



PERKFILTER[™] OFFERS HALLMARK SOLUTION FOR HALL CREEK ENHANCEMENT PROJECT

Beaverton, OR

Up the creek. Without funding or a plan, that's where a consortium of civic, corporate and volunteer entities found themselves back in 2009 when faced with a rather large clean-up effort of Hall Creek in Beaverton, Oregon.

Undeterred, the city of Beaverton started the process by applying for a capital grant with Metro, the agency that oversees the Portland metropolitan area. Created more than 30 years ago, Metro coordinates regional planning for managing growth, infrastructure and development, often crossing various jurisdictional boundaries while serving an area of some 1.5 million residents. Beaverton, a community of some 92,000 people, is located about seven miles west of downtown

Portland, Oregon. "We wanted to clean up an area of Hall Creek that had become known as the dirtiest section of the creek," said Debbie Martisak, Project Manager in the Public Works Department in the city of Beaverton. "It was because of the big car lots and mechanics shops that are there," she added.

In 2012, the city was awarded a significant grant from Metro in the amount of \$354,000 to help fund a 650-foot section of Hall Creek. Officially known as the Hall Creek Water Quality & Pathway Enhancement Project, the plan was quite ambitious. According to the Beaverton Public Information office, the goal was to "realign the creek and adjacent trail, reconnect the floodplain, remove invasive

DESIGN & CONSTRUCTION TEAM

Owner

Beaverton Public Works Department

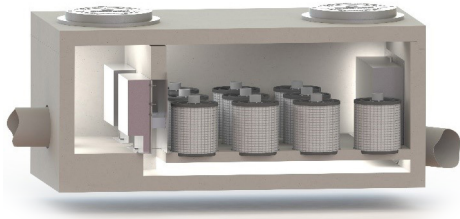
Civil Engineer

Cardno WRG

Manufacturing Facility

Oldcastle Infrastructure
Wilsonville, OR

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plants, stabilize banks with native plants, remove impervious surfaces and create swales for enhanced water quality.

Martisak noted that the Metro grant amounted to about one-third of the total estimated cost of the project. “This grant really sparked the design and made it possible to have this project happen,” she said. “Without that money, we wouldn’t have been able to afford it. So, with the grant in hand, we went through the design process.”

MEDIA FILTRATION

“Putting a filter vault in wasn’t part of the original plan, but the design process indicated that this was the right step to take for our area,” Martisak said. “It became important to us once we went through the design process and began looking at hydrology, pervious and impervious surfaces, and what’s actually flowing into the creek to be treated by this vault.

“It’s a very substantial area, an area that’s highly industrial and commercial. It’s in the heart of what we call our downtown. So, we started talking to our agency called Clean Water Services about our plans, and what types of things that they would like to see. They’re a regulatory agency here in Beaverton that provides permits for this area of Washington County.

“They were also a big supporter of our plans, donating plants and their employees’ time. They recommended having a filter vault in this location, to collect all of the runoff on private property and a little bit of public property as well.

“Most of what we were doing was to improve the urbanized area, taking what was a poorly functioning creek and make modifications to the creek that would support the aquatic life and hydrology of the area. It’s a straight and narrow creek, with high velocities that was scouring out the banks by up to four feet. We had to do something.

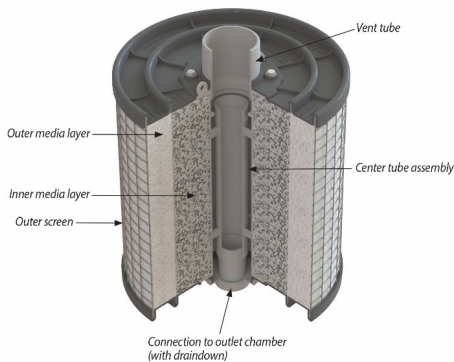
“There’s quite a bit of area there that was not being filtered, and it was a very dirty area of the city because of the types of businesses that are there. So, we decided to add on a filter vault to our project.”

Martisak learned, however, that at that time there was currently only one approved supplier for these vaults. “So initially, we were only getting one bid, which isn’t the way that we do business. It’s not normally cost effective, especially when we’re talking about a \$40,000 to \$50,000 piece of equipment for our infrastructure.

“Therefore, we requested that they work out and approve another manufacturer and different design. This resulted in Oldcastle Infrastructure’s Stormwater getting their PerkFilter™ vault approved in addition to a third manufacturer as well, so now there are more competitors in the area.”

Deon Lourens, Area Technical Manager with Oldcastle Infrastructure’s Stormwater, explained that there are several advantages to the PerkFilter system. “Its cartridges have no moving parts and no cartridge hood, allowing for easier maintenance observation. In addition, its design allows for fewer cartridges than alternative models, and the bypass flow underneath the cartridge bay limits re-entrainment of pollutants.”

He noted that cartridge lifecycle can range up to three years, depending on the pollutant load. “The cleaner the influent,” he said, “the longer the duration between maintenance cycles.”



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OLDCASTLE INFRASTRUCTURE'S STORMWATER

Martisak described the city of Beaverton's relationship with Oldcastle. "We ended up hiring Oldcastle. They came in as the lowest bidder, and they came up with a design for us, together with our engineer who sat in with Cardno WRG, the engineering firm who did the design work. They approved our shop drawings and they made modifications as they saw fit, in consultation with Oldcastle.

"Oldcastle and Cardno WRG were very helpful in discussing exactly which area is being covered by the vault, how much water is being filtered, and the precise numbers for this creek enhancement project."

Construction finally began in July 2015. "That's when our contractor started excavation," explained Martisak. "We've been working on it since, and our own city staff actually installed this vault. So, it was a cost saving to the city to purchase the vault, and our team of engineers worked with Oldcastle to see what we were going to get before it came onsite, to work with them regarding how it was going to be delivered, and how it was going to be set up.

"They were onsite with us when it came, and it was crucial to make sure that it was set up with the correct grade and level. Our city team could place and install the connections and everything that comes into this vault, as well as the pipes that come out of the vault.

"That saved us quite a bit of money, since our labor hours are much less than if we would have contracted it out to another contractor. That was a unique aspect to this project, having our city staff able to place and install the vault. This was a challenge that we overcame, and it came out perfect."

Another issue the city encountered before the work could get very far along was a problem with what was found underground where the vault was to be placed.

"We ran into a situation with some contaminated soil," explained Martisak. "When we were digging, we found oil sheens. We would dig a hole, and it would just fill up and have a sheen to it. We had it tested, and we had to reclaim everything that came out of that area, and send it to a specific location to be handled quickly.

"We're talking very low amounts here. We did more than we had to, but when we found something in one small spot, we decided to treat the whole area. These oils we found are likely a direct result of the businesses that have been in that area for decades."

The oil contaminants weren't the only underground problem. "When we started digging our test holes for this new vault, we found that some major electrical lines were in the way, so we had to move the location of the vault, in order not to have to go under or above the electrical transformers. You never know what's underground until you start tunneling in.

"So, we had to do some adjustments with moving the vault's alignment. The original design had one way for the pipes to go in, but now it's turned and moved over so we can get a more direct shot without having to worry about a transformer."

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LOW-IMPACT DEVELOPMENT

The PerkFilter vault was just one element of this overall water quality improvement effort. In addition, the city installed new curbs, a landscaping planter and did some parking lot resurfacing. In the project area, they now have some pervious concrete, several plantings and a new boardwalk.

The plantings were part of a low-impact development effort. Martisak indicated that native plants, shrubs and trees have been newly planted along both sides of the creek. Local volunteers assisted in the plantings, conducted in October and November of 2015, and in January 2016. A final volunteer planting day took place in April 2016 on Arbor Day, in conjunction with a ribbon cutting ceremony for the new trail that was created in the area.

“This helps ensure that the area is going to eventually maintain its own water quality, as the planted trees get bigger, the shading of the creek increases, and as the stormwater is being treated by plants that were specifically chosen for this environment,” Martisak said. “It’s a low-impact development project.”

The Oldcastle PerkFilter vault is now in place, and is filtering the water and taking out the garbage that is collected from the storm system, including the runoff from the parking lot, before it goes directly into Hall Creek.

“The vault was operational through all the big winter storm events that we had,” Martisak said. “Beaverton has gone through some record storms, and it has performed really well.”

She explained some of the other elements in the local enhancement effort. “We already had plantings and water quality plants that went into this project. We also did mitigation upstream, to ensure that we’ve got good shading of the creek. We pretty much took out most the trees that were non-native and invasive. When we cleared them all out, it left the area looking very bare, although it was nice to be able to see the aesthetics of what we were able to change in the channel.

“For water quality, we have a rain garden that is also part of the project. We have two swales that are part of this project, that are taking stormwater outfall from the parking lot at the car dealership. The filters we’re using are all from plants. We’ve also made changes to the creek’s alignment, to slow it down, and to give the channel and the area downstream a better chance to avoid flooding.

“The other stormwater work we have done is to install new catch basins in the parking lot for an apartment complex on the north side of the creek to handle the stormwater coming off these adjacent properties.” Additional details of the other stormwater aspects of the project were provided by Cedimir Jesic, an engineer with the consulting firm Cardno WRG. “There are two treatment trains. One is the filter vault, with catch basins clearing the stormwater of debris before it even reaches the vault. Then there is also a series of catch

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basins throughout the parking lot, with a water quality pretreatment manhole that lead into the swale.

“It wasn’t entirely clear what drains here, so with the catchment area it was assumed that it can either drain to this vault, or to the adjacent water quality swale. So, we have the vault, and we have a water quality planter, a swale, that treats another part of the catchment area.

“A part of the development drains directly to this water quality facility. So, on this project we are using both mechanical treatment, with the PerkFilter, and we’re also using vegetative treatment with the water quality swale.

“We were very fortunate that we were able to build this vegetative facility and call it a conveyance facility, but it’s planted as a water quality facility, so we know that some treatment will occur. This is with the swale.

“We’re doing as much water quality treatment as is feasible, with existing outfalls. There has been extensive landscaping. So, there has been stream restoration, enhancement and improvement of water quality.”

One of the problems that had been encountered prior to the start of this project was that there are five separate private property owners in this area of Hall Creek. As Martisak commented, it had become a case of “who’s doing what?”, with the result being nothing.

“There was a trail,” she said, “but it was a bit dicey, because it wasn’t maintained by these property owners. So, we took over responsibility not just for the installation of this filter vault on private property, but we will be continuing to do all the maintenance on it forever, changing all the filters forever. We will also be ensuring that these plants are maintained and nourished for three years. We did everything we possibly could to make this a very natural, established end product. We went the extra mile to get this filter vault. We had to get more money to do the right thing.

“That shows the city’s sense of responsibility for the creek and its integrity by actually paying some \$40,000 for a piece of equipment that wasn’t initially planned. We didn’t have to do this, we weren’t required to; it was a matter of doing the right thing, and that’s what the city did. We were able to take all the issues that we saw, and make something that is not just effective, but is beautiful. The project turned out incredibly fabulous.”

Cardno WRG’s Jesic was equally impressed with the finished project. “The city crews did a really good job,” he said. “There were different groups working within the city – there were utility and pipe crews doing one thing, street crews doing another thing, and the landscape people working with volunteers to do all the planting.”

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Martisak noted that without the Metro funding, this project might never have taken place, or would have been significantly scaled down. But the city of Beaverton didn't sit idly by, waiting for a funding decision. They were incredibly pro-active.

"We got 26 big local supporters for this project – big players who came to the table and said at the beginning of the process that they like the idea, that there is a strong need here, and that they support this project.

"Because we had so many supporters that came to the Metro meetings, I think the grant committee was overwhelmed with the fact that there was so much support, it would have been difficult for them to say 'no.' But without that grant, I don't think this project would have gone forward to the level that it did. We probably would have had to do a low maintenance project and just cleaned it up a bit."

About Oldcastle Infrastructure

Oldcastle Infrastructure, A CRH Company, is the leading provider of building materials, products and services for infrastructure projects to several market sectors nationwide, including: Building Structures, Communications, Energy, Transportation and Water.

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