

Building or upgrading facilities

Pump stations are needed at points in the pipelines to carry wastewater around lakes or over hills. Most of King County's 42 pump stations were built in the 1960s. Some are reaching the end of their useful lifespan and need replacement.



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The visible aboveground structure is only a portion of a pump station construction project. Pump stations generally require several floors below ground for mechanical rooms and odor control and ventilation facilities. New pump stations require a lot of excavation and several acres of land to serve as a staging area during construction and a buffer once construction is complete. Shoring methods like piling are needed to build underground supports.

The amount of land required for pump station construction or upgrades can vary widely. King County might use property it already owns, though sometimes it is necessary to acquire new property to accommodate the facilities. People can expect construction to last about three years. Typical impacts of building a pump station project are noise, dust, and construction vehicle traffic.

Mitigation

Mitigation to minimize impacts during construction and operation is an important part of all Wastewater Treatment Division construction projects. King County ordinances, as well as agencies and jurisdictions that grant permits, require mitigation to protect the environment and interests of the community.

Noise control

Construction sites are typically noisy, but many steps can be taken to minimize noise: installing sound barriers, shutting off idling equipment not in use, equipping motors with mufflers and using vehicles with ambient alarms or strobes instead of loud beeps. Occasionally, periods of high level noise are unavoidable. In those situations, King County staff will work with neighbors to minimize disruption.

Erosion, emissions, and dust control

To preserve air quality and control mud, dust and run-off, wheel washing stations can clean trucks leaving the site. Measures can be taken to protect slopes and soil stockpiles, and contractors are required to use vehicles that comply with air quality laws.

Traffic and parking

Traffic management plans worked out with the jurisdictions as a condition of permitting generally designate construction haul routes and limit the number of trucks leaving the site so roadways aren't overwhelmed. These plans also incorporate safety measures to protect pedestrians and cyclists.

Safety

Sites are secured with fencing and lighting, and off-duty police officers and flaggers can be brought in to direct traffic in busier areas. For each project, King County develops a comprehensive safety plan in compliance with state and federal laws. Emergency response plans are developed and shared with police and fire departments.

Alternative formats on request for people with disabilities. Please call 206-684-1280 or TTY 711.



Pump stations can be attractively designed and landscaped to fit into the community. Pump station improvements also enable installation of quieter equipment and better odor control, making these new facilities better neighbors.



A pump station under construction.

Being a Good Neighbor During Construction



In the 1950s, Lake Washington was so polluted that it was a health threat, and swimming was prohibited. Thanks to our current regional wastewater

treatment system, Lake Washington is now one of the cleanest urban lakes in the world.

Wastewater system – under construction

King County is undertaking a number of projects in the coming years to expand and improve our regional wastewater treatment system. Some of the projects are part of the Regional Wastewater Services Plan, a 30-year plan to meet our region's wastewater treatment needs, while others are simply routine maintenance or upgrades.

What can neighbors expect?

Construction sites for Wastewater Treatment Division projects are busy. Crews could range from three or four people to a dozen or more depending on the size of the project.

Heavy equipment like backhoes, cranes, cement trucks and generators are common, and this equipment does generate noise. People might also see specialized equipment being delivered to the site, like a tunnel boring machine. While work is taking place, excavation and earthwork activities tend to create dust or mud. Construction vehicles and possible road closures or detours could affect traffic.

Before construction starts, King County staff routinely holds small neighborhood meetings to discuss the project and answer questions for construction site neighbors. When construction starts, near neighbors will always have a point of contact for asking questions or reporting concerns. Project offices, sometimes located on or near the work sites, provide a place where people can drop in during business hours to talk to staff.

Did you know?
Construction on King County's regional wastewater treatment system began in the 1960s. Today, the system serves 1.4 million people across a 420-square-mile area in King, Snohomish and Pierce counties.



What's going on out there?



The Wastewater Treatment Division undertakes several types of projects to ensure our treatment system stays efficient and has enough capacity.

Cut-and-cover or trenching

Adding new pipeline or repairing existing pipeline is sometimes accomplished using cut-and-cover, or trenching, construction techniques. To minimize local disruption, trenching work is generally done in segments, with each segment taking several days or weeks to complete. When one segment is done, the construction operation moves to the next segment. A trenching project might consist of several segments.



A trenching project in progress

Most trenching operations take place in public streets or rights-of-way. First, equipment is used to break up concrete and asphalt. Then trenches are dug using backhoes, and dump trucks remove excavated dirt. Trench depths rarely exceed 30 feet. Depending on soil conditions or trench depth, sheet piles or trench boxes might be used to reinforce the sides of the trench. When the trench is completed, workers lay new pipes or repair existing pipes and refill the trench with gravel bedding material.



When work is done, the area gets a temporary paving and workers then move on to do another section. Permanent pavement is put down after construction to restore the entire area to its original condition or better.

Access to streets can be limited, and detours are common. In some cases, a road might be closed, though King County would preserve access for residents.

For more information about the Wastewater Treatment Division and what we do, visit our Web site: <http://dnr.metrokc.gov/wtd/> or call **206-684-1280**.

To learn more about current construction projects, visit: <http://dnr.metrokc.gov/wtd/homepage/construction.htm>

Trenchless methods—tunneling and drilling

Installing a new pipeline or repairing an existing pipeline can also be done using trenchless methods, such as tunneling or horizontal directional drilling. Trenchless methods are typically used to go under a busy roadway or stream—or to avoid a sensitive environmental area such as a wetland or steep slope. Trenchless methods are also considered when the sewer line is more than 25 feet deep, and cut-and-cover methods are high risk.

Trenchless methods can be more costly and can be used in only certain soil and ground conditions. For example, trenchless methods may not work well if the ground contains buried trees or large boulders.

Tunneling

Tunnels are built using specialized tunnel boring machines. King County has 344 miles of sewer pipelines, including 25 miles of tunnels. Building a tunnel often causes fewer impacts on a community because the tunneling takes place underground—usually more than 25 feet deep. Tunneling causes noticeable impacts at access shafts where the machine is inserted and dirt is removed. Also, because tunneling machines run in a straight line, other access shafts may be built so workers can redirect a machine to go a different direction.

Construction starts with site preparation—fencing, grading and clearing vegetation. Then workers build the access shaft. The shafts can be built using several shoring methods that support the surrounding soil. Those methods include sheet piles made of metal and walls or piles made of concrete.

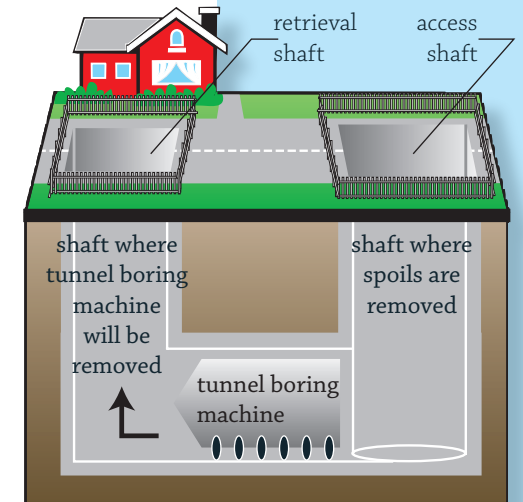
After a tunnel access shaft is built, much of the noticeable activity centers on removing the excavated dirt, called spoils or muck. Trucks then transport spoils to a disposal site. Excavation and spoils removal will affect traffic as trucks come and go, and equipment will run on the site, sometimes continuously.

Microtunneling

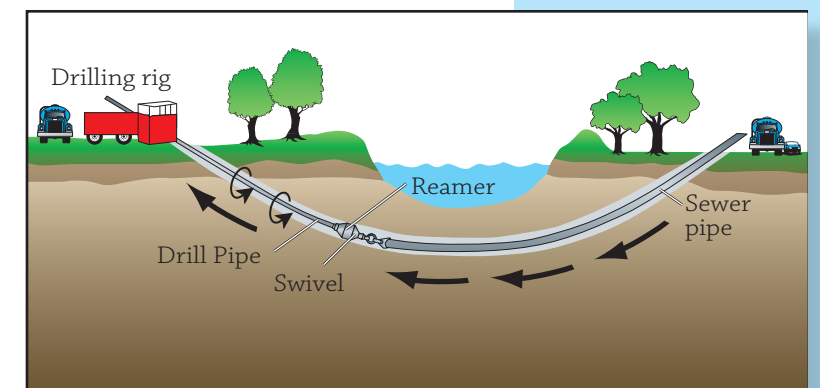
King County has used microtunneling, which uses a small boring machine that's remotely controlled from the surface, to install pipes up to 6 feet in diameter. Pipe is installed immediately behind the boring machine. In microtunneling, there are normally no workers in the tunnel, although they sometimes may enter to repair equipment. This method can be used below the water table and in most soil types.

Horizontal directional drilling

Other trenchless methods are available for different soil conditions. Horizontal directional drilling uses a drilling rig on the surface to install a drill pipe in a shallow underground arc. The drilling rig bores a pilot hole that's filled with fluid and then uses a swiveling reamer to enlarge the hole to the final sewer pipe size. Sewer pipe is then pulled through the hole. Directional drilling often needs a large staging area so the pipe can be lined up before it's pulled into the hole.



Spoils removal from a microtunneling operation.



Horizontal directional drilling.