

Project ref/no = Typical ESFR system
 Client ref/no = All unsized
 Address/notes 1 = Address 1
 Address/notes 2 = Address 2
 Address/notes 3 = Address 3
 Building ref/no = Building
 Hazard classification = ESFR
 System/design ref (MR/MF) = 12 heads operating - unsized
 Installation ref/no = 1
 Drawing(s) ref/no = Drawings
 Drawing(s) dates/issues = Issues
 Reviewer/Insurance/Fire = Insurance co
 Designer/Dept = Alan Ashfield
 Comments 1 = Comments 1
 Comments 2 = -
 Start X Y + building DXF = 0 0 None
 Design area sq.m = 94.0
 Elbows welded above mm = 65
 Specific gravity = 1.00
 Node no for zero datum = 0
 Design authority = NFPA 13/15 Sprinkler Rules using Hazen-Williams formula
 Installer/designer = Your name will appear here
 Your address

Telephone no(s) = Your telephone number
 FAX no(s) = Your FAX no or Email address
 Registration = 17485 from 20 February 2017 [E50F2D2C]
 Reference = Alan on ACE2 to doPDF v6
 Data file = D:\aacalc7\ALANSDEMO4.AHC last amended 09:05 200217

All pages checked by

Sprinklers operating = 12
 Area of operation = 94.08 sq.m
 Max area per head = 7.840 sq.m
 Min head density = 48.202 mm/min at node 189
 Min head pressure = 3.500 bars at node 189
 Max head pressure = 3.904 bars at node 166
 Max head height = 11.216 m
 Most remotest head node = 189
 Pipes = 36
 Pipes sized to 6.0 m/s = 35
 Min pipe size = 40 mm
 Max pressure drop = 0.370 bars in pipe 150 160
 Max pressure drop/metre = 70.66 mbar/m in pipe 162 166
 Max velocity = 5.24 m/s in pipe 162 163
 Hydrants / hoses reels = 945 L/min
 Volume of pipework = 1.287 cu.m

SOURCE DUTY = 5609.7 L/min at 6.408 bars [node 100]

OPERATING SPRINKLER HEADS AND HYDRANTS

Node no	Size mm	"K" factor	Flows Min	in L/min Actual	+	%	Area sq.m	Density Min	mm/min Actual	Pipe mm	MRH #	Height m	Pressures Min	Normal	Vel	bar Total
166	20.0	202.00	377.9	399.1	6		7.840	48.00	50.91	40		10.776	3.50	3.904		3.904
167	20.0	202.00	377.9	392.1	4		7.840	48.00	50.01	40		10.923	3.50	3.768		3.768
168	20.0	202.00	377.9	388.4	3		7.840	48.00	49.54	40		11.070	3.50	3.697		3.697
169	20.0	202.00	377.9	382.9	1		7.840	48.00	48.84	40		11.216	3.50	3.594		3.594
176	20.0	202.00	377.9	398.5	5		7.840	48.00	50.82	40		10.776	3.50	3.891		3.891
177	20.0	202.00	377.9	391.4	4		7.840	48.00	49.93	40		10.923	3.50	3.755		3.755
178	20.0	202.00	377.9	387.7	3		7.840	48.00	49.46	40		11.070	3.50	3.684		3.684
179	20.0	202.00	377.9	382.3	1		7.840	48.00	48.76	40		11.216	3.50	3.581		3.581
186	20.0	202.00	377.9	394.0	4		7.840	48.00	50.25	40		10.776	3.50	3.804		3.804
187	20.0	202.00	377.9	387.0	2		7.840	48.00	49.36	40		10.923	3.50	3.671		3.671
188	20.0	202.00	377.9	383.3	1		7.840	48.00	48.89	40		11.070	3.50	3.601		3.601
189	20.0	202.00	377.9	377.9	0		7.840	48.00	48.20	40		11.216	3.50	3.500		3.500
999				945.0						100		1.300				6.216
Hydrant																

HYDRAULICALLY SIGNIFICANT PIPES

N o d e s Start	S i z e End	F l o w mm ref	Length L/min	Directi on m	F i t t i n g s <-slope	E q u i v +options	Vel len m	Vel m/s	Stati c m	Height end m	P r e s s u r e s Start	F r i c t Frict	V e l Vel	b a r End
100	110	150 MW	5609.7	1.300	Up	GV	0.95	4.93	1.300	1.300	6.408	0.036	0.122	6.245
110	120	150 MW	4664.7	0.300	Up	SV	10.14	4.10	0.300	1.600	6.245	0.117	0.084	6.098
120	130	150 MW	4664.7	8.400	Up			4.10	8.400	10.000	6.098	0.095	0.084	5.181
130	140	150 MW	4664.7	2.000	South	L	2.85	4.10		10.000	5.181	0.055	0.084	5.126
140	150	150 MW	4664.7	16.000	East	L	2.85	4.10		10.000	5.126	0.212	0.084	4.914
150	160	150 MW	4664.7	30.000	South	L	2.85	4.10		10.000	4.914	0.370	0.084	4.544
160	161	80 MW	1562.5	1.001	W >87.0	T	5.42	5.09	1.000	11.000	4.544	0.232	0.130	4.214
161	162	80 MW	1562.5	1.454	E > 3.0	L	1.81	5.09	0.076	11.076	4.214	0.118	0.130	4.089
162	163	65 MW	1163.4	2.804	E > 3.0			5.24	0.147	11.223	4.089	0.129	0.137	3.946
163	164	65 MW	771.3	2.804	E > 3.0			3.47	0.147	11.370	3.946	0.060	0.060	3.871
164	165	40 MW	382.9	2.804	E > 3.0			4.64	0.147	11.516	3.871	0.183	0.108	3.673
162	166	40 MW	399.1	0.300	E <87.0	T	2.73	4.83	-0.300	10.776	4.089	0.214	0.117	3.904
163	167	40 MW	392.1	0.300	E <87.0	T	2.73	4.75	-0.300	10.923	3.946	0.207	0.113	3.768
164	168	40 MW	388.4	0.300	E <87.0	T	2.73	4.70	-0.300	11.070	3.871	0.204	0.111	3.697
165	169	40 MW	382.9	0.300	E <87.0	E	1.37	4.64	-0.300	11.216	3.673	0.109	0.108	3.594
160	170	150 MW	3102.1	2.800	South			2.73		10.000	4.544	0.015	0.037	4.529
170	171	80 MW	1559.9	1.001	W >87.0	T	5.42	5.09	1.000	11.000	4.529	0.231	0.129	4.200
171	172	80 MW	1559.9	1.454	E > 3.0	L	1.81	5.09	0.076	11.076	4.200	0.118	0.129	4.075
172	173	65 MW	1161.4	2.804	E > 3.0			5.23	0.147	11.223	4.075	0.128	0.137	3.932
173	174	65 MW	770.0	2.804	E > 3.0			3.47	0.147	11.370	3.932	0.060	0.060	3.858
174	175	40 MW	382.3	2.804	E > 3.0			4.63	0.147	11.516	3.858	0.183	0.107	3.661
172	176	40 MW	398.5	0.300	E <87.0	T	2.73	4.83	-0.300	10.776	4.075	0.213	0.116	3.891
173	177	40 MW	391.4	0.300	E <87.0	T	2.73	4.74	-0.300	10.923	3.932	0.207	0.112	3.755
174	178	40 MW	387.7	0.300	E <87.0	T	2.73	4.70	-0.300	11.070	3.858	0.203	0.110	3.684
175	179	40 MW	382.3	0.300	E <87.0	E	1.37	4.63	-0.300	11.216	3.661	0.109	0.107	3.581
170	180	80 MW	1542.2	2.800	South			5.03		10.000	4.529	0.099	0.126	4.431
180	181	80 MW	1542.2	1.001	W >87.0	T	5.42	5.03	1.000	11.000	4.431	0.227	0.126	4.106
181	182	80 MW	1542.2	1.454	E > 3.0	L	1.81	5.03	0.076	11.076	4.106	0.115	0.126	3.984
182	183	65 MW	1148.2	2.804	E > 3.0			5.17	0.147	11.223	3.984	0.126	0.134	3.844
183	184	65 MW	761.2	2.804	E > 3.0			3.43	0.147	11.370	3.844	0.059	0.059	3.770
184	185	40 MW	377.9	2.804	E > 3.0			4.58	0.147	11.516	3.770	0.179	0.105	3.577
182	186	40 MW	394.0	0.300	E <87.0	T	2.73	4.77	-0.300	10.776	3.984	0.209	0.114	3.804
183	187	40 MW	387.0	0.300	E <87.0	T	2.73	4.69	-0.300	10.923	3.844	0.202	0.110	3.671
184	188	40 MW	383.3	0.300	E <87.0	T	2.73	4.64	-0.300	11.070	3.770	0.199	0.108	3.601
185	189	40 MW	377.9	0.300	E <87.0	E	1.37	4.58	-0.300	11.216	3.577	0.106	0.105	3.500
110	999	100 MW	945.0	0.500	North	T	6.98	1.81		1.300	6.245	0.029	0.016	6.216

KEY TO FITTINGS AND PIPEWORK QUANTITIES (Above pipes only)

E = Screwed elbow, L = Long turn elbow, H = 45deg elbow, T = Tee/cross, J = Through tee
GV = Gate valve, SV = Swinging valve, MV = Angle valve, BV = Butterfly valve, GL = Globe valve

MW = Medium Weight steel [BS1387] "C" wet=120 "C" dry=100(d) "C" nipa=120 Total = 100.31 m
 Sizes = 40 65 80 100 150 mm
 Bores = 41.86 68.67 80.68 105.14 155.32 mm
 Lengths = 12.02 16.82 10.17 0.50 60.80 m