

[EROSION PREVENTION]

Damage Control

Site stakeholders collaborate to protect downstream resources

By Rob J. Beilfuss

The City Center North Village is a 68-acre multi-use development in Lenexa, Kan. It will combine high-density commercial and residential development, storm water best management practices (BMPs) and pedestrian-friendly design to create a “new urbanism” community.

The site drains to an unnamed tributary of Mill Creek, which flows into Shawnee Mission Lake, approximately 0.5 miles to the northwest.

System Failure

Rough grading at the City Center North Village commenced in early 2007. Due to steep slopes on site, extensive cut-and-fill activities were required to bring the site to final grade. Unadjusted earthwork quantities were estimated at 335,096 cu yd of cut and 231,973 cu yd of fill. Cut-and-fill activities extended through the summer of 2007. With frequent disturbance across the majority of the site, phasing and temporary seeding were not utilized during early project stages.

Prior to rough grading, trees on

site were mulched and formed into 5-ft-high berms along the northern (down-gradient) site border. Silt fences were installed around two topsoil storage piles, the central drainage way and western, eastern and southern perimeters. Three rock checks were also installed where the central drainage leaves the site to the north.

A series of sediment ponds were included on the land disturbance plans, but the contractor did not install three of them prior to rough grading because a future sanitary sewer line and existing abandon sewer line intersected one of the pond locations. One small sediment pond was installed in the eastern central portion of the site.

Lenexa received approximately 3 in. of rainfall on March 29, 2007. The next morning, the water quality specialist and erosion and sediment control inspector conducted site inspections throughout the city to determine the extent of runoff and sedimentation. Perimeter BMPs had failed at City Center North Village, and a significant amount of sediment had left the site

and impacted the eastern cove of Shawnee Mission Lake.

Runoff from the western portion of the site blew out a perimeter mulch berm and rock check, with a sediment plume visibly leaving City Center North Village. Runoff from the central drainage had eroded underneath and around three ditch checks, and sediment-laden water was visibly leaving the site.

Digital photos were taken of the site and lake to document the failed BMPs and extent of damage. Water samples were not taken because state water quality standards and city land disturbance provisions do not include a quantitative standard, and total suspended solids data would not affect compliance activities.

Remedial Actions

Photos were circulated to key city staff. A meeting was called and an onsite meeting scheduled for later in the day. During the onsite meeting, the contractor, city staff and county parks staff walked the site perimeter and visited the lake. All parties helped formulate a plan of remedial action.

The contractor informed the group that sediment pond installation had been delayed because it was waiting on county approval to remove an abandon sewer line. City and county parks staff immediately contacted the Johnson County Wastewater Department to request an expedited approval to remove the sewer line. Subsequently, the contractor was given approval.

On March 30, 2007, a compliance notice was faxed to the contractor.



Rainfall sent sediment-laden site runoff into Shawnee Mission Lake via an unnamed tributary.

Within 24 hours, the contractor was required to complete the following: repair existing rock checks and face them with gravel; maintain perimeter mulch berms and replace those along the western drainage; and place an additional rock check in the western drainage. Within 10 working days, the contractor was required to install sediment basins with skimmers and maintain and replace all other onsite sediment controls as appropriate.

On April 2, 2007, city staff conducted a follow-up inspection and determined that the existing sediment pond was discharging suspended clay into the central site drainage and receiving stream. Another compliance notice was faxed to the contractor, requiring maintenance of the sediment pond and the addition of flocculants to settle out the fine clay on site.

In addition to the aforementioned compliance activities, the city voluntarily installed a series of rock checks through a section of city parkland upstream of the lake.

All existing rock checks were originally constructed with large rock (12 in. or more) excavated from the site. The contractor was instructed to use smaller rock faced with 0.75-in. clean gravel. After making repairs and installing additional rock checks, water began to pond, increasing settling time and filtration.

The contractor voluntarily installed rows of silt fence along the western drainage to help protect the perimeter controls. They slowed velocities reaching the mulch berm and rock checks; however, they did need regular maintenance and sediment removal.

The existing sediment pond was cleaned out to provide more settling time, but there was not a good way to mix flocculants into the pond. The contractor installed bags of BioStar CH (natural chitosan) in the outfall pipe, increasing settling throughout the receiving stream and rock check system. No water quality samples were taken during this project. Water clarity, however, did appear to improve after flocculants were added to the system of controls.

The main sediment ponds were eventually installed, but shallow bedrock and slow sewer line removal activities hindered progress. All ponds were equipped with skimmers to enhance sediment removal. As mass grading proceeded, the series of rock checks and sediment ponds sufficiently controlled runoff and protected downstream resources. **SWS**

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