CITY OF KIRKLAND WASHINGTON

POLLUTION CONTROL FOR CONSTRUCTION ACTIVITY

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Kirkland is one of the most livable cities in America. It is a vibrant, attractive, green and welcoming place to live, work and play. We are lucky to have beautiful lakes, streams and wetlands and be able to enjoy outdoor activities such as a hiking, swimming and fishing, all within our City.

Protecting our natural resources can be simple and easy. All storm drains in Kirkland flow to the nearest lake, stream, or wetland. It is illegal to allow pollutants to enter a storm drain (KMC 15.52).

Contractors, subcontractors, property owners, businesses, AND any other responsible party(s) can be subject to fines and the cost for the City to clean the municipal storm system (KMC 1.12.200).

- The minimum fine is $500 - divided among all responsible parties.
- A fine for a repeat violation shall be determined by multiplying the fine by the number of violations.
- Fines may be reduced or waived if **self-reported to the City at 425-587-3900.**

This guide should complement your existing TESC and/or CSWPPP (if applicable) and all Kirkland design manuals/ pre-approved standard plans and construction notes. Below is a list of Kirkland Policies, Standards, and Codes:

- **Development Services Center**
  www.kirklandwa.gov/devservices
- **Kirkland Permitting Page** - MyBuildingPermit.com
- **Kirkland Erosion Control Pre-Approved Plans**
  www.kirklandwa.gov (search Pre-Approved Plans)
- **Temporary Erosion Sedimentation Control (TESC)**
  www.kirklandwa.gov (search Temporary Erosion Control)
- **Kirkland Municipal Code (KMC)**
  www.codepublishing.com/WA/Kirkland/
  - Ch. 15.52 - Surface Water Management
  - Ch. 15.52.090 - Illicit Discharges & Connections
  - Ch. 1.12.200 - Special Provisions Relating to Enforcement of Chapter 15.52

HOW TO USE THIS GUIDE

This guide will assist you in making informed decisions on your construction site to prevent pollution to our lakes, streams, and wetlands and stay in compliance with Kirkland Municipal Code (KMC). It is organized as follows:

1) SITE MANAGEMENT
2) POLLUTANT CONTROL & SUBCONTRACTOR ACTIVITY
3) PROTECT STORMWATER FACILITIES & BMPS
4) PERIMETER PROTECTION
5) TRAFFIC AREA STABILIZATION
6) COVER MEASURES
7) DETENTION & VELOCITY CONTROL
8) DUST CONTROL & DEWATERING
9) FILTRATION & CHEMICAL TREATMENT

Acronyms and Definitions

- **BMP** – Best Management Practices are managerial, operational, structural and physical tools implemented on projects to prevent discharge of sediment or other pollutants into waters in Kirkland
- **CESCL** - Certified Erosion & Sediment Control Lead
- **CSWPPP** – Construction Stormwater Pollution Prevention Plan
- **ESC** – Erosion and Sediment Control
- **KCSWDM** – King County Surface Water Design Manual
- **KMC** – Kirkland Municipal Code
- **LID** – Low Impact Development or green infrastructure that promotes infiltration of surface water
- **NGRA** – Native Growth Retention Area
- **NTU** – Nephelometric Turbidity Units measures the "cloudiness" of the water due to suspended particles
- **pH** – A measure of acidity and alkalinity of a solution

Key Points:

- All work must meet Kirkland Public Works Standards, Policies, and Codes.
- Clearly mark and maintain limits of soil disturbance.
- Install tree protection prior to excavation and maintain during construction (see Plan CK-R.49).
- Minimize the amount of soil disturbance on site and phase the construction as much as possible
- If no pre-construction meeting is required, schedule the 1st erosion control inspection with Public Works on Mybuildingpermit.com prior to any excavation.
- Schedule city inspections 24 hours in advance.
- Pay attention to the weather and make sure that your BMPs are prepared to handle anticipated storm events. BE PREPARED FOR RAIN AT ANY TIME!
- BMPs must be maintained throughout the duration of the project and managed by onsite personnel that are knowledgeable in ESC or are CESCL certified.
- A copy of the ESC plan and a CSWPPP (if required) must be on-site and maintained at all times.
- Make sure the site will be secure while unattended:
    - Cover exposed soils with straw or plastic (see Cover Measures pg. 16)
    - Maintain silt fence and/or wattles (see Perimeter Protection pg. 11)
    - Maintain construction entrance (see Traffic Area Stabilization pg. 14)
    - Protect Kirkland storm infrastructure and roads (see Detention & Velocity Control pg. 18)

Kirkland Erosion Control Pre-Approved Plans:

- Plan No. CK-E.04: Small Site ESC Plan.

Keep your project on schedule and on budget by avoiding costly cleanup and potential Stop Work Orders.

Tree protection must be done with chain link fence prior to grading the site (see Plan CK-R.49).

Inspections should be done by onsite personnel that are knowledgeable in ESC or are CESCL certified.

Schedule city inspections 24 hours in advance (Mybuildingpermits.com).

Hard surface perimeter control and safety fences also need to be installed prior to excavation.

KEY POINTS

- All storm drains in Kirkland flow to the nearest lake, stream, or wetland. **It is illegal to allow pollutants to enter a storm drain (KMC 15.52).** Examples of pollutants are:
  - Construction materials
  - Paints
  - Soaps
  - Silt, sediment (no discharges above 25 NTU)
  - Concrete, cement, or gravel
- Prepare a containment area, lined pit, or container (Eco-pan, Outpak, etc.) on site designated for concrete washout and equipment and tool cleanup. Make sure these areas are covered when raining and do not overflow.
- Make sure you have a vendor available to pump your liquid waste from the concrete washout container before it becomes too full.
- All liquids and materials, including but not limited to, paints, stucco, fuels, oils, pesticides/herbicides, and other liquids should be placed in secondary containment and undercover at the end of every day or when not in use. Make sure your site is secure.

Concrete washout pits can be created on site with a liner; however, the water and solids in the pit must be properly disposed of.

It is important to prevent rain water from accumulating in the concrete washout BMP. Have a routine cleaning operation.

Portable concrete washout BMPs can be moved around the site as necessary.

Concrete washout discharged into a storm drain is a violation of KMC 15.52.

Drain seals help protect the storm system in an emergency and make clean up easier and less expensive.

Asphalt sealer sprayed into a storm drain is a violation of KMC 15.52.

Consider where potential pollutant sources are located on your project.

Oil sheens can go a great distance on the surface. If discharged into a storm drain, it is a violation of KMC 15.52.

Have spill kits readily accessible to cleanup any materials used on site.

Do not stockpile landscaping materials in the right-of-way.

Paints and other materials must be managed and disposed of properly.

Other BMPs to Consider:

- Inlet protection and filters
- Straw wattles or other containment berms
- Drain seals or plugs
- Minimize materials brought onsite

KEY POINTS

- Flow Control Facilities (vaults, tanks): These facilities may be used for on-site construction stormwater management, but must be thoroughly cleaned of any debris, including sediment, at the end of the project and/or as needed.
- Do not allow sedimentation of newly installed catch basins/inlets.
- Do not allow sedimentation of City infrastructure and proprietary water quality devices such as treatment cartridge vaults, stormwater biofiltration facilities, etc. If siltation of these devices causes malfunction or maintenance, you will be responsible for the cost to bring the device back to full function.
- Do not compact or allow siltation of areas used for infiltration or stormwater low impact development facilities (LID BMPs) during construction.
    - The location of on-site infiltration facilities must be recommended by a geotechnical engineer of record, and meet conditions in the soils report.
    - All residential storm drain systems including drywell/infiltration trenches must be inspected prior to backfill.
- Soil Amendment per Pre-Approved Plan CK-E.12 is required for all landscaped areas.
- A catch basin insert with overflow capability must be installed in the first downstream catch basin.

Kirkland Erosion Control Pre-Approved Notes:

- Plan No. CK-E.08: Catch Basin/Inlet Sediment Trap
- Plan No. CK-E.09: Temporary Sediment Pond
- Plan No. CK-E-09a: Temporary Sediment Trap
- Plan No. CK-E.11: Storm Drain Protection Insert
- Plan No. CK-E.12: Soil Amendment Notes for Ecology BMP T5.13

Do not allow sedimentation of catch basins.

Untrimmed filter fabric creates flooding.

Trim extra filter flap or use an adjustable metal framed insert.

Eductor cleaning head for permeable hard surfaces.

Permeable hard surfaces must pass infiltration tests.

Post-construction stormwater systems plugged up with sediment and debris may be expensive to clean.

Sedimentation of bioretention facilities may require replacement of the media and plantings.

In some situations, above-grate protection in addition to the filter can make the inlets more maintainable.

Other BMPs to Consider:

- Routine sweeping
- Inlet protection
- Eductor truck
- Vendor/sub contractor management

KEY POINTS

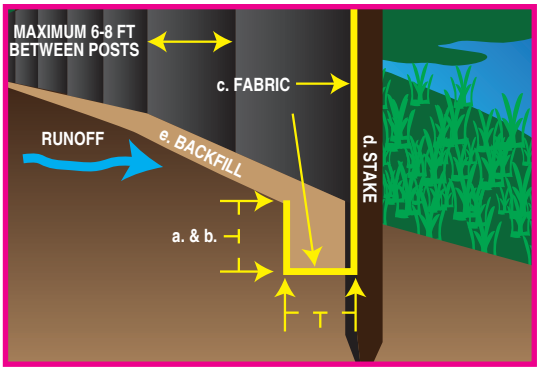
- **These BMPs are the last line of defense for your project.** They should go in first and be the last to be removed.
- Focus on not letting sediment accumulate on your perimeter controls by preventing erosion.
- All required erosion control BMPs must be constructed and in operation prior to excavation.
- Delineate and protect NGRA during construction.
- Protect adjacent properties from runoff by installing perimeter protection (interceptor trench drain, silt fence, swale, berm).

Kirkland Erosion Control Pre-Approved Plans:

- Plan No. CK-E.03: Silt Fence
- Plan No. CK-E.10: Straw Wattles

Sediment/Silt Fence

- Key-in bottom of filter fabric materials in 4 x 4 in. trench.
- Secure wire-backed silt fence with the steel post downstream of flow path.
- Remove sediment when it reaches 1/3 fence height.
- Routinely inspect and maintain.



a. Straight, "J" or "U" hook of fabric tail
b. Depth of backfill may vary
c. Woven, filter, high visibility geotextile options
d. T-post stakes with wirebacked support
e. Backfill material can be native fill, compost or pea gravel.

Wire backed sediment fence may be orange to also delineate areas of disturbance. Chain linked safety fence may be required to keep the public off your project.

Sediment fence without wire backing is easily brought down by wind or water. Only wire backed sediment fence is allowed in Kirkland.

Undercutting of the wire backed sediment fence can occur if not trenched in and happens most frequently near the stake.

Wire backed sediment fence that is not keyed in is ineffective.

BMPs require frequent inspection and maintenance to be effective.

Sediment fence should not be the only ESC measure.

Perimeter controls can be easily damaged and must be monitored and replaced as necessary by onsite personnel.

Wattles

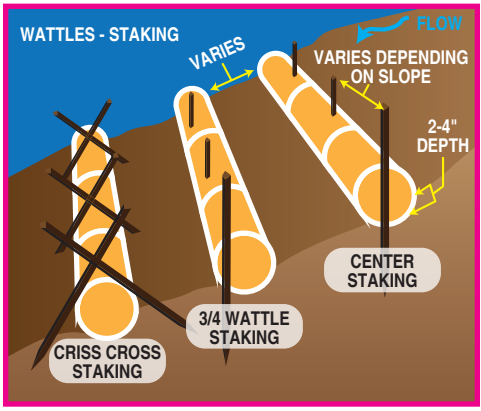
- Key-in and stake down to prevent runoff from flowing underneath
- Overlap wattles to prevent gap
- Wattles are barriers, not filter BMPs
- Routinely inspect and maintain

Durable and reuseable wattle that can go from project to project.

Stormwater will easily undercut wattles that are not trenched in, not staked, and not overlapped appropriately.

Durable wattle staking.

Perimeter control with filtration using a compost sock.



Make sure that wattles are trenched in and staked down.

Other BMPs to Consider:

- Synthetic wattles
- Vegetated strip
- Compost berms
- Brush barrier
- Triangular silt dike
- Compost socks

KEY POINTS

- Trackout is not allowed on public streets or sidewalks. If dirt is tracked out, it shall be cleaned up immediately with a power sweeper or other equipment.
- When building a construction entrance, put a geotextile down underneath the quarry spalls to prevent the spalls from sinking into the subgrade.
- Recycled concrete shall not be used for erosion protection (construction entrances, shoulder widening).
- No steel plates are allowed in the right-of-way over the weekend or on city closure days. Sheets must be removed and asphalt patching in place before 3:00pm on Friday.
- Keep any adjacent public alley open, clean, and in good driving conditions.
- A Public Works ESC inspection is required prior to pouring or paving any driveway.
- Stabilize your job shack and laydown areas as they are one of the highest traffic areas on your project.

Kirkland Erosion Control Pre-Approved Plans:

- Plan No. CK-E.01: Temporary Single Family Const. Entrance.
- Plan No. CK-E.02: Temporary Plat/Commercial Const. Entrance.

An example of heavy duty plastic plates that are adaptable and reusable for construction entrances.

Mud mat is a quickly installed project entrance BMP or track pad for wetland work.

Install geotextile underneath the rock to prevent the spalls from sinking into the subgrade.

Contractor is responsible for keeping streets clean and free of pollutants at all times and for prevention of an illicit discharge (KMC 15.52).

"Belly bath" depressions are not appropriate wheel washes.

Other BMPs to Consider:

- Construction road/parking area stabilization
- Wheel wash
- Heavy duty plastic plates
- Rumble strip
- Sweeper truck

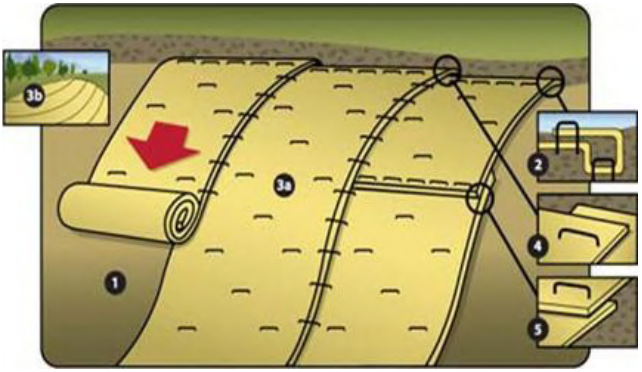
KEY POINTS

- Cover measures protect bare soil from washing away with rain or wind.
- Soils must not remain exposed and unworked for:
  - 2 days - between October 1st to April 30th.
  - 7 days - between May 1st to September 30th.
- Stabilize soils at the end of the workday prior to a weekend, holiday, or predicted rain event.
- Streets and sidewalks shall not be used for stockpiling building materials, debris, or equipment.
- When installing plastic sheeting on stockpile:
  - Install vertically down slope.
  - Ensure edges are overlapped and shingled appropriately.
  - Shall be minimum 6 millimeters in thickness.
  - To secure, tie sandbags to ropes, stake ropes 12 inches minimum away from edges of sheeting.
  - Surround entire stockpile with perimeter protection.
- When required, apply straw mulch at a minimum thickness of 2 inches.
- Cover BMPs, except plastic, need good soil contact which can mean surface preparation with track walking to get an even surface.
- If applying seed for long term stabilization, make sure the seed has contact with the soil and then covered by the blanket or mulch.
- Consider the time of year for seed growth success. Will you need to protect against freezing conditions or will you need to irrigate for seed survivorship?

Kirkland Erosion Control Pre-Approved Plans:

- Plan No. CK-E.05: Temporary Stockpile
- Plan No. CK-E.06: Nets and Blankets, Temporary Stabilization

Slope checks and covering BMPs used in combination are effective for erosion prevention and seed establishment



1. Roll out and make firm contact with the groomed slope
2. Key in at the top of the slope
3. Staple size and frequency based on slope and soil type
4. Overlap adjoining blankets
5. Shingle down the slope.

Straw applications should completely cover soil and should be at least 2" thick.

Velocity reduction along the base of plastic covered stockpiles is important.

"Track walking" the slope is important preparation to maximize seed establishment.

Spray-applied mulches can provide equivalent if not superior performance to rolled erosion control products.

Other BMPs to Consider:

- Surface roughening
- Plastic covering
- Hydroseeding
- Rolled erosion control blankets
- Mulching
- Sodding
- Compost blankets

KEY POINTS

- Retention of stormwater on site allows for gravity to help settle sediment in suspension and reduce turbid runoff.
- Retention facilities should be inspected daily during non-rainfall periods, every hour (daylight) during a rainfall event, and at the end of every rainfall.
- If a sediment pond is not proposed, a storage tank may be required.
- Temporary sediment ponds and traps must be sized and in accordance with Kirkland Pre-Approved Erosion Control Plans (see below reference).
- All interceptor swales shall be cleaned if silt accumulation exceeds one-quarter depth.
- If process water enters the retention BMP and commingles with the stormwater, the entire volume is considered process water and must be disposed of properly.
- If post construction stormwater infrastructure (e.g. vaults) are utilized for ESC retention during construction, the system must be fully cleaned and functional before final inspection.
- Install check dams and rip-rap/scour pads to slow the flow of water and allow sediment and debris to drop out.
- To help reduce turbidity level of any detention BMP, flocculants may be used to assist settling of particles in suspension. However, you must follow State protocol to implement (see Dewatering, Filtration and Chemical Treatment section pg. 22).

Kirkland Erosion Control Pre-Approved Plans:

- Plan No. CK-E.07: Check Dam
- Plan No. CK-E.09: Temporary Sediment Pond
- Plan No. CK-E.09a: Temporary Sediment Trap

Grass lined channel.

Rip rap and channel linings reduce velocity and prevent the seed from being washed away from the soil.

Insufficiently sized and maintained sediment trap .

Onsite personnel should monitor retention BMPs frequently.

Check dams slow the flow of water and allow sediment and debris to drop out.

Fiber rolls such as TerraTube can filter the water as well as slow velocity.

Reuseable check dams such as Spring Berms can be very cost effective over time and are easy to install.

Other BMPs to Consider:

- Inlet protection
- Straw wattles and coir logs
- Concrete cloth
- Spring berms
- Triangular silt dike
- Channel lining

KEY POINTS

- Developer/contractor is responsible for controlling dust, mud, and debris within the project limits.
- The City of Kirkland may determine at any time during construction that implemented dust, erosion, and sedimentation control measures are not sufficient and additional action is required.
- When applying water to the site make sure to not apply so much that runoff is generated.
- Only use non-contaminated water for dust control applications.
- Tackifiers and spray mulches can also serve to control sediment from being blown away.
- Dewatering:
    - Discharges shall always meet water quality guidelines listed in Policy E-1.
    - Discharges to the Kirkland stormwater system must be below 25 NTU and not considered an illicit discharge (KMC 15.52).
    - All projects (except single-family infill) must obtain permit authorization from King County Industrial Wastewater Program.
    - Single-family infill projects may discharge to sanitary sewer without a permit from King County Industrial Wastewater Program as long as the discharge is less than 7 mg/L of suspended solids (see Policy E-1).

Make sure that enough water is used to moisten the soil but not so much that water runs off.

Single family infill projects may discharge to the sanitary sewer per Public Works Policy E-1 but check with the City inspector before doing so.

Dewatering turbid water to the storm system may be subject to fines and cost recovery (KMC 15.52).

Dewatering through dispersion in a sand trap or in vegetation can be useful if water and soil is non-contaminated and it will not generate downstream surface runoff.

Other BMPs to Consider:

- Tackifiers
- Storage tanks
- Treatment
- Dispersal systems in established vegetation
- Sweeper truck
- Eductor truck

KEY POINTS

- **You must be a certified technician to apply flocculants to construction stormwater. Formal written approval from Ecology is required for the use of chemical treatment regardless of site size.**
- If you have never done chemical treatment of stormwater you need to seek professional help to assist you in meeting the regulatory requirements and to be successful in treating the water.
- Flocculants are filter aids that coagulate particles together, so they get large enough for gravity to settle them or be caught by a filter.
- If you use chemical flocculants, you must follow D.2.2.5 in the 2016 KCSWDM.
- Treatment may be necessary on projects that discharge to sensitive receiving waters, for dewatering a site, for managing water discharging from site with contamination, or even as pretreatment to permitted sanitary discharge.
- Sites that plan on working through the winter need to consider advanced treatment to stay in compliance through difficult weather and have a plan and footprint to implement when it becomes necessary.
- All filters can get plugged and need maintenance or replacement to remain functional. To minimize that impact, source control BMPs discussed earlier need to be installed to prevent pollutant loading to the treatment system. Most automated sand filters can self-clean.
- Dry ice can be used to neutralize high pH water.

Flocculants, such as chitosan, coagulate the fine particles in the water to promote settling. When used in combination with a filter, water can be made very clean.

Treatment systems can take up footprint on a project and should be planned well in advance.

Some treatment systems can be mobile to move with different phases of a project.

Advanced treatment systems can be used to treat stormwater and groundwater to address many different pollutants.

Other BMPs to Consider:

- Dewatering bags
- Water storage tanks
- Chemical Enhanced Sand Filtration (CESF)
- Vegetated spray field
- Stormwater treatment services

POLLUTION CONTROL FOR CONSTRUCTION ACTIVITY

Schedule a Final Inspection when your site is fully stabilized/landscaped:
www.Mybuidlingpermit.com

Final Approval Requirements:

- Review all permit conditions.
- Complete all punch list items from Final Inspection:
  - Remove all temporary erosion control measures such as sediment fence, liners and catch basin filters.
  - All storm structures are clean of sediment and pollutants and are fully functional
  - Submit as-built drawing(s) - See Public Works Policy G-3 for requirements.
- Final Inspection will not be granted until all cost associated with clean-up and fines are paid in full.
- Establish a two-year maintenance security. Refer to the Maintenance Security Agreement.

If you have any questions regarding your permit or site, please contact your city site inspector. You may also refer to Development Services, **www.kirklandwa.gov/devservices** or contact Public Works at 425-587-3800.

If you are interested in more erosion control training:
www.ecology.wa.gov/Regulations-Permits/Permits-certifications/Certified-erosion-sediment-control

For suggestions where to purchase ESC BMPs:
www.kirklandwa.gov/devservices

To report a spill, please call 425-587-3900.

CITY OF KIRKLAND WASHINGTON

This project is funded by the
King County Wastewater Treatment Division

King County
Department of Natural Resources and Parks
Wastewater Treatment Division