South Omaha Industrial Area Lift Station Bioretention System

2214 Washington Street, Omaha, NE

City of Omaha CSO & Stormwater Programs

SITE AND PROJECT SUMMARY

The South Omaha Industrial Area (SOIA) Lift Station, located at 2214 Washington Street, was a part of the SOIA Sewer Separation Project and CSO Program. The SOIA Lift Station was designed to collect industrial waste from meat packing facilities in the surrounding area. This high-strength industrial wastewater is removed from the old combined sewer system and transported into a new sanitary sewer line. Once separated, the industrial wastewater is pumped to the Missouri River Wastewater Treatment Plant for treatment. This conveyance project ensures treatment and prevents industrial waste from entering the Missouri River at combined sewer outfalls.

After completion of the SOIA Lift Station, a bioretention garden was installed on the south end of the property. Completed in 2014, the bioretention garden covers an area of about 3,400 ft^2 with a contributing area of 0.7 acres. Stormwater runoff primarily enters the bioretention garden through the northwest and northeast most corners via grass swales. The grass swales help to reduce overall stormwater velocities and prevent erosion of the bioretention garden.

This bioretention system incorporated native and non-native, well adapted vegetation including Blue Grama, Little Bluestem, Red Twig Dogwood, Karl Forester Reed Grass, Beebalm, and Wild Golden Glow.

Today's bioretention design features the use of an infiltration cell that spans the length of the bioretention garden and promotes efficient drainage of the system over a 24-hour period. Infiltration cells are comprised of multiple layers including a Bioretention Soil Mix (BSM), a separation layer (geo-textile), an aggregate layer, and a perforated under-drain pipe (layered in that order). Most BSM mixtures include a mix of fine sand and compost (70/30 by volume; Omaha standard) allowing for rapid drainage to the underdrain, but still retaining sufficient moisture and nutrients to support plant growth. The SOIA Lift Station bioretention system is unique in that the system's infiltration cell, a two foot wide trench across 90% of the bottom of the system, is composed entirely of 1" washed limestone to a depth of 18 to 24 inches. Additionally, 3 inches of 1" washed limestone on top of the infiltration cell was rounded above the pond bottom in order to increase surface area to promote better drainage to the underdrain.

PROJECT DETAILS

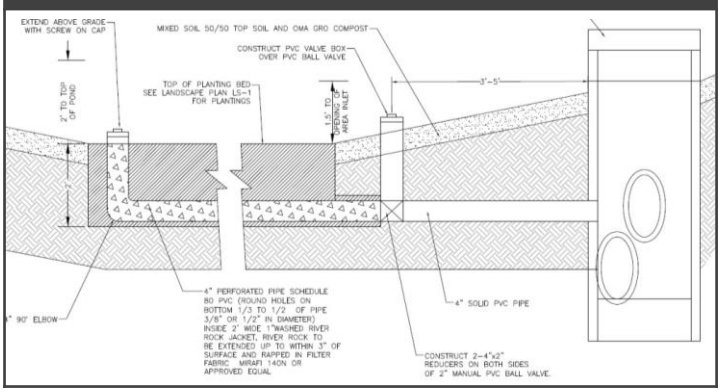
	BIORETENTION GARDEN
System Footprint	3,400 ft^2
Contributing Area	0.7 acres
Design Volume	3,400 ft^3
Percent Impervious (%)	35%
Land Use Type	Industrial
Predominant Existing Soil Types	Silty Clay Loam
Underdrain	4" perforated PVC
Pre-Treatment System	Grass Swales
Outlet Control	4" Polyball valve
Overflow	High flow structure & soft weir

MONITORING	METHOD
Infiltration	MPD Infiltrometers; Double-Ring Infiltrometers, Mini-Disk Infiltrometers
Plant Assessment	Visual Assessment

DESIGNED BY	CONSTRUCTED BY	MONITORING/ ASSESSMENT BY	MAINENTANCE BY
Wade Trim	Erikson Construction	City of Omaha Stormwater Program	City of Omaha Stormwater Program

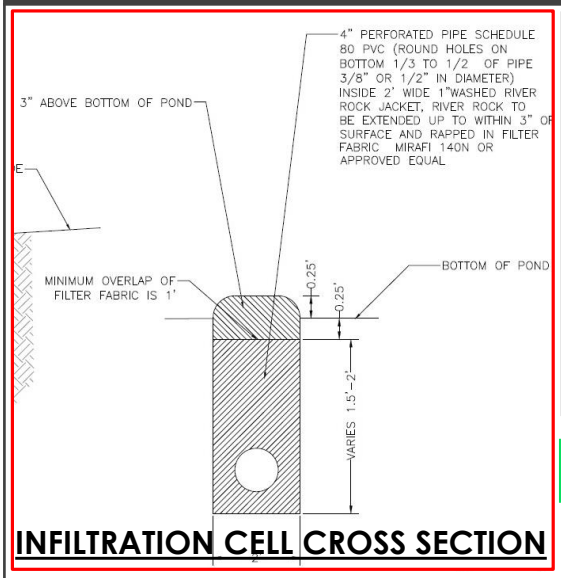
SITE LOCATION – 2214 Washington Street

INFILTRATION CELL LONGITUDINAL VIEW



PHOTOS

PROJECT LAYOUT



INFILTRATION CELL CROSS SECTION