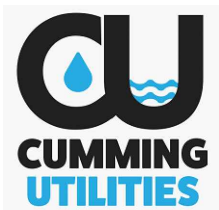


MAXIMUM SLOPE FOR GRAVITY SEWER LINES (FLOW AT HALF-PIPE CAPACITY WITH A MAXIMUM VELOCITY OF 15ft/s)		
PIPE MATERIAL	PIPE SIZE DIAMETER (in)	MAXIMUM PIPE SLOPE (%)
Ductile Iron (n=0.012)	4	40.1
	6	23.4
	8	15.9
	10	11.8
	12	9.3
	14	7.5
	16	6.3
Polyvinyl Chloride (PVC) (n=0.010)	4	27.8
	6	16.2
	8	11
	10	8.2
	12	6.4
	14	5.2
	16	4.4
Concrete (n=0.012)	12	9.3
	14	7.5
	16	6.3
	18	5.4
	20	4.7
	24	3.7
	36	2.1

CALCULATION FORMULAS
<u>Cross Section Area of Half Circle Flow</u> $A = 0.5 \pi r^2$
<u>Wetted Perimeter of Half Circle Flow</u> $P = (0.5)2\pi r$
<u>Hydraulic Radius</u> $R = A/P$
<u>Pipe Slope (V=15 ft/s)</u> $S = \left[ \frac{Vn}{1.49R^{0.66}} \right]^2$



# CITY OF CUMMING

DEPARTMENT OF UTILITIES

## MAXIMUM SLOPE FOR GRAVITY SEWER LINES

DETAIL NUMBER:

# S-31

LATEST REVISION

07/14/2017

SCALE: NOT TO SCALE