| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| v2_1d_boundary_condtions | | | | | | Boundary condition for 1D connection nodes.<br>Boundaries can only be placed on nodes connected to a single channel or pipe. |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | connection_node_id | integer | * | | | Unique connection node id. |
| | boundary_type | integer | * | | 1: m above datum<br>2: m/s<br>3: m3/s | Boundary type.<br>1: waterlevelbnd<br>2: velocitybnd<br>3: discharge boundary<br>For types 2 and 3 the channel direction determines sign of the input value. If the boundary is placed on the channel endpoint, positive values mean water is being extracted from the model. |
| | timeseries | text | * | | min,value<br>min,value | Format:<br> min,value<br> min,value<br>Between time succesive lines values are interpolated. (note that during 1 timestep the values is still constant)<br>- Leave no trailing spaces or empty rows at the end of your file.<br>- Make sure there is no space between min,value<br>- In case of multiple boundaries in 1 model: make sure they all have the same number of timeseries rows with exactly the same temporal interval.<br>- In case of multiple boundaries in 1 model: also start- and end time of all timeseries must be the same.<br>- In QGIS it is not posible to directly type enter/newline characters into a table. To enter this format into spatialite you must either use a text editor to compose your timeseries through the field calculator using '\n' to add a new line. |
| v2_1d_lateral | | | | | | Lateral for 1D connection nodes |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | connection_node_id | integer | * | | | Unique connection node id. |
| | timeseries | text | * | | min,m3/s | Format:<br> min,value<br> min,value<br>Between time succesive lines values are interpolated. (note that during 1 timestep the values is still constant)<br>- Leave no trailing spaces or empty rows at the end of your file.<br>- Make sure there is no space between min,value<br>- In case of multiple laterals in 1 model: make sure they all have the same number of timeseries rows with exactly the same temporal interval.<br>- In case of multiple laterals in 1 model: also start- and end time of all timeseries must be the same.<br>- In QGIS it is not posible to directly type enter/newline characters into a table. To enter this format into spatialite you must either use a text editor to compose your timeseries through the field calculator using '\n' to add a new line. |
| v2_2d_boundary_conditions | | | | | | Boundary condition for 2D model edge (must be on edge of DEM file) |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | display_name | text | * | | | Name field, no constraints |
| | boundary_type | integer | * | | 1: m above datum<br>2: m/s<br>3: m3/s<br>5: - | 1: waterlevelbnd<br> 2: velocitybnd<br> 3: discharge boundary<br> 5: Sommerfeld rand (waterlevel slope)<br><br>schematisation requirements:<br>- the boundary linestring must be placed on the edge of the DEM (outer calculation cells)<br>- the boundary linestring must intersect at least two calculation cells<br>- the complete boundary Linestring must be on on active edge (read: on data pixels). If (a part of) the boundary is on nodata pixels then the boundarie is ignored<br>- the boundary linestring may be slightly skewed (maximum 6 pixels skewed)<br>- the boundary also looks at the cross section area at the outside of the model (so the outer pixels at the dem) whether flow is possible |
| | timeseries | text | * | | min,value<br>min,value | Format:<br> min,value<br> min,value<br>Between time succesive lines values are interpolated. (note that during 1 timestep the values is still constant)<br>- Leave no trailing spaces or empty rows at the end of your file.<br>- Make sure there is no space between min,value<br>- In case of multiple boundaries in 1 model: make sure they all have the same number of timeseries rows with exactly the same temporal interval.<br>- In case of multiple boundaries in 1 model: also start- and end time of all timeseries must be the same.<br>- In QGIS it is not posible to directly type enter/newline characters into a table. To enter this format into spatialite you must either use a text editor to compose your timeseries through the field calculator using '\n' to add a new line. |
| v2_2d_lateral | | | | | | Lateral discharge for location on 2D |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | type | integer | * | | | 1: surface |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | | | | | | "Format:<br> min,value<br> min,value<br>Between time succesive lines values are interpolated. (note that during 1 timestep the values is still constant)<br>- Leave no trailing spaces or empty rows at the end of your file.<br>- Make sure there is no space between min,value<br>- In case of multiple laterals in 1 model: make sure they all have the same number of timeseries rows with exactly the same temporal interval.<br>- In case of multiple laterals in 1 model: also start- and end time of all timeseries must be the same.<br>- In QGIS it is not possible to directly type enter/newline characters into a table. To enter this format into spatialite you must either use a text editor to compose your timeseries through the field calculator using '\n' to add a new line. |
| | discharge | double | * | | min, m3/s | |
| v2_aggregation_settings | | | | | | Settings for aggretation that are found in the flow_aggregate.nc |
| | id | | | | | Leave blank. Is filled automatically. |
| | global_settings | integer | | | | v2_global_settings scenario id.<br> If not set, the aggregation rule is applied to all models in global_settings. if set, the aggregation rule is only applied to that specific model. |
| | var_name | char(100) | * | | - | Name field for flow variable name.<br> Mandatory when using multiple aggregations on the same variable |
| | flow_variable | char(100) | | | - | The name of output variable that is aggregated.<br>Possible flow variables:<br>discharge<br>flow_velocity<br>infiltration<br>pump_discharge<br>rain<br>waterlevel<br>wet_cross-section<br>wet_surface<br>lateral_discharge |
| | aggregation_method | char(10) | * | | - | Method of aggretation, choose from: avg, min, max, cum, med, cum_negative, cum_positive |
| | aggregation_in_space | boolean | * | FALSE | - | If set to true, aggregation will also be done spatially over calculation ponts |
| | timestep | integer | * | | s | Timestep size for aggregation. |
| v2_channel | | | | | | Channel lines between connection nodes.<br> All channels must have at least one cross_section_location. |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | display_name | text | * | | | Name field, no constraints |
| | code | text | * | | | Name field, no constraints |
| | calculation_type | integer | * | | | 100 = embedded channel<br>101 = stand-alone channel<br>102 = connected channel<br>105 = double connected channel<br>Embedded or connected can only be used where a DEM is present. Any start-, end- or calculation node along a channel with these types may not lay outside the DEM. |
| | dist_calc_points | double | * | | m | Distance between calculation points on linesegments. |
| | zoom_category | integer | | | | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | connection_node_start_id | integer | * | | | Start node for channel line. Must be present in v2_connection_nodes and the channel geometry startpoint must be snappen on the given connection node. |
| | connection_node_end_id | integer | * | | | End node for channel line. Must be present in v2_connection_nodes and the channel geometry endpoint must be snappen on the given connection node. |
| v2_connection_nodes | | | | | | Location and ID of nodes between channels, pipes and structures.<br>Make sure that:<br>i) When removing a node or changing its ID, make sure the<br>node is not referred to in any of the other tables,<br>ii) When moving a node, make sure to also move any channels<br>and culverts that are snapped to the node,<br>iii) make sure no node is left without any connection, and<br>iv) make sure that every node is connected to either a channel or is<br>used as a manhole (otherwise the calculation type is unknown). |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | storage_area | | | | m2 | Storage area for manhole in sewerage calculations.<br> If a manhole is present on a connection node the storage area must be larger than zero.<br> Storage area can also be added to a connection node without the use of a manhole.<br> Nodes that are not connected to channels (for instance when betwee 2 culverts) require a storage area larger than zero, for others storage area is derived from the channel cross section, reference level and calculation distance. |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | initial_waterlevel | double | | | m above datum (NL: NAP) | Initial water level at connection node. Initial waterlevel is interpolated across channel calculation nodes. |
| v2_cross_section_definition | | | | | | Table of cross-section definitions |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | code | text | * | | | Name field, no constraints |
| | shape | integer | * | | | 1 = rectangle; specify width and height (profile/upper side is automatically closed) 2 = circle; specify width (profile/upper side is automatically closed) 3 = egg; specify space-sperated width and height intervals. Between intervals the profile is interpolated. Can be closed by stating width 0 at heighest heigth 5 = tabulated rectangle; specify space-sperated width and height intervals. Between intervals the profile is defined straight. Can be closed by stating width 0 at highest heigth 6 = tabulated trapezium; specify space-sperated width and height intervals. Between intervals the profile is interpolated. Can be closed by stating width 0 at heighest heigth |
| | width | text | * | | - | For tabulated fill in space-separated widths of profile. Fill in diameter for circle. |
| | height | text | ** | | m | For tabulated fill in space-separated heights of profile. All height values must be larger than zero, except for the first value **Mandatory for types 3, 5 & 6. |
| v2_cross_section_location | | | | | | Location of cross-section for channels. All cross-section locations must be snapped to a channel vertex. May not be placed on or within 1 cm within start- or endnode. |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | code | text | * | | | Name field, no constraints |
| | channel_id | integer | * | | | Reference to v2_channel id. Channel id must match the channel on which the location lies. |
| | definition_id | integer | * | | | Reference to v2_cross_section_definition id. Must be present in v2_cross-section_definition table. |
| | reference_level | double | * | | m above datum (NL: NAP) | Reference level or bottom level for profile. |
| | friction_type | integer | * | | | 1 = Chezy 2 = Manning |
| | friction_value | double | * | | 1: m1/2/s 2: s/m1/3 | Friction or roughness value for profile |
| | bank_level | double | ** | | m above datum (NL: NAP) | For connected channels only. Reference level for exchange between 1D and 2D. ** Mandatory when channel type is 102. |
| v2_culvert | | | | | | Table of culverts, connection between connection nodes |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | display_name | text | * | | | Name field, no constraints |
| | code | text | * | | | Name field, no constraints |
| | calculation_type | integer | * | 101 | | 100 = embedded channel 101 = stand-alone channel 102 = connected channel 105 = double connected channel Embedded or connected can only be used where a DEM is present. Any start-, end- or calculation node along a channel with these types may not lay outside the DEM. |
| | friction_value | double | * | | 1: m1/2/s 2: s/m1/3 | Friction or roughness value for profile |
| | friction_type | integer | * | | | Friction type 1 = Chezy 2 = Manning |
| | dist_calc_points | double | * | | m | Distance between calculation points on linesegments. |
| | zoom_category | integer | | | | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | cross_section_definition_id | integer | * | | | Reference to v2_cross_section_definition id. Must be present in v2_cross_section_definition table. |
| | discharge_coefficient_positive | double | | | | Not yet implemented. |
| | discharge_coefficient_negative | double | | | | Not yet implemented. |
| | invert_level_start_point | double | * | | m above datum (NL: NAP) | Invert level at culvert startpoint. Must be equal or above ajoining manhole or channel bottom/reference level. |
| | invert_level_end_point | double | * | | m above datum (NL: NAP) | Invert level at culvert endpoint. Must be equal or above ajoining manhole or channel bottom/reference level. |
| | connection_node_start_id | integer | * | | | Start node for culvert line. Must be present in v2_connection_nodes and the culvert geometry startpoint must be snappen on the given connection node. |
| | connection_node_end_id | integer | * | | | End node for culvert line. Must be present in v2_connection_nodes and the culvert geometry endpoint must be snappen on the given connection node. |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| v2_global_settings | | | | | | Global settings |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | use_0d_inflow | integer | * | | | Include 0D inflow (NWRW/impervious surfaces) in simulation.<br>0  do not use 0d inflow<br>1  use v2_impervious_surface<br>2  use v2_surface |
| | use_2d_flow | boolean | * | | | Include 2D flow in simulation.<br> When using only 2D flow, set manhole_storage_area to NULL. |
| | use_1d_flow | boolean | * | | | Include 1D flow in simulation.<br> When using only 1D flow, manhole_storage_area must be larger than zero. |
| | manhole_storage_area | double | ** | | m2 | Default manhole storage area.<br> **Mandatory when using only 1d flow (no dem) manhole area must be larger than 0 (and an INTEGER)<br> Must be NULL when using only 2d. |
| | name | text | * | | | Names must be unique globally.<br> Do not use spaces or capitals.<br> Keep names shorter than 10 characters.<br> Don't use same name as sqlite name. |
| | sim_time_step | double | * | | s | Simulation time step |
| | output_time_step | double | * | | s | Timestep written in output file |
| | nr_timesteps | integer | * | | | Maximum nr of timesteps.<br> This value is not used in the web portal. |
| | start_time | timestamp with time z | * | | | Starttime of simulation. Format: 00:00:00 (LM: volgens mij mag dit format niet en moet het zoiets zijn: 2014-01-01 00:00:00) |
| | start_date | date | * | | | Format: 2017-01-01 |
| | grid_space | double | * | | m | Size of smallest grid cell in quadtree, k=1.<br> Must be a multitude of the raster pixel size. |
| | kmax | integer | * | | | Maximum multitude of smallest grid size in quadtree starting from grid_space at k=1.<br> Grid size increases according to 2^(k-1) * grid_space. |
| | dist_calc_points | double | | | m | Global distance between calculation points for line elements. |
| | table_step_size | double | * | | m | User-defined table stepsize/increment (m).<br> Use 0.01 for detailed simulation or larger stepsize to speed up exploring model schematisation. |
| | table_step_size_1d | double | | table_step_size | m | User-defined table stepsize/increment (m) for 1d cross-sections and volumes.  default value = table_step_size |
| | table_step_size_volume_2d | double | | table_step_size | m | User-defined table stepsize/increment (m) for defining 2D volumes. Can increase speed when this is set larger than  table_step_size. default value = table_step_size |
| | flooding_threshold | double | * | 1.d-2 | m | Water depth threshold for flow between 2D cells. Depth relative to lowest bathymetry pixel in 2D cell. |
| | advection_1d | integer | * | 0/1 | | Use advection in 1D, other schemes 2-6 are in experimental phase |
| | advection_2d | integer | * | 0/1 | | Use advection in 2D. |
| | dem_file | text | * | raster/yourfile.tif | m above datum (NL: NAP) | Relative path to dem file (.tif) |
| | frict_type | integer | | | | 1: Chezy<br> 2: Manning |
| | frict_coef | double | * | | 1:[m1/2/s], 2:[s/m1/3] | Constant friction coefficient for 2D. |
| | frict_coef_file | text | | raster/yourfile.tif | 1:[m1/2/s], 2:[s/m1/3] | Relative path to friction file (.tif) |
| | water_level_ini_type | integer | ** | | | 0=max, 1=min, 2=avg<br> **Mandatory when using initial water level file. |
| | initial_waterlevel | double | * | | m above datum (NL: NAP) | Global initial water level. |
| | initial_waterlevel_file | text | | raster/yourfile.tif | m above datum (NL: NAP) | Relative path to initial water level file (.tif) |
| | infiltration_rate | double | * | 0 | mm/day | Global infiltration rate. |
| | infiltration_rate_file | text | | raster/yourfile.tif | mm/day | Relative path to infiltration file (.tif).<br> Infiltration uses the sum of pixel values per calculation cell in case of rain and sum of wet pixels in case of standing water.<br> Must be NULL (and not "") when not using infiltration otherwise 3di expects infiltration. |
| | max_infiltration_capacity_file | text | | raster/yourfile.tif | m | Relative path to max infiltration file (.tif).<br> Maximum infiltration uses the sum of pixel values per calculation cell. |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | interflow_type | integer | *<br>** | 0 | | Include interflow in simulation.<br>0: No Interflow<br>1: define 1 porosity value for model. This porsity will be rescaled per pixel (to lowest pixel per cell), so (interflow) volume is the same for each pixel within 1 cell --> define porosity, hydraulic_conductivity, porosity_layer_thickness and impervious_layer_elevation<br>2: define 1 porosity value for model. This porsity will be rescaled per pixel (to lowest pixel whole model), so (interflow) volume is the same for each pixel in whole model --> define porosity, hydraulic_conductivity, porosity_layer_thickness and impervious_layer_elevation<br>3: define 1 porosity value for model. This porsity will not be rescaled, but each pixel in the model has the same porosity. The (interflow) volume for each pixel depends on the impervious_layer_elevation, which is below lowest pixel of cell --> define porosity, hydraulic_conductivity and impervious_layer_elevation<br>4: define 1 porosity value for model. This porsity will not be rescaled, but each pixel in the model has the same porosity. The (interflow) volume for each pixel depends on the impervious_layer_elevation, which is below lowest pixel of whole model --> define porosity, hydraulic_conductivity and impervious_layer_elevation<br><br>* NOT NULL<br>** do not use interflow in combination with limiter_slope_crossectional_area_2d=1 AND/OR limiter_slope_crossectional_area_2d=1 |
| | hydraulic_conductivity | double | ** | | m/day | Global hydraulic conductivity (Darcy)<br>**When interflow_type > 0 then hydraulic_conductivity OR hydraulic_conductivity_file is mandatory |
| | hydraulic_conductivity_file | text | | raster/yourfile.tif | m/day | Relative path to hydraulic conductivity path (.tif)<br>**When interflow_type > 0 then hydraulic_conductivity OR hydraulic_conductivity_file is mandatory |
| | porosity_layer_thickness | double | ** | > 0 | m | Thickness of porosity layer relative to DEM.<br>**Mandatory for interflow_type 1 and 2. |
| | porosity | double | ** | | | Porosity (between 0 and 1) of interflow layer.<br>** Mandatory when using interflow |
| | porosity_file | text | | raster/yourfile.tif | - | Relative path to porosity file (.tif) |
| | impervious_layer_elevation | double | ** | > 0 | m | When using interflow: Depth of interflow layer defined below lowest pixel (so always positive). Imaginary bottom of interflow layer.<br>For interflow types 1 and 2 it is ignored for the volume in the interflow layer (but still it must be filled in when using interflow). The volume in these types is determined by the porosity and the porosity layer thickness.<br>For interflow types 3 and 4 it is used to determine the volume in the interflow layer.<br>In all types the waterlevel in the interflow layer starts at this level. It does not influence flow.<br>** Mandatory when using interflow |
| | dem_obstacle_detection | boolean | * | | - | Automatically detect obstacles based on DEM-file. Works only in combination with dem_obstacle_height (has no relation with v2_obstacle) |
| | dem_obstacle_height | double | ** | | m | Relative height (above lowest pixel of calc cell) for obstacle detection.<br>** Mandatory when using dem obstacle detection. |
| | embedded_cutoff_threshold | double | | 0.05 | factor [0 - 1] | Relative length of cell size. When embedded channel intersects 2D grid size over length shorter than the cellsize * cutoff threshold, the embedded channel skips this 2D cell. Usefull for preventing very short embedded channel segments (which slow down your model). |
| | max_angle_1d_advection | double | | | degrees [0-90] | Maximum angle at which advection is considered. |
| | epsg_code | integer | * | | m | Define map projection for study area. Much match raster projection. |
| | timestep_plus | boolean | * | | - | Allow switching to larger timestep when simulation is steady. |
| | maximum_sim_time_step | double | ** | | s | Maximum timestep during simulation.<br>** Mandatory when using timestep plus. |
| | minimum_sim_time_step | double | | | s | Minimum timestep during smulation. |
| | infiltration_surface_option | integer | | 0 | | Option that sets how the infiltration works in calculation cells.<br>0: rain (whole surface when raining, only wet pixels when dry)<br>1: whole surface (always whole surface)<br>2: only wet surface (always only wet pixels) |
| | frict_avg | integer | * | 0 | - | The roughness coefficient will be averaged within one cell. |
| | wind_shielding_file | text | | | | |
| | control_group_id | integer | | | | |
| | numerical_settings_id | integer | | | | |
| | use_2d_rain | integer | * | | - | |
| v2_numerical_settings | | | | | | Advanced numerical settings |
| | integration_method | integer | * | 0 | | Time integration method: 0=Euler implicit |
| | max_nonlin_iterations | integer | * | 20 | | Maximum number of nonlinear iterations in single time step. |
| | convergence_eps | double | * | 0.00001 | | Minimal residual for convergence of newton iteration. |
| | max_degree | integer | * | see comment | | Setting for matrix solver. Values below are adviced for different model types<br>700 for 1D flow<br>7 for 1D and 2D flow<br>5 for 2D flow only |
| | use_of_cg | integer | * | 20 | | Number of iteration of conjugate gradient method, before swtiching to another method |
| | precon_cg | integer | | 1 | - | Use preconditioner for matrix solver. Increases simulation speed in most cases, Set to 0 or 1 (default). |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | use_of_nested_newton | integer | * | 0/1 | | 1 for 1D calculation with closed profiles to handle non-linearity in volume-waterlevel relation. When using 0 nested newton is switch off by default but will be used when calculations become non-linear. For sewerage systems 1 is advised. |
| | preissmann_slot | double | | 0 | m2 | A conceptual vertical and narrow slot providing a conceptual free surface condition for the flow when the water level is above the top of a closed conduit. Often used to guarentee stability, in 3Di unnessary unless used for presurized pipe flow. Works only for circular profiles. |
| | cfl_strictness_factor_1d | double | | 1 | - | Stricktness of CFL condition for 1D. |
| | cfl_strictness_factor_2d | double | | 1 | - | Stricktness of CFL condition for 2D. |
| | pump_implicit_ratio | double | | 1 | | Determines whether pump discharge is always maximum capacity (0) or discharge is limited to available inflow (1). The latter ensures a smooth discharge. Value between 0 and 1. |
| | frict_shallow_water_correction | integer | | 0 | - | In case the friction assumptions based on the dominant friction balance gives a structurally underestimation of the friction, one can switch this setting on. 0 is off, 1 is maximum between averaged friction and divided channel based friction, 2 is always linearized, 3 linearizes the depth based on a weighed averaged. In this case the maximum depth of a thin layer needs to be defined. Do not use in combination with interflow |
| | limiter_slope_crossectional_area_2d | integer | | 0 | - | This limiter starts working in case the depth based on the downstream water level is zero and may be useful in sloping areas. 0 is off, and 1 is a limiter which ends in a a higher order scheme, but is sensitive too instabilities, 2, treats the cross-sections as an upwind method volume/surface area under the assumption that the flow acts like a thin layer,  3 makes a combination of the traditional method in combination with the  thin layer apporach. In this case the maximum depth of a thin layer needs to be defined.  Do not use in combination with interflow |
| | limiter_slope_friction_2d | integer | | 0 | - | This limiter starts working in case the depth based on the downstream water level is zero and may be useful in sloping areas.  0 is off, and 1 is on. This limiter is obliged in combination with limiter_slope_crossectional_area_2d>0.. l Do not use in combination with interflow |
| | limiter_grad_2d | integer | | 0 | - | The limiter on the water level gradient allows the model to deal with unrealistically steep gradients. When field is left empty, it is switched on!!! |
| | limiter_grad_1d | integer | | 1 | | The limiter on the water level gradient allows the model to deal with unrealistically steep gradients. |
| | flow_direction_threshold | double | | 0.000001 | m/s | For numerical computation several tresholds are needed in the code, to avoid deficiencies due to a limited numerical accuracy. Generally this is to keep the behaviour consistent. |
| | minimum_friction_velocity | double | | 0.05 | m/s | For numerical computation several tresholds are needed in the code, to avoid deficiencies due to a limited numerical accuracy. Generally this is to keep the behaviour consistent. |
| | convergence_cg | double | | 0.000000001 | | For numerical computation several tresholds are needed in the code, to avoid deficiencies due to a limited numerical accuracy. Generally this is to keep the behaviour consistent. |
| | general_numerical_threshold | double | | 0.00000001 | | For numerical computation several tresholds are needed in the code, to avoid deficiencies due to a limited numerical accuracy. Generally this is to keep the behaviour consistent. |
| | minimum_surface_area | double | | 0.00000001 | m2 | For numerical computation several tresholds are needed in the code, to avoid deficiencies due to a limited numerical accuracy. Generally this is to keep the behaviour consistent. |
| | thin_water_layer_definition | double | ** | 0.1 | m | ** mandatory when using friction shallow water correction option 3 or limiter_slope_crossectional_area_2d on option 3 |
| v2_grid_refinement | | | | | | Lines that determine local 2D calculation grid refinement. |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | display_name | text | * | | | Name field, no constraints |
| | refinement_level | integer | * | | | Local refinement level. Starting from 1. Values above kmax (v2_global_settings) are ignored. |
| v2_grid_refinement_area | | | | | | Lines that determine local 2D calculation grid refinement. |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | display_name | text | * | | | Name field, no constraints |
| | refinement_level | integer | * | | | Local refinement level. Starting from 1. Values above kmax (v2_global_settings) are ignored. |
| v2_impervious_surface | | | | | | Definition of 0D-surfaces. |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | display_name | text | * | | - | Name field, no constraints |
| | code | text | * | | - | Code field, no constraints |
| | surface_class | text | * | | - | gesloten verharding , open verharding , half verhard , onverhard , pand |
| | surface_inclination | text | * | | - | vlak, hellend, uitgestrekt |
| | zoom_category | integer | | | - | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | nr_of_inhabitants | double | | | - | Number of inhabitant used for dry wheather flow. |
| | dry_weather_flow | double | | | L/day per inhabitant | Dry weather flow per inhabitant. |
| | area | double prec | * | | | Cannot be left blank. A value of 0 is allowed. |
| v2_impervious_surface_map | | | | | | Table that linkes v2_impervious_surfaces to connection node ID's. |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | impervious_surface_id | integer | * | | - | ID of impervious surfce feature |
| | connection_node_id | integer | * | | - | ID of connection node |
| | percentage | integer | * | | % | Percentage of impervious surface area places on connection node |
| v2_levee | | | | | | Line with fixed crest level that overides DEM- values at calculation cell borders. |
| | id | serial | * | | - | Leave blank. Is filled automatically. |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | crest_level | double | * | | m above datum (NL: NAP) | Crest level of levee segment. |
| | material | integer | ** | | - | ** Mandatory when you want to use a levee breach during your calculation<br>Material used for breach growth.<br>1: sand<br>2: clay |
| | max_breach_depth | double | ** | | m below levee crest_level | ** Mandatory when you want to use a levee breach during your calculation<br>Maximum breach depth relative to crest level (thus a positive value must be filled in). |
| v2_manhole | | | | | | Sewerage manhole |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | display_name | text | * | | - | Name field, no constraints |
| | code | text | * | | - | Name field, no constraints |
| | connection_node_id | integer | * | | - | ID of connection node on which manhole is placed. |
| | shape | text | * | | - | 00: vierkant<br>01: rond<br>02: rechthoek |
| | width | double | * | | m | Manhole width or diameter |
| | length | double | ** | | m | Manhole length<br>**Mandatory when shape = 02 |
| | manhole_indicator | integer | * | | - | 0: inspection (inspectieput)<br>1: outlet<br>2: pump |
| | calculation_type | integer | * | | - | Manhole calculation type for 1D-2D connection.<br>0: embedded<br>1: isolated<br>2: connected |
| | bottom_level | double | * | | m above datum (NL: NAP) | Manhole bottom level. |
| | surface_level | double | * | | m above datum (NL: NAP) | Manhole surface level. |
| | drain_level | double | ** | | m above datum (NL: NAP) | Manhole drain level (**for connected manholes). If there is a connected manhole without drain level, 3Di will take the top of the pipe from the connection pipes as drain level. |
| | zoom_category | integer | * | | - | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| v2_obstacle | | | | | | Line with fixed crest level that overides DEM- values at calculation cell borders. |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | crest_level | double | * | | m above datum (NL: NAP) | Crest level of obstacle segment |
| v2_orifice | | | | | | Structure that can be used for spillways or bridges |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | display_name | text | * | | - | Name field, no constraints |
| | code | text | * | | - | Name field, no constraints |
| | crest_level | double | * | | m above datum (NL: NAP) | Crest or bottom level.<br> Must be equal or above ajoining manhole or channel bottom/reference level. |
| | sewerage | boolean | | | - | For internal book keeping. Can be used for statistics in QGIS plugin. |
| | cross_section_definition_id | integer | * | | - | ID of cross section definition in v2_cross_section_definition |
| | friction_value | double | * | | 1:[m1/2/s], 2:[s/m1/3] | Friction or roughness value for profile |
| | friction_type | integer | * | | | Friction Type.<br>1: Chezy<br>2: Manning |
| | discharge_coefficient_positive | double | * | 1 | - | Discharge coefficient for positive flow (from start to end node). Can be set to 0 when closed. |
| | discharge_coefficient_negative | double | * | 1 | - | Discharge coefficient for positive flow (from start to end node). Can be set to 0 when closed. |
| | zoom_category | integer | * | | | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | crest_type | integer | * | | - | Type of weir formulation.<br>3: broad crested<br>4: short crested |
| | connection_node_start_id | integer | * | | - | Start node for orifice.<br> Must be present in v2_connection_nodes |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | connection_node_end_id | integer | * | | - | End node for orifice.<br> Must be present in v2_connection_nodes |
| v2_pipe | | | | | | Table of pipes |
| | id | serial | | | - | Leave blank. Is filled automatically. |
| | display_name | text | | | - | Name field, no constraints |
| | code | text | | | - | Name field, no constraints |
| | profile_num | integer | | | | For internal use only. |
| | sewerage_type | integer | | | - | Pipe type. 3Di requires the sewerage_type to be one of the following:<br>0: gemengd - mixed<br>1: rwa - rain water<br>2: dwa - dry wheather flow<br>3: transport<br>4: overstort - spillway<br>5: zinker<br>6: berging - storage<br>7: bergbezinkbak - storage tank<br>Some organisations use additional codes. This is not allowed in 3Di. |
| | calculation_type | integer | * | 101 | | Calculation type for pipe. When start en end connection nodes are manholes only used for calculation points half-way pipe.<br>0 = embedded<br>1 = isolated<br>2 = connected<br>3 = broad crest<br>4 = short crest |
| | invert_level_start_point | double | * | | m above datum (NL: NAP) | Invert level at culvert startpoint.<br> Must be equal or above ajoining manhole or channel bottom/reference level. |
| | invert_level_end_point | double | * | | m above datum (NL: NAP) | Invert level at culvert endpoint.<br> Must be equal or above ajoining manhole or channel bottom/reference level. |
| | cross_section_definition_id | integer | * | | - | ID of cross section definition in v2_cross_section_definition |
| | friction_value | double | * | | 1:[m1/2/s], 2:[s/m1/3] | Friction or roughness value for profile; friction only accounted for in case of broad crested weir |
| | friction_type | integer | * | | | Friction type.<br>1: Chezy<br>2: Manning |
| | dist_calc_points | double | | | m | Distance between calculation points on pipe. |
| | material | integer | | | | Material of pipe, used for internal bookkeeping only.<br>0: concrete<br>1: pvc<br>2: gres<br>3: cast iron<br>4: brickwork<br>5: HPE<br>6: HDPE<br>7: plate iron<br>8: steel |
| | original_length | double | | | m | For internal use only. |
| | zoom_category | integer | | | | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | connection_node_start_id | integer | | | | Start node for pipe.<br> Must be present in v2_connection_nodes |
| | connection_node_end_id | integer | | | | End node for pipe.<br> Must be present in v2_connection_nodes |
| v2_pumpstation | | | | | | List of pumpstations |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | display_name | text | * | | | Name field, no constraints |
| | code | text | * | | | Name field, no constraints |
| | classification | integer | | | | For internal book keeping. |
| | sewerage | boolean | * | | | For internal book keeping. |
| | type | integer | * | | | Type that determines pump function.<br>1: pump reacts only on suction side<br>2: pump reacts only on delivery side |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | start_level | double | * | | m above datum (NL: NAP) | Level at pump start or end node from from which it starts pumping.<br> Must be equal or above ajoining manhole or channel bottom/reference level. |
| | lower_stop_level | double | * | | m above datum (NL: NAP) | Level at pump start or end node at which pump stops pumping.<br> Must be below start level. |
| | upper_stop_level | double | | | m above datum (NL: NAP) | Level at pump start or end node at which pump stops pumping.<br> Must be above start level. |
| | capacity | double | * | | L/s | Pump capacity. |
| | zoom_category | integer | * | | | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | connection_node_start_id | integer | | | | Start node for pumpstation.<br> Must be present in v2_connection_nodes.<br> Can be left blanc in which case pump functions as boundary. |
| | connection_node_end_id | integer | | | | End node for pumpstation.<br> Must be present in v2_connection_nodes.<br> Can be left blanc in which case pump functions as boundary. |
| v2_surface | | | | | | |
| | id | serial | * | | | Leave blank. Is filled automatically. |
| | display_name | text | * | | | Name field, no constraints |
| | code | text | * | | | Name field, no constraints |
| | zoom_category | integer | * | | | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | nr_of_inhabitants | double | | | - | Number of inhabitant used for dry wheather flow. |
| | dry_weather_flow | double | | | L/day per inhabitant | Dry weather flow per inhabitant. |
| | function | text | | | | LM: I think this is for your own administration. You can fill in for instance: dak vlak, dak hellend |
| | area | double | * | | m2 | Cannot be left blank. A value of 0 is allowed. |
| | surface_parameters_id | integer | * | | | Reference to v2_surface_parameters. The id filled in here must be present in this (v2_surface_parameters) table |
| v2_surface_map | | | | | | |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | surface_type | text | * | | - | choice to use the 'v2_surface' or 'v2_impervious_surface' |
| | surface_id | integer | * | | - | ID of surface feature |
| | connection_node_id | integer | * | | - | ID of connection_node. Connecting the surface area from v2_surface to an connection_node |
| | percentage | double | * | | % | percentage of area to the connection_node |
| v2_surface_parameter For more information on these parameters see: Leidraad riolering C2100 page: 51 | | | | | | |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | outflow_delay | double | * | | /min | delay of outflow |
| | surface_layer_thickness | double | * | | mm | mm storage on the surface |
| | infiltration | boolean | * | | | False or True |
| | max_infiltration_capacity | double | * | | mm/h | Maximum ifiltration capacity of the surface |
| | min_infiltration_capacity | double | * | | mm/h | Minimum ifiltration capacity of the surface |
| | infiltration_decay_constant | double | * | | /h | time factor decay infiltration capacity of the surface |
| | infiltration_recovery_constant | double | * | | /h | time factor recovery infiltration capacity of the surface |
| v2_weir | | | | | | List of weirs |
| | id | serial | * | | - | Leave blank. Is filled automatically. |
| | display_name | text | * | | - | Name field, no constraints |
| | code | text | * | | - | Name field, no constraints |
| | crest_level | double | * | | m above datum (NL: NAP) | Crest level.<br> Must be equal or above ajoining manhole or channel bottom/reference level. |
| | crest_type | integer | * | | - | Type of weir formulation.<br> 3: broad crested<br> 4: short crested |
| | cross_section_definition_id | integer | * | | - | ID of cross section definition in v2_cross_section_definition |
| | sewerage | boolean | | | | For internal book keeping, 0 (false) or 1 (true) |
| | discharge_coefficient_positive | double | * | | - | Discharge coefficient for positive flow (from start to end node). |
| | discharge_coefficient_negative | double | * | | - | Discharge coefficient for positive flow (from start to end node). |
| | external | boolean | | | | For internal book keeping |
| | zoom category | integer | | | | Visibility in live site. - 1 is lowest for smallest level (i.e. ditch) and 5 for highest (rivers) |
| | friction_value | double | * | | 1:[m1/2/s], 2:[s/m1/3] | Friction or roughness value for profile; friction only accounted for in case of broad crested weir |

| table name | attribute | type | mandatory | default | unit | comment |
|---|---|---|---|---|---|---|
| | friction_type | integer | * | | | Friction type.<br>1: Chezy<br>2: Manning |
| | connection_node_start_id | integer | | | | Start node for weir.<br> Must be present in v2_connection_nodes and on channel start node |
| | connection_node_end_id | integer | | | | End node for weir.<br> Must be present in v2_connection_nodes and on channel end node |
| v2_wind | | | | | | Settings for wind external forcing. |
| | id | serial | | | | Leave blank. Is filled automatically. |
| | time | integer | | | s | Point in time from start of simulation |
| | windspeed | double | | | m/s | Wind speed |
| | winddirection | double | | | degrees | Wind direction based on North Azimuth |
| | drag_coeffictient | double | | 0.005 | - | Wind drag coeficient. |
| v2_windshielding | | | | | | List of drag coefficients for 1D channels. (does not work on 2D) |
| | id | | | | | Leave blank. Is filled automatically. |
| | channel_id | integer | | | | Reference to v2_channel id. |
| | north | double | | 1 | - | windshielding coefficient for direction north (0 degrees) |
| | ... | doube | | | | ... |
| | nothwest | double | | 1 | - | windshielding coefficient for direction northwest (0 degrees) |