Hydraulic Calculations
for

Project: ESCOLA CLORINDA MORANO CARVALHO
Drawing no.:
Date: 13/08/2024

Design

Remote area number:
Remote area location:
Occupancy classification:
Density:
Area of application:
Coverage per sprinkler:
Type of sprinklers calculated:
No. of sprinklers calculated: 2
Hose streams: none outside + none inside
Total water required (including hose streams): 301,14 lpm at 3,512 bar [0,071 bar safety margin (2%)]
Maximum water flow velocity: 1,625 M/s
Type of system:

Water Supply Information

Date:
Location:
Source:

Contractor: SCI FURLANETTI
Under contract with: PREFEITURA DE SALES
Name of designer: ENG. RAFAEL ZANATA PINTO
Authority having jurisdiction: CORPO DE BOMBEIROS

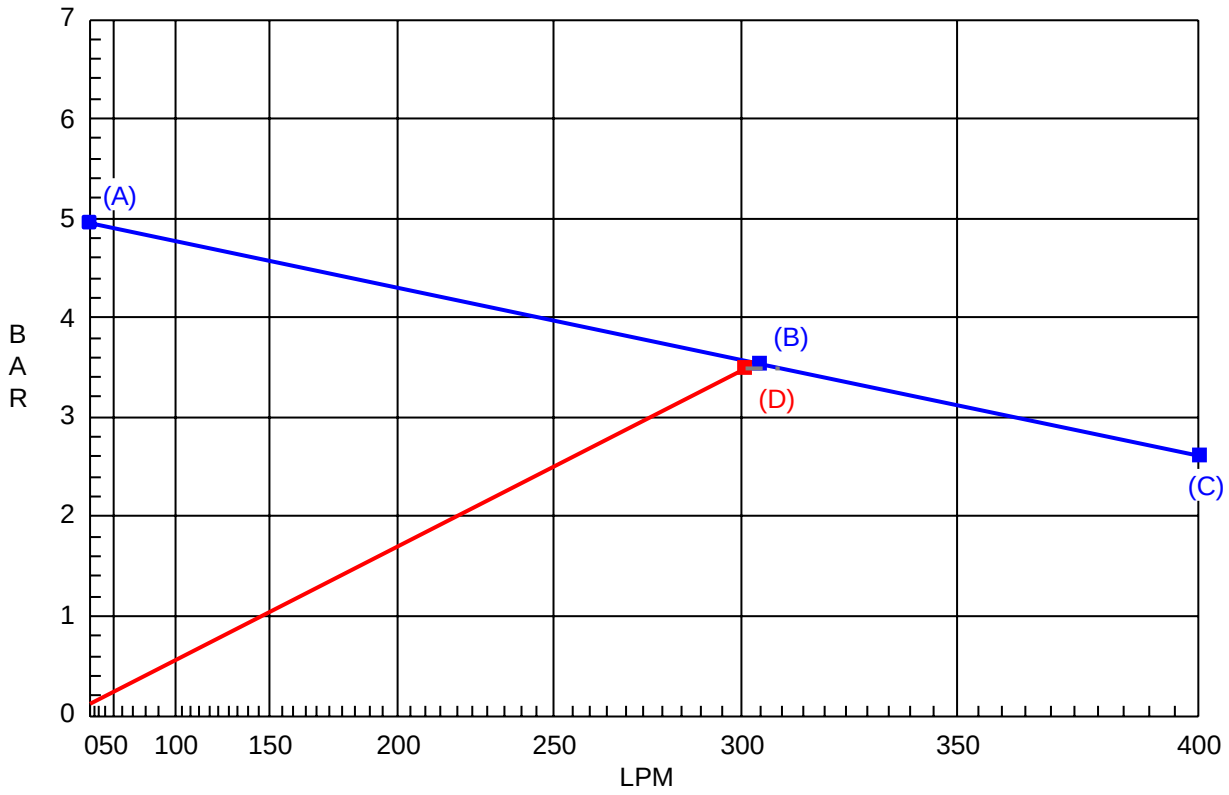
Notes

SISTEMA DE HIDRANTES
TIPO 2

RAFAEL ZANATA PINTO:37880761861

Assinado de forma digital por RAFAEL ZANATA PINTO:37880761861
Dados: 2024.08.19 13:57:50 -03'00'

Hydraulic Demand Graph



Water Source:
A) 4,97 bar Static
B) 305 lpm at 3,55 bar
C) 400 lpm at 2,62 bar

Demand at Source:
D) 301,1 lpm at 3,51 bar

Supply Analysis

Node at	Static Pressure [bar]	Residual Pressure [bar]	Flow [lpm]	Available Pressure [bar]	Total Demand [lpm]	Required Pressure [bar]
RI	4,97	3,55	305,0	3,58	301,14	3,51

Node Analysis

Node Tag	Elev [M]	Type	Pressure [bar]	Req Disch [lpm]	Discharge [lpm]
RI	0,000	source	3,512		-301,142
MB	0,000	ref	3,504		0,000
A	-1,000	ref	3,520		0,000
H1	1,500	K=86,60	3,000	150,000	150,000
H2	1,500	K=86,60	3,046	150,000	151,142

Pipe Information

negative pipe flow (Q) indicates flow is from node 2 towards node 1

Pipe	Node 1 / Node 2	Elev [M]	K-factor	Discharge & Flow [lpm]	Nom i.d. [in]	Fittings num & length [M]	L [M] / F [M] / T [M]	material / C factor / bar/M	Pressure Summary [bar]
	H1	1,500	86,6	q= 150,000	2,5	1LV=18,600	130,950	S40	Pt= 3,000 Pe= -0,245
H1-A				Q=-150,000	2,469	11E=19,800	39,620	C=120	Pf= 0,275 Pv= 0,003
	A	-1,000		q= 0,000		1TN=1,220	170,570	0,002	Pt= 3,520 V= 0,81m/s
	H2	1,500	86,6	q= 151,142	2,5	1LV=18,600	97,990	S40	Pt= 3,046 Pe= -0,245
H2-A				Q=-151,142	2,469	9E=16,200	42,200	C=120	Pf= 0,229 Pv= 0,003
	A	-1,000		q= 0,000		2T=7,400	140,190	0,002	Pt= 3,520 V= 0,82m/s
	A	-1,000		q= 0,000	2,5	3E=5,400	2,680	S40	Pt= 3,520 Pe= 0,098
A-MB				Q=-301,142	2,469	1TN=1,220	11,220	C=120	Pf= 0,081 Pv= 0,013
	MB	0,000		q= 0,000		1C=4,300	13,900	0,006	Pt= 3,504 V= 1,63m/s
						1G=0,300			
	MB	0,000		q= 0,000	2,5	1G=0,300	1,000	S40	Pt= 3,504 Pe= 0,000
MB-RI				Q=-301,142	2,469		0,300	C=120	Pf= 0,008 Pv= 0,013
	RI	0,000		q=-301,142			1,300	0,006	Pt= 3,512 V= 1,63m/s

Material Codes

Pipe Material

S40 - Schedule 40 Steel

Fittings

C - Check Valve (Swing)
E - Standard 90 degree elbow
G - Gate Valve
T - Tee - Flow turn 90 degrees
LV - Globe Valve
TN - Tee - Straight thru path