

EROSION AND SEDIMENT CONTROL PLAN DESIGN

8.00 DESIGN STANDARDS

8.01 PURPOSE

~~The purpose of erosion~~ Erosion and sediment control planning ~~is to establish~~ clearly establishes which control/preventative measures ~~shall be used to use~~ to prevent erosion and off-site sediment transport/sedimentation during construction ~~of a project, to prevent pollution related to construction projects, and to meet state and federal requirements.~~ The Erosion and Sediment Control Plan (ESCP), ~~required for all public construction planning and construction within the City of Springfield, shall direct~~ shall serve as a guide for the location, installation, and maintenance of practices to control/prevent erosion and prevent sediment from leaving the site during construction.

~~An Erosion and Sediment Control Plan (ESCP) shall be developed and submitted for City approval for each project proposed within the City of Springfield. The ESCP shall be submitted as a part of the public improvement plans to be approved for construction by the City of Springfield. The ESCP shall specify~~ Erosion and sediment control planning determines the measures which must be provided to prevent or minimize erosion and intercept and treat sediment laden runoff which occurs during construction and site stabilization. The ESCP specifies the measures identified during planning to prevent sediment deposition onto adjacent properties and into receiving waters. The ESCP also ~~shall specify~~ identifies measures to control volume, velocity, and peak flow rates of concentrated ~~storm water~~ stormwater runoff on-site and to meet the ~~Oregon Drainage Law~~ regulatory requirements relating to the quality, quantity and velocity of runoff leaving the site during construction. The permanent stormwater management facilities such as curbs, inlets, gutters, etc., incorporated in the project design to control runoff after construction is complete may be used as elements of the ESCP for use during construction.

In order to prevent pollution related to construction projects and meet state and federal requirements, the City of Springfield requires an ESCP for each project. The ESCP is submitted as a part of the Public Improvement Plans and is approved for construction by the City of Springfield. An approved ESCP is the primary document specifying the necessary requirements for minimizing impacts related to erosion and sedimentation and shall be available on the construction site for review.

~~Permanent stormwater management facilities such as curbs, inlets, gutters, etc., are incorporated in the project design to control runoff after construction is complete. These facilities may be incorporated as elements of the ESCP for use during construction.~~

8.02 DESIGNER/ENGINEER RESPONSIBILITIES

~~The designer shall develop~~ An Oregon Registered engineer designs the ESCP based upon information provided from the plans and a field site visit. ~~The designer of the plan shall conditions to~~ determine ~~what~~ which best management practices (BMP's/BMPs) are appropriate for ~~the project~~ existing and anticipated conditions. A variety of BMP's/BMPs shall be included on

Style Definition: Level 1: Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0"

Style Definition: Bullet - Che: Tab stops: 0.25", Left + 0.75", Left + 1.25", Left + 1.75", Left + 2.25", Left + 2.75", Left + 3.25", Left + 3.75", Left + 4.25", Left + 4.75", Left + 5.25", Left + 5.75", Left + 6.25", Left + Not at -0.25" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6"

Style Definition: Header: Tab stops: 3.25", Centered + 6.5", Right + Not at 3" + 6"

Style Definition: Footer: Tab stops: 3.25", Centered + 6.5", Right + Not at 3" + 6"

Style Definition: _level1: Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0"

Formatted: Justified, No widow/orphan control

Formatted: Justified, No widow/orphan control

Formatted: Font: Not Bold

Formatted: Justified, No widow/orphan control

Formatted: Justified, No widow/orphan control

Formatted: Justified, Tab stops: -1", Left + -0.5", Left + 0", Left + 0.5", Left + 0.75", Left + 1", Left + 1.5", Left + 2", Left + 2.5", Left + 3", Left + 3.5", Left + 4", Left + 4.5", Left + 5", Left + 5.5", Left + 6", Left + 6.5", Left

the ~~plan~~ESCP in order to provide the contractor and inspector with adequate tools in the field. ~~The professional design must be submitted, under sub contract of the engineer of record, by a person licensed in Oregon as a: civil engineer, environmental engineer, landscape architect, certified geologist, or a certified professional in erosion and sediment control (CPESC); or any other qualified person determined by the City Public Works Director.~~

Formatted: Justified, No widow/orphan control

The ESCP shall be designed and established to meet or exceed performance criteria set forth by all permitting agencies ~~which~~that have jurisdiction over the project. At a minimum, the ~~designer~~Engineer of Record (Engineer) shall ensure that the ~~plan~~ESCP and the activities on the construction site meet or exceed the performance standards within the most current National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit (1200-CA permit) issued to the City of Springfield. ~~A copy of the current 1200-CA (as of the date of this Design Manual) is contained in Exhibit 8-1. A copy of the most current 1200-CA permit is available by contacting the Public Works Engineering Department. If the development requires site specific permits pertaining to erosion control and/or stormwater runoff, the engineer shall ensure that the plan and the activities on site meet or exceed all the requirements of both the most current 1200-CA permit and the site specific permits. C permit) applicable to Springfield. It shall be the responsibility of the Engineer to apply for and obtain individual 1200-C coverage with the Oregon Department of Environmental Quality (DEQ) when the grading area of the project exceeds the current allowable area for automatic coverage under the 1200-CN general permit.~~ In the event that multiple performance criteria are defined for one item, the most stringent criteria shall apply to the ESCP and the construction activity.

The ~~designer shall be~~Engineer is responsible, directly or through ~~his~~their designated inspector, for ensuring that the ~~plan~~ESCP is functioning properly at all times and that the contractor and his/her subcontractors are correctly implementing the approved ESCP. In order to avoid delays and reaction time in the field, the ~~designer~~Engineer shall ensure ~~that~~ all erosion prevention and sediment control items and the labor to install and maintain these items are identified~~included~~ on the ESCP and in the contract. ~~Construction and erosion and sediment control contractors are also responsible to prevent pollution from leaving a site.~~

~~Contractors shall follow the ESCP under the supervision of the designer and obtain approval through the City of Springfield to revise the ESCP as necessary to insure that the site is stable~~

~~Whether the~~The approved ESCP is adequate or not, the designer shall follow up with the contractor to ensure that erosion is controlled on the site. ~~If the plan is inadequate, it considered a set of minimum requirements and will be difficult for the frequently require adjustments in order to meet the required outcomes throughout the span of a project. It is the responsibility of the Engineer and their designated inspector to obtain compliance and to have the BMP's available to obtain adequate control. Therefore, the designer shall develop a robust plan, develop open lines of communication and define responsibilities in the field~~direct the contractor when changes to the ESCP are necessary.

Formatted: Justified, No widow/orphan control

8.03 PLANESCP PREPARATION

The ESCP serves as a blueprint for the location, installation, and maintenance practices to control erosion and prevent sediment from leaving the site during construction.

The following planning issues ~~shall~~must be considered in preparing Erosion and Sediment Control Plans:

Formatted: Justified, No widow/orphan control

- Data collection (Section 8.03.1)
- ~~Erosion~~ Prevention vs. ~~Sediment Control~~ sediment control (Section 8.03.2)
- Assessing the project site (Section 8.03.3)
- Five basic rules (Section 8.03.4)
- Project scheduling (Section 8.03.5)

The City of Springfield recommends the Oregon Department of Environmental Quality's Erosion and Sediment Control Manual as a resource in developing and implementing an ESCP for site development. The manual can be found online at:

<http://www.deq.state.or.us/wq/stormwater/escmanual.htm>

The Oregon Department of Transportation's (ODOT's) Erosion Control Manuals are also a useful resource. These manuals are based on the requirements of the National Pollutant Discharge Elimination System (NPDES) and may be more suitable in designing an ESCP for linear projects. They can be found online at:

http://www.oregon.gov/ODOT/HWY/GEOENVIRONMENTAL/erosion_control_manuals.shtml

8.03.1 Data Collection

Formatted: Justified, No widow/orphan control

An ~~erosion and sediment control plan shall~~ESCP must contain sufficient information to describe the site development ~~plans~~ and the ~~systems~~system intended to control erosion and prevent off-site ~~damage~~impacts from sedimentation. The ~~design engineer~~Engineer responsible for the ~~plan~~ESCP shall inspect the site to verify ~~and develop~~ the base map with respect to natural drainage patterns, drainage areas, general soil characteristics, and off-site factors. The base map ~~shall~~must reflect such characteristics as:

- A. Soil types.
- ~~B.~~A. Natural drainage patterns.
- ~~C.~~B. Unstable stream reaches and flood marks.
- ~~D.~~C. Watershed areas.
- ~~E.~~D. Existing vegetation, noting special vegetative considerations.
- ~~F.~~E. Critical areas such as steep slopes, eroding areas, rock ~~outcroppings~~outcroppings, and seepage zones.
- ~~G.~~A. Critical or highly erodible soils that ~~should~~shall be left undisturbed.

Formatted: Font: Times New Roman

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

Formatted: Font: Times New Roman

Formatted: Font: Times New Roman

The ~~design engineer~~Engineer shall evaluate the data collected and identify:

Formatted: Justified, Tab stops: -1", Left + -0.5", Left + 0", Left + 0.5", Left + 0.75", Left + 1", Left + 1.5", Left + Not at 3.75"

- 1. Buffer zones.
- 2. Suitable stream crossing areas.
- 3. Access routes for construction and maintenance of erosion and sediment control devices.

4. Borrow and waste disposal areas.
5. The most practical sites for ~~best management practices~~BMPs.

8.03.1.A Soil Types

The base map for the ESCP ~~shall be~~ prepared from a detailed topographic map. ~~A~~Obtaining a soils map ~~shall be obtained~~ from the local office of the USDA Natural Resource Conservation Service ~~or the Soil Survey of Lane County Area, Oregon prepared by the United States Department of Agriculture and Soil Conservation Service may be utilized. Soil survey is encouraged, as transferring soil survey~~ information ~~shall be transferred~~ to the topographic ~~map is~~ helpful for site evaluation.

The Lane County soil survey~~Soil Survey~~ contains information useful in any land-planning program. Of prime importance are the predictions of soil behavior for selected land uses. Great differences in soil properties can occur even within short distances. Soils may be seasonally wet, subject to landslides or flooding, or they may be shallow to bedrock,

Formatted: Not Strikethrough

These and many other soil properties that affect land use are described in the soil survey. Broad areas of soils are shown on a general soil map. The location of each kind of soil is shown on detailed soil maps. Each kind of soil in the survey area is described, and much information is given about each soil for specific uses.

8.03.1.B Precipitation Data

The occurrence and amounts of rainfall ~~shall be considered by~~are important for the engineer~~Engineer~~ when deciding to what extent the erosion control measures must be used. Precipitation data may be found ~~by~~be contacting the National Weather Service West Coast Weather Observation at:

<http://www.wrh.noaa.gov/Portland/climatepqr/>

Formatted: Default Paragraph Font
 Field Code Changed
 Formatted: Font color: Black
 Formatted: Justified, Indent: Left: 0"
 Formatted: Justified

This web site ~~gives information on temperatures~~provides historical weather data such as temperature, wind direction, relative humidity, and precipitation at various times of the year as well as detailed 7-day spot forecasts for all of western Oregon. Weather patterns ~~shall~~must be considered when developing a construction schedule and ~~developing Best Management Practices~~selecting appropriate BMPs for the site.

8.03.2 — Erosion Prevention vs. Sediment Control

The driving consideration in creating and implementing ~~the an effective~~ ESCP ~~shall be~~ providing erosion prevention measures rather than sediment control. Although every ESCP will have elements of both, it is ~~generally~~often far more cost effective and practical to emphasize erosion prevention. Erosion prevention measures ~~shall be~~are designed to prevent exposed soil particles from becoming dislodged by rain and wind, as well as construction activity and traffic. Such measures ~~shall~~ include stabilized construction roads, ~~seeding areas to establish vegetation~~, temporary ~~and permanent~~ ground covers (mulch, temporary grasses, straw mulch, tackifier, etc.), matting, plastic sheeting, and numerous other products designed to provide mechanical or physical protection to exposed soil. ~~— Sediment control involves techniques to remove transported sediment from runoff, where common control measures include sediment basins, sediment traps, sediment fences, check dams, bio-filter berms, catch basin filters, etc.~~

~~Sediment control, which involves techniques to re-capture transported sediment from runoff shall also be utilized in the ESCP. Sediment control measures may, sediment fences, mulch berms, check dams, sediment barriers, catch basin filters, sediment basins, etc.~~

The benefit of erosion prevention is that it seeks to prevent the problem before it starts. It is also often impractical to recover large amounts of sediment after it becomes dislodged and suspended in runoff. ~~Most of the time~~On projects where the predominant soil particle size is very small (fine silts and clays), the amount of time required to allow for settling the particles can reach days or even weeks. It is also generally true that erosion prevention measures are more reliable, whereas sediment control measures require continual and costly maintenance.

Formatted: Justified

Because successful erosion control requires minimizing disturbed areas, the ESCP ~~shall~~must emphasize scheduling and phasing ~~of site disturbance and protection~~. Project scheduling and phasing is often driven by factors other than erosion control, however, so contingency planning ~~shall be included~~is essential. Most importantly, the ESCP ~~shall~~must be designed and implemented as a living, dynamic plan ~~and shall~~that can be adapted to address changes in the project as work progresses.

Formatted: Justified, Indent: First line: 0"

Formatted: Justified

8.03.3 Assessing the Project Site

The ~~erosion and sediment control plan shall~~ESCP must seek to protect the soil surface from erosion; control the ~~amount~~quantity, quality, and velocity of runoff; and capture all sediment on-site during each phase of the construction project. When assessing erosion control needs for the project, the ~~designer~~Engineer shall note any of the following regulatory requirements, existing conditions, or construction conditions:

A. Regulatory Requirements

1. All requirements and conditions outlined in the current 1200-~~CAC~~ General Permit issued by the Department of Environmental Quality ~~to the City of Springfield are~~shall be the minimum criteria used to evaluate the design and functionality of the ~~erosion control plan~~ESCP developed by the ~~engineer~~Engineer for the specific site.
2. Requirements of other involved ~~local~~ agencies such as ODOT or Lane County.
3. Special ~~Requirements~~requirements by other permitting agencies such as the Oregon Department of Fish & Wildlife, Department of Environmental Quality, ~~Division~~Department of State Lands, or the Army Corps of Engineers. Any permits required from other regulatory agencies for a project shall be obtained prior to the submittal of the ESCP. Copies of applications and permits shall be submitted with the ESCP.

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

Formatted: Justified

B.A. Existing Conditions

1. Type and condition of existing vegetation.
2. Soil types expected.
3. Runoff flowing onto the construction site.
4. Swales or streams ~~which~~that run through the site.
5. Runoff ~~which~~that concentrates in ~~drainage~~swales or ditches.
6. Streams that could rise during high water flow.
7. ~~Storm drain system~~Stormwater systems with inlets, which might receive sediment.

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

Formatted: Justified

laden water.

8. Outlets at culverts and other ~~storm water~~stormwater conveyances.
9. Permanent landscaping.

C.A. Construction Conditions

1. Construction traffic routes throughout the work site.
2. Runoff flowing onto the construction site.
3. Runoff that will flow onto disturbed areas having slopes 4H:1V or steeper.
4. Cut or fill slopes 3H:1V or steeper and higher than six feet.
5. Runoff leaving the disturbed areas as sheet flow.
6. Runoff leaving disturbed areas as concentrated flow

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

Formatted: Justified

7. Exposed soils within 100 feet of a waterway or wetland
8. Disturbed areas of more than five acres that drain to a common location.
9. Disturbed areas of less than five acres that drain to a common location.
10. ~~Storm drain system~~ Stormwater systems with inlets that might receive sediment-laden water.
11. Outlets at culverts and other ~~storm water~~ stormwater conveyances.
12. Permanent landscaping.

Formatted: Justified, Indent: Left: 0.5", Hanging: 0.25"

Formatted: Justified

8.03.4 Five Basic Rules

~~The Attention to the~~ following five basic rules ~~shall be used in at~~ the planning ~~of the ESCP~~ stage will develop a successful program:

- A. Timing - Schedule work to minimize overall impacts.
- B. Stage Work - Identify and process critical areas first, look at new drainage patterns created through phases of work.
- C. Minimize Disturbance - Create buffers and reduce mass grading.
- D. Pre-construction Planning - Identify construction sequences and lay out erosion control measures.
- E. Documentation - Photograph/video/record existing conditions prior to and throughout construction.

Formatted: Font: Not Bold, No underline, Font color: Auto

Formatted: Justified, Indent: Left: 0", Hanging: 0.5"

Formatted: Font: Not Bold, No underline, Font color: Auto

Formatted: Font: Not Bold, No underline, Font color: Auto

Formatted: Font: Not Bold, No underline, Font color: Auto

Formatted: Font: Not Bold, No underline, Font color: Auto

Formatted: Justified

8.03.5 Project Scheduling

~~The ESCP shall specify~~ Following a specified work schedule that coordinates the timing of land disturbing activities and the installation of control measures. ~~This~~ is perhaps the most cost-effective way of controlling erosion during construction. The removal of 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. The ESCP ~~shall~~ must indicate in each phase of the scheduled work how the proposed erosion/sediment control measures will divert flows, store flows, limit runoff from exposed areas, stabilize exposed soil, and filter sediment.

Formatted: Font: Not Bold, No underline, Font color: Auto

Formatted: Justified

8.04 ESCP - DETERMINE APPLICABLE DESIGN ELEMENTS

The ESCP shall be developed according to the following general principles of erosion and sedimentation:

- ~~F.A.~~ Fit grading to the surrounding terrain.
- ~~G.A.~~ Time grading operations to minimize soil disturbance.
- ~~H.B.~~ Emphasize erosion control measures to stabilize disturbed areas.
- ~~I.C.~~ Retain existing vegetation wherever possible.
- ~~J.D.~~ Direct runoff away from disturbed areas.
- ~~K.E.~~ Minimize the length and steepness of slopes.
- ~~L.F.~~ Use energy dissipation devices to reduce runoff velocities.
- ~~M.G.~~ Install permanent ~~storm drainage~~ stormwater facilities as soon as possible.
- ~~N.H.~~ Manage clean water to prevent it from coming into contact with exposed soil.
- ~~O.I.~~ Provide stabilized construction roads for all internal traffic.
- ~~P.J.~~ Clearly mark all restricted areas and natural features to be protected.

Formatted: Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab

Keeping these design principals in mind, the following ten elements ~~shall~~^{should} be evaluated for every project. Erosion control measures ~~shall~~^{must} be chosen based on the elements that apply to the project ~~and on the Best Management Practices design criteria contained in Appendix 8A.~~

- Clearing Limits (Section 8.04.1)
- Sensitive Area Restrictions (Section 8.04.2)
- Surface Water Control (Section 8.04.3)
- Perimeter Protection (Section 8.04.4)
- Sediment Retention (Section 8.04.5)
- Cover Measures (Section 8.04.6)
- Inlet Protection (Section 8.04.7)
- Traffic Area Stabilization (Section 8.04.8)
- Dust Control (Section 8.04.9)
- Permanent Ground Cover (Section 8.04.10)

8.04.1 Clearing Limits

Limiting site disturbance is the single most effective method for reducing erosion. Clearing limits prevent disturbance of areas not designated for clearing or grading, protect the natural environment, provide a buffer between disturbed areas and sensitive areas, and reduce the need for other erosion control measures. Clearing limits shown on the ~~plan~~^{ESCP} shall be clearly marked in the field.

Since clearing limits must be marked before ground disturbance occurs, the ~~engineer~~^{Engineer} shall show the sensitive areas as "no work" areas on the ESCP, even when the "no work" areas are shown elsewhere in the plans. Sensitive areas and their buffers may require more substantial protection such as plastic or metal safety fences or stake and wire fences. ~~Sediment~~^{High} ~~visibility construction~~ fence, ~~(manufactured in combination with survey flagging, is also an acceptable method or orange instead of marking sensitive areas and their buffers. However, sediment fence shall only be used for this black)~~ may serve the dual-purpose ~~if it is also needed for of both~~ sediment control ~~and delineation~~.

8.04.2 Sensitive Area Restrictions

Any project, regardless of size, that disturbs areas near or within a stream or associated buffer, a wetland or its associated buffer, or within 100 feet of a lake has the potential to ~~seriously~~^{cause} ~~serious~~ damage ~~to~~ water resources. Projects along or near waterways may have special requirements that must be incorporated into the ESCP. Contact the City of Springfield or other applicable permitting agency for specific requirements.

Any permits required from other regulatory agencies for a project shall be obtained prior to the submittal of the ESCP. Copies of applications and permits shall be submitted with the ESCP.

When dealing with sensitive areas, the following recommendations shall be incorporated into the ~~plan~~^{ESCP} where appropriate:

~~Q. — Before~~^{Prior to} the wet season, a sediment ~~barrier~~^{control measure} shall be constructed ~~between the disturbed areas and the surface water~~^{at an appropriate location} in order to

Formatted: Font color: Black

Formatted: Body Text 2, Indent: First line: 0.5"

Formatted: Justified

isolate the construction ~~area~~zone from the ~~water resource~~.

~~R.A. Additional perimeter protection shall be installed to reduce the likelihood of sediment entering the surface waters. This might include multiple sediment fences; sediment fences in combination with sediment barriers, a berm, or application of a thick layer of mulch up slope of a sediment fence protected area.~~

Formatted: Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab

~~S.A. Runoff generated by decanting shall be directed through a sediment trap and/or the water released uniformly over a well-vegetated, relatively flat area. A well-vegetated area with dense grass or similar vegetation is a filter for the runoff to pass through. Since pumps are used for decanting, it may be possible to pump the sediment-laden water away from the surface water so that vegetation can be more effectively used for filtration.~~

Formatted: Justified

The following items shall be considered and applicable items shall be included on the ESCP:

1. Specify the type, locations, and details of any measures necessary to comply with requirements to protect surface waters.

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

~~2.1. Specify the type, locations, and details of any measures necessary to comply with any additional protection required for steep slopes.~~

Formatted: Justified, Tab stops: -1", Left + 0.75", Left + Not at 1.25"

8.04.3 Surface Water Control

Surface water controls ~~shall be used to~~ collect and convey surface water to minimize erosion: ~~The techniques that shall be considered include and may:~~

A. Intercept runoff on and above disturbed slopes.

~~B.A. Divert offsite runoff around project.~~

~~C.B. Convey the runoff to a sediment trap, basin or stabilized outlet.~~

~~D.C. Release the runoff downslope of any disturbed areas.~~

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

Surface water control measures include dikes, swales, ditches, pipe slope drains, and level spreaders. Interceptor dikes/swales intercept runoff and ~~take~~convey it away from disturbed ground. Ditches and pipe slope drains convey runoff through a site. Riprap or level spreaders dissipate the velocity of runoff and release it in a non-erosive manner. Vegetation-lined channels are preferable to pipe slope drains whenever the channel gradient does not exceed five percent, vegetation can be adequately established, and the channel is accessible for maintenance.

Surface water controls ~~shall~~should be constructed during the initial grading ~~of an area so they are in place before there is any opportunity for~~ storm runoff ~~to cause~~from causing erosion. If the soils and topography are such that no offsite discharge of surface water is anticipated based on the ten-year six-hour storm, surface water controls may not be needed. When using vegetation-lined channels, they ~~shall~~should be established early in the project. Irrigation may be required to establish a thick, dense stand of vegetation. Grass may require mowing and removal of the dead plant material to optimize its effectiveness. If vegetation cannot be adequately established, the channel ~~shall~~should be protected with temporary measures such as matting or rock.

The following items shall be considered and applicable items shall be included on the ESCP:

1. Locate all pipes, ditches, and interceptor ditches and swales that will be used to convey stormwater.
 2. Provide details sufficient to install and maintain all conveyance systems.
 3. Indicate locations of outlet protection and provide detail of ~~protections~~ **protection measures**.
 4. Indicate locations and outlets of any possible de-watering systems.
 5. Indicate the location of any level spreaders, and provide details sufficient to install and maintain.
- ~~6.1.~~ Provide all temporary pipe inverts.
- ~~7.2.~~ Provide location and specifications for the interception of runoff from disturbed areas and the conveyance of the runoff to a non-erosive discharge point.
- ~~8.3.~~ Provide front and side sections of typical rock check dams.

8.04.4 Perimeter Protection

Perimeter protection measures are so named because they are installed at the perimeter of disturbed areas. These measures either reduce runoff velocity, retain sediment while allowing water to pass, or collect runoff and direct it to a sediment trap or basin for treatment.

Perimeter protection ~~may can~~ be used as the primary means of sediment removal when the catchment area is very small. It may be a secondary means of sediment removal, for instance, following a sediment trap or basin. Perimeter protection measures include sediment ~~fence~~ **fences**, sediment barriers, interceptor dikes and swales, and sediment traps and basins. Perimeter protection may be used as the primary treatment when the flow path meets the criteria listed below. Otherwise, perimeter protection shall be used in combination with other measures.

Table 8-1: Criteria for Perimeter Protection as Primary Treatment

Average Slope	Flow Path Length
1.5H:1V or flatter	100 feet or shorter
2H:1V or flatter	115 feet or shorter
4H:1V or flatter	150 feet or shorter
6H:1V or flatter	200 feet or shorter

Conveyance of runoff from a construction site can more safely be achieved by:

- A. Utilizing and supplementing existing stable watercourses.
- B. Installing storm drains with stable outlets.
- C. Designing and constructing stable open channels.

The ~~plan shall~~ **ESCP must** indicate locations for these design facilities. Outlets for channels, diversions, slope drains, or other structures shall be completed and stabilized before installing perimeter protection measures. Impacts to existing facilities, if they are to be used for erosion control during construction, shall be evaluated.

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: 0.5", List tab + 0.75", Left

Formatted: Justified

Formatted: Font: Not Bold

Formatted: Justified, Indent: First line: 0.5"

Formatted Table

Formatted: Line spacing: Exactly 3.1 pt, Tab stops: Not at 0" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6" + 6.5"

Formatted: Line spacing: Exactly 3.1 pt, Tab stops: Not at 0" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6" + 6.5"

Formatted: Centered, Space After: 2.15 pt

Formatted: Centered, Space After: 2.15 pt

Formatted: Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: Not at 0" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6" + 6.5"

Formatted: Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: Not at 0" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6" + 6.5"

Formatted: Line spacing: Exactly 3.1 pt, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: Not at 0" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6" + 6.5"

Formatted: Line spacing: Exactly 3.1 pt, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: Not at 0" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6" + 6.5"

Formatted: Line spacing: Exactly 3.1 pt, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: Not at 0" + 0.5" + 1" + 1.5" + 2" + 2.5" + 3" + 3.5" + 4" + 4.5" + 5" + 5.5" + 6" + 6.5"

Formatted

Formatted: Justified, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

The following items shall be considered and applicable items shall be included on the ESCP:

1. Specify the location and type of perimeter protection to be used.
2. Provide typical details sufficient for installation and maintenance of perimeter protection.
3. If a sediment fence is to be used, specify the type of fabric.

8.04.5 Sediment Retention

Sediment retention measures remove sediment from runoff by holding a volume of water for a length of time, allowing particles 0.02 mm and larger to settle out. Sediment retention shall be used as a last line of defense when included in an ESCP. Other design elements shall also be included in the ~~plan~~ESC~~P~~ to assure sediment from erosion is under control.

When sediment retention is used by itself, the potential for catastrophic failures is high. Sediment traps are a common facility used for sediment retention. When a sediment trap is required, it shall be shown on the ESCP and the dimensions of each trap described on the sediment trap detail or plan sheets.

8.04.6 Cover Measures

Temporary and permanent cover measures protect disturbed areas. Covering exposed soils prevents erosion, thus reducing reliance on less effective sediment removal and is the only practical method of reducing turbidity. In ideal conditions, all disturbed ground not being worked ~~should~~shall be covered to prevent wind and water erosion. ~~Cover measures shall be incorporated into the ESCP.~~

Temporary cover protects disturbed areas not at finished grade or areas that will be re-disturbed ~~at a later date~~. Temporary cover methods include mulch, erosion control matting, plastic sheeting, seeding, and sodding. Mulch and plastic sheeting protect disturbed areas from days to a few months. Plastic sheeting is most applicable to short-term stockpile protection and on slopes steeper than 1.5H:1V. Seeding and sodding protect unworked areas for months. Soil stockpiles ~~shall~~should always be protected with plastic sheeting, tarpaulins, ~~silt~~sediment fence, diversion dikes, or combinations thereof.

Permanent cover methods include seeding and mulching, erosion control matting with seed on steep slopes, riprap, gravel, bark mulch with tree and shrub planting, and sodding.

The following items shall be considered and applicable items shall be included on the ESCP:

- A. Specify the type and location of temporary cover measures to be used on site.
- B. If more than one type of cover is to be used on site, indicate the areas where each different measure shall be used, including steep cut and fill slopes.
- C. If the type of cover measures to be used will vary depending on the time of year, soil type, gradient, or ~~some~~other ~~factor~~factors, specify the conditions that control the use of the different measures.
- D. Specify the nature and location of permanent cover measures. If a landscaping plan is prepared, this may not be necessary.
- E. ~~Specify~~Correctly quantify the ~~approximate~~required amount of ~~cover measures necessary to cover all disturbed areas~~the selected soil coverage BMPs by calculating the surface

Formatted: Font: Not Bold, No underline

Formatted: Justified, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

area of exposed soil.

- F. If erosion netting or blankets are specified, provide typical details sufficient for installation and maintenance.
- G. Specify the seed mixes, fertilizers, and soil amendments to be used, as well as the application rate for each item.

8.04.7 Inlet Protection

Inlet protection ~~shall~~must prevent sediment from entering the ~~storm drainage~~stormwater systems by filtering runoff and retaining sediment before it reaches a ~~drainage~~inlet or ~~storm sewer~~stormwater system.

The following items shall be considered and applicable items shall be included on the ESCP:

- ~~T.A.~~ A. Indicate catch basins that are to be protected.
- ~~U.B.~~ B. Provide details of the catch basin protection sufficient to install and maintain.
- ~~V.C.~~ C. Consider potential traffic hazards when selecting applicable basin protection method.

8.04.8 Traffic Area Stabilization

Construction road and parking area stabilization ~~shall be included in the ESCP as applicable to reduce~~reduces safety hazards caused by sediment on public right-of-way ~~and to reduce~~. It also reduces the amount of sediment that ~~can end up in~~may enter the ~~drainage~~stormwater system by minimizing the amount of sediment transported off site. Stabilization is also an excellent form of dust control in the summer months. Construction ~~site~~entrances ~~shall be included in the ESCP~~are needed to protect sediment from being tracked off site or onto paved surfaces.

The following items shall be considered and applicable items shall be included on the ESCP:

- ~~W.A.~~ A. Locate the construction entrance(s).
- ~~X.B.~~ B. Provide typical details sufficient for installation and maintenance of the construction entrance.
- ~~Y.C.~~ C. Locate the construction roads and parking areas.
- ~~Z.D.~~ D. Specify the measure(s) that will be used to create stabilized construction roads and parking areas. Provide sufficient detail to install and maintain.

8.04.9 Dust Control

Dust control ~~shall be used as applicable in the ESCP to~~measures minimize the transport of soil by wind and traffic, thereby reducing traffic hazards and sediment deposition in water resources and on adjacent properties. Watering is the most common dust control used. Other methods include mulching, seeding, gravel, or spraying exposed areas with an approved dust palliative. Dust control shall be considered on the ESCP.

8.04.10 Permanent Ground Cover

Seeding ~~shall be included~~is a part of work required on all construction projects with disturbed soil anticipated at the end of the construction season or conclusion of a project. Seeding activities may also include fertilizing, mulching, and soil testing operations that are necessary for vegetation establishment. ~~An important part of seeding is the selection of~~Selecting the appropriate seed mixtures and rate of application is an essential part of the ESCP. Each ~~job~~project may have unique soil, climatic, or other environmental conditions. ~~The City may require a qualified Landscape Architect, so it is recommended that an~~ agronomist, horticulturist, or erosion control specialist ~~be used for seeding specifications, or an Oregon Registered Landscape Architect provide recommendations.~~

8.05 ESCP PLAN DESIGN

The base map shall be plotted at the same scale as the rest of the roadway plans so important

Formatted: Justified, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

Formatted: Font: Bold, Underline

Formatted: Font: Times New Roman

features such as ~~drainage~~ swales and topography can be easily distinguished. The ESCP ~~plan~~ ~~shall~~must be a separate section in a ~~public improvement~~Public Improvement Project plan set ~~following all other plans as applicable.~~ ESCP sheets shall be included in the sheet numbering sequence so that the total number of pages includes all ESCP sheets.

Best Management Practices (BMP's)

BMPs shall be designed to function under the conditions of a ten-year, six-hour storm event. For ~~BMP's~~BMPs requiring design such as sediment ponds or traps, sizing calculations shall be submitted with the ESCP.

Formatted: Justified, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

In the event that the ESCP is not too complicated and the plans can accommodate additional items without appearing confusing, the erosion control items can be incorporated into similar sections of the construction plans. (For example, the ESCP Notes ~~should~~may be included with the Standard Construction Notes.)

Formatted: Justified, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

8.05.1 Base Map

The base map ~~shall~~must include the following information:

~~AA.A.~~ Alignment(s) showing stationing on control line.

~~BB.B.~~ Names of roads and waterways.

~~CC.C. Right~~Rights-of-way and easements.

~~DD.D.~~ Existing and proposed permanent ~~storm water drainage~~stormwater facilities (culverts, pipes, etc.).

~~EE.E.~~ Boundaries of natural drainage features and sensitive areas (lakes, swales, rivers, streams, wetlands, etc.).

~~FF.F.~~ Cut and fill lines ~~and~~ on major slopes (greater than 3H:1V).

~~GG.G.~~ Existing and proposed ground contour lines (labeled).

~~HH.H.~~ Roadway grades.

~~II.I.~~ Extent of surrounding development.

~~JJ.J.~~ Existing structures.

~~KK.K.~~ Existing vegetation, shrubs, trees, etc. -identified to remain or to be removed.

~~LL.L.~~ Arrows indicating drainage patterns and flow directions in concentrated flow areas.

8.05.2 Erosion and Sediment Control Design using ~~BMP's~~BMPs

To fully develop the ESCP, applicable design elements outlined in Section 8.04 ~~shall~~should be added to the base map. A combination of ~~best management practices outlined in Appendix~~ ~~8~~BMPs shall be incorporated into the ESCP.

~~8.05.3~~ ~~Complete~~ A list of recommended BMPs can be found in the Oregon Department of ~~Environmental Quality manual entitled~~ Best Management Practices for Storm Water Discharges Associated with Construction Activities as well as in Appendices E and F of the DEQ Erosion and Sediment Control ~~Plan~~Manual. These resources provide information about each BMP, such as: basic design and construction, design considerations, efficiency, and maintenance. Each can be found online via the following links:

Formatted: Justified, Indent: Left: 0", First line: 0", Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

Formatted: Font: Not Bold, No underline, Font color: Auto

Best Management Practices for Storm Water Discharges Associated with Construction Activities: <http://www.deq.state.or.us/wq/stormwater/docs/nwr/constrbmps.pdf>

[Appendix E: http://www.deq.state.or.us/wq/stormwater/docs/escmanual/appxe.pdf](http://www.deq.state.or.us/wq/stormwater/docs/escmanual/appxe.pdf)

[Appendix F: http://www.deq.state.or.us/wq/stormwater/docs/escmanual/appxf.pdf](http://www.deq.state.or.us/wq/stormwater/docs/escmanual/appxf.pdf)

8.05.3 Complete ESCP

Following is a list of items that shall be included on each ESCP Plan Sheet.

~~MM.A.~~ AA.A. Sheet title.

~~NN.B.~~ BB.B. Sheet number (in the format Sheet X of Y).

~~OO.C.~~ CC.C. Signature block including name, address, and telephone number.

~~PP.D.~~ DD.D. ~~Designer's~~Engineer's stamp & signature.

~~QQ.E.~~ EE.E. North Arrow.

~~RR.F.~~ FF.F. Initials of engineer and drafter.

All ~~Erosion & Sediment Control Plans shall~~ESCPs must contain the following sheets in the following order:

~~Plan~~Cover Sheet(s) (Section 8.05.3.A)

Detail Sheet(s) (Section 8.05.3.B)

Plan View Sheet(s) (Section 8.05.3.C)

Formatted: Justified, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

8.05.3.A Plan Sheets ESCP Cover Sheet

~~At a minimum, the ESCP plan (two sets need to be provided) shall address the follow factors as appropriate:~~

~~Site location and vicinity~~The following items shall be included on the first ESCP Sheet:

- ~~1. Vicinity Map~~
- ~~2. Standard ESCP notes (as stated in Section 8.06).~~
- ~~3. Special ESCP notes specific to site (if necessary).~~
- ~~4. Jurisdictional Requirements (ACOE, DSL, etc.).~~
- ~~5. General Construction Plan included staging of Erosion Control Measures.~~
- ~~6. Contingency Plan for critical area(s).~~
- ~~7. Total Project Areas.~~
- ~~8. Total Disturbed Area.~~
- ~~9. Soil Types including erodibility (Soil Conservation Service K value).~~
- ~~10. Symbol Legend.~~

8.05.3.B ESCP Plan View Sheet(s)

~~The following items shall be included on ESCP plan view sheets:~~

- ~~1) Base map:~~
- ~~2) A site development plan, drawn to scale, containing the following:
 - ~~a) Soil types and areas subject to flooding or landslides (include 100-year floodplain boundaries).~~
 - ~~b) Existing and proposed contour lines.~~
 - ~~c) Property lines and north arrow.~~
 - ~~d) Building pad floor elevations~~
 - ~~e) Identify threatened or endangered species habitat (if applicable).~~
 - ~~f) Surface drainage patterns, riparian areas, top of stream banks and wetlands.~~
 - ~~g) Existing vegetation type & trees over 5 inches in DBH and greater.~~~~
- ~~3) Delineate areas where ground clearing or ground disturbing activities are prohibited such as but not limited to conservation zones, wetlands, public or private drainage easements, open waterways, natural resource sites, buffer areas, roadside ditches, water features and other protected areas.~~
- ~~4) Identify measures which will be implemented to physically protect areas where ground disturbance is prohibited.~~
- ~~5) Show measures for preventing, and/or controlling erosion, sedimentation, and other pollutants into the City's stormwater system and related natural resources.~~
- ~~6) Vegetation specifications for temporary and permanent stabilization (include a planting plan).~~
- ~~7) Access for all vehicles including:~~

Formatted: Justified, Indent: Left: 0", First line: 0", Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

- a) ~~1. Areas where a construction entrance/exit will be constructed described in section 8.05.1.~~
- b) ~~1. Location of a vehicle wheel wash area (if applicable). BMPs.~~

~~8) All storm drainage facilities, such as but not limited to pipes, manholes, catch basins, curb inlets, channels, ditches and outfalls.~~

- 9) ~~Disposal locations and methods of containment for the following:~~
 - a) ~~Debris and garbage~~
 - b) ~~Stockpiles~~
 - e) ~~Concrete wash out~~

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: -1", Left + -0.5", Left + 0", Left + 0.5", List tab + 0.75", Left + 1", Left + 1.5", Left + 2", Left + 2.5", Left + 3", Left + 3.5", Left + 4", Left + 4.5", Left + 5", Left + 5.5", Left + 6", Left + 6.5", Left

~~Unless the following information is to be provided by the contractor please indicate them on the ESCP. If the information is to be provided by the contractor, a note shall be placed on the plans indicating this:~~

- ~~1) Construction Schedule:~~
 - a) ~~Haul routes~~

- b) ~~2. Schedule of Erosion control construction notes and numbered reference bubbles.~~
 - 1. ~~References to standard or detailed drawings.~~

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: -1", Left + -0.5", Left + 0", Left + 0.5", List tab + 0.75", Left + 1", Left + 1.5", Left + 2", Left + 2.5", Left + 3", Left + 3.5", Left + 4", Left + 4.5", Left + 5", Left + 5.5", Left + 6", Left + 6.5", Left

8.05.3.BC ESCP Detail Sheet(s)

~~The following items shall be included on ESCP detail sheets:~~

- 1. ~~Drawings and text; detailing complete installation and maintenance instructions for BMP's to be BMPs used on project; shall be included on the detail sheets.~~

Formatted: Justified, Indent: Left: 0", First line: 0", Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

8.06 EROSION CONTROL CONSTRUCTION NOTES

~~The standard ESCP construction notes are a minimum to shall be included on all Erosion and Sediment Control Plans the cover sheet of all ESCPs and shall not be altered. The engineer/Engineer may add additional notes to further condition the and conditions specific to the ESCP.~~

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: 1, 2, 3, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: 0.5", List tab

Following are the standard ESCP construction notes:

~~1. Prior to any ground disturbance on the site one inspection with LDAP staff is required. Issuance of this plan does not relieve the permit holder and or the contractor from all other permitting requirements. Prior to beginning construction activities, all other necessary approvals shall be obtained.~~

~~2. The erosion and sediment control measures shown on the plan are the minimum requirements for anticipated site conditions. During the construction period, these measures shall be upgraded as needed for unexpected storm events and to ensure that sediment and sediment laden water does not leave the site.~~

~~A. 3. Approval of this ESCP does not constitute an approval of permanent road or stormwater system design (e.g., size and location of roads, pipes, restrictors, channels, retention facilities, utilities, etc.).~~

~~B. The implementation of the this ESCP and the construction, maintenance, replacement, and upgrading of the these erosion and sediment control measures (ESC) facilities is the responsibility of the permit holder and or the contractor until all construction is~~

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: -1", Left + -0.5", Left + 0", Left + 0.5", List tab + 0.75", Left + 1", Left + 1.5", Left + 2", Left + 2.5", Left + 3", Left + 3.5", Left + 4", Left + 4.5", Left + 5", Left + 5.5", Left + 6", Left + 6.5", Left

~~completed approved and the project is accepted and vegetation / landscaping is established by the City.~~

~~C. 4. The boundaries of the clearing limits shown on this plan shall be clearly flagged in the field by the engineer. In the event the ESC facilities identified on the ESCP are not functioning properly, the contractor shall be responsible for immediately implementing changes to the ESCP as directed by the Engineer or his/her inspector. The Engineer, the inspector or the City may stop all construction activity on site until the erosion problem is corrected and all ESC facilities are functioning properly. If the contractor does not immediately implement changes to the ESCP identified by the Engineer or his/her inspector, the City may implement the necessary changes and require payment from the contractor prior to project acceptance by the City.~~

~~D. The boundaries of the clearing limits shown on this ESCP shall be clearly flagged by a continuous length of survey tape (or fencing, if required) prior to construction. During the construction period, no disturbance beyond the flagged clearing limits shall be permitted. The flagging contractor shall be maintained by the permit holder and or the contractor maintain the clearing limits for the duration of the construction.~~

~~5. The erosion and sediment control measures on active sites shall be inspected and maintained daily and within the 24 hours after any storm event of greater than 0.5 inches of rain per 24 hour period. Measures shall be inspected by the permit holder and or the contractor after each rainfall and at least daily during prolonged rainfall. Any required repairs or adjustments shall be made immediately. The erosion and sediment control measures on inactive sites shall be inspected a minimum of once every two (2) weeks or within 48 hours following a storm event.~~

~~6. All erosion and sediment control measures shall be protected from damage at all times. Control measures shall remain in place until permanent re-vegetation has been stabilized. Any measure that is damaged or destroyed shall be repaired or replaced immediately.~~

~~7. Any areas of exposed soils, including roadway embankments, that will not be disturbed for two days during the wet season (October 1 to April 30) or seven days during the dry season (May 1 to September 30) shall be immediately stabilized with an approved ESC method (seeding & mulching with straw, bark, compost, or plastic covering, etc.).~~

~~8. Street sweeping shall be performed as needed or when directed by the City inspector to ensure public right-of-ways are kept clean and free of debris. Street flushing is prohibited.~~

~~9. When trucking saturated soils from the site, either water tight trucks shall be used or loads shall be drained on site until dripping has been reduced to no more than one gallon per hour. Sediment laden water will not be allowed to enter the storm water system~~

~~10. Extracted ground water from excavated trenches shall be disposed of in a suitable manner without damage to adjacent property, City's storm water system, water features, and related natural resources. Approval of a dewatering system does not guarantee that it will meet compliance or be acceptable for use in all situations. Modifications to the dewatering system will be required if compliance can not be met. At no time will sediment laden water be allowed to leave the construction site.~~

Formatted: Level 1, Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Tab stops: -1", Left + -0.5", Left + 0", Left + 0.5", List tab + 0.75", Left + 1", Left + 1.5", Left + 2", Left + 2.5", Left + 3", Left + 3.5", Left + 4", Left + 4.5", Left + 5", Left + 5.5", Left + 6", Left + 6.5", Left

~~11. A supply of materials necessary to meet compliance and implement the LDAP or other best management erosion practices under all weather conditions shall be maintained at all times on the construction site.~~

~~12. No hazardous substances, such as paints, thinners, fuels and other chemicals shall be released onto the site, adjacent properties, or into water features, the City's storm water system, or related natural resources.~~

E. The ESC facilities shown on the ESCP shall be constructed prior to or in conjunction with all clearing and grading so as to ensure that the transport of sediment to surface waters, stormwater systems, and adjacent properties is minimized.

F. The ESC facilities shown on this ESCP are the minimum requirements for anticipated site conditions. During the construction period, these ESC facilities shall be upgraded as needed for unexpected storm events and modified to account for changing site conditions (e.g., additional sump pumps, relocation of ditches and silt fences, etc.). All changes to the ESCP shall be noted on the contractors and inspector's approved ESCP plan set. One updated ESCP plan set shall be kept on site at all times.

~~13.~~ G. The ESC facilities shall be inspected daily by the contractor and maintained to ensure continued proper functioning. Written records shall be kept of weekly reviews of the ESC facilities during the wet season (October 1 to April 30) and of monthly reviews during the dry season (May 1 to September 30).

A. Any areas of exposed soils, including roadway embankments, that will not be disturbed for two days during the wet season (October 1 to April 30) or seven days during the dry season (May 1 to September 30) shall be immediately stabilized with the approved ESC methods (e.g., seeding, mulching, plastic covering, etc.).

B. The ESC facilities on inactive sites shall be inspected and maintained a minimum of once a month or within twenty-four hours following a storm event.

C. At no time shall more than one foot of sediment be allowed to accumulate within a catch basin. All catch basins and conveyance lines shall be cleaned prior to paving. The cleaning operation shall not flush sediment-laden water into the downstream system.

D. Stabilized construction entrances and roads shall be installed at the beginning of construction and maintained for the duration of the project. Additional measures, such as wash pads, may be required to ensure that all paved areas are kept clean for the duration of the project.

E. Any permanent flow control facilities used as a temporary settling basin shall be modified with the necessary erosion control measures and shall provide adequate storage capacity.

F. Where straw mulch for temporary erosion control is required, it shall be applied at a minimum thickness of two to three inches.

G. In preparation for the wet season, all disturbed areas shall be reviewed to identify which ones can be seeded in preparation for the winter rains. A sketch map of those areas to be seeded and those areas to remain uncovered shall be submitted to the City by September 15. The City can require seeding of additional areas in order to protect surface waters, adjacent properties, or stormwater facilities. Disturbed areas identified for seeding shall be seeded prior to the beginning of the wet season (October 1).

8.07 CONSTRUCTION SEQUENCE

A detailed construction sequence is needed to ensure that erosion and sediment control measures

Formatted: Level 1, Justified, Indent:
Hanging: 0.5", Outline numbered + Level: 1 +
Numbering Style: A, B, C, ... + Start at: 1 +
Alignment: Left + Aligned at: 0" + Indent at:
0", Tab stops: -1", Left + -0.5", Left + 0",
Left + 0.5", List tab + 0.75", Left + 1", Left +
1.5", Left + 2", Left + 2.5", Left + 3", Left +
3.5", Left + 4", Left + 4.5", Left + 5", Left +
5.5", Left + 6", Left + 6.5", Left

Formatted: No underline, Font color: Auto

Formatted: Justified, Border: Top: (No
border), Bottom: (No border), Left: (No border),
Right: (No border)

are applied at the appropriate times. Prior to scheduling the pre-construction conference, the ~~designer~~Engineer shall identify approximate dates of proposed activities and submit it to the City for review and approval.

A recommended construction sequence is provided below:

- ~~SS.A.~~ Conduct a pre-construction meeting.
- ~~TT.B.~~ Flag or fence clearing limits (~~as stated on the approved plans~~).
- ~~UU.C.~~ Install catch basin protection, if required.
- ~~D.~~ Grade and install construction entrance(s).
- ~~VV.E.~~ Install perimeter protection (~~sediment~~silt fence, ~~mulch berm, wattlebrush barrier~~, etc.).
- ~~WW.~~ Call to schedule an on-site inspection of all erosion measures after installation.
- ~~XX.~~ Install construction entrance(s).
- ~~YY.A.~~ Construct sediment ponds and traps.
- ~~ZZ.A.~~ Grade and stabilize construction roads.
- ~~AAA.B.~~ Construct surface water controls (interceptor dikes, pipe slope drains, etc.) simultaneously with clearing and grading for project development.
- ~~BBB.C.~~ Maintain erosion prevention and sediment control measures in accordance with City of Springfield standards and manufacturer's recommendations.
- ~~CCC.D.~~ Update erosion and sediment control measures to handle major change in site
- ~~DDD.E.~~ Conditions all areas that will ~~be unworked~~remain undisturbed for more than seven days during the dry season or two days during the wet season with straw, wood fiber mulch, compost, plastic sheeting, or equivalent.
- ~~EEE.F.~~ Stabilize all areas within seven days of reaching final grade.
- ~~FFF.G.~~ Seed or sod any areas to remain ~~unworked~~undisturbed for more than 30 days.
- ~~GGG.H.~~ Upon completion of the project, stabilize all disturbed areas and remove ~~BMP's~~BMPs if appropriate.

8.08 NARRATIVE

A narrative ~~shall~~must accompany the ESCP for inclusion in the project file. ~~The narrative shall, and must~~ explain the ESCP in ~~greater~~ detail. The narrative ~~shall~~must be brief, clear, and concise while stating pertinent information. The narrative ~~shall~~must include: the approximate construction schedule; ESCP staging; design dates; expected rainfall; expected runoff velocities; expected peak flows; soil types; total project area; and total disturbed area. ~~The narrative shall~~ It must discuss any particular concerns related to the project ESCP special areas including special environmental and jurisdictional requirements, steep slopes, highly erodible soils, etc., and how the concerns were addressed. The narrative ~~shall~~must also address contingency plans to protect those special areas in case of failure of the ESCP.

The following items shall be considered when preparing a narrative:

- ~~HHH.A.~~ Estimated total project area (acres).
- ~~HH.B.~~ Estimated total area disturbed (acres).
- ~~HH.C.~~ Surficial soil types and erodibility (Soil Conservation Service K value).
- ~~KKK.D.~~ Runoff coefficients for disturbed areas.
- ~~LLL.E.~~ Estimated peak flows for the design storm runoff.
- ~~MMM.F.~~ Receiving waters.
- ~~NNN.G.~~ Jurisdictions within the project limits.

Formatted: Justified, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border)

Formatted: Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: 0.5", List tab

Formatted: Justified, Indent: Left: 0", Hanging: 0.5", Outline numbered + Level: 1 + Numbering Style: A, B, C, ... + Start at: 1 + Alignment: Left + Aligned at: 0" + Indent at: 0", Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: 0.5", List tab

Formatted: Font: Not Italic

- ~~OOO.H.~~ State and local requirements incorporated into the ~~plan~~ESCP.
- ~~PPP.I.~~ Special environmental considerations related to ~~storm-water~~stormwater runoff.
- ~~QQQ.J.~~ Anticipated concerns or possible problems.
- ~~RRR.K.~~ Information sources and/or contacts.
- ~~SSS.L.~~ Discuss special design features used for ~~drainage~~runoff control with average grades exceeding, three percent.
- ~~TTT.M.~~ Contingency Plan(s) for crucial areas.
- ~~UUU.N.~~ Sediment Basins (volume, infiltration rate, discharge rate, and time of retention).

8.09 ESCP REVIEW AND APPROVAL

The following items shall be submitted as a part of the public improvement plan sets for City review and approval:

- A. ESCP cover sheet as identified in Section 8.05.3.A.
- B. ESCP plan view sheet(s) as identified in Section 8.05.3.B.
- C. ESCP detail sheet(s) as identified in Section 8.05.3.C.

ESCP sheets shall be included in the sheet numbering sequence so the total number of sheets includes the ESCP sheets. The ~~engineer~~Engineer may include the letters "EC" before the page number to distinguish the erosion control plan sheets from the other plan sheets (~~i.e. If~~within in the Public Improvement Project (i.e. if the ESCP sheets start on page 11, the sheet may be numbered "EC11").

The following items shall be submitted concurrently with the ~~public-improvement~~Public Improvement Project plan sets:

1. A narrative as described in Section 8.08.
2. Sizing calculations for and applicable ~~BMP's~~BMPs proposed on the ESCP.
3. Copies of permits and applications made to permitting agencies with jurisdiction over the project (i.e. Army Corps of Engineers/Division of State Lands permits for a site with wetlands).

Since the ESCP is included in the ~~public-improvement~~Public Improvement Project plan set, the City will review and approve all required ESCP material concurrently with the improvements. Comments and required modifications will be addressed at the same time and in the same fashion as the other portions of the construction drawings.

The Construction Sequence with approximate dates as detailed in Section 8.07 shall be submitted prior to scheduling a pre-construction meeting.

~~EXHIBIT 8 1: NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORM WATER DISCHARGE PERMIT~~

~~GENERAL PERMIT
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORM WATER DISCHARGE PERMIT~~

~~Oregon Department of Environmental Quality
811 SW Sixth Avenue, Portland, OR, 97204, (503) 229-5279
Issued pursuant to ORS 468B.050 and The Federal Clean Water Act~~

~~Assigned to: _____ Assigned 4/4/01~~

~~File Number: 108070 _____ Lane County _____ ORR10-1638~~

~~Springfield, City of
225 Fifth St.
Springfield, OR 97477~~

~~Site Location: _____ Within boundary of City of Springfield~~

~~SOURCES COVERED BY THIS PERMIT:~~

~~All Construction activities including clearing, grading, excavation, and stockpiling activities under the authority or jurisdiction of a public agency what will result in the disturbance of five or more acres. Also included are activities that disturb a total of five or more acres if part of a larger common plan of development.~~

~~Effective December 1, 2002 the previously described construction activities will include land disturbance of one acre or more, and will also include activities that disturb a total of one or more acres if part of a larger common plan of development.~~

~~This permit does not authorize in water or riparian work. These activities are regulated by the Oregon Division of State Lands, US Army Corp of Engineers, and/or the DEQ Section 401 certification program.~~

~~Signed by: _____ Michael T. Llewelyn, Administrator _____ Dated: _____ February 20, 2001
_____ Water Quality Division~~

~~PERMITTED ACTIVITIES~~

~~Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify, or operate erosion and sediment control measures, and storm water treatment and control facilities, and to discharge storm water to public waters in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:~~

	Page
Schedule A _____ Limitations and Controls for Storm Water Discharges _____	2
Schedule B _____ Minimum Monitoring Requirements _____	7
Schedule C _____ Compliance Schedule _____	9
Schedule D _____ Special Conditions _____	10
Schedule F _____ General Conditions _____	11

~~Unless specifically authorized by this permit, by another NPDES or WPCF permit, or by Oregon Administrative Rule, any other direct or indirect discharge to waters of the state is prohibited, including discharges to an underground injection control system.~~

SCHEDULE A

~~LIMITATIONS AND CONTROLS FOR STORM WATER DISCHARGES~~

~~**Performance Limitations** An Erosion and Sediment Control Plan (ESCP) shall be developed and implemented to prevent the discharge of significant amounts of sediment to surface waters. The following conditions describe significant amounts of sediment and shall be prevented from occurring:~~

- ~~a. Earth slides or mud flows that leave the construction site and are likely to discharge to surface waters.~~
- ~~b. Evidence of concentrated flows* of water causing erosion when such flows are not filtered or settled to remove sediment prior to leaving the construction site and are likely to discharge to surface waters. Evidence includes the presence of rills, rivulets or channels.~~
- ~~c. Turbid flows* of water that are not filtered or settled to remove turbidity prior to leaving the construction site and are likely to discharge to surface waters.~~
- ~~d. Deposits of sediment at the construction site in areas that drain to unprotected storm water inlets or catch basins that discharge to surface waters. Inlets and catch basins with failing sediment controls due to lack of maintenance or inadequate design will be considered unprotected.~~
- ~~e. Deposits of sediment from the construction site on public or private property outside of the permitted construction activity that are likely to discharge to surface waters.~~
- ~~f. Deposits of sediment from the construction site on any adjacent property outside of the permitted construction activity that are likely to discharge to surface waters.~~

~~* Flow to storm water inlets or catch basins located on the site will be considered "leaving the site" if there are no sediment control structures designed for expected construction flows downstream of the inlets or catch basins that are under the permittee's control.~~

~~**Erosion and Sediment Control Plan Preparation and Submittal** The permittee shall ensure that a comprehensive ESCP is prepared and implemented for the construction activity regulated by this permit.~~

- ~~d. A copy of the ESCP shall be retained on site and made available to the Department upon request. During inactive periods of greater than seven (7) consecutive calendar days, the ESCP shall be retained by the permittee.~~
- ~~e. The Department may request modifications to the ESCP at any time if the ESCP is ineffective at preventing the discharge of significant amounts of sediment and turbidity to~~

~~surface waters.~~

- ~~f. The ESCP shall include any procedures necessary to meet local erosion and sediment control requirements or storm water management requirements.~~
- ~~g. If possible, during the period of October through May, construction activities should avoid or minimize excavation and bare ground activities. If the operator chooses to continue land disturbance activities within this period, additional wet weather requirements (refer to A.3.d) are required in the ESCP. Specifically, if construction activity occurs during the winter season where slopes are greater than five (5) percent and the soils have medium to high erosion potential additional erosion controls will be required.~~
- ~~h. The following non-storm discharges are allowed as long as they are identified in the ESCP and all necessary controls are implemented to minimize sediment transport. These include: firefighting activity, hydrant flushing and potable waterline flushing (DEQ guidance must be followed), air conditioning condensate, dewatering activities of uncontaminated groundwater or spring water, and uncontaminated foundation or footer drain water.~~

~~**Erosion and Sediment Control Plan Requirements** The ESCP shall, at a minimum, include the following elements:~~

- ~~a. Site Description A description of the following:

 - ~~i. Nature of the construction activity, including a proposed timetable for major activities.~~
 - ~~ii. Estimates of the total area of the permitted site and the area of the site that is expected to undergo clearing, grading and/or excavation.~~
 - ~~iii. Nature of the fill materials to be used, the in-situ soils, and the erosion potential of such soils.~~
 - ~~iv. Names of the receiving water(s) for storm water runoff.~~~~
- ~~b. Site Map Indicating the following: (Note: In order to provide all the required information, a general location map in addition to the site map is required.)

 - ~~i. Areas of total development~~
 - ~~ii. Drainage patterns~~
 - ~~iii. Areas of total soil disturbance (including, but not limited to, showing cut and fill areas and pre and post development elevation contours)~~
 - ~~iv. Areas used for the storage of soils or wastes~~
 - ~~v. Areas where vegetative practices are to be implemented. Include type of vegetation seed mix.~~
 - ~~vi. Location of all erosion and sediment control measures or structures~~
 - ~~vii. Location of impervious structures after construction is completed. Include buildings, roads, parking lots, outdoor storage areas, etc., if any.~~
 - ~~viii. Springs, wetlands and other surface waters located on site~~
 - ~~ix. Boundaries of the 100-year flood plain if determined~~
 - ~~x. Location of storm drainage outfalls to receiving water(s) if applicable~~
 - ~~xi. Location of drinking water wells and underground injection controls~~~~

- ~~xii. Details of sediment and erosion controls~~
- ~~xiii. Details of detention ponds, storm drain piping, in-flow and outflow details~~

- ~~e. Required Controls and Practices The following controls and practices are required:~~
 - ~~i. Each site shall have graveled, paved, or constructed entrances, exits and parking areas, prior to beginning any other work, to reduce the tracking of sediment onto public or private roads.~~
 - ~~ii. All unpaved roads located on site shall be graveled. Other effective erosion and sediment control measures either on the road or down gradient may be used in place of graveling.~~
 - ~~iii. When trucking saturated soils from the site, either water tight trucks shall be used or loads shall be drained on site until dripping has been reduced to minimize spillage on roads.~~
 - ~~iv. A description of procedures that describe controls to prevent the discharge of all wash water from concrete trucks.~~
 - ~~v. A description of procedures for correct installation or use of all erosion and sediment control measures.~~
 - ~~vi. A description of procedures for prompt maintenance or repair of erosion and sediment control measures utilized on site (refer to A.4).~~
- ~~d. Additional Controls and Practices Additional controls and practices shall be developed that are appropriate for the site. At a minimum the following shall be considered:~~
 - ~~i. A description of clearing and grading practices, including a schedule of implementation, that will minimize the area of exposed soil throughout the life of the project. Whenever practicable, clearing and grading shall be done in a phased manner to prevent exposed inactive areas from becoming a source of erosion.~~
 - ~~ii. A description of vegetative erosion control practices, including a schedule of implementation, designed to preserve existing vegetation where practicable and re-vegetate open areas when practicable after grading or construction.~~

~~In developing vegetative erosion control practices, at a minimum the following shall be considered: temporary seeding, permanent seeding, mulching, sod stabilization, vegetative buffer strips, and protection of trees with protective construction fences.~~
 - ~~iii. A description of additional erosion control practices, including a schedule of implementation, designed to protect exposed areas and prevent soil from being eroded by storm water.~~

~~In developing additional erosion control practices, at a minimum the following shall be considered: mulching with straw or other vegetation, use of erosion control blankets, and application of soil tackifiers.~~
 - ~~iv. A description of sediment control practices, including a schedule of implementation, that will be used to divert flows from exposed soil, store flows to allow for sedimentation, filter flows, or otherwise reduce soil laden runoff. All~~

~~temporary sediment control practices shall not be removed until permanent vegetation or other cover of exposed areas is established.~~

~~In developing sediment control practices, at a minimum the following shall be considered: use of silt fences, earth dikes, brush barriers, drainage swales, check dams, subsurface drains, pipe slope drains, rock outlet protection, sediment traps, and temporary or permanent sedimentation basins.~~

- ~~v. A description of erosion and sediment control practices that will be used to prevent stockpiles from becoming a source of erosion. Stockpiles located away from the construction activity but still under the control of the permittee shall also be protected to prevent significant amounts of sediment from discharging to surface waters. At the end of each workday the soil stockpiles must be stabilized or covered.~~

~~In developing these practices, at a minimum the following shall be considered: diversion of uncontaminated flows around stockpiles, use of cover over stockpiles, and installation of silt fences around stockpiles.~~

- ~~vi. A description of the best management practices that will be used to prevent or minimize storm water from being exposed to pollutants from spills, cleaning and maintenance activities, and waste handling activities. These pollutants include fuel, hydraulic fluid, and other oils from vehicles and machinery, as well as debris, leftover paints, solvents, and glues from construction operations. The reuse and recycling of construction wastes should be promoted.~~

~~In developing these practices, at a minimum the following shall be considered: written spill prevention and response procedures; employee training on spill prevention and proper disposal procedures; regular maintenance schedule for vehicles and machinery; and covered storage areas for waste and supplies.~~

~~1. **Maintenance Requirements** The following maintenance activities shall be implemented:~~

- ~~a. Significant amounts of sediment that leave the site shall be cleaned up within 24 hours and placed back on the site or properly disposed. Any in-stream clean up of sediment shall be performed according to Oregon Division of State Lands' required timeframe.~~
- ~~b. Under no circumstances shall sediment be intentionally washed into storm sewers or drainageways unless it is captured by a BMP before entering receiving waters.~~
- ~~e. For a filter fence, the trapped sediment shall be removed before it reaches one third of the above ground fence height.~~
- ~~d. For catch basin protection, cleaning must occur when design capacity has been reduced by fifty percent.~~

- e. ~~For a sediment basin, removal of trapped sediments shall occur when design capacity has been reduced by fifty percent.~~
- f. ~~All erosion and sediment controls not in the direct path of work shall be installed before any land disturbance.~~
- g. ~~If fertilizers are used to establish vegetation, the application rates shall follow manufacture's guidelines and the application shall be done in such a way to minimize nutrient laden runoff to receiving waters.~~
- h. ~~If construction activities cease for thirty (30) days or more, the entire site must be stabilized, using vegetation or a heavy mulch layer, temporary seeding, or another method that does not require germination to control erosion.~~
- i. ~~Any use of toxic or other hazardous materials shall include proper storage, application, and disposal.~~
- j. ~~The permittee shall manage abandoned hazardous wastes, used oils, contaminated soils or other toxic substances discovered during construction activities in a manner approved by the Department.~~
- k. ~~If a storm water treatment system for construction activities is employed, the operation and maintenance plan shall be submitted to the Department for approval.~~

~~2. Additional Requirements~~

~~a. Water Quality Standards:~~

~~The ultimate goal for permittees is to comply with water quality standards in OAR 340-41. In instances where a storm water discharge adversely impacts water quality, the Department may require the facility to implement additional management practices, apply for an individual permit, or take other appropriate action.~~

~~b. Turbidity (Nephelometric Turbidity Units, NTU) Water Quality Standard:~~

~~No more than ten percent cumulative increase in natural stream turbidities shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activity. However, limited duration activities necessary to address an emergency or to accommodate essential dredging, construction or other legitimate activities and which cause the standard to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and one of the following has been granted:~~

~~(A) Emergency activities: Approval coordinated by DEQ with the Department of Fish and Wildlife under conditions they may prescribe to accommodate response to emergencies or to protect public health and welfare;~~

~~(B) Dredging, Construction or other Legitimate Activities: Permit or certification authorized under terms of Section 401 or 404 (Permits and Licenses, Federal Water Pollution Control Act) or OAR 141-085-0100 et seq. (Removal and Fill Permits, Division of State Lands, with limitations and~~

~~conditions governing the activity set forth in the permit or certificate.
— [see OAR 340-041 (basin)(2)(c)]~~

~~e. **Water Quality Limited Streams:**~~

~~The Department may establish additional controls on construction activities that discharge storm water runoff to water quality limited streams if Total Maximum Daily Loads are established and construction activities are determined to be a significant contributor to these loads. The Department may also require application for individual permit or develop a watershed based general permit for the activity.~~

~~**SCHEDULE B**~~

~~**MINIMUM MONITORING REQUIREMENTS**~~

~~**All Sites**~~

- ~~1. A person with knowledge and experience in construction storm water controls and management practices shall conduct the inspections. The ESCP shall identify the person(s) and/or title of the personnel that will conduct the inspections and provide a contact phone number of such person(s).~~

~~**Active Sites**~~

- ~~2. Frequency of inspections shall be daily during storm water runoff or snowmelt runoff and at least once every seven (7) calendar days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24 hour period.~~

~~**Inactive Sites**~~

- ~~3. During inactive periods of greater than seven (7) consecutive calendar days, inspections shall only be required once every two (2) weeks.~~
- ~~4. Prior to discontinuing activities at the site, any exposed area shall be stabilized to prevent erosion. Stabilization may occur by applying appropriate cover (mulch, erosion control blanket, soil tackifier, etc.) or establishing adequate vegetative cover.~~
- ~~5. When a site is inaccessible due to adverse weather conditions, inspections shall not be required. Adverse weather condition shall be recorded on the inspection sheet.~~
- ~~6. Prior to leaving an inactive site or in anticipation of site inaccessibility, existing erosion and sediment control measures shall be inspected to ensure that they are in working order. Any necessary maintenance or repair shall be made prior to leaving the site.~~

~~**Written Records**~~

- ~~7. All visual inspections must document the following information:
 - ~~a. Inspection date, inspector's name, weather conditions, and rainfall amount for past 24 hours (inches). (Rainfall information can be obtained from the nearest weather~~~~

~~recording station.)~~

- ~~b. List observations of all BMPs: erosion and sediment controls, chemical and waste controls, locations where vehicles enter and exit the site, status of areas that employ temporary or final stabilization control, soil stockpile area, and non-stormwater controls.~~
 - ~~e. At representative discharge location(s) from the construction site conduct observation and document the quality of the discharge for any turbidity, color, sheen, or floating materials. If possible, in the receiving stream, observe and record color and turbidity or clarity upstream and downstream within 30 feet of the discharge from the site. For example, a sheen or floating material could be noted as present/absent, if observation is yes, it could indicate concern about a possible spill and/or leakage from vehicles or materials storage. For turbidity and color an observation would describe any apparent color and the clarity of the discharge, and any apparent difference in comparison with the receiving stream.~~
 - ~~d. If significant amounts of sediment are leaving the property, briefly explain the corrective measures taken to reduce the discharge and/or clean it up and describe efforts to prevent future releases. The ESCP shall be amended accordingly.~~
 - ~~e. If a site is inaccessible due to inclement weather the inspection shall include observations at a relevant discharge point or downstream location, if practical.~~
- ~~8. All inspection records for an active site shall be kept on site or be maintained with the permittee, and shall be made available to the Department, its Agent, or local municipality upon request.~~
- ~~9. A written record of inspections for an inactive site shall be maintained with the permittee and made available to the Department, its Agent, or local municipality upon request.~~
- ~~10. Retention of all inspection records shall be for a period of one year from project completion.~~

~~**SCHEDULE C**~~
~~**COMPLIANCE SCHEDULE**~~

- ~~1. Registration of Underground Injection Systems (40 CFR 144 and OAR 340-044). The permittee shall submit to DEQ a registration form if construction activities include disposal of storm water or other wastewater discharges to an injection system. These types of disposal systems are classified under the Underground Injection Control Program as a Class V well, require registration, and must meet Division 44 standards.~~
- ~~a. A new permittee shall register any applicable underground treatment systems prior to the construction of a new facility.~~
 - ~~b. For facilities covered by the previous 1200-CA permit the registration form is due~~

~~within thirty (30) days after receipt of this new 1200-CA permit.~~

SCHEDULE D

SPECIAL CONDITIONS

- ~~1. Issuance of this permit does not relieve the permittee from all other permitting and licensing requirements. Prior to beginning construction activities, all other necessary approvals shall be obtained.~~
- ~~2. The permit will remain in effect after the expiration date or until another permit is issued if the permittee has paid all fees and has filed a renewal application.~~
- ~~3. Any permittee that does not want to be covered or limited by this general permit may make application for an individual NPDES permit in accordance with the procedures in OAR 340-45-030.~~

~~4. Permit Specific Definitions:~~

~~*Best Management Practices (BMPs)* Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, erosion and sediment control, source control, and operating procedures and practices to control site runoff, spillage or leaks, and waste disposal.~~

~~*Dewatering* The removal and disposal of surface water or groundwater for purposes of preparing a site for construction.~~

~~*Erosion* The movement of soil particles resulting from the tracking, flow or pressure from storm water or wind.~~

~~*Grade* Construction activity that causes the disturbance of the earth. This shall include but not be limited to any excavating, filling, stockpiling of earth materials, grubbing, root mat or topsoil disturbance, or any combination of them.~~

~~*Hazardous Materials* As defined in 40 CFR 302 Designation, Reportable Quantities, and Notification. Available on the web at <http://www.epa.gov>.~~

~~*Phasing* Clearing a parcel of land in distinct phases, with the stabilization of each phase before clearing of the next phase; including soil stockpiling.~~

~~*Stabilization* The completion of all soil disturbance activities at the site and the establishment of a permanent vegetative cover, or equivalent permanent stabilization measures (such as riprap, gabions, geotextiles, or bioengineering methods) that will prevent erosion.~~

~~*Start of Construction* The first land disturbing activity associated with a development, including land preparation such as clearing, grading, excavation, and filling; installation of streets and walkways; erection of temporary forms; and installation of accessory buildings such as garages.~~

~~Storm Water~~ Storm water runoff, snow melt runoff, and surface runoff associated with a storm event.

~~Turbidity~~ An expression of the optical property of a sample which causes light to be scattered and absorbed rather than transmitted in a straight line through the sample. It is caused by the presence of suspended matter in a liquid. —

SCHEDULE F

NPDES GENERAL CONDITIONS

SECTION A. STANDARD CONDITIONS

1. Duty to Comply

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Oregon Revised Statutes (ORS) 468B.025 and is grounds for enforcement action; for permit termination, suspension, or modification; or for denial of a permit renewal application.

2. Penalties for Water Pollution and Permit Condition Violations

Oregon Law (ORS 468.140) allows the Director to impose civil penalties up to \$10,000 per day for violation of a term, condition, or requirement of a permit.

Under ORS 468.943, unlawful water pollution, if committed by a person with criminal negligence, is punishable by a fine of up to \$25,000 or by imprisonment for not more than one year, or by both. Each day on which a violation occurs or continues is a separately punishable offense.

Under ORS 468.946, a person who knowingly discharges, places or causes to be placed any waste into the waters of the state or in a location where the waste is likely to escape into the waters of the state, is subject to a Class B felony punishable by a fine not to exceed \$200,000 and up to 10 years in prison.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment. In addition upon request of the Department, the permittee shall correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application shall be submitted at least 180 days before the expiration date of this permit.

The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

~~5. Permit Actions~~

~~This permit may be modified, suspended, revoked and reissued, or terminated for cause including, but not limited to, the following:~~

- ~~a. Violation of any term, condition, or requirement of this permit, a rule, or a statute;~~
- ~~b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts;~~
- ~~or~~
- ~~c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.~~

~~The filing of a request by the permittee for a permit modification or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.~~

~~6. Toxic Pollutants~~

~~The permittee shall comply with any applicable effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.~~

~~7. Property Rights~~

~~The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.~~

~~8. Permit References~~

~~Except for effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants and standards for sewage sludge use or disposal established under Section 405(d) of the Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.~~

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

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. Proper operation and maintenance also includes adequate laboratory controls, and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.~~

~~1. Duty to Halt or Reduce Activity~~

~~For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee shall, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. 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.~~

~~2. Bypass of Treatment Facilities~~

~~a. Definitions~~

- ~~(1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The term "bypass" does not include nonuse of singular or multiple~~

~~units or processes of a treatment works when the nonuse is insignificant to the quality and/or quantity of the effluent produced by the treatment works. The term "bypass" does not apply if the diversion does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation.~~

~~(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities or treatment processes which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.~~

~~b. Prohibition of bypass.~~

~~(1) Bypass is prohibited unless:~~

~~(a) Bypass was necessary to prevent loss of life, personal injury, or severe property damage.~~

~~(b) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventative maintenance; and~~

~~(c) The permittee submitted notices and requests as required under General Condition B.3.c.~~

~~(2) The Director may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when the Director determines that it will meet the three conditions listed above in General Condition B.3.b.(1).~~

~~e. Notice and request for bypass.~~

~~(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior written notice, if possible at least ten days before the date of the bypass.~~

~~(2) Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in General Condition D.5.~~

~~3. Upset~~

~~a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.~~

~~b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of General Condition B.4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.~~

~~e. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:~~

~~(1) An upset occurred and that the permittee can identify the cause(s) of the upset;~~

- ~~(2) The permitted facility was at the time being properly operated;~~
- ~~(3) The permittee submitted notice of the upset as required in General Condition D.5, hereof (24-hour notice); and~~
- ~~(4) The permittee complied with any remedial measure required under General Condition A.3 hereof.~~

~~d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof. —~~

~~4. Treatment of Single Operational Event~~

~~For purposes of this permit, A Single Operational Event which leads to simultaneous violations of more than one pollutant parameter shall be treated as a single violation. A single operational event is an exceptional incident which causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one Clean Water Act effluent discharge pollutant parameter. A single operational event does not include Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational event is a violation.~~

~~5. Overflows from Wastewater Conveyance Systems and Associated Pump Stations~~

~~a. Definitions~~

- ~~(1) "Overflow" means the diversion and discharge of waste streams from any portion of the wastewater conveyance system including pump stations, through a designed overflow device or structure, other than discharges to the wastewater treatment facility.~~
- ~~(2) "Severe property damage" means substantial physical damage to property, damage to the conveyance system or pump station which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of an overflow.~~
- ~~(3) "Uncontrolled overflow" means the diversion of waste streams other than through a designed overflow device or structure, for example to overflowing manholes or overflowing into residences, commercial establishments, or industries that may be connected to a conveyance system.~~

~~b. Prohibition of overflows. Overflows are prohibited unless:~~

- ~~(1) Overflows were unavoidable to prevent an uncontrolled overflow, loss of life, personal injury, or severe property damage;~~
- ~~(2) There were no feasible alternatives to the overflows, such as the use of auxiliary pumping or conveyance systems, or maximization of conveyance system storage; and~~
- ~~(3) The overflows are the result of an upset as defined in General Condition B.4, and meeting all requirements of this condition.~~

~~e. Uncontrolled overflows are prohibited where wastewater is likely to escape or be carried into the waters of the State by any means.~~

~~d. Reporting required. Unless otherwise specified in writing by the Department, all overflows and uncontrolled overflows must be reported orally to the Department within 24 hours from the time the permittee becomes aware of the overflow. Reporting procedures are described in more detail in General Condition D.5.~~

~~6. Public Notification of Effluent Violation or Overflow~~

~~If effluent limitations specified in this permit are exceeded or an overflow occurs, upon request by the Department, the permittee shall take such steps as are necessary to alert the public about the extent and nature of the discharge. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.~~

~~7. Removed Substances~~

~~Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters shall be disposed of in such a manner as to prevent any pollutant from such materials from entering public waters, causing nuisance conditions, or creating a public health hazard.~~

~~**SECTION C. MONITORING AND RECORDS**~~

~~1. Inspection and Entry~~

~~The permittee shall allow the Director, or an authorized representative upon the presentation of credentials to:~~

- ~~a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;~~
- ~~b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;~~
- ~~c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and~~
- ~~d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.~~

~~**SECTION D. REPORTING REQUIREMENTS**~~

~~1. Planned Changes~~

~~The permittee shall comply with Oregon Administrative Rule (OAR) 340, Division 52, "Review of Plans and Specifications". Except where exempted under OAR 340-52, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers shall be commenced until the plans and specifications are submitted to and approved by the Department. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility.~~

~~2. Anticipated Noncompliance~~

~~The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.~~

~~3. Transfers~~

~~This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and the rules of the Commission. No permit shall be transferred to a third party without prior written approval from the Director. The permittee shall notify the Department when a transfer of property interest takes place.~~

~~4. Compliance Schedule~~

~~Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date. Any reports of noncompliance shall~~

~~include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.~~

~~5. Twenty-Four Hour Reporting~~

~~The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally (by telephone) within 24 hours, unless otherwise specified in this permit, from the time the permittee becomes aware of the circumstances. During normal business hours, the Department's Regional office shall be called. Outside of normal business hours, the Department shall be contacted at 1-800-452-0311 (Oregon Emergency Response System).~~

~~A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The if the permittee is establishing an affirmative defense of upset or bypass to any offense under ORS 468.922 to 468.946, and in which case if the original reporting notice was oral, delivered written notice must be made to the Department or other agency with regulatory jurisdiction within 4 (four) calendar days. The written submission shall contain:~~

- ~~a. A description of the noncompliance and its cause;~~
- ~~b. The period of noncompliance, including exact dates and times;~~
- ~~c. The estimated time noncompliance is expected to continue if it has not been corrected;~~
- ~~d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance; and~~
- ~~e. Public notification steps taken, pursuant to General Condition B.7.~~

~~The following shall be included as information which must be reported within 24 hours under this paragraph:~~

- ~~a. Any unanticipated bypass which exceeds any effluent limitation in this permit.~~
- ~~b. Any upset which exceeds any effluent limitation in this permit.~~
- ~~c. Violation of maximum daily discharge limitation for any of the pollutants listed by the Director in this permit.~~

~~The Department may waive the written report on a case by case basis if the oral report has been received within 24 hours.~~

~~6. Other Noncompliance~~

~~The permittee shall report all instances of noncompliance not reported under General Condition D.4 or D.5, at the time monitoring reports are submitted. The reports shall contain:~~

- ~~a. A description of the noncompliance and its cause;~~
- ~~b. The period of noncompliance, including exact dates and times;~~
- ~~c. The estimated time noncompliance is expected to continue if it has not been corrected; and~~
- ~~d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.~~

~~7. Duty to Provide Information~~

~~The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by this permit.~~

~~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 Department, it shall promptly submit such facts or information.~~

~~8. Signatory Requirements~~

~~All applications, reports or information submitted to the Department shall be signed and certified in accordance with 40 CFR 122.22.~~

~~9. Falsification of Reports~~

~~Under ORS 468.953, 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, is subject to a Class C felony punishable by a fine not to exceed \$10,000 per violation and up to 5 years in prison.~~

~~10. Changes to Indirect Dischargers [Applicable to Publicly Owned Treatment Works (POTW) only]~~

~~The permittee must provide adequate notice to the Department of the following:~~

- ~~a. Any new introduction of pollutants into the POTW from an indirect discharger which would be subject to section 301 or 306 of the Clean Water Act if it were directly discharging those pollutants and;~~
- ~~b. Any substantial change in the volume or character of pollutants being introduced into the POTW by a source introducing pollutants into the POTW at the time of issuance of the permit.~~
- ~~c. For the purposes of this paragraph, adequate notice shall include information on (i) the quality and quantity of effluent introduced into the POTW, an (ii) any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW.~~

~~11. Changes to Discharges of Toxic Pollutant [Applicable to existing manufacturing, commercial, mining, and silvicultural dischargers only]~~

~~The permittee must notify the Department as soon as they know or have reason to believe of the following:~~

- ~~a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - ~~(1) One hundred micrograms per liter (100 g/l);~~
 - ~~(2) Two hundred micrograms per liter (200 g/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 g/l) for 2,4 dinitrophenol and for 2 methyl 4,6 dinitrophenol; and one milligram per liter (1 mg/l) for antimony;~~
 - ~~(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with CFR 122.21(g)(7); or~~
 - ~~(4) The level established by the Department in accordance with 40 CFR 122.44(f).~~~~
- ~~b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - ~~(1) Five hundred micrograms per liter (500 g/l);~~
 - ~~(2) One milligram per liter (1 mg/l) for antimony;~~
 - ~~(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR 122.21(g)(7); or~~
 - ~~(4) The level established by the Department in accordance with 40 CFR 122.44(f).~~~~

SECTION E. DEFINITIONS

- 8. ~~BOD means five day biochemical oxygen demand.~~
 - 9. ~~TSS means total suspended solids.~~
 - 10. ~~mg/l means milligrams per liter.~~
 - 11. ~~kg means kilograms.~~
 - 12. ~~m³/d means cubic meters per day.~~
 - 13. ~~MGD means million gallons per day.~~
 - 14. ~~Composite sample means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.~~
 - 15. ~~FC means fecal coliform bacteria.~~
 - 16. ~~Technology based permit effluent limitations means technology based treatment requirements as defined in 4 CFR 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-41.~~
 - 17. ~~CBOD means five day carbonaceous biochemical oxygen demand.~~
 - 18. ~~Grab sample means an individual discrete sample collected over a period of time not to exceed 15 minutes.~~
 - 19. ~~Quarter means January through March, April through June, July through September, or October through December.~~
 - 20. ~~Month means calendar month.~~
 - 21. ~~Week means a calendar week of Sunday through Saturday.~~
 - 22. ~~Total residual chlorine means combined chlorine forms plus free residual chlorine.~~
 - 23. ~~The term "bacteria" includes but is not limited to fecal coliform bacteria, total coliform bacteria, E. coli bacteria.~~
- POTW means a publicly owned treatment works.

24.

Formatted: Top: 0.69", Header distance from edge: 0.69"

Formatted: Font: Times New Roman

Formatted: Normal, Justified, Line spacing: single, Border: Top: (No border), Bottom: (No border), Left: (No border), Right: (No border), Tab stops: 3.25", Centered + 5", Left + Not at -0.75" + -0.5" + 0" + 0.38" + 0.63" + 0.88" + 1.13" + 1.5" + 2" + 2.5" + 3" + 4.9"