

VALLEY MEADOWS PARK IMPROVEMENTS REPORT

for

The Borough of Carlisle

CUMBERLAND COUNTY, PENNSYLVANIA

Prepared by:

FREDERICK, SEIBERT & ASSOCIATES, INC.		www.fsa-md.com
CIVIL ENGINEERS ■ SURVEYORS ■ LANDSCAPE ARCHITECTS ■ LAND PLANNERS ■ ENVIRONMENTAL		
128 South Potomac Street Hagerstown, MD 21740 (301) 791-3650 Fax: (301) 739-4956	20 West Baltimore Street Greencastle, PA 17225 (717) 597-1007 Fax: (717) 597-1028	101 North Hanover Street Carlisle, PA 17013 (717) 701-8111 Fax: (717) 701-8254

JTD

Date: February, 2015

Job No. 50038

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Narrative:

Valley Meadows Park is located on the west end of the Borough of Carlisle. Historically, this park has been the downstream drainage point for a watershed of about 265 acres. This watershed is composed mainly of developed land. There are several warehouse properties upstream of the park which have stormwater management features that discharge flow toward the park. A subdivision, also known as Valley Meadows, was developed upstream of the park with little or no stormwater management implemented. This residential development is composed of 1/4 acre lots, curbs and streets, with a total subdrainage area of about 28 acres. Almost all of the drainage culminates at the intersection of Meadow Boulevard and Terrace Avenue. The gravel parking lot just downstream of this street intersection receives much of the flow from the development and conveys this flow to the downstream areas of the park. This gravel parking lot is also the juncture of downstream discharges of the warehouse properties. According to historic, topographic maps, the natural drainage path is through the center of the park to the adjacent agricultural field to the northeast.

The lack of stormwater management and the sudden, uninhibited peak flows associated with runoff from the Valley Meadows neighborhood exacerbates erosion of the existing gravel parking lot as the water continues to find a way around the lot to the downstream end of the park. This erosion is evident as a 1 ft. – 2 ft. deep gully has been eroded around the southwest side. Furthermore, as this storm flow joins with the discharge of the upstream stormwater management ponds, it is increased to the point that any conveyance channel or stormwater management features constructed in the past are quickly overwhelmed and have even begun to erode themselves.

The previous stormwater management efforts in the park include a drainage swale graded around the parking lot which was meant to deliver storm flow to a small, excavated infiltration pond on the south end of the park. This pond was excavated on the upper side of the park due to the existing ball fields which occupy the historic drainage path. The infiltration bed itself is not large enough to effectively manage the types of flows draining to it. It is evident that there is rock in the immediate vicinity of the pond and so excavation was likely limited due to this factor. The elevated discharge pipes in this pond currently discharge to a location between the softball field and the lacrosse field. This discharge pipe and associated rip-rap outfall protection have been identified as a safety concern in the park and have since been fenced off with orange safety fence.

For these reasons and more, FSA recommends that several steps be taken to better manage stormwater runoff, improve the safety and usability of the park and even increase and improve the ball fields and park amenities.

First, in order to best manage stormwater, the drainage path should be returned to the low point in the natural valley where it historically had travelled before the park was built. This requires that a 20 ft. wide, multi-stage channel with gradual return slopes, be constructed in the middle of the park in such a way that runoff will be safely conveyed from the southwest end of the park where concentrated discharge accumulates from upstream development, to the discharge point on the eastern end of the park. As it is, the area at the downstream end of the park will flood during large inundations of storm flow and so attempting to re-direct and infiltrate into an undersized facility will prove futile during larger storm events (10 yr. flows+). This channel should be vegetated and should receive low maintenance in order to promote vegetation that prevents erosion, provides shade in order to reduce stream temperatures and provides habitat for wildlife. This channel will also have

areas where infiltration, biological uptake and nutrient management will be promoted within the channel. The channel should have two or three pedestrian crossings with large enough spans that large storm events are able to be conveyed safely and without major erosion due to constriction of the channel.

Once the drainage channel has been constructed, the storm flow from the upstream neighborhood should be conveyed to the new channel in a manner that does not require overland flow for most frequent storm events. This overland flow has caused erosion and has degraded the stone parking surface over time. FSA recommends that a slotted drain system be installed just inside of the curb on the downstream side of the intersection of Meadow Boulevard and Terrace Avenue. This drain system will convey flow from the pavement and into a pipe that will discharge to the new conveyance channel. This would be a good opportunity to pave the existing parking lot in such a way that large overflows from major storm events are conveyed along a hard surface to the drainage channel instead of being confined to a small, eroding gully where the problem is only made worse over time. The slotted drain and paved overflow conveyance are a more permanent and stable solution to the runoff problem from the Valley Meadows neighborhood.

Once the drainage channel and stormwater conveyance systems have been constructed, the next step is to fill the existing stormwater management facility and re-grade the park for the multi-use recreational fields. This project allows for an opportunity to piggy-back the “West End Trail Connection” project already taking place and create an exceptional facility for lacrosse, softball, soccer and any other activity that will benefit from the redeveloped park.

These activities have been broken into various phases and a cost estimate for each phase has been developed. The phases can be “stand-alone” projects that do not necessarily rely on each other to be completed, although economies of scale and minimal mobilization will certainly help to reduce overall costs should the entire project be performed at once. Phase I must occur before any of the following three phases can be implemented but phases II – IV can be implemented in any order. The estimates and plans are exhibits attached to this report. The phasing proposed is:

- Phase I – Bioswale, trail relocation, baseball field relocation and multi-purposed fields I and II
- Phase II – Multi-Purpose Field III
- Phase III – Parking lot and slotted drain

An additional way to mitigate some of the storm flow associated with the Valley Meadows neighborhood is to design and install small infiltration practices, like rain gardens, within the neighborhood that will reduce the runoff that flows to the park by decreasing concentrated flow during storm events. This type of approach takes cooperation between individual property owners and the Borough in order to be effective. Every small “Best Management Practice (BMP)” that takes some of the upstream peak flow offline helps in the effort to safely and effectively convey flow through Valley Meadows Park and improves overall water quality.

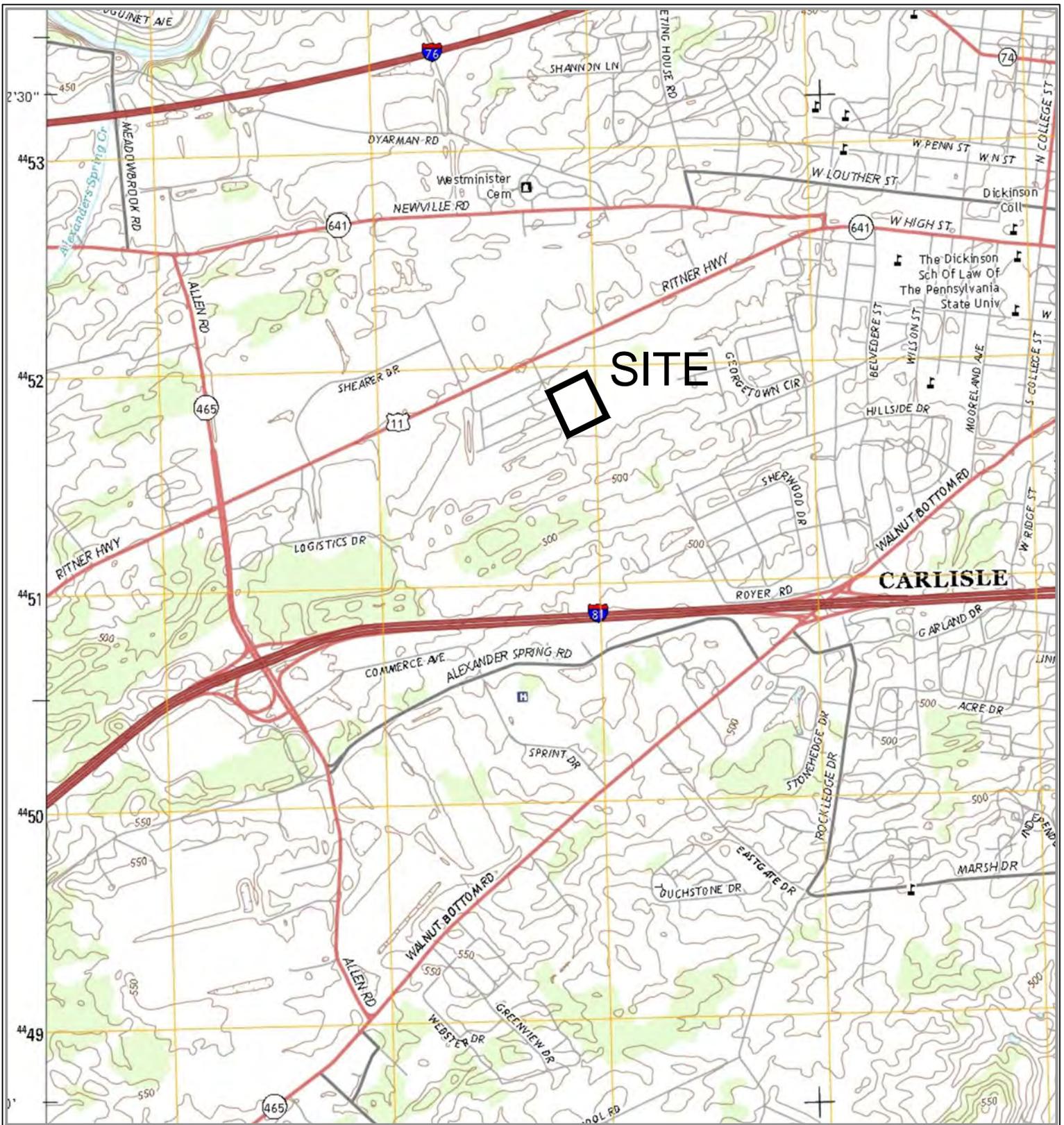


EXHIBIT A: USGS QUAD-CARLISLE	
DRAWING NUMBER 1 OF 1	
DRAWN BY: JTD	DATE: 02-04-2015
CHECKED BY: JTD	DATE: 2015
SCALE: 1" = 2000'	

FREDERICK SEIBERT & ASSOCIATES, INC.

EST. 1984

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128 SOUTH POTOMAC STREET, HAGERSTOWN, MARYLAND 21740
 20 WEST BALTIMORE STREET, GREENCASTLE, PENNSYLVANIA 17225
 101 NORTH HANOVER STREET, CARLISLE, PENNSYLVANIA 17013

(301) 791-3650 (301) 416-7478 www.fsa-md.com (717) 597-1007 (717) 701-8111

JOB NUMBER: 50038

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Exhibit B

Historic Flooding Photos



Flood Photo from 1994 showing that the center of the park is completely inundated during large storm events



Parking lot during the same 1994 event depicting that runoff from the adjacent neighborhood enters this parking lot and flows around the baseball field in current configuration. This is not the natural drainage path for the watershed valley.



This is the same parking lot which also shows the upstream neighborhood in a flooded condition. The area south of the neighborhood has since been remediated to prevent flooding in basements but the floodwaters continue to flow toward the park.



This is a view of the downstream property during the 1994 flood event. The property has very little gradient and floods very similarly to the park.

VALLEY MEADOWS PARK

existing conditions - exhibit c



CARLISLE
PENNSYLVANIA EST. 1751



N/F
DICKINSON COLLEGE
INST. # 200932197
PIN# 50-08-0579-003

DOWNSTREAM DRAINAGE
LOCATION

N/F
GLENN & LINDA REXROTH
D.B. 00192-00187
PIN# 50-21-0326-011

SPORTS FIELDS

SPORTS FIELDS

N/F
CARLISLE BOROUGH
D.B. 0030A-00766
PIN# 50-21-0326-060A

BASEBALL FIELD

INFILTRATION POND

N/F
CARLISLE BOROUGH
INST. # 200812607
PIN# 50-08-0579-018

PLAYGROUND

SWALE (SITE BMP)

N/F
EXEL INC
D.B. 248-1784
PIN# 40-08-0579-020

PARKING

STORMWATER
MANAGEMENT
POND

meadow blvd

VALLEY MEADOWS
DEVELOPMENT

shirley ave

hemlock ave

terrace ave

30 0 30 60 120 240

SCALE: 1" = 60'



VALLEY MEADOWS PARK

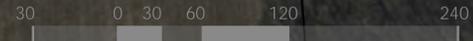
proposed improvements - exhibit d



CARLISLE
PENNSYLVANIA EST. 1751



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SCALE: 1" = 60'



PHASING

STREAM + SPORTS FIELDS



MULTI-PURPOSE FIELD 3



PARKING + SLOTTED DRAIN



Exhibit E

Phased and Final Cost Estimates

**ENGINEERS OPINION OF PROBABLE COSTS
VALLEY MEADOWS PARK REHABILITATION**

PHASE I - BIOSWALE, TRAILS, SOFTBALL FIELD AND M.P. FIELDS 1 AND 2

Project: 50038
 Owner: Borough of Carlisle
 Date: 2/4/2015

Engineer: Frederick, Seibert & Associates, Inc.

Description: This is the phase I cost associated with the drainage and layout improvements of the Valley Meadows Park. This is an Engineers Opinion of Probable Costs and should be used for budgeting purposes only.

Disturbed Area = 6.90 Ac.

PROPOSED IMPROVEMENTS					
ITEM #	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL COST
100	MISCELLANEOUS				
101	Sediment and Erosion Control (Lump Sum)	EST.	\$10,000.00	1	\$10,000.00
102	Design costs and permitting	EST.	\$30,000.00	1	\$30,000.00
103	Overhead and Mobilization	EST.	\$10,000.00	1	\$10,000.00
					MISC. \$50,000.00 Sub-Total
200	SITE PREPARATION				
201	Clearing & Grubbing - Medium Cover	ACRE	\$4,500.00	0.75	\$3,375.00
					SITE PREPARATION \$3,375.00 Sub-Total
300	EARTHWORK				
301	Strip Topsoil (6")	CY	\$3.50	5615	\$19,652.50
302	Unclassified Excavation (common)	CY	\$15.00	1945	\$29,175.00
303	Excess Material - Imported/Exported	CY	\$20.00	50	\$1,000.00
304	Replace Topsoil	CY	\$5.00	2670	\$13,350.00
305	Seed and Mulch	SY	\$0.30	33900	\$10,170.00
					EARTHWORK \$73,347.50 Sub-Total
400	STORMWATER MANAGEMENT & STORM DRAINAGE				
401	Ammended Soils	CY	\$55.00	588	\$32,340.00
402	Riparian Plantings/Seed Mix	SF	\$2.00	15880	\$31,760.00
409	Pedestrian Bridge/Culverts	LS	\$5,000.00	3	\$15,000.00
					STORMWATER MANAGEMENT & STORM DRAINAGE \$79,100.00 Sub-Total
500	ACCESS PATHS (REPAIRS DUE TO CONSTRUCTION)				
501	Stone Base (8" Thick)	SY	\$9.00	600	\$5,400.00
502	2" HMA Wearing (9.5 mm Superpave)	TON	\$100.00	70	\$7,000.00
503	3" HMA Binder (19.0 mm Superpave)	TON	\$90.00	105	\$9,450.00
					SITE PAVING & LIGHTING \$21,850.00 Sub-Total
					\$227,672.50 Subtotal
				+10% Contingency	\$22,767.25
				ANTICIPATED COSTS FOR PHASE I	\$250,439.75 TOTAL

ENGINEERS OPINION OF PROBABLE COSTS

VALLEY MEADOWS PARK REHABILITATION

PHASE II - MULTI-PURPOSE FIELD III

Project: 50038
 Owner: Borough of Carlisle
 Date: 2/4/2015

Engineer: Frederick, Seibert & Associates, Inc.

Description: This is the Phase II cost associated with the drainage and layout improvements of the Valley Meadows Park. This is an Engineers Opinion of Probable Costs and should be used for budgeting purposes only.

Disturbed Area = 2.10 Ac.

PROPOSED IMPROVEMENTS					
ITEM #	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL COST
100	MISCELLANEOUS				
101	Sediment and Erosion Control (Lump Sum)	EST.	\$5,000.00	1	\$5,000.00
102	Design costs and permitting	EST.	\$0.00	1	\$0.00 *
103	Overhead and Mobilization	EST.	\$5,000.00	1	\$5,000.00
					MISC. \$10,000.00 Sub-Total
200	SITE PREPARATION				
201	Clearing & Grubbing - Medium Cover	ACRE	\$4,500.00	0.5	\$2,250.00
					SITE PREPARATION \$2,250.00 Sub-Total
300	EARTHWORK				
301	Strip Topsoil (6")	CY	\$3.50	1670	\$5,845.00
302	Unclassified Excavation (common)	CY	\$15.00	1865	\$27,975.00
303	Excess Material - Imported/Exported	CY	\$20.00	0	\$0.00
304	Replace Topsoil	CY	\$5.00	1670	\$8,350.00
305	Plant Grass	SY	\$0.30	10000	\$3,000.00
					EARTHWORK \$45,170.00 Sub-Total
					\$57,420.00 Subtotal
					+10% Contingency \$5,742.00
					ANTICIPATED COSTS FOR PHASE II \$63,162.00 TOTAL

**ENGINEERS OPINION OF PROBABLE COSTS
VALLEY MEADOWS PARK REHABILITATION
PHASE III COSTS - PARKING AND STREET DRAINAGE**

Project: 50038
Owner: Borough of Carlisle
Date: 2/4/2015

Engineer: Frederick, Seibert & Associates, Inc.

Description: This is the phase III cost associated with the drainage and layout improvements of the Valley Meadows Park. This is an Engineers Opinion of Probable Costs and should be used for budgeting purposes only.

Disturbed Area = 0.50 Ac.

PROPOSED IMPROVEMENTS					
ITEM #	DESCRIPTION	UNIT	UNIT COST	QUANTITY	TOTAL COST
100	MISCELLANEOUS				
101	Sediment and Erosion Control (Lump Sum)	EST.	\$4,000.00	1	\$4,000.00
102	Design costs and permitting	EST.	\$0.00	1	\$0.00
103	Overhead and Mobilization	EST.	\$5,000.00	1	\$5,000.00
					MISC. \$9,000.00 Sub-Total
200	SITE PREPARATION				
201	Clearing & Grubbing - Medium Cover	ACRE	\$4,500.00	0.1	\$450.00
					SITE PREPARATION \$450.00 Sub-Total
300	EARTHWORK				
301	Strip Topsoil (6")	CY	\$3.50	50	\$175.00
302	Unclassified Excavation (common)	CY	\$15.00	50	\$750.00
303	Excess Material - Imported/Exported	CY	\$20.00	100	\$2,000.00
305	Replace Topsoil	CY	\$5.00	50	\$250.00
					EARTHWORK \$3,175.00 Sub-Total
400	STORMWATER MANAGEMENT & STORM DRAINAGE				
402	18" Storm Drain	LF	\$30.00	188	\$5,640.00
403	12" Slot Drain	LF	\$50.00	200	\$10,000.00
406	Inlet	EA	\$2,500.00	1	\$2,500.00
410	End Wall	EA	\$2,000.00	1	\$2,000.00
					STORMWATER MANAGEMENT & STORM DRAINAGE \$20,140.00 Sub-Total
500	PARKING LOTS AND ACCESS PATHS				
501	Stone Base (8" Thick)	SY	\$9.00	1801	\$16,209.00
502	2" HMA Wearing (9.5 mm Superpave)	TON	\$100.00	200	\$20,000.00
503	3" HMA Binder (19.0 mm Superpave)	TON	\$90.00	300	\$27,000.00
					SITE PAVING & LIGHTING \$63,209.00 Sub-Total
					\$95,974.00 Subtotal
					+10% Contingency \$9,597.40
					ANTICIPATED COSTS FOR PHASE III \$105,571.40 TOTAL

ENGINEERS OPINION OF PROBABLE COSTS
VALLEY MEADOWS PARK REHABILITATION

TOTALS

Project: 50038
Owner: Borough of Carlisle
Date: 2/4/2015

Engineer: Frederick, Seibert & Associates, Inc.

Description: This is the total cost associated with the drainage and layout improvements of the Valley Meadows Park. This is an Engineers Opinion of Probable Costs and should be used for budgeting purposes only.

PROPOSED IMPROVEMENTS		
PHASE	DESCRIPTION	TOTAL COST
1	Relocated stream valley, baseball field and 2 m.p. fields	\$250,439.75
2	Proposed multi-purpose field III	\$63,162.00
3	Improved parking lot and street drainage	\$105,571.40
TOTAL OF ALL PHASES		\$419,173.15

