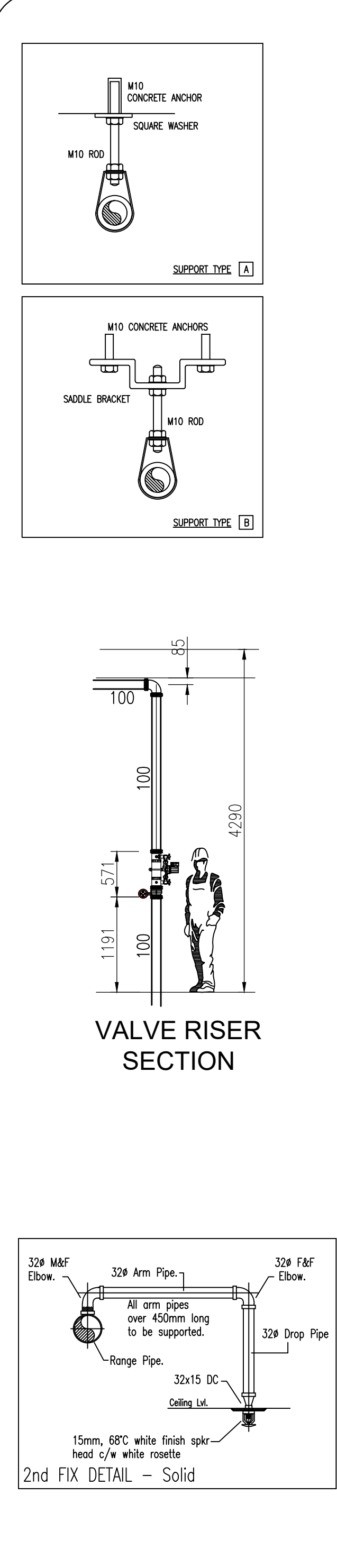
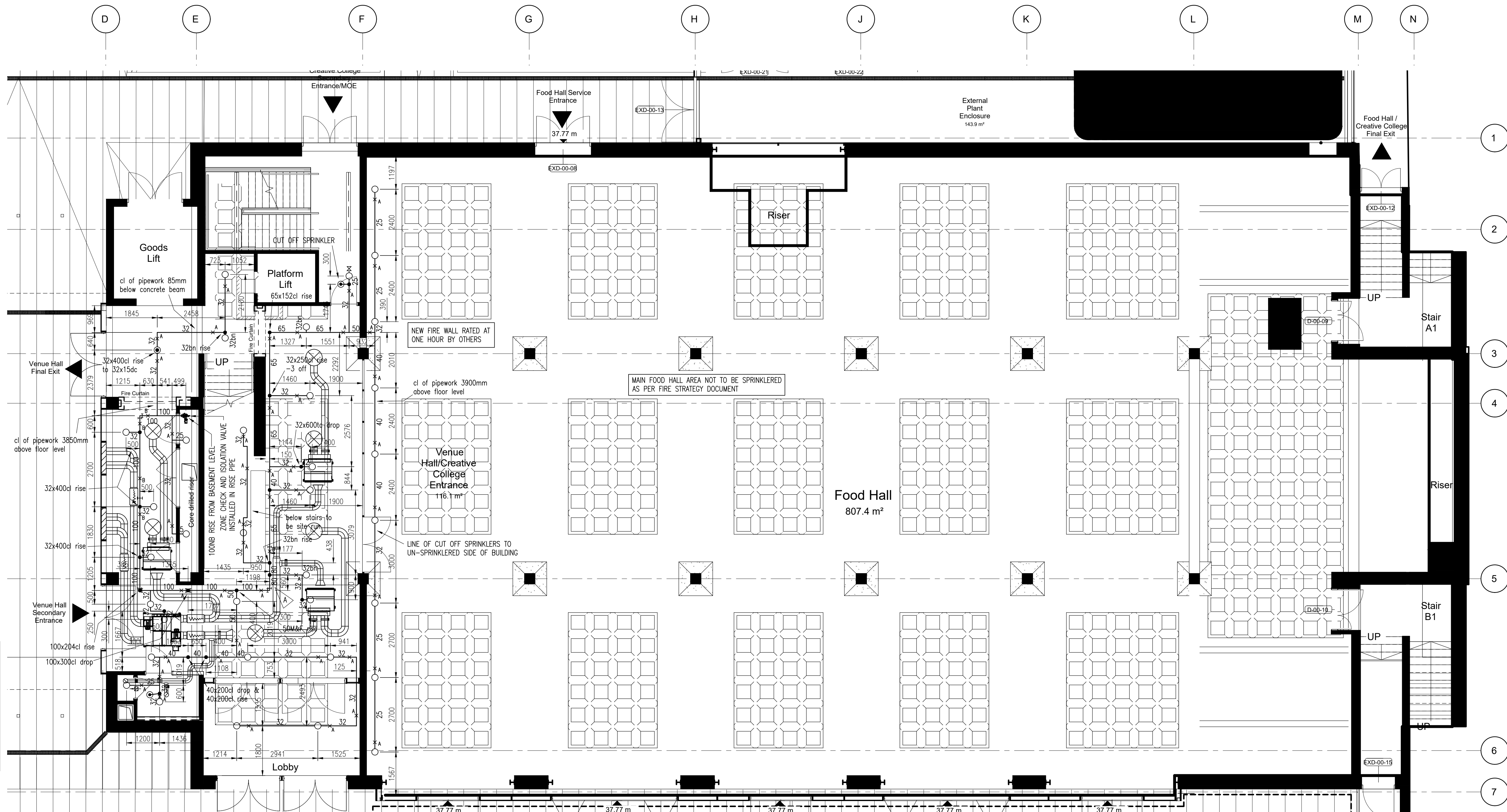




Hall & Kay Fire Engineering Summary of Hydraulic Losses Between Various Design Points and Control Valves For Ordinary Hazard Installations									
New Century Hall, Manchester, NCH									
Highest Design Point (metres above G Gauge): 12.87									
Design Point	Pipe Dia mm	Pipe Length m	No of Elbows	No of Tee's (Branch)	No of Tee's (Run)	Check Valve	Gate Valve	Flow Valve	Sub Total
A	65	0	0	0	0	0	0	0	0
Height	80	1	1	0	0	0	0	0	35
above G	100	24	7	1	0	1	0	0	54.4
Gauge (m)	150	20	3	0	0	1	0	0	25.545
12.87									
Drawing Number: 82468-01									Total Losses (mb) = 325.025 Less Static Gain = 3.92 Net Loss = 321.105 millibars

DESIGN CHECKLIST	
1. Client drawings checked	
2. Design criteria table completed	
3. Any special requirements noted	
4. Drawing title block & sprinkler schedule etc. completed	
5. Storage type / height / category noted (table changed to suit)	
6. Sections shown	
7. Any non conformances listed and Gen 10 form completed	
8. Unprotected area noted	
9. Pipe work required, T&E, noted	
10. Approved equipment manufacturer type	
11. General sprinkler spacing correct - section 12	
12. Sprinkler head selection - T8207	
13. Spacing around openings - 12.4.1.1	
14. Min / Max Level below soffit shown - 12.4.2	
15. Obstructions/beam rule compliance - 12.4.6	
16. Drain & test valves - 15.4 / 15.5	
17. Remote test valve - 15.5.2	
18. Flushing points (if applicable) - 15.6	
19. Brackets - 17.2	
20. Details of types used	
21. Locations shown and in correct positions RE: arm pipes/joints etc	
22. Bracket spacing correct	
23. Pre-Calculated Hydraulics - Section 13	
24. Correct design point location	
25. Calculations shown and cross referenced with drawing	
26. Correct number of direction changes	
27. Correct static allowance	
28. Loss <500mb (allow 10%)	
29. Pressure loss calculation between pump & most remote 'C' gauge	

LEGEND	
	SPRINKLER HEAD UPRIGHT
	SPRINKLER HEAD PENDENT
	SPRINKLER HEAD FALSE CEILING / ON DROP PIPE
	SPRINKLER HEAD WITH FLEXIBLE ARM & DROP TO FALSE CEILING
	SPRINKLER HEAD ON RISE PIPE
	SPRINKLER HEAD SIDEWALL
	SPRINKLER HEAD HIGH TEMPERATURE
	CHANGE OF ELEVATION IN PIPEWORK
	CENTRE LINE ELEVATION OF PIPEWORK BELOW SLAB / SOFFIT
	CENTRE LINE ELEVATION OF PIPEWORK ABOVE FINISH FLOOR LEVEL (DATUM)
	DESIGN POINT
	POSITION AND TYPE OF PIPE SUPPORT
	POSITION OF MECHANICAL COUPLING
	DRAIN / FLUSHING / TEST VALVE WITH BRASS PLUG
	FLUSHING CONNECTION
	NORTH POINT

SPECIFICATION STANDARD:	
LPC Rules for Automatic Sprinkler Installations 2015 incorporating BS EN 12845	
DESIGN CRITERIA:	
ANNEX D & F ENHANCEMENTS	YES
ANY OTHER APPLICABLE ANNEXES	A-F
HAZARD CLASS	ORDINARY
DISCHARGE DENSITY	5.0
AREA OF OPERATION	AMAO 216m²
HIGHEST HEAD ABOVE 'C' GAUGE	13m
INSTALLATION TYPE	WET
SYSTEM VOLUME - (TRY / ALTERNATE ONLY)	N/A
FHC or PRE-CALCULATED	PRE-CALC
PIPE WORK PAINT FINISH:	
RED OXIDE	NO
POWDER COATED WHITE - RAL 9010	YES
POWDER COATED RED - RAL 3000	YES
OTHER (SPECIFY)	OTHER (IF APPLICABLE)
FLUSHWORK SPECIFICATION (UNLESS OTHERWISE STATED)	
1. ALL PIPE WORK TO BS EN 10255 MEDIUM WEIGHT UP TO 150m	
2. PIPEWORK ABOVE 150m TO SCHEDULE 20 ANSI B36.10M	
3. ALL SWEATED FITTINGS TO BE BLACK MALLEABLE IRON TO BS 143	
4. ALL WELDED FITTINGS TO BS EN 10253	
Clear space to be maintained below the deflector of roof and ceiling sprinklers of at least 0.5m for ordinary hazard systems and 1.0m for high hazard.	
Maximum Storage Heights:	
Storage Category	Maximum Storage Height in m
Category I	2.0
Category II	3.0
Category III	4.0
Category IV	5.0

WEIGHT LOADINGS FOR MEDIUM WEIGHT PIPE WORK & FITTINGS MAXIMUM SPACING BETWEEN BRACKET LOCATIONS (see 17.2 - BS EN 12845)				
NOMINAL PIPE DIAMETER (mm)	OUTSIDE PIPE WEIGHT (kg/m)	HEIGHT (m)	WEIGHT (kg)	BRACKET LOCATIONS
25	3.3	2.5	8.3	4m Maximum
32	5.3	2.5	13.3	4m Maximum
40	6.8	3.0	20.4	4m Maximum
50	10.8	3.5	37.8	4m Maximum
63	16.8	4.0	67.2	4m Maximum
75	22.8	4.5	102.6	4m Maximum
89	32.8	5.0	164.0	4m Maximum
100	43.8	5.5	241.1	4m Maximum
125	68.8	6.5	447.2	4m Maximum
150	103.8	7.5	778.5	4m Maximum
200	168.8	8.5	1435.0	4m (SEE 17.2 - BS EN 12845)
250	233.8	9.5	2211.1	4m (SEE 17.2 - BS EN 12845)
300	303.8	10.5	3185.0	4m (SEE 17.2 - BS EN 12845)
350	373.8	11.5	4311.1	4m (SEE 17.2 - BS EN 12845)
400	443.8	12.5	5544.4	4m (SEE 17.2 - BS EN 12845)
450	513.8	13.5	6888.9	4m (SEE 17.2 - BS EN 12845)
500	583.8	14.5	8388.9	4m (SEE 17.2 - BS EN 12845)
550	653.8	15.5	10000.0	4m (SEE 17.2 - BS EN 12845)
600	723.8	16.5	11722.2	4m (SEE 17.2 - BS EN 12845)
650	793.8	17.5	13555.6	4m (SEE 17.2 - BS EN 12845)
700	863.8	18.5	15488.9	4m (SEE 17.2 - BS EN 12845)
750	933.8	19.5	17522.2	4m (SEE 17.2 - BS EN 12845)
800	1003.8	20.5	19655.6	4m (SEE 17.2 - BS EN 12845)
850	1073.8	21.5	21888.9	4m (SEE 17.2 - BS EN 12845)
900	1143.8	22.5	24222.2	4m (SEE 17.2 - BS EN 12845)
950	1213.8	23.5	26655.6	4m (SEE 17.2 - BS EN 12845)
1000	1283.8	24.5	29188.9	4m (SEE 17.2 - BS EN 12845)
1050	1353.8	25.5	31822.2	4m (SEE 17.2 - BS EN 12845)
1100	1423.8	26.5	34555.6	4m (SEE 17.2 - BS EN 12845)
1150	1493.8	27.5	37388.9	4m (SEE 17.2 - BS EN 12845)
1200	1563.8	28.5	40322.2	4m (SEE 17.2 - BS EN 12845)
1250	1633.8	29.5	43355.6	4m (SEE 17.2 - BS EN 12845)
1300	1703.8	30.5	46488.9	4m (SEE 17.2 - BS EN 12845)
1350	1773.8	31.5	49722.2	4m (SEE 17.2 - BS EN 12845)
1400	1843.8	32.5	53055.6	4m (SEE 17.2 - BS EN 12845)
1450	1913.8	33.5	56488.9	4m (SEE 17.2 - BS EN 12845)
1500	1983.8	34.5	60022.2	4m (SEE 17.2 - BS EN 12845)
1550	2053.8	35.5	63655.6	4m (SEE 17.2 - BS EN 12845)
1600	2123.8	36.5	67388.9	4m (SEE 17.2 - BS EN 12845)
1650	2193.8	37.5	71222.2	4m (SEE 17.2 - BS EN 12845)
1700	2263.8	38.5	75155.6	4m (SEE 17.2 - BS EN 12845)
1750	2333.8	39.5	79188.9	4m (SEE 17.2 - BS EN 12845)
1800	2403.8	40.5	83322.2	4m (SEE 17.2 - BS EN 12845)
1850	2473.8	41.5	87555.6	4m (SEE 17.2 - BS EN 12845)
1900	2543.8	42.5	91888.9	4m (SEE 17.2 - BS EN 12845)
1950	2613.8	43.5	96322.2	4m (SEE 17.2 - BS EN 12845)
2000	2683.8	44.5	100855.6	4m (SEE 17.2 - BS EN 12845)
2050	2753.8	45.5	105488.9	4m (SEE 17.2 - BS EN 12845)
2100	2823.8	46.5	110222.2	4m (SEE 17.2 - BS EN 12845)
2150	2893.8	47.5	115055.6	4m (SEE 17.2 - BS EN 12845)
2200	2963.8	48.5	120088.9	4m (SEE 17.2 - BS EN 12845)
2250	3033.8	49.5	125322.2	4m (SEE 17.2 - BS EN 12845)
2300	3103.8	50.5	130655.6	4m (SEE 17.2 - BS EN 12845)
2350	3173.8	51.5	136188.9	4m (SEE 17.2 - BS EN 12845)
2400	3243.8	52.5	141922.2	4m (SEE 17.2 - BS EN 12845)
2450	3313.8	53.5	147855.6	4m (SEE 17.2 - BS EN 12845)
2500	3383.8	54.5	153988.9	4m (SEE 17.2 - BS EN 12845)
2550	3453.8	55.5	160322.2	4m (SEE 17.2 - BS EN 12845)
2600	3523.8	56.5	166855.6	4m (SEE 17.2 - BS EN 12845)
2650	3593.8	57.5	173588.9	4m (SEE 17.2 - BS EN 12845)
2700	3663.8	58.5	180522.2	4m (SEE 17.2 - BS EN 12845)
2750	3733.8	59.5	187655.6	4m (SEE 17.2 - BS EN 12845)
2800	3803.8	60.5	194988.9	4m (SEE 17.2 - BS EN 12845)
2850	3873.8	61.5	202522.2	4m (SEE 17.2 - BS EN 12845)
2900	3943.8	62.5	210255.6	4m (SEE 17.2 - BS EN 12845)
2950	4013.8	63.5	218188.9	4m (SEE 17.2 - BS EN 12845)
3000	4083.8	64.5	226322.2	4m (SEE 17.2 - BS EN 12845)
3050	4153.8	65.5	234655.6	4m (SEE 17.2 - BS EN 12845)
3100	4223.8	66.5	243188.9	4m (SEE 17.2 - BS EN 12845)
3150	4293.8	67.5	251922.2	4m (SEE 17.2 - BS EN 12845)
3200	4363.8	68.5	260855.6	4m (SEE 17.2 - BS EN 12845)
3250	4433.8	69.5	270088.9	4m (SEE 17.2 - BS EN 12845)
3300	4503.8	70.5	279522.2	4m (SEE 17.2 - BS EN 12845)
3350	4573.8	71.5	289155.6	4m (SEE 17.2 - BS EN 12845)
3400	4643.8	72.5	299088.9	4m (SEE 17.2 - BS EN 12845)
3450	4713.8	73.5	309322.2	4m (SEE 17.2 - BS EN 12845)
3500	4783.8	74.5	319755.6	4m (SEE 17.2 - BS EN 12845)
3550	4853.8	75.5	330388.9	4m (SEE 17.2 - BS EN 12845)
3600	4923.8	76.5	341222.2	4m (SEE 17.2 - BS EN 12845)
3650	4993.8	77.5	352255.6	4m (SEE 17.2 - BS EN 12845)
3700	5063.8	78.5	363488.9	4m (SEE 17.2 - BS EN 12845)
3750	5133.8	79.5	374922.2	4m (SEE 17.2 - BS EN 12845)
3800	5203.8	80.5	386555.6	4m (SEE 17.2 - BS EN 12845)
3850	5273.8	81.5	398388.9	4m (SEE 17.2 - BS EN 12845)
3900	5343.8	82.5	410422.2	4m (SEE 17.2 - BS EN 12845)
3950	5413.8	83.5	422655.6	4m (SEE 17.2 - BS EN 12845)
4000	5483.8	84.5	435088.9	4m (SEE 17.2 - BS EN 12845)
4050	5553.8	85.5	447722.2	4m (SEE 17.2 - BS EN 12845)
4100	5623.8	86.5	460555.6	4m (SEE 17.2 - BS EN 12845)
4150	5693.8	87.5	473588.9	4m (SEE 17.2 - BS EN 12845)
4200	5763.8	88.5	486822.2	4m (SEE 17.2 - BS EN 12845)
4250	5833.8	89.5	499255.6	4m (SEE 17.2 - BS EN 12845)
4300	5903.8	90.5	511888.9	4m (SEE 17.2 - BS EN 12845)
4350	5973.8	91.5	524722.2	4m (SEE 17.2 - BS EN 12845)
4400	6043.8	92.5	537755.6	4m (SEE 17.2 - BS EN 12845)
4450	6113.8	93.5	550988.9	4m (SEE 17.2 - BS EN 12845)
4500	6183.8	94.5	564422.2	4m (SEE 17.2 - BS EN 12845)
4550	6253.8	95.5	578055.6	4m (SEE 17.2 - BS EN 12845)
4600	6323.8	96.5	591888.9	4m (SEE 17.2 - BS EN 12845)
4650	6393.8	97.5	605922.2	4m (SEE 17.2 - BS EN 12845)
4700	6463.8	98.5	620155.6	4m (SEE 17.2 - BS EN 12845)
4750	6533.8	99.5	634588.9	4m (SEE 17.2 - BS EN 12845)
4800	6603.8	100.5	649222.2	4m (SEE 17.2 - BS EN 12845)
4850	6673.8	101.5	664055.6	4m (SEE 17.2 - BS EN 12845)
4900	6743.8	102.5	679088.9	4m (SEE 17.2 - BS EN 12845)
4950	6813.8	103.5	694322.2	4m (SEE 17.2 - BS EN 12845)
5000	6883.8	104.5	709755.6	4m (SEE 17.2 - BS EN 12845)
5050	6953.8	105.5	725388.9	4m (SEE 17.2 - BS EN 12845)
5100	7023.8	106.5	741222.2	4m (SEE 17.2 - BS EN 12845)
5150	7093.8	107.5	757255.6	4m (SEE 17.2 - BS EN 12845)
5200	7163.8	108.5	773488.9	4m (SEE 17.2 - BS EN 12845)
5250	7233.8	109.5	789922.2	4m (SEE 17.2 - BS EN 12845)
5300	7303.8	110.5	806555.6	4m (SEE 17.2 - BS EN 12845)
5350	7373.8	111.5	823388.9	4m (SEE 17.2 - BS EN 12845)
5400	7443.8	112.5	840422.2	4m (SEE 17.2 - BS EN 12845)
5450	7513.8	113.5	857655.6	4m (SEE 17.2 - BS EN 12845)
5500	7583.8	114.5	875088.9	4m (SEE 17.2 - BS EN 12845)
5550	7653.8	115.5	892722.2	4m (SEE 17.2 - BS EN 12845)
5600	7723.8	116.5	910555.6	4m (SEE 17.2 - BS EN 12845)
5650	7793.8	117.5	928588.9	4m (SEE 17.2 - BS EN 12845)
5700	7863.8	118.5	946822.2	4m (SEE 17.2 - BS EN 12845)
5750	7933.8	119.5	965255.6	4m (SEE 17.2 - BS EN 12845)
5800	8003.8	120.5	983888.9	4m (SEE 17.2 - BS EN 12845)
5850	8073.8	121.5	1002722.2	4m (SEE 17.2 - BS EN 12845)
5900	8143.8	122.5	1021755.6	4m (SEE 17.2 - BS EN 12845)
5950	8213.8	123.5	1040988.9	4m (SEE 17.2 - BS EN 12845)
6000	8283.8	124.5	1060422.2	4m (SEE 17.2 - BS EN 12845)
6050	8353.8	125.5	1080055.6	4m (SEE 17.2 - BS EN 12845)
6100	8423.8	126.5	1100888.9	4m (SEE 17.2 - BS EN 12845)
6150	8493.8	127.5	1121922.2	4m (SEE 17.2 - BS EN 12845)
6200	8563.8	128.5	1143155.6	4m (SEE 17.2 - BS EN 12845)
6250	8633.8	129.5	1164588.9	4m (SEE 17.2 - BS EN 12845)
6300	8703.8	130.5	1186222.2	4m (SEE 17.2 - BS EN 12845)
6350	8773.8	131.5	1208055.6	4m (SEE 17.2 - BS EN 12845)
6400	8843.8	132.5	1230088.9	4m (SEE 17.2 - BS EN 12845)
6450	8913.8	133.5	1252322.2	4m (SEE 17.2 - BS EN 12845)
6500	8983.8	134.5	1274755.6	4m (SEE 17.2 - BS EN 12845)
6550	9053.8	135.5	1297388.9	4m (SEE 17.2 - BS EN 12845)
6600	9123.8	136.5	1320222.2	4m (SEE 17.2 - BS EN 12845)
6650	9193.8	137.5	1343255.6	4m (SEE 17.2 - BS EN 12845)
6700	9263.8	138.5	1366488.9	4m (SEE 17.2 - BS EN 12845)
6750	9333.8	139.5	1389922.2	4m (SEE 17.2 - BS EN 12845)
6800	9403.8	140.5	1413555.6	4m (SEE 17.2 - BS EN 12845)
6850	9473.8	141.5	1437388.9	4m (SEE 17.2 - BS EN 12845)
6900	9543.8	142.5	1461422.2	4m (SEE 17.2 - BS EN 12845)
6950	9613.8	143.5	1485655.6	4m (SEE 17.2 - BS EN 12845)
7000	9683.8	144.5	1510088.9	4m (SEE 17.2 - BS EN 12845)
7050	9753.8	145.5	1534722.2	4m (SEE 17.2 - BS EN 12845)
7100	9823.8	146.5	1559555.6	4m (SEE 17.2 - BS EN 12845)
7150	9893.8	147.5	1584588.9	4m (SEE 17.2 - BS EN 12845)
7200	9963.8	148.5	1609822.2	4m (SEE 17.2 - BS EN 12845)
7250	10033.8	149.5	1635255.6	4m (SEE 17.2 - BS EN 12845)
7300	10103.8	150.5	1660888.9	4m (SEE 17.2 - BS EN 12845)
7350	10173.8	151.5	1686722.2	4m (SEE 17.2 - BS EN 12845)
7400	10243.8	152.5	1712755.6	4m (SEE 17.2 - BS EN 12845)
7450	10313.8	153.5	1738988.9	4m (SEE 17.2 - BS EN 12845)
7500	10383.8	154.5	1765422.2	4m (SEE 17.2 - BS EN 12845)
7550	10453.8	155.5	1792055.6	4m (SEE 17.2 - BS EN 12845)
7600	10523.8	156.5	1818888.9	4m (SEE 17.2 - BS EN 12845)
7650	10593.8	157.5	1845922.2	4m (SEE 17.2 - BS EN 12845)
7700	10663.8	158.5	1873155.6	4m (SEE 17.2 - BS EN 12845)
7750	10733.8	159.5	1900588.9	4m (SEE 17.2 - BS EN 12845)
7800	10803.8	160.5	1928222.2	4m (SEE 17.2 - BS EN 12845)
7850	10873.8	161.5	1956055.6	4m (SEE 17.2 - BS EN 12845)
7900	10943.8	162.5	1984088.9	4m (SEE 17.2 - BS EN 12845)
7950	11013.8	163.5	2012322.2	4m (SEE 17.2 - BS EN 12845)
8000	11083.8	164.5	2040755.6	4m (SEE 17.2 - BS EN 12845)
8050	11153.8	165.5	2069388.9	4m (SEE 17.2 - BS EN 12845)
8100	11223.8	166.5	2098222.2	4m (SEE 17.2 - BS EN 12845)
8150	11293.8	167.5	2127255.6	4m (SEE 17.2 - BS EN 12845)
8200	11363.8	168.5	2156488.9	4m (SEE 17.2 - BS EN 12845)
8250	11433.8	169.5	2185922.2	4m (SEE 17.2 - BS EN 12845)
8300	11503.8	170.5	2215555.6	4m (SEE 17.2 - BS EN 12845)
8350	11573.8	171.5	2245388.9	4m (SEE 17.2 - BS EN 12845)
8400	11643.8	172.5	2275422.2	4m (SEE 17.2 - BS EN 12845)
8450	11713.8	173.5	2305655.6	4m (SEE 17.2 - BS EN 12845)
8500	11783.8	174.5	2336088.9	4m (SEE 17.2 - BS EN 12845)
8550	11853.8	175.5	2366722.2	4m (SEE 17.2 - BS EN 12845)
8600	11923.8	176.5	2397555.6	4m (SEE 17.2 - BS EN 12845)
8650	11993.8	177.5	2428588.9	4m (SEE 17.2 - BS EN 12845)