



## Storm Water Management for new PSU Ice Rink

Runoff from the new parking areas will be directed into bioretention swales with parabolic cross section which will double as parking separators. The construction of the swales follows guidelines of the UNH Storm Water Center. Each swale will have a number of catch basins with rims set above the swale center so the "first flush" will pass through the bioretention soil mix. The swales will handle a 2-year storm level; in greater events the level will rise to drop into the catch basins. (The rims are not raised in the three northern-most swales in the repaved parking areas immediately behind the Facilities building, and the cross slope is too steep and space limited to allow for much storage volume).

The catch basins will pick up the runoff not picked up by the bioswales and direct it to subsurface infiltration galleries, basically one per bioswale. Prior to the galleries, water quality units will be placed as pretreatment to protect the chambers from any remaining sediment or oils that are not captured in the bioswales. Each unit incorporates a bypass so high flows do not stir up accumulated sediment. The combined system will handle a 50-year storm level. A high-level relief pipe will prevent backing up into the parking lots in larger storms. It is directed to an existing depression at the southern extremity of the property.

All but the front segment of the building has a pitched roof with ridge running north-south. Drip trenches on the east and west sides will intercept roof runoff and direct it to the flat area on the west side of the building. Runoff from the flat roof of the front segment will connect to the same point of discharge, as well as sheet runoff from the terraced ground on the west side. There is an existing culvert under Avery Street directing whatever runoff is not absorbed in the flat area towards the river.

Runoff from the embankment between the building and the south sidewalk of Route 175A will flow into an existing DOT catch basin, along with a portion of the reconstructed north-south access driveway. This basin discharges to an infiltration depression behind the gas station immediately east of the Facilities Building.

In a flood situation, the site will be submerged to one degree or another depending on the severity of the flood. While in the submerged condition, the storm water systems – though inundated - will be dormant, carrying no flow. As the arena site is not in the high velocity zone of flow (that is, the floodway of the river), the inevitable sediment should be distributed more or less evenly over the full site. When the flood waters recede – draining off in the southerly direction – a layer of sediment will be left behind on the ground and in the storm water systems. As the gallery design incorporates access risers and cleanouts, and the systems are fairly small, flushing of the systems can be readily accomplished. It will be important to clean up the sediment from the pavement and other areas quickly, as it is far easier to clean up the surface than letting subsequent rain events wash some of it into the storm water system.