



## **CITY OF WASHINGTON**

### **Public Works Committee Agenda Communication**

**Meeting Date:** 02-03-2020

**Prepared By:** Kevin Schone – Public Works Director

**Agenda Item:** Cambridge Estates Drainage Options

**Explanation:** In October of 2019, Chuck Boysen of the Cambridge Estates contacted me about making improvements in a depressed area behind the homes on the south side of the complex by re-grading to allow the area to drain. Mr. Boysen is the Association President and I met with him to help determine why the area they wanted to regrade was not draining and actually discovered the area was a detention basin. I let Mr. Boysen know that the basin should not be disturbed because of this reason. Mr. Boysen asked where the detention basin was supposed to drain to and as I walked the property it became clear there wasn't a logical place for the basin to drain. I told Mr. Boysen that I would check into this and get back to him.

After investigating the construction drawings, it became clear that the section in front of the homes on Newcastle Rd. was formerly a ditch section when the detention basin was constructed. This allowed for the basin to drain to the front of the homes and to the ditch, however the drainage for the basin was not taken into consideration when the ditch section was improved to curb and gutter. Because this was missed, there was no longer a means for the basin to drain.

In December of 2019, the interim Engineer and myself met with Mauer Stutz to walk the property and discuss a solution for this drainage issue. In January of 2020, Mauer Stutz provided five options for restoring drainage for the rear yard basin, these options are attached. Of the five options presented, only one option is feasible. There is some field work needed to confirm this option will in fact work and will be completed dependent on direction.

**Fiscal Impact:** Engineers estimate is \$35,583

#### **Recommendation/**

**Committee Discussion Summary:** This is not a planned expenditure and should be deferred until next fiscal year when weather allows. This is also on private property and may need some agreement to hold the City harmless once construction is completed. An easement will also be needed to allow for the proposed drainage. Recommendation would be to budget for the 20/21 fiscal year and to complete this work as this was something that was missed during improvement of Newcastle Road from a ditch section to curb and gutter.

**Action Requested:** Direction on whether to proceed with budgeting for this project in fiscal year 20/21.

# Gravity Flow

**Project Name:** Newcastle-Cambridge flooding

**Location:** East along Newcastle from 4 inlets

**Project Description:** checking for pipe capacity

**Practice:** 12" pipe gravity capacity

**Designed by:** SRH

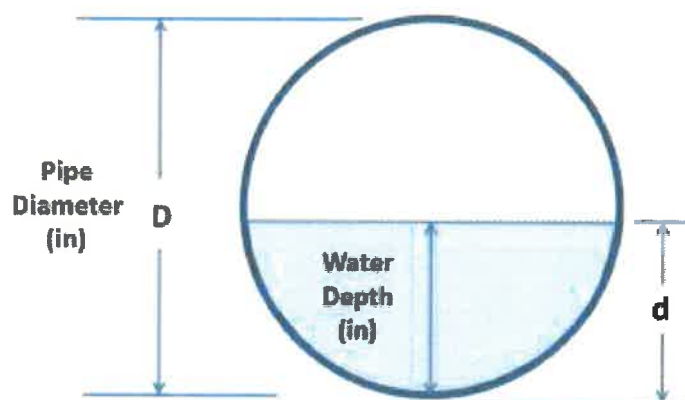
**Date:** 1/24/20

**Checked by:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Approved by:** \_\_\_\_\_

**Date:** \_\_\_\_\_



$$Q = \frac{1.486}{n} A r^{2/3} s^{1/2}$$

## Inputs

Pipe Diameter : 12.00 in  
Water Depth : 11.40 in  
Pipe Slope : 0.0141 ft/ft  
Manning's n : 0.013

## Outputs

Hydraulic Radius : 0.29 ft  
Flow Area : 0.77 sq ft  
Capacity : 4.55 cfs  
Velocity : 5.90 ft/sec  
Critical Depth : 10.7 in

# Gravity Flow

**Project Name:** Newcastle-Cambridge flooding  
**Project Description:** checking for pipe capacity

**Location:** north from Royal Ct  
**Practice:** 12" pipe gravity capacity

**Designed by:** SRH

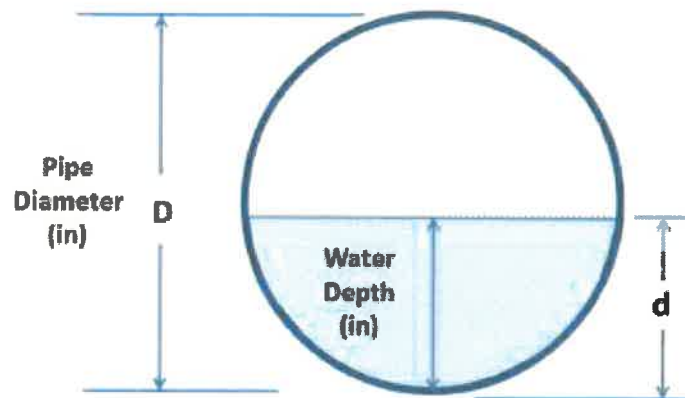
**Date:** 1/24/20

**Checked by:** \_\_\_\_\_

**Date:** \_\_\_\_\_

**Approved by:** \_\_\_\_\_

**Date:** \_\_\_\_\_



$$Q = \frac{1.486}{n} A r^{2/3} s^{1/2}$$

## Inputs

Pipe Diameter : 12.00 in  
Water Depth : 11.40 in  
Pipe Slope : 0.0073 ft/ft  
Manning's n : 0.013

## Outputs

Hydraulic Radius : 0.29 ft  
Flow Area : 0.77 sq ft  
Capacity : 3.27 cfs  
Velocity : 4.24 ft/sec  
Critical Depth : 9.3 in



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**PROJECT ACTIVITY DESCRIPTION**  
**Cambridge Estates - Newcastle Area Drainage Issue**  
**Option 1 (Ballpark quantities, costs 1/24/20)**

DESCRIPTION	UNITS	QUANTITY	UNIT COST	TOTAL COST
Earthwork	CU YD	210	\$25.00	\$5,250.00
Connect to Existing Inlet	EA	1	\$600.00	\$600.00
Storm Sewer, Class B, Type 1, 8"	LF	265	\$35.00	\$9,275.00
Inlet, Type A	EA	5	\$1,200.00	\$6,000.00
Perm. Seeding, Fert., & Mulch, or Sod	SY	725	\$2.10	\$1,522.50
Inlet and Pipe Protection	EA	5	\$250.00	\$1,250.00
Sidewalk, Remove & Replace	SF	210	\$6.00	\$1,260.00
Driveway, Remove & Replace	SY	23	\$65.00	\$1,495.00
Mobilization	LS	1	\$2,500.00	\$2,500.00
Traffic Control Complete	LS	1	\$500.00	\$500.00
SUBTOTAL CONSTRUCTION COST OPINION				\$29,653
CONTINGENCIES (20%)				\$5,931
<b>TOTAL CONSTRUCTION PROJECT COST OPINION</b>				<b>\$35,583</b>

S:\237\2019\23719019.01 (Washington City Eng Assistance)\Drainage Issues\Newcastle Drainage\Design Calcs





