



MasterDrain
SW

Muir Associates (UK) Limited

www.muir-associates.co.uk

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Job No. 1132-22		
Sheet no. 1		
Date 21/11/22		
By MJ	Checked	Reviewed

Project

Title **Surcharge calcs (Sized at 30 yrs storm) for SURFACE WATER DESIGN.SW**

Using in-line restrictors
Return period = 30 yrs
Climate change factor = 0

PEAK hydrograph values printed
Storm duration = 60 mins
No offline storage

Mean rain intens. 29.00 mm/hr
Storm profile = Summer
Using FSR data

Peak rain intens. 113.68 mm/hr
Sample period = 30.0 secs.

Entry No.	SECT. No.	MANHOLE REF	PIPE CAPACITY l/s	RATE FLOW l/s	PIPE SIZE mm	CHAMBER DIAM/LxW mm	INVERT LEVEL m	WATER LEVEL m	GRND LEVEL m	SURCHARGE fract. Depth		EXCESS FLOW l/s	FLOODED VOL m³	DRAINED AREA (m²) :x FACTOR	STATUS	
1	I	1.01	S-MH-01	42.1	7.3	225	1200	43.85	43.91	44.80	0.17	0.05	0.00	0.000	527	OK
2	I	1.02	S-MH-02	77.8	21.8	300	1200	43.58	43.68	44.80	0.28	0.10	0.00	0.000	1579	OK
3	I	1.03	S-MH-03	78.4	29.1	300	1200	43.43	43.55	44.80	0.37	0.12	0.00	0.000	2106	OK
4	I	1.04	S-MH-04	78.0	29.1	300	1500	43.30	43.42	44.60	0.37	0.12	0.00	0.000	2106	OK
5	B	2.01	S-MH-09	184.0	14.7	450	1500	43.08	43.14	44.35	0.08	0.06	0.00	0.000	1065	OK
6	B	2.02	S-MH-10	184.9	49.1	450	1500	42.99	43.14	44.35	0.27	0.14	0.00	0.000	3560	OK
7	B	2.03	S-MH-12	398.2	49.1	450	1500	42.87	42.95	44.35	0.12	0.08	0.00	0.000	3560	OK
8	I	1.05	S-MH-05	227.8	78.2	450	1500	42.79	42.97	44.42	0.34	0.17	0.00	0.000	5666	OK
9	B	3.01	S-MH-13	42.1	7.3	225	1200	43.90	43.95	44.80	0.17	0.05	0.00	0.000	527	OK
10	B	3.02	S-MH-14	95.8	21.8	300	1200	43.70	43.78	44.80	0.23	0.08	0.00	0.000	1582	OK
11	B	3.03	S-MH-15	298.4	29.1	300	1200	43.47	43.52	44.92	0.10	0.05	0.00	0.000	2109	OK
12	I	1.06	S-MH-06‡	14.6	4.8	150	1500	42.72	42.77	44.75	0.33	0.05	0.00	0.000	7775	OK
13	I	1.07	S-MH-07	14.6	0.0	150	1200	42.65	42.66	44.35	0.00	0.00	0.00	0.000	0	OK
14	I	1.08	S-MH-08	18.6	0.0	150	1200	42.40	42.40	44.46	0.00	0.00	0.00	0.000	0	OK



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Notes

Printout headings

- | | | |
|---|---|--|
| 1) Entry no - position in file | 2) Section no - pipe identifier | 3) Manhole ref - Manhole identifier |
| 4) Pipe cap - full bore capacity of that pipe | 5) Rate of flow - calculated flow rate (l/s) ‡ = flow restrictor. | 6) Pipe diam - outlet pipe diameter (mm) |
| 7) Chamber diam - chamber diam. at base of MH | 8) Invert level - invert level of manhole | 9) Water level - calculated peak water level. |
| 10) Grnd level - ground / cover level | 11) Surch. fract - calc.flow/pipe capacity | 12) Surch. depth - surcharge level above soffit |
| 13) Overflow - surcharged flow rate (l/s) | 14) Flooded vol - volume of water above cover | 15) Upstrm Vol - upstream pipe vol to previous manhole(s) |
| 16) Status - OK - outlet not surcharged | 17) Status - Surcharged - outlet surcharged | 18) Status - Warning - water level within 299mm of cover level |
| 19) Status - Flooded - cover over-topped | 20) § against diameter indicates throttle pipe used. | |

Title box

Hydrograph data

- | | | |
|---|--------------------------------------|--|
| 1) Ret. period - that used to calculate profile | 2) Duration - length of storm (mins) | 3) Profile - either Winter (75%) or Summer (50%) |
|---|--------------------------------------|--|

Flow restrictors

Manhole reference - S-MH-06

Restrictor flowrate - 4.83 l/s



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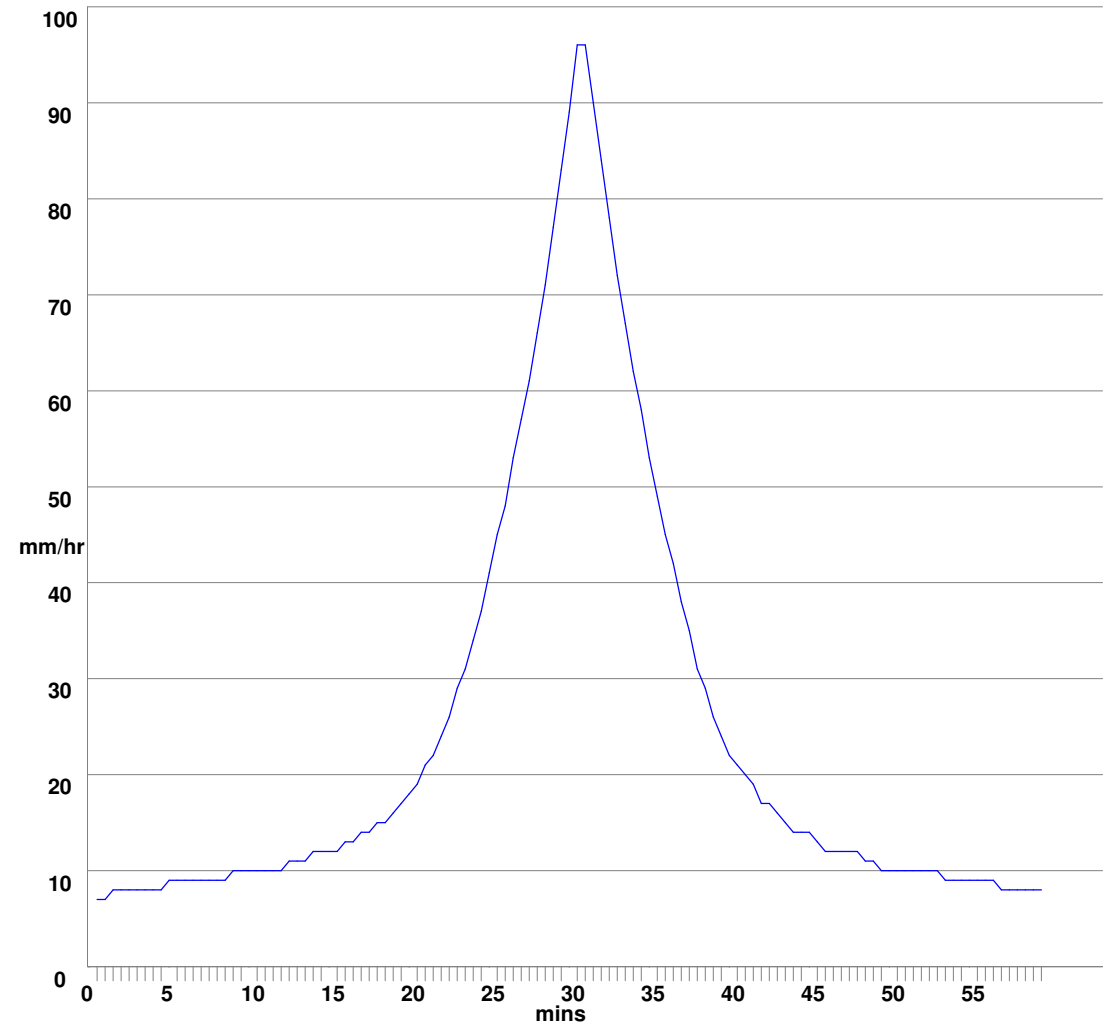
Project

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Time mins	Rain mm/hr	Time mins	Rain mm/hr	Time mins	Rain mm/hr
0:30	6.82	20:30	19.49	40:30	20.95
1:00	6.82	21:00	20.71	41:00	19.74
1:30	7.80	21:30	21.93	41:30	18.52
2:00	7.80	22:00	23.63	42:00	17.30
2:30	7.80	22:30	25.83	42:30	16.57
3:00	8.04	23:00	28.51	43:00	15.59
3:30	8.04	23:30	30.94	43:30	14.86
4:00	8.28	24:00	33.62	44:00	14.38
4:30	8.28	24:30	37.28	44:30	13.89
5:00	8.53	25:00	40.93	45:00	13.64
5:30	8.53	25:30	44.59	45:30	12.91
6:00	8.53	26:00	48.49	46:00	12.43
6:30	8.77	26:30	52.63	46:30	12.43
7:00	8.77	27:00	56.53	47:00	12.18
7:30	9.26	27:30	60.91	47:30	11.94
8:00	9.26	28:00	66.27	48:00	11.70
8:30	9.26	28:30	71.39	48:30	10.96
9:00	9.50	29:00	76.75	49:00	10.72
9:30	9.75	29:30	82.84	49:30	10.48
10:00	9.99	30:00	89.17	50:00	10.48
10:30	9.99	30:30	95.51	50:30	10.23
11:00	10.23	31:00	95.51	51:00	9.99
11:30	10.23	31:30	90.39	51:30	9.99
12:00	10.48	32:00	83.81	52:00	9.75
12:30	10.72	32:30	77.97	52:30	9.50
13:00	10.96	33:00	72.36	53:00	9.50
13:30	11.45	33:30	67.00	53:30	9.26
14:00	11.94	34:00	62.13	54:00	9.26
14:30	12.18	34:30	57.50	54:30	8.77
15:00	12.43	35:00	53.36	55:00	8.77
15:30	12.43	35:30	49.22	55:30	8.53
16:00	12.91	36:00	45.07	56:00	8.53
16:30	13.16	36:30	41.66	56:30	8.53
17:00	13.89	37:00	37.77	57:00	8.28
17:30	14.38	37:30	34.60	57:30	8.28
18:00	14.86	38:00	31.43	58:00	8.04
18:30	15.35	38:30	28.75	58:30	8.04
19:00	16.32	39:00	26.31	59:00	8.04
19:30	17.06	39:30	23.88	59:30	7.80
20:00	18.27	40:00	22.17	60:00	7.80

Hydrograph profile derived from data in the Flood Studies Report

Return period= 30 yrs Duration= 60 mins Profile - summer





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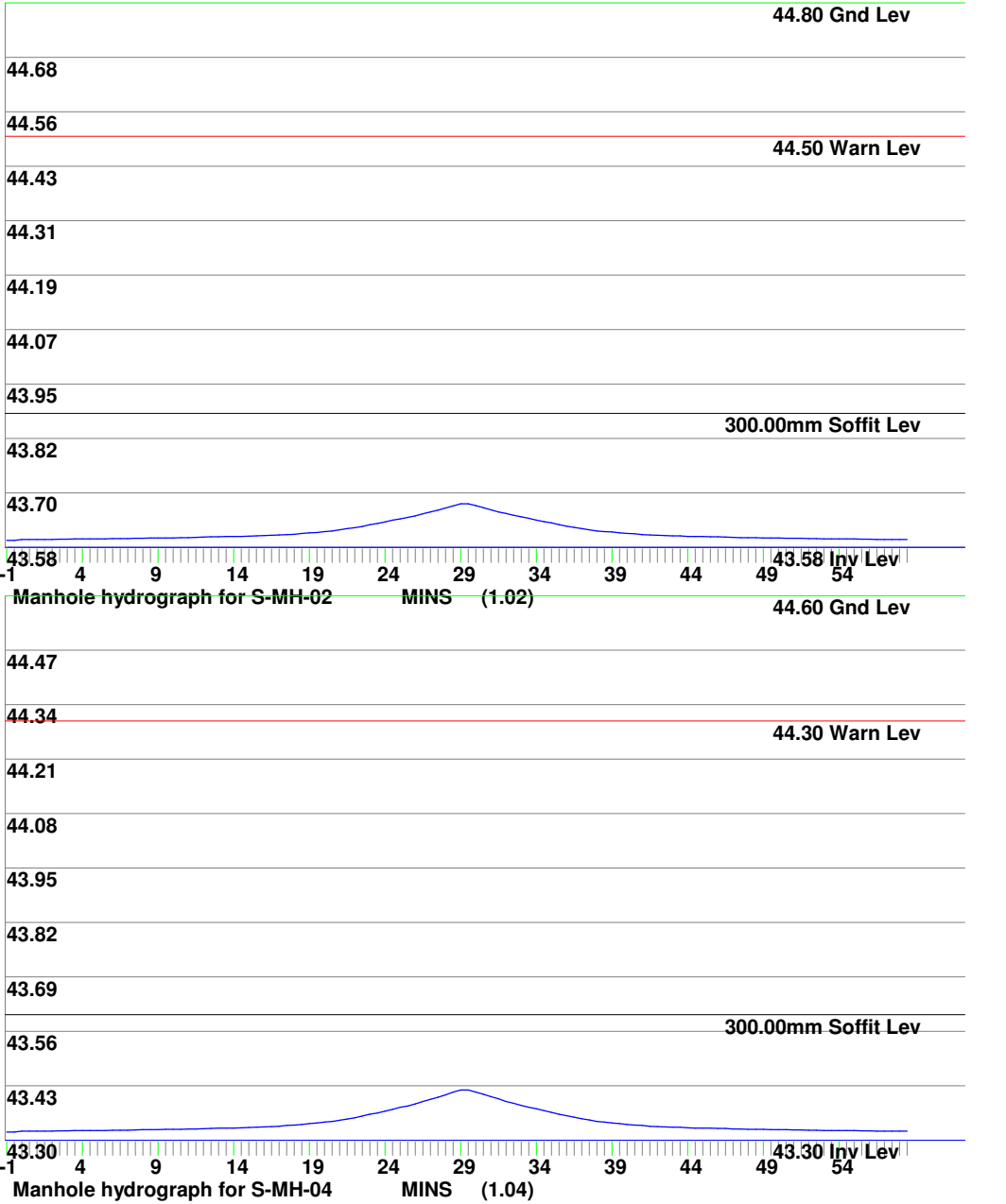
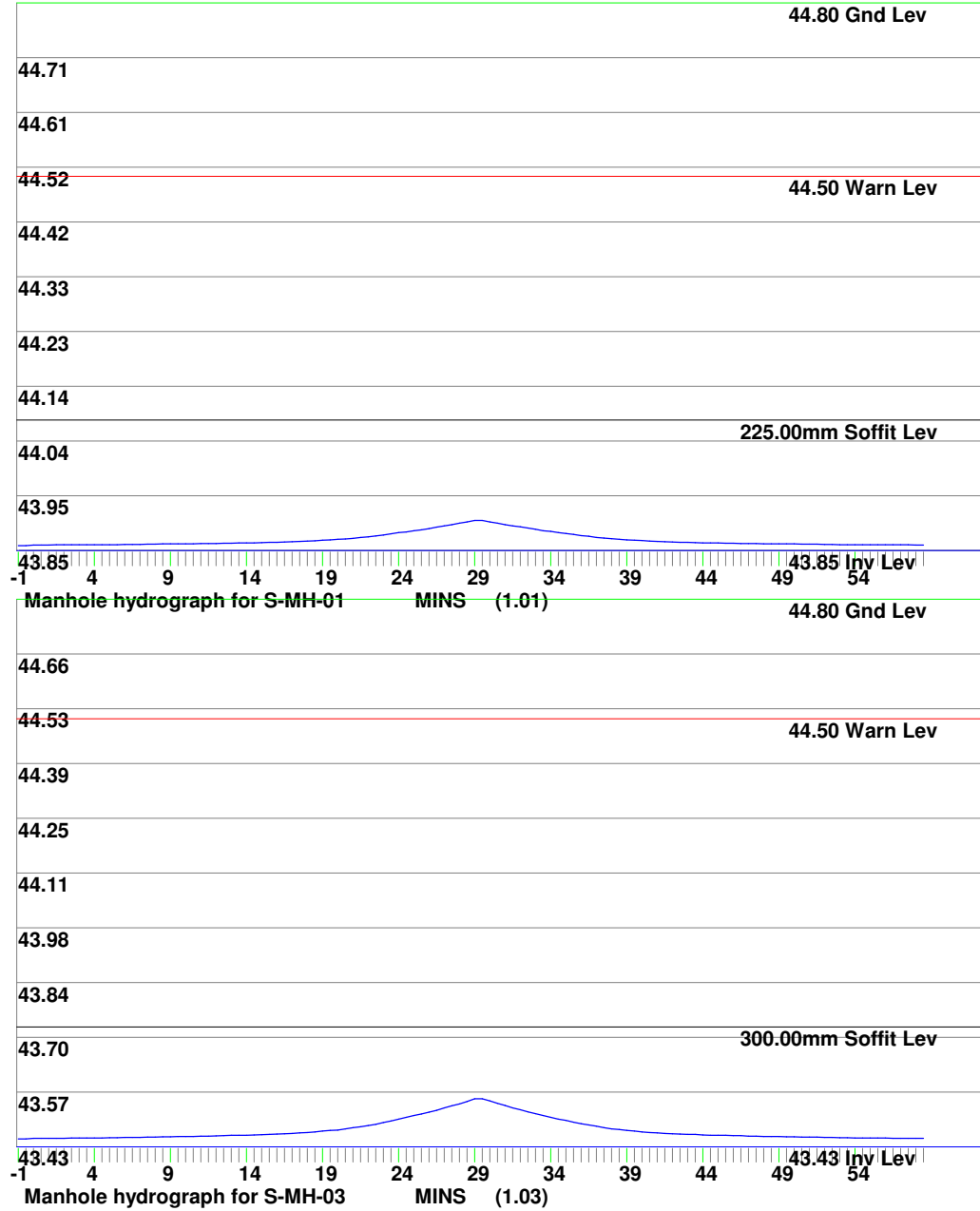
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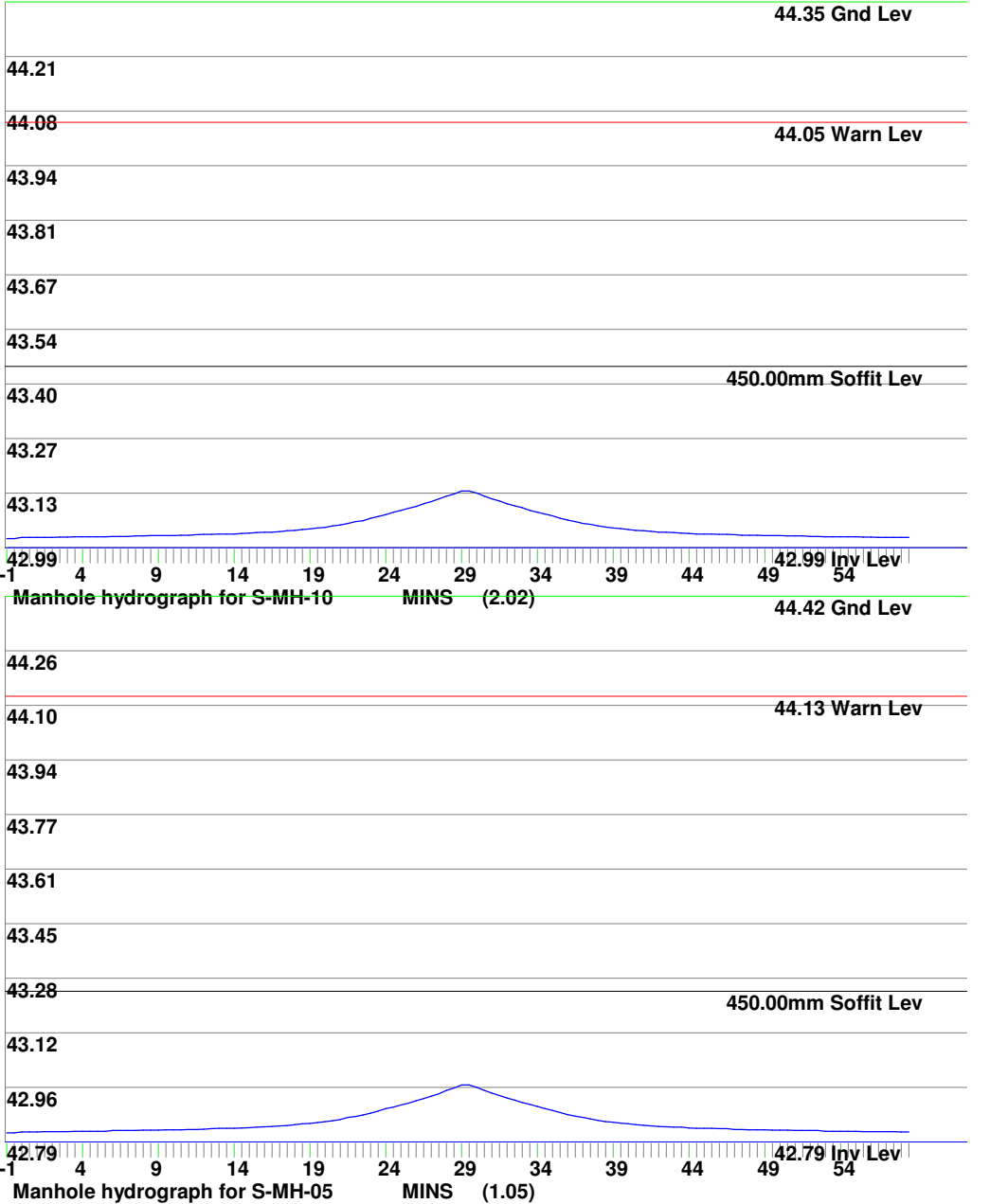
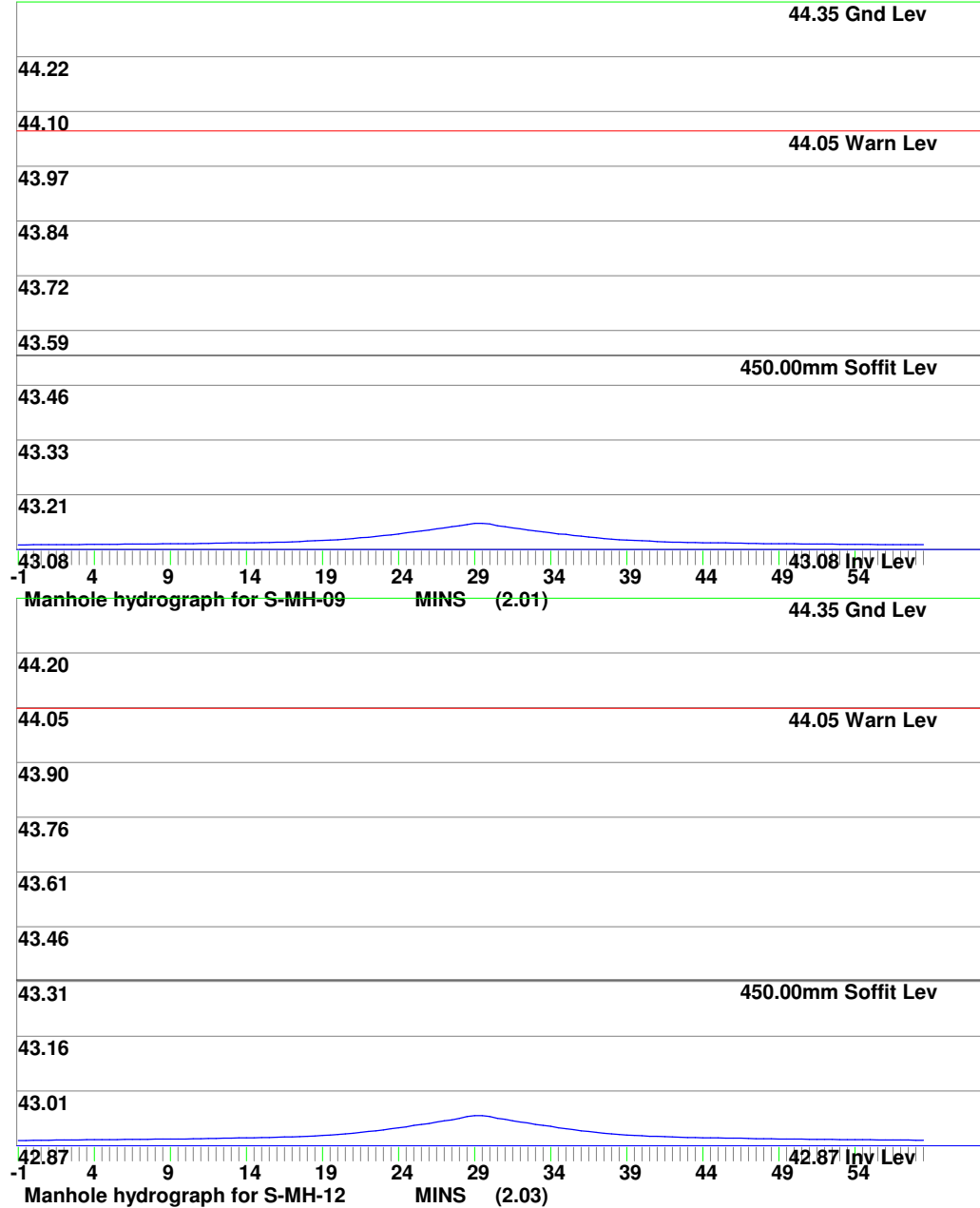
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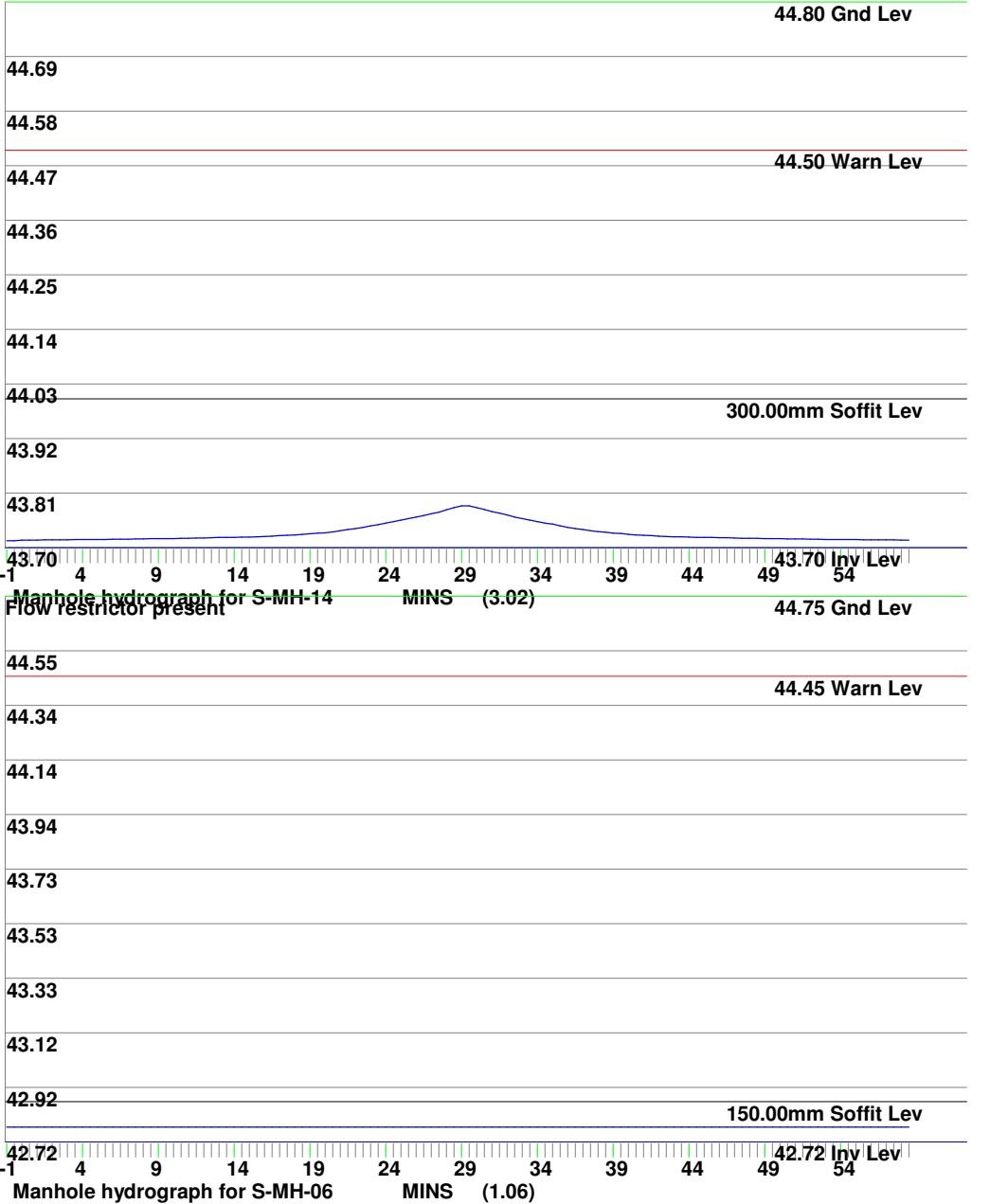
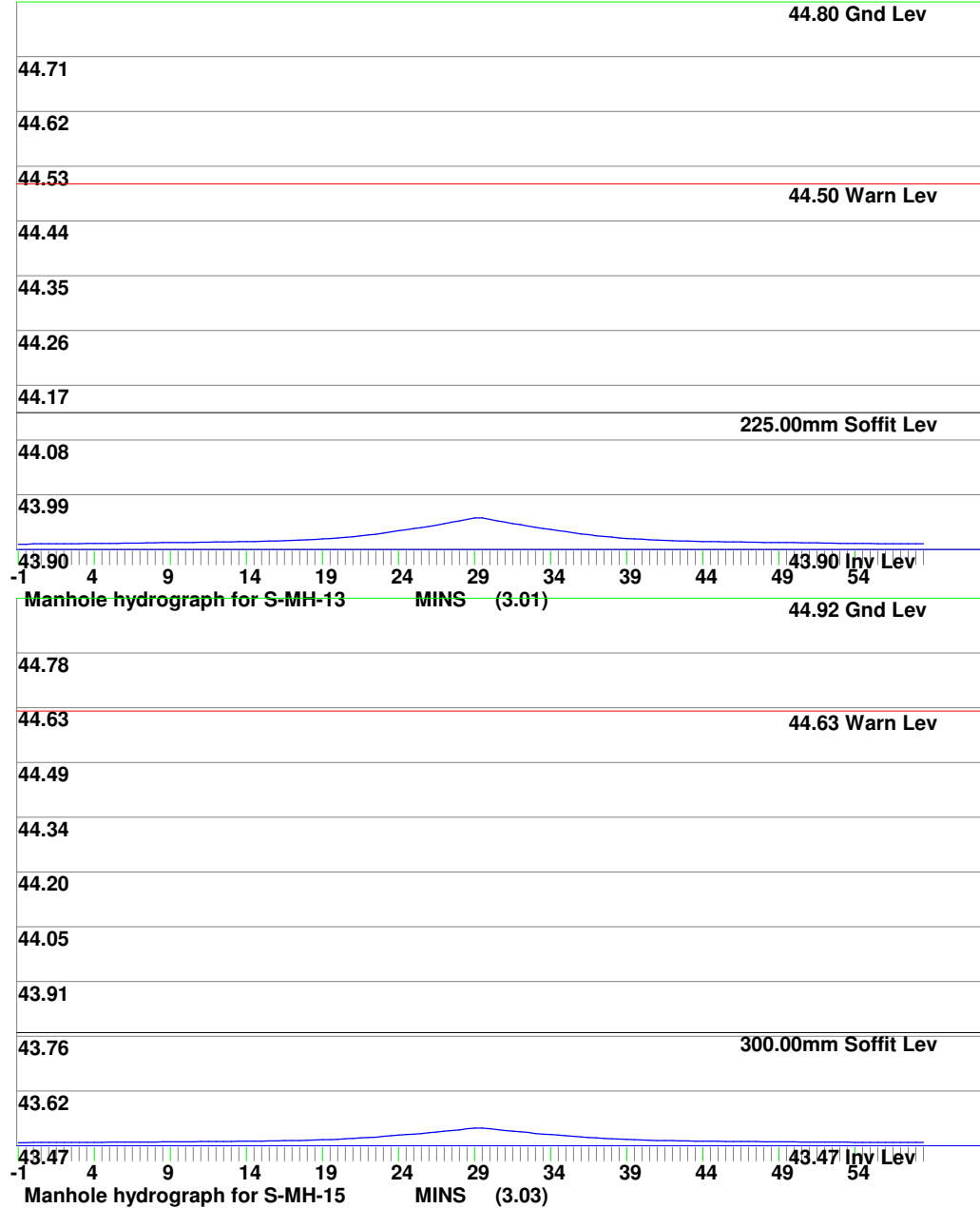
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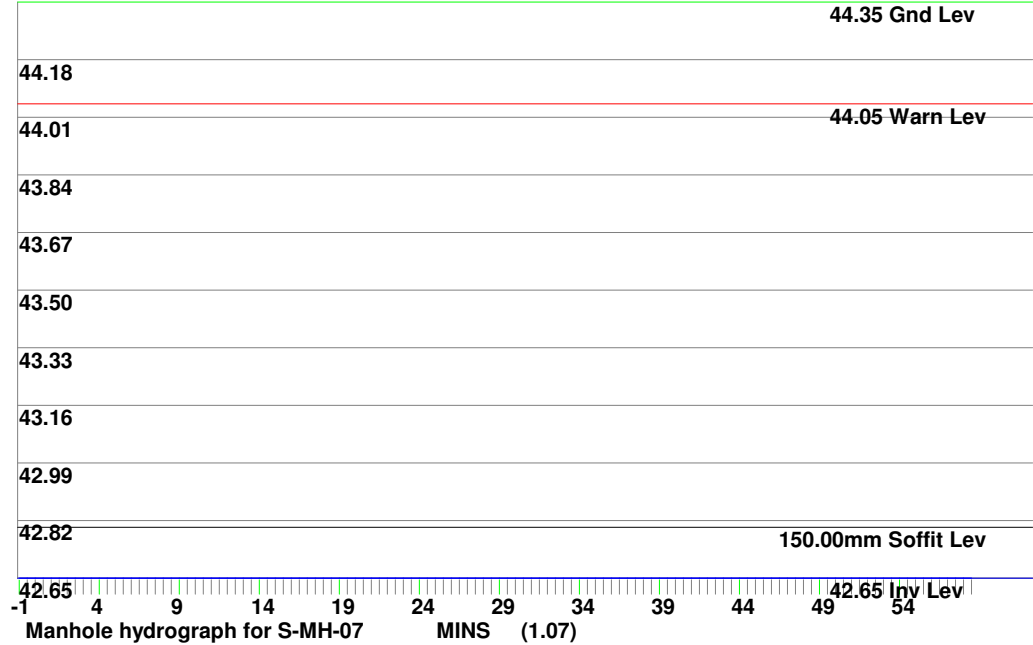
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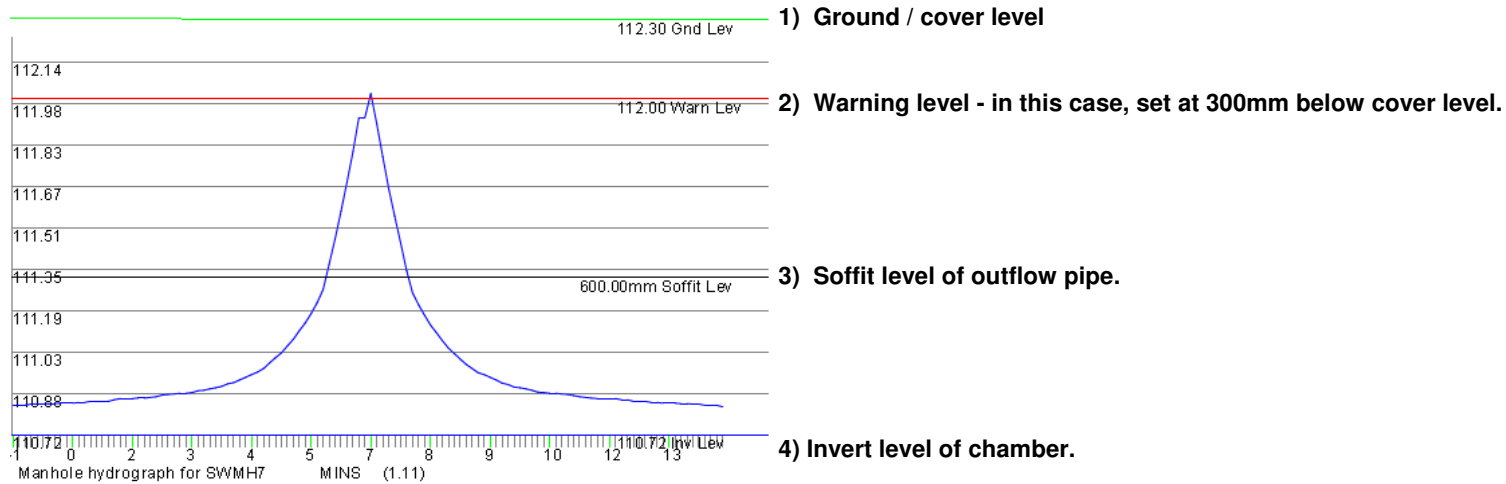
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Notes

- Lower section of the graph shows the water depth filling the channel. Channel is assumed to be a full pipe diameter in depth.
- Upper section of the graph shows the water depth filling the chamber. Chamber has a greater width/diameter than the channel, so increases in depth are proportionally less.
- The top of the graph clips the warning level and would be marked thus on the printout.
- In many cases the invert of the offline storage is required to enter at the channel soffit level, meaning that the pipe will still surcharge but flooding risk reduced.
- The diagram above is a general one and is not part of the current calculation.