

HYDRAULIC CALCULATIONS COMPUTER PRINTOUT SUBMITTED BY :-
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Program HYD V1.2 [150509] by Alan Ashfield

Project name : EXAMPLE OF A 4 RANGE GRIDDED SYSTEM
User / owner / client : ---
Address / location : ---
Project number : 4
Building occupancy : WAREHOUSE
Hazard class : HIGH HAZARD
Insurance company : ---
Area identification : MOST REMOTE
Installation number : 1
Drawing no(s) : 1234/A/1
Issue / date(s) : March 2002
Designers reference : ALAN ASHFIELD
Comments : NONE
Water supply / pump reference : NONE
Height of water in tank in m : 0

Design authority : BSEN 12845 RULES
Specified density of coverage : 12.5 mm/min (L/min per sq.m)
Assumed maximum area of operation : 108.00 sq.m
Number of operating heads/nozzles : 12
Maximum area covered per head : 9.00 sq.m
Sprinkler orifice size used : 20 mm
Most remotest head node number : 168
Number of pipes in system : 45
Volume of pipework and fittings : 0.20 cu.m
Maximum fluid velocity : 7.0 m/s in pipe 173 to 174
Number of loops in system : 3
Max. pressure drop error in loops : 0.08 mbar
Max. pressure drop error at pipes : 0.40 mbar
Max. flow error at heads / nodes : 0.01 L/min
Overall flow balance error : 0.00 %
Job data file name : D:\HYD\HYDDEMO.HYD

4 most remotest head node numbers :
Actual density of discharge : 0.0 mm/min over 9.00 sq.m

"C" gauge node number : 120
"C" gauge height above source : 1.50 m
Highest head above this "C" gauge : 5.04 m
"C" gauge flow and pressure : 1475 L/min at 3.207 bar

Source node number : 100
Highest head above the source : 6.54 m
Source duty : 1475 L/min at 3.420 bar

OPERATING SPRINKLER HEADS AND NOZZLES

: Node:	Size :	"k" :	F l o w:	A r e a:	Density	mm/min:	Pressure	bar:	Heights	in metres :
: no :	mm :	factor:	L/min :	sq.m :	Req.d	Actual:	Min	Actual:	Source :	"C" gauge :
154	20.0	115.0	141.4	9.000	12.50	15.71	0.50	1.512	6.23	4.73
155	20.0	115.0	131.7	9.000	12.50	14.64	0.50	1.312	6.54	5.04
165	20.0	115.0	131.2	9.000	12.50	14.58	0.50	1.303	6.23	4.73
166	20.0	115.0	117.3	9.000	12.50	13.04	0.50	1.041	6.54	5.04
168	20.0	115.0	112.5	9.000	12.50	12.50	0.50	0.957	6.54	5.04
169	20.0	115.0	113.8	9.000	12.50	12.64	0.50	0.978	6.23	4.73
170	20.0	115.0	116.4	9.000	12.50	12.93	0.50	1.024	5.91	4.41
176	20.0	115.0	135.6	9.000	12.50	15.07	0.50	1.391	6.23	4.73
177	20.0	115.0	121.3	9.000	12.50	13.48	0.50	1.112	6.54	5.04
179	20.0	115.0	116.2	9.000	12.50	12.91	0.50	1.021	6.54	5.04
180	20.0	115.0	117.4	9.000	12.50	13.04	0.50	1.042	6.23	4.73
181	20.0	115.0	119.9	9.000	12.50	13.33	0.50	1.088	5.91	4.41

HYDRAULICALLY SIGNIFICANT PIPES IN SYSTEM

: Node nos:		Size:	P i p e:		F l o w:	Length:	F i t t i n g s:	Eq. Len:	Static:	Vel :	Pressures in bars :		
: Start:	End:	mm :	Type	C :	L/min :	m :	:	m :	m :	m/s:	Start:	End :	Fri c t:
100	110	100	MW	120	1475	1.00	GV	1.81	1.00	2.8	3.420	3.306	0.016
110	120	100	MW	120	1475	0.50	SV	5.60	0.50	2.8	3.306	3.207	0.050
120	130	100	MW	120	1475	3.70	CG	3.70	3.70	2.8	3.207	2.811	0.033
130	140	100	MW	120	1475	0.50	W	1.90		2.8	2.811	2.794	0.017
140	151	80	MW	120	1214	1.50	T	6.30		4.0	2.794	2.652	0.143
151	152	32	MW	120	377	0.60	T	2.70	0.60	6.2	2.652	2.232	0.361
152	153	32	MW	120	377	1.07	E	2.07	0.11	6.2	2.232	1.945	0.276
153	154	32	MW	120	377	3.02		3.02	0.32	6.2	1.945	1.512	0.402
154	155	32	MW	120	236	3.02		3.02	0.31	3.9	1.512	1.312	0.169
155	156	32	MW	120	104	1.51		1.51	0.16	1.7	1.312	1.278	0.019
156	157	32	MW	120	104	1.51		1.51	-0.16	1.7	1.278	1.275	0.019
157	158	32	MW	120	104	3.02		3.02	-0.31	1.7	1.275	1.269	0.037
158	159	32	MW	120	104	3.02		3.02	-0.32	1.7	1.269	1.262	0.037
159	160	32	MW	120	104	1.07	E	2.07	-0.11	1.7	1.262	1.248	0.026
160	161	32	MW	120	104	0.60	T	2.70	-0.60	1.7	1.248	1.273	0.033
161	162	80	MW	120	837	3.00		3.00		2.7	2.652	2.618	0.034
162	163	32	MW	120	411	0.60	T	2.70	0.60	6.7	2.618	2.137	0.421
163	164	32	MW	120	411	1.07	E	2.07	0.11	6.7	2.137	1.804	0.323
164	165	32	MW	120	411	3.02		3.02	0.32	6.7	1.804	1.303	0.470
165	166	32	MW	120	279	3.02		3.02	0.31	4.6	1.303	1.041	0.231
166	167	32	MW	120	162	1.51		1.51	0.16	2.7	1.041	0.984	0.042
167	168	32	MW	120	162	1.51		1.51	-0.16	2.7	0.984	0.957	0.042
168	169	32	MW	120	50	3.02		3.02	-0.31	0.8	0.957	0.978	0.009
170	169	32	MW	120	64	3.02		3.02	0.32	1.1	1.024	0.978	0.015
171	170	32	MW	120	181	1.07	E	2.07	0.11	3.0	1.106	1.024	0.071
172	171	32	MW	120	181	0.60	T	2.70	0.60	3.0	1.257	1.106	0.092
162	173	80	MW	120	426	3.00		3.00		1.4	2.618	2.608	0.010
173	174	32	MW	120	426	0.60	E	1.60	0.60	7.0	2.608	2.281	0.267
174	175	32	MW	120	426	1.07	E	2.07	0.11	7.0	2.281	1.925	0.345
175	176	32	MW	120	426	3.02		3.02	0.32	7.0	1.925	1.391	0.503
176	177	32	MW	120	290	3.02		3.02	0.31	4.8	1.391	1.112	0.248
177	178	32	MW	120	169	1.51		1.51	0.16	2.8	1.112	1.051	0.046
178	179	32	MW	120	169	1.51		1.51	-0.16	2.8	1.051	1.021	0.046
179	180	32	MW	120	53	3.02		3.02	-0.31	0.9	1.021	1.042	0.011
181	180	32	MW	120	64	3.02		3.02	0.32	1.1	1.088	1.042	0.015
182	181	32	MW	120	184	1.07		1.07	0.11	3.0	1.137	1.088	0.038
183	182	32	MW	120	184	0.60	E	1.60	0.60	3.0	1.252	1.137	0.057
140	184	80	MW	120	261	1.50	E	3.90		0.8	2.794	2.789	0.005
184	185	32	MW	120	261	0.60	E	1.60	0.60	4.3	2.789	2.623	0.108
185	186	32	MW	120	261	8.61	E	9.61	0.90	4.3	2.623	1.888	0.646
186	187	32	MW	120	261	8.61	E	9.61	-0.90	4.3	1.888	1.331	0.646
187	194	32	MW	120	261	0.60	E	1.60	-0.60	4.3	1.331	1.282	0.108
172	183	65	MW	120	184	3.00		3.00		0.8	1.257	1.252	0.005
161	172	65	MW	120	365	3.00		3.00		1.6	1.273	1.257	0.016
194	161	65	MW	120	261	3.00		3.00		1.2	1.282	1.273	0.009

QUANTITIES OF PIPEWORK USED IN ABOVE SYSTEM

MW = Medium weight steel pipe to BS1387

Size :	32	65	80	100	mm
Bore :	35.97	68.67	80.68	105.14	mm
Length :	73.71	9.00	9.00	5.70	m

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