UNO Baxter Arena Bioretention Gardens

2425 S 67th Street, Omaha, NE

City of Omaha Stormwater Program & University of Nebraska - Omaha

SITE AND PROJECT SUMMARY

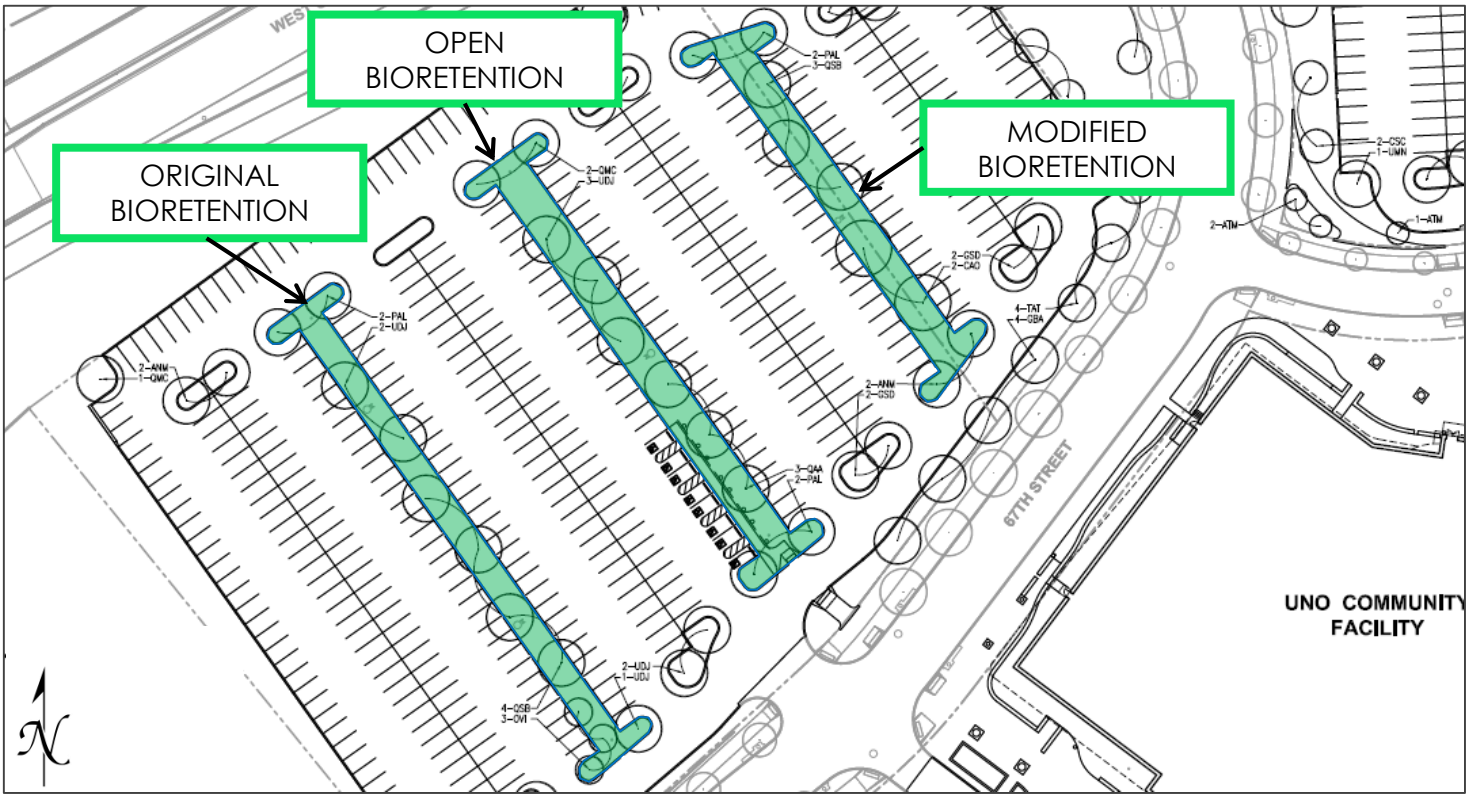
Baxter Arena is located at South 67th Street and West Center Road, just south of the University of Nebraska-Omaha (UNO) Scott Campus and Aksarben Village. Completed in the summer of 2015, Baxter Arena sits on roughly 15 acres, housing a 7,500-seat arena, a community ice rink, and five adjacent parking lots with roughly 2,500 available parking stalls. The seconded largest parking lot, just northwest of the arena, occupies 3.8 acres and contains three linear bioretention systems running parallel to each other. After installation it was noted that the bioretention systems at the arena were not draining as intended. Steve Rodie, UNO Professor, and Lowell Neuhaus, UNO Landscape Services Manager, worked with the City of Omaha Stormwater Program to figure out why these bioretention systems failed and see if they could fix or improve them.

After examining the bioretention systems there were three main issues as to why they did not drain: (1) a nonwoven geotextile was laid flat over the drainage aggregate resulting in it being clogged from the beginning, (2) the Bioretention Soil Mixture (BSM) included 1/3 top soil which had an unknown texture leading to a slower percolation rate, and (3) the inlets into the bioretention system were eroding, causing sediment deposition and clogging of the infiltration cell.

Once all problems were identified, a plan was developed to fix and improve permeability/infiltration rates within the bioretention systems. Rather than reconstruction the entire infiltration cell, the plan was to repair portions of it to allow for better drainage into the underdrain system. First, three sections of the BSM were excavated and hauled off. Second, the existing geotextile was cut and removed. Third, the existing drainage aggregate was evaluated and additional rock was added to create a convex mound and increase surface area for better drainage. Next, a woven geotextile, designed for subsurface drainage, was placed over the drainage aggregate. Fifth, a new BSM of 80/20, sand/compost was placed into each excavated infiltration cell section. Finally, each repaired sections was plugged with palm and fox sedge, and a thin layer of mulch was placed on top.

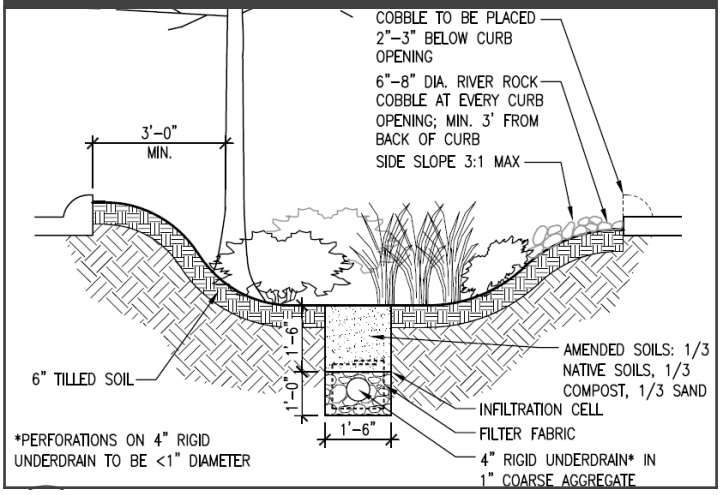
Note the three linear bioretention systems in the northwest parking lot on the map below. The bioretention system on the west side of the parking lot is of current conditions at a failed state. In the middle of the parking lot there is a bioretention system that is opened up so that we can show and discuss the issues that led to the over failure of the bioretention systems. On the east side of the parking lot there is the fully repaired bioretention system. The east bioretention system has experience several rain events since being repaired and is functioning as expected.

PROJECT LAYOUT



SITE LOCATION – 2425 S 67th St

BIORETENTION LAYOUT



PHOTOS

Water logged bioretention systems in northwest parking lot

Excavated section of infiltration cell

Clogged geotextile on top of the aggregate (Note that the geotextile is flat across the top)

Thick deposits of clay and silt found on top of geotextile

New 80/20, sand/compost BSM being installed

Palm and Fox sedge plugs and thin layer of mulch placed on top of repaired sections within the bioretention system