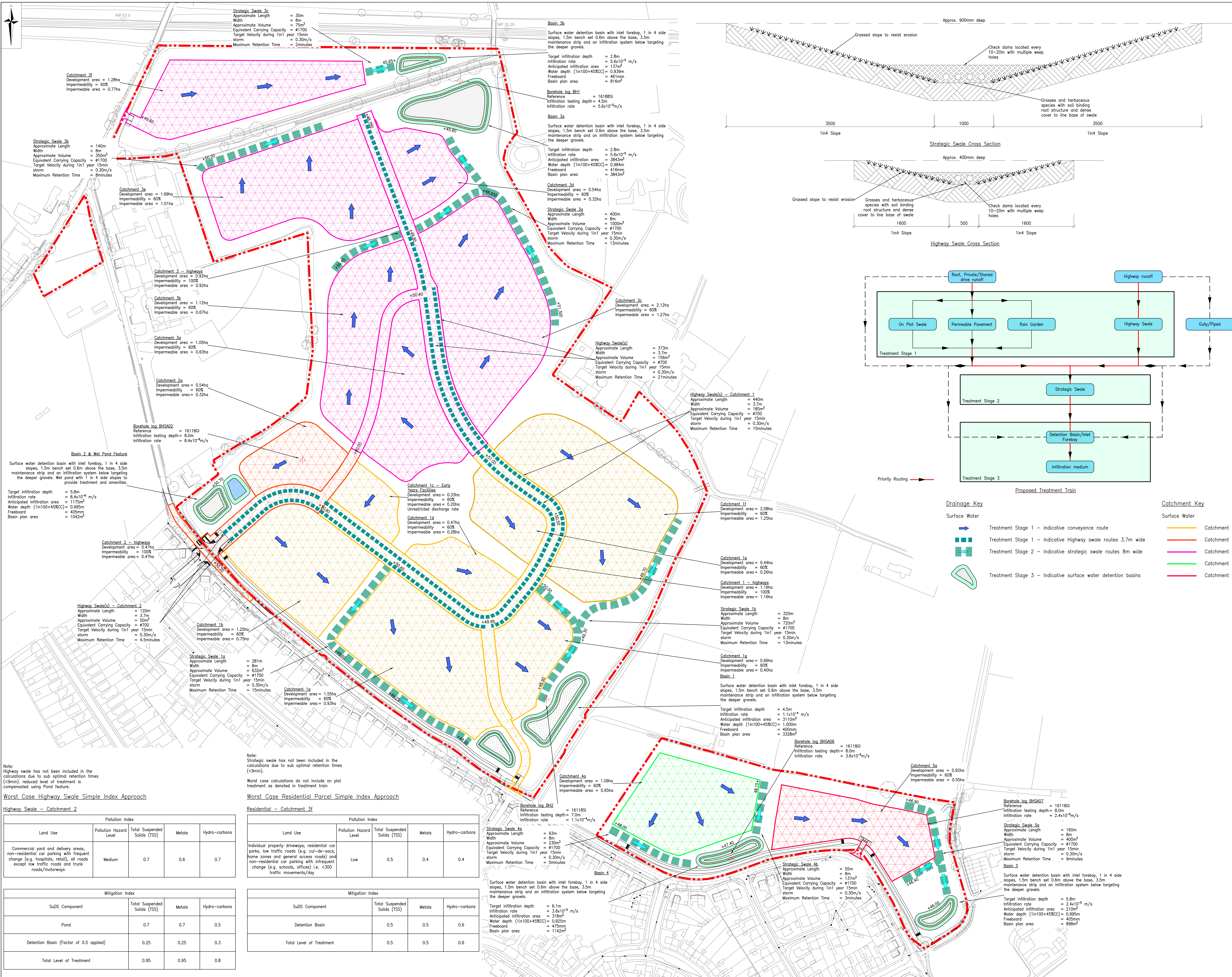




CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing.
Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:

- The information contained within this drawing is subject to discussion and agreement with the local authority and all relevant planning consultees.
- Borehole logs have been taken from RSA Geotechnics Ltd documents:
 - Geotechnical and Geoenvironmental Interpretative Report ref 16118S1 dated November 2022
 - Borehole logs ref 16118G1 dated 27.02.24
- Infiltration results have been taken from RSA Geotechnics Ltd documents:
 - Geotechnical and Geoenvironmental Interpretative Report ref 16118S1 dated November 2022
 - Soakage tests ref 16118G1 dated 27.02.24

P03	08.01.25	Revised to sub LFA comments.	RA	TRF	RD
P02	04.12.24	Revised to sub LFA comments.	RA	TRF	RD
P01	29.02.24	Preliminary issue.	AS	TRF	RD

Rev.	Date	Amendment	Drawn	Chk'd	Ap'd
Rev.	Date	Amendment	Drawn	Chk'd	Ap'd



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Project Title
HUMBER DOUCY LANE, IPSWICH

Status
PLANNING

Drawing Title
**PROPOSED SURFACE WATER
DRAINAGE STRATEGY**

Drawn	Date	Checked	Date	Approved	Date
AS	29.02.24	TRF	29.02.24	RD	29.02.24

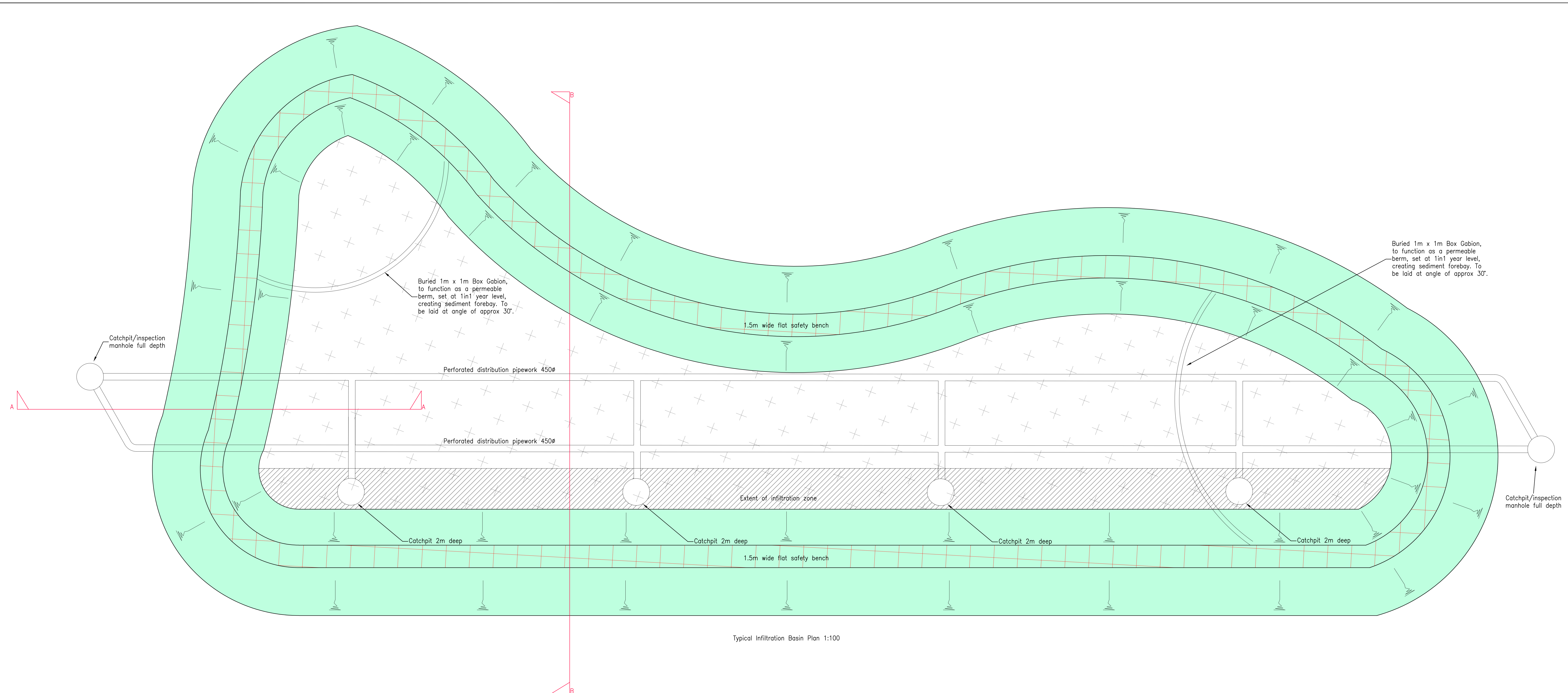
Scale	Orig Size	Dimensions
1:1250	A0	m

Project No.	Project Name	Drawing File
890695	890695-RSK-ZZ-XX-DR-C-0007-Proposed Surface Water Drainage Strategy.dwg	

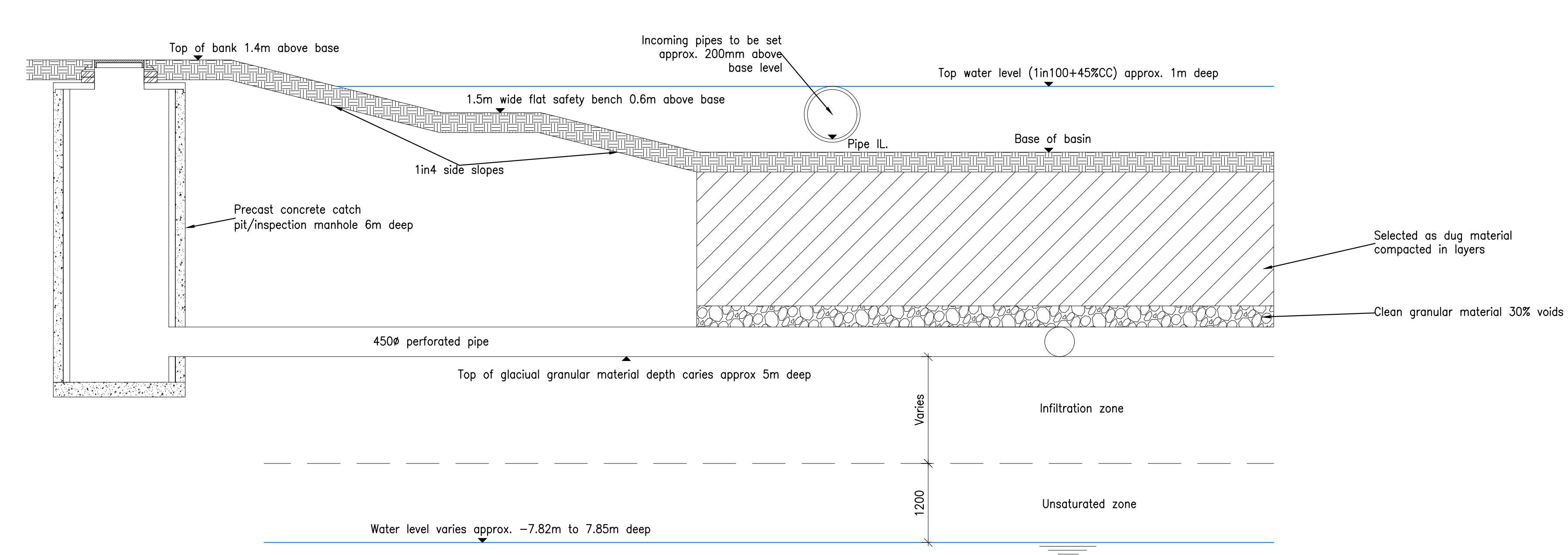
Drawing No.	Rev.
890695	0007

Project	Orig	Vol/Rev	Rev	Rev	Rev
890695	RSK	ZZ	XX	DR	C

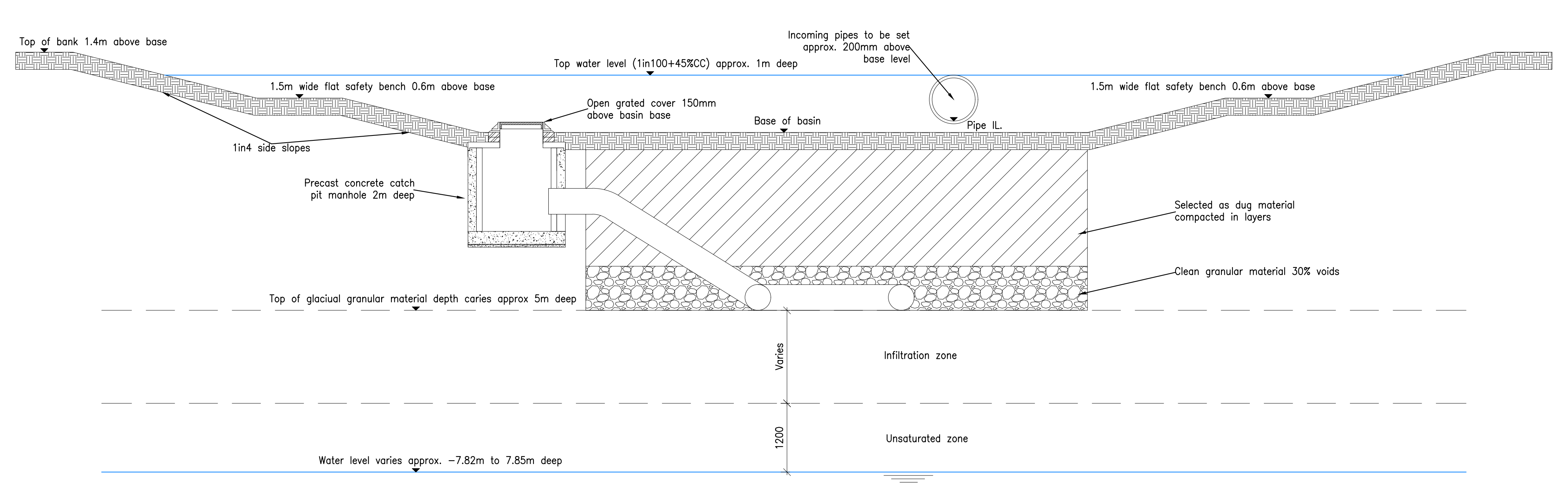
Scale	1:1250
0	25
50	75
100m	



Typical Infiltration Basin Plan 1:100



Typical Infiltration Basin Section A - A 1:50



Typical Infiltration Basin Section B - B 1:50

CIVIL / STRUCTURAL DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

RSK LDE LTD has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing. Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type.

Notes:
1. The information contained within this drawing is subject to discussion and agreement with the local authority and all relevant planning consultees.

P02	08.01.25	Revised to suit LLFA comments.	AS	TRF	RD
P01	29.02.24	Preliminary issue.	AS	TRF	RD
Rev.	Date	Amendment	Drawn	Chk'd	App'd

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Project Title
HUMBER DOUCY LANE, IPSWICH

Status
PLANNING

Drawing Title
PROPOSED SURFACE WATER DRAINAGE DETAILS

Drawn	Date	Checked	Date	Approved	Date
AS	29.02.24	TRF	29.02.24	RD	29.02.24
Scale	Orig Size	Dimensions			
1:1250	A0	m			

Project No. 890695		Drawing File 890695-01-02-03-04-05-06-07-08-09-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1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Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	0.20
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	999.9		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.200	5.00	50.950	1350	618539.063	246782.422	1.650
2	0.247	5.00	50.900	1350	618518.387	246755.127	1.650
3	0.158	5.00	50.450	1350	618569.550	246716.044	1.650
4	0.188	5.00	51.000	1350	618460.807	246750.959	1.650
5	0.188	5.00	50.700	1350	618505.949	246713.629	1.650
6	0.186	5.00	50.250	1200	618582.664	246660.387	1.500
7			50.450		618558.149	246701.821	2.643
8	0.188	5.00	50.800	1350	618436.005	246721.848	1.575
9	0.188	5.00	50.500	1350	618483.024	246678.568	1.575
10	0.186	5.00	49.950	1350	618556.699	246631.899	1.650
11			49.600		618503.640	246631.194	1.882
12	0.186	5.00	49.900	1350	618612.400	246641.621	1.575
13	0.186	5.00	49.550	1350	618595.631	246608.895	1.574
14			48.900		618574.097	246573.041	1.875
15	0.186	5.00	49.300	1350	618639.714	246595.637	1.575
16			48.500		618649.497	246524.079	1.860
17	0.250	5.00	51.000	1350	618739.932	246832.754	1.650
18	0.250	5.00	50.700	1350	618793.536	246801.003	1.650
19	0.250	5.00	50.450	1500	618830.650	246778.255	1.800
20			50.350	1500	618869.991	246758.643	1.800
21			50.000	1500	618831.526	246685.316	1.800
22	0.250	5.00	50.300	1350	618798.644	246760.992	1.650
23	0.250	5.00	50.150	1350	618794.015	246699.217	1.650
24			49.800	1500	618788.010	246667.320	1.800
25	0.096	5.00	51.000	1200	618660.509	246832.497	1.500
26	0.093	5.00	50.850	1200	618697.839	246800.194	1.500
27	0.094	5.00	50.600	1350	618734.690	246772.921	1.575
28	0.080	5.00	50.300	1350	618737.621	246732.670	1.575
29	0.130	5.00	50.800	1350	618678.422	246774.150	1.575
30	0.140	5.00	50.450	1350	618628.747	246706.291	1.500
31			50.600	1350	618654.166	246739.633	1.664
32	0.140	5.00	50.050	1350	618662.975	246679.569	1.500
33	0.130	5.00	50.550	1350	618714.951	246745.261	1.425
34			50.200	1350	618691.906	246710.960	1.663
35	0.131	5.00	49.950	1200	618652.321	246654.149	1.500
36	0.088	5.00	49.700	1350	618693.961	246666.488	1.575
37			50.000	2175	618714.519	246695.298	2.900
38			49.900	2175	618726.696	246683.669	2.801
39	0.133	5.00	49.700	1350	618724.000	246653.953	1.500
40			49.750	2175	618771.141	246641.226	2.712
41	0.064	5.00	49.550	1350	618672.800	246619.498	1.425
42	0.133	5.00	49.700	1350	618704.648	246631.718	1.581
43	0.133	5.00	49.300	1200	618700.926	246591.525	1.500
44			49.100	1350	618724.898	246567.767	1.516
45			49.400	2175	618736.532	246591.475	2.742
46	0.142	5.00	48.300	1200	618701.298	246529.237	1.011
47			47.874		618744.454	246559.316	1.400
47_OUT			48.000	1800	618762.082	246544.375	3.500

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
12.000	1	2	34.242	0.600	49.300	49.250	0.050	684.8	450	5.74	118.1
12.001	2	3	64.383	0.600	49.250	48.800	0.450	143.1	450	6.37	113.2
12.002	3	7	18.228	0.600	48.800	48.032	0.768	23.7	450	6.45	112.6
13.000	4	5	58.578	0.600	49.350	49.050	0.300	195.3	450	5.67	118.7
13.001	5	7	53.519	0.600	49.050	48.032	1.018	52.6	450	5.99	116.0
14.000	6	7	48.143	0.600	48.750	48.182	0.568	84.8	300	5.47	120.4

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
12.003	7	11	89.215	0.080	47.807	47.718	0.089	1002.4	675	13.62	77.2
15.000	8	9	63.906	0.600	49.225	48.925	0.300	213.0	375	5.86	117.1
15.001	9	11	51.665	0.600	48.925	48.018	0.907	57.0	375	6.22	114.3
16.000	10	11	53.064	0.600	48.300	47.943	0.357	148.6	450	5.53	119.9
12.004	11	14	91.356	0.080	47.718	47.025	0.693	131.8	675	16.29	69.5
17.000	12	13	36.772	0.600	48.325	47.976	0.349	105.4	375	5.35	121.4
17.001	13	14	41.824	0.600	47.976	47.325	0.651	64.2	375	5.66	118.8
12.005	14	16	89.902	0.080	47.025	46.640	0.385	233.5	675	19.77	61.9
18.000	15	16	72.224	0.600	47.725	46.940	0.785	92.0	375	5.64	119.0
12.006	16	47	16.000	0.080	46.640	46.624	0.016	1000.0	675	21.06	59.5
1.000	17	18	62.302	0.600	49.350	49.050	0.300	207.7	450	5.74	118.1
1.001	18	19	43.531	0.600	49.050	48.800	0.250	174.1	450	6.21	114.4
1.002	19	20	43.958	0.600	48.650	48.550	0.100	439.6	600	6.84	109.7
1.003	20	21	82.803	0.600	48.550	48.200	0.350	236.6	600	7.72	103.8
1.004	21	24	47.090	0.600	48.200	48.000	0.200	235.5	600	8.21	100.8
2.000	22	23	61.948	0.600	48.650	48.500	0.150	413.0	450	6.04	115.7
2.001	23	24	32.457	0.600	48.500	48.150	0.350	92.7	450	6.30	113.7
1.005	24	40	31.072	0.600	48.000	47.713	0.287	108.3	600	8.44	99.5
3.000	25	26	49.366	0.600	49.500	49.350	0.150	329.1	300	5.96	116.3
3.001	26	27	45.846	0.600	49.350	49.100	0.250	183.4	300	6.62	111.4
3.002	27	28	40.358	0.600	49.025	48.725	0.300	134.5	375	7.05	108.2
3.003	28	37	43.936	0.600	48.725	48.000	0.725	60.6	375	7.36	106.1
4.000	29	31	42.187	0.600	49.225	49.011	0.214	197.1	375	5.55	119.7
5.000	30	31	41.926	0.600	48.950	48.936	0.014	2994.7	450	6.93	108.8
4.001	31	34	47.397	0.600	48.936	48.537	0.399	118.8	450	7.35	106.0
6.000	32	34	42.690	0.600	48.550	48.537	0.013	3283.8	450	7.06	108.0
7.000	33	34	41.323	0.600	49.125	48.612	0.513	80.6	375	5.34	121.4
4.002	34	37	27.507	0.600	48.537	47.925	0.612	44.9	450	7.51	105.0
8.000	35	36	43.430	0.600	48.450	48.200	0.250	173.7	300	5.61	119.2
8.001	36	37	35.393	0.600	48.125	48.000	0.125	283.1	375	6.16	114.8
3.004	37	38	16.838	0.600	47.100	47.099	0.001	16838.0	1500	8.38	99.6
3.005	38	40	61.455	0.600	47.099	47.038	0.061	1007.5	1275	9.23	95.0
9.000	39	40	48.829	0.600	48.200	47.938	0.262	186.4	375	5.61	119.2
1.006	40	45	60.605	0.600	47.038	46.658	0.380	159.5	1275	9.55	93.3
10.000	41	42	34.112	0.600	48.125	48.119	0.006	5685.3	375	7.46	105.9
10.001	42	45	51.343	0.600	48.119	47.558	0.561	91.5	375	7.92	102.9
11.000	43	44	33.751	0.600	47.800	47.659	0.141	239.4	300	5.56	119.6
11.001	44	45	26.409	0.600	47.584	47.558	0.026	1015.7	375	6.34	113.4
1.007_1	45	47	33.120	0.600	46.658	46.625	0.033	1003.6	1100	10.05	91.0
19.000	46	47	52.604	0.600	47.289	46.999	0.290	181.4	300	5.75	118.0
1.007	47	47_OUT	23.108	0.600	46.474	44.500	1.974	11.7	825	21.10	92.2

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

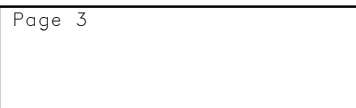
Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node 47 Online Orifice Control

Flap Valve	x	Invert Level (m)	47.873	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.500		

Node 47 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.39600	Safety Factor	2.0	Invert Level (m)	46.474
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	140



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**Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.74%**

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	50.060	0.760	152.8	1.0869	0.0000	SURCHARGED
15 minute summer	2	11	49.968	0.718	337.0	1.0274	0.0000	SURCHARGED
15 minute summer	3	11	49.104	0.304	447.6	0.4347	0.0000	OK
15 minute summer	4	10	49.617	0.267	143.6	0.3815	0.0000	OK
15 minute summer	5	10	49.307	0.257	285.8	0.3679	0.0000	OK
15 minute summer	6	11	49.287	0.537	142.1	0.6071	0.0000	SURCHARGED
15 minute summer	7	12	48.525	0.718	863.1	0.0000	0.0000	SURCHARGED
15 minute summer	8	11	49.565	0.340	143.6	0.4872	0.0000	OK
15 minute summer	9	11	49.271	0.346	283.5	0.4952	0.0000	OK
15 minute summer	10	10	48.536	0.236	142.1	0.3379	0.0000	OK
15 minute summer	11	13	48.281	0.563	1137.9	0.0000	0.0000	OK
15 minute summer	12	11	48.705	0.380	142.1	0.5442	0.0000	SURCHARGED
15 minute summer	13	11	48.496	0.520	270.3	0.7447	0.0000	SURCHARGED
30 minute summer	14	23	47.661	0.636	1076.0	0.0000	0.0000	OK
15 minute summer	15	10	47.951	0.226	142.1	0.3241	0.0000	OK
120 minute winter	16	120	47.475	0.835	501.8	0.0000	0.0000	SURCHARGED
15 minute summer	17	11	50.908	1.558	190.9	2.2301	0.0000	FLOOD RISK
15 minute summer	18	11	50.700	1.650	362.1	2.3612	2.8162	FLOOD
15 minute summer	19	11	50.166	1.516	521.7	2.6782	0.0000	FLOOD RISK
15 minute summer	20	11	49.852	1.302	500.8	2.3007	0.0000	SURCHARGED
15 minute summer	21	11	49.338	1.138	502.0	2.0102	0.0000	SURCHARGED
15 minute summer	22	11	49.813	1.163	190.9	1.6645	0.0000	SURCHARGED
15 minute summer	23	11	49.579	1.079	368.1	1.5446	0.0000	SURCHARGED
15 minute summer	24	11	49.010	1.010	872.4	1.7847	0.0000	SURCHARGED
15 minute summer	25	11	50.657	1.157	73.3	1.3088	0.0000	SURCHARGED
15 minute summer	26	11	50.428	1.078	137.5	1.2189	0.0000	SURCHARGED
15 minute summer	27	11	49.604	0.579	205.7	0.8279	0.0000	SURCHARGED
15 minute summer	28	12	49.119	0.394	262.4	0.5641	0.0000	SURCHARGED
15 minute summer	29	10	49.465	0.240	99.3	0.3435	0.0000	OK
15 minute summer	30	10	49.317	0.367	106.9	0.5251	0.0000	OK
15 minute summer	31	11	49.229	0.293	202.0	0.4190	0.0000	OK
15 minute summer	32	11	48.957	0.407	106.9	0.5829	0.0000	OK
15 minute summer	33	10	49.303	0.178	99.3	0.2545	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	12.000	2	148.3	0.936	1.212	5.4254	
15 minute summer	2	12.001	3	332.5	2.345	1.232	8.7653	
15 minute summer	3	12.002	7	448.2	3.628	0.673	2.4816	
15 minute summer	4	13.000	5	142.2	1.496	0.616	5.6056	
15 minute summer	5	13.001	7	283.6	2.455	0.635	6.6926	
15 minute summer	6	14.000	7	137.0	1.945	1.134	3.3902	
15 minute summer	7	12.003	11	758.4	0.351	1.465	201.9929	
15 minute summer	8	15.000	9	140.0	1.345	1.024	6.7589	
15 minute summer	9	15.001	11	278.6	2.682	1.049	5.5394	
15 minute summer	10	16.000	11	139.8	1.699	0.528	5.0031	
15 minute summer	11	12.004	14	939.7	0.513	0.658	176.5901	
15 minute summer	12	17.000	13	134.8	1.465	0.692	4.0558	
15 minute summer	13	17.001	14	269.1	2.499	1.076	4.5577	
30 minute summer	14	12.005	16	914.5	0.426	0.853	193.6479	
15 minute summer	15	18.000	16	138.8	2.047	0.665	4.9315	
120 minute winter	16	12.006	47	423.1	0.478	0.816	58.9153	
15 minute summer	17	1.000	18	180.1	1.137	0.805	9.8713	
15 minute summer	18	1.001	19	330.9	2.088	1.353	6.8972	
15 minute summer	19	1.002	20	500.8	1.778	1.534	12.3820	
15 minute summer	20	1.003	21	502.0	1.782	1.125	23.3237	
15 minute summer	21	1.004	24	501.8	1.782	1.122	13.2642	
15 minute summer	22	2.000	23	186.0	1.174	1.177	9.8153	
15 minute summer	23	2.001	24	370.7	2.340	1.104	5.1426	
15 minute summer	24	1.005	40	873.0	3.100	1.320	8.6498	
15 minute summer	25	3.000	26	69.7	0.990	1.145	3.4763	
15 minute summer	26	3.001	27	137.2	1.948	1.676	3.2284	
15 minute summer	27	3.002	28	204.1	1.851	1.184	4.4514	
15 minute summer	28	3.003	37	250.9	2.594	0.975	4.4403	
15 minute summer	29	4.000	31	97.3	1.372	0.685	3.0128	
15 minute summer	30	5.000	31	104.7	0.841	1.818	5.1856	
15 minute summer	31	4.001	34	203.5	1.632	0.687	5.8784	
15 minute summer	32	6.000	34	102.6	0.737	1.868	6.1846	
15 minute summer	33	7.000	34	98.4	1.681	0.441	2.9096	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.74%

Node	Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute	summer	34	11	48.905	0.368	401.7	0.5270	0.0000	OK
15 minute	summer	35	10	49.008	0.558	100.1	0.6306	0.0000	SURCHARGED
15 minute	summer	36	10	48.595	0.470	165.6	0.6728	0.0000	SURCHARGED
15 minute	summer	37	12	47.863	0.763	816.8	2.8347	0.0000	OK
15 minute	summer	38	12	47.834	0.735	804.5	2.7315	0.0000	OK
15 minute	summer	39	10	48.437	0.237	101.6	0.3397	0.0000	OK
15 minute	summer	40	12	47.770	0.732	1719.8	2.7177	0.0000	OK
15 minute	summer	41	10	48.403	0.278	48.9	0.3973	0.0000	OK
15 minute	summer	42	11	48.362	0.243	149.1	0.3473	0.0000	OK
15 minute	summer	43	10	48.229	0.429	101.6	0.4855	0.0000	SURCHARGED
15 minute	summer	44	11	47.918	0.334	100.4	0.4778	0.0000	OK
15 minute	summer	45	12	47.620	0.962	1955.1	3.5751	0.0000	OK
15 minute	summer	46	11	47.712	0.423	108.5	0.4781	0.0000	SURCHARGED
120 minute	winter	47	120	47.474	1.000	1105.1	2031.2490	0.0000	SURCHARGED
15 minute	summer	47_OUT	1	44.500	0.000	0.0	0.0000	0.0000	OK
Link	Event	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute	summer	34	4.002	37	402.9	3.163	0.834	3.4918	
15 minute	summer	35	8.000	36	98.4	1.397	1.170	3.0583	
15 minute	summer	36	8.001	37	163.4	1.512	1.381	3.6110	
15 minute	summer	37	3.004	38	804.5	1.039	1.422	14.8015	
15 minute	summer	38	3.005	40	801.2	1.084	0.517	46.5649	
15 minute	summer	39	9.000	40	99.4	1.415	0.680	3.4535	
15 minute	summer	40	1.006	45	1731.1	1.928	0.441	54.1281	
15 minute	summer	41	10.000	42	47.6	0.583	1.866	2.7786	
15 minute	summer	42	10.001	45	147.0	2.022	0.703	3.7326	
15 minute	summer	43	11.000	44	100.4	1.434	1.405	2.2791	
15 minute	summer	44	11.001	45	99.4	1.115	1.607	2.3140	
15 minute	summer	45	1.007_1	47	1965.9	2.429	1.862	26.6255	
15 minute	summer	46	19.000	47	105.6	1.512	1.283	3.5096	
120 minute	winter	47	Orifice	47_OUT	0.0				0.0
120 minute	winter	47	Infiltration		171.1				

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	20	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	999.9		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.141	5.00	50.750	1200	618373.834	246723.352	1.382
3	0.198	5.00	51.100	1200	618458.853	246785.565	1.500
4	0.124	5.00	51.100	1500	618425.169	246769.536	2.239
5	0.160	5.00	51.200	1200	618482.461	246837.701	1.500
6	0.160	5.00	50.800	1350	618428.639	246810.153	1.575
7			50.200	1350	618404.398	246790.966	1.400
7_OUT			50.500	1350	618421.146	246818.956	3.500

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	4	69.052	0.600	49.368	49.086	0.282	244.9	300	6.15	106.2
2.000	3	4	37.303	0.600	49.600	49.086	0.514	72.6	300	5.34	112.6
1.001	4	7	29.844	0.600	48.861	48.800	0.061	489.3	525	6.65	102.7
3.000	5	6	60.462	0.600	49.700	49.300	0.400	151.2	300	5.79	109.0
3.001	6	7	30.915	0.600	49.225	48.875	0.350	88.3	375	6.06	106.9
1.004	7	7_OUT	32.618	0.600	48.800	47.000	1.800	18.1	450	6.76	96.3

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node 7 Online Orifice Control

Flap Valve	x	Invert Level (m)	50.100	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.500		

Node 7 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.03024	Safety Factor	2.0	Invert Level (m)	48.800
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	1008

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	341.0	1175.0	0.600	542.0	1175.0	0.601	686.0	1175.0	1.400	1042.0	1175.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.23%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
30 minute summer	1	18	49.942	0.574	96.5	0.6489	0.0000	SURCHARGED
15 minute summer	3	10	50.166	0.566	151.1	0.6399	0.0000	SURCHARGED
480 minute winter	4	472	49.795	0.934	37.7	1.6500	0.0000	SURCHARGED
15 minute summer	5	10	50.548	0.848	122.1	0.9588	0.0000	SURCHARGED
480 minute winter	6	472	49.795	0.570	26.0	0.8154	0.0000	SURCHARGED
480 minute winter	7	472	49.795	0.995	61.9	571.6663	0.0000	SURCHARGED
15 minute summer	7_OUT	1	47.000	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
30 minute summer	1	1.000	4	93.8	1.332	1.327	4.8626	
15 minute summer	3	2.000	4	150.1	2.131	1.149	2.5920	
480 minute winter	4	1.001	7	37.0	0.760	0.170	6.4473	
15 minute summer	5	3.000	6	119.0	1.690	1.319	4.2577	
480 minute winter	6	3.001	7	24.9	0.834	0.117	3.4098	
480 minute winter	7	Orifice	7_OUT	0.0				0.0
480 minute winter	7	Infiltration		4.9				

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	50	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	1.000
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	999.9		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.157	5.00	51.000	1350	618620.098	246845.505	1.650
2	0.157	5.00	51.100	1350	618582.829	246909.357	1.932
3	0.134	5.00	50.900	1500	618540.598	246952.071	1.955
4	0.157	5.00	51.100	1350	618582.268	246840.464	1.650
5	0.134	5.00	51.100	1350	618527.407	246902.235	1.853
6	0.134	5.00	50.850	1500	618511.217	246967.607	2.048
7	0.157	5.00	50.900	1350	618584.279	246955.455	1.650
8	0.134	5.00	50.600	1350	618549.523	246993.361	1.650
9			50.450	1500	618511.593	247026.374	1.800
10	0.134	5.00	50.350	1350	618570.859	247019.127	1.650
11			50.050	1800	618566.775	247054.901	2.025
12	0.092	5.00	50.950	1350	618635.877	246870.927	1.650
13	0.103	5.00	51.000	1350	618617.514	246918.243	1.825
14	0.096	5.00	50.950	1350	618612.284	246961.670	1.883
15	0.303	5.00	50.450	1350	618602.882	247008.416	1.650
16	0.051	5.00	49.950	1800	618586.744	247062.845	2.025
17	0.181	5.00	51.000	1350	618672.608	246909.422	1.650
18	0.181	5.00	50.800	1350	618659.268	246950.379	1.650
19	0.181	5.00	50.850	1500	618705.242	246959.922	1.966
20			50.680	1500	618739.039	246962.727	1.855
21	0.181	5.00	50.450	1350	618648.395	247004.461	1.650
22	0.181	5.00	51.000	1350	618682.433	247023.048	2.296
23			49.950	1500	618717.040	247033.033	1.800
24	0.181	5.00	49.800	1350	618628.042	247047.246	1.650
25	0.181	5.00	50.200	1350	618660.326	247072.145	2.150
26			48.650	1800	618668.615	247102.988	2.025
27	0.106	5.00	48.950	1350	618610.757	247105.243	1.650
28			48.300	1800	618655.389	247120.149	2.025
29	0.106	5.00	48.150	1350	618586.651	247157.237	1.650
30	0.106	5.00	48.600	1350	618597.966	247129.703	1.650
31			47.800	1800	618634.127	247147.928	2.025
32	0.144	5.00	50.450	1350	618410.512	247079.271	1.650
33	0.144	5.00	50.200	1350	618399.192	247123.369	1.650
34			50.200	1350	618378.429	247134.239	1.708
35	0.144	5.00	49.050	1350	618540.115	247074.422	1.650
36	0.144	5.00	49.450	1350	618522.788	247113.903	2.156
37	0.144	5.00	49.850	1500	618508.794	247143.877	2.713
38	0.144	5.00	50.100	1350	618459.719	247096.817	1.650
39	0.144	5.00	49.700	1350	618453.482	247139.761	1.650
40			49.000	1500	618489.249	247171.022	1.931
41	0.065	5.00	49.500	1350	618579.615	247079.384	1.650
42	0.000	5.00	48.950	1350	618563.253	247125.653	1.650
43	0.133	5.00	48.350	1500	618543.243	247171.747	1.725
44			47.900	1500	618564.386	247183.012	1.725
45	0.192	5.00	49.980	1350	618328.382	247189.999	1.650
46	0.192	5.00	49.490	1350	618373.474	247198.435	1.650
47	0.192	5.00	48.790	1350	618430.706	247215.058	1.650
48	0.192	5.00	47.930	1350	618499.042	247225.949	1.650
49			47.102	1350	618555.570	247231.834	1.650
50			45.646	1800	618593.338	247236.784	1.400
31_OUT			45.600	1800	618643.160	247200.688	1.400
Dummy			45.634	1800	618646.160	247208.688	2.100

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	73.933	0.600	49.350	49.168	0.182	406.2	450	6.23	125.1
1.001	2	3	60.066	0.600	49.168	49.020	0.148	405.9	450	7.23	117.4
1.002	3	6	33.236	0.600	48.945	48.877	0.068	488.8	525	7.78	113.6
2.000	4	5	82.616	0.600	49.450	49.247	0.203	407.0	450	6.38	124.0
2.001	5	6	67.347	0.600	49.247	48.952	0.295	228.3	450	7.21	117.5
1.003	6	9	58.768	0.600	48.802	48.650	0.152	386.6	600	8.57	108.5
3.000	7	8	51.428	0.600	49.250	48.950	0.300	171.4	450	5.55	130.8
3.001	8	9	50.285	0.600	48.950	48.800	0.150	335.2	450	6.31	124.5
1.004	9	11	62.120	0.600	48.650	48.250	0.400	155.3	600	9.10	105.4
4.000	10	11	36.006	0.600	48.700	48.400	0.300	120.0	450	5.32	132.8
1.005	11	16	21.491	0.600	48.025	47.925	0.100	214.9	825	9.28	104.4
5.000	12	13	50.754	0.600	49.300	49.175	0.125	406.0	450	5.84	128.3
5.001	13	14	43.741	0.600	49.175	49.067	0.108	405.0	450	6.57	122.4
5.002	14	15	47.682	0.600	49.067	48.800	0.267	178.6	450	7.09	118.4
5.003	15	16	56.771	0.600	48.800	48.300	0.500	113.5	450	7.59	114.9
1.006	16	26	91.183	0.600	47.925	46.625	1.300	70.1	825	9.71	102.1
6.000	17	19	60.127	0.600	49.350	49.034	0.316	190.3	450	5.68	129.7
7.000	18	19	46.954	0.600	49.150	49.034	0.116	404.8	450	5.78	128.8
6.001	19	20	33.913	0.600	48.884	48.825	0.059	574.8	600	6.34	124.2
6.002	20	23	73.667	0.600	48.825	48.150	0.675	109.1	600	6.87	120.1
8.000	21	22	38.782	0.600	48.800	48.704	0.096	404.0	450	5.64	130.0
8.001	22	23	36.019	0.600	48.704	48.300	0.404	89.2	450	5.92	127.6
6.003	23	26	85.080	0.600	48.150	46.850	1.300	65.4	600	7.34	116.7
9.000	24	25	40.770	0.600	48.150	48.050	0.100	407.7	450	5.68	129.7
9.001	25	26	31.937	0.600	48.050	47.000	1.050	30.4	450	5.82	128.5
1.007	26	28	21.666	0.600	46.625	46.275	0.350	61.9	825	9.81	101.5
10.000	27	28	47.055	0.600	47.300	46.650	0.650	72.4	450	5.33	132.8
1.008	28	31	34.982	0.600	46.275	45.775	0.500	70.0	825	9.97	100.7
11.000	29	31	48.380	0.600	46.500	46.150	0.350	138.2	450	5.47	131.6
12.000	30	31	40.494	0.600	46.950	46.150	0.800	50.6	450	5.24	133.6
1.009	31	31_OUT	53.528	0.600	45.775	44.275	1.500	35.7	825	10.15	99.8
13.000	32	33	45.528	0.600	48.800	48.550	0.250	182.1	450	5.50	131.2
13.001	33	34	23.436	0.600	48.550	48.492	0.058	404.1	450	5.89	127.9
13.002	34	40	116.765	0.600	48.492	47.144	1.348	86.6	450	6.78	120.7
14.000	35	36	43.116	0.600	47.400	47.294	0.106	406.8	450	5.72	129.4
14.001	36	37	33.080	0.600	47.294	47.212	0.082	403.4	450	6.27	124.8
14.002	37	40	33.449	0.600	47.137	47.069	0.068	491.9	525	6.82	120.4
15.000	38	39	43.395	0.600	48.450	48.050	0.400	108.5	450	5.37	132.4
15.001	39	40	47.503	0.600	48.050	47.144	0.906	52.4	450	5.65	129.9
13.003	40	43	53.999	0.600	47.069	46.625	0.444	121.6	525	7.26	117.2
16.000	41	42	49.077	0.600	47.850	47.300	0.550	89.2	450	5.38	132.3
16.001	42	43	50.250	0.600	47.300	46.700	0.600	83.7	450	5.76	129.0
13.004	43	44	23.957	0.600	46.625	46.175	0.450	53.2	525	7.39	116.3
13.005	44	31_OUT	80.733	0.600	46.175	44.575	1.600	50.5	525	7.82	113.3
17.000	45	46	45.874	0.600	48.330	47.840	0.490	93.6	450	5.36	132.5
17.001	46	47	59.597	0.600	47.840	47.140	0.700	85.1	450	5.81	128.5
17.002	47	48	69.198	0.600	47.140	46.280	0.860	80.5	450	6.32	124.4
17.003	48	49	56.834	0.600	46.280	45.452	0.828	68.6	450	6.71	121.3
17.004	49	50	38.091	0.600	45.452	44.246	1.206	31.6	450	6.88	119.9
17.005	50	31_OUT	44.000	0.600	44.246	44.200	0.046	956.5	900	7.61	103.3
1.010	31_OUT	Dummy	8.544	0.600	44.200	43.534	0.666	12.8	900	10.16	89.0

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m ³ /ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node 31_OUT Online Orifice Control

Flap Valve	x	Invert Level (m)	45.500	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.500		

Node 50 Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.20160	Safety Factor	2.0	Invert Level (m)	44.246
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	164
Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	90.7	137.0	0.600	286.0	137.0
			0.601	440.0	137.0
			1.400	816.0	137.0

Node 31_OUT Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.20160	Safety Factor	2.0	Invert Level (m)	44.200
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	244
Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	2170.0	3843.0	0.600	2700.0	3843.0
			0.601	3050.0	3843.0
			1.400	3843.0	3843.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	12	50.775	1.425	119.8	2.0394	0.0000	FLOOD RISK
15 minute summer	2	12	50.704	1.536	233.8	2.1985	0.0000	SURCHARGED
15 minute summer	3	12	50.405	1.460	315.2	2.5806	0.0000	SURCHARGED
15 minute summer	4	11	50.790	1.340	119.8	1.9180	0.0000	SURCHARGED
15 minute summer	5	11	50.700	1.453	212.9	2.0787	0.0000	SURCHARGED
15 minute summer	6	12	50.231	1.429	597.4	2.5251	0.0000	SURCHARGED
15 minute summer	7	11	50.039	0.789	119.8	1.1285	0.0000	SURCHARGED
15 minute summer	8	11	49.946	0.996	214.3	1.4256	0.0000	SURCHARGED
15 minute summer	9	12	49.717	1.067	776.7	1.8862	0.0000	SURCHARGED
15 minute summer	10	10	48.891	0.191	102.2	0.2739	0.0000	OK
15 minute summer	11	12	48.756	0.731	854.8	1.8608	0.0000	OK
15 minute summer	12	11	50.104	0.804	70.2	1.1511	0.0000	SURCHARGED
15 minute summer	13	11	50.090	0.915	142.8	1.3090	0.0000	SURCHARGED
15 minute summer	14	11	50.045	0.978	203.6	1.3990	0.0000	SURCHARGED
15 minute summer	15	11	49.793	0.993	424.7	1.4216	0.0000	SURCHARGED
15 minute summer	16	12	48.646	0.721	1254.1	1.8358	0.0000	OK
15 minute summer	17	10	49.597	0.247	138.1	0.3532	0.0000	OK
15 minute summer	18	11	49.499	0.349	138.1	0.4996	0.0000	OK
15 minute summer	19	11	49.400	0.516	410.0	0.9114	0.0000	OK
15 minute summer	20	11	49.183	0.358	404.5	0.6322	0.0000	OK
15 minute summer	21	10	49.146	0.346	138.1	0.4952	0.0000	OK
15 minute summer	22	10	49.037	0.333	274.2	0.4763	0.0000	OK
15 minute summer	23	13	48.748	0.598	673.5	1.0568	0.0000	OK
15 minute summer	24	11	48.463	0.313	138.1	0.4476	0.0000	OK
15 minute summer	25	12	48.319	0.269	274.7	0.3846	0.0000	OK
15 minute summer	26	12	48.129	1.504	1995.3	3.8283	0.0000	SURCHARGED
15 minute summer	27	10	47.438	0.138	80.9	0.1979	0.0000	OK
15 minute summer	28	12	47.441	1.166	2062.5	2.9663	0.0000	SURCHARGED
15 minute summer	29	10	46.672	0.172	80.9	0.2456	0.0000	OK
15 minute summer	30	9	47.077	0.127	80.9	0.1820	0.0000	OK
15 minute summer	31	12	46.449	0.674	2193.5	1.7146	0.0000	OK
15 minute summer	32	10	49.009	0.209	109.9	0.2990	0.0000	OK
15 minute summer	33	12	48.948	0.398	218.8	0.5699	0.0000	OK

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	114.0	0.779	0.715	11.7142	
15 minute summer	2	1.001	3	217.8	1.375	1.366	9.5171	
15 minute summer	3	1.002	6	301.7	1.397	1.385	7.1801	
15 minute summer	4	2.000	5	115.4	0.938	0.725	13.0900	
15 minute summer	5	2.001	6	211.9	1.338	0.994	10.6707	
15 minute summer	6	1.003	9	576.3	2.046	1.654	16.5536	
15 minute summer	7	3.000	8	116.8	1.023	0.474	8.1484	
15 minute summer	8	3.001	9	202.1	1.318	1.150	7.9673	
15 minute summer	9	1.004	11	771.8	2.741	1.399	17.1580	
15 minute summer	10	4.000	11	101.0	1.648	0.343	3.3324	
15 minute summer	11	1.005	16	830.3	2.163	0.769	10.6810	
15 minute summer	12	5.000	13	71.2	0.642	0.447	8.0416	
15 minute summer	13	5.001	14	140.1	1.032	0.877	6.9305	
15 minute summer	14	5.002	15	205.1	1.338	0.849	7.5549	
15 minute summer	15	5.003	16	393.3	2.483	1.297	8.8522	
15 minute summer	16	1.006	26	1211.7	2.406	0.639	46.8410	
15 minute summer	17	6.000	19	138.1	1.242	0.591	6.7512	
15 minute summer	18	7.000	19	133.9	1.048	0.839	6.3385	
15 minute summer	19	6.001	20	404.5	1.897	1.419	7.3419	
15 minute summer	20	6.002	23	408.5	2.075	0.620	16.1827	
15 minute summer	21	8.000	22	136.1	1.061	0.852	4.9747	
15 minute summer	22	8.001	23	269.4	2.287	0.786	4.8066	
15 minute summer	23	6.003	26	623.8	2.544	0.732	23.9462	
15 minute summer	24	9.000	25	136.6	1.417	0.859	4.3216	
15 minute summer	25	9.001	26	260.8	3.114	0.444	4.1072	
15 minute summer	26	1.007	28	1999.8	3.751	0.991	11.5509	
15 minute summer	27	10.000	28	80.3	1.660	0.211	4.6756	
15 minute summer	28	1.008	31	2061.6	3.923	1.086	17.4778	
15 minute summer	29	11.000	31	80.8	1.424	0.294	3.7982	
15 minute summer	30	12.000	31	80.6	2.078	0.177	2.8937	
15 minute summer	31	1.009	31_OUT	2173.3	5.180	0.817	22.4373	
15 minute summer	32	13.000	33	108.9	0.992	0.456	4.9434	
15 minute summer	33	13.001	34	215.2	1.824	1.346	3.2389	

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.91%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	34	12	48.831	0.339	215.2	0.4847	0.0000	OK
15 minute summer	35	11	48.889	1.489	109.9	2.1302	0.0000	FLOOD RISK
15 minute summer	36	11	48.838	1.544	208.8	2.2095	0.0000	SURCHARGED
15 minute summer	37	12	48.698	1.561	310.6	2.7591	0.0000	SURCHARGED
15 minute summer	38	12	48.779	0.329	109.9	0.4708	0.0000	OK
15 minute summer	39	12	48.767	0.717	219.0	1.0257	0.0000	SURCHARGED
15 minute summer	40	12	48.572	1.503	671.3	2.6562	0.0000	SURCHARGED
15 minute summer	41	10	47.968	0.118	49.6	0.1689	0.0000	OK
15 minute summer	42	13	47.581	0.281	49.2	0.4023	0.0000	OK
15 minute summer	43	13	47.539	0.914	714.1	1.6155	0.0000	SURCHARGED
15 minute summer	44	13	46.839	0.664	711.8	1.1725	0.0000	SURCHARGED
15 minute summer	45	11	49.233	0.903	146.4	1.2916	0.0000	SURCHARGED
15 minute summer	46	11	49.155	1.315	282.0	1.8814	0.0000	SURCHARGED
15 minute summer	47	11	48.714	1.574	412.2	2.2528	0.0000	FLOOD RISK
15 minute summer	48	12	47.543	1.263	521.2	1.8069	0.0000	SURCHARGED
15 minute summer	49	12	45.827	0.375	510.7	0.5368	0.0000	OK
180 minute winter	50	180	45.186	0.939	138.1	291.6638	0.0000	SURCHARGED
180 minute winter	31_OUT	180	45.184	0.984	873.8	2707.8870	0.0000	SURCHARGED
15 minute summer	Dummy	1	43.534	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	34	13.002	40	203.7	1.456	0.586	16.7242	
15 minute summer	35	14.000	36	103.4	0.652	0.649	6.8314	
15 minute summer	36	14.001	37	205.8	1.299	1.287	5.2413	
15 minute summer	37	14.002	40	305.0	1.412	1.405	7.2261	
15 minute summer	38	15.000	39	109.1	1.522	0.352	6.1327	
15 minute summer	39	15.001	40	200.1	1.746	0.447	7.5265	
15 minute summer	40	13.003	43	605.9	2.805	1.379	11.6656	
15 minute summer	41	16.000	42	49.2	1.558	0.144	3.0658	
15 minute summer	42	16.001	43	72.7	0.642	0.206	6.5982	
15 minute summer	43	13.004	44	711.8	3.295	1.069	5.1755	
15 minute summer	44	13.005	31_OUT	691.7	3.512	1.012	17.2723	
15 minute summer	45	17.000	46	145.1	1.431	0.434	7.2684	
15 minute summer	46	17.001	47	272.4	1.836	0.777	9.4428	
15 minute summer	47	17.002	48	381.5	2.408	1.058	10.9640	
15 minute summer	48	17.003	49	510.7	3.255	1.307	8.5149	
15 minute summer	49	17.004	50	516.0	3.678	0.895	5.5809	
180 minute winter	50	17.005	31_OUT	59.0	0.785	0.092	27.8860	
180 minute winter	50	Infiltration		3.8				
180 minute winter	31_OUT	Orifice	Dummy	0.0				0.0
180 minute winter	31_OUT	Infiltration		107.6				

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	999.9		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.163	5.00	48.600	1200	618858.309	246496.835	1.500
2	0.000	5.00	48.000	1200	618797.843	246432.591	1.405
3	0.163	5.00	48.050	1200	618863.333	246434.656	1.500
4	0.000	5.00	47.850	1350	618882.506	246396.442	1.781
5	0.163	5.00	48.400	1350	618900.855	246486.922	1.500
6	0.000	5.00	48.150	1350	618960.862	246485.952	1.575
7	0.163	5.00	48.100	1200	618902.411	246458.749	1.500
8	0.000	5.00	47.900	1350	618951.153	246429.470	1.608
4_OUT			47.400	1350	618910.292	246400.509	1.400
DUMMY			47.400	1350	618910.971	246394.876	1.650

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
1.000	1	2	88.224	0.600	47.100	46.595	0.505	174.7	300	6.24	114.2
1.001	2	4	92.057	0.600	46.595	46.219	0.376	244.8	300	7.77	103.5
2.000	3	4	42.754	0.600	46.550	46.219	0.331	129.2	300	5.52	120.0
1.002	4	4_OUT	28.082	0.600	46.069	46.000	0.069	407.0	450	8.24	100.6
3.000	5	6	60.015	0.600	46.900	46.575	0.325	184.7	375	5.75	118.0
3.001	6	8	57.310	0.600	46.575	46.292	0.283	202.5	375	6.50	112.2
4.000	7	8	56.860	0.600	46.600	46.367	0.233	244.0	300	5.95	116.4
3.002	8	4_OUT	50.084	0.600	46.292	46.075	0.217	230.8	375	7.21	107.1
1.003	4_OUT	DUMMY	5.674	0.600	46.000	45.750	0.250	22.7	450	8.26	100.5

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node 4_OUT Online Orifice Control

Flap Valve	x	Invert Level (m)	47.300	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.500		

Node 4_OUT Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.12960	Safety Factor	2.0	Invert Level (m)	46.000
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	672

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	132.7	318.9	0.600	437.9	318.9	0.601	647.6	318.9	1.400	1142.3	318.9

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 98.33%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	48.505	1.405	124.4	1.5889	0.0000	FLOOD RISK
15 minute summer	2	12	47.543	0.948	114.4	1.0720	0.0000	SURCHARGED
15 minute summer	3	11	47.112	0.562	124.4	0.6357	0.0000	SURCHARGED
360 minute winter	4	352	46.925	0.856	32.9	1.2255	0.0000	SURCHARGED
15 minute summer	5	11	47.503	0.603	124.4	0.8634	0.0000	SURCHARGED
15 minute summer	6	11	47.252	0.677	130.5	0.9681	0.0000	SURCHARGED
15 minute summer	7	11	47.773	1.173	124.4	1.3261	0.0000	SURCHARGED
15 minute summer	8	12	47.059	0.767	219.0	1.0971	0.0000	SURCHARGED
360 minute winter	4_OUT	352	46.925	0.925	63.9	415.7066	0.0000	SURCHARGED
15 minute summer	DUMMY	1	45.750	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	1.000	2	114.4	1.624	1.364	6.2127	
15 minute summer	2	1.001	4	108.9	1.547	1.541	6.4826	
15 minute summer	3	2.000	4	121.6	1.729	1.245	3.0107	
360 minute winter	4	1.002	4_OUT	32.0	0.690	0.201	4.4494	
15 minute summer	5	3.000	6	130.5	1.479	0.888	6.6195	
15 minute summer	6	3.001	8	108.6	1.024	0.774	6.3211	
15 minute summer	7	4.000	8	121.7	1.729	1.719	4.0040	
15 minute summer	8	3.002	4_OUT	214.9	1.949	1.638	5.5241	
360 minute winter	4_OUT	Orifice	DUMMY	0.0				0.0
360 minute winter	4_OUT	Infiltration		5.7				

Design Settings

Rainfall Methodology	FEH-22	Minimum Velocity (m/s)	1.00
Return Period (years)	30	Connection Type	Level Soffits
Additional Flow (%)	0	Minimum Backdrop Height (m)	0.200
CV	1.000	Preferred Cover Depth (m)	1.200
Time of Entry (mins)	5.00	Include Intermediate Ground	✓
Maximum Time of Concentration (mins)	30.00	Enforce best practice design rules	✓
Maximum Rainfall (mm/hr)	999.9		

Nodes

Name	Area (ha)	T of E (mins)	Cover Level (m)	Diameter (mm)	Easting (m)	Northing (m)	Depth (m)
1	0.110	5.00	47.550	1200	619026.248	246460.520	1.500
2	0.110	5.00	46.900	1350	619107.295	246442.617	1.575
3	0.000	5.00	46.900	1350	619135.884	246450.319	1.667
4	0.110	5.00	47.600	1200	618985.786	246441.839	1.500
5	0.110	5.00	47.050	1350	619047.802	246432.929	1.575
6	0.110	5.00	46.800	1350	619102.824	246424.488	1.650
7	0.000	5.00	46.700	1350	619147.427	246399.215	1.704
8_OUT			46.075	1500	619139.403	246375.745	1.400
DUMMY			46.075	1500	619136.539	246370.895	2.075

Links (Input)

Name	US Node	DS Node	Length (m)	ks (mm) / n	US IL (m)	DS IL (m)	Fall (m)	Slope (1:X)	Dia (mm)	T of C (mins)	Rain (mm/hr)
2.000	1	2	83.001	0.600	46.050	45.400	0.650	127.7	300	6.00	116.0
2.001	2	3	29.608	0.600	45.325	45.233	0.092	321.8	375	6.49	112.3
2.002	3	7	52.391	0.600	45.233	45.071	0.162	323.4	375	7.36	106.2
1.000	4	5	62.653	0.600	46.100	45.550	0.550	113.9	300	5.71	118.4
1.001	5	6	55.666	0.600	45.475	45.225	0.250	222.7	375	6.48	112.4
1.002	6	7	51.266	0.600	45.150	44.996	0.154	332.9	450	7.25	106.9
1.003	7	8_OUT	24.804	0.600	44.996	44.750	0.246	100.8	450	7.56	104.8
1.004	8_OUT	DUMMY	5.632	0.600	44.675	44.000	0.675	8.3	525	7.57	102.9

Simulation Settings

Rainfall Methodology	FEH-22	Analysis Speed	Normal	Starting Level (m)	
Rainfall Events	Singular	Skip Steady State	x	Check Discharge Rate(s)	x
Summer CV	1.000	Drain Down Time (mins)	10080	Check Discharge Volume	x
Winter CV	1.000	Additional Storage (m³/ha)	0.0		

Storm Durations

15	60	180	360	600	960	2160	4320	7200	10080
30	120	240	480	720	1440	2880	5760	8640	

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
100	45	0	0

Node 8_OUT Online Orifice Control

Flap Valve	x	Invert Level (m)	46.000	Discharge Coefficient	0.600
Replaces Downstream Link	✓	Diameter (m)	0.500		

Node 8_OUT Depth/Area Storage Structure

Base Inf Coefficient (m/hr)	0.08640	Safety Factor	2.0	Invert Level (m)	44.675
Side Inf Coefficient (m/hr)	0.00000	Porosity	1.00	Time to half empty (mins)	1515

Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)	Depth (m)	Area (m²)	Inf Area (m²)
0.000	171.3	210.0	0.600	381.7	210.0	0.601	531.6	210.0	1.400	898.8	210.0

Results for 100 year +45% CC Critical Storm Duration. Lowest mass balance: 99.71%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute summer	1	11	46.657	0.607	83.9	0.6867	0.0000	SURCHARGED
15 minute summer	2	11	46.180	0.855	158.2	1.2229	0.0000	SURCHARGED
15 minute summer	3	11	45.954	0.721	147.8	1.0312	0.0000	SURCHARGED
15 minute summer	4	11	46.727	0.627	83.9	0.7095	0.0000	SURCHARGED
15 minute summer	5	11	46.373	0.898	158.3	1.2844	0.0000	SURCHARGED
15 minute summer	6	11	45.966	0.816	234.1	1.1676	0.0000	SURCHARGED
720 minute winter	7	705	45.670	0.674	30.2	0.9644	0.0000	SURCHARGED
720 minute winter	8_OUT	705	45.670	0.995	29.2	413.1838	0.0000	SURCHARGED
15 minute summer	DUMMY	1	44.000	0.000	0.0	0.0000	0.0000	OK
Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)	Discharge Vol (m³)
15 minute summer	1	2.000	2	75.3	1.202	0.767	5.8449	
15 minute summer	2	2.001	3	147.8	1.340	1.333	3.2657	
15 minute summer	3	2.002	7	149.4	1.354	1.350	5.7786	
15 minute summer	4	1.000	5	78.3	1.337	0.752	4.4120	
15 minute summer	5	1.001	6	154.1	1.397	1.153	6.1398	
15 minute summer	6	1.002	7	229.8	1.450	1.303	8.1228	
720 minute winter	7	1.003	8_OUT	29.2	0.792	0.091	3.9300	
720 minute winter	8_OUT	Orifice	DUMMY	0.0				0.0
720 minute winter	8_OUT	Infiltration		2.5				