

SCORE Jail

Technical Information Report



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kpff Consulting Engineers



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1. Project Overview

The SCORE project consists of an approximately 137,000 square foot (SF) correctional facility, associated parking, and site improvements on a 15.613-acre collection of parcels in Des Moines, Washington. The site is currently the remnants of a partially demolished residential development. The site is outwash soil forest covered, with the exception of original asphalt roads, in moderate to poor condition.

Currently stormwater that falls on the site mostly infiltrates into outwash soils. In extremely heavy events, stormwater from the northeast corner may flood over the existing crowned 208th Street into a closed depression directly north of the site. Analysis shows this closed depression to be predominantly fed by groundwater.

There is some runoff that sheet flows onto the site from western residential lots. This runoff is currently dispersed by the forested ground cover. This flow is captured in the developed condition and mitigated by on-site elements.

The site includes the northern ditch of 208th and thereby captures off-site runoff from the north. These off-site areas are not analyzed because the developed condition does not divert these flows from their natural discharge location into the northern closed depression, or modify the drainage path in the north 208th ditch.

Stormwater hitting the southern portion of the site will mostly infiltrate into the outwash soils as well. In extremely heavy events, stormwater sheet flows southerly off-site into the Des Moines Creek.

In order to meet the level one flow control and minimum Best Management Practices (BMP) surface area requirements, runoff from the developed condition is mitigated by a combination of surface BMPs and an underground infiltration facility. The surface BMPs selected are permeable pavements and rain gardens. The infiltration facility infiltrates runoff up to the 10-year storm, and outlets greater events to the Des Moines Creek directly south of the site, through a bubble up catch basin energy dissipater and riprap-lined swale. The outlet is located within the buffer of a category 3 wetland and will require restoration.

All runoff rates are calculated using the 2009 *King County Surface Water Design Manual (2009 KCSWDM)*. 2009 KCSWDM specifies acceptable input values to model existing and proposed conditions as well as proposed BMPs using the King County Runoff Time Series computer program (KCRS).

2. Conditions and Requirements Summary

Des Moines requires level 1 flow control and 1994 pre-developed conditions. This less stringent standard is allowed in lieu of the current code requirements because the Des Moines Regional



Detention Ponds, the Bypass Pipeline, and the Outfall Pipeline mitigate flows to the Des Moines Creek. This adjustment is described in a December 15, 2008 letter from the Des Moines Creek Basin Committee to the City of Des Moines.

The project is in an Enhanced Basic Water Quality (WQ) area. The Enhanced Basic WQ menu is designed to achieve 50 percent total zinc removal for flows up to and including the WQ design flow or volume (2009 KCSMDM §6.1.2).

The project is located adjacent to a ravine steep slope area to the south. Code requires all construction activities to be located at least 20 feet from the top of the ravine.

Security is a concern; therefore, all lids must be locking type.

3. Off-Site Analysis

Currently stormwater that falls on the site and mostly infiltrates into outwash soils. In extremely heavy events, stormwater from the northeast corner may flood over the existing crowned 208th Street into a closed depression directly north of the site. Analysis shows this closed depression to be predominantly fed by groundwater. Stormwater falling on the southern portion of the site will mostly infiltrate into the outwash soils as well. In extremely heavy events, stormwater sheet flows southerly off-site into the Des Moines Creek.

Site inspection shows no channelization upstream of Des Moines Creek. Des Moines Creek is a well-defined creek within a protected park and does not require further analysis.

4. Flow Control and Water Quality Facility Analysis and Design

The project uses permeable pavements, a rain garden, and an infiltration facility to achieve the enhanced basic water quality and level one flow control standard.

The treatment train is described as follows. Runoff is captured by the conveyance network then piped to the pre-settlement tank where most of the heavier pollutants will remain. The two-foot layer of imported soil underlying the facility filters and treats the runoff before it reenters the groundwater. All flows exceeding the 10-year event will overtop the control riser and discharge to the Des Moines Creek directly south of the site through a bubble up catch basin energy dissipater and rip-rap-lined swale.

The infiltration facility is designed to infiltrate all flows up to the 10-year storm. The soils under the facility have a design infiltration rate of 1.5 inch/hour (February 20, 2009 Hart Crowser Geotechnical Engineering Design Study).

The use of two-feet of imported soil underlying the infiltration facility in lieu of native soil requires a code variance to be issued.



5. Conveyance System Analysis and Design

Conveyance is achieved by a network of catch basins and pipes designed to convey the 25-year storm to the infiltration facility. Conveyance downstream of the infiltration facility is designed to convey the 100-year storm to the bubble up energy dissipater. All conveyance flows are modeled using the 15-minute time step in KCRTS.

Conveyance from all closed depressions created by on-site elements is designed to convey the 100-year storm to the infiltration facility.

6. Special Reports and Studies

Wetland Analysis by Hart Crowser

7. Other Permits

8. CSWPPP Analysis and Design

Silt fences around the clearing limit and at the property line, fluidized soil stabilizers, and slope benches will protect Des Moines Creek from initial silted construction runoff.

After rough grading is complete and the southern slope is stabilized, runoff from the site will be routed to a temporary sedimentation infiltration pond located at the northeast corner of the site. All construction swales are rock lined and check dammed to prevent silt and sediment transport. If site conditions show that sedimentation is accumulating in the temporary pond, the pond will be dredged of sediment and lined with filter fabric to maintain the infiltration properties of the soil.

This pond will infiltrate most storm events and in extreme events overtop into the northern closed depression via a controlled rip-rap lined swale.



9. Bond Quantities, Facility Summaries, and Declaration of Covenant

10. Operations and Maintenance Manual

See Appendix A 2009 KCSWDM.

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