

Derry Township

Stormwater Management Study — 2nd Phase

December 9, 2008



[BUILDING RELATIONSHIPS.
DESIGNING SOLUTIONS.]

HRG CONTACT INFORMATION

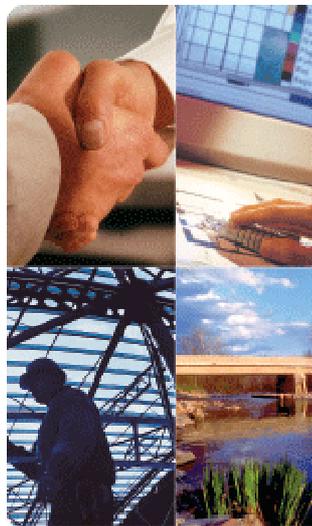
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**BUILDING RELATIONSHIPS.
DESIGNING SOLUTIONS.**

PRIORITY AREA NO. 10 – MILL ROAD UNDERPASS

The location of this priority area is illustrated on Drawing No. 10. During a field view of this problem area, all but one of the five (5) storm inlets at this railroad overpass was observed to be free of debris. The number, size and location of the storm inlets should be able to capture the runoff that collects at the low point of this underpass. Consequently, it is suspected that the pipe network connecting these inlets and discharging to Swatara Creek north of Park Boulevard is either partially blocked or under capacity for the design discharges being experienced. The drainage area for the storm sewer system that passes through this underpass is approximately 0.09 square miles. Table 18 summarizes the estimated peak storm discharges for this drainage area.

**TABLE 18
PRIORITY AREA NO. 10 – ESTIMATED PEAK DISCHARGES**

DRAINAGE AREA (SQ. MI.)	PEAK DISCHARGE (CFS) FOR INDICATED RETURN FREQUENCY EVENT			
	2.33 YEAR	10 YEAR	50 YEAR	100 YEAR
0.09	10	74	180	230

It is recommended to televise the storm sewer network from the underpass to the stream outfall point to determine the condition and size of the pipes and whether there are any blockages. Afterwards, it can be determined whether to replace the storm sewer network from the underpass to the quarry outfall point with pipes having greater capacity. If needed, the proposed culvert, illustrated on Drawing No. 10, would be approximately 400 feet in length and the average slope would be approximately 2.0 percent. Using the 50-year return frequency storm event as the design criteria, the pipe would be sized at 48 inches in diameter to handle the estimated 180 cfs peak discharge.

Assuming that the storm sewer system would need to be replaced, the estimated cost for the recommended system is \$72,160.



LEGEND



STRUCTURE BENEFITED BY PROJECT



PROPOSED STORM SEWER



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**DERRY TOWNSHIP
STORMWATER MANAGEMENT STUDY
PRIORITY AREA NO. 10
MILL ROAD UNDERPASS**

DAUPHIN COUNTY

PENNSYLVANIA

PROJ. MGR. - MSB
DESIGN- ATB
CADD-
CHECKED-
SCALE- 1" = 500'
DATE- 11-4-08

DRAWING NO. 10
SHEET NO. 10 OF 17
PROJECT 2484.0429

PRIORITY AREA NO. 11 – PALMDALE PARK AND ROUTE 422

Palmdale Park was built in the floodplain of Spring Creek. The area encompassing both the baseball and soccer field, illustrated on Drawing No. 11, becomes inundated during severe rain events. In addition, homes upstream of the park area, between 2nd Street and Caracas Avenue were flooded during Hurricane Ivan. The Corps of Engineers constructed a berm upstream of the park after Hurricane Ivan to protect the homes, but it does not protect the ball fields. This area is drained by five culverts under Route 422 (three 3' by 5' elliptical CMPs and two 5' RCPs), but the ground on either side of the pipes is so flat that they do not convey the water effectively. The drainage area of this watershed is just over 4 square miles and the estimated peak discharges are tabulated in Table 19.

TABLE 19
PRIORITY AREA NO. 11 – ESTIMATED PEAK DISCHARGES

DRAINAGE AREA (SQ. MI.)	PEAK DISCHARGE (CFS) FOR INDICATED RETURN FREQUENCY EVENT			
	2.33 YEAR	10 YEAR	50 YEAR	100 YEAR
4.04	218	549	1,161	1,525

There are two alternatives for mitigating this problem. The first is to relocate the ball fields to higher, adjacent ground. This would involve purchasing additional property and then re-grading it to provide suitably flat ground for the ball fields. Because the adjacent property is on a hillside, the re-grading would have to be extensive. This option would not provide any additional protection from flooding for the homes at the west end of 2nd Street and Caracas Avenue.

The second alternative would involve excavating and re-grading the property adjacent to the Corps of Engineers berm to convert that area into a detention pond. An embankment would have to be constructed with an outlet structure at the west end of the berm area. The detention pond would normally be dry. However, during rain events, it would detain the runoff from the upstream watershed and release it at a slow rate. A shallow channel would be constructed to convey the discharge from the detention pond around the ball fields to the culverts under Route 422.

The estimated cost for the detention pond and outlet channel is \$449,430.

PRIORITY AREA NO. 12 – WEST CHOCOLATE AT SWATARA AVENUE

The location of this priority area is illustrated on Drawing No. 12. The intersection of West Chocolate and Swatara Avenues is a low spot of the roadway. There does not appear to be any storm inlets at the low point, so runoff ponds until it either infiltrates or evaporates. The area draining to this low spot is approximately 10 acres. The estimated peak discharges for the design storm events are presented in Table 20.

**TABLE 20
PRIORITY AREA NO. 12 – ESTIMATED PEAK DISCHARGES**

DRAINAGE AREA (SQ. MI.)	PEAK DISCHARGE (CFS) FOR INDICATED RETURN FREQUENCY EVENT			
	2.33 YEAR	10 YEAR	50 YEAR	100 YEAR
0.02	2	24	45	58

The recommended solution is to install inlets and a storm sewer that would tie into the storm sewer recommended for Priority Area No. 1. As illustrated on Drawing No. 12, the storm sewer would be approximately 200 feet long and would be 30 inches in diameter.

The estimated cost for the recommended system is \$34,280.

