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Project

1.- HYDRAULIC ANALYSIS

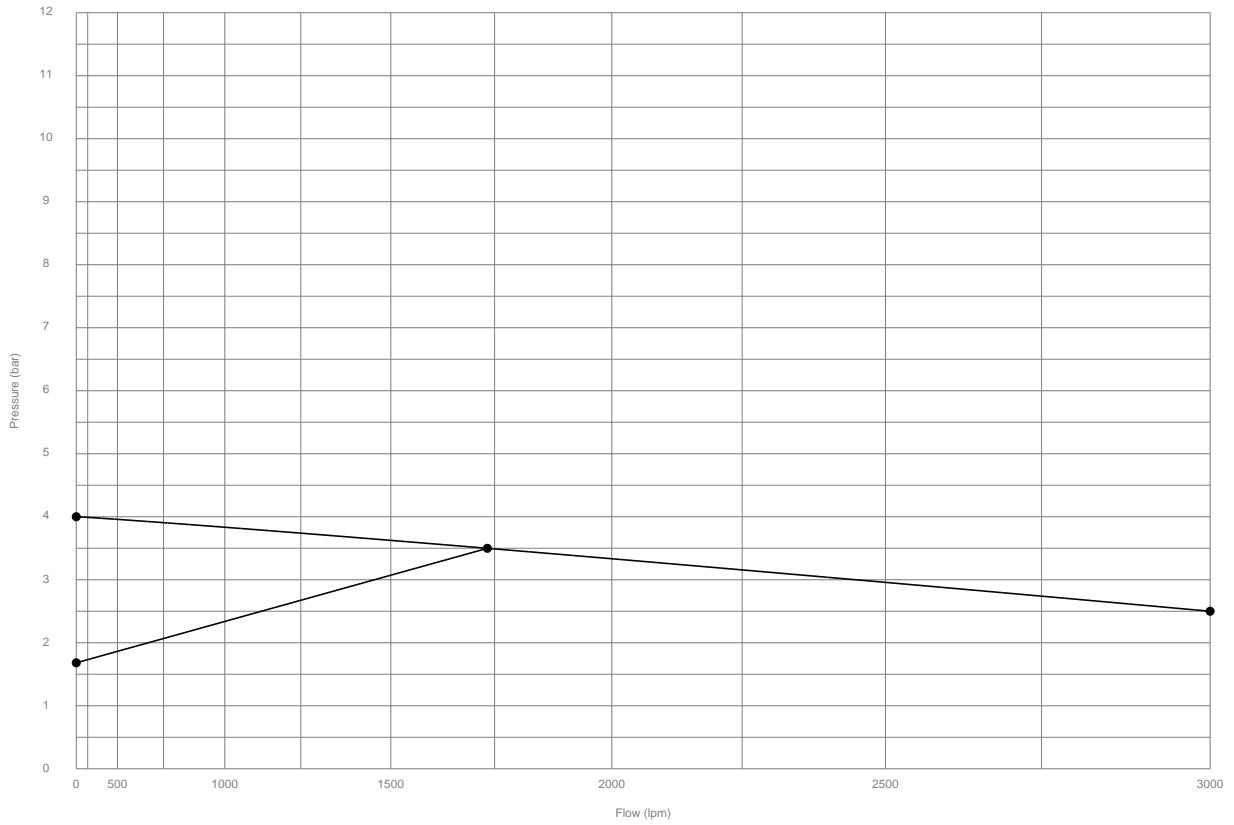
Hydraulic analysis	
Project name:	
Location:	
Drawing n°:	
Date: 05/04/2017	
Design	
Remote area number:	
Remote area location: Floor 4 and Floor 3	
Occupancy classification: Light Hazard	
Density: 4.1 mm/min	
Area of operation: 79.75 m ²	
Coverage per sprinkler: 3.80 m ²	
Type of sprinkler calculated: Standard sprinkler	
No. of sprinklers calculated: 21	
In-rack demand: --	
Hose streams: 0.0 lpm	
Total water required (including hose streams): 3.4990 bar @ 1733.6 lpm	
Type of system: Wet system	
Volume of dry or preaction system: --	
Water supply information	
Date: 05/04/2017	
Location: Ground floor	
Source: Supply connection	
Name of contractor:	
Address:	
Phone number:	
Name of designer:	
Authority having jurisdiction:	

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FLOW TEST SUMMARY SHEET

$N^{1.85}$



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2.- NODES

Nodes				
Node	Elevation (m)	Type	Pressure (bar)	Flow (lpm)
124	0.00	Supply connection	3.4990	1733.6
125	2.70	Transition node	3.0934	--
153	2.70	Riser	2.9370	--
107	6.40	Riser	2.3813	--
66	10.10	Riser	1.8255	--
24	13.80	Sprinkler	1.1686	86.5
27	13.80	Sprinkler	1.1670	86.4
25	13.80	Sprinkler	1.1669	86.4
26	13.80	Sprinkler	1.1654	86.4
23	13.80	Sprinkler	1.0890	83.5
13	13.80	Sprinkler	1.0811	83.2
14	13.80	Sprinkler	1.0783	83.1
17	13.80	Sprinkler	1.0700	82.7
22	13.80	Sprinkler	1.0696	82.7
18	13.80	Sprinkler	1.0672	82.6
16	13.80	Sprinkler	1.0614	82.4
15	13.80	Sprinkler	1.0586	82.3
21	13.80	Sprinkler	1.0553	82.2
12	13.80	Sprinkler	1.0519	82.0
11	13.80	Sprinkler	1.0491	81.9
19	13.80	Sprinkler	1.0421	81.7
20	13.80	Sprinkler	1.0393	81.5
9	13.80	Sprinkler	1.0334	81.3
10	13.80	Sprinkler	1.0307	81.2
28	13.80	Riser	1.2698	--
4	17.15	Riser	0.9393	--
2	17.15	Sprinkler	0.9255	77.0
1	17.15	Sprinkler	0.9172	76.6

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3.- PIPES

Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
124 125	0.00 2.70	Ø3	2.70	1733.6	6.06	3.4990 3.0934	120
125 151	2.70 2.70	Ø3	0.50	1733.6	6.06	3.0934 3.0674	120
151 152	2.70 2.70	Ø3	1.97	1733.6	6.06	3.0674 2.9647	120
152 153	2.70 2.70	Ø3	0.53	1733.6	6.06	2.9647 2.9370	120
152 163	2.70 2.70	Ø3	2.29	0.0	0.00	2.9647 2.9647	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
163 164	2.70 2.70	Ø3	1.04	0.0	0.00	2.9647 2.9647	120
164 165	2.70 2.70	Ø3	2.03	0.0	0.00	2.9647 2.9647	120
157 158	2.70 2.70	Ø3	1.36	0.0	0.00	2.9647 2.9647	120
165 157	2.70 2.70	Ø3	0.47	0.0	0.00	2.9647 2.9647	120
158 161	2.70 2.70	Ø1½	3.21	0.0	0.00	2.9647 2.9647	120
159 156	2.70 2.70	Ø3	2.16	0.0	0.00	2.9647 2.9647	120
158 159	2.70 2.70	Ø3	1.03	0.0	0.00	2.9647 2.9647	120
162 163	2.70 2.70	Ø3	1.01	0.0	0.00	2.9647 2.9647	120
162 149	2.70 2.70	Ø1½	0.21	0.0	0.00	2.9647 2.9647	120
136 161	2.70 2.70	Ø1½	1.36	0.0	0.00	2.9647 2.9647	120
161 133	2.70 2.70	Ø1½	0.82	0.0	0.00	2.9647 2.9647	120
156 139	2.70 2.70	Ø1½	1.51	0.0	0.00	2.9647 2.9647	120
165 144	2.70 2.70	Ø1½	0.95	0.0	0.00	2.9647 2.9647	120
149 146	2.70 2.70	Ø1½	2.73	0.0	0.00	2.9647 2.9647	120
133 132	2.70 2.70	Ø1½	2.51	0.0	0.00	2.9647 2.9647	120
165 143	2.70 2.70	Ø1½	2.36	0.0	0.00	2.9647 2.9647	120
137 129	2.70 2.70	Ø1½	2.30	0.0	0.00	2.9647 2.9647	120
136 137	2.70 2.70	Ø1½	2.30	0.0	0.00	2.9647 2.9647	120
156 126	2.70 2.70	Ø1½	0.94	0.0	0.00	2.9647 2.9647	120
156 155	2.70 2.70	Ø3	2.28	0.0	0.00	2.9647 2.9647	120
154 162	2.70 2.70	Ø3	2.03	0.0	0.00	2.9647 2.9647	120
159 150	2.70 2.70	Ø1½	0.94	0.0	0.00	2.9647 2.9647	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
160 134	2.70 2.70	Ø1½	0.82	0.0	0.00	2.9647 2.9647	120
164 142	2.70 2.70	Ø1½	2.36	0.0	0.00	2.9647 2.9647	120
154 148	2.70 2.70	Ø1½	0.21	0.0	0.00	2.9647 2.9647	120
162 141	2.70 2.70	Ø1½	2.36	0.0	0.00	2.9647 2.9647	120
155 128	2.70 2.70	Ø1½	0.70	0.0	0.00	2.9647 2.9647	120
164 145	2.70 2.70	Ø1½	1.47	0.0	0.00	2.9647 2.9647	120
135 138	2.70 2.70	Ø1½	2.30	0.0	0.00	2.9647 2.9647	120
135 160	2.70 2.70	Ø1½	1.36	0.0	0.00	2.9647 2.9647	120
134 131	2.70 2.70	Ø1½	2.51	0.0	0.00	2.9647 2.9647	120
161 160	2.70 2.70	Ø1½	2.28	0.0	0.00	2.9647 2.9647	120
138 130	2.70 2.70	Ø1½	2.30	0.0	0.00	2.9647 2.9647	120
148 147	2.70 2.70	Ø1½	2.73	0.0	0.00	2.9647 2.9647	120
155 127	2.70 2.70	Ø1½	2.22	0.0	0.00	2.9647 2.9647	120
154 140	2.70 2.70	Ø1½	2.36	0.0	0.00	2.9647 2.9647	120
153 107	2.70 6.40	Ø3	3.70	1733.6	6.06	2.9370 2.3813	120
107 108	6.40 6.40	Ø3	2.52	0.0	0.00	2.3813 2.3813	120
110 120	6.40 6.40	Ø3	2.18	0.0	0.00	2.3813 2.3813	120
108 110	6.40 6.40	Ø3	0.48	0.0	0.00	2.3813 2.3813	120
111 112	6.40 6.40	Ø3	2.27	0.0	0.00	2.3813 2.3813	120
120 111	6.40 6.40	Ø3	0.20	0.0	0.00	2.3813 2.3813	120
112 113	6.40 6.40	Ø3	4.04	0.0	0.00	2.3813 2.3813	120
113 115	6.40 6.40	Ø3	0.33	0.0	0.00	2.3813 2.3813	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
112 116	6.40 6.40	Ø3	0.60	0.0	0.00	2.3813 2.3813	120
115 118	6.40 6.40	Ø3	2.12	0.0	0.00	2.3813 2.3813	120
116 122	6.40 6.40	Ø3	3.02	0.0	0.00	2.3813 2.3813	120
118 117	6.40 6.40	Ø3	2.78	0.0	0.00	2.3813 2.3813	120
108 109	6.40 6.40	Ø3	1.53	0.0	0.00	2.3813 2.3813	120
109 119	6.40 6.40	Ø3	1.97	0.0	0.00	2.3813 2.3813	120
120 82	6.40 6.40	Ø1½	0.81	0.0	0.00	2.3813 2.3813	120
122 93	6.40 6.40	Ø1½	1.41	0.0	0.00	2.3813 2.3813	120
115 89	6.40 6.40	Ø1½	1.53	0.0	0.00	2.3813 2.3813	120
116 84	6.40 6.40	Ø1½	1.28	0.0	0.00	2.3813 2.3813	120
117 88	6.40 6.40	Ø1½	1.58	0.0	0.00	2.3813 2.3813	120
115 92	6.40 6.40	Ø1½	1.24	0.0	0.00	2.3813 2.3813	120
98 96	6.40 6.40	Ø1½	2.55	0.0	0.00	2.3813 2.3813	120
106 102	6.40 6.40	Ø1½	2.31	0.0	0.00	2.3813 2.3813	120
116 83	6.40 6.40	Ø1½	1.13	0.0	0.00	2.3813 2.3813	120
122 98	6.40 6.40	Ø1½	1.44	0.0	0.00	2.3813 2.3813	120
117 85	6.40 6.40	Ø1½	1.10	0.0	0.00	2.3813 2.3813	120
119 106	6.40 6.40	Ø1½	0.63	0.0	0.00	2.3813 2.3813	120
113 114	6.40 6.40	Ø3	2.53	0.0	0.00	2.3813 2.3813	120
121 97	6.40 6.40	Ø1½	1.44	0.0	0.00	2.3813 2.3813	120
122 121	6.40 6.40	Ø3	1.99	0.0	0.00	2.3813 2.3813	120
110 99	6.40 6.40	Ø1½	2.07	0.0	0.00	2.3813 2.3813	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
119 101	6.40 6.40	Ø1½	2.07	0.0	0.00	2.3813 2.3813	120
118 87	6.40 6.40	Ø1½	1.58	0.0	0.00	2.3813 2.3813	120
114 90	6.40 6.40	Ø1½	1.53	0.0	0.00	2.3813 2.3813	120
97 95	6.40 6.40	Ø1½	2.55	0.0	0.00	2.3813 2.3813	120
110 104	6.40 6.40	Ø1½	1.26	0.0	0.00	2.3813 2.3813	120
114 91	6.40 6.40	Ø1½	1.24	0.0	0.00	2.3813 2.3813	120
109 100	6.40 6.40	Ø1½	2.07	0.0	0.00	2.3813 2.3813	120
105 103	6.40 6.40	Ø1½	2.31	0.0	0.00	2.3813 2.3813	120
118 86	6.40 6.40	Ø1½	1.10	0.0	0.00	2.3813 2.3813	120
121 94	6.40 6.40	Ø1½	1.41	0.0	0.00	2.3813 2.3813	120
109 105	6.40 6.40	Ø1½	0.63	0.0	0.00	2.3813 2.3813	120
107 66	6.40 10.10	Ø3	3.70	1733.6	6.06	2.3813 1.8255	120
66 67	10.10 10.10	Ø3	2.52	0.0	0.00	1.8255 1.8255	120
79 70	10.10 10.10	Ø3	0.20	0.0	0.00	1.8255 1.8255	120
67 69	10.10 10.10	Ø3	0.48	0.0	0.00	1.8255 1.8255	120
69 79	10.10 10.10	Ø3	2.18	0.0	0.00	1.8255 1.8255	120
70 71	10.10 10.10	Ø3	2.27	0.0	0.00	1.8255 1.8255	120
72 74	10.10 10.10	Ø3	0.33	0.0	0.00	1.8255 1.8255	120
71 72	10.10 10.10	Ø3	4.04	0.0	0.00	1.8255 1.8255	120
74 77	10.10 10.10	Ø3	2.12	0.0	0.00	1.8255 1.8255	120
71 75	10.10 10.10	Ø3	0.60	0.0	0.00	1.8255 1.8255	120
77 76	10.10 10.10	Ø3	2.78	0.0	0.00	1.8255 1.8255	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
75 81	10.10 10.10	Ø3	3.02	0.0	0.00	1.8255 1.8255	120
75 42	10.10 10.10	Ø1½	1.13	0.0	0.00	1.8255 1.8255	120
75 43	10.10 10.10	Ø1½	1.28	0.0	0.00	1.8255 1.8255	120
67 68	10.10 10.10	Ø3	1.53	0.0	0.00	1.8255 1.8255	120
81 80	10.10 10.10	Ø3	1.99	0.0	0.00	1.8255 1.8255	120
68 78	10.10 10.10	Ø3	1.97	0.0	0.00	1.8255 1.8255	120
80 56	10.10 10.10	Ø1½	1.44	0.0	0.00	1.8255 1.8255	120
74 51	10.10 10.10	Ø1½	1.24	0.0	0.00	1.8255 1.8255	120
77 45	10.10 10.10	Ø1½	1.10	0.0	0.00	1.8255 1.8255	120
74 48	10.10 10.10	Ø1½	1.53	0.0	0.00	1.8255 1.8255	120
69 58	10.10 10.10	Ø1½	2.07	0.0	0.00	1.8255 1.8255	120
78 65	10.10 10.10	Ø1½	0.63	0.0	0.00	1.8255 1.8255	120
73 50	10.10 10.10	Ø1½	1.24	0.0	0.00	1.8255 1.8255	120
79 41	10.10 10.10	Ø1½	0.81	0.0	0.00	1.8255 1.8255	120
68 64	10.10 10.10	Ø1½	0.63	0.0	0.00	1.8255 1.8255	120
76 47	10.10 10.10	Ø1½	1.58	0.0	0.00	1.8255 1.8255	120
77 46	10.10 10.10	Ø1½	1.58	0.0	0.00	1.8255 1.8255	120
65 61	10.10 10.10	Ø1½	2.31	0.0	0.00	1.8255 1.8255	120
81 52	10.10 10.10	Ø1½	1.41	0.0	0.00	1.8255 1.8255	120
73 49	10.10 10.10	Ø1½	1.53	0.0	0.00	1.8255 1.8255	120
64 62	10.10 10.10	Ø1½	2.31	0.0	0.00	1.8255 1.8255	120
76 44	10.10 10.10	Ø1½	1.10	0.0	0.00	1.8255 1.8255	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
78 60	10.10 10.10	Ø1½	2.07	0.0	0.00	1.8255 1.8255	120
72 73	10.10 10.10	Ø3	2.53	0.0	0.00	1.8255 1.8255	120
68 59	10.10 10.10	Ø1½	2.07	0.0	0.00	1.8255 1.8255	120
69 63	10.10 10.10	Ø1½	1.26	0.0	0.00	1.8255 1.8255	120
57 55	10.10 10.10	Ø1½	2.55	0.0	0.00	1.8255 1.8255	120
80 53	10.10 10.10	Ø1½	1.41	0.0	0.00	1.8255 1.8255	120
81 57	10.10 10.10	Ø1½	1.44	0.0	0.00	1.8255 1.8255	120
56 54	10.10 10.10	Ø1½	2.55	0.0	0.00	1.8255 1.8255	120
66 28	10.10 13.80	Ø3	3.70	1733.6	6.06	1.8255 1.2698	120
28 29	13.80 13.80	Ø3	2.18	1580.1	5.52	1.2698 1.1741	120
29 38	13.80 13.80	Ø3	2.87	1234.4	4.31	1.1741 1.0943	120
38 35	13.80 13.80	Ø3	0.42	738.1	2.58	1.0943 1.0898	120
35 36	13.80 13.80	Ø3	2.26	654.6	2.29	1.0898 1.0704	120
36 30	13.80 13.80	Ø3	0.94	571.9	2.00	1.0704 1.0641	120
38 39	13.80 13.80	Ø3	1.58	496.3	1.73	1.0943 1.0862	120
30 31	13.80 13.80	Ø3	1.58	489.7	1.71	1.0641 1.0562	120
29 33	13.80 13.80	Ø3	0.34	345.6	1.21	1.1741 1.1732	120
39 40	13.80 13.80	Ø3	2.03	248.0	0.87	1.0862 1.0833	120
31 34	13.80 13.80	Ø3	2.03	244.7	0.86	1.0562 1.0534	120
33 32	13.80 13.80	Ø3	2.22	172.8	0.60	1.1732 1.1716	120
39 17	13.80 13.80	Ø1½	1.05	165.2	2.09	1.0862 1.0700	120
40 18	13.80 13.80	Ø1½	1.05	164.9	2.09	1.0833 1.0672	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
31 19	13.80 13.80	Ø1½	0.94	163.0	2.06	1.0562 1.0421	120
34 20	13.80 13.80	Ø1½	0.94	162.8	2.06	1.0534 1.0393	120
33 24	13.80 13.80	Ø1½	1.00	86.5	1.09	1.1732 1.1686	120
33 27	13.80 13.80	Ø1½	1.33	86.4	1.09	1.1732 1.1670	120
32 25	13.80 13.80	Ø1½	1.00	86.4	1.09	1.1716 1.1669	120
32 26	13.80 13.80	Ø1½	1.33	86.4	1.09	1.1716 1.1654	120
35 23	13.80 13.80	Ø1½	0.20	83.5	1.06	1.0898 1.0890	120
39 13	13.80 13.80	Ø1½	1.17	83.2	1.05	1.0862 1.0811	120
40 14	13.80 13.80	Ø1½	1.17	83.1	1.05	1.0833 1.0783	120
36 22	13.80 13.80	Ø1½	0.20	82.7	1.05	1.0704 1.0696	120
17 16	13.80 13.80	Ø1½	2.02	82.4	1.04	1.0700 1.0614	120
18 15	13.80 13.80	Ø1½	2.02	82.3	1.04	1.0672 1.0586	120
30 37	13.80 13.80	Ø1½	1.88	82.2	1.04	1.0641 1.0562	120
37 21	13.80 13.80	Ø1½	0.20	82.2	1.04	1.0562 1.0553	120
31 12	13.80 13.80	Ø1½	1.02	82.0	1.04	1.0562 1.0519	120
34 11	13.80 13.80	Ø1½	1.02	81.9	1.04	1.0534 1.0491	120
19 9	13.80 13.80	Ø1½	2.09	81.3	1.03	1.0421 1.0334	120
20 10	13.80 13.80	Ø1½	2.09	81.2	1.03	1.0393 1.0307	120
28 4	13.80 17.15	Ø3	3.35	153.6	0.54	1.2698 0.9393	120
5 6	17.15 17.15	Ø3	0.81	153.6	0.54	0.9388 0.9384	120
6 7	17.15 17.15	Ø3	1.15	153.6	0.54	0.9384 0.9377	120
7 8	17.15 17.15	Ø3	0.90	153.6	0.54	0.9377 0.9372	120

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Pipes							
Initial node Final node	Initial elevation (m) Final elevation (m)	Size	Length (m)	Flow (lpm)	Velocity (m/s)	Initial pressure (bar) Final pressure (bar)	HWC
4 5	17.15 17.15	Ø3	0.81	153.6	0.54	0.9393 0.9388	120
8 2	17.15 17.15	Ø1½	0.87	153.6	1.94	0.9372 0.9255	120
2 1	17.15 17.15	Ø1½	2.23	76.6	0.97	0.9255 0.9172	120
5 3	17.15 17.15	Ø1½	2.03	0.0	0.00	0.9388 0.9388	120

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