

**Lorenzini**  
**Detention Pump to Gravity Discharge System**

JOB # : 21071  
 DATE : 11/18/2022  
 CALC BY: JSE  
 CK BY : MAJ

(Pump Discharging from Wet Well to DMH 3)

**TRANSMISSION MAIN FRICTION WORKSHEET**  
**HAZEN WILLIAMS FORMULA**

**INPUT----->**

C=	150	ROUGHNESS COEFFICIENT
PVC		
NOMINAL DIAMETER (N.D.)	2.5	
I.D.=	2.5 INCHES	0.21 FEET 0.034 SQ FT
L=	11 FEET	
ELEV. DIFF =	12.39 FEET	(Pump intake to DMH 3) (295.36-282.97)= 12.39'

  

FLOWRATE (GPM)	VELOCITY (CFS)	VELOCITY (FPS)	LENGTH OF PIPE	FRICTION LOSS FEET	FRICTION LOSS PSI
12	0.027	0.78	11	0.0	0.0
20	0.045	1.31	11	0.0	0.0
25	0.056	1.63	11	0.0	0.0
30	0.067	1.96	11	0.1	0.0

**PUMP STATION FRICTION WORKSHEET**

PUMP SUCTION HEAD	<b>INPUT-----&gt;</b>	0	Feet	0	PSI
FRICTION LOSS THROUGH FITTINGS					
EQUIVALENT LENGTH OF NEW STRAIGHT PIPE (STEEL & SCREWED)					
PUMP STATION ROUGHNESS COEFFICIENT	C=	150			<b>-----INPUT</b>

	SIZES @ 1/2 Q				SIZES @ 1/2 Q			
NOMINAL DIAMETER (IN)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
NOMINAL DIAMETER (FT)	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
STRAIGHT PIPE (FT)	0	11	0	11	0	11	0	11
<b>INPUT-----&gt;</b>	# FITTINGS ± FITTINGS				TOTAL EQUIV. LENGTH (FT)			
REGULAR 90 ELL	0	1	0	1	0	9	0	9
LONG RADIUS 90 ELL	0	0	0	0	0	0	0	0
REGULAR 45 ELL	0	2	0	2	0	6	0	6
TEE-LINE FLOW	0	0	0	0	0	0	0	0
TEE-BRANCH FLOW	0	1	0	1	0	13	0	13
180 RETURN BEND	0	0	0	0	0	0	0	0
GLOBE VALVE	0	1	0	1	0	62	0	62
GATE VALVE or d/D=¾	0	0	0	0	0	0	0	0
ANGLE VALVE	0	0	0	0	0	0	0	0
SWING CHECK VALVE	0	1	0	1	0	22	0	22
COUPLING/UNION	0	1	0	1	0.0	0.5	0.0	0.5
BELL MOUTH INLET	0	0	0	0	0.0	0.0	0.0	0.0
SQUARE INLET or d/D=½	0	0	0	0	0	0	0	0
RE-ENTRANT PIPE	0	1	0	1	0	10	0	10
TOTAL EQUIVALENT STRAIGHT PIPE LENGTH (FT.)	0				134	0	134	
UNIT FRICTION LOSS (FT.) @ 20 GPM	0.00				0.59	0.00	0.16	

**SYSTEM CURVE INFORMATION**

FLOW RATE	GPM	12	20	25	30
FRICTION LOSS					
PUMP STATION EQUIV. PIPE LOSS	FEET	0.2	0.5	0.8	1.1
OTHER LOSSES <b>INPUT-----&gt;</b>	FEET	0.0	0.0	0.0	0.0
FORCE MAIN	FEET	0.0	0.0	0.0	0.1
DISCHARGE ELEVATION DIFFERENCE	FEET	12.4	12.39	12.39	12.39
PUMP SUCTION HEAD	FEET	0	0	0	0
TOTAL DYNAMIC HEAD	FEET	12.6	12.9	13.2	13.5
	PSI	5.5	5.6	5.7	5.9