

Mason Clark Associates Ltd		Page 3																																										
Church House 44 Newland Park Kingston upon Hull, HU5 2DW																																												
Date 22/02/2021 08:56 File Storage Requirements 10...	Designed by brandon.waddington Checked by																																											
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<u>Rainfall Details</u> <table> <tr> <td>Rainfall Model</td> <td>FSR</td> <td>Winter Storms</td> <td>Yes</td> </tr> <tr> <td>Return Period (years)</td> <td>100</td> <td>Cv (Summer)</td> <td>0.750</td> </tr> <tr> <td>Region</td> <td>England and Wales</td> <td>Cv (Winter)</td> <td>0.840</td> </tr> <tr> <td>M5-60 (mm)</td> <td>19.000</td> <td>Shortest Storm (mins)</td> <td>15</td> </tr> <tr> <td>Ratio R</td> <td>0.309</td> <td>Longest Storm (mins)</td> <td>10080</td> </tr> <tr> <td>Summer Storms</td> <td>Yes</td> <td>Climate Change %</td> <td>+30</td> </tr> </table> <u>Time Area Diagram</u> Total Area (ha) 0.186 <table> <thead> <tr> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> <th>Time (mins)</th> <th>Area</th> </tr> <tr> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> <th>From: To:</th> <th>(ha)</th> </tr> </thead> <tbody> <tr> <td>0 4</td> <td>0.062</td> <td>4 8</td> <td>0.062</td> <td>8 12</td> <td>0.062</td> </tr> </tbody> </table>			Rainfall Model	FSR	Winter Storms	Yes	Return Period (years)	100	Cv (Summer)	0.750	Region	England and Wales	Cv (Winter)	0.840	M5-60 (mm)	19.000	Shortest Storm (mins)	15	Ratio R	0.309	Longest Storm (mins)	10080	Summer Storms	Yes	Climate Change %	+30	Time (mins)	Area	Time (mins)	Area	Time (mins)	Area	From: To:	(ha)	From: To:	(ha)	From: To:	(ha)	0 4	0.062	4 8	0.062	8 12	0.062
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Model Details Storage is Online Cover Level (m) 87.000 Cellular Storage Structure Invert Level (m) 85.600 Safety Factor 2.0 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95 Infiltration Coefficient Side (m/hr) 0.00000 <table><tr><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th><th>Depth (m)</th><th>Area (m²)</th><th>Inf. Area (m²)</th></tr><tr><td>0.000</td><td>50.0</td><td>0.0</td><td>0.801</td><td>0.0</td><td>0.0</td></tr><tr><td>0.800</td><td>50.0</td><td>0.0</td><td></td><td></td><td></td></tr></table> Hydro-Brake® Optimum Outflow Control Unit Reference MD-SHE-0190-1800-1000-1800 Design Head (m) 1.000 Design Flow (l/s) 18.0 Flush-Flo™ Calculated Objective Minimise upstream storage Application Surface Sump Available Yes Diameter (mm) 190 Invert Level (m) 85.600 Minimum Outlet Pipe Diameter (mm) 225 Suggested Manhole Diameter (mm) 1500 <table><tr><th>Control Points</th><th>Head (m)</th><th>Flow (l/s)</th></tr><tr><td>Design Point (Calculated)</td><td>1.000</td><td>18.0</td></tr><tr><td>Flush-Flo™</td><td>0.332</td><td>18.0</td></tr><tr><td>Kick-Flo®</td><td>0.714</td><td>15.3</td></tr><tr><td>Mean Flow over Head Range</td><td>-</td><td>15.2</td></tr></table> The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated <table><tr><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th><th>Depth (m)</th><th>Flow (l/s)</th></tr><tr><td>0.100</td><td>6.6</td><td>1.200</td><td>19.6</td><td>3.000</td><td>30.4</td><td>7.000</td><td>45.8</td></tr><tr><td>0.200</td><td>17.2</td><td>1.400</td><td>21.1</td><td>3.500</td><td>32.8</td><td>7.500</td><td>47.4</td></tr><tr><td>0.300</td><td>18.0</td><td>1.600</td><td>22.5</td><td>4.000</td><td>34.9</td><td>8.000</td><td>48.9</td></tr><tr><td>0.400</td><td>17.9</td><td>1.800</td><td>23.8</td><td>4.500</td><td>37.0</td><td>8.500</td><td>50.3</td></tr><tr><td>0.500</td><td>17.5</td><td>2.000</td><td>25.0</td><td>5.000</td><td>38.9</td><td>9.000</td><td>51.7</td></tr><tr><td>0.600</td><td>17.0</td><td>2.200</td><td>26.2</td><td>5.500</td><td>40.8</td><td>9.500</td><td>53.1</td></tr><tr><td>0.800</td><td>16.2</td><td>2.400</td><td>27.3</td><td>6.000</td><td>42.5</td><td></td><td></td></tr><tr><td>1.000</td><td>18.0</td><td>2.600</td><td>28.4</td><td>6.500</td><td>44.2</td><td></td><td></td></tr></table>			Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	0.000	50.0	0.0	0.801	0.0	0.0	0.800	50.0	0.0				Control Points	Head (m)	Flow (l/s)	Design Point (Calculated)	1.000	18.0	Flush-Flo™	0.332	18.0	Kick-Flo®	0.714	15.3	Mean Flow over Head Range	-	15.2	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	0.100	6.6	1.200	19.6	3.000	30.4	7.000	45.8	0.200	17.2	1.400	21.1	3.500	32.8	7.500	47.4	0.300	18.0	1.600	22.5	4.000	34.9	8.000	48.9	0.400	17.9	1.800	23.8	4.500	37.0	8.500	50.3	0.500	17.5	2.000	25.0	5.000	38.9	9.000	51.7	0.600	17.0	2.200	26.2	5.500	40.8	9.500	53.1	0.800	16.2	2.400	27.3	6.000	42.5			1.000	18.0	2.600	28.4	6.500	44.2		
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