Asset/Model Data Format - Is There a Standard?

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Introduction

The requirements of the industry are changing rapidly and the uses the models created have to support also have to change. Models need to be developed more and be able to support a wider range of applications, which require more complex modelling, discipline and standards to succeed.

Are working methods and standards keeping pace with the new technology and software being introduced?

This paper discusses and introduces the first fundamental stage of a proposed standard for sewer network models. Namely the data that is captured to generate the models. It also gives a description for a possible standard which can be adopted by anyone. A pre-requisite for any standard, must be that it is fixed.

The premise proposed by this paper is that if a fixed standard is defined then you can begin to :-

a) maintain the model created.
b) re-use models for another purpose.
c) pick and choose the appropriate software for the required result.

Perhaps every water company has looked at preparing corporate systems that will hold "model" information. Developing the idea further the model data set is just an extension of the asset data set. The model data set also produces a results data set. Is there a need to standardise these as well?

Current Practice

The phrase "fit for purpose" is one that this industry in particular has had, by necessity, to live by. The experience and knowledge required for sewer network modelling cannot readily be gained as each project requires its own special approach to achieve the clients needs. The standard by introducing a standard data editor and a standard data audit tool. This will also allow the transfer of data to any chosen model format.

Benefits of introducing the MTF Standard.

1) Generates a minimum model data pool
2) Enables transfer between model packages
3) Can develop standard interfaces (to data) to other systems
4) Modeller has more confidence in completed model, they know what is expected
5) Helps to promote client confidence in completed model, common understanding
6) Models can be continually developed and re-used
7) Promotes common practice, aids transfer of knowledge
8) Reduces maintenance costs

What Next - Is this Enough

So a model standard has been introduced, the Model Transfer Format (MTF), and accepted! Should MTF be extended or further standards be introduced?

1. Should more (all) asset data be included?

The model may often mask localised problems because of the lack of detail contained about the assets in the model structure. If the smallest element in the model can be a discrete pipe length then the model will always maintain reference to the real (or imaginary for design) world. The problems here are more to do with data ownership and corporate procedures and more importantly the confidence you can place on this information. During the model build more often than not the asset data is continually being corrected as the modeller discovers how the system really works. Modellers should not be spending time repairing the asset data set this could be a never ending task best left to those maintaining the assets.

2. Is there a need for a Results standard?

This perhaps has the same value as a model standard. With a standard results set the client can begin to relate to information through its own corporate systems and develop a consistent method of viewing and interpreting the results.

Conclusions

1) Propose the common use of this standard.
2) Implement as widely as possible.
3) Invite all software houses producing hydraulic modelling systems to produce a mechanism to move this data in and out of their systems thus avoiding translations.
4) Consider introducing a reports standard.

Model Transfer Format

For Sewer Network Models

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This document/standard is still under revision and may change.
A final version will be available in the next WaPUG mailshot.

Field Name	Field Length	Format	Start Column	Node / Link relation
44. Invert Level of Orifice	7	decimal (3)	211	node
45. Head Index	3	decimal (1)	218	node
46. Continuation Branch Index	1	integer	221	node
47. Branch Label of Next Pipe	3	integer	222	node
48. Level of Bottom of Tank	7	decimal (3)	225	node
49. Plan Area of Tank	5	integer	232	node
50. Crest Length (Width)	5	decimal (2)	237	node
51. Discharge Coefficient of Weir	6	decimal (2)	242	node
52. Crest Level of Weir	7	decimal (3)	248	node
53. Minimum Head	7	decimal (3)	255	node
54. Head Increment	7	decimal (3)	262	node
55. Head Decrement	7	decimal (3)	269	node
56. Number of Entries in Tables	2	integer	276	node
57. Discharge Values	7	decimal (3)	278	node
58. Pump Switch-on Level (Per Pump)	7	decimal (3)	285	node
59. Pump Switch-off Level (Per Pump)	7	decimal (3)	292	node
60. Number of Pumps	2	integer	299	node
61. Delay Time	5	decimal (1)	301	node
62. Plan Area of Wet-Well	7	decimal (3)	306	node
63. Design Discharge	7	decimal (3)	313	node
64. Initial Water Level in Wet-Well	7	decimal (3)	320	node
65. Closed Valve Head	6	decimal (3)	327	node
66. Base Level (For Discharge Table)	7	decimal (3)	333	node
67. Branch Number of Outfall Pipe	3	integer	340	node
68. Pipe Number of Outfall Pipe (+1)	3	integer	343	node
69. Total Surface Area Draining To Pipe	5	decimal (3)	346	node
70. Area Surface 1 (Ha)	5	decimal (3)	351	node
71. Area Surface 1 (%Contributing)	3	integer	356	node
72. Runoff Index 1	2	integer	359	node
73. Pollution Index 1	2	integer	361	node
74. Area Surface 2 (Ha)	5	decimal (3)	363	node
75. Area Surface 2 (%Contributing)	3	integer	368	node
76. Runoff Index 2	2	integer	371	node
77. Pollution Index 2	2	integer	373	node
78. Area Surface 3 (Ha)	5	decimal (3)	375	node
79. Area Surface 3 (%Contributing)	3	integer	380	node
80. Runoff Index 3	2	integer	383	node
81. Pollution Index	2	integer	385	node
82. Flood Type: Sealed Manhole	1	text	387	node
83. Flood Type: Flood Area Water Returns	1	text	388	node
84. Flood Type: Water Lost from System	1	text	389	node
85. Flood Area 1 (% of Total)	3	integer	390	node
86. Flood Depth 1	4	decimal (1)	393	node
87. Flood Area 2 (% of Total)	3	integer	397	node
88. Flood Depth 2	4	decimal (1)	400	node
89. Rain Profile Number	2	integer	404	node
90. Dry Weather Inflow To Pipe	5	decimal (4)	406	node