

Construction Best Management Practices

FISH WINDOW FOR CONSTRUCTION ACTIVITIES

- Standard fish window is July 1 – September 30.
- If Chinook are present, then the fish window is July 1 – September 1 or 15, depending on the waterway. Chinook show up early in September in waterways lower in the systems.
- Non-fish-bearing stream work window is June 15 – September 30.

GENERAL BMPs

Construction BMPs will be dependent on whether there is enough water flowing in the waterway to reasonably support fish. If water is flowing in sufficient quantity and quality to support fish, then a bypass system will be used and the project will begin at the upstream end of the project and proceed down the channel. If water is not present in sufficient quantity and quality to support fish, then the project will start from the downstream end and proceed upstream with sediment control BMPs at the downstream end of the project. The goal of the BMPs is to minimize or eliminate the discharge of sediment or fill in waterways and/or wetlands.

The following BMPs apply to all projects:

Sediment shall not be excavated deeper than the historic bottom of the channel as determined by a change in the color of the material in the bottom of the channel, a change in consistency in the material in the bottom of the channel, or other means determined by the ADAP engineer.

Side slopes of the channel shall not be changed except to preserve the ditch from future failure or decline and where the capacity of the channel is controlled by a downstream section of channel or culvert. Where side slopes are reshaped, their final slope shall not exceed 2h:1v.

Projects may proceed from downstream to upstream or upstream to downstream. For projects that move upstream, a sediment control measure shall be installed at the downstream end of the project and 100 feet upstream from the end of the project. The channel between the sediment control measures shall remain untouched until the end of the project when it will be the last section to be cleaned. For projects that move downstream, a sediment control measure shall be installed at the downstream end of that day's work and 100 feet downstream, leaving the channel between sediment control measures untouched. The sediment control measures shall be moved downstream at the beginning of the next construction segment.

Turbidity measurements¹ shall be made upstream of the project before the start of construction each day and recorded on the Water Quality Monitoring Data Sheet. The upstream turbidity measurement shall be the baseline measurement. Turbidity shall also be measured at least 15 minutes after the start of construction at a point at least 100 feet downstream from the most downstream sediment control measure but not more than 1000 feet downstream. If the turbidity measurement after construction starts does not exceed state water quality standards, construction can proceed and the turbidity shall be measured hourly on the first day of construction. Current state water quality standards are defined as not to exceed the baseline turbidity measurement by

¹ King County will review valid methods to measure turbidity with the landowner or contractor prior to start of construction.

more than 5 Nephelometric Turbidity Units (NTU) for baseline turbidity measurements below 50 NTU and to not exceed the baseline turbidity measurements by more than 10 percent for baseline turbidity measurements above 50 NTU. If any turbidity measurement exceeds state water quality standards, construction shall stop and existing sediments control BMPs shall be modified or additional sediment control BMPs shall be added to the project. After alterations or additions of sediment control BMPs are completed, construction can proceed and another turbidity measurement will be taken at least 15 minutes after construction has recommenced.

On subsequent construction days, if there have been no exceedence of water quality standards, then turbidity measurements shall be taken three times during the day -- at least 15 minutes after the start of construction, midway through the day, and within an hour of the end of the day. If any turbidity measurement exceeds water quality standards, work shall stop, existing sediment control BMPs shall be modified or additional sediment control BMPs shall be added to the project, and turbidity measurements shall be taken hourly for the rest of the day. If three successive turbidity measurements exceed water quality standards, work shall stop and the contractor shall contact the ADAP Engineer for guidance.

Whenever water is pumped into the downstream channel, energy dissipation measures shall be in place to minimize erosion and re-suspension of sediment at the outfall. Common energy dissipation measures are to pump onto a sheet of plastic extending across the entire channel or pumping into a large bucket or container placed on its side with the opening pointing upstream and allowing water to overflow the container.

Spoils may be spread in the adjoining fields in a single lift no higher than six inches. Spoils shall be placed in active production areas (crop areas or pasture areas). If no active production areas are available, spoils can be placed on site outside of wetlands. If spreading the spoils in the adjoining field is not feasible, the spoils shall be removed from the site and disposed of at an approved disposal site. If spoils are disposed of offsite, a construction entrance equivalent to that detailed in the King County Surface Water Design Manual, or equivalent measures, shall be installed to prevent material from being tracked onto the public road.

BYPASS BMPs

The bypass system generally consists of two coffer dams (steel plates are commonly used) and two pumps (the bypass pump and the dirty water pump). The installation sequence for a bypass is as follows:

- 1) Setup up the bypass pump and start pumping.
- 2) Install the first coffer dam just upstream of the discharge point for the bypass pump.
- 3) Install the second coffer dam just downstream of the bypass pump intake.
- 4) Setup the dirty water pump and start pumping the water in the channel between the coffer dams into the adjoining fields at a location where it cannot flow back into the channel prior to having the suspended sediments removed.
- 5) Defish the channel between the coffer dams as the water level drops.
- 6) Begin sediment removal.

During bypass installation, operation, or removal, the downstream channel must always have water flowing in it. The channel cannot be allowed to dry out or have such a small amount of water flowing as to harm fish that were not removed.

BYPASS REMOVAL

When the sediment between the coffer dams is removed and the project is being shut down for the day, the bypass system shall be removed or the bypass pump will be operated continuously until construction starts again the next day. The sequence for bypass removal is as follows:

- 1) Start bypass removal by slowly removing the upstream coffer dam.
- 2) Reduce the capacity of the bypass pump or cycle its operation to allow the cleaned channel to fill with water.
- 3) Continue to operate the bypass pump until the water upstream from the downstream coffer dam is clear. The dirty water pump can speed this process by pumping dirty water into the adjoining fields.
- 4) When the water at the remaining coffer dam is as clean as the water flowing into the cleaned ditch, slowly remove the remaining coffer dam and turn the pumps off.

BYPASS LEAPFROGGING

When the sediment between the coffer dams is removed, if the project will continue that day, the bypass will be moved downstream by leapfrogging one coffer dam over the other. The sequence for moving the bypass is as follows:

- 1) Slowly remove the upstream coffer dam.
- 2) Reduce the capacity of the bypass pump or cycle its operation to allow the cleaned channel to fill with water.
- 3) Continue to operate the bypass pump until the water upstream from the downstream coffer dam is clear. The dirty water pump can speed this process by pumping dirty water into the adjoining fields.
- 4) When the water upstream of the coffer dam is clear move the discharge of the dirty water pump into the channel just downstream of the coffer dam.
- 5) Move the bypass pump down to the remaining coffer dam and start pumping from above the coffer dam to the end of the next construction segment.
- 6) When the bypass pump is setup and operating again, turn off the dirty water pump.
- 7) Install the downstream coffer dam upstream from the bypass pump discharge point.
- 8) Setup the dirty water pump and start pumping the water in the channel between the coffer dams into the adjoining fields at a location where it cannot flow back into the channel prior to having the suspended sediments removed.
- 9) De-fish the channel between the coffer dams as the water level drops.
- 10) Begin sediment removal.

NON-BYPASS BMPs

When there is not enough water flowing in the waterway to reasonably support fish, construction can proceed without a bypass. The sequence for construction without a bypass is as follows:

- 1) Install approved sediment control measures downstream of the end of the project if possible or within the last 100 feet of channel. Approved sediment control measures include silt fences, coir logs, culvert obstruction, or silt dam.
- 2) Leave the lowest 100 feet of channel undisturbed and begin the project working from downstream to upstream.
- 3) If groundwater starts to enter the cleaned channel and causes turbidity measurements to be higher than state water quality standards, add additional sediment control measures in the cleaned section of the channel. As noted in the earlier section on general BMPs, current state water quality standards are to not exceed the baseline turbidity measurement by more than 5 Nephelometric Turbidity Units (NTU) for baseline (pre-construction) turbidity measurements below 50 NTU and to not exceed the baseline turbidity measurements by more than 10 percent for baseline turbidity measurements above 50 NTU.
- 4) If water starts to enter the channel from field tiles, follow the procedures for groundwater entering the channel or temporarily plug the field tiles.
- 5) Continue sediment removal to the upstream end of the project.
- 6) Move to the downstream end of the project and clean the last 100 feet of starting at the downstream end and working upstream.
- 7) If any water is flowing in the channel after sediment removal, allow channel to flow for at least 24 hours with sediment control measures in place.
- 8) Remove accumulated sediment from in front of sediment control measures.
- 9) If sediment is still moving in the channel, repeat steps 7 and 8.
- 10) Remove sediment control measures.