12d Model

Civil and Surveying Software

Drainage Attributes

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This document lists every attribute name used by the *Drainage Network Editor* in *12d Model* .

Drainage Network Attributes

red = new in V9.0

* = <blank>, 2, 3

\# = <blank>, 2, 3, …

Data	Type	Name	Remarks
model	*real*	arr1987 intensity	glob def = 70.0 mm/hr
model	*int*	auto catchment naming	
model	*int*	auto profile	Auto-profile push-button on DNE
model	*int*	auto redraw	Auto-redraw push-button on DNE
model	*text*	bypass flow model	
model	*real*	c major impervious	glob def = 0.9
model	*real*	c minor impervious	glob def = 0.9
model	*real*	capacity velocity max	glob def = 1e6 m/s
model	*real*	capacity velocity min	glob def = -1e6 m/s
model	*text*	catchment labels model	
model	*text*	catchment labels textstyle	
model	*text*	catchments file	
model	*text*	catchments model*	
model	*int*	clean lsec plot	
model	*int*	clean plan plot	
model	*int*	confirm set catchments	Toggle on/off via RMB click on DNE button
model	*int*	confirm set pit details	Toggle on/off via RMB click on DNE button
model	*int*	confirm regrade pipes	Toggle on/off via RMB click on DNE button
model	*text*	cover file	replaces "default design cover"
model	*real*	default assumed pipe velocity	def = 2.0 m/s
model	*real*	default c major pervious	def = 0.75
model	*real*	default c minor pervious	def = 0.75
model	*real*	default catchment grade impervious	def = 2.5 %
model	*real*	default catchment grade pervious	def = 2.5 %
model	*real*	default catchment length impervious	def = 50.0 m
model	*real*	default catchment length pervious	def = 100.0 m
model	*real*	default catchment roughness impervious	def = 0.013
model	*real*	default catchment roughness pervious	def = 0.150
model	*real*	default choke pog major	def = 0.8
model	*real*	default choke pog minor	def = 1.0
model	*real*	default choke sag major	def = 0.5
model	*real*	default choke sag minor	def = 1.0
model	*int*	default cover rl mode	def = 0

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Data	Type	Name	Remarks
model	*int*	default design alignment mode	def = 0
model	*real*	default design cover	obsolete: deleted once cover file is specified
model	*int*	default design cover mode	def = 0
model	*real*	default design freeboard	def = 0.3 m
model	*real*	default design grade	obsolete: deleted once grade file is specified
model	*real*	default design percent depth	def = 100.0 %
model	*int*	default design size mode	def = 0
model	*real*	default direct flow minor	def = 0.0 cumecs
model	*real*	default direct flow major	def = 0.0 cumecs
model	*real*	default direct pipe flow minor	def = 0.0 cumecs
model	*real*	default direct pipe flow major	def = 0.0 cumecs
model	*real*	default grate rl mode	def = 7 (to cover rl)
model	*real*	default ku	def = 2.0
model	*int*	default ku config	def = 0
model	*int*	default ku method	def = 0
model	*real*	default percent impervious*	def = 90.0 %
model	*int*	default road chainage mode	def = 0
model	*real*	default roughness	def = 0.010
model	*text*	default roughness type	def = Manning; formerly global, now default
model	*real*	default setout adjustment	def = 0.0 m
model	*real*	default setout adjustment z	def = 0.0 m
model	*int*	default setout xy mode	def = 0
model	*int*	default setout z mode	def = 7 (to cover rl)
model	*real*	default sump offset	def = 0.0 m
model	*real*	default tc major impervious	def = 5.0 minutes
model	*real*	default tc major pervious	def = 10.0 minutes
model	*text*	default tc method impervious	def = Direct
model	*text*	default tc method pervious	def = Direct
model	*real*	default tc minor impervious	def = 5.0 minutes
model	*real*	default tc minor pervious	def = 10.0 minutes
model	*int*	default veg soil index	def = 5

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Data	Type	Name	Remarks
model	*int*	do bypass	tick on Storm Main tab to consider bypass flows
model	*int*	do capacity	tick on Storm Main tab to ensure pipe Q < Qcap
model	*int*	do flood contain overflows	tick on Storm Flood tab
model	*int*	do flood extents	tick on Storm Flood tab
model	*int*	do flood sag ponds	tick on Storm Flood tab
model	*int*	do flood sections	tick on Storm Flood tab
model	*int*	do flood sections trim	choice-box on Storm Flood tab
model	*int*	do flood warnings depvel	tick on Storm Flood tab
model	*int*	do flood warnings qcap	tick on Storm Flood tab
model	*int*	do flood warnings width	tick on Storm Flood tab
model	*int*	do flood widths	tick on Storm Flood tab
model	*int*	do flood widths edges	tick on Storm Flood tab
model	*int*	do hydraulic report	tick on Storm Main tab
model	*int*	do hydrology report	tick on Storm Main tab
model	*int*	do inverts	tick on Storm Main tab to modify pipe inverts
model	*int*	do lsec plot	tick on Storm Main tab
model	*int*	do pipes	tick on Storm Main tab to modify pipe sizes
model	*int*	do plan plot	tick on Storm Main tab
model	*int*	do upsize	tick on Storm Main tab to upsize only
model	*text*	drop file	
model	*text*	event type	Minor or Major
model	*real*	excess flow increment	Qx routing increment on Storm Main tab

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Data	Type	Name	Remarks
model	*real*	flood levee tolerance	
model	*real*	flood mannings correction factor	
model	*real*	flood mannings n	
model	*real*	flood min grade	
model	*text*	flood sag ponds model	
model	*real*	flood sag ponds model blend	
model	*int*	flood sag ponds model colour	
model	*real*	flood section length	
model	*real*	flood section separation	
model	*text*	flood sections model	
model	*int*	flood sections model colour	
model	*real*	flood warnings depvel max	
model	*text*	flood warnings depvel model	
model	*int*	flood warnings depvel model colour	
model	*text*	flood warnings qcap model	
model	*int*	flood warnings qcap model colour	
model	*real*	flood warnings width max	
model	*text*	flood warnings width model	
model	*int*	flood warnings width model colour	
model	*text*	flood widths exclusion model	
model	*text*	flood widths model	
model	*int*	flood widths model colour	
model	*real*	full velocity max	glob def = 1e6 m/s
model	*real*	full velocity min	glob def = -1e6 m/s
model	*text*	grade file	replaces "default design grade"
model	*text*	hydraulic report file	
model	*text*	hydraulic report model	not used at present
model	*text*	hydraulic report type	
model	*text*	hydro file	
model	*text*	hydrology report file	
model	*text*	hydrology report model	not used at present
model	*text*	hydrology report type	

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Data	Type	Name	Remarks
model	*text*	impervious tc strings model*	
model	*int*	io bypass	
model	*int*	io catch	
model	*text*	io filename	
model	*text*	io format	
model	*int*	io junctions	
model	*text*	io listfile	
model	*text*	io listtype	
model	*int*	io obvert	
model	*int*	io pipes	
model	*int*	io use mapping file	
model	*text*	lsec model stem	
model	*text*	lsec ppf	
model	*int*	overwrite hydraulic report	
model	*int*	overwrite hydrology report	
model	*real*	part velocity max	glob def = 1e6 m/s
model	*real*	part velocity min	glob def = -1e6 m/s
model	*int*	partial areas	tick on Storm Main tab to consider partial areas
model	*text*	pervious tc strings model*	
model	*int*	pipe travel time method	
model	*int*	pit naming do pipes	
model	*int*	pit naming do pits	
model	*text*	pit naming file	
model	*int*	pit naming letters	
model	*text*	pit naming method	
model	*text*	pit naming pipe method	
model	*text*	pit naming posttext	
model	*text*	pit naming pretext	
model	*int*	pit naming reverse	
model	*text*	pit naming separator	
model	*int*	pit naming start number	
model	*int*	pit naming zero pack	

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Data	Type	Name	Remarks
model	*text*	plan model	
model	*text*	plan ppf	
model	*text*	preferred pipes file	
model	*text*	rainfall method	
model	*text*	rc method	glob def = Direct
model	*text*	remarks	from GLOBAL=>Notes tab
model	*real*	return period	
model	*text*	road design file	
model	*text*	service clash file	
model	*text*	setout updated	date string
model	*text*	units	glob def = Metric
model	*real*	viscosity	glob def = 1.14e-6 m^2/s

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Data	Type	Name	Remarks
manhole	*real*	area*	area, A, for individual catchment polygon
manhole	*real*	basin discharge	input via Pit=>Main tab (Outlet data: Qo)
manhole	*real*	basin volume	input via Pit=>Main tab (Outlet data: Vs)
manhole	*real*	basin drop pit factor	input via Pit=>Main tab (Outlet data: f)
manhole	*real*	bypass distance	
manhole	*text*	bypass pit	
manhole	*real*	c major pervious*	
manhole	*real*	c minor pervious*	
manhole	*real*	calculated basin inflow	output on outlet pits only (Qi)
manhole	*real*	calculated basin inflow volume	output on outlet pits only (Vi)
manhole	*real*	calculated basin tc	output on outlet pits only (tc)
manhole	*real*	calculated basin storm duration	output on outlet pits only (td)
manhole	*real*	calculated basin storm intensity	output on outlet pits only (I)
manhole	*real*	calculated basin volume	output on outlet pits only (Vs)
manhole	*real*	calculated basin discharge	output on outlet pits only (Qo)
manhole	*real*	calculated approach flow	Qa
manhole	*real*	calculated bypass flow	Qb
manhole	*real*	calculated catchment flow	Qc = MAX(Qcf,Qcp)
manhole	*real*	calculated choke	
manhole	*real*	calculated composite c*	C=(Ai.Ci+Ap.Cp)/A for individual catchment polygon
manhole	*real*	calculated critical effective c	calculated critical sum ca/calculated critical sum a
manhole	*real*	calculated critical intensity	
manhole	*real*	calculated critical sum a	
manhole	*real*	calculated critical sum ca	
manhole	*real*	calculated critical tc	
manhole	*real*	calculated direct flow	Qdg
manhole	*real*	calculated excess flow	Qx (also set on pipe)
manhole	*real*	calculated flooded depth	overland flow (sag & on-grade pits)
manhole	*real*	calculated flooded depth x velocity	overland flow (on-grade pits)
manhole	*real*	calculated flooded flow capacity	overland flow (sag & on-grade pits)
manhole	*real*	calculated flooded level	overland flow (sag & on-grade pits)
manhole	*real*	calculated flooded velocity	overland flow (on-grade pits)
manhole	*real*	calculated flooded volume	overland flow (sag pits) [+ Volumes module]
manhole	*real*	calculated flooded volume capacity	overland flow (sag pits) [+ Volumes module]
manhole	*real*	calculated flooded width	overland flow (on-grade pits)

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Data	Type	Name	Remarks
manhole	*real*	calculated freeboard	
manhole	*real*	calculated full catchment flow	Qcf
manhole	*real*	calculated full effective c	calculated full sum ca/calculated full sum a
manhole	*real*	calculated full intensity	
manhole	*real*	calculated full sum a	
manhole	*real*	calculated full sum ca	
manhole	*real*	calculated full tc	
manhole	*real*	calculated hgl	
manhole	*real*	calculated impervious c*	Ci for individual catchment polygon
manhole	*real*	calculated impervious intensity*	
manhole	*real*	calculated impervious tc*	
manhole	*real*	calculated inflow	Qg (will be negative if pit surcharges)
manhole	*text*	calculated inlet capacity curve	
manhole	*real*	calculated ku	
manhole	*text*	calculated ku chart	shows chart(s) used: G1-2 and/or T1-10
manhole	*text*	calculated ku config	
manhole	*real*	calculated ku diameter ratio	
manhole	*real*	calculated ku grate flow angle	
manhole	*real*	calculated ku grate flow ratio	
manhole	*text*	calculated ku method	
manhole	*real*	calculated ku pipe flow angle	
manhole	*real*	calculated ku submergence ratio	
manhole	*text*	calculated kukw text	for plotting purposes
manhole	*real*	calculated kw	
manhole	*real*	calculated outfall pressure head loss	for outfalls based on Ko
manhole	*real*	calculated partial catchment flow	Qcp
manhole	*real*	calculated partial effective c	calculated partial sum ca/calculated partial sum a
manhole	*real*	calculated partial intensity	
manhole	*real*	calculated partial sum a	
manhole	*real*	calculated partial sum ca	
manhole	*real*	calculated partial tc	
manhole	*real*	calculated pervious c*	Cp for individual catchment polygon
manhole	*real*	calculated pervious intensity*	
manhole	*real*	calculated pervious tc*	

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Data	Type	Name	Remarks
manhole	*real*	calculated pit pressure head loss	for inlets based on Ku
manhole	*real*	calculated pit wse loss	for inlets based on Kw
manhole	*real*	calculated surcharge flow	Qs = -Qg (can only occur if choke = 0)
manhole	*real*	catchment grade impervious*	
manhole	*real*	catchment grade pervious*	
manhole	*real*	catchment length impervious*	
manhole	*real*	catchment length pervious*	
manhole	*uid*	catchment model id*	internal use
manhole	*real*	catchment roughness impervious*	
manhole	*real*	catchment roughness pervious*	
manhole	*uid*	catchment string id*	internal use
manhole	*uid*	centre model id	internal use
manhole	*uid*	centre string id	internal use
manhole	*real*	choke major	Set Pit Details button
manhole	*real*	choke minor	Set Pit Details button
manhole	*real*	choke pog major	Pit=>Bypass tab
manhole	*real*	choke pog minor	Pit=>Bypass tab
manhole	*real*	choke sag major	Pit=>Bypass tab
manhole	*real*	choke sag minor	Pit=>Bypass tab
manhole	*real*	cover rl	cover level of pit
manhole	*int*	cover rl mode	controls cover level of pit
manhole	*real*	design freeboard	
manhole	*uid*	design model id	internal use
manhole	*uid*	design string id	internal use
manhole	*real*	direct flow minor	Qdg (minor)
manhole	*real*	direct flow major	Qdg (major)
manhole	*real*	ds invert	same as newer MH attribute "invert ds" (sorry)
manhole	*text*	ds pit	useful for some pit setout tables
manhole	*real*	entrance hgl	internal use
manhole	*real*	grate level	
manhole	*real*	grate level adjustment	internal use
manhole	*real*	grate rl mode	

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Data	Type	Name	Remarks
manhole	*real*	gutter grade	calculated for I/O with "Drains"
manhole	*real*	gutter length	calculated for I/O with "Drains"
manhole	*text*	inlet capacity curve	Set Pit Details button
manhole	*int*	inlet type	used by external package
manhole	*real*	invert ds	ds of manhole (same line only)
manhole	*real*	invert us	us of manhole (same line only)
manhole	*real*	invert junction#	connecting invert of incoming junction line
manhole	*text*	junction line#	name of incoming junction line
manhole	*real*	ko	for outfalls only
manhole	*real*	ku	for pits and manholes
manhole	*int*	ku config	
manhole	*int*	ku method	
manhole	*real*	kw	for pits and manholes
manhole	*int*	manual pit grade	
manhole	*int*	manual pit xfall	
manhole	*int*	manual pond depth	
manhole	*int*	mirror pit	used by Plan Plot
manhole	*int*	number of sub catchments	internal use
manhole	*real*	percent impervious*	Ai=A.(percent impervious/100), Ap=A-Ai
manhole	*real*	pit centre fs level	finished surface rl at centre of pit/mh
manhole	*real*	pit centre ns level	natural surface rl at centre of pit/mh
manhole	*real*	pit centre x	centre of pit/mh chamber
manhole	*real*	pit centre y	centre of pit/mh chamber
manhole	*real*	pit chainage	drainage string chainage at centre of pit/mh
manhole	*real*	pit depth	"cover rl" - "sump level"
manhole	*real*	pit diameter	optionally set from drainage.4d (mhdiam)
manhole	*real*	pit grade	% (via tin)
manhole	*text*	pit group	(now) set from drainage.4d (mhgroup)
manhole	*real*	pit length	set from drainage.4d
manhole	*text*	pit name	
manhole	*real*	pit symbol angle	used by Plan Plot, CCW decimal deg from E
manhole	*real*	pit symbol bearing	CW decimal deg from N
manhole	*text*	pit symbol bearing dms	CW DDDMMSS from N

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Data	Type	Name	Remarks
manhole	*text*	pit type	
manhole	*text*	pit type description	set from drainage.4d (mhdesc)
manhole	*text*	pit type remarks	set from drainage.4d (mhnotes)
manhole	*real*	pit width	set from drainage.4d
manhole	*real*	pit xfall	% (via tin)
manhole	*real*	pond depth	max pond depth (via tin and catchments)
manhole	*int*	rational index	internal use
manhole	*text*	remarks	from Pit=>Notes tab
manhole	*real*	road chainage	
manhole	*int*	road chainage mode	
manhole	*text*	road name	
manhole	*real*	road offset	
manhole	*int*	sag pit	Inlet config = Sag pit
manhole	*int*	sealed pit	Inlet config = Manhole
manhole	*real*	setout adjustment	Sxy
manhole	*real*	setout adjustment z	Sz
manhole	*real*	setout distance	plan distance from pit centre to setout point
manhole	*real*	setout x	
manhole	*int*	setout xy mode	
manhole	*real*	setout y	
manhole	*real*	setout z	setout level of pit
manhole	*int*	setout z mode	controls setout level of pit
manhole	*real*	sump level	
manhole	*real*	sump offset	normally negative
manhole	*real*	tailwater level major	
manhole	*real*	tailwater level minor	
manhole	*text*	tailwater mode	
manhole	*real*	tc major impervious*	
manhole	*real*	tc major pervious*	
manhole	*text*	tc method impervious*	
manhole	*text*	tc method pervious*	
manhole	*real*	tc minor impervious*	
manhole	*real*	tc minor pervious*	
manhole	*int*	veg soil index*	

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Data	Type	Name	Remarks
pipe	*real*	assumed pipe velocity	
pipe	*real*	calculated catchment flow	Qc = MAX(Qcf,Qcp)
pipe	*real*	calculated critical effective c	calculated critical sum ca/calculated critical sum a
pipe	*real*	calculated critical intensity	
pipe	*real*	calculated critical sum a	
pipe	*real*	calculated critical sum ca	
pipe	*real*	calculated critical tc	
pipe	*real*	calculated design cover	from "design cover" or "cover file"
pipe	*real*	calculated design drop	from "design drop" or "drop file"
pipe	*real*	calculated design grade minimum	from "design grade" or "grade file"
pipe	*real*	calculated design grade maximum	from "grade file"
pipe	*real*	calculated drop	at pipe exit
pipe	*real*	calculated ds deflection	
pipe	*real*	calculated excess flow	Qx (also set on pit)
pipe	*real*	calculated full catchment flow	Qcf
pipe	*real*	calculated full effective c	calculated full sum ca/calculated full sum a
pipe	*real*	calculated full intensity	
pipe	*real*	calculated full sum a	
pipe	*real*	calculated full sum ca	
pipe	*real*	calculated full tc	
pipe	*real*	calculated hgl ds	
pipe	*real*	calculated hgl grade	% grade of hgl in pipe
pipe	*real*	calculated hgl grade 1 in	1 in grade of hgl in pipe
pipe	*real*	calculated hgl us	
pipe	*real*	calculated net bypass flow	Qb(net)
pipe	*real*	calculated partial catchment flow	Qcp
pipe	*real*	calculated partial effective c	calculated partial sum ca/calculated partial sum a
pipe	*real*	calculated partial intensity	
pipe	*real*	calculated partial sum a	
pipe	*real*	calculated partial sum ca	
pipe	*real*	calculated partial tc	
pipe	*real*	calculated peak flow	Qrat = Qc + Qdg + Qdp
pipe	*real*	calculated percent depth	at pipe entrance

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Data	Type	Name	Remarks
pipe	*real*	calculated pipe area	Af
pipe	*real*	calculated pipe grade	% grade
pipe	*real*	calculated pipe grade 1 in	1 in grade
pipe	*real*	calculated pipe length	plan length between pit centres
pipe	*real*	calculated pipe total head loss	
pipe	*real*	calculated sum direct pipe flow	sum of all Qdp contributing
pipe	*real*	calculated sum direct pit flow	sum of all Qdg contributing
pipe	*real*	calculated travel velocity	
pipe	*real*	calculated us deflection	
pipe	*real*	calculated velocity head	for Ku/Kw calcs [(Q-Qx)/Af]^2/2g
pipe	*real*	capacity velocity	Vcap = Qcap/Af
pipe	*real*	critical depth	dc
pipe	*real*	critical depth relative	dcrel
pipe	*real*	critical velocity	Vc = Q/Ac
pipe	*int*	design alignment mode	
pipe	*real*	design cover	
pipe	*int*	design cover mode	
pipe	*real*	design drop	
pipe	*real*	design grade	
pipe	*real*	design percent depth	
pipe	*int*	design size mode	
pipe	*real*	diameter	
pipe	*real*	direct pipe flow minor	Qdp (minor)
pipe	*real*	direct pipe flow major	Qdp (major)
pipe	*int*	drowned pipe	1 if both us and ds Grate RLs < TW level
pipe	*real*	flow capacity	Qcap
pipe	*real*	flow capacity ratio	Q/Qcap
pipe	*real*	full pipe velocity	Vf = Q/Af
pipe	*real*	invert ds	ds relative to pipe
pipe	*real*	invert us	us relative to pipe
pipe	*int*	lock ds il	
pipe	*int*	lock size	
pipe	*int*	lock us il	

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Data	Type	Name	Remarks
pipe	*real*	max height	
pipe	*real*	mid pipe radius horizontal	horizontal curve radius at mid-pipe length
pipe	*real*	min height	
pipe	*real*	minimum cover	
pipe	*real*	normal depth	dn
pipe	*real*	normal depth relative	dnrel
pipe	*real*	normal velocity	Vn = Q/An
pipe	*int*	number of pipes	for specifying multi-barrel pipes
pipe	*int*	number of services	internal use
pipe	*int*	number of sub catchments	internal use
pipe	*int*	open channel	
pipe	*real*	pipe flow	Q = Qrat + Qb(net)
pipe	*text*	pipe name	
pipe	*text*	pipe size	as shown in Hydraulics Report
pipe	*text*	pipe type	
pipe	*int*	rational index	internal use
pipe	*text*	remarks	from Pipe=>Notes tab
pipe	*int*	ridiculous	internal use
pipe	*real*	roughness	
pipe	*text*	roughness text	for plotting when using a mix of n and k
pipe	*text*	roughness type	formerly global, now explicit&default
pipe	*real*	service clearance#	
pipe	*real*	service drainage invert#	
pipe	*real*	service height#	
pipe	*real*	service invert#	
pipe	*real*	service location#	
pipe	*real*	service min clearance#	
pipe	*text*	service name#	
pipe	*int*	service number of pipes#	
pipe	*real*	service width top#	
pipe	*real*	service width#	
pipe	*real*	width	for specifying box culverts
pipe	*real*	width top	for specifying vee and trapezoid channels

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red = new in V9.0

* = <blank>, 2, 3

\# = <blank>, 2, 3, …

Data	Type	Name	Remarks
string	*real*	Capacity Depth	set on flood widths, sag ponds & xsecs
string	*real*	Capacity Flow	set on flood widths & sag ponds
string	*real*	Capacity Level	set on flood widths & sag ponds
string	*real*	Capacity Volume	set on flood sag ponds [+ Volumes module]
string	*real*	Channel Slope	set on flood widths, sag ponds & xsecs
string	*text*	dependancy	used for Smart Clean of various models
string	*real*	Depth x Velocity	set on flood widths
string	*real*	Flood Depth	set on flood widths & sag ponds
string	*real*	Flood Flow	set on flood widths & sag ponds
string	*real*	Flood Level	set on flood widths & sag ponds
string	*real*	Flood Volume	set on flood sag ponds [+ Volumes module]
string	*real*	Flood Width	set on flood widths
string	*real*	Grate Level	set on flood sag ponds
string	*text*	identifier	used for Smart Clean of various models
string	*real*	Invert Level	set on flood widths
string	*real*	Flow Chainage	set on flood widths
string	*text*	Flow String	set on flood widths
string	*real*	Mannings F	set on flood widths
string	*real*	Mannings n	set on flood widths
string	*text*	NSTin	legacy: NS tin stored on drainage string
string	*real*	Overflow	set on flood widths & sag ponds
string	*text*	Pit Name	set on flood widths & sag ponds
string	*text*	Pit Type	set on flood widths & sag ponds
string	*real*	Reach Chainage	set on flood widths
string	*real*	Reach Ratio	set on flood widths
string	*text*	Tin	legacy: FS tin stored on drainage string
string	*real*	Velocity	set on flood widths
string	*text*	Warning	set on flood widths, sag ponds & xsecs
string	*real*	Wetted Area	set on flood widths
string	*real*	Wetted Perimieter	set on flood widths
string	*real*	x	used for Smart Clean of various models
string	*real*	y	used for Smart Clean of various models

Drainage Network Attributes: Choice Box Values

red = new in V9.0

Data	Type	Name	Valid Values	Internal/Complementary Values
model	*text*	units		
			Metric	1
			US	0
model	*text*	rainfall method		
			IFD Table	1990
			ARR 1987	1987
			ARR 1977	1977
model	*text*	event type		
			Minor	0
			Major	1
model	*int*	pipe travel time method		
			0	t = L/<assumed pipe velocity>
			1	t = L/Vcap
			2	t = L/Vf
			3	t = L/Vn
model	*text*	hydrology report type		
model	*text*	hydraulic report type		
			Formatted	0
			Box Formatted	4
			Comma-delimited	1
			Tab-delimited	2
model	*int*	do flood sections trim		
			0	Nothing
			1	Levees
			2	Overflow

Drainage Network Attributes: Choice Box Values

red = new in V9.0

Data	Type	Name	Valid Values	Internal/Complementary Values
model	*text*	rc method		
			Direct	999
			Direct * Fy	1000
			ARR 1987	1987
			QUDM 2007	2007
			ACT	2003
model	*int*	default veg soil index		
manhole	*int*	veg soil index		
			1	1: Dense vegetation / High permeability
			2	2: Dense vegetation / Medium permeability
			3	3: Dense vegetation / Low permeability
			4	4: Medium vegetation / High permeability
			5	5: Medium vegetation / Medium permeability
			6	6: Medium vegetation / Low permeability
			7	7: Light vegetation / High permeability
			8	8: Light vegetation / Medium permeability
			9	9: Light vegetation / Low permeability
model	*text*	default tc method impervious		
model	*text*	default tc method pervious		
manhole	*text*	tc method impervious*		
manhole	*text*	tc method pervious*		
			Direct	1
			QUDM Standard Inlet Times	11
			Friend Equation	2
			Kinematic Wave	3
			Bransby Williams Equation	8
			QUDM Velocity Table	10
			QUDM Channel Formula	12
model	*int*	default cover rl mode		
manhole	*int*	cover rl mode		
			0	FS Tin
			3	NS Tin
			1	Setout String
			8	Sz + Setout String
			4	Max Obvert
			2	Manual
model	*int*	default grate rl mode		
manhole	*int*	grate rl mode		
			7	Cover RL
			0	FS Tin
			3	NS Tin
			1	Setout String
			8	Sz + Setout String
			4	Max Obvert
			2	Manual

Drainage Network Attributes: Choice Box Values

red = new in V9.0

Data	Type	Name	Valid Values	Internal/Complementary Values
model	*int*	default ku method		
manhole	*int*	ku method		
			0	Direct
			1	Ku,Kw - Missouri/Hare Charts
			2	Ku,Kw>0 - Missouri/Hare Charts
			3	Ku - Culvert Inlet - Generic (101 or 201)
			101	Ku - 101 Pipe Culvert Inlet - Concrete; Square Edge with Headwall
			102	Ku - 102 Pipe Culvert Inlet - Concrete; Socket End with Headwall
			103	Ku - 103 Pipe Culvert Inlet - Concrete; Socket End Projecting
			104	Ku - 104 Pipe Culvert Inlet - CMP; Headwall
			105	Ku - 105 Pipe Culvert Inlet - CMP; Mitred to Slope
			106	Ku - 106 Pipe Culvert Inlet - CMP; Projecting
			107	Ku - 107 Pipe Culvert Inlet - Beveled ring 45°
			108	Ku - 108 Pipe Culvert Inlet - Beveled ring 33.7°
			109	Ku - 109 Pipe Culvert Inlet - Concrete; Tapered Inlet Throat
			110	Ku - 110 Pipe Culvert Inlet - CMP; Tapered Inlet Throat
			201	Ku - 201 Box Culvert Inlet - 30° to 70° Wingwalls
			202	Ku - 202 Box Culvert Inlet - 90° Headwall or 15° Wingwalls
			203	Ku - 203 Box Culvert Inlet - 0° Wingwalls (Extension of Sides)
			204	Ku - 204 Box Culvert Inlet - 45° Wingwalls; d=D/24 Top Bevel
			205	Ku - 205 Box Culvert Inlet - 18° to 33.7° Wingwalls; d=D/12 Top Bevel
			206	Ku - 206 Box Culvert Inlet - 90° Headwall; 20mm Chamfers
			207	Ku - 207 Box Culvert Inlet - 90° Headwall; 45° Bevels
			208	Ku - 208 Box Culvert Inlet - 90° Headwall; 33.7° Bevels
			209	Ku - 209 Box Culvert Inlet - 45° Skewed Headwall; 20mm Chamfers
			210	Ku - 210 Box Culvert Inlet - 30° Skewed Headwall; 20mm Chamfers
			211	Ku - 211 Box Culvert Inlet - 15° Skewed Headwall; 20mm Chamfers
			212	Ku - 212 Box Culvert Inlet - 10° to 45° Skewed Headwall; 45° Bevels
			213	Ku - 213 Box Culvert Inlet - 45° Non-offset Wingwalls; 20mm Top Chamfer
			214	Ku - 214 Box Culvert Inlet - 18.4° Non-offset Wingwalls; 20mm Top Chamfer
			215	Ku - 215 Box Culvert Inlet - 30° Skew; 18.4° Non-offset Wingwalls; 20mm Top Chamfer
			216	Ku - 216 Box Culvert Inlet - 45° Offset Wingwalls; d=D/24 Top Bevel
			217	Ku - 217 Box Culvert Inlet - 33.7° Offset Wingwalls; d=D/12 Top Bevel
			218	Ku - 218 Box Culvert Inlet - 18.4° Offset Wingwalls; d=D/12 Top Bevel
			219	Ku - 219 Box Culvert Inlet - Tapered Inlet Throat
			220	Ku - 220 Box Culvert Inlet - Side Tapered Inlet Throat; Less Favourable Edges
			221	Ku - 221 Box Culvert Inlet - Side Tapered Inlet Throat; More Favourable Edges
			222	Ku - 222 Box Culvert Inlet - Slope Tapered Inlet Throat; Less Favourable Edges
			223	Ku - 223 Box Culvert Inlet - Slope Tapered Inlet Throat; More Favourable Edges
model	*int*	default ku config		
manhole	*int*	ku config		
			0	Preferred
			1	Good
			2	Fair
			3	Poor
manhole	*text*	tailwater mode		
			Minimum	0
			Critical	1
			Normal	2

Drainage Network Attributes: Choice Box Values

red = new in V9.0

Data	Type	Name	Valid Values	Internal/Complementary Values
model	*int*	default setout xy mode		
manhole	*int*	setout xy mode		
			0	Pit Centre
			1	Setout String
			2	Manual
model	*int*	default setout z mode		
manhole	*int*	setout z mode		
			7	Cover RL
			0	FS Tin
			3	NS Tin
			1	Setout String
			8	Sz + Setout String
			4	Max Obvert
			5	DS Invert
			6	Sump Invert
			2	Manual
model	*int*	default road chainage mode		
manhole	*int*	road chainage mode		
			0	No Road
			1	Centre String
			2	Manual
manhole	*int*	inlet type		
			0	100% capture (no bypass pit)
			1	pit on grade bypassing to another pit
			2	pit on grade bypassing out of the system (LOST)
			3	sag pit bypassing to another pit
			4	sag pit bypassing out of the system (LOST)
model	*text*	default roughness type		
pipe	*text*	roughness type		
			Manning	0
			Colebrook	1
model	*int*	default design alignment mode		
pipe	*int*	design alignment mode		
			0	Min Drop
			3	Min Drop < DS-Dia
			2	OL-OL Drop
			4	CL-CL Drop
			1	IL-IL Drop
model	*int*	default design cover mode		
pipe	*int*	design cover mode		
pipe	*int*	design cover mode		
			0	Min Depth
			1	Min Grade
			2	Grade from DS
			3	Const Depth Channel

Drainage Network Attributes: Choice Box Values

red = new in V9.0

Data	Type	Name	Valid Values	Internal/Complementary Values
model	*int*	default design size mode		
pipe	*int*	design size mode		
			0	Pressurised Pipe: Freeboard Design
			1	Part-full Pipe: Freeboard Design
			2	Part-full Pipe: Flow-depth Design
			3	Open Channel: Freeboard Design
model	*text*	pit naming method		
			String name - Pit num	1
			Pit num - String name	0
			Sequential numbering	2
model	*text*	pit naming pipe method		
			US-Pit to DS-Pit	1
			US-Pit	0
			Independent	2
model	*text*	io format		
			Spreadsheet clipboard	1
			Drains clipboard - Ver 1	2
			Drains clipboard - Ver 5 Rational	3
			Drains clipboard - Ver 5 ILSAX	4
			PC Drain Int (Windows)	5
			XP SWMM	7
			Micro Drainage (*.sws)	8
			Micro Drainage (*.fws)	9
			RATHGL	12
model	*text*	io listtype		
			All data	1
			PC Drain	3
			Ilsax	4
			House connections	5
			Customised list file	2

Hardcoded 12d Drainage String Variables
Set to Null prior to Import from external drainage package

Data	Type	Name
manhole	*real*	hgl
pipe	*real*	upstream_hgl
pipe	*real*	downstream_hgl
pipe	*real*	flow_velocity
pipe	*real*	flow_volume

Calculated 12d Drainage Analysis Attributes
Deleted prior to Import from external drainage package

red = new in V9.0

* = <blank>, 2, 3

Data	Type	Name
manhole	*real*	calculated approach flow
manhole	*real*	calculated basin discharge average
manhole	*real*	calculated basin discharge basha
manhole	*real*	calculated basin discharge boyd
manhole	*real*	calculated basin discharge carroll
manhole	*real*	calculated basin discharge culp
manhole	*real*	calculated basin inflow
manhole	*real*	calculated basin inflow volume
manhole	*real*	calculated basin tc
manhole	*real*	calculated basin volume average
manhole	*real*	calculated basin volume basha
manhole	*real*	calculated basin volume boyd
manhole	*real*	calculated basin volume carroll
manhole	*real*	calculated basin volume culp
manhole	*real*	calculated bypass flow
manhole	*real*	calculated catchment flow
manhole	*real*	calculated choke

Calculated 12d Drainage Analysis Attributes
Deleted prior to Import from external drainage package

red = new in V9.0

* = <blank>, 2, 3

Data	Type	Name
manhole	*real*	calculated composite c*
manhole	*real*	calculated critical effective c
manhole	*real*	calculated critical intensity
manhole	*real*	calculated critical sum a
manhole	*real*	calculated critical sum ca
manhole	*real*	calculated critical tc
manhole	*real*	calculated direct flow
manhole	*real*	calculated excess flow
manhole	*real*	calculated flooded depth
manhole	*real*	calculated flooded depth x velocity
manhole	*real*	calculated flooded flow capacity
manhole	*real*	calculated flooded level
manhole	*real*	calculated flooded velocity
manhole	*real*	calculated flooded volume
manhole	*real*	calculated flooded volume capacity
manhole	*real*	calculated flooded width
manhole	*real*	calculated freeboard
manhole	*real*	calculated full catchment flow
manhole	*real*	calculated full effective c
manhole	*real*	calculated full intensity
manhole	*real*	calculated full sum a
manhole	*real*	calculated full sum ca
manhole	*real*	calculated full tc
manhole	*real*	calculated hgl
manhole	*real*	calculated impervious c*
manhole	*real*	calculated impervious intensity*
manhole	*real*	calculated impervious tc*
manhole	*real*	calculated inflow
manhole	*text*	calculated inlet capacity curve

Calculated 12d Drainage Analysis Attributes
Deleted prior to Import from external drainage package

red = new in V9.0

* = <blank>, 2, 3

Data	Type	Name
manhole	*real*	calculated ku
manhole	*text*	calculated ku chart
manhole	*text*	calculated ku config
manhole	*real*	calculated ku diameter ratio
manhole	*real*	calculated ku grate flow angle
manhole	*real*	calculated ku grate flow ratio
manhole	*text*	calculated ku method
manhole	*real*	calculated ku pipe flow angle
manhole	*real*	calculated ku submergence ratio
manhole	*text*	calculated kukw text
manhole	*real*	calculated kw
manhole	*real*	calculated outfall pressure head loss
manhole	*real*	calculated partial catchment flow
manhole	*real*	calculated partial effective c
manhole	*real*	calculated partial intensity
manhole	*real*	calculated partial sum a
manhole	*real*	calculated partial sum ca
manhole	*real*	calculated partial tc
manhole	*real*	calculated pervious c*
manhole	*real*	calculated pervious intensity*
manhole	*real*	calculated pervious tc*
manhole	*real*	calculated pit pressure head loss
manhole	*real*	calculated pit wse loss
manhole	*real*	calculated surcharge flow
manhole	*real*	entrance hgl
manhole	*real*	grate level adjustment
manhole	*int*	number of sub catchments
manhole	*int*	rational index

Calculated 12d Drainage Analysis Attributes
Deleted prior to Import from external drainage package

red = new in V9.0

* = <blank>, 2, 3

Data	Type	Name
pipe	*real*	calculated critical tc
pipe	*real*	calculated percent depth
pipe	*real*	calculated catchment flow
pipe	*real*	calculated critical effective c
pipe	*real*	calculated critical intensity
pipe	*real*	calculated critical sum a
pipe	*real*	calculated critical sum ca
pipe	*real*	calculated excess flow
pipe	*real*	calculated full catchment flow
pipe	*real*	calculated full effective c
pipe	*real*	calculated full intensity
pipe	*real*	calculated full sum a
pipe	*real*	calculated full sum ca
pipe	*real*	calculated full tc
pipe	*real*	calculated hgl ds
pipe	*real*	calculated hgl grade
pipe	*real*	calculated hgl grade 1 in
pipe	*real*	calculated hgl us
pipe	*real*	calculated net bypass flow
pipe	*real*	calculated partial catchment flow
pipe	*real*	calculated partial effective c
pipe	*real*	calculated partial intensity
pipe	*real*	calculated partial sum a
pipe	*real*	calculated partial sum ca
pipe	*real*	calculated partial tc
pipe	*real*	calculated peak flow
pipe	*real*	calculated pipe area
pipe	*real*	calculated pipe total head loss
pipe	*real*	calculated sum direct pipe flow
pipe	*real*	calculated sum direct pit flow

Calculated 12d Drainage Analysis Attributes
Deleted prior to Import from external drainage package

red = new in V9.0

* = <blank>, 2, 3

Data	Type	Name
pipe	*real*	calculated travel velocity
pipe	*real*	calculated velocity head
pipe	*real*	capacity velocity
pipe	*real*	critical depth
pipe	*real*	critical depth relative
pipe	*real*	critical velocity
pipe	*int*	drowned pipe
pipe	*real*	flow capacity
pipe	*real*	flow capacity ratio
pipe	*real*	full pipe velocity
pipe	*real*	normal depth
pipe	*real*	normal depth relative
pipe	*real*	normal velocity
pipe	*int*	number of sub catchments
pipe	*real*	pipe flow
pipe	*int*	rational index