Wastewater Inspection Tutorial

1

Working with Inspection Data

NOTE This tutorial ships with a display model, and a sample inspection file. Before you can work through the exercises, your administrator needs to provide the following:

- Create a workspace Tutorial WW Import.
- Import the Wastewater demo data set, and name the document TB_WW_MAIN.
- Copy the sample inspection file Section_Aa18-Aa17.xml to a data folder, for example \Data\Wastewater\Inspection.
- Copy the display model WW Import to your display model repository. We will be using the same display model repository as in the Display Model tutorial: c:\Topobase2010.

In this tutorial you will import a section inspection, check the imported data, identify and fix data errors and violations of standards, and transfer the valid data into the main document. You will use the Inspection Editor to visualize the results.

In the real world, inspection files are not flawless, for example, section names could be misspelled or incomplete, attributes are missing, or observations are not consistent. However this information is crucial to match the observations to existing data, or for a later classification.

Topobase Wastewater provides an error-resistant import workflow that allows you to validate the data in a temporary document. In the temporary document, you correct any errors, or add missing attributes. Then, you transfer valid and consistent data into your main document.

Exercise 1: Set up the Import Workspace

In this exercise you will set up the environment to import wastewater data.

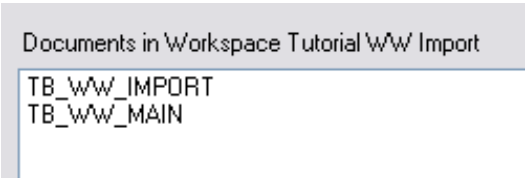
Task: Add the temporary import document

You import inspection data into a temporary document, where the data can be checked for consistency and completeness. You can fix any errors, and then transfer valid inspection data into the target document.

In this exercise you will add a temporary import document to the workspace Tutorial WW Import, which contains your main wastewater document TB_WW_MAIN.

1. Start Topobase Administrator and open the workspace Tutorial WW Import.
2. In the Documents group, click New.
3. In the Create New Document dialog box, under General, enter the Name: TB_WW_IMPORT.
4. Under Extensions, clear all selected extensions.
5. Under Modules, select Wastewater Data Model (For Import Document).
6. Leave the settings under Units, Spatial, and Jobs as they are.
7. Click Save. Click Update. When the update has finished, click Close.

   The document is added to your workspace.



8. In the Administrator explorer, select the TB_WW_MAIN document node.

9 Click Document menu ➤ Explorer.

10 Under Check Explorer Tree Nodes To Be Displayed, select all topics, and click Save Tree.

11 In the Administrator explorer, select the TB_WW_IMPORT document node.

12 Click Document menu ➤ Explorer. Under Check Explorer Tree Nodes To Be Displayed, select all topics, and click Save Tree.

The structure of the import document is the same as the wastewater data structure, with some feature rules and workflows disabled.

Task: Set up the Feature Explorer Display

In this task you will customize the feature representation, so the classification messages will show the feature class name, and the observation code instead of the FID.

1 In the Administrator explorer, select the main document node TB_WW_MAIN.

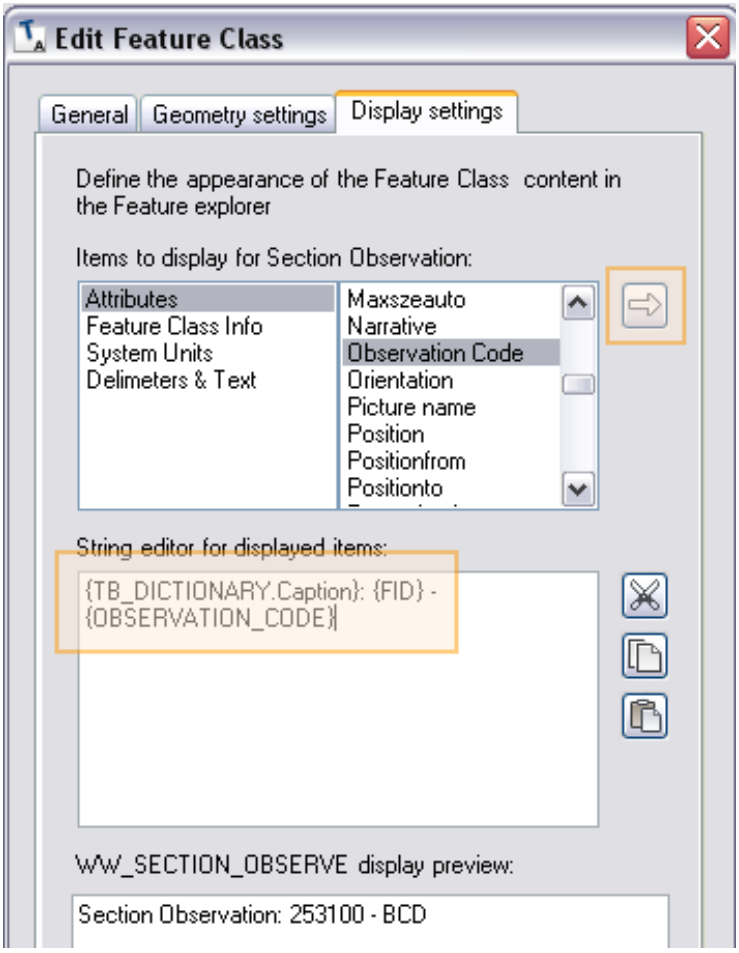
2 Click Document menu ➤ Data Model.

3 In the data model explorer, select the feature class Inspection -> Inspection -> Section Observation. Right click, and select Edit Feature Class.

4 Click the Display Settings tab.

5 Under String Editor, enter the following expression:

```
{TB_DICTIONARY.Caption}: {FID} - {OBSERVATION_CODE}
```



6 Click OK.

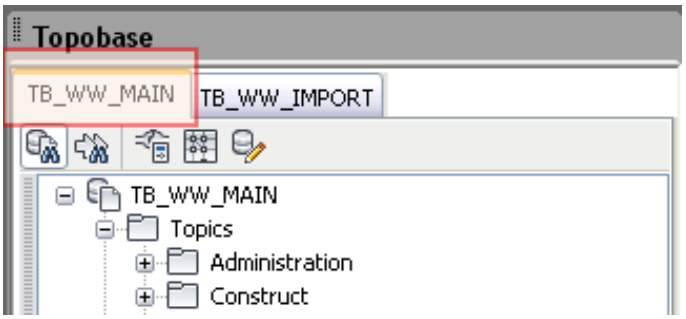
7 Exit Topobase Administrator.

Task: Check Wastewater Options

NOTE This task in not required for this tutorial. However, in real world production, we recommend that you check the Wastewater options before you start your work in a wastewater document.

The following setting is important for classification, and if you manually add inspection data and did not specify the coding system. You check the default classification in the main document TB_WW_MAIN.

1 Start Topobase Client, and open the workspace Tutorial WW Import.



2 In the Topobase task pane, notice that there are two documents open, the temporary document, and the main document. To access the Document options for the main document, click the TB_WW_MAIN tab.

3 In the ribbon, on the Settings tab, click Document Options.

4 In the left pane, click the Wastewater node.

5 Under Wastewater Options, click the Classification tab.

6 Check the Default Classification.

NOTE The following steps must be performed once in each wastewater document, to force the system to create a missing wastewater setting in TB_SETTINGS. Although the list shows a Default Classification "DWA-M 149-3" there is no corresponding entry in TB_SETTINGS, and the default classification would be ISYBAU 2006 (XML).

To create the wastewater settings

1 On the Classification tab, select ISYBAU 2006 (XML).

2 Click OK.

This action creates the missing entry SELECTEDWWCLASSIFIER in TB_SETTINGS. If necessary, change back the default classification.

Task: Remove duplicate Labels

This task is optional.

The demo data set contains duplicate manhole labels. In this task you will delete all manhole labels (WW_MANHOLE_TBL) with label definition ID 10001. This makes it easier to identify features in the drawing.

1. In the Topobase task pane, in the Document explorer, select the Manhole Label feature class. Expand the topic Point -> Manhole -> WW_Manhole_TBL.
2. Right-click, and click Show Form.
3. Filter for the Label_Def_ID = 10001. 1313 records should show.
4. Right-click somewhere in the form, and select Delete ➤ All Filtered Records.
5. Close the form.

Task: Enhance the Import Display Model

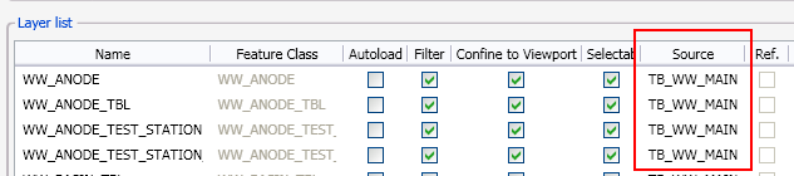
This task is optional. You can enhace the display model, so the features in the temporary import document are displayed.

NOTE If you are not familiar with display models, we recommend that you run through the Display Model tutorial.

The WW Import workspace is special, because it contains two documents with the same data model. That means that your display model must specify the feature source, so the feature layers can be loaded from the right document.

To review the display model

1. Open the display model WW Import.
2. Generate graphics.
3. In the Home tab, on the Display panel, click Display Model Properties. Notice that the Source for all feature layers is your main document TB_WW_MAIN. That means that no feature layers of the import document are loaded.



4 Click Cancel.

You will now add some feature layers from the import document.

To add the Import feature layers to the display model

1 In the Display Manager task pane, click Data ➤ Connect To Data.

2 In the Data Connect window, click Add Topobase Connection.

You are prompted to create a connection, such as Topobase_2.

3 In the Add A New Connection area, provide the service name, user name and password.

See your administrator for this information.

4 From the Document list, select TB_WW_Import. Click Connect.

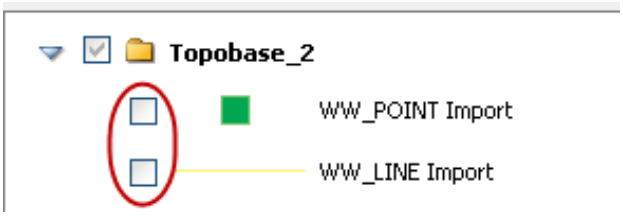
You are now prompted to select the feature class layers to add to the map.

5 In the Add Data To Map area, select WW_LINE and WW_POINT. Click Add To Map and then close the Data Connect window.

Layers corresponding to the WW Point feature class and WW Line feature class are added to the Display Manager with a default stylization.

6 Rename the layers: WW_POINT (1) to WW_POINT Import, and WW_LINE (1) to WW_LINE Import.

7 Deselect the layers WW_POINT Import, and WW_LINE Import.



8 Save the Display Model. Notice that there are different Sources assigned now.

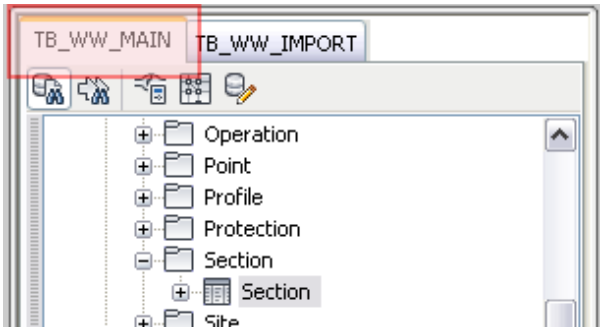
NOTE If your display model has feature layers with a Source assigned, you cannot share the display model with other documents, because in this case, the document names are stored with the display model.

The document name (feature source) is stored in the *.tbdmmap file: `<FeatureSourceResourceId>TB_WW_MAIN</FeatureSourceResourceId>`.

Exercise 2: Explore existing inspection data

The Wastewater demo data set contains imported inspection data, including a video. In this exercise you will explore the inspected section, and navigate through the inspection data model.

1. In the Topobase task pane, notice that there are two documents open, the temporary document, and the main document. To access the main document, click the TB_WW_MAIN tab.



2. In the Document Explorer, expand the topic Section.
3. Right-click Section, and click Show Form.
4. In the Section form, click the General tab, and filter for NameNumber 3119-289.

5. Click the Related Tables tab. Click WW_Section_Observe. Notice that the Section Observation feature class is of type collection, and stores point and line type observations.

   The Section Observation form opens and shows the related observations (5 features in the filter).

6. In the Section Observation form, click the Details tab.

7. Double-click the Inspection field. The Inspection form opens.

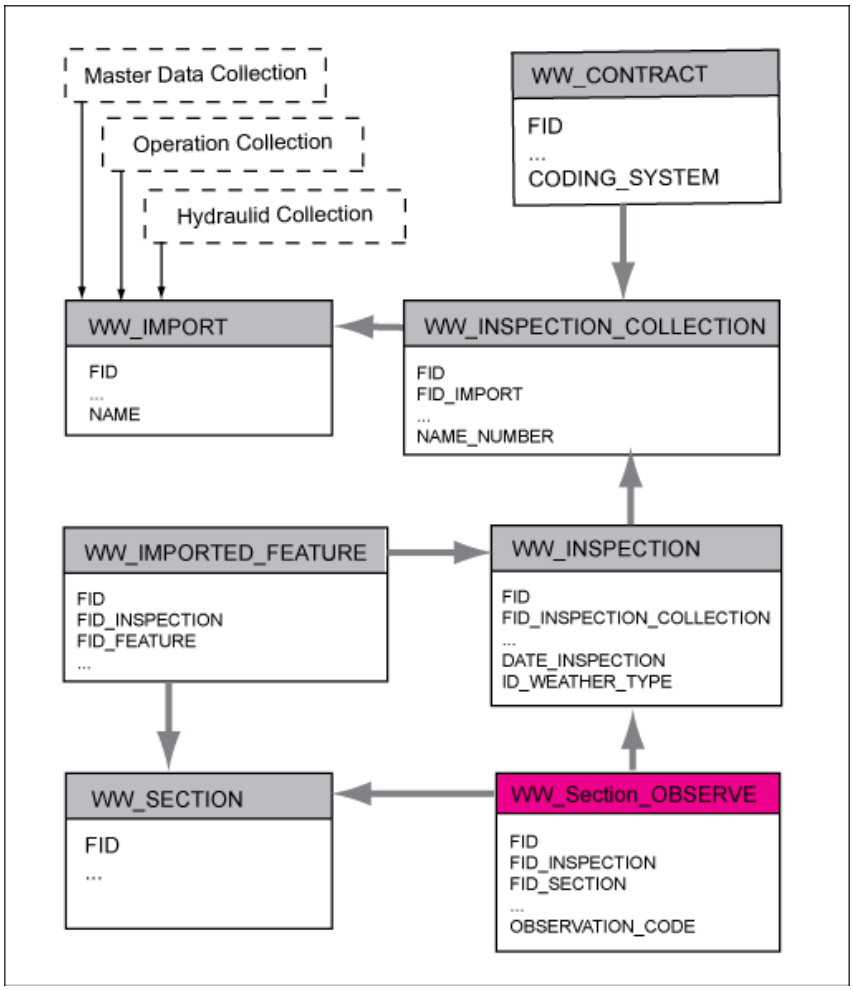
8. In the Inspection form, click the Details tab, and double-click the Inspection Collection field. The Inspection collection form opens.

9. In the Inspection Collection form, click the Related Tables tab, and click WW_contract. The Contract form opens.

10. In the Contract form, click the Details tab, and see the coding system. Note: Do not modify the coding system because it determines the classification standard, and any changes would let the classification fail.

11. Close all forms, except the Section form.

The Topobase inspection data model is based on the ISYBAU XML schema.



You use the Inspection Editor to visualize the section observations.

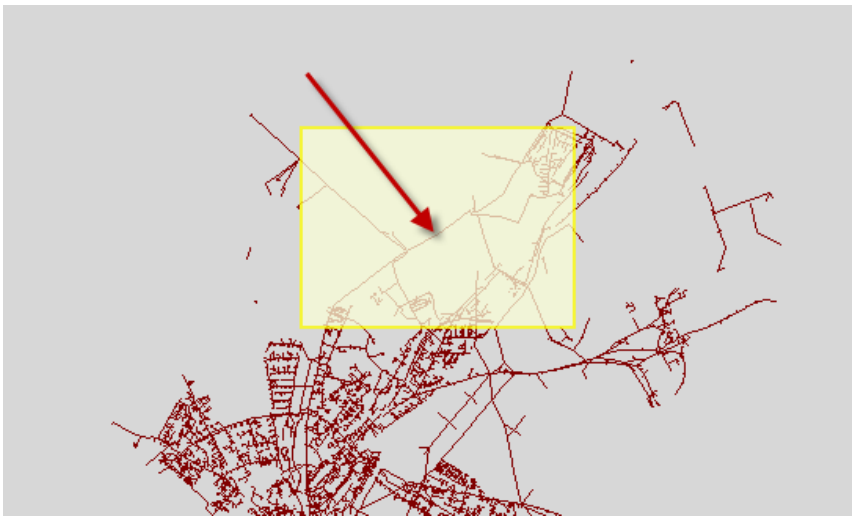
1. In the Section form, click the Inspection Editor tab. To watch the related video, scroll to the bottom of the form, and click the Play button.
2. In the Side View, to the left of the video pane, notice the red arrow as it indicates the station of the video.
3. Stop the video, and close the form.

We will use the Inspection Editor again in Exercise 4.

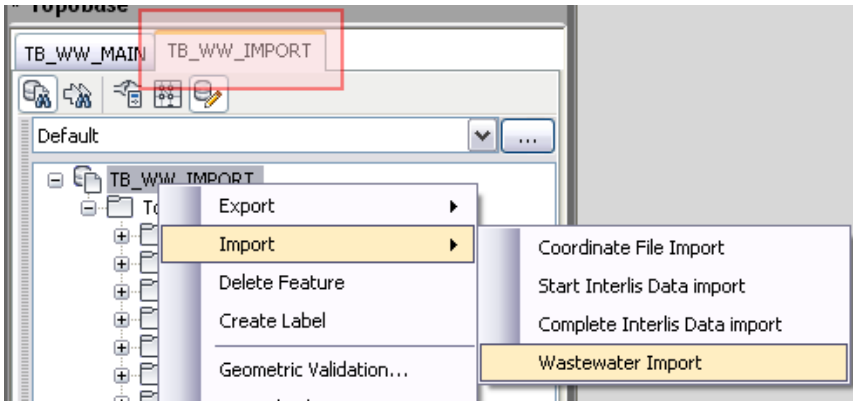
Exercise 3: Import Inspection Data

In this exercise you will import an ISYBAU XML file. When you receive inspection files from your contractor, you copy all files to one folder, including the media files. This example does not contain media files.

1. In Topobase Client, in the workspace Tutorial WW Import, Generate Graphic.
2. Specify a viewport that roughly contains the area shown in the following illustration.Then you can easily identify features in the drawing.



3. In the Topobase task pane, click the TB_WW_IMPORT tab.
4. Right-click the document node, and click Import ➤ Wastewater Import.



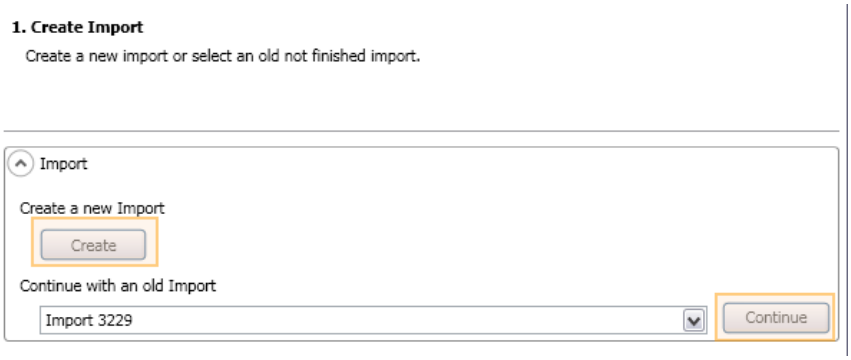
5 The Import wizard opens. Continue with Step 1 - Create Import.

Step 1: Create Import

For each set of inspection data files, you create an import project. After each step, you save the current state of the features in the temporary import document. At any time you can continue with the import.

1 In the wizard, Step 1, click Create. Notice that the Import name is created automatically. You can modify the name in Step 2.

2 Click Continue.

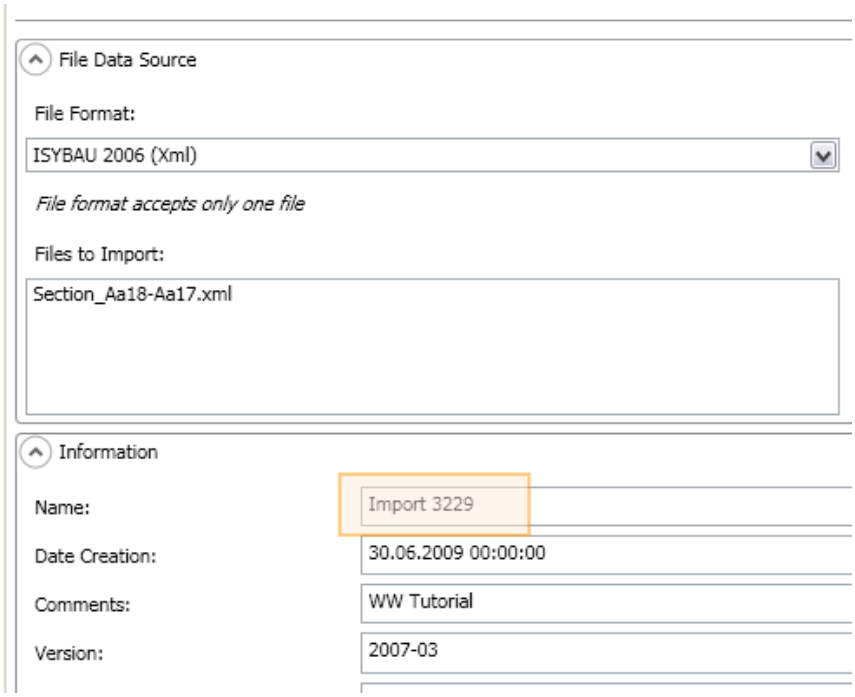


Step 2: Select Files

When you select the files to import, the file format is checked. You can only import valid formats into your temporary document. Any format errors are listed in the File Data Source group box. You fix the error, and select the file again.

NOTE Depending on the file format, you can import multiple files in one import project, such as ISYBAU 96/01 files. For ISYBAU XML file, you can import only one file per import project.

1. Under File Data Source, Select the File Format ISYBAU 2006 (xml).
2. Click Add to select the file. Select the sample import file *Section_Aa18-Aa17.xml*.
3. Under Information, rename the import: Tutorial Import 1.



The Information group is populated with some meta data that is stored in the selected file. Meta data will be stored in the database in the table TB_IMPORT.

4 Click Next to start the import into the temporary document.

5 When the import is finished, click Next to start the Data Matching.

NOTE The import uses the geometry that is provided in the import files. Exception: The ISYBAU 96/01 import does not support ISYBAU.V files, and in this case the section geometry is created as a straight line, connecting the start and end manholes.

Step 3: Data Matching

Data Matching compares the features from the import file with existing features in the main document TB_WW_MAIN. Matching features are found by the following rules.

- Manhole: NAME_NUMBER
- Section: Start and end points. If no matching points are found, NAME_NUMBER is used.

If features do not match, you can manually assign the features, or exclude them from the import.

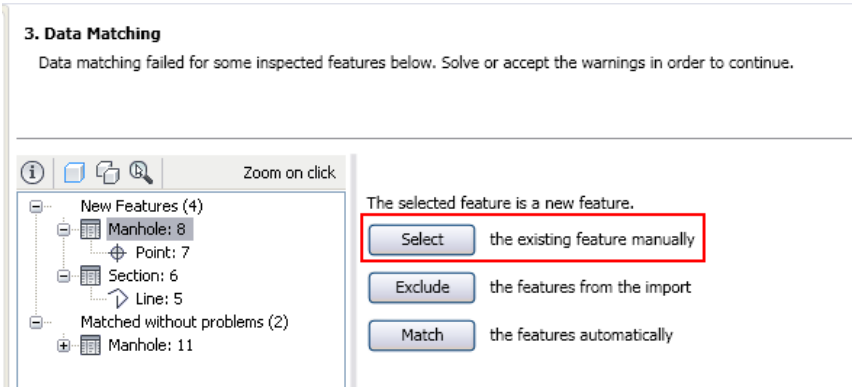
The result of the data matching is displayed in a feature explorer. Use the toolbar buttons to process the selected features.

NOTE The number that is displayed with the feature is the FID in the import document. It is different from the FID of the corresponding features in the main document.

The matching attributes are stored in the import document. After saving Step 3 - Data Matching, in the import document WW_IMPORT, expand the topic Exchange, and open the Imported Features table (WW_IMPORTED_FEATURE).

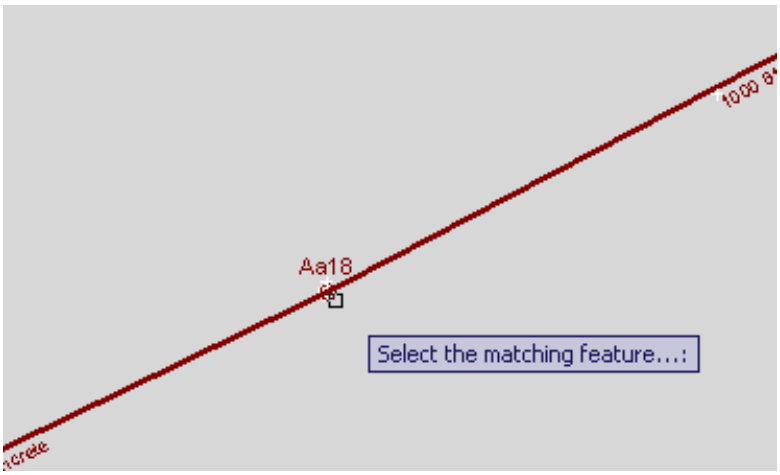
Data Matching - New Features

The New Features node lists features, such as manholes and sections that are not found in the main document, either because they are new, or because they are stored with another Name Number. The sample file contains a typo in the manhole name Aa18.



To manually assign the manhole

1. Expand the New Features node.
2. Expand the Manhole. Notice that the import has created the manhole parent, and the related point, according to the utility model.
3. Click the Manhole item. Click Select.
4. In the drawing, select the manhole Aa18.



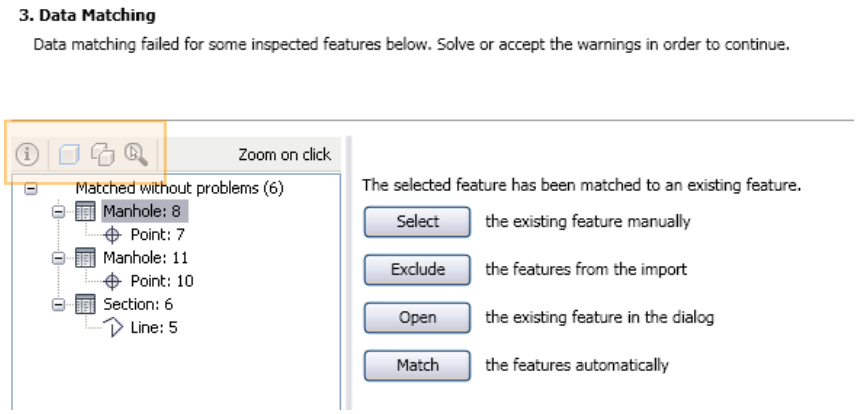
As soon as you have fixed an issue, the feature moves from the New Features node to the Matched Without Problems node.

5. For the point, the section, and the line, repeat the same steps.

NOTE For any remaining new features, the import will create a new feature without geometry.

Data Matching - Matched Without Problems

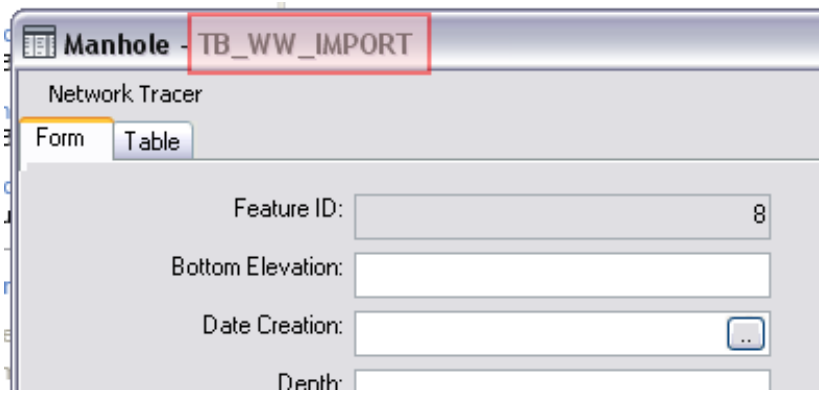
This node lists the features for which corresponding features have been found in the main document.



To review the features in the import document

1 In the feature explorer, select an item, such a Manhole, right-click, and click Show Form.

The Manhole form opens, so you can review what has been imported into the temporary Import document. Notice the title of the form: it is the temporary document.



2 Close the Manhole TB_WW_IMPORT form.

You can now check and adjust the matched features. If necessary, do one of the following: Click

- Select, to select another matching feature in the drawing.
- Exclude, if you do not want to import this feature.
- Open, to open the feature class form of the existing feature.
- Match, to repeat the data matching after you have modified any data.

To continue with the import

1 Click Save, to save your modifications.

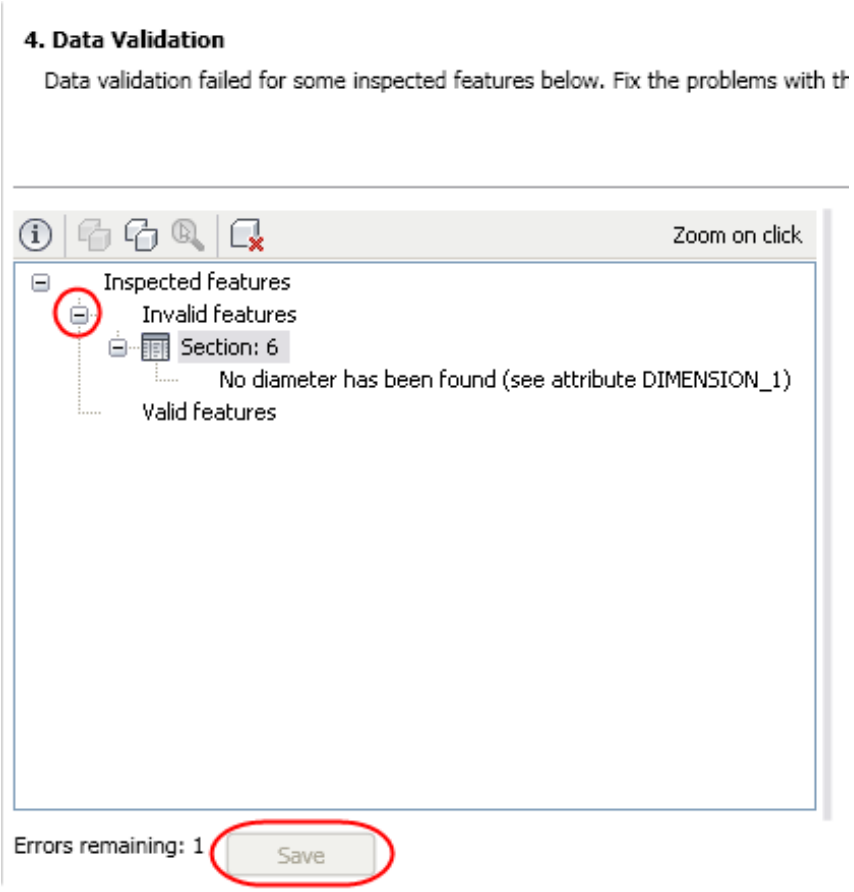
2 Click Next, to start data validation.

NOTE You cannot continue your import, unless all conflicts are resolved.

Step 4: Data Validation

This step validates the inspection data against the provided coding system. This ensures that the inspection data can be used for a classification. If no coding system is provided, the validation will use the default classification as specified in the Wastewater document options. Depending on the file format and the coding system, different attributes will be checked. See also Validation of classification attributes (page 34).

The results of the validation are displayed in the feature explorer. The Invalid Features node lists features where inspection data is incomplete, inconsistent, or does not meet the classification standard.



To fix invalid features

The message No Diameter Has Been Found (See Attribute DIMENSION_1) means that the classification standard requires the section diameter.

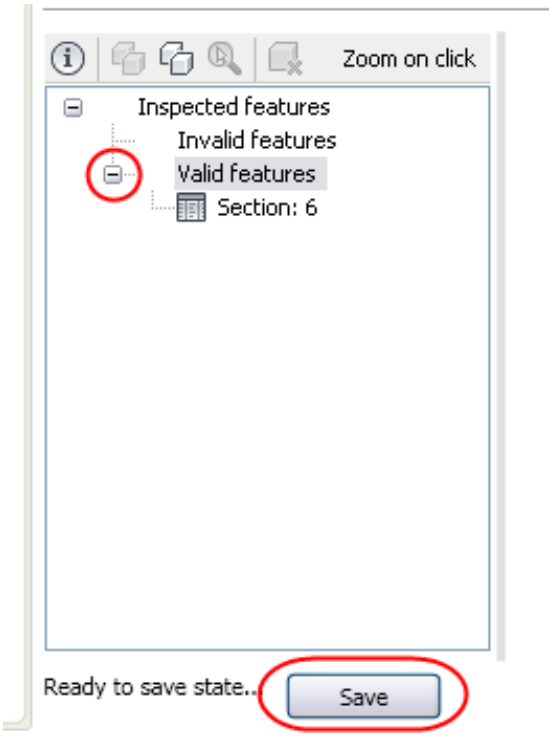
1. In the feature explorer, select the section.
2. Right-click, and click Show Form. Notice that two forms open: Section, and Section Observation. Both forms show the records in the temporary document.

   NOTE If you right-click the message item, only the Observation form opens.

3. In the Section form, enter the missing value DIMENSION_1: 1000.

4 Click Update&Close.

5 On the Task Overview pane, click Step 4. Data Validation again. The feature is moved to the Valid Features node.



6 Click Save.

7 Click Next to start geometry creation.

Data Validation - Messages

The following data validation messages do not apply to the sample data.

- No Validation Rule Found for Observation Code <empty>: No observation code. To resolve the issue, right-click the message, and click one of the following:
  - Open Form: Add the missing values.
  - Delete Observation From The Import Document.

- No Classification Rule Found For Observation Code <code>
- No Classification Rule Can Be Found. Verify The Attribute <attribute>.

Messages with No Classification Rule indicate that the observation does not meet the requirements of the classification standard.

To resolve the issue

1. Right-click the message, and click Show Form.
2. In the Observation form, check whether the observation code is valid.
3. Or check whether the inspection contains all mandatory attribute values for the observation code.

Step 5: Geometry Creation

The import step 5 creates the geometry for the observations and stores the features in WW_SECTION_OBSERVE, or WW_MANHOLE_OBSERVE. The coordinates of the observation points and lines are interpolated according to the ratio of the section length and inspection length.

After the geometry has been created, click Next to continue.

NOTE Section observation point coordinates can only be calculated, if the inspection length and the section geometry is available.

Step 6: Conflict Resolving

This step checks the attributes of corresponding features in the main document. For example, diameter, or material. You can decide whether to keep the original values, or to override with the new ones.

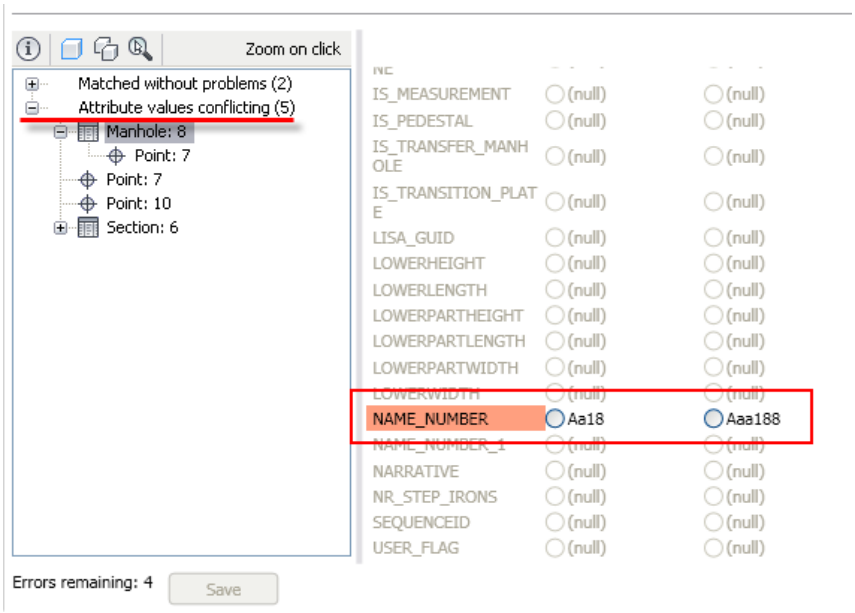
To resolve attribute conflicts

In the feature explorer, you select each feature that is listed under Attribute Values Conflicting.

1. Select the manhole.

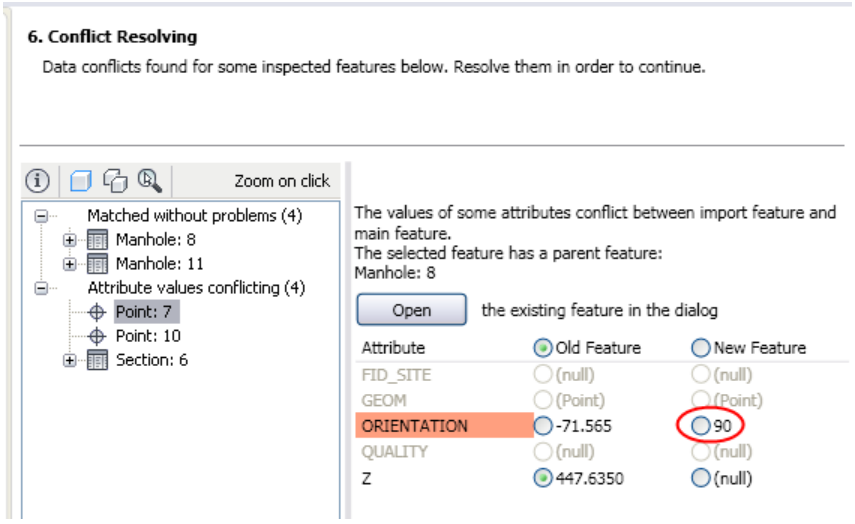
   The right pane displays the comparison between the old and new feature attributes. You can select which values to store.

2 Scroll down to see the Name_Number attribute, and select the old attribute Aa18.



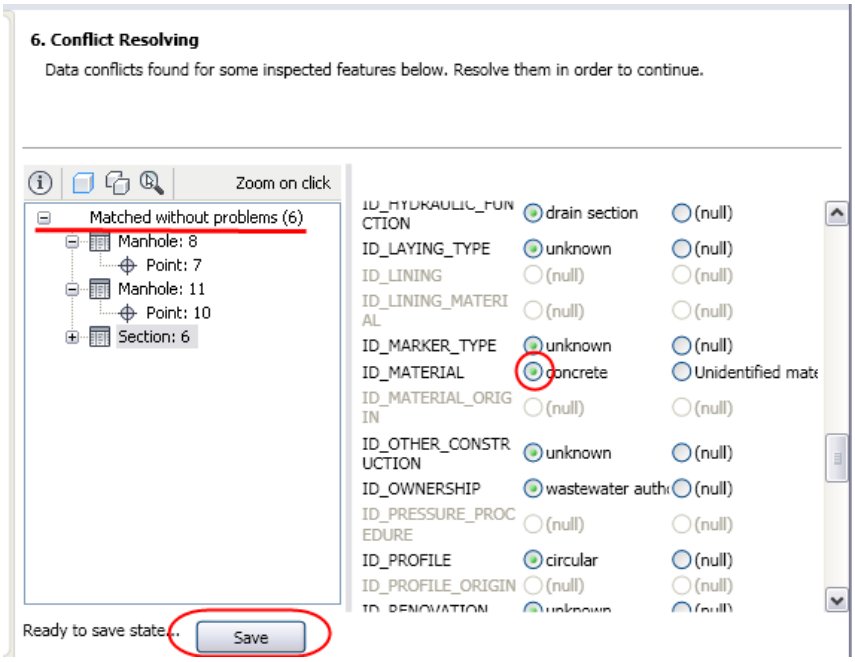
3 Continue with the next features. Select the Points.

4 For Orientation, keep the old values.



5 Continue with the section. Scroll down to the first conflict, and select ID_DISPOSITION_STATE = Permanent.

6 Scroll down, and select ID_MATERIAL = Concrete.



When you resolve a conflict, the feature moves to the Matched Without Problems node. Before transferring the data to your main document, you can compare the imported attributes (New Feature) with the existing attributes (Old Features).

7 In the feature explorer, under Matched Without Problems, select the feature.

8 When all conflicts are resolved, and the features in the import document meet your expectations, you start the data transfer.

9 Click Save.

10 Click Next, to start the transfer from the import document to the main document.

NOTE Attributes, where one value is NULL, are not considered as conflict, however you can decide which value to store. Conflicting attributes are highlighted.

Step 7: Update the Main Document

This step copies the media files to the server location, and the imported features to the main document.

To transfer the inspection data to the main document

1. Click Next, to copy the media files.

   NOTE Media files will only be copied, if they are stored in the same folder as the import files, and if you have specified a server location in Step 2 - Select Files. Meta data about the media files is stored in the database WW_FILM.

2. Click Next to transfer the inspection data.
3. Click File menu ➤ Exit, to close the Import wizard.

Exercise 4: Use the Inspection Editor

In this exercise you will use the Inspection Editor to review the imported inspection, and to manually add an observation.

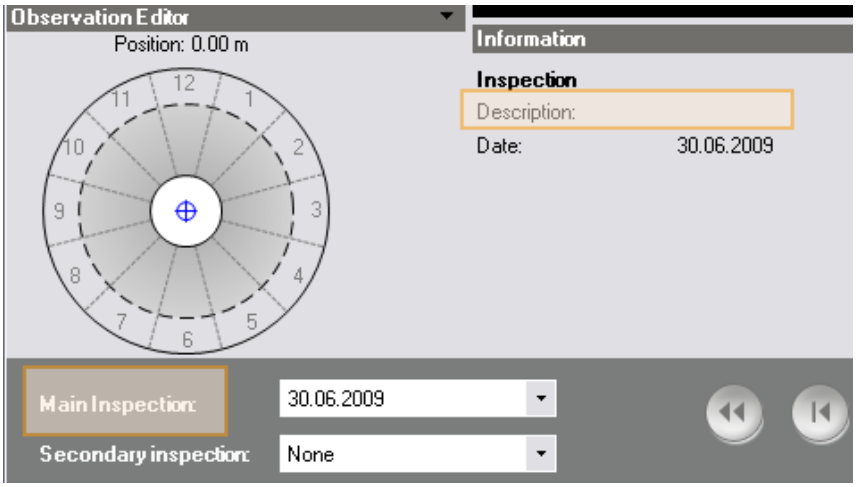
NOTE Optionally you can style the feature layer WW_SECTION_OBSERVE accordingly, and display the observations in the drawing.

To view the section observations

1. In the drawing, select the section Aa18-Aa17, right-click, and click Attributes.
2. In the Section form, click the Inspection Editor tab.

   In the Inspection Editor, the Side View pane displays the section, and the observations.
3. Right-click an observation code, and click Open Form. The Section Observation form opens.
4. Close the Section Observation form.

At the bottom of the Section form, notice the Main Inspection. A section can have multiple inspections. The Main Inspection data and video is displayed in the Inspection Editor.



Notice the secondary inspection. If selected, it is displayed beside the main inspection in the side view so you can perform a side-by-side comparison of the two inspections, with the main inspection displayed on the right side.

You can store a description of the inspection in the database in the table WW_INSPECTION.REMARK.

The Inspection Editor Side View displays the section observations that are stored in the feature class WW_SECTION_OBSERVE. You can manually add more damage points, for example, if you watch an associated video, and detect any damages that have not been recorded in the inspection file.

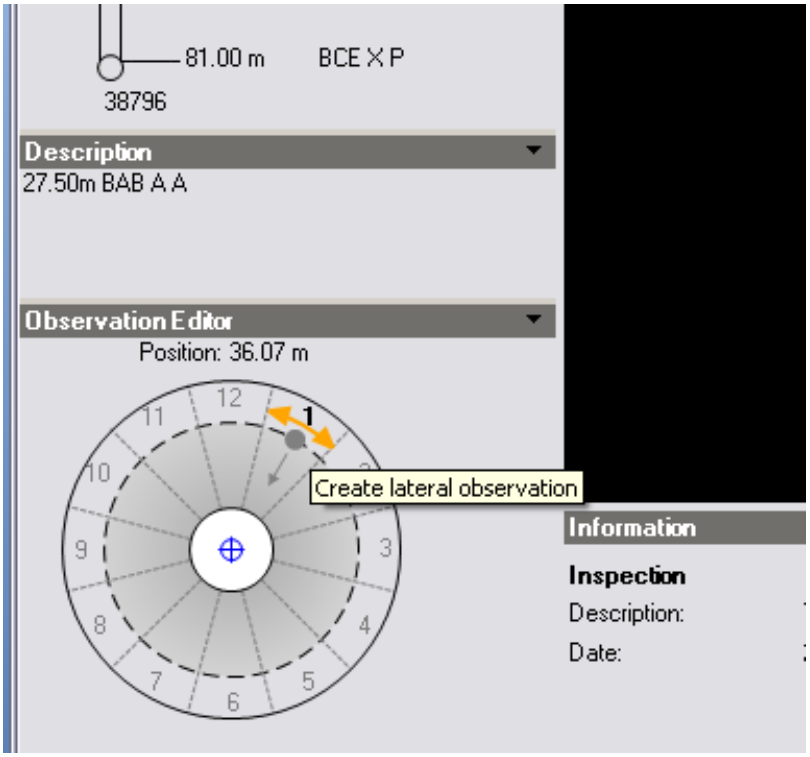
When the video plays, in the side view, a red slider indicates the position of the camera in the pipe. In this example, no video is available, however you can drag the slider manually to any position.

To add section observations

1. In the Side View, drag the slider to a position between 27.50 m and 40.00 m.

   Notice that in the Description area, the station, and observation code of the previous observation is displayed. The Observation Editor displays the position of the slider.

2. Move the cursor to the Observation Editor. Hover over the pipe representation, and watch the tool tips indicating three types of observations: point, lateral, and longitudinal.

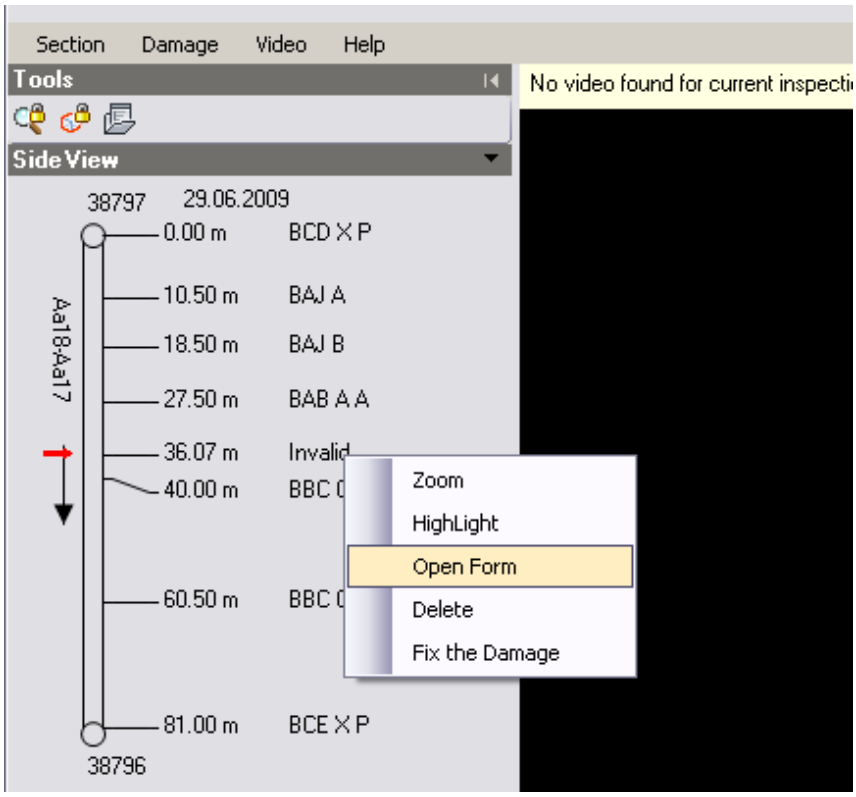


3 Move the cursor to the wedge at 3 o'clock.

4 When the tool tip Create Lateral Observation appears, drag the cursor to the wedge at 5 o'clock.

5 Click Yes, to create the lateral observation.

In the Site View, a new observation is added. It is invalid, because it has no observation code yet.



6 Right-click the observation, and click Open Form.

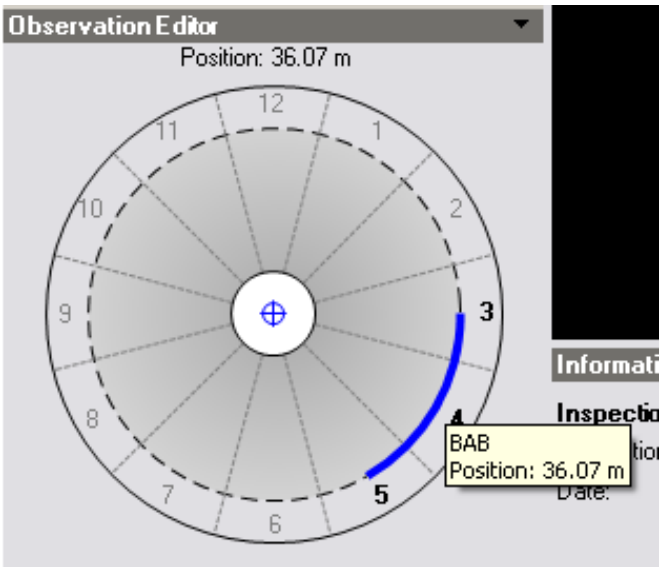
7 In the Section Observation form, enter the following values:

- Characterization1: B
- Characterization2: B
- Observation Code: BAB (Lateral Break)
- Quantification 1 Numeric: 2
- Position: 36.07

Notice that the values PositionFrom and PositionTo are populated.

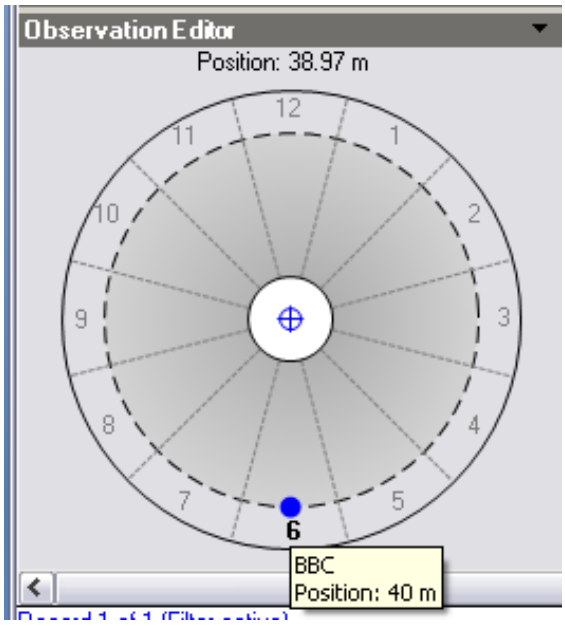
8 Click Update & Close.

9 In the Observation Editor, the new observation is displayed. Hover over the line to see the details.



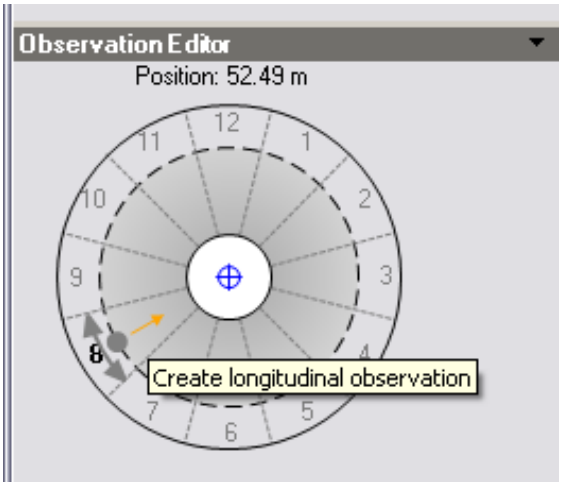
10 In the Side View, drag the slider to a position between 36.07 m and 40.00 m.

11 The Observation Editor displays the position of the next point observation. Hover over the point, and watch the tool tip.



To create a longitudinal damage observation

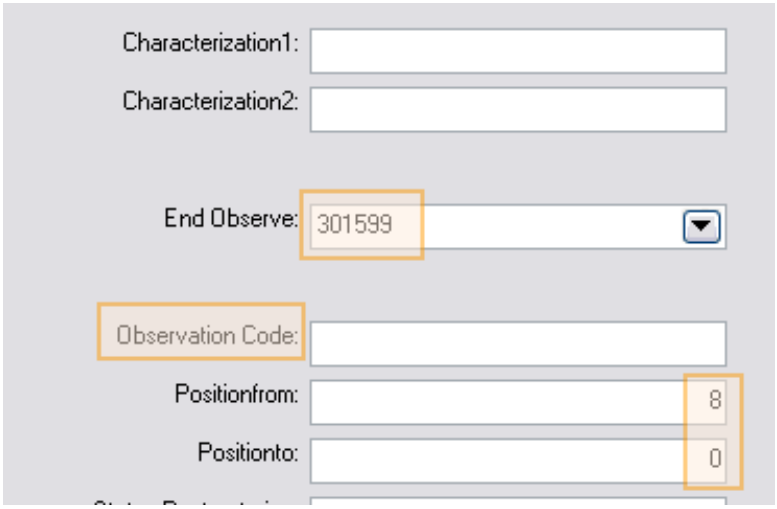
1. In the Side View, drag the slider to a position at about 50 m.
2. In the Observation Editor, move the cursor towards the center of the pipe, at the wedge at 8 o'clock.
3. When the tool tip Create Longitudinal Observation appears, click the arrow.



4 In the Create Longitudinal Observation dialog box, enter the length of the damage: 3 (in document units).

5 In the Site View, two new invalid observations are added. To enter the observation code, select the observation that is closer to the start manhole, right-click, and click Open Form.

6 In the Section Observation form, notice that the position, and the relation to the second observation is stored.



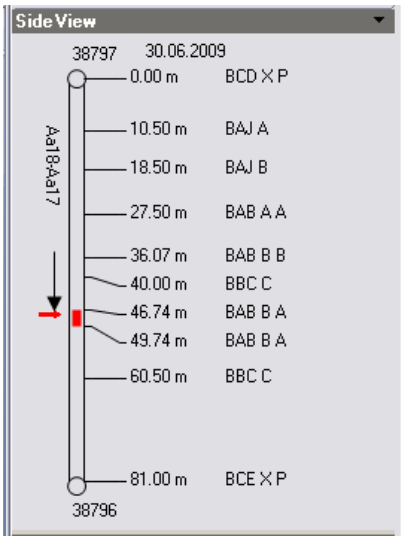
7 Enter the observation:
   - Characterization1: B
   - Characterization2: A
   - Observation Code: BAB
   - Quantification 1 Numeric: 3000
   - Damage Number: 1
   - Section Damage: Beginning of Section Damage (A).

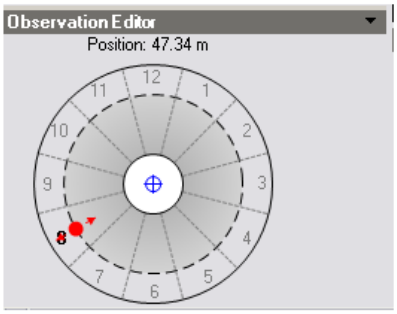
8 Click Update.

9 Double click the EndObserve field. This filters for the related observation. For the end observation, enter the following values:
   - Characterization1: B
   - Characterization2: A
   - Observation Code: BAB
   - Quantification 1 Numeric: 3000
   - Damage Number: 1
   - Section Damage: End Of Section Damage (Only DIN EN 13 508-2).

10 Click Update.

11 In the Side View, the new observation is displayed. Move the slider to see the observation in the Observation Editor.



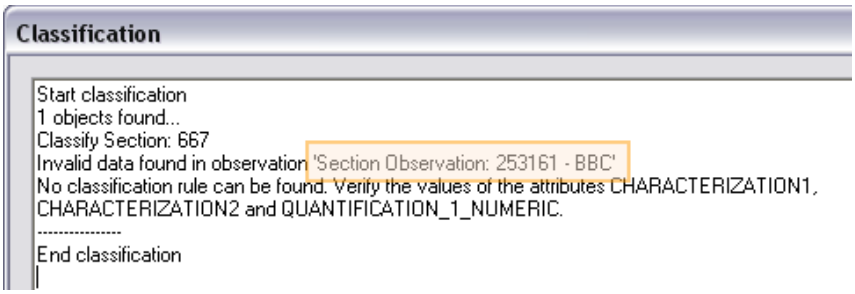


In the Inspection Editor, you can also use the Damage menu commands to create observations.

Exercise 5: Classify the Section

In this exercise you will classify the inspected section. The coding system of the inspection data determines the classification standard. Our example uses the coding system EN 13 508-2.

1 In the Section form, click Classification menu ➤ Classify.



The section cannot be classified, because the observation has missing or invalid attributes. Notice that the message displays the FID of the invalid observations.

2 Check the observations.

3 In the Section Observation form, click the General tab, and filter for the FID 253161.

4 Click Detail tab. Check the attributes according to the classification message.

In the example, the invalid observation has the observation code BBC. The classification standard requires a numeric quantification (QUANTIFICATION_1_NUMERIC).

5 Enter a value for Quantification 1 Numeric: 0.5.

6 Click Update&Close.

7 Start the classification again.

The classification results are stored in the database. See also Classification Results (page 36).

Exercise 6: Export Inspection Data

In this exercise you will export section inspection data. Topobase Wastewater Export supports the following formats: ISYBAU 2006 XML, ISYBAU 1996 / ISYBAU 2001, ATV-DVWK-M150, EN 13508-2.

To export inspection data

1 In the Topobase task pane, click the TB_WW_MAIN tab.

2 In the document explorer, right-click the document node, and click Export ➤ Wastewater Export.

3 In the Topobase pane, under Select Features, click  Select In Map.

4 In the drawing, select the section Aa18-Aa17. Click OK.

5 Select the Export Format: ISYBAU 2006 (XML).

6 Under Output Files, select Inspection Data.

7 Enter meta data to be included in the export files.

8 Under Name, select Create New.

The Export form opens.

9 In the Export form toolbar, click  New Record.

10 Enter the following values:
- Version: WW ISYBAU Export <<Version>>
- Name: WW Export 1
- Property Number: 12345 <<Liegenschaftsnummer>>
- Property Name: Meadow Heights <<Liegenschaftsbezeichnung>>
- Comments: WW Tutorial Exercise <<Kommentar>>

11 Click Insert (F5), and close the form.

12 In the explorer panel, enter the export file name, such as Tutorial_Sections.

13 Select a directory, such as \Data\WWTutorial\Inspection.

14 Click OK.

Appendix

Classification standards

The classification standard is determined by the coding system that is provided in the inspection files.

When you import inspection data, the coding system is stored in the contract table (WW_CONTRACT.ID_CODING_SYSTEM). Coding systems are stored in the domain table WW_CODING_SYSTEM_TBD.

Exception: the inspection file does not provide the coding system; in that case the system uses the default classification that is set in the Wastewater document options. For example, if the inspection data has not been imported, but migrated from another system.

Topobase Wastewater supports classification standards, and coding systems as shown in the following table.

Classification Standard	Coding System
ISYBAU 1996/2001	ISYBAU 2001 (ID = 5) ISYBAU 1996 (ID = 6)
ISYBAU 2006 (XML)	DIN EN 13508-2:2003: without national definitions (ID = 2)
DWA 149-3	DIN EN 13508-2:2003: National definition DWA M 149-2 (ID = 3)

Supported versions

- ISYBAU 01 version 20.10.2006
- ISYBAU 06 version 10.10.2008
- DWA-M 149-3 version November 2007
- ATV-DVWK-M 150 version October 2003 (Ohne Arbeitsbericht Zusatz von 2007)
- DIN EN 13508-2 version September 2003

NOTE EN 13508-2 import files do not provide any information about the coding system. You must set the classification standard in the Wastewater document options, so the import can validate the inspection data against the standard, and a later classification can be run successfully.

Validation of classification attributes

Topobase Wastewater import strictly checks the content of the import files for mandatory attributes, so the appropriate classification standard can be applied.

NOTE You cannot import erroneous, inconsistent, or incomplete data into your main document.

Data Validation checks your inspection data for the following attributes, according to the coding system that is provided with the inspection file.

Each observation that does not contain the required attributes, or that contains an invalid value for a required attribute, will be listed under Invalid Features. Missing or invalid values can be fixed in the import document. See also Step 4: Data Validation (page 17).

Depending on the coding system, and on the observation code, the following attributes will be validated.

- Characterization 1
- Characterization 2
- Dimension
- Manhole area
- Manhole name
- Material
- Name of starting manhole
- Name of end manhole
- Observation Code
- Quantification_1_Text
- Quantification_1_Numeric
- Quantification_2_Numeric
- Section name
- Standard Annotation

For example, the classification standard ISYBAU 2006 (XML) requires the section dimension to create different ranges depending on the section dimension, and on the material.

BEST PRACTICE If your inspection data does not provide dimension information, you can add a dummy dimension in the import document. In the Import wizard, Step 4. Data Validation, select the section node. Right-click, and click Show Form. In the Section form, click Global Update, and update all missing dimension values with a dummy value and change this value after import to NULL.

Classification Results

Depending on the classification standard, the following classification results will be stored in the database.

ISYBAU 2006 (XML) classification

feature class	attributes
WW_MANHOLE_OBSERVE	SK<D, S or B>vAuto SZ<D, S or B>vAuto SZ<D, S or B>eAuto SK<D, S or B>eAuto MaxSZeAuto MaxSKeAuto
WW_MANHOLE_CLASSIFICATION	NumberPreliminary (OZv) NumberFinal (OZe) ClassAutomatic (OK)
WW_SECTION_OBSERVE	SK<D, S or B>vAuto SZ<D, S or B>vAuto SZ<D, S or B>eAuto SK<D, S or B>eAuto MaxSZeAuto MaxSKeAuto
WW_SECTION_CLASSIFICATION	NumberPreliminary (OZv) NumberFinal (OZe) ClassAutomatic (OK)

The attribute names with the suffix Auto are used to store the calculated classification results. Besides, there are attribute names with the suffix Manual that can be used to manually enter classification values.

In the attribute names, the values D, S, or B indicate the following constraints: (D = leak tightness, S = stability, B = operational).

The attribute ClassAutomatic stores the object class (OK) that represents the condition of the manhole, or the section.

NOTE For ISYBAU 2006 and DWA 149-3, you can override the calculated classification results. In the Observation form, use the attributes with the suffix "Manu" to enter your values manually: SkdvManu, SksvManu, SkbvManu. If these attributes are populated, the classification will use these values to override the standard.

DWA 149-3 classification

feature class	attributes
WW_MANHOLE_OBSERVE	SK<D, S or B>eAuto MaxSKeAuto
WW_MANHOLE_CLASSIFICATION	NumberPreliminary NumberFinal ClassAutomatic (no official value)
WW_SECTION_OBSERVE	SK<D, S or B>eAuto MaxSKeAuto
WW_SECTION_CLASSIFICATION	NumberPreliminary NumberFinal ClassAutomatic (no official value)

ISYBAU 1996/2001 classification

feature class	attributes
WW_MANHOLE_OBSERVE	MaxSKeAuto MaxSZeAuto
WW_MANHOLE_CLASSIFICATION	NumberPreliminary NumberFinal ClassAutomatic
WW_SECTION_OBSERVE	MaxSKeAuto MaxSZeAuto
WW_SECTION_CLASSIFICATION	NumberPreliminary (OZv) NumberFinal (OZe) ClassAutomatic (OK)