPDES Permit (other than the UPDES Permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

7.22. "Impaired waters" means any segment of surface waters that has been identified by the Division as failing to support classified uses. The Division periodically compiles a list of such waters known as the 303(d) List.

7.23. "Indian Country" is defined as in 40 CFR §122.2 to mean:

7.23.1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;

7.23.2. All dependent Indian communities within the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and

7.23.3. All Indian allotments, the Indian titles to which have not been extinguished, including right-of-ways running through the same.

7.24. "Large MS4" *Large municipal separate storm sewer system* means all municipal separate storm sewers that are located in an incorporated place with a population of 250,000 or more as determined by the current Decennial Census by the Bureau of the Census.

7.25. "Low Impact Development" (LID) is an approach to land development (or re-development) that works with nature to more closely mimic pre-development hydrologic functions. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product. There are many practices that have been used to adhere to these principles such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements.

7.26. "MS4" is an acronym for "municipal separate storm sewer system".

7.27. "Maximum Extent Practicable" (MEP) is the technology-based discharge standard for Municipal Separate Storm Sewer Systems established by paragraph 402(p)(3)(B)(iii) of the Federal Clean Water Act (CWA), which reads as follows: "Permits for discharges from municipal storm sewers shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system, design, and engineering methods, and other such provisions as the Administrator or the State determines appropriate for the control of such pollutants."

7.28. "Medium MS4" *Medium municipal separate storm sewer system* means all municipal separate storm sewers that are located in an incorporated place with a population of 100,000 or more but less than 250,000, as determined by the1990 Decennial Census by the Bureau of the Census

7.29. "Monitoring" refers to tracking or measuring activities, progress, results, etc.;

7.30. "Municipal separate storm sewer system" means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) pursuant to paragraphs R317-8-1.6(4), (7), & (14), or designated under UAC R317-8-3.9(1)(a)5:

7.30.1. that is owned or operated by a state, city, town, county, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of wastes, storm water, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the CWA that discharges to Waters of the State;

7.30.2. that is designed or used for collecting or conveying storm water;

7.30.3. which is not a combined sewer; and

7.30.4. which is not part of a Publicly Owned Treatment Works (POTW) as defined in 40 CFR 122.2.

7.31. "NOI" is an acronym for "Notice of Intent" to be covered by this Permit and is the mechanism used to "register" for coverage under a general Permit.

7.32. "Non-analytical monitoring" refers to monitoring for pollutants by means other than UAC R317-2-10 and 40 CFR 136, such as visually or by qualitative tools that provide comparative or rough estimates.

7.33. "Operator" is the person or entity responsible for the operation and maintenance of the MS4.

7.34. "Outfall" means a point source as defined by UAC R317-8-1.5(34) at the point where a municipal separate storm sewer discharges to Waters of the State and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other Waters of the State and are used to convey waters of the State.

7.35. "Phase II areas" means areas regulated under UPDES storm water regulations encompassed by Small MS4's (see definition 7.39.).

7.36. "Priority construction site" means a construction site that has potential to threaten water quality when considering the following factors: soil erosion potential; site slope; project size and type; sensitivity of receiving waterbodies; proximity to receiving waterbodies; non-storm water discharges and past record of non-compliance by the operators of the construction site.

7.37. "Redevelopment" is the replacement or improvement of impervious surfaces on a developed site.

7.38. "Runoff" is water that travels across the land surface, or laterally through the ground near the land surface, and discharges to water bodies either directly or through a collection and conveyance system. Runoff includes storm water and water from other sources that travels across the land surface.

7.39. "SWMP" is an acronym for storm water management program. The SWMP document is the written plan that is used to describe the various control measures and activities the Permittee will undertake to implement the storm water management plan.

7.40. "SWPPP" is an acronym for storm water pollution prevention plan.

7.41. "Small municipal separate storm sewer system" is any MS4 not already covered by the Phase I program as a medium or large MS4. The Phase II Rule automatically covers on a nationwide basis all Small MS4s located in "urbanized areas" (UAs) as defined by the Bureau of the Census (unless waived by the UPDES Permitting authority), and on a case-by-case basis those Small MS4s located outside of UAs that the UPDES Permitting authority designates.

7.41.1. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

7.42. "SOP" is an acronym for standard operating procedure which is a set of written instructions that document a routine or repetitive activity. For the purpose of this Permit, SOPs should emphasize pollution control measures to protect water quality.

7.43. "Storm water" means storm water runoff, snowmelt runoff, and surface runoff and drainage.

7.44. "Storm water management program" means a set of measurable goals, actions, and activities designed to reduce the discharge of pollutants from the Small MS4 to the maximum extent practicable and to protect water quality.

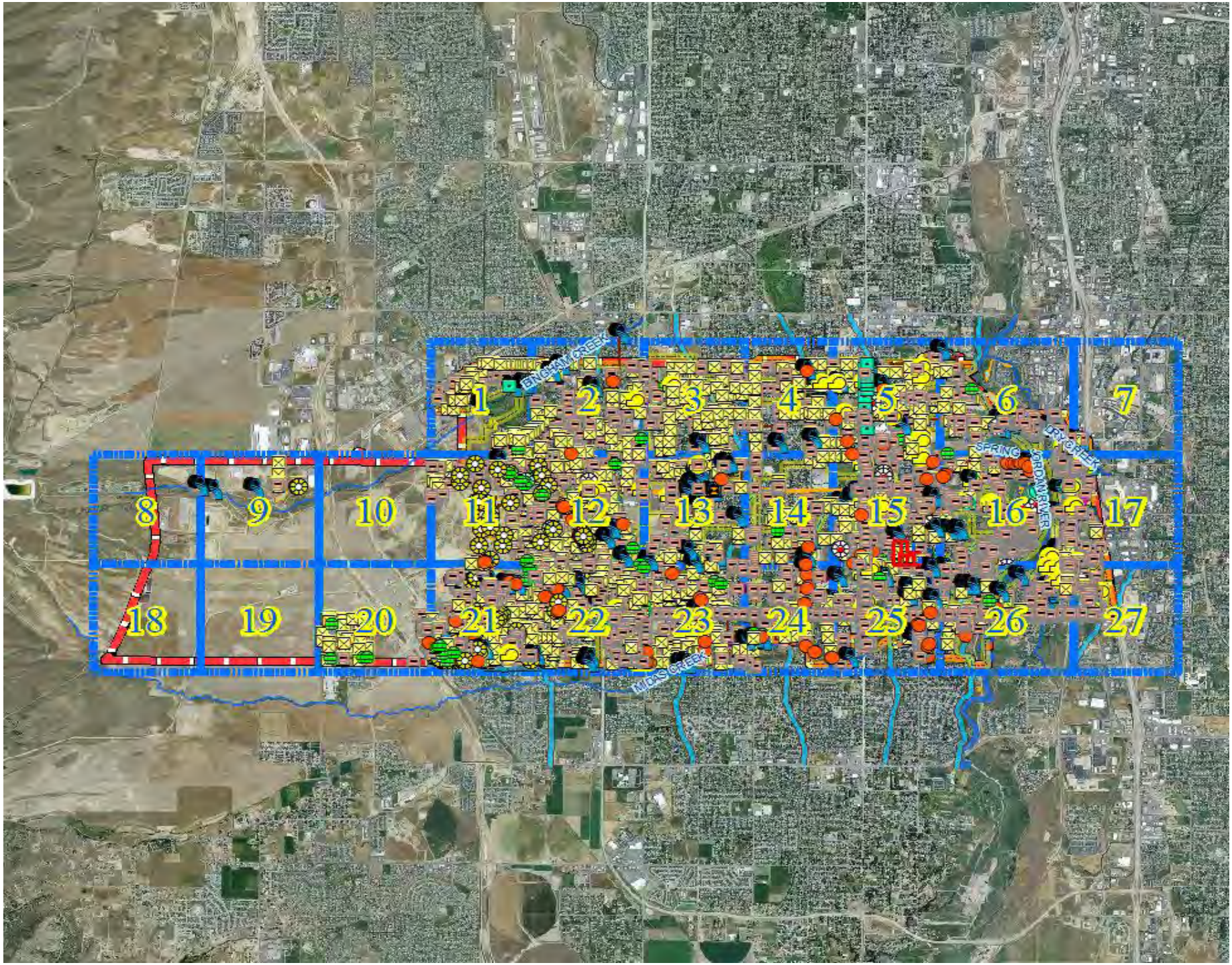
7.45. "TMDL" is an acronym for "Total Maximum Daily Load" and in this Permit refers to a study that: 1) quantifies the amount of a pollutant in a stream; 2) identifies the sources of the pollutant; and 3) recommends regulatory or other actions that may need to be taken in order for the impaired waterbody to meet water quality standards.

7.46. "Urbanized area" is a land area comprising one or more places and the adjacent densely settled surrounding area that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile.

7.47. "Waters of the State" means all streams, lakes, ponds, marshes, water-courses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private which are contained within, flow through, or border upon this state or any portion thereof, except bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife which shall not be considered to be "Waters of the State" under this definition ("UAC" R317-1-1.32).

Appendix F

SOUTH JORDAN
UTAH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JORDAN RIVER
LITTLE CREEK
MOSS CREEK

Appendix G

SOUTH JORDAN
UTAH

County Contract No. PV13166
D.A. No. 13-10564

INTERLOCAL COOPERATION AGREEMENT

between

SALT LAKE COUNTY

and

SOUTH JORDAN CITY

for

Participation as Co-Permittees under
UPDES Permit No. UTS000001
(Jordan Valley Municipalities)

***

THIS AGREEMENT is entered into this ____ day of _____ 20____, by and between SALT LAKE COUNTY (the "COUNTY"), a body corporate and politic of the State of Utah; and SOUTH JORDAN CITY (the "CITY"), a municipal corporation of the State of Utah;

W I T N E S S E T H :

WHEREAS, the parties are public agencies and are therefore authorized by the Utah Interlocal Cooperation Act, Section 11-13-1, et seq., UTAH CODE ANN., to enter into agreements with each other for joint or cooperative action; and

WHEREAS, the Environmental Protection Agency has published its "Final Rule" setting forth the National Pollutant Discharge Elimination Systems permit application rules and regulations for stormwater discharges to municipal separate storm sewer systems; and

WHEREAS, the State of Utah, through its Department of Environmental Quality, Division of Water Quality, has statutory rulemaking authority and authority to issue pollutant discharge elimination system permits within the State of Utah pursuant to the rules and regulations of the Utah Pollutant Discharge Elimination System ("UPDES"); and

WHEREAS, the rules and regulations provide that where more than one public entity owns or operates a municipal separate storm sewer within a geographic area (including adjacent or interconnected municipal separate storm sewer systems), such entities may be co-applicants to the same application and permit renewal; and

WHEREAS, the State of Utah has issued a UPDES permit (Permit No. UTS000001, the "Permit") to the Jordan Valley Municipalities, including the COUNTY and the CITY. A copy of the Permit is attached hereto as Exhibit "A" and incorporated herein; and

WHEREAS, Section 1.5.1.2 of the Permit provides, in addition to the Jordan Valley Municipalities including the COUNTY and the CITY, additional operators of small municipal separate storm sewers within the boundaries of Salt Lake County which sign on during the course of the permit cycle may also be co-permittees under the Permit; and

WHEREAS, the COUNTY and the CITY desire to sign on as co-permittees under the Permit and participate in the Jordan Valley Municipalities UPDES municipal storm water permit program under the terms and conditions set forth in the Permit and in this Agreement; and

WHEREAS, the parties now desire to enter into this Agreement setting forth their present understanding as to their respective responsibilities with regard to their participation as co-permittees under the Permit;

NOW, THEREFORE, in consideration of the mutual promises set forth herein, the parties agree as follows:

AGREEMENT

1. The COUNTY and the CITY agree to be co-permittees under the existing Permit for the geographic area, which includes all of the municipal separate storm water systems

belonging to and operated by the parties to this Agreement as described in Section 1.2.1 of the Permit and in "Exhibit B."

2. As co-permittees, each party agrees to implement and enforce within its own jurisdiction its own responsibilities for complying with the Permit requirements including, but not limited to, those responsibilities and requirements listed in the Co-Permittee Accountability statement. The Co-Permittee Accountability statement is attached hereto as Exhibit "C" and incorporated herein.

3. Each party shall be responsible to pay the costs relating to its own stormwater systems. The parties shall reimburse each other for expenses incurred in providing services for each other as may be agreed by the parties concerning the various tasks and responsibilities required under the Permit. Detailed services to be provided and reimbursement thereof is set forth in the interlocal media agreement, already in place, which is attached hereto as Exhibit "D" and incorporated herein.

4. To the maximum extent possible, the parties agree to assist each other in providing and sharing information, maps, data, drawings, plans and other resources necessary to comply with the Permit requirements. Co-permittes may also collaborate on projects, programs and control measures as may be required in Sections 1.6.1.2, 1.6.1.3 and 4.4 of the Permit. Exhibit "C" will be amended as necessary to include specific assignments.

5. The parties agree the duration of this Agreement shall commence upon entry and shall run concurrent with the duration of the Permit, which expires at midnight on September 4, 2018. The parties agree that this Agreement shall not apply to any subsequent permits or co-permits unless the parties agree in writing to extend this Agreement.

6. No separate entity is created by this Agreement; however, to the extent that any

administration of this Agreement becomes necessary, then the Public Works Director or City Engineer of each party, or their designees, shall constitute a joint board for such purpose.

7. In the event any property is jointly acquired and paid for by the parties for this undertaking, then it shall be divided as the parties' representatives shall agree; or, if no agreement is reached, then it shall be divided according to their respective payments for property; or, if it cannot be practically divided, then the property shall be sold and the proceeds divided according to the parties' proportionate share of the purchase of the item of property. If property is purchased at one party's sole expense in connection with this agreement, then the property so purchased shall be and remain the property of the party which purchased it.

8. This Agreement embodies the entire agreement between the parties hereto and cannot be altered except in a written amendment signed by the parties.

9. Liability and Indemnification. The Parties are governmental entities under the Utah Governmental Immunity Act, UTAH CODE ANN. Section 63G-7, as amended (the "Immunity Act"). There are no indemnity obligations between these parties. Consistent with the terms of the Immunity Act, it is mutually agreed that each Party is responsible and liable for its own wrongful or negligent acts which it commits or which are committed by its agents, officials, or employees. Neither Party waives any defenses or limits of liability available under the Immunity Act and other applicable law. Both parties maintain all privileges, immunities, and other rights granted by the Immunity Act and all other applicable law.

IN WITNESS WHEREOF, the parties hereto execute this Agreement effective as of the day and year first written above.

SALT LAKE COUNTY

By: _____
Mayor or Designee

Approved as to form:

_____
Date: _____

SOUTH JORDAN CITY

By: Joey L Whatcott
Title: Interim City Manager

Approved as to form:
Charity Bruemy
Date: 1/13/2014

EXHIBIT A

STATE OF UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

Authorization to Discharge Municipal Storm Water Under the Utah Pollutant Discharge Elimination System (UPDES)

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 2004, as amended (the "Act"), the Federal Water Pollution Control Act (33 U.S.C. §§ 1251 et. seq., as amended to date), and the rules and regulations made pursuant to those statutes, the

JORDAN VALLEY MUNICIPALITIES, specifically,

SALT LAKE COUNTY, BLUFFDALE CITY, COTTONWOOD HEIGHTS, DRAPER CITY, HERRIMAN CITY, HOLLADAY CITY, MIDVALE CITY, MURRAY CITY, RIVERTON CITY, SANDY CITY, SOUTH JORDAN CITY, SOUTH SALT LAKE CITY, TAYLORSVILLE CITY, WEST JORDAN CITY, AND WEST VALLEY CITY

This Permit shall become effective on September 5, 2013.

This Permit and the authorization to discharge shall expire at midnight, September 4, 2018, except as described in Part 6.3 of this Permit.

Signed this 3 day of September, 2013.

Walter L. Baker, P.E.
Director

UPDES PERMIT FOR DISCHARGES FROM MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4s)

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1.0 Coverage Under this Permit

1.1. Authority to Discharge

This Permit authorizes the discharge, to Waters of the State of Utah, of storm water from Co-Permittees defined in Part 1.2. of this Permit. This authorization is subject to all of the terms and conditions of this Permit. This Permit does not authorize discharges prohibited under Part 1.4. of this Permit.

1.2. Permit Area and Eligibility

1.2.1. This Permit covers all the following separate jurisdictional areas located within Greater Salt Lake County as follows:

1.2.1.1. Areas covered under "Phase I" provisions in this Permit which includes unincorporated Salt Lake County. This permitted area covers all areas within the unincorporated boundary of Salt Lake County served by, or otherwise contributing to discharges from, the municipal separate storm sewer(s) owned or operated by Salt Lake County and also includes all Salt Lake County owned and operated storm drainage facilities ("countywide facilities"); and

1.2.1.2. Areas covered under "Phase II" provisions in this Permit which includes:

1.2.1.2.1 Salt Lake County "countywide" facilities owned and maintained by Salt Lake County that are within Greater Salt Lake County, but outside of the boundaries of Salt Lake City and unincorporated Salt Lake County; and

1.2.1.2.2 Incorporated areas within Salt Lake County, which are defined as small municipal separate storm sewer systems as defined in *Utah Administrative Code* (UAC) R317-8-3.9 and listed below:

- Bluffdale City
- Cottonwood Heights
- Draper City
- Herriman City
- Holladay City
- Midvale City
- Murray City
- Riverton City
- Sandy City
- South Jordan City
- South Salt Lake City
- Taylorsville City
- West Jordan City
- West Valley City

1.2.1.2.3 Additional operators of small municipal separate storm sewers within the boundaries of Salt Lake County, which submit application and are approved for inclusion under the Permit during the course of this Permit cycle.

1.2.1.3. No operator of a Small MS4 described in 40 CFR 122.32 may discharge from that system without authorization from the Executive Secretary. (See Utah Administrative Code Section R317-8-3.9(1)(h)(1)(a), which sets forth the Permitting requirement, and R317-8-1.10(13), which incorporates 40 CFR 122.32 by reference). Authorization to discharge under the terms and conditions of this Permit is granted if:

1.2.1.4. The operator submits a Notice of Intent (NOI) in accordance with Part 2.0 of this Permit;

1.2.1.5. The MS4 is located fully or partially within an urbanized area as determined by the latest Decennial Census by the Bureau of Census;

1.2.1.6. The operator is ordered by the Executive Secretary to obtain coverage under this Permit, as provided in the UPDES rules, R317-8.

1.2.2. The following are types of authorized discharges:

1.2.2.1. *Storm water discharges.* This Permit authorizes storm water discharges to waters of the State from the Small MS4s identified in 1.2.1., except as excluded in Part 1.4.

1.2.2.2. *Non-storm water discharges.* The following non-storm water discharges do not need to be addressed unless the Co-Permittee or the Executive Secretary identifies these discharges as significant sources of pollutants to Waters of the State or as causing or contributing to a violation of water quality standards:

- Water line flushing
- Landscape irrigation
- Diverted stream flows
- Rising ground waters
- Uncontaminated ground water infiltration (as defined at 40 CFR 35.2005(20)) to separate storm sewers
- Uncontaminated pumped ground water
- Discharges from potable water sources
- Uncontaminated footing/foundation drains
- Air conditioning condensate
- Irrigation water
- Springs
- Uncontaminated water from crawl space pumps
- Individual residential car washing
- Flows from riparian habitats and wetlands
- Dechlorinated swimming pool discharges
- Residual street wash water
- Dechlorinated water reservoir discharges
- Discharges or flows from emergency firefighting activity

1.3. Local Agency Authority

This Permit does not pre-empt or supersede the authority of local agencies to prohibit, restrict, or control discharges to storm drain systems or other water courses within their jurisdiction.

1.4. Limitations on Coverage

This Permit does not authorize:

1.4.1. Discharges that are mixed with sources of non-storm water unless such non-storm water discharges are in compliance with a separate UPDES Permit or are determined not to be a substantial contributor of pollutants to Waters of the State.

1.4.2. Storm water discharges associated with industrial activity as defined in *Utah Administrative Code (UAC) R317-8-3.9(6)(c).*

1.4.3. Storm water discharges associated with construction activity as defined in *UAC R317-8-3.9(6)(d)(10)* and *R317-8-3.9(6)(d)(11).*

1.4.4. Storm water discharges currently covered under another Permit.

1.4.5. Discharges that would cause or contribute to in-stream exceedances of water quality standards as contained in *UAC R317-2.*

1.4.6. Discharges of any pollutant into any Waters of the State for which a Total Maximum Daily Load (TMDL) has been approved by EPA unless the discharge is consistent with the TMDL. This consistency determination applies at the time a Notice of Intent is submitted. If conditions change after coverage is issued, the coverage may remain active provided the conditions and requirements of Part 3.1. of this Permit are complied with.

1.4.7. Discharges or discharge-related activities that are likely to jeopardize the continued existence of any species that are listed as endangered or threatened under the Endangered Species Act (ESA) or result in the adverse modification or destruction of habitat that is designated as critical under the ESA. More information regarding endangered species in the State of Utah is available at http://www.fws.gov/mountain-prairie/.

1.4.8. Discharge from an MS4 if the operator has been ordered by the Executive Secretary, as provided in Part 6.15 that it may no longer be covered under this General Permit, and the period established by the Executive Secretary for applying for a UPDES Permit has passed.

1.5. Co-Permittee(s) and Co-Permitee Accountability

1.5.1. The following entities are Co-Permittees covered in this Permit:

1.5.1.1 All entities listed in Permit Parts 1.2.1.1., 1.2.1.2.1, and 1.2.1.2.2, and;

1.5.1.2. Additional operators of small municipal separate storm sewers within the boundaries of Salt Lake County, which submit application and are approved for inclusion under the Permit during the course of this Permit cycle.

Each Co-Permittee is individually accountable for:

1.5.2. Permit compliance for discharges from portions of the MS4 where it is the operator and for areas within its legal jurisdiction, unless another Co-Permittee has agreed in writing to assume that responsibility within the jurisdiction of the Co-Permittee as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.3. Development of a Storm Water Management Program (SWMP) as further described in Part 4.0., in the MS4 area of their jurisdiction, unless another Co-Permittee has agreed to assume that responsibility within the jurisdiction of the Co-Permittee as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.4. Implementation of a SWMP and ensuring that the six minimum control measures described in Part 4.2. are implemented for portions of the MS4 where it is the operator and in areas within its legal jurisdiction, unless another Co-Permittee has agreed to assume that responsibility within the jurisdiction of the Co-Permittee as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.5. Permit compliance (all or part), development of a SWMP (all or part), and implementation of the SWMP (all or part) in an area outside of the Co-Permittees legal municipal jurisdiction if the Co-Permittee has agreed to the added responsibility as described in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.6. Cooperation in compiling any shared portions of the annual reporting requirements listed in Part 5.6., except that a Co-Permittee is individually liable for any parts of the annual report that relate exclusively to portions of the MS4 where it is the operator as specified in Appendix I: *Co-Permittee Identification and Accountability*;

1.5.7. Phase I Co-Permittee, Salt Lake County, shall provide wet weather monitoring as described in Appendix III.

1.5.8. Phase I Co-Permittee, Salt Lake County shall comply with the additional Industrial and High Risk Runoff Permit requirements contained in Part 4.3.

1.6 Documents the Co-Permittees Shall Develop to Append the Permit

The following documents shall be developed and signed (in accordance with Part 6.8. *Signatory Requirements)* by the Co-Permittees, and will append the Permit as enforceable Permit conditions binding on the Co-Permittees:

1.6.1. Appendix I: *Co-Permittee Identification and Accountability* shall contain:

1.6.1.1. A list of all Co-Permittees covered by this Permit, a description of the legal jurisdiction of the Co-Permittees, MS4 boundaries, and the date the Co-Permittee is officially included as a Co-Permittee under this Permit (the Permit shall be modified as a minor modification, not requiring public notice, pursuant to *UAC R317-8-5.6(3)(d)* to officially include additional Co-Permittees);

1.6.1.2. Where Permit compliance and SWMP development and implementation accountability is transferred, all or part, to another Co-Permittee, a description of where (on which Co-Permittee) the accountability falls. The description shall assign clear and distinct accountability to the Co-Permittees involved as to who is responsible for what Permit compliance issues, who is to develop what portions of a SWMP, and who is to implement what portions of the SWMP;

1.6.1.3. Any necessary agreements, contracts, or memorandum of understanding (MOUs) between Co-Permittees and/or other municipal (or non-municipal) entities that affect the implementation and operation of SWMP.

1.6.2. Timing for Development & Inclusions or Exclusions of Co-Permittees:

1.6.2.1. The *Co-Permittee Identification and Accountability* document shall be updated within 30 days of issuance of this Permit;

1.6.2.2. The *Co-Permittee Identification and Accountability* document shall be updated immediately for each new inclusion or exclusion of a Co-Permittee.

1.6.3. Appendix II: *Storm Water Management Program* (for each MS4 listed in *Appendix I*):

1.6.3.1. The purposes, objectives, and the required contents of Appendix II are listed in Part 4.0 of this Permit.

1.6.4. Appendix III: *Storm Water Wet and Dry Weather Monitoring Plans*:

1.6.4.1. The purposes, objectives, and the required contents for Appendix III are listed in Part 5.2 of this Permit.

1.6.4.2. Modifications to this document shall be approved with a signature by the *Division*.

1.6.5. Modification and Maintenance of Appendices:

1.6.5.1. Co-Permittees shall keep the documents in the appendices current and up to date and attempt to achieve the purpose and objectives of the required document;

1.6.5.2. All modifications to the appendix documents shall show proof that it was submitted to the *Division* (a received date stamp from the Division of Water Quality, or verification e-mail from DWQ would be sufficient), and if required, it shall show that it was approved by the *Division* (a signature by the *Division* by an approval statement on the document, a separate letter signed by the *Division* approving of the modification, or similar is sufficient);

1.6.5.3. Each Appendix shall maintain a record of the original document, each modification, and the date the modification was made;

1.6.5.4. The *Division* may at any time make a written determination that parts or all of the appendix documents are unacceptable, wherein the Co-Permittee(s) shall make modifications to the unacceptable parts within 30 days, or within a time frame specified by the *Division*.

2.0 Notice of Intent and Storm Water Management Program Requirements

2.1. New Applicants

The requirements of this Part apply only to Co-Permittees **not** covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001, i.e. **New Applicants**. Co-Permittees that were covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001, i.e. Renewal Applicants, and have submitted a notice of intent (NOI) at least 180 days prior to the expiration date of the previous Permit, shall instead follow the requirements of Part 2.3.

2.1.1. New applicants shall meet the following application requirements. The Notice of Intent (NOI) shall include submittal of the Storm Water Management Program (SWMP) document. Detailed information on SWMP requirements can be found in Part 4.0 of this Permit.

2.1.2. Within 180 days of notification from the Executive Secretary, the operator of the MS4 shall submit a NOI form as provided by the Division at http://www.waterquality.utah.gov/UPDES/stormwatermun.htm. (The Executive Secretary retains the right to grant permission for a later submission date upon good cause shown). One original completed NOI shall be submitted, by mail or hand delivery to:

Attention: UPDES IES
Department of Environmental Quality
Division of Water Quality
195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

2.1.3. Late submittal of an NOI is prohibited (unless permission has been granted by the Executive Secretary). If a late NOI is submitted, authorization is only for discharges

that occur after Permit coverage is granted. The Executive Secretary reserves the right to take appropriate enforcement actions for any unpermitted discharges.

2.1.4. Where application is made by a new applicant that has assumed operational control of an MS4 for which coverage under this Permit was previously held by a separate entity, the Division may determine that the new applicant shall comply with the Permit requirements in this Permit, as directed for Renewal Permittees. Notification shall be made by the Executive Secretary of this requirement in writing to the New Applicant prior to issuance of Permit coverage

2.1.5. Implementation of the Co-Permittee's SWMP shall include the six minimum control areas, including Measurable Goals, described in Part 4.2. Measurable Goals for each of the program areas shall include, as appropriate, the year by which the Co-Permittee will undertake required actions, including interim milestones and the frequency of the action if applicable.

2.1.6. Implementation of the Co-Permittee's SWMP as described in the Co-Permittee's application is required to begin within 30 days after the completed application is submitted. The Co-Permittee shall fully develop and implement the SWMP as discussed in Part 4.0 of the Permit by the end of the Permit term unless a more restrictive timeframe is indicated.

2.1.7. If an Operator is designated by the Executive Secretary as requiring Permit coverage later than one year after the effective date of this General Permit, the Executive Secretary may approve alternative deadlines that would allow the Co-Permittee to have its program areas implemented.

2.2. Contents of the Notice of Intent

The Notice of Intent requires, at a minimum, the following information:

2.2.1. Name, address, and telephone number of the principal executive officer, ranking elected official or other duly authorized employee in charge of municipal resources used for implementation of the SWMP;

2.2.2. Name(s)/ identification of Waters of the State as defined by UAC R317-1-1.32 that receive discharges from the Co-Permittee's MS4;

2.2.3. Name of the person responsible for overseeing implementation and coordination of the SWMP;

2.2.4. Summary description of the overall water quality concerns, priorities, and measurable goals specific to the Co-Permittee that were considered in the development of the SWMP;

2.2.5. The SWMP document shall consist of, at a minimum, a description of the program elements that will be implemented (or already exist) for each of the SWMP minimum control measures. The plan shall be detailed enough for the Division to determine the Co-Permittee's general strategy for complying with the required items in each of the six minimum control measures in the SWMP document (see Part 4.2 of this Permit);

2.2.6. Information on the chosen Best Management Practices (BMPs) and the measurable goals for each of the storm water minimum control measures in Part 4.2 of this Permit and, as appropriate, the timeframe by which the Co-Permittee will achieve required actions, including interim milestones;

2.2.7. Co-Permittees shall each submit an NOI and individual SWMP document which will clearly identify the areas of the MS4 for which each of the Co-Permittees are responsible. Co-Permittees which are relying on another entity(ies) to satisfy one or more of their Permit obligations shall include with the NOI, a summary of the Permit obligations that will be carried out by the other entity(ies). During the term of the Permit, Co-Permittees may terminate or amend shared responsibility arrangements by notifying the Executive Secretary, provided this does not alter implementation deadlines.

2.2.8. Certification and signature requirements in accordance with Part 6.8.

2.3. Storm Water Management Program Plan Description for Renewal Co-Permittees

2.3.1. The requirements of this part apply only to **Renewal Co-Permittees** that were covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001. New applicants are not required to meet the requirements of this Part and instead shall follow the requirements of Part 2.0.

2.3.2. Renewal Co-Permittees shall submit a **revised SWMP document** to the Division within 120 days of the effective date of this Permit, which includes at a minimum, the following information:

2.3.2.1. Permit number;

2.3.2.2. MS4 location description and map;

2.3.2.3. Information regarding the overall water quality concerns, priorities, and measurable goals specific to the Co-Permittee that were considered in the development and/or revisions to the SWMP document. Each Co-Permittee shall provide measurable goals for each minimum control measure described in Permit Part 4.2. Measurable goals should be based on:

- Improvements in reducing annual loadings of pollutants to the watershed;
- Improvements to "receiving stream" water quality, hydrology, geomorphology, habitat, or biology;
- Quantifiable improvements in the MS4s discharged storm water quality;
- Improvements in meeting the objectives of the SWMP;
- Progress in BMP implementation or performance; and
- At a minimum, a measure of specific actions, the frequency of those actions, and dates.

2.3.3. A description of the program elements that will be implemented (or are already being implemented) in each of the six minimum control measures (see Part 4.0);

2.3.3.1. A description of any modifications to ordinances or long-term/ongoing processes implemented in accordance with the previous MS4 general Permit for each of the six minimum control measures;

2.3.3.2. A description of how the Co-Permittee intends to meet the Permit requirements as described in Part 4.0 by either referencing existing program areas that already meet the Permit requirements or a description and relevant measurable goals that include, as appropriate, the year by which the Co-Permittee will achieve required actions, including interim milestones.

2.3.3.3. Indicate the joint submittal (s) of Co-Permittees (if applicable) and the associated responsibility (ies) in meeting requirements of the SWMP.

2.3.3.4. Certification and signature requirements in accordance with Part 6.8.

2.3.4. The revised SWMP document shall contain specific details for complying with the required items in each of the six minimum control measures contained within the SWMP document (See Part 4.2.).

3.0. Special Conditions

3.1. Discharges to Water Quality Impaired Waters

3.1.1. Applicability: Co-Permittees shall:

3.1.1.1. Determine whether storm water discharge from any part of the MS4 contributes to a 303(d) listed (i.e., impaired) waterbody. A 303(d) list of impaired waterbodies is available at http://www.waterquality.utah.gov/TMDL/index.htm. Water quality impaired waters means any segment of surface waters that has been identified by the Division as failing to support classified uses. If the Co-Permittee has discharges meeting these criteria, the Co-Permittee shall comply with Part 3.1.2. below and if no such discharges exist, the remainder of this Part 3.1 does not apply.

3.1.1.2. If the Co-Permittee has "303(d)" discharges described above, the Co-Permittee shall also determine whether a Total Maximum Daily Load (TMDL) has been developed by the Division and approved by EPA for the listed waterbody. If there is an approved TMDL, the Permittee shall comply with all requirements associated with the TMDL as well as the requirements of Part 3.1.2. below. If no TMDL has been approved, the Co-Permittee shall comply with Part 3.1.2. below and any TMDL requirements once it has been approved. TMDL requirements may be put into effect at any time during this Permit term.

3.1.2. Water Quality Controls for Discharges to Impaired Waterbodies. If the Co-Permittee discharges to an impaired waterbody, the Co-Permittee shall include in its SWMP document a description of how the Co-Permittee will control the discharge of the pollutants of concern. This description shall identify the measures and BMPs that will collectively control the discharge of the pollutants of concern. The measures should be presented in the order of priority with respect to controlling the pollutants of concern.

3.1.3. Where a discharge is already authorized under this Permit and is later determined to cause or have the reasonable potential to cause or contribute to the violation of an applicable water quality standard, the Division will notify the Co-Permittee of such violation(s). The Co-Permittee shall take all necessary actions to ensure future discharges do not cause or contribute to the violation of a water quality standard and document these actions as required by the Division. If violations remain or re-occur, coverage under this Permit may be terminated by the Division and an alternative general Permit or individual Permit may be issued. Compliance with this requirement does not preclude any enforcement activity as provided by the Utah Water Quality Act for the underlying violation.

3.2. Threatened or Endangered Species and Historic Properties

This Permit does not relieve the Co-Permittee from compliance with Federal or State laws pertaining to threatened or endangered species or historic properties. Where applicable, compliance efforts to these laws shall be reflected in the SWMP document.

4.0 Storm Water Management Program

4.1. Requirements

4.1.1. All Co-Permittees shall develop, implement, and enforce a SWMP designed to reduce the discharge of pollutants from the MS4, protect water quality, and satisfy the appropriate water quality requirements of the *Utah Water Quality Act.* The SWMP shall include the six minimum control measures described in Part 4.2 of this Permit.

4.1.1.1. The SWMP shall be developed and implemented in accordance with the schedules contained in Part 4.0. of this Permit.

4.1.2. Within **90 days** after the coverage from this Permit is granted, each Co-Permittee shall have an ongoing documentation process for gathering, maintaining, and using information to conduct planning, set priorities, track the development and implementation of the SWMP, evaluate Permit compliance/non-compliance, and evaluate the effectiveness of the SWMP implementation.

4.1.2.1. Each Co-Permittee shall track the number of inspections performed, official enforcement actions taken, and types of public education activities implemented as required for each SWMP component. This information shall be provided to the Division upon request and used by the Division to determine compliance with this Permit.

4.1.2.2. Each Co-Permittee shall secure the resources necessary to meet all requirements of this Permit. Each Co-Permittee shall conduct an annual analysis of the capital and operation and maintenance expenditures needed, allocated, and spent as well as the necessary staff resources needed and allocated to meet the requirements of this Permit, including any development, implementation, and enforcement activities required. Each Co-Permittee shall submit a summary of its fiscal analysis with each annual report.

4.1.3. The SWMP document shall include BMPs that the Co-Permittee or another entity will implement for each of the storm water minimum control measures.

4.1.3.1. The measurable goals for each of the BMPs shall include, as appropriate, the months and years in which the Co-Permittee will undertake required actions, including interim milestones and the frequency of the actions.

4.1.3.2. The SWMP document shall indicate the person or persons responsible for implementing or coordinating the BMPs contained within the SWMP document.

4.1.3.3. Failure to meet these requirements with a good faith effort and within the timeframes set forth may result in an enforcement action by the *Executive Secretary*.

4.2. Minimum Control Measures

Co-Permittees covered under the previous Jordan Valley Municipalities UPDES Permit No. UTS000001, i.e. **Renewal Co-Permittees**, are expected to have fully implemented Storm Water Management Programs (SWMPs) that reflect the permit requirements of the previous permit cycle. A Renewal Co-Permittee shall continue to implement its SWMP as described in the application and submittals provided in accordance with the previous Jordan Valley Municipalities MS4 Permit, while updating its SWMP document pursuant to this renewal Permit. This Permit does not extend the compliance expectations set forth in the previous MS4 general Permit or any corrective action plans and associated schedules unless specifically noted.

The six minimum control measures that shall be included in the storm water management program are:

4.2.1. Public Education and Outreach on Storm Water Impacts

The Co-Permittee shall implement a public education and outreach program to promote behavior change by the public to reduce water quality impacts associated with pollutants in storm water runoff and illicit discharges. Outreach and educational efforts shall include a multimedia approach and shall be targeted and presented to specific audiences for increased effectiveness. The educational program shall include documented education and outreach efforts for the following four audiences: (1) residents, (2) businesses, institutions, and commercial facilities, (3) developers and contractors (construction), and (4) MS4 industrial facilities. The minimum performance measures which should be based on the land uses and target audiences found within the community include:

4.2.1.1. Target specific pollutants and pollutant sources determined by the Co-Permittee to be impacting, or have the potential to impact, the beneficial uses of receiving water. This includes providing information which describe the potential impacts from storm water discharges; methods for avoiding, minimizing, reducing and /or eliminating the adverse impacts of storm water discharges; and the actions individuals can take to improve water quality, including encouraging participation in local environmental stewardship activities, based on the land uses and target audiences found within the community;

4.2.1.2. Provide and document information given to the general public of the Co-Permittee's prohibitions against and the water quality impacts associated with illicit discharges and improper disposal of waste. The Co-Permittee shall at a minimum consider the following topics. These topics are not inclusive and the Co-Permittee shall focus on those topics most relevant to the community: maintenance of septic systems; effects of outdoor activities such as lawn care (use of pesticides, herbicides, and fertilizers); benefits of on-site infiltration of storm water; effects of automotive work and car washing on water quality; proper disposal of swimming pool water; and proper management of pet waste.

4.2.1.3. Provide and document information given to businesses and institutions of the Co-Permittee's prohibition against and the water quality impacts associated with illicit discharges and improper disposal of waste. The Co-Permittee shall at a minimum consider the following topics. These topics are not inclusive and the Co-Permittee shall focus on those topics most relevant to the community: proper lawn

maintenance (use of pesticides, herbicides and fertilizer); benefits of appropriate on-site infiltration of storm water; building and equipment maintenance (proper management of waste water); use of salt or other deicing materials (cover/prevent runoff to storm system and contamination to ground water); proper storage of materials (emphasize pollution prevention); proper management of waste materials and dumpsters (cover and pollution prevention); and proper management of parking lot surfaces (sweeping). This education can also be a part of the Illicit Discharge Detection and Elimination measure detailed in Part 4.2.3.

4.2.1.4. Provide and document information given to engineers, construction contractors, developers, development review staff, and land use planners concerning the development of storm water pollution prevention plans (SWPPPs) and BMPs for reducing adverse impacts from storm water runoff from development sites. This education can also be a part of the Construction Site Storm Water Runoff minimum control measure detailed in Part 4.2.4.

4.2.1.5. Provide annually, at a minimum, training given to employees, of Co-Permittee-owned or operated facilities concerning the Co-Permittee's prohibition against and the water quality impacts associated with illicit discharges and improper disposal of waste. The Co-Permittee shall at a minimum consider the following topics: equipment inspection to ensure timely maintenance; proper storage of industrial materials (emphasize pollution prevention); proper management and disposal of wastes; proper management of dumpsters; minimization of use of salt and other de-icing materials (cover/prevent runoff to MS4 and ground water contamination); benefits of appropriate on-site infiltration (areas with low exposure to industrial materials such as roofs or employee parking); and proper maintenance of parking lot surfaces (sweeping). The Co-Permittee shall document and maintain records of the training provided and the staff in attendance.

4.2.1.6. Provide and document information and training given to MS4 engineers, development and plan review staff, land use planners, and other parties as applicable to learn about Low Impact Development (LID) practices, green infrastructure practices, and to communicate the specific requirements for post-construction control and the associated Best Management Practices (BMPs) chosen within the SWMP.

4.2.1.7. An effective program shall show evidence of focused messages and audiences as well as demonstration that the defined goal of the program has been achieved. The Co-Permittee shall define the specific messages for each audience. The Co-Permittee shall identify methods that will be used to evaluate the effectiveness of the educational messages and the overall education program. Any methods used to evaluate the effectiveness of the program shall be tied to the defined goals of the program and the overall objective of changes in behavior and knowledge. One method of evaluation of the program may be an evaluation of audience knowledge prior to commencement of the educational message followed by an evaluation after delivery of the message, such as a survey.

4.2.1.8. The Co-Permittee shall include written documentation or rationale as to why particular BMPs were chosen for its public education and outreach program.

4.2.2. Public Involvement/Participation

The Co-Permittee shall implement a program that complies with applicable State and Local public notice requirements. The SWMP shall include ongoing opportunities for public involvement and participation such as advisory panels, public hearings, watershed committees, stewardship programs, environmental activities, other volunteer opportunities, or other similar activities. The Co-Permittee should involve potentially affected stakeholder groups, which include but is not limited to, commercial and industrial businesses, trade associations, environmental groups, homeowners associations, and education organizations. The minimum performance measures are:

4.2.2.1. Co-Permittees shall adopt a program or policy directive to create opportunities for the public to provide input during the decision making processes involving the development, implementation and update of the SWMP document including development and adoption of all required ordinances or regulatory mechanisms.

4.2.2.2. Renewal Co-Permittees shall make the revised SWMP document available to the public for review and input within 120 days from the effective date of this Permit. New Applicants shall make the SWMP document available to the public for review and input within 180 days of receiving notification from the Executive Secretary of the requirement for Permit coverage.

4.2.2.3. A current version of the SWMP document shall remain available for public review and input for the life of the Permit. If the Co-Permittee maintains a website, the latest version of the SWMP document shall be posted on the website to allow the public to review and provide input.

4.2.2.4. The Co-Permittee shall at a minimum comply with State and Local public notice requirements when implementing a public involvement/participation program.

4.2.3. Illicit Discharge Detection and Elimination (IDDE)

All Co-Permittees shall develop, implement and enforce an IDDE program to systematically find and eliminate sources of non-storm water discharges from the MS4 and to implement defined procedures to prevent illicit connections and discharges according to the minimum performance measures listed below within 18 months of receiving coverage under this Permit unless a different timeframe is indicated. The IDDE program shall be described in writing, incorporated as part of the Co-Permittee's SWMP document, and contain the elements detailed in this part of the Permit. The minimum performance measures are:

4.2.3.1. Maintain a current storm sewer system map of the MS4, showing the location of all municipal storm sewer outfalls with the names and location of all State waters that receive discharges from those outfalls, storm drain pipe and other storm water conveyance structures within the MS4.

4.2.3.2. Effectively prohibit, through ordinance or other regulatory mechanism, non-storm water discharges to the MS4, including spills, illicit connections, illegal dumping and sanitary sewer overflows ("SSOs") into the storm sewer system, require removal of

such discharges consistent with Part 4.2.3.6. of this Permit, and implement appropriate enforcement procedures and actions. The Co-Permittee shall have a variety of enforcement options in order to apply escalating enforcement procedures as necessary for the severity of violation and/or the recalcitrance of the violator. The Co-Permittee shall include in its SWMP document a description of the types of escalating enforcement options which would be used in response to all anticipated types of noncompliance including repeat and continued violations. These descriptions shall identify by title the official(s) responsible for each type of enforcement response. Exceptions are discharges pursuant to a separate UPDES Permit (other than the UPDES Permit for discharges from the MS4) and non-storm water discharges listed in Part 1.2.2.2. An SSO is a discharge of untreated sanitary wastewater. SSOs are illegal and shall be eliminated. All SSOs shall be reported to the Division of Water Quality and to the Co-Permittee's local wastewater treatment plant.

4.2.3.2.1 The IDDE program shall have adequate legal authority to detect, investigate, eliminate and enforce against non-storm water discharges, including illegal dumping, into the MS4. Adequate legal authority consists of an effective ordinance, by-law, or other regulatory mechanism. The documented IDDE program that is included in the Co-Permittee's SWMP shall include a reference or citation of the authority the Co-Permittee will use to implement all aspects of the IDDE program.

4.2.3.3. Develop, implement and prepare in writing a plan to detect and address non-storm water discharges to the MS4, including spills, illicit connections, sanitary sewer overflows and illegal dumping. The plan shall include:

4.2.3.3.1 Develop and implement written systematic procedures for locating and listing the following priority areas likely to have illicit discharges (if applicable to the jurisdiction):

- Areas with older infrastructure that are more likely to have illicit connections;
- Industrial, commercial, or mixed use areas;
- Areas with a history of past illicit discharges;
- Areas with a history of illegal dumping;
- Areas with onsite sewage disposal systems;
- Areas with older sewer lines or with a history of sewer overflows or cross-connections; and
- Areas upstream of sensitive waterbodies.

The Co-Permittee shall document the basis for its selection of each priority area and create a list of all priority areas identified in the system. This priority area list shall be updated annually to reflect changing priorities.

4.2.3.3.2 Field assessment activities for the purpose of verifying outfall locations and detecting illicit discharges, including dry weather screening of outfalls or facilities serving priority areas identified in Part 4.2.3.3.1 as well as routine dry weather screening of all outfalls that discharge within the Co-Permittee's jurisdiction to a receiving water. Compliance with this provision shall be achieved by: prioritizing receiving waters for visual inspection to identify previously unknown outfalls and field assessing at

least 20 percent of the priority areas identified in Part 4.2.3.3.1 to detect illicit discharges within one year of receiving coverage from this Permit, and field assessing an additional 20 percent of the identified high priority water bodies or other high priority area each year thereafter. Field assessment activities shall utilize an inspection form to document findings.

4.2.3.4. Develop and implement standard operating procedures (SOPs) or similar type of documents for tracing the source of an illicit discharge; including visual inspections, and when necessary, opening manholes, using mobile cameras, using field tests of selected chemical parameters as indicators of discharge sources, collecting and analyzing water samples for the purpose of determining sanctions or penalties, and/or other detailed inspection procedures.

4.2.3.5. Develop and implement standard operating procedures (SOPs) or similar type of documents for characterizing the nature of, and the potential public or environmental threat posed by, any illicit discharges found by or reported to the Co-Permittee by the hotline or other telephone number described in 4.2.3.9. These procedures shall include detailed instructions for evaluating how the discharge shall be immediately contained and steps to be taken for containment of the discharge. Compliance with this provision will be achieved by initiating an investigation immediately upon being alerted of a potential illicit discharge.

4.2.3.5.1 When the source of a non-storm water discharge is identified and confirmed, the Co-Permittee shall record the following information in an inspection report: the date the Co-Permittee became aware of the non-storm water discharge, the date the Co-Permittee initiated an investigation of the discharge, the date the discharge was observed, the location of the discharge, a description of the discharge, the method of discovery, date of removal, repair, or enforcement action; date, and method of removal verification. Analytical monitoring may be necessary to aid in the identification of potential sources of an illicit discharge and to characterize the nature of the illicit discharge. The decision process for utilizing analytical monitoring shall be fully documented in the inspection report.

4.2.3.6. Develop and implement standard operating procedures (SOPs) or similar type of documents for ceasing the illicit discharge, including notification of appropriate authorities; notification of the property owner; technical assistance for removing the source of the discharge or otherwise eliminating the discharge; follow-up inspections; and escalating enforcement and legal actions if the discharge is not eliminated. Illicit discharges to the MS4 are prohibited and any such discharges violate this Permit and remain in violation until they are eliminated. Upon detection, the Co-Permittee shall require immediate cessation of improper disposal practices upon confirmation of responsible parties in accordance with its enforceable legal authorities established pursuant to Part 4.2.3.2.1. of this Permit.

4.2.3.6.1 All IDDE investigations shall be thoroughly documented and may be requested at any time by the *Division*. If a Co-Permittee is unable to meet the minimum performance measures outlined in Parts 4.2.3.5. or 4.2.3.6., the Co-Permittee shall immediately submit to the Division written documentation or rationale describing the circumstances why compliance with the minimum performance measures was not possible. All IDDE documentation shall be included in the SWMP document.

4.2.3.7. Co-Permittees shall inform public employees, businesses, and the general public of hazards associated with illicit discharges and improper disposal of waste.

4.2.3.8. Co-Permittees shall promote or provide services for the collection of household hazardous waste.

4.2.3.9. Co-Permittees shall publicly list and publicize a hotline or other local telephone number for public reporting of spills and other illicit discharges. A written record shall be kept of all calls received, all follow-up actions taken, and any feedback received from public education efforts.

4.2.3.9.1 The Co-Permittee shall develop a written spill/dumping response procedure, and a flow chart for internal use, that shows the procedures for responding to public referrals of illicit discharges, the various responsible agencies and their contacts, and who would be involved in illicit discharge incidence response, even if it is a different entity other than the Co-Permittee. The procedure and list shall be incorporated as part of the IDDE program and incorporated into the Co-Permittee's SWMP document. The list shall be maintained and updated as changes occur.

4.2.3.10. Co-Permittees shall adopt and implement procedures for program evaluation and assessment which includes maintaining a database for mapping, tracking of the number and type of spills or illicit discharges identified; and inspections conducted.

4.2.3.11. Co-Permittees shall at a minimum, annually train employees about the IDDE program including identification, investigation, termination, cleanup, and reporting of illicit discharges including spills, improper disposal, and illicit connections. Co-Permittees shall provide training to all field staff that as part of their normal job responsibilities might come into contact with or otherwise observe an illicit discharge or illicit connection to the MS4. Co-Permittees shall also train office personnel who might receive initial reports of illicit discharges. Training shall include how to identify a spill, an improper disposal, or an illicit connection to the MS4 and proper procedures for reporting the illicit discharge. Co-Permittees shall document and maintain records of the training provided and the staff in attendance.

4.2.3.12. The Division reserves the right to request documentation or further study of a particular non-storm water discharge of concern, to require a reasonable basis for allowing the non-storm water discharge and excluding the discharge from the Co-Permittee's program, and to require inclusion of the discharge in the Co-Permittee's program, if water quality concerns can not otherwise be reasonably satisfied.

4.2.4. Construction Site Storm Water Runoff Control

All Co-Permittees shall develop, implement and enforce a program to reduce pollutants in any storm water runoff to the MS4 from construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale according to the minimum performance measures listed below within **18 months** of receiving coverage under this Permit. Public and private projects, including projects proposed by the Co-Permittee's own departments and agencies, shall comply with these requirements. The minimum performance measures are:

4.2.4.1. Develop and adopt an ordinance or other regulatory mechanism that requires the use of erosion and sediment control practices at construction sites. The ordinance or other regulatory mechanism shall, at a minimum, be equivalent with the technical requirements set forth in the UPDES Storm Water General Permit for Construction Activities, UTR300000 which can be found at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm. The ordinance or other regulatory mechanism shall include sanctions to ensure compliance. The ordinance or other regulatory mechanism shall apply, at a minimum, to construction projects disturbing greater than or equal to one acre and to construction projects of less than one acre that are part of a larger common plan of development or sale. Existing local requirements to apply storm water controls at smaller sites shall be retained.

4.2.4.1.1 The ordinance or other regulatory mechanism shall, at a minimum, require construction operators to prepare a Storm Water Pollution Prevention Plan (SWPPP) and apply sediment and erosion control BMPs as necessary to protect water quality, reduce the discharge of pollutants, and control waste such as, but not limited to, discarded building materials, concrete truck washout, chemicals, litter and sanitary waste at the construction site that may cause adverse impacts to water quality. The SWPPP requirements shall be, at a minimum, equivalent with the SWPPP requirement set forth in the UPDES Storm Water General Permit for Construction Activities, UTR300000.

4.2.4.1.2. The ordinance or other regulatory mechanism shall include a provision for access by qualified personnel to inspect construction sites as well as storm water BMPs on private properties that discharge to the MS4.

4.2.4.1.3. The ordinance or other regulatory mechanism shall require that all construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, obtain a Utah Pollutant Discharge Elimination System UPDES Storm Water Permit (UPDES General Permit No. UTR300000) prior to local permit approval and issuance.

4.2.4.2. Develop a written enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism which shall include:

4.2.4.2.1. Standard operating procedures (SOPs) or similar type of documents that include specific processes and sanctions to minimize the occurrence of, and obtain compliance from violators which shall include appropriate, escalating enforcement procedures and actions.

4.2.4.2.2. Documentation and tracking of all enforcement actions.

4.2.4.3. Develop and implement SOPs or similar type of documents for pre-construction Storm Water Pollution Prevention Plan (SWPPP) review and keep records for, at a minimum, all construction sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, to ensure plans are complete and in compliance with State and Local regulations. Co-Permittees shall keep records of these projects for five years

or until construction is completed, whichever is longer. Prior to construction, the Co-Permittee shall:

4.2.4.3.1 Conduct a pre-construction SWPPP review which includes a review of the site design, the planned operations at the construction site, planned BMPs during the construction phase, and the planned BMPs to be used to manage runoff created after development.

4.2.4.3.2 Incorporate into the SWPPP review procedures the consideration of potential water quality impacts and procedures for pre-construction review which shall include the use of a checklist.

4.2.4.3.3 Incorporate into the SWPPP review procedures for an evaluation of opportunities for use of low impact design (LID) and green infrastructure and when the opportunity exists, encourage such BMPs to be incorporated into the site design.

4.2.4.3.4 Identify priority construction sites, including at a minimum those construction sites discharging directly into or immediately upstream of waters that the State recognizes as impaired (for sediment) or high quality;

4.2.4.4. All Co-Permittees shall develop and implement SOPs or similar type of documents for construction site inspection and enforcement of construction storm water pollution control measures. The procedures shall clearly define who is responsible for site inspections as well as who has authority to implement enforcement procedures. The Co-Permittee shall have the authority to the extent authorized by law to impose sanctions to ensure compliance with the local program. These procedures and regulatory authorities shall be written and documented in the SWMP. The construction site storm water runoff control inspection program shall provide:

4.2.4.4.1 Inspections of all new construction sites with a land disturbance of greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale at least monthly by qualified personnel using the Construction Storm Water Inspection Form (Checklist) found on the Division's website at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm.

4.2.4.4.2 The Co-Permittee shall inspect all phases of construction: prior to land disturbance, during active construction, and following active construction. The Co-Permittee shall include in its SWMP document a procedure for being notified by construction operators/owners of their completion of active construction so that verification of final stabilization and removal of all temporary control measures may be conducted.

4.2.4.4.3 Inspections by the MS4 of priority construction sites defined in Part 7.36. shall be conducted at least biweekly using the Construction Storm Water Inspection Form (Checklist) found on the Division's website at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm.

4.2.4.4.4 Based on site inspection findings, the Co-Permittee shall take all necessary follow-up actions (i.e., reinspection, enforcement) to ensure compliance in accordance with the Co-Permittee's enforcement strategy. These follow-up and enforcement actions shall be tracked and documented.

4.2.4.5 The Co-Permittee shall ensure that all staff whose primary job duties are related to implementing the construction storm water program, including permitting, plan review, construction site inspections, and enforcement, are trained at a minimum annually, to conduct these activities. The training can be conducted by the MS4 or outside training can be attended. Such training shall extend to third-party inspectors and plan reviewers as well. The Co-Permittee shall document and maintain records of the training provided and the staff in attendance.

4.2.4.6. All Co-Permittees shall adopt and implement a procedure to maintain records of all projects disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. All Co-Permittees must keep a list or inventory of construction sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. Co-Permittees shall keep records which include but are not limited to, site plan reviews, SWPPPs, inspections and enforcement actions including verbal warnings, stop work orders, warning letters, notices of violation, and other enforcement records. Co-Permittees shall keep records of these projects for five years or until construction is completed, whichever is longer.

4.2.5. Long-Term Storm Water Management in New Development and Redevelopment (Post-Construction Storm Water Management)

All Co-Permittees shall develop, implement and enforce a program to address post-construction storm water runoff to the MS4 from new development and redevelopment construction sites disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, according to the minimum performance measures listed below within 18 months of receiving coverage under this Permit. The objective of this control measure is for the hydrology associated with new development to mirror the pre-development hydrology of the previously undeveloped site or to improve the hydrology of a redeveloped site and reduce the discharge of storm water. The water quality considerations of this minimum control measure do not replace or substitute for water quantity or flood management requirements implemented on the local level for new developments. The water quality controls may be incorporated into the design of structures intended for flow control; or water quality control may be achieved with separate control measures. The program shall apply to private and public development sites, including roads.

The minimum performance measures are:

4.2.5.1. Develop and adopt an ordinance or other regulatory mechanism that requires long-term post-construction storm water controls at new development and redevelopment sites. The ordinance or other regulatory mechanism shall apply, at a minimum, to new development and redevelopment sites that discharge to the MS4 and that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. The ordinance or other regulatory mechanism shall, at a minimum, be equivalent with the technical requirements set forth in the UPDES Storm Water General Permit for Construction Activities, UTR300000 which can be found at http://www.waterquality.utah.gov/UPDES/stormwatercon.htm. Existing local

requirements to apply storm water controls at smaller sites shall be retained. The ordinance or other regulatory mechanism shall require BMP selection, design, installation, operation and maintenance standards necessary to protect water quality and reduce the discharge of pollutants to the MS4.

4.2.5.2. Develop an enforcement strategy and implement the enforcement provisions of the ordinance or other regulatory mechanism. Procedures for enforcement of BMPs include:

4.2.5.2.1 Procedures that include specific processes and sanctions to minimize the occurrence of, and obtain compliance from, chronic and recalcitrant violators which shall include appropriate, escalating enforcement procedures and actions.

4.2.5.2.2 Documentation on how the requirements of the ordinance or other regulatory mechanism will protect water quality and reduce the discharge of pollutants to the MS4. Documentation shall include:

- How long-term storm water BMPs were selected;
- The pollutant removal expected from the selected BMPs; and
- The technical basis which supports the performance claims for the selected BMPs.

4.2.5.3. The Co-Permittee's new development/redevelopment program shall have requirements or standards to ensure that any storm water controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality.

4.2.5.3.1 The Co-Permittee's new development/redevelopment program should include non-structural BMPs such as requirements and standards to minimize development in areas susceptible to erosion and sediment loss; to minimize the disturbance of native soils and vegetation; to preserve areas in the municipality that provide important water quality benefits; to implement measures for flood control; and to protect the integrity of natural resources and sensitive areas.

4.2.5.3.2 For new development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, the program shall include a process to evaluate and encourage a Low Impact Development (LID) approach which encourages the implementation of structural BMPs, where practicable, that infiltrate, evapotranspire or harvest and use storm water from the site to protect water quality. Structural controls may include green infrastructure practices such as rainwater harvesting, rain gardens, permeable pavement, and vegetated swales. The selection and design of post-construction controls shall take into consideration clogging or obstruction issues, freeze-thaw problems, effect on slope stability and groundwater, and the ability to effectively maintain the control.

4.2.5.3.3 The Co-Permittee shall develop a plan to retrofit existing developed sites that are adversely impacting water quality. The retrofit plan shall be developed to emphasize controls that infiltrate, evapotranspire or harvest and use storm water discharges. The plan shall include a ranking of control measures to determine those best suited for retrofitting as well as those that could later be considered for retrofitting. The Co-

Permittee shall include the following when developing the criteria for the retrofit plan:

- Proximity to waterbody
- Status of waterbody to improve impaired waterbodies and protect unimpaired waterbodies
- Hydrologic condition of the receiving waterbody
- Proximity to sensitive ecosystem or protected area
- Any upcoming sites that could be further enhanced by retrofitting storm water controls

4.2.5.3.4 Each Co-Permittee shall develop and define specific hydrologic method or methods for calculating runoff volumes and flow rates to ensure consistent sizing of structural BMPs in their jurisdiction and to facilitate plan review. Specific criteria which require that Best Management Practices (BMPs) are designed to treat the water from a specific design storm (e.g., the 2-year, 24-hour event) shall be incorporated into the Co-Permittee's post-construction minimum control measure and documented in the SWMP. Co-Permittees may allow other unique or complex methodologies.

4.2.5.4. All Co-Permittees shall adopt and implement procedures for site plan review which incorporate consideration of water quality impacts. Prior to construction, Co-Permittees shall:

4.2.5.4.1 Review Storm Water Pollution Prevention Plans (SWPPPs) for, at a minimum, all new development and redevelopment sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, to ensure that the plans include long-term storm water management measures that meet the requirements of this minimum control measure.

4.2.5.4.2 Co-Permittees shall provide developers and contractors with preferred design specifications to more effectively treat storm water for different development types such as industrial parks, commercial strip malls, retail gasoline outlets, restaurants, parking lots, automotive service facilities, street and road construction, and projects located in, adjacent to, or discharging to environmentally sensitive areas.

4.2.5.4.3 Co-Permittees shall keep a representative copy of information that is provided to design professionals; and if information is distributed to a large number of design professionals at once, the dates of the mailings and lists of recipients.

4.2.5.5. All Co-Permittees shall adopt and implement SOPs or similar type of documents for site inspection and enforcement of post-construction storm water control measures. These procedures shall ensure adequate ongoing long-term operation and maintenance of approved storm water control measures.

4.2.5.5.1 The ordinance or other regulatory mechanism shall include provisions for both construction-phase and post-construction access for Co-Permittees to inspect storm water control measures on private properties that discharge to the MS4 to ensure that adequate maintenance is being performed. The ordinance or other regulatory mechanism may, in lieu of requiring that the Co-Permittee's staff inspect and maintain storm water controls on private property, instead require private property

owner/operators or qualified third parties to conduct maintenance and provide annual certification that adequate maintenance has been performed and the structural controls are operating as designed to protect water quality. In this case, the Co-Permittee shall require a maintenance agreement addressing maintenance requirements for any control measures installed on site. The agreement shall allow the Co-Permittee to conduct oversight inspections of the storm water control measures and also account for transfer of responsibility in leases and/or deeds. The agreement shall also allow the Co-Permittee to perform necessary maintenance or corrective actions neglected by the property owner/operator, and bill or recoup costs from the property owner/operator as needed.

4.2.5.5.2 Permanent structural BMPs shall be inspected at least once during installation by qualified personnel.

4.2.5.5.3 Inspections and any necessary maintenance shall be conducted annually by either the Co-Permittee or through a maintenance agreement, the property owner/operator. On sites where the property owner/operator is conducting maintenance, the Co-Permittee shall inspect those storm water control measures at least once every five years, or more frequently as determined by the Co-Permittee to verify and ensure that adequate maintenance is being performed. The Co-Permittee shall document its findings in an inspection report which includes the following:

- Inspection date;
- Name and signature of inspector;
- Project location
- Current ownership information
- A description of the condition of the storm water control measure including the quality of: vegetation and soils; inlet and outlet channels and structures; catch basins; spillways; weirs, and other control structures; and sediment and debris accumulation in storage as well as in and around inlet and outlet structures;
- Specific maintenance issues or violations found that need to be corrected by the property owner or operator along with deadlines and reinspection dates.

4.2.5.6. Co-Permittees shall provide adequate training for all staff involved in post-construction storm water management, planning and review, and inspections and enforcement. Training shall be provided or made available for staff annually, at a minimum, in the fundamentals of long-term storm water management through the use of structural and non-structural control methods. The Co-Permittees shall document and maintain records of the training provided and the staff in attendance.

4.2.5.7. The Co-Permittee shall maintain an inventory of all post-construction structural storm water control measures installed and implemented at new development and redeveloped sites that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale. This inventory shall include both public and private sector sites located within the Co-Permittee's service area.

4.2.5.7.1 Each entry to the inventory shall include basic information on each project, such as project's name, owner's name and contact information, location, start/end date, etc. In addition, inventory entries shall include the following for each project:

- Short description of each storm water control measure (type, number, design or performance specifications);
- Short description of maintenance requirements (frequency of required maintenance and inspections); and
- Inspection information (date, findings, follow up activities, prioritization of follow-up activities, compliance status).

4.2.5.7.2 Based on inspections conducted pursuant to Part 4.2.5.5., the Co-Permittee shall update the inventory as appropriate where changes occur in property ownership or the specific control measures implemented at the site.

4.2.6. Pollution Prevention and Good Housekeeping for Municipal Operations

All Co-Permittees shall develop and implement an operations and maintenance (O & M) program for Co-Permittee-owned or operated facilities, operations and structural storm water controls that includes standard operating procedures (SOPs) or similar type of documents and a training component that have the ultimate goal of preventing or reducing pollutant runoff from all Co-Permittee-owned or operated facilities and operations. All components of an O & M program shall be included in the SWMP document and shall identify the department (and where appropriate, the specific staff) responsible for performing each activity described in this section. The Co-Permittee shall develop an inventory of all such Co-Permittee-owned or operated facilities. The Co-Permittee shall review this inventory annually and update as necessary. The minimum performance measures are:

4.2.6.1. Permitees shall develop and keep current a written inventory of Co-Permittee-owned or operated facilities and storm water controls that may include but is not limited to:

- Composting facilities
- Equipment storage and maintenance facilities
- Fuel farms
- Hazardous waste disposal facilities
- Hazardous waste handling and transfer facilities
- Incinerators
- Landfills
- Landscape maintenance on municipal property
- Materials storage yards
- Pesticide storage facilities
- Public buildings, including libraries, police stations, fire stations, municipal buildings, and similar Co-Permittee-owned or operated buildings
- Public parking lots
- Public golf courses
- Public swimming pools
- Public works yards

- Recycling facilities
- Salt storage facilities
- Solid waste handling and transfer facilities
- Street repair and maintenance sites
- Vehicle storage and maintenance yards
- Co-Permittee-owned and/or maintained structural storm water controls

Facilities covered under the General UPDES Permit for Storm Water Discharges Associated with Industrial Activities do not need to develop an O & M program but shall instead maintain the Storm Water Pollution Prevention Plan (SWPPP) required by that Permit.

4.2.6.2. All Co-Permittees shall initially assess the written inventory of Co-Permittee-owned or operated facilities, operations and storm water controls identified in Part 4.2.6.1. for their potential to discharge to storm water the following typical urban pollutants: sediment, nutrients, metals, hydrocarbons (e.g., benzene, toluene, ethylbenzene and xylene), pesticides, chlorides, and trash. Other pollutants may be associated with, but not generated directly from, the municipally-owned or operated facilities, such as bacteria, chlorine, organic matter, etc. Therefore, the Co-Permittee shall determine additional pollutants associated with its facilities that could be found in storm water discharges. A description of the assessment process and findings shall be included in the SWMP document.

4.2.6.3. Based on the assessment required in Part 4.2.6.2., the Co-Permittee shall identify as "high-priority" those facilities or operations that have a high potential to generate storm water pollutants. Among the factors that shall be considered in giving a facility a high priority ranking is the amount of urban pollutants stored at the site, the identification of improperly stored materials, activities that shall be performed outside (e.g., changing automotive fluids), proximity to waterbodies, poor housekeeping practices, and discharge of pollutant(s) of concern to impaired water(s).

4.2.6.4. Each "high priority" facility identified in Part 4.2.6.3. shall develop facility-specific standard operating procedures (SOPs) or similar type of documents. The SOPs shall include BMPs that, when applied to the municipal operation, facility or storm water control will protect water quality and reduce the discharge of pollutants to the MS4. Low impact development (LID) techniques should be considered for all new and redeveloped Co-Permittee-owned or operated facilities. The SOPs shall include appropriate pollution prevention and good housekeeping procedures for all of the following types of facilities and/or activities listed below:

4.2.6.4.1 Buildings and facilities: The O & M program shall address, but is not limited to: Co-Permittee-owned or operated offices, police and fire stations, pools, parking garages, and other Co-Permittee-owned or operated buildings or utilities. The SOPs shall address the use, storage and disposal of chemicals and ensure through employee training, that those responsible for handling these products understand and implement the SOPs. All Co-Permittee-owned or operated facilities shall develop and ensure that spill prevention plans are in place, if applicable, and coordinate with the local fire department as necessary. The SOPs shall address dumpsters and other waste management which includes, but is not limited to, cleaning, washing, painting and

other maintenance activities. The O & M program shall include schedules and SOPs for sweeping parking lots and keeping the area surrounding the facilities clean to minimize runoff of pollutants. Within 180 days of receiving coverage from this Permit, all Co-Permittees shall develop an inventory of all floor drains inside all Co-Permittee-owned or operated buildings. The inventory shall be kept current. The Co-Permittee shall ensure that all floor drains discharge to appropriate locations. Within 180 days of receiving coverage from this Permit, all Co-Permittees shall develop an inventory including a map of all storm drains located on the property of all Co-Permittee-owned or operated buildings and facilities. The Co-Permittee shall ensure that only storm water is allowed into these drains and that the appropriate BMPs are in place to minimize pollutants from entering the MS4.

4.2.6.4.2 Material storage areas, heavy equipment storage areas and maintenance areas. Co-Permittees shall develop and implement SOPs to protect water quality at each of these facilities owned or operated by the Co-Permittee and not covered under the General UPDES Permit for Storm Water Discharges Associated with Industrial Activities.

4.2.6.4.3 Parks and open space. The O & M program shall address, but is not limited to: SOPs for the proper application, storage, and disposal of fertilizer, pesticides, and herbicides including minimizing the use of these products and using only in accordance with manufacturer's instruction; sediment and erosion control; evaluation of lawn maintenance and landscaping activities to ensure practices are protective of water quality such as, proper disposal of lawn clippings and vegetation, and use of alternative landscaping materials such as drought tolerant plants. The SOPs shall address the management of trash containers at parks and other open spaces which include scheduled cleanings and establishing a sufficient number of containers, and for placing signage in areas concerning the proper disposal of pet wastes. The SOPs shall also address the proper cleaning of maintenance equipment, building exterior, trash containers and the disposal of the associated waste and wastewater. Co-Permittees shall implement park and open space maintenance pollution prevention/good housekeeping practices at all park areas, and other open spaces owned or operated by the Co-Permittee.

4.2.6.4.4 Vehicle and Equipment. The O & M program shall address, but it not limited to: SOPs that address vehicle maintenance and repair activities that occur on Co-Permittee-owned or operated vehicles. BMPs should include using drip pans and absorbents under or around leaky vehicles and equipment or storing indoors where feasible. Fueling areas for Co-Permittee-owned or operated vehicles shall be evaluated. If possible, place fueling areas under cover in order to minimize exposure. The O & M program shall include SOPs to ensure that vehicle wash waters are not discharged to the MS4 or surface waters. This Permit strictly prohibits such discharges.

4.2.6.4.5 Roads, highways, and parking lots. The O & M program shall address, but it not limited to: SOPs and schedule for sweeping streets and Co-Permittee-owned or operated parking lots and any other BMPs designed to reduce road and parking lot debris and other pollutants from entering the MS4; road and parking lot maintenance, including pothole repair, pavement marking, sealing and repaving; cold weather operations, including plowing, sanding, and application of deicing compounds and maintenance of snow disposal areas; right-of-way maintenance, including mowing,

herbicide and pesticide application; and municipally-sponsored events such as large outdoor festivals, parades or street fairs. The Co-Permittee shall ensure that areas used for snow disposal will not result in discharges to receiving waters.

4.2.6.4.6 Storm water collection and conveyance system. The O & M program shall address, but is not limited to: SOPs and schedule for the regular inspection, cleaning, and repair of catch basins, storm water conveyance pipes, ditches and irrigation canals, culverts, structural storm water controls, and structural runoff treatment and/or flow control facilities. Co-Permittees shall implement catch basin cleaning, storm water system maintenance, scheduled structural BMP inspections and maintenance, and pollution prevention/good housekeeping practices. Co-Permittees should prioritize storm sewer system maintenance, with the highest priority areas being maintained at the greatest frequency. Priorities should be driven by water quality concerns, the condition of the receiving water, the amount and type of material that typically accumulates in an area, or other location-specific factors. All Co-Permittee-owned or operated storm water structural BMPs including but not limited to, swales, retention/detention basins or other structures shall be inspected annually to ensure that they are properly maintained to reduce the discharge of pollutants into receiving waters. Co-Permittees shall develop, ensure, and document proper disposal methods of all waste and wastewater removed from the storm water conveyance system. These disposal methods apply to, but are not limited to, street sweeping and catch basin cleaning. Materials removed from the MS4 should be dewatered in a contained area and discharged to the local sanitary sewer (with approval of local authorities) where feasible. The solid material will need to be stored and disposed of properly to avoid discharge during a storm event. Any other treatment and disposal measures shall be reviewed and approved by the Division. Some materials removed from storm drains and open channels may require special handling and disposal, and may not be authorized to be disposed of in a landfill.

4.2.6.4.7. Other facilities and operations Co-Permittees shall identify any facilities and operations not listed above that would reasonably be expected to discharge contaminated runoff, and develop, implement, and document the appropriate BMPs to protect water quality from discharges from these sites in the O & M program.

4.2.6.5. If a Co-Permittee contracts with a third-party to conduct municipal maintenance or allows private developments to conduct their own maintenance, the contractor shall be held to the same standards as the Co-Permittee. This expectation shall be defined in contracts between the Co-Permittee and its contractors or the contractors of private developments. The Co-Permittee shall be responsible for ensuring, through contractually-required documentation or periodic site visits that contractors are using appropriate storm water controls and following the standard operating procedures, storm water control measures, and good housekeeping practices of the Co-Permittee.

4.2.6.6 An O & M program designed for Co-Permittee-owned or operated facilities shall include the following inspections:

4.2.6.6.1 Weekly visual inspections: The Co-Permittee shall perform weekly visual inspections of "high priority" facilities in accordance with the developed SOPs to minimize the potential for pollutant discharge. The Co-Permittee shall look for evidence of spills and immediately clean them up to prevent contact with precipitation or runoff. The weekly inspections shall be tracked in a log for every facility and records kept with

the SWMP document. The inspection log should also include any identified deficiencies and the corrective actions taken to fix the deficiencies.

4.2.6.6.2 Quarterly comprehensive inspections: At least once per quarter, a comprehensive inspection of "high priority" facilities, including all storm water controls, shall be performed, with specific attention paid to waste storage areas, dumpsters, vehicle and equipment maintenance/fueling areas, material handling areas, and similar pollutant-generating areas. The quarterly inspection results shall be documented and records kept with the SWMP document. This inspection shall be done in accordance with the developed SOPs. An inspection report shall also include any identified deficiencies and the corrective actions taken to remedy the deficiencies.

4.2.6.6.3 Quarterly visual observation of storm water discharges: At least once per quarter, the Co-Permittee shall visually observe the quality of the storm water discharges from the "high priority" facilities (unless climate conditions preclude doing so, in which case the Co-Permittee shall attempt to evaluate the discharges four times during the wet season). Any observed problems (e.g., color, foam, sheen, turbidity) that can be associated with pollutant sources or controls shall be remedied to prevent discharge to the storm drain system. Visual observations shall be documented and records kept with the SWMP document. This inspection shall be done in accordance with the developed SOPs. The inspection report shall also include any identified deficiencies and the corrective actions taken to remedy the deficiencies.

4.2.6.7. The Co-Permittee shall develop and implement a process to assess the water quality impacts in the design of all new flood management structural controls that are associated with the Co-Permittee or that discharge to the MS4. This process shall include consideration of controls that can be used to minimize the impacts to site water quality and hydrology while still meeting project objectives. A description of this process shall be included in the SWMP document

4.2.6.7.1 Existing flood management structural controls shall be assessed to determine whether changes or additions should be made to improve water quality. A description of this process and determinations should be included in the SWMP document.

4.2.6.8. Construction Projects. Public construction projects shall comply with the requirements applied to private projects. All construction projects disturbing greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, owned or operated by the Co-Permittee are required to be covered under the General UPDES Permit for Storm Water Discharges Associated with Construction Activities. All public projects approved after the effective date of this Permit shall include construction and post-construction controls selected and implemented pursuant to the requirements in Parts 4.2.4. and 4.2.5.

4.2.6.9. Co-Permittees shall provide training for all employees who have primary construction, operation, or maintenance job functions that are likely to impact storm water quality. The Co-Permittee shall identify target employees to participate in the training sessions. Training shall be conducted annually, at a minimum, and shall address the importance of protecting water quality, the requirements of this Permit, operation and maintenance requirements, inspection procedures, ways to perform their job activities to prevent or minimize impacts to water quality, SOPs for the various Co-Permittee-owned or operated facilities and procedures for reporting water

quality concerns, including potential illicit discharges. Follow-up training shall be provided as needed to address changes in procedures, methods or staffing. Co-Permittees shall document and maintain records of the training provided and the staff in attendance.

4.3. Industrial and High Risk Runoff (Phase I Co-Permittee Only)

Phase I Co-Permittee (Salt Lake County) shall continue to develop and implement an inspection and oversight program to monitor and control pollutants in storm water discharges to the MS4 from industrial facilities. Phase I regulations specify that several key elements shall be included in Phase I storm water management programs. These elements include: adequate legal authority to require compliance and inspect sites, inspection of priority industrial and commercial facilities, establishing control measure requirements for facilities that may pose a threat to water quality, and enforcing storm water requirements. The following permit requirements apply to only Phase I Co-Permittee (Salt Lake County):

4.3.1. The Phase I Co-Permittee shall maintain an inventory of all industrial and commercial sites/sources within its jurisdiction (regardless of ownership) that could discharge pollutants in storm water to the MS4. The inventory shall be updated annually, at a minimum, and made available for review by the Division upon request.

4.3.1.1. The inventory shall include the following minimum information for each industrial and commercial site/source:

- Name
- Address
- Physical location of storm drains and other conveyance structures receiving discharge
- Name of receiving water
- Pollutants potentially generated by the site/source
- Identification of whether the site/source is (1) tributary to an impaired water body segment (i.e., whether it is listed under Section 303(d) of the Clean Water Act) and (2) whether it generates pollutants for which the water body segment is impaired.
- A narrative description including the standard industrial classification (SIC) codes, which best reflects the principal products or services provided by each facility.

4.3.1.2. At a minimum, the following sites/sources shall be included in the inventory:

Commercial Sites/Sources:

- Automobile and other vehicle body repair or painting
- Automobile (or other vehicle) parking lots and storage facilities
- Automobile repair, maintenance, fueling, or cleaning
- Building material retailers and storage
- Cement mixing or cutting
- Eating or drinking establishments (e.g., restaurants), including food markets
- Equipment repair, maintenance, fueling, or cleaning
- Golf courses, parks and other recreational areas/facilities
- Landscaping
- Masonry

- Mobile automobile or other vehicle washing
- Mobile carpet, drape or furniture cleaning
- Nurseries and greenhouses
- Painting and coating
- Pest control services
- Pool and fountain cleaning
- Portable sanitary services
- Power washing services
- Retail or wholesale fueling

Industrial Sites/Sources

- Industrial Facilities, as defined at 40 CFR 122.26(b)(14), including those subject to the Multi Sector General Permit or individual UPDES permit
- Facilities subject to Title III of the Superfund Amendments and Reauthorization Act (SARA)
- Hazardous waste treatment, disposal, storage and recovery facilities

4.3.1.3. All other commercial or industrial sites/sources tributary to an impaired water body segment, where the site/source generates pollutants for which the water body segment is impaired.

4.3.1.4. All other commercial or industrial sites/sources that the Co-Permittee determines may contribute a significant pollutant load to the MS4 including those that the Co-Permittee may have a history of past water quality problems.

4.3.2. The Co-Permittee shall require industrial and commercial facilities listed in the inventory included in Part 4.3.1.2. to select, install, implement, and maintain storm water control measures as necessary to minimize storm water pollution.

4.3.2.1. The Co-Permittee is required to notify industrial and commercial sites of any control measure requirements pertaining to their site and their responsibility to implement and comply with the requirements.

4.3.2.2. The Co-Permittee may need to require industrial and commercial facilities that discharge into impaired waterbodies to implement additional controls as necessary to prevent the discharge of pollutants of concern.

4.3.3. The Co-Permittee shall prioritize all facilities on the basis of the potential for water quality impact using criteria such as pollutant sources on site, pollutants of concern, proximity to a water body, and violation history of the facility.

4.3.3.1. The Co-Permittee shall describe in its SWMP document the process for prioritizing facilities.

4.3.4. The Co-Permittee is required to conduct inspections of all industrial and commercial facilities at least once during this Permit term with the highest priority facilities receiving more frequent inspections.

4.3.4.1. For facilities with no exposure of commercial or industrial activities to storm water, no inspections are required. However, the Co-Permittee shall continue to track these facilities for significant change in the exposure of their operations to storm water.

4.3.4.2. All industrial and commercial facility inspections shall at a minimum:

- Evaluate the facility's compliance with this permit's Part 4.3.2. requirement to select, design, install, and implement storm water control measures;
- Conduct a visual observation for evidence of unauthorized discharges, illicit connections, and potential discharge of pollutants to storm water;
- Verify whether the facility is required to be authorized under the UPDES Multi-Sector General Permit (MSGP) for Storm Water Discharges Associated with Industrial Activities and whether the facility has in fact obtained such permit coverage;
- Evaluate the facility's compliance with any other relevant local storm water requirements;

4.3.4.3. At a minimum, the Co-Permittee shall document the following for each inspection:

- The inspection date and time;
- The name(s) and signature(s) of the inspectors;
- Weather information and a description of any discharges occurring at the time of the inspection;
- Any previously unidentified discharges of pollutants from the site;
- Any control measures needing maintenance or repairs;
- Any failed control measures that need replacement;
- Any incidents of noncompliance observed; and
- Any additional control measures needed to comply with this permit's requirements.

4.3.4.4. Inspection findings shall be tracked to ensure inspections are conducted at a frequency consistent with the prioritization process required in Part 4.3.3.1.

4.3.5. The Co-Permittee shall ensure that all necessary follow up inspections and enforcement activities are conducted as necessary to require implementation and maintenance of all storm water control measures.

4.3.6. The Co-Permittee shall ensure that all staff whose primary job duties are implementing the industrial storm water program is trained annually, at a minimum, to conduct facility inspections. The training shall cover what is required under this permit in terms of storm water control measures, the requirements of the Multi-Sector General Permit for Discharges Associated with Industrial Activities or other related local requirements, the Co-Permittee's site inspection and documentation protocols, and enforcement procedures. Co-Permittees shall document and maintain records of the training provided and the staff the staff in attendance.

4.4. Sharing Responsibility

4.4.1. Implementation of one or more of the six minimum measures may be shared with another entity, or the entity may fully take over the measure. A Co-Permittee may rely on another entity only if:

4.4.2. The other entity, in fact, implements the control measure;

4.4.3. The particular control measure, or component of that measure, is at least as stringent as the corresponding Permit requirement; and

4.4.4. The other entity agrees to implement the control measure through a written agreement. This obligation shall be maintained as part of the description given in the Co-Permittee's SWMP document. If the other entity agrees to report on the minimum control measure, the Co-Permittee shall supply the other entity with the reporting requirements contained in Part 5.6. of this Permit. If the other entity fails to implement the control measure, then the Co-Permittee remains liable for any discharges due to that failure to implement.

4.5. Reviewing and Updating Storm Water Management Programs

4.5.1. Storm Water Management Program Review*:* All Co-Permittees shall conduct, at a minimum, an annual review of the SWMP document in conjunction with preparation of the annual report required in Part 5.6. This annual review shall include:

4.5.1.1. A review of the status of program implementation and compliance (or non-compliance) with the schedule of compliance contained in the SWMP;

4.5.1.2. A review of any revision or change of BMPs in the reporting year and assessment of the change or revision for effectiveness;

4.5.1.3. An overall assessment of the goals and direction of the SWMP and effectiveness of BMPs including an assessment of any SWMP modifications needed to comply with the Clean Water Act section 402(p)(3)(B)(iii) requirement to reduce the discharge of pollutants to the maximum extent practicable (MEP);

4.5.1.4. For Phase I Co-Permittee, Salt Lake County, a review of monitoring data, any changes in monitoring methods and parameters, considerations for how to change monitoring to improve information gathered from data, considerations about what kind of information is most useful for assessing storm water, and another look at what or how assessments can be made to track water quality as impacted by storm water.

4.5.2. *Storm Water Management Program Update:* A Co-Permittee may change the SWMP document during the life of the Permit in accordance with the following procedures:

4.5.2.1. Changes to the SWMP document may be made at any time provided written notification is submitted to the Division and subsequently approved by the Division.

4.5.2.2. Changes replacing an ineffective or unfeasible BMP specifically identified in the SWMP document with an alternate BMP may be adopted at any time, provided the analysis is clearly outlined and subsequently approved by the Division. An analysis shall include:

4.5.2.2.1 An explanation of why the BMP is ineffective or infeasible,

4.5.2.2.2 Expectations or report on the effectiveness of the replacement BMP, and

4.5.2.2.3 An analysis of why the replacement BMP is expected to achieve the goals of the BMP to be replaced, or has achieved those goals.

4.5.3. Change requests or notifications shall be made in writing and signed in accordance with Part 6.8.

4.5.4. Change requests or notifications will receive confirmation and approval or denial in writing from the Division.

4.5.5. Storm Water Management Program Updates required by the Division: The Division may require changes to the SWMP as needed to:

4.5.5.1. Address impacts on receiving water quality caused, or contributed to, by discharges from the MS4;

4.5.5.2. Include more stringent requirements necessary to comply with new Federal regulatory requirements; or

4.5.5.3. Include such other conditions deemed necessary by the Division to comply with the goals and requirements of the Clean Water Act.

5.0 Narrative Standard, Monitoring, Recordkeeping and Reporting

5.1. Narrative Standard

It shall be unlawful, and a violation of this Permit, for the Co-Permittee to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste, or conditions which produce undesirable aquatic life or which produces objectionable tastes in edible aquatic organisms; or concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures.

5.2. General Monitoring and Sampling Requirements

5.2.1. **Wet Weather Monitoring**: Co-Permittees with jurisdictions within Phase I areas shall implement a wet weather monitoring program that is appended to this Permit in Appendix III. The program may be modified provided the modification (s) meets the requirements of this section and Part 1.6.4. The Co-Permittee shall meet the objectives of the monitoring program as listed below:

5.2.1.1. Assess storm water impacts to in-stream water quality, hydrology, geomorphology, habitat, and biology;

5.2.1.2. Provide data to estimate annual cumulative pollutant loadings from the MS4;

5.2.1.3. Estimate event mean concentrations and pollutants in discharges from major outfalls;

5.2.1.4. Identify and prioritize portions of the MS4 requiring additional controls, and;

5.2.1.5. Identify water quality improvements or degradation.

5.2.2. Phase I Co-Permittee, Salt Lake County, shall select at least four monitoring locations. The four locations should serve to best characterize the purpose of the objective listed above and be representative of the area covered by the Permit and be within the Co-Permittee's jurisdiction.

5.2.2.1. The latest version of Salt Lake County's *Sampling Plan for Representative Storm Monitoring ("the sampling plan")* shall be placed in Appendix III within 90 days of issuance of this Permit. The *Sampling Plan for Representative Storm Monitoring* shall attempt to address monitoring of a representative storm for the area.

5.2.2.2. Phase I Co-Permittee, Salt Lake County, may modify the sampling plan and submit the modified plan for approval by the *Executive Secretary*. All modifications to the sampling plan shall be approved by the *Executive Secretary*.

5.2.2.3. The minimum monitoring to be conducted each year shall be a planned wet weather monitoring frequency of twice a year, subject to the occurrence of appropriate storm events. If the Co-Permittee is not able to accomplish the planned monitoring frequency the Co-Permittee shall submit detailed reasons and weather data showing why it was not possible.

5.2.2. **Dry Weather Screening:** Phase I Co-Permittee, Salt Lake County, shall continue its dry weather screening efforts and include the latest version of its *Sampling Plan for Dry Weather Screening* in Appendix III and submitted to the *Executive Secretary* within 90 days of issuance of this Permit.

5.2.2.1. The *Sampling Plan for Dry Weather Screening* shall include the screening methodology used for screening all outfalls of the MS4 at least once during the permit term. The inventory of outfalls and associated maps shall be kept current. Phase I Co-Permittee, Salt Lake County, must also comply with the requirements of Part 4.2.3.3.2 of this Permit and address priority areas identified in Part 4.2.3.3.1 to detect illicit discharges within one year of receiving coverage from this Permit, and

field assessing an additional 20 percent of the identified high priority water bodies or other high priority area each year thereafter.

5.2.3. Phase I Co-Permittee, Salt Lake County, shall at a minimum, annually train all staff involved with Wet Weather Monitoring and Dry Weather Screening. The Co-Permittee shall document and maintain records of the training provided and the staff in attendance.

5.3. Analytical Monitoring

Phase II Co-Permittees are not required to conduct analytical monitoring (see definition in Part 7.3) during the effective term of this Permit, with the following exceptions:

5.3.1. Water quality sampling may be required for compliance with TMDLs, pursuant to Part 3.1. of this Permit.

5.3.2. Sampling or testing may be required for characterizing illicit discharges pursuant to Parts 4.2.3.4., 4.2.3.5., and 4.2.3.5.1 of this Permit.

5.3.3. In the event that the Phase II MS4 elects to conduct analytical monitoring as part of its Storm Water Management Program, the Co-Permittee is required to comply with Part 6.18. of this Permit.

5.4. Non-analytical Monitoring

5.4.1. Non-analytical monitoring (see definition in Part 7.32.) such as visual dry weather screening is required to comply with Part 4.2.3.3.2 of this Permit.

5.5. Record keeping

5.5.1. Co-Permittees shall keep all supplementary documents associated with this Permit (e.g., Storm Water Management Program (SWMP) document, SWMP Implementation Schedule) current and up to date to achieve the purpose and objectives of the required document.

5.5.2. All modifications to supplementary documents shall be submitted to the *Division* in accordance with Parts 4.5. and 6.8.

5.5.3. The *Division* may at any time make a written determination that parts or all of the supplementary documents are not in compliance with this Permit, wherein the Co-Permittee shall make modifications to these parts within a time frame specified by the *Division*.

5.5.4. The Co-Permittee shall retain all required plans, records of all programs, records of all monitoring information, copies of all reports required by this Permit, and records of all other data required by or used to demonstrate compliance with this Permit, for at least five years from the date of the record. This period may be explicitly modified

by alternative provisions of this Permit or extended by request of the *Division* at any time.

5.5.5. The Co-Permittee shall make records, including the Notice of Intent (NOI) and the SWMP document, available to the public if requested.

5.6. Reporting

5.6.1. Each Co-Permittee shall submit an annual report to the Division by October 1 of each year of the Permit term using the report form provided on the Division's website.

5.6.2. In addition to the annual report forms, the following information shall also be included:

- Appendix I: Co-Permittee Identification and Accountability
- Appendix II: Current Storm Water Management Program (for each MS4 listed in Appendix I) which reflects any modifications as a result of the minimal annual review required in Part 4.5.1.).
- Appendix III: Storm Water Wet and Dry Weather Monitoring Plans as applicable
- The status and assessment of BMP implementation as stated in the SWMP and the assessment of effectiveness of BMPs.
- A summary of data collected for both wet weather and dry weather monitoring that is accumulated throughout the reporting year. The summary must include conclusions concerning what is shown by the data and how objectives of the permit are being or are not being met.

5.6.2.1. The Phase I Co-Permittee, Salt Lake County shall continue to submit a summary of five years of wet weather monitoring and assess trends and make conclusions (This timeframe takes into account the previous Permit conditions and reporting requirements, some of the data was required by the previous Permit term).

5.6.3. Each Co-Permittee shall sign and certify the annual report in accordance with Part 6.8.

5.6.4. Signed copies of the Annual Report and all other reports required herein, shall be submitted to:

Department of Environmental Quality
Division of Water Quality
PO Box 144870
195 North 1950 West
Salt Lake City, UT 84114-4870

5.7. Legal Authority

Each Co-Permittee shall insure legal authority exists to control discharges to and from those portions the MS4 over which it has jurisdiction. This legal authority may be a combination of

statute, ordinance, Permit, contract, order or inter-jurisdictional agreements with co-applicants with existing legal authority to:

5.7.1. Control the contribution of pollutants to the MS4 by storm water discharges associated with industrial activity and the quality of storm water discharged from sites of industrial activity (including construction activity);

5.7.2. Effectively prohibit illicit and non-storm water discharges through ordinance, or other regulatory mechanism, into the MS4 and shall be able to implement appropriate enforcement procedures and actions;

5.7.3. Control the discharge of spills and the dumping or disposal of materials other than storm water into the MS4;

5.7.4. Control through interagency agreements among Co-Permittees the contribution of pollutants from one portion of the MS4 to another;

5.7.5. Require compliance with conditions in ordinances, permits, contract or orders; and

5.7.6. Conduct all inspection, surveillance and monitoring activities and procedures necessary to determine compliance with conditions in this Permit.

6.0 Standard Permit Conditions

6.1. Duty to Comply

The Permittee shall comply with all conditions of this Permit. Any Permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a Permit renewal application. The Permittee shall give advance notice to the Division of any planned changes in the Permitted facility or activity, which may result in noncompliance with Permit requirements.

6.2. Penalties for Violations of Permit Conditions

The *Act* provides that any person who violates a Permit condition implementing provisions of the *Act* is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates Permit conditions or the Act is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under *UCA 19-5-115(2)* a second time shall be punished by a fine not exceeding $50,000 per day.

6.3. Duty to Reapply

If the Permittee wishes to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittee shall apply for and obtain a new Permit. The application shall be submitted at least 180 days before the expiration date of this Permit. Continuation of expiring Permits shall be governed by regulations promulgated at *UAC R317-8-5* and any subsequent amendments.

6.4. Need to Halt or Reduce Activity not a Defense

It shall not be a defense for a Permittee in an enforcement action that it would have been necessary to halt or reduce the Permitted activity in order to maintain compliance with the conditions of this Permit.

6.5. Duty to Mitigate

The Permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this Permit, which has a reasonable likelihood of adversely affecting human health or the environment.

6.6. Duty to Provide Information

The Permittee shall furnish to the Division, within a time specified by the Division, any information which the Division may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittee shall also furnish to the Division, upon request, copies of records required to be kept by this Permit.

6.7. Other Information

When the Permittee becomes aware that it failed to submit any relevant facts in a Permit application, or submitted incorrect information in a Permit application or any report to the Division, it shall promptly submit such facts or information.

6.8. Signatory Requirements

All notices of intent, storm water management programs, storm water pollution prevention plans, reports, certifications or information either submitted to the *Division* or that this Permit requires to be maintained by the Permittee, shall be signed, dated and certified as follows:

6.8.1. All Permit applications shall be signed by either a principal executive officer or ranking elected official.

6.8.2. All reports required by the Permit and other information requested by the Division shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

6.8.2.1. The authorization is made in writing by a person described above and submitted to the Division, and,

6.8.2.2. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility, such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters. A duly authorized representative may thus be either a named individual or any individual occupying a named position.

6.8.2.3. Changes to authorization. If an authorization under *Part 6.8.2.* is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of *Part 6.8.2.* shall be submitted to the Division prior to or together with any reports, information, or applications to be signed by an authorized representative.

6.8.3. *Certification.* Any person signing documents under this Part shall make the following certification:

"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 gathered and evaluated 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."

6.9 Availability of Reports

Except for data determined to be confidential under the Government Records Access and Management Act (*see* particularly Utah Code Ann. § 63-2-309) and Utah Code Ann. § 19-1-3-6, all reports prepared in accordance with the terms of this Permit shall be available for public inspection at the office of the Division. As required by the *Act*, Permit applications, Permits and effluent data shall not be considered confidential.

6.10. Penalties for Falsification of Reports

The *Act* provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this Permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000.00 per violation, or by imprisonment for not more than six months per violation, or by both. Utah Code Ann. § 19-5-115(4)

6.11. Penalties for Tampering

The *Act* provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this Permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

6.12. Oil and Hazardous Substance Liability

Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties to which the Permittee is or may be subject under the "*Act*".

6.13. Property Rights

The issuance of this Permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or Local laws or regulations.

6.14. Severability

The provisions of this Permit are severable, and if any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this Permit shall not be affected thereby.

6.15. Requiring a Different Permit

The *Division* may require the Permittee authorized by this Permit to obtain an individual *UPDES* Permit. Any interested person may petition the *Division* to take action under this paragraph. The *Division* may require the Permittee authorized to discharge under this Permit to apply for an individual *UPDES* Permit only if the Permittee has been notified in writing that a Permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form (as necessary), a statement setting a deadline for the Permittee to file the application, and a statement that on the effective date of the municipal *UPDES* Permit, coverage under this Permit shall automatically terminate. Permit applications shall be submitted to the address of the *Division of Water Quality* shown in *Part 5.5.* of this Permit. The *Division* may grant additional time to submit the application upon request of the applicant. If the municipality fails to submit in a timely manner a municipal *UPDES* Permit application as required by the *Division*, then the applicability of this Permit to the Permittee is automatically terminated at the end of the day specified for application submittal.

6.16. State/Federal Laws

Nothing in this Permit shall be construed to preclude the institution of any legal action or relieve the Permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by *UCA 19-5-117* and *Section 510* of the *Clean Water Act* or any applicable Federal or State transportation regulations, such as but not limited to the Department of Transportation regulations.

6.17. Proper Operation and Maintenance

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this Permit and with the requirements of the SWMP. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by the Permittee only when necessary to achieve compliance with the conditions of the Permit.

6.18. Monitoring and Records

6.18.1. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

6.18.2. The Permittee shall retain records of all monitoring information including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of the reports required by this Permit, and records of all data used to complete the application for this Permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the *Division* at any time.

6.18.3. Records of monitoring information shall include:

6.18.3.1 The date, exact place, and time of sampling or measurements;

6.18.3.2 The name(s) of the individual(s) who performed the sampling or measurements;

6.18.3.3 The date(s) and time(s) analyses were performed;

6.18.3.4 The name(s) of the individual(s) who performed the analyses;

6.18.3.5 The analytical techniques or methods used; and

6.18.3.6 The results of such analyses.

6.19. Monitoring Procedures

Monitoring shall be conducted according to test procedures approved under *40 CFR Part 136*, unless other test procedures have been specified in this Permit.

6.20. Inspection and Entry

The Permittee shall allow the *Division* or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

6.20.1. Enter upon the Permittee's premises where a regulated facility or activity is located or conducted or where records shall be kept under the conditions of this Permit;

6.20.2. Have access to and copy at reasonable times, any records that shall be kept under the conditions of this Permit; and

6.20.3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

6.20.4. Sample or monitor at reasonable times, for the purposes of assuring Permit compliance or as otherwise authorized by law, any substances or parameters at any location.

6.21. Permit Actions

This Permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Permittee for a Permit modification, revocation and re-issuance, or termination, or

a notification of planned changes or anticipated noncompliance does not stay any Permit condition.

6.22. Storm Water-Reopener Provision

At any time during the duration (life) of this Permit, this Permit may be reopened and modified (following proper administrative procedures) as per *UAC R317.8*, to include, any applicable storm water provisions and requirements, a storm water pollution prevention plan, a compliance schedule, a compliance date, monitoring and/or reporting requirements, or any other conditions related to the control of storm water discharges to "Waters-of-State".

7.0 Definitions

Definitions related to this Permit and small municipal separate storm sewers (MS4s).

7.1. "40 CFR" refers to Title 40 of the Code of Federal Regulations, which is the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal government.

7.2. "Act" means the *Utah Water Quality Act*.

7.3. "Analytical monitoring" refers to monitoring of waterbodies (streams, ponds, lakes, etc.) or of storm water, according to UAC R317-2-10 and 40 CFR 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants," or to State or Federally established protocols for biomonitoring or stream bioassessments.

7.4. "Beneficial Uses" means uses of the Waters of the State, which include but are not limited to: domestic, agricultural, industrial, recreational, and other legitimate beneficial uses.

7.5. "Best Management Practices" (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of Waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control facility site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

7.6. "CWA" means *The Clean Water Act of 1987*, formerly referred to as the Federal Water Pollution Control Act.

7.7. "Co-Permittee" means any operator of a regulated Small MS4 that is applying jointly with another applicant for coverage under this Permit. A Co-Permittee owns or operates a regulated Small MS4 located within or adjacent to another regulated MS4. A Co- Permittee is only responsible for complying with the conditions of this Permit relating to discharges from the MS4 the Co-Permittee owns or operates. See also 40 CFR 122.26(b)(1).

7.8. "Control Measure" refers to any Best Management Practice or other method used to prevent or reduce the discharge of pollutants to Waters of the State.

7.9. "Common plan of development or sale" means one plan for development or sale, separate parts of which are related by any announcement, piece of documentation (including a sign, public notice or hearing, sales pitch, advertisement, drawing, plat, blueprint, contract, Permit application, zoning request, computer design, etc.), physical demarcation (including contracts) that identify the scope of the project. A plan may still be a common plan of development or sale even if it is taking place in separate stages or phases, is planned in combination with other construction activities, or is implemented by different owners or operators.

7.10. "Director" means the director of the Utah Division of Water Quality, otherwise known as the Executive Secretary of the Utah Water Quality Board.

7.11. "Division" means the Utah Division of Water Quality.

7.12. "Discharge" for the purpose of this Permit, unless indicated otherwise, refers to discharges from the Municipal Separate Storm Sewer System (MS4).

7.13. "Dry weather screening" is monitoring done in the absence of storm events to discharges representing, as much as possible, the entire storm drainage system for the purpose of obtaining information about illicit connections and improper dumping.

7.14. "Escalating enforcement procedures" refers to a variety of enforcement actions in order to apply as necessary for the severity of the violation and/or the recalcitrance of the violator.

7.15. "Entity" means a governmental body or a public or private organization.

7.16. "EPA" means the United States Environmental Protection Agency.

7.17. "General Permit" means a Permit which covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual Permits being issued to each discharger.

7.18. "Ground water" means water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

7.19. "High quality waters" means any water, where, for a particular pollutant or pollutant parameter, the water quality exceeds that quality necessary to support the existing or designated uses, or which supports an exceptional use.

7.20. "Illicit connection" means any man-made conveyance connecting an illicit discharge directly to a municipal separate storm sewer.

7.21. "Illicit discharge" means any discharge to a municipal separate storm sewer that is not composed entirely of storm water except discharges pursuant to a UPDES Permit (other than the UPDES Permit for discharges from the municipal separate storm sewer) and discharges resulting from firefighting activities.

7.22. "Impaired waters" means any segment of surface waters that has been identified by the Division as failing to support classified uses. The Division periodically compiles a list of such waters known as the 303(d) List.

7.23. "Indian Country" is defined as in 40 CFR §122.2 to mean:

7.23.1. All land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation;

7.23.2. All dependent Indian communities within the borders of the United States whether within the originally or subsequently acquired territory thereof, and whether within or without the limits of a state; and

7.23.3. All Indian allotments, the Indian titles to which have not been extinguished, including right-of-ways running through the same.

7.24. "Large MS4" *Large municipal separate storm sewer system* means all municipal separate storm sewers that are located in an incorporated place with a population of 250,000 or more as determined by the current Decennial Census by the Bureau of the Census.

7.25. "Low Impact Development" (LID) is an approach to land development (or re-development) that works with nature to more closely mimic pre-development hydrologic functions. LID employs principles such as preserving and recreating natural landscape features, minimizing effective imperviousness to create functional and appealing site drainage that treat storm water as a resource rather than a waste product. There are many practices that have been used to adhere to these principles such as bioretention facilities, rain gardens, vegetated rooftops, rain barrels, and permeable pavements.

7.26. "MS4" is an acronym for "municipal separate storm sewer system".

7.27. "Maximum Extent Practicable" (MEP) is the technology-based discharge standard for Municipal Separate Storm Sewer Systems established by paragraph 402(p)(3)(B)(iii) of the Federal Clean Water Act (CWA), which reads as follows: "Permits for discharges from municipal storm sewers shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques, and system, design, and engineering methods, and other such provisions as the Administrator or the State determines appropriate for the control of such pollutants."

7.28. "Medium MS4" *Medium municipal separate storm sewer system* means all municipal separate storm sewers that are located in an incorporated place with a population of 100,000 or more but less than 250,000, as determined by the1990 Decennial Census by the Bureau of the Census

7.29. "Monitoring" refers to tracking or measuring activities, progress, results, etc.;

7.30. "Municipal separate storm sewer system" means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains) pursuant to paragraphs R317-8-1.6(4), (7), & (14), or designated under UAC R317-8-3.9(1)(a)5:

7.30.1. that is owned or operated by a state, city, town, county, district, association, or other public body (created by or pursuant to State Law) having jurisdiction over disposal of wastes, storm water, or other wastes, including special districts under State Law such as a sewer district, flood control district or drainage district, or similar entity, or a designated and approved management agency under section 208 of the CWA that discharges to Waters of the State;

7.30.2. that is designed or used for collecting or conveying storm water;

7.30.3. which is not a combined sewer; and

7.30.4. which is not part of a Publicly Owned Treatment Works (POTW) as defined in 40 CFR 122.2.

7.31. "NOI" is an acronym for "Notice of Intent" to be covered by this Permit and is the mechanism used to "register" for coverage under a general Permit.

7.32. "Non-analytical monitoring" refers to monitoring for pollutants by means other than UAC R317-2-10 and 40 CFR 136, such as visually or by qualitative tools that provide comparative or rough estimates.

7.33. "Operator" is the person or entity responsible for the operation and maintenance of the MS4.

7.34. "Outfall" means a point source as defined by UAC R317-8-1.5(34) at the point where a municipal separate storm sewer discharges to Waters of the State and does not include open conveyances connecting two municipal separate storm sewers, or pipes, tunnels or other conveyances which connect segments of the same stream or other Waters of the State and are used to convey waters of the State.

7.35. "Phase II areas" means areas regulated under UPDES storm water regulations encompassed by Small MS4's (see definition 7.39.).

7.36. "Priority construction site" means a construction site that has potential to threaten water quality when considering the following factors: soil erosion potential; site slope; project size and type; sensitivity of receiving waterbodies; proximity to receiving waterbodies; non-storm water discharges and past record of non-compliance by the operators of the construction site.

7.37. "Redevelopment" is the replacement or improvement of impervious surfaces on a developed site.

7.38. "Runoff" is water that travels across the land surface, or laterally through the ground near the land surface, and discharges to water bodies either directly or through a collection and conveyance system. Runoff includes storm water and water from other sources that travels across the land surface.

7.39. "SWMP" is an acronym for storm water management program. The SWMP document is the written plan that is used to describe the various control measures and activities the Permittee will undertake to implement the storm water management plan.

7.40. "SWPPP" is an acronym for storm water pollution prevention plan.

7.41. "Small municipal separate storm sewer system" is any MS4 not already covered by the Phase I program as a medium or large MS4. The Phase II Rule automatically covers on a nationwide basis all Small MS4s located in "urbanized areas" (UAs) as defined by the Bureau of the Census (unless waived by the UPDES Permitting authority), and on a case-by-case basis those Small MS4s located outside of UAs that the UPDES Permitting authority designates.

7.41.1. This term includes systems similar to separate storm sewer systems in municipalities, such as systems at military bases, large hospital or prison complexes, and highways and other thoroughfares. The term does not include separate storm sewers in very discrete areas, such as individual buildings.

7.42. "SOP" is an acronym for standard operating procedure which is a set of written instructions that document a routine or repetitive activity. For the purpose of this Permit, SOPs should emphasize pollution control measures to protect water quality.

7.43. "Storm water" means storm water runoff, snowmelt runoff, and surface runoff and drainage.

7.44. "Storm water management program" means a set of measurable goals, actions, and activities designed to reduce the discharge of pollutants from the Small MS4 to the maximum extent practicable and to protect water quality.

7.45. "TMDL" is an acronym for "Total Maximum Daily Load" and in this Permit refers to a study that: 1) quantifies the amount of a pollutant in a stream; 2) identifies the sources of the pollutant; and 3) recommends regulatory or other actions that may need to be taken in order for the impaired waterbody to meet water quality standards.

7.46. "Urbanized area" is a land area comprising one or more places and the adjacent densely settled surrounding area that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile.

7.47. "Waters of the State" means all streams, lakes, ponds, marshes, water-courses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private which are contained within, flow through, or border upon this state or any portion thereof, except bodies of water confined to and retained within the limits of private property, and which do not develop into or constitute a nuisance, or a public health hazard, or a menace to fish and wildlife which shall not be considered to be "Waters of the State" under this definition ("UAC" R317-1-1.32).

EXHIBIT B

(Appendix I of the Permit)

UTS 000001 (section 1.6) List of Co-Permittees, Legal jurisdiction, MS4 boundaries, date of inclusion in the permit and Contract numbers.

Municipality	Legal Jurisdiction(1.2)	MS4 boundary	Date of inclusion	CONTRACT#	Media #
Salt Lake County	All area within the County Boundaries not incorporated Into municipalities and inter-Jurisdictional drainage systems County-wide identified in County ordinance Title 17.08.	County-wide various	7/1/1995	Administrators of both contracts and the permit itself	

Municipality	Legal Jurisdiction	MS4 boundary	Date of Inclusion	CO#	Media#
Bluffdale City	All areas within the incorporated boundary of the municipality	Coincides with the incorporated boundary of the municipality	10/14/2003	PV13157	PV12134C
Cottonwood Heights City	All areas within the incorporated boundary of the municipality	Coincides with the incorporated boundary of the municipality	1/27/2009	PV13158	PV11132C

Municipality	Legal Jurisdiction	MS4 boundary	Date of Inclusion	CO#	Media#
Draper City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	3/11/2003	PV13159	PV
Herriman City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	4/8/2003	PV13160 ~~PV13161~~	PV11138C
Holladay City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	4/8/2003	PV13161 ~~PV13160~~	PV11144C
Midvale City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	3/11/2003	PV13162	PV12153C
Murray City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	3/11/2003	PV13163	PV11133C
Riverton City	All areas within the incorporated boundary of the municipality	Coincides with the incorporated boundary of the municipality	4/8/2003	PV13164	PV11134C
Sandy CIty	All areas within the incorporated boundary of the municipality	Coincides with the incorporated boundary of the municipality	5/6/2003	PV13165	PV11135C
South Jordan City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	3/11/2003	PV13166	PV11136C

Municipality	Legal Jurisdiction	MS4 boundary	Date of Inclusion	CO#	Media#
South Salt Lake	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	3/11/2003	PV13167	PV11131C
Taylorsville City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	3/11/2003	PV13168	PV
West Jordan City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	8/26/2003	PV13169	PV11154C
West Valley City	All areas within the incorporated Boundary of the municipality	Coincides with the incorporated boundary of the municipality	3/11/2003	PV13170	PV11137C

EXHIBIT C

CO-PERMIT REQUIREMENT ACCOUNTABILITY (sections 1.5, 1.6, 4. 4)

Salt Lake County accepts responsibility for Administering and the implementation of the following permit requirements of South Jordan City under UPDES Permit UTS000001 issued September 3, 2013, to be completed during the life of the permit and developed in detail in the Jordan Valley Municipalities Permit :

Task 1. *County will prepare and administer the Co-Permittee Identification and Accountability document, the jurisdictional boundary document 'Exhibit B', and the co-permittee interlocal agreement document (identified in Part 1.5 of the Permit), at no direct cost to the City. City shall provide necessary information in a timely fashion to County for inclusion into these documents.*

Task 2. County will develop and implement a **core** County-wide Public Education and Outreach program identified in the INTERLOCAL MEDIA agreement ' Exhibit D'. The program will be coordinated through the Storm Water Coalition, intended as part or all of Minimum Control Measures 1 and 2 in the Permit.

Task 3. County will develop a portion of a public involvement/participation program identified in 'EXHIBIT D', at direct cost to the City as agreed to in the INTERLOCAL MEDIA agreement. This program will also be identified and intended as part or all of the Minimum Control measures 1 and 2 in the Permit. The program will be coordinated through the Storm Water Coalition, and is also listed in 'EXHIBIT D'.

Task 4. County will maintain and submit to the State the identified sections in Appendix I (annual report required by the Permit), which will include the City's required information. If boundaries or jurisdictions change during the year, City shall provide necessary information for this submittal to the County, (the updated version), in a compatible electronic format as required. Information must be provided to the County at least 45 days prior to report submission of the annual report deadline (Section 5.6). If City fails to submit information to County as described, COUNTY shall not be liable.

Task 5. County will maintain a County wide storm water system map, and distribute to County wide agencies, to assist in Spills, Tracking, Emergency responses on behalf of all the County and city MS4. The distribution list will include The Salt Lake County Health Department, The Emergency agencies (VECC, Unified Fire and Police) and any other agency that may need help to track events affecting or using our storm drain systems.

EXHIBIT D

INTERLOCAL MEDIA AGREEMENT

County Contract No. PV11136C
D.A. No. 2011-5509

INTERLOCAL COOPERATION AGREEMENT BETWEEN SOUTH JORDAN CITY AND SALT LAKE COUNTY FOR COST SHARING 2011 -2016 UPDES MEDIA CAMPAIGN

THIS AGREEMENT is made this 20 day of July, 2011, by and between SOUTH JORDAN City, a municipal corporation of the State of Utah, hereinafter "City," and SALT LAKE COUNTY, a body corporate and politic of the State of Utah, hereinafter "County."

WITNESSETH:

WHEREAS, the parties are public agencies and are therefore authorized by the Utah Interlocal Cooperation Act, section 11-13-101, et seq., U.C.A., to enter into agreements with each other which will enable them to make the most efficient use of their powers; and,

WHEREAS, in connection with the Utah Pollutant Discharge Elimination System, hereinafter "UPDES", permitting process, the parties desire to cooperate with each other in funding a 2011 through 2016 multi-media public information and education campaign, hereinafter "campaign," for the purpose of increasing public awareness about storm water pollution and educating the public about the prevention of storm water pollution in the *City* and the County; and,

WHEREAS, the parties desire to enter into an agreement whereby their respective responsibilities concerning the campaign are specifically set forth;

NOW, THEREFORE, in consideration of the mutual promises set forth herein, the parties agree as follows:

1. **Media Campaign Services.** The County has obtained the services of a consultant and has developed a plan for the public education and awareness campaign, which will consist of many phases of development for the benefit of all coalition participants.

2. ***Budget.*** The proposed budget for the campaign is $_178,000 per year, and includes the components and funding shown on *Appendix A* which is incorporated as part of this agreement.

3. ***County Responsibilities.*** The County shall be responsible for all matters pertaining to administering the campaign and the consultant's contract, and shall further be responsible for providing all funds necessary to complete the campaign over and above the sum to be provided by the City as set forth in paragraph 5 below.

4. ***City Responsibilities.*** The City shall pay to the County the sum of $5000 per year as the City's share of the costs of funding the initial phase of the campaign. Such payment shall be made within thirty (30) days after execution of this agreement by the parties.

5. ***No Interlocal Entity.*** Pursuant to Utah Code Annotated 11-13-206(b), the parties agree that they do not by this agreement create an interlocal entity.

6. ***Joint Board.*** Pursuant to Utah Code Ann. 11-13-207, the parties agree that the cooperative undertakings under this agreement shall be administered by a joint board, the "Board" consisting of the City's mayor (or designee) and the County's Public Works Director (or designee). No real or personal property shall be acquired, held and disposed of by this agreement.

7. ***Termination.*** Pursuant to Utah Code Ann. 11-13-206(a), the parties agree that this agreement may be terminated (with or without cause) by either party upon at least thirty (30) days prior written notice to the other party, in which event an accounting shall be made of all funds not spent or encumbered as of the date of termination.

8. *Term.* This agreement shall be effective on the date hereof and unless terminated as provided herein shall terminate 5 years from the date of execution, renewable yearly, provided funding and budgets allow.

9. ***Applicable Law.*** The provisions of this agreement shall be governed by and construed in accordance with the laws of the State of Utah.

10. ***Integration.*** This agreement constitutes the entire agreement between the parties pertaining to the subject matter hereof, and supersedes all prior agreements and understandings pertaining thereto.

11. ***Amendment.*** The parties may amend this agreement by a writing signed by the parties. The amendment shall not be effective if it is not in writing or if it is not signed by all the parties.

12. ***No Agency.*** Agents, employees or representatives of each party shall not be deemed to be agents, employees or representatives of the other.

IN WITNESS WHEREOF, the parties execute this agreement on the day and year first set forth above.

SALT LAKE COUNTY

By _____
Peter Corroon Mayor or Designee

Approved as to form and legality

Gavin J. Anderson

Deputy District Attorney

Date: 14 July 2011

STATE OF UTAH)

: ss.

County of Salt Lake)

On this 20 day of July, 2011, personally appeared before me Linda Hamilton, who being duly sworn, did say that (s)he is the Chief Administrative Officer of Salt Lake County, Office of Mayor, and that the foregoing instrument was signed on behalf of Salt Lake County, by authority of law.

[SEAL]

KAREN R. LOWE
NOTARY PUBLIC - STATE OF UTAH
My Comm. Exp. 01/08/2014
Commission # 581113

Karen R. Lowe

NOTARY PUBLIC

Residing in Salt Lake County, Utah

SOUTH JORDAN CITY

By Leona Wiggen

Mayor Pro-Tem

ATTEST:

Anna M. West

City Recorder

Approved as to form and legality

Ryan W. Loose

ASSISTANT City Attorney

Date: 6/7/2011

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Appendix A

Salt Lake County Stormwater Coalition Budget 2011

TV Media Partnership	
Movie Theatre Advertising	
Stormwater Quality Fair	
TV Commercial – Concept to Finished Spot	
Design/Print of Education Material	
Concept to Production of Leave Behinds	
Website Design, Hosting and Maintenance	
Social Media Management	
TOTAL:	$178,000

We All Live Downstream
stormwatercoalition.org

RESOLUTION R2011-31

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF SOUTH JORDAN, UTAH, AUTHORIZING MAYOR TO SIGN AN INTERLOCAL AGREEMENT WITH SALT LAKE COUNTY FOR THE SHARING OF COSTS OF THE 2011-2016 UPDES MEDIA CAMPAIGN.

WHEREAS, South Jordan City and Salt Lake County are local governmental units under the laws of the State of Utah; and

WHEREAS, they are authorized by the Utah Interlocal Cooperation Act, Sections 11-13-101, et seq., U.C.A., 1953 as amended, to enter into agreements with each other, upon a resolution to do so by their respective governing bodies, for the purpose of enabling them to make the most efficient use of their resources; and

WHEREAS, such an agreement has been prepared which pertains to the sharing of costs of the 2011 through 2016 UPDES media campaign; and

WHEREAS, said agreement will benefit the citizens of South Jordan City and allow South Jordan City to make a more efficient use of its resources;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF SOUTH JORDAN CITY, STATE OF UTAH:

Section 1. **Authorization to Sign**. South Jordan City Mayor W. Kent Money is authorized to sign the Interlocal Cooperation Agreement with Salt Lake County for the sharing of costs of the 2011 through 2016 UPDES Media Campaign.

Section 2. **Severability.** If any section, part or provision of this Resolution is held invalid or unenforceable, such invalidity or unenforceability shall not affect any other portion of this Resolution and all sections, parts, provisions and words of this Resolution shall be severable.

Section 3. **Effective Date.** This resolution will be effective immediately upon publication or posting as required by law.

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APPROVED BY THE CITY COUNCIL OF THE CITY OF SOUTH JORDAN, STATE OF UTAH, ON THIS 21 DAY OF June, 2011, BY THE FOLLOWING VOTE:

	YES	NO	ABSTAIN	ABSENT
Leona Winger	X			
Larry Short	X			
Kathie L. Johnson	X			
Brian C. Butters	X			
Aleta A. Taylor	X			

Mayor: Leona Winger
~~W. Kent Money,~~ Mayor Pro Tem

ATTEST: Anna M. West
City Recorder

Legal Review: [illegible]
Attorney for the City

SALT LAKE COUNTY COUNCIL
RESOLUTION

RESOLUTION NO. 4543 DATE August 2, 2011

INTERLOCAL AGREEMENT
SOUTH JORDAN CITY
(2011UPDES MEDIA CAMPAIGN)

The Legislative Body of Salt Lake County resolves as follows:

WHEREAS, Salt Lake County and South Jordan City are local governmental units under the laws of the State of Utah; and

WHEREAS, they are authorized, by the Utah Interlocal Cooperation Act, Sections 11-13-101, et seq., U.C.A., 1953 as amended, to enter into agreements with each other, upon a resolution to do so by their respective governing bodies, for the purpose of enabling them to make the most efficient use of their resources; and

WHEREAS, such an agreement has been prepared which pertains to the sharing of costs of the 2011 through 2016 UPDES media campaign; and

WHEREAS, said agreement will benefit the citizens of Salt Lake County and allow Salt Lake County to make a more efficient use of its resources;

NOW, THEREFORE, BE IT RESOLVED by the Salt Lake County Council that the aforementioned agreement be approved and the Mayor is hereby authorized to execute the same.

APPROVED and ADOPTED this 2nd day of August, 2011.

SALT LAKE COUNTY COUNCIL

By _____
Max Burdick Chairman

ATTEST:

_____
Salt Lake County Clerk
Approved as to form and legality

Gavin J. Anderson
Deputy District Attorney
Date: 14 July 2011

Voting:

Council Member Bradley	"Aye"
Council Member Bradshaw	"Aye"
Council Member Burdick	"Aye"
Council Member DeBry	"Aye"
Council Member Horiuchi	Absent
Council Member Iwamoto	"Aye"
Council Member Jensen	"Aye"
Council Member Snelgrove	"Aye"
Council Member Wilde	"Aye"