



To: Doug Kohl

Date: August 3, 2009

RE: Northern Avenue
Suggested Amount for Stormwater Maintenance Escrow Account

Doug:

The stormwater controls for the Northern Avenue project consist of standard catch basins, standard drainage pipes and manholes, a Stormceptor treatment system, drywells, rain gardens, and an open dry detention basin.

Although each of these systems work together to provide an overall stormwater maintenance system, each individual system does and can work independent of the other systems. It is highly unlikely that all or even more than one of the systems would fail and require repair at any one time.

For the purpose of establishing an estimated reasonable maintenance escrow account for maintenance and/or repair, it should be assumed that the entire infrastructure is installed and functioning, and the escrow account would only be used for a one-time forced maintenance of the entire stormwater system and/or the replacement/repair of a failed single element of the system.

For the purpose of determining the appropriate amount of escrow, the characteristics of each to the following stormwater systems was considered:

- *The catch basins* typically do not require any maintenance other than annual or bi-annual cleaning. Catch basins rarely "fail" and as such no repair cost are typically assigned to the CBs.
- *The stormwater pipes and manholes* typically require no maintenance, and likely would not experience any "failure", other than a possible single location break or clog. As such no maintenance or repair cost are typically assigned to the drainage pipe system.
- *The Stormceptor* typically requires regular inspection and typically annual or bi-annual cleaning. This system has no moving parts and is very unlikely to experience a "failure" It is highly unlikely that this system would fail and as such no repair cost are typically assigned to the Stormceptor.
- *The detention basin* will require annual or bi-annual mowing, and removal of sediment once every 5 to 10 years. The detention basin is not likely to "fail" and as such no repair cost are typically assigned to the detention basin.
- *The rain garden* will require annual mulching, possible fertilization, and pruning of dead vegetation. In the event of failure, the rain garden would need to be excavated, the bottom scarified, and the system replaced.

- *The drywells* require periodic observation, and no specific maintenance. In the event of failure, the drywell would require removal of the drywell, scarification of the bottom, and replacement of the drywell.

The cost to provide a “one time” maintenance of the entire stormwater system, consisting of cleaning all of the catch basins, cleaning of the Stormceptor, mowing the detention basin, removing sediment from the detention basin, and mowing and mulching the rain garden, would cost approximately \$3,400.

	Annual Maintenance
Catch Basin (2)	\$1,200
Drain Pipes	\$0
Stormceptor (1)	\$700
Detention Basin (1)	\$1,000
Rain Garden (2)	\$400
Drywell (4)	\$100
Total	\$3,400

The cost to replace/repair the most likely item to require repair/replacement, (i.e. the rain garden or the largest drywell), would be approximately \$4,000.

In the highly unlikely situation that the most expensive system, (i.e. the Stormceptor), should totally fail, the replacement cost for a new Stormceptor model 900 would be approximately \$8,000

In summary, it is my opinion that a reasonable escrow amount for a one time “full maintenance” operation and a one time replacement of a failed rain garden would be $\$3,400 + \$4,000 = \$7,400$

As a worst case scenario, a reasonable escrow amount for a “full maintenance” operation and one time replacement of the Stormceptor, a reasonable escrow amount would be $\$3,400 + \$8,000 = \$11,400$.

Sincerely,
The Berkshire Design Group, Inc.



Mark B. Darnold, P.E.
Principal