Appendix A

Inputting additional attribute data for canals and foul water bodies

1. Canals

Tables A.1. and A.2. and Figures A.1. and A.2. give details of the additional attributes required for link data and node data of canals.

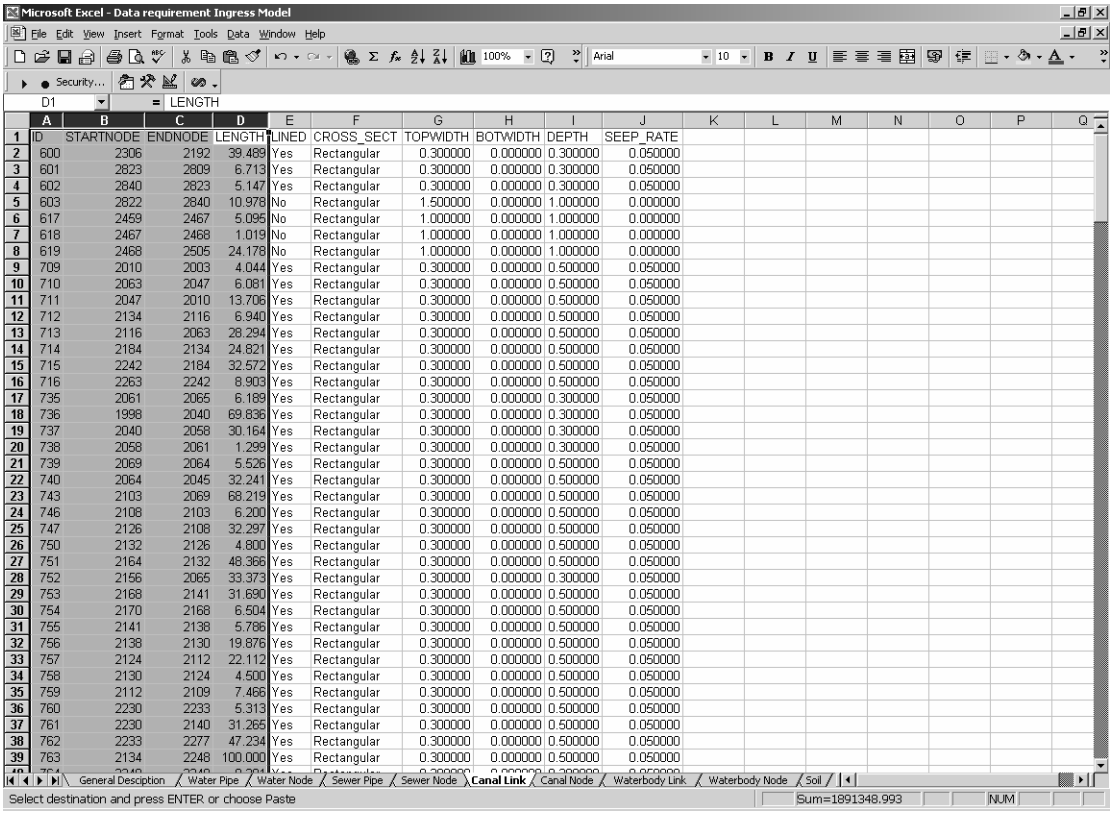
Table A.1. Canal link data for Contaminant Ingress Model			
Field name	**Unit**	**Description**	**Useful references**
LINED	*Yes/**No***	Lined or unlined	N/A
CROSS_SECT		Type of cross section	Section 2.3.2.1 of Book 3
TOPWIDTH	*Metres*	Top width of cross section	
BOTWIDTH	*Metres*	Bottom width of cross section	
DEPTH	*Metres*	Depth of cross section	
SEEP_RATE	*Metre/day*	Seepage rate from canal	

Table A.2. Canal node data for Contaminant Ingress Model			
Field name	**Unit**	**Description**	**Useful references**
ELEVATION	*Metres*	Elevation of the node	Section 2.3.2.1 of Book 3
WATER_DEPT	*Metres*	Depth of water in canal	

2. Foul water bodies

Table A.3. and Figure A.3. give details of the additional attributes required for node data of foul water bodies.

Table A.3. Foul water body node data for Contaminant Ingress Model			
Field name	**Unit**	**Description**	**Useful references**
WATER_DEP	***Metres***	Depth of water in water body	Section 2.3.2.2 of Book 3



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D1 = LENGTH

	A	B	C	D	E	F	G	H	I	J
1	ID	STARTNODE	ENDNODE	LENGTH	LINED	CROSS_SECT	TOPWIDTH	BOTWIDTH	DEPTH	SEEP_RATE
2	600	2306	2192	39.489	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
3	601	2823	2809	6.713	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
4	602	2840	2823	5.147	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
5	603	2822	2840	10.978	No	Rectangular	1.500000	0.000000	1.000000	0.000000
6	617	2459	2467	5.095	No	Rectangular	1.000000	0.000000	1.000000	0.000000
7	618	2467	2468	1.019	No	Rectangular	1.000000	0.000000	1.000000	0.000000
8	619	2468	2505	24.178	No	Rectangular	1.000000	0.000000	1.000000	0.000000
9	709	2010	2003	4.044	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
10	710	2063	2047	6.081	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
11	711	2047	2010	13.706	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
12	712	2134	2116	6.940	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
13	713	2116	2063	28.294	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
14	714	2184	2134	24.821	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
15	715	2242	2184	32.572	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
16	716	2263	2242	8.903	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
17	735	2061	2065	6.189	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
18	736	1998	2040	69.836	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
19	737	2040	2058	30.164	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
20	738	2058	2061	1.299	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
21	739	2069	2064	5.526	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
22	740	2064	2045	32.241	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
23	743	2103	2069	68.219	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
24	746	2108	2103	6.200	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
25	747	2126	2108	32.297	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
26	750	2132	2126	4.800	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
27	751	2164	2132	48.366	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
28	752	2156	2065	33.373	Yes	Rectangular	0.300000	0.000000	0.300000	0.050000
29	753	2168	2141	31.690	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
30	754	2170	2168	6.504	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
31	755	2141	2138	5.786	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
32	756	2138	2130	19.876	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
33	757	2124	2112	22.112	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
34	758	2130	2124	4.500	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
35	759	2112	2109	7.466	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
36	760	2230	2233	5.313	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
37	761	2230	2140	31.265	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
38	762	2233	2277	47.234	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000
39	763	2134	2248	100.000	Yes	Rectangular	0.300000	0.000000	0.500000	0.050000

General Description | Water Pipe | Water Node | Sewer Pipe | Sewer Node | Canal Link | Canal Node | Waterbody Link | Waterbody Node | Soil

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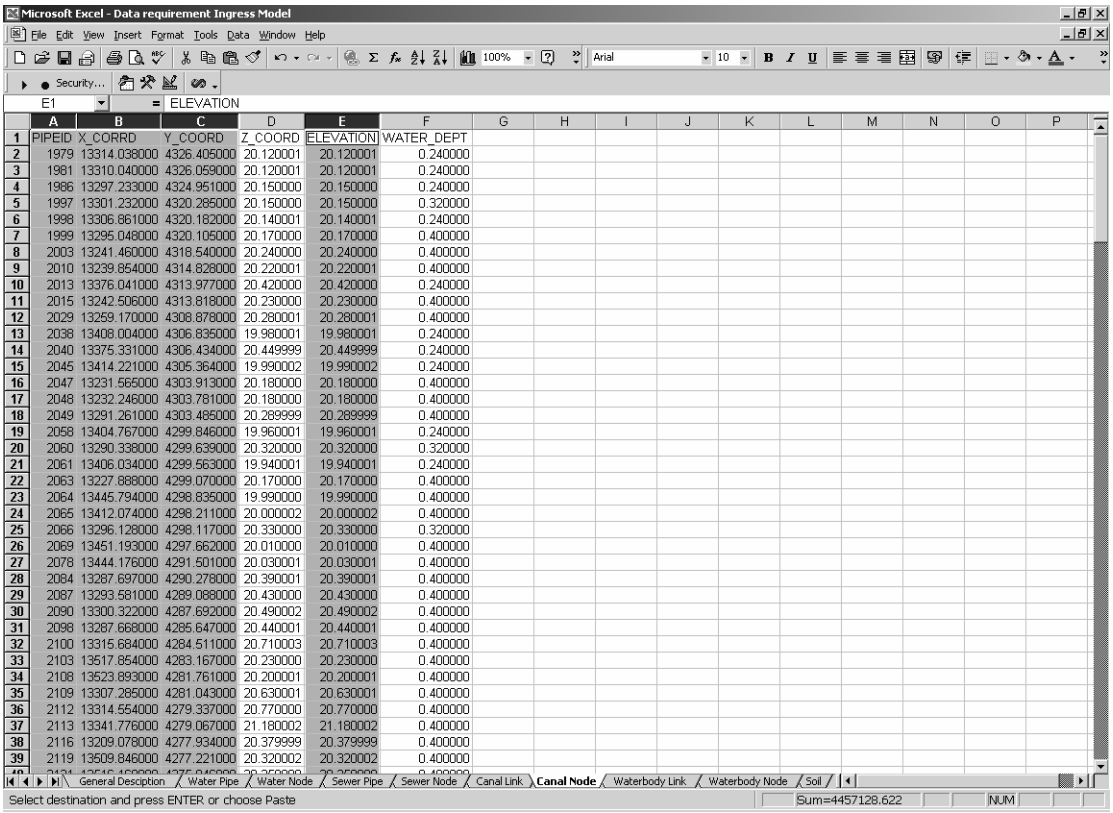
Figure A.1. Link data entry for canals



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E1 = ELEVATION

	A	B	C	D	E	F
1	PIPEID	X_CORRD	Y_COORD	Z_COORD	ELEVATION	WATER_DEPT
2	1979	13314.038000	4326.405000	20.120001	20.120001	0.240000
3	1981	13310.040000	4326.059000	20.120001	20.120001	0.240000
4	1986	13297.233000	4324.951000	20.150000	20.150000	0.240000
5	1997	13301.232000	4320.285000	20.150000	20.150000	0.320000
6	1998	13306.861000	4320.182000	20.140001	20.140001	0.240000
7	1999	13295.048000	4320.105000	20.170000	20.170000	0.400000
8	2003	13241.460000	4318.540000	20.240000	20.240000	0.400000
9	2010	13239.854000	4314.828000	20.220001	20.220001	0.400000
10	2013	13376.041000	4313.977000	20.420000	20.420000	0.240000
11	2015	13242.506000	4313.818000	20.230000	20.230000	0.400000
12	2029	13259.170000	4308.878000	20.280001	20.280001	0.400000
13	2038	13408.004000	4306.835000	19.980001	19.980001	0.240000
14	2040	13375.331000	4306.434000	20.449999	20.449999	0.240000
15	2045	13414.221000	4305.364000	19.990002	19.990002	0.240000
16	2047	13231.565000	4303.913000	20.180000	20.180000	0.400000
17	2048	13232.246000	4303.781000	20.180000	20.180000	0.400000
18	2049	13291.261000	4303.485000	20.289999	20.289999	0.400000
19	2058	13404.767000	4299.846000	19.960001	19.960001	0.240000
20	2060	13290.338000	4299.639000	20.320000	20.320000	0.320000
21	2061	13406.034000	4299.563000	19.940001	19.940001	0.240000
22	2063	13227.888000	4299.070000	20.170000	20.170000	0.400000
23	2064	13445.794000	4298.835000	19.990000	19.990000	0.400000
24	2065	13412.074000	4298.211000	20.000002	20.000002	0.400000
25	2066	13296.128000	4298.117000	20.330000	20.330000	0.320000
26	2069	13451.193000	4297.662000	20.010000	20.010000	0.400000
27	2078	13444.176000	4291.501000	20.030001	20.030001	0.400000
28	2084	13287.697000	4290.278000	20.390001	20.390001	0.400000
29	2087	13293.581000	4289.088000	20.430000	20.430000	0.400000
30	2090	13300.322000	4287.692000	20.490002	20.490002	0.400000
31	2098	13287.668000	4285.647000	20.440001	20.440001	0.400000
32	2100	13315.684000	4284.511000	20.710003	20.710003	0.400000
33	2103	13517.854000	4283.167000	20.230000	20.230000	0.400000
34	2108	13523.893000	4281.761000	20.200001	20.200001	0.400000
35	2109	13307.285000	4281.043000	20.630001	20.630001	0.400000
36	2112	13314.554000	4279.337000	20.770000	20.770000	0.400000
37	2113	13341.776000	4279.067000	21.180002	21.180002	0.400000
38	2116	13209.078000	4277.934000	20.379999	20.379999	0.400000
39	2119	13509.846000	4277.221000	20.320002	20.320002	0.400000

General Description | Water Pipe | Water Node | Sewer Pipe | Sewer Node | Canal Link | Canal Node | Waterbody Link | Waterbody Node | Soil

Select destination and press ENTER or choose Paste | Sum=4457128.622 | NUM

Figure A.2. Node data entry for canals

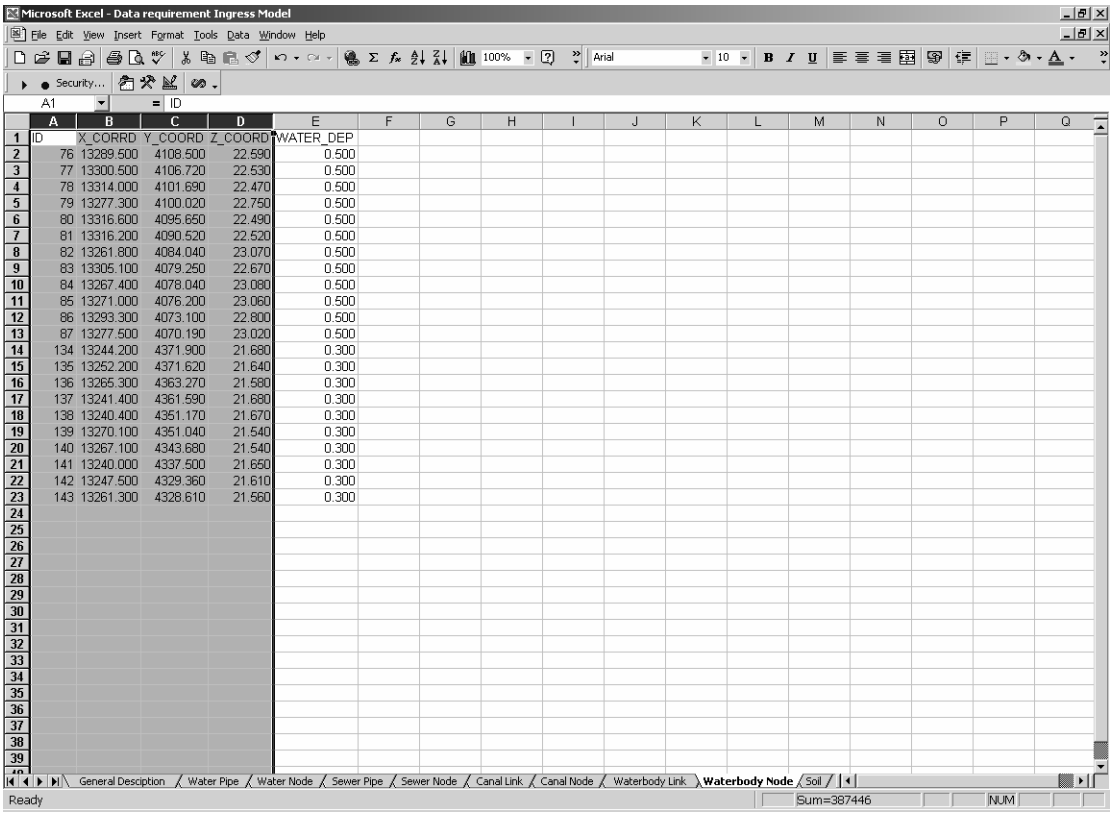

Figure A.3. Node data entry for foul water bodies

Appendix B

Time required for steady conditions

The time required for flow to establish steady conditions is determined by Philip's Equation (Philip, 1969) (B1) as being approximately equal to:

$$t_0 = \frac{5S^2}{2K_s^2} \qquad \text{(B1)}$$

where
S – sorptivity (L/T^2)
K_s – saturated hydraulic conductivity.

The estimated time to establish steady flow conditions is given in Table B.1.

Table B.1. Steady flow conditions

Soil texture	Time (hours)
Sand	0.08
Loamy sand	0.50
Sandy loam	1.00
Silt loam	35.50
Loam	11.50
Sandy clay loam	6.93
Silt clay loam	38.50
Clay loam	55.50
Sandy clay	12.25
Silty clay	63.50
Clay	50.50

Reference

Philip, J. R. (1969) Theory of Infiltration. *Advances in Hydro Sciences*, Vol 5, pp 215-290.