TILOS – GETTING STARTED & EXERCISES

1. Release 2010-03 TILOS 7.0

Created by Linear project GmbH Training – Support – Software Development

For further information please contact:

Linear project GmbH G.-Braun-Strasse 14 76187 Karlsruhe Germany

Sales:	Tel: Fax: Email:	+49 / 721 - 46 47 - 280 +49 / 721 - 50 96 10 42 Info@TILOS.org
Support:	Tel: Fax: Email: Web:	+49 / 721 - 46 47 28 29 +49 / 721 - 50 96 10 42 Support@ TILOS.org www.tilos.org

All rights reserved. Duplication is strictly prohibited. All trademarks registered.

Table of contents

Installation	5
Global Concept	8
Creating a project	12
Creating tasks	13
Splitting tasks	16
Copy tasks to a new location	16
Linking tasks	17
Layers	19
Viewing task in the Gantt chart	19
View tasks in the task list	20
Exercise	21
Adding distance graphics	21
Inserting a distance grid	23
Inserting Tasks	24
Linking tasks	26
Annotating tasks	27
Structuring tasks	29
Printing	30
Print a view	30
Print a Gantt chart	31
Importing tasks	33
ASCII Text Import	
MS Excel Import	
MS Project Import	
	40
Creating a New View	
Creating a New View	
-	40
Cell Settings	40 41
Cell Settings View range	40 41 42
Cell Settings View range Exercise	40 41 42 44
Cell Settings View range Exercise Time-distance cell settings	40 41 42 44 45
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler	40 41 42 44 44 45 46
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler	40 41 42 44 45 46 49
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell	40 41 42 44 45 46 49 51
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols	40 41 42 44 45 46 49 51 54
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids	40 41 42 44 45 46 46 49 51 54 54
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo	40 41 42 44 45 46 46 49 51 51 54 56
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources	40 41 42 44 45 46 49 51 54 56 60 60 62 64
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources	40 41 42 44 45 46 49 51 51 54 56 60 62 62 64 65
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources	40 41 42 44 45 46 49 51 54 56 60 62 62 65
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources Assigning resources Assigning Income as fixed cost	40 41 42 44 45 46 49 51 51 54 54 60 62 62 64 65 65 65 67
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources Assigning resources Assigning resources Assigning lncome as fixed cost Evaluating resources	40 41 42 44 45 46 49 51 54 56 60 62 62 64 65 65 65 65 67 68
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources Assigning resources Assigning Income as fixed cost Evaluating resources Resource usage bar chart	40 41 42 44 45 46 49 51 54 54 56 60 62 62 64 65 65 65 65 65 65 65 65
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources Assigning resources Assigning Income as fixed cost Resource usage bar chart Resource diagram	40 41 42 44 45 46 49 51 54 56 60 62 62 64 65 65 65 65 65 67 68 69 72
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources Assigning resources Assigning Income as fixed cost Evaluating resources Resource usage bar chart Resource diagram Cost diagram	40 41 42 44 45 46 49 51 54 56 60 60 62 62 64 65 65 65 65 65 67 67 68 69
Cell Settings View range Exercise Time-distance cell settings Adding a time ruler Adding a distance ruler Distance scale in the time distance cell Create a distance cell with sketches from symbols Adding and Enhancing distance grids Adding distance diagrams (Elevation) Adding distance diagrams (quantities) Border with company logo Working with costs and resources Assigning resources Assigning resources Assigning Income as fixed cost Resource usage bar chart Resource diagram	40 41 42 44 45 46 49 51 54 54 56 60 62 62 64 65 65 65 65 67 68 69 72 74 74

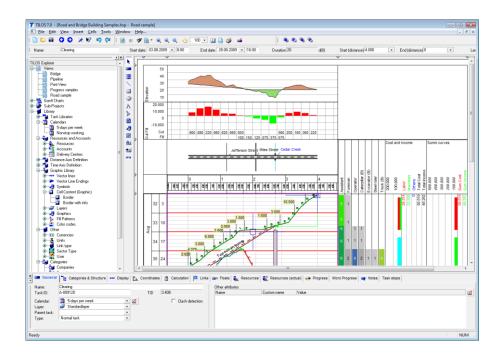
Baseline and Progress	82
Creating a baseline	82
Entering progress	82
Defining line styles	84
Task templates	85
Defining calendars	88
Appendix	90
Task presentation types	90
Task calculation models	91
Resource allocation calculation models	92

Introduction

Thank you for selecting TILOS project management software.

Linear project GmbH, Germany has put a lot of time and effort into creating a Getting Started & Exercises tutorial which we believe will provide TILOS novices and pros alike with a set of tools to master any task involving linear scheduling. The logical sequence of exercises will provide an interesting insight into how linear planning works whilst learning the necessary skills to create your own customized time-location diagrams.

By becoming familiar with the TILOS7 and its enhanced functionalities, plans like the one shown below, can be produced in a short period of time with a little exercise.



Your Linear project Team

Installation

TILOS set-up package contains this manual on the installation CD-ROM.

- 1. Place the installation disk in the CD-ROM drive. If the set-up doesn't start automatically, open the CD with the Windows Explorer and start the **SETUP.EXE** file.
- 2. Follow the installation instructions of the TILOS set-up wizard.
- 3. Start TILOS7 using the Windows menu.
- 4. If no licence is found, the following screen appears:

0	Licence TILOS with Serial Number
0	Connect to existing Licence Path
0	Start in Demo Mode
0	Upgrade to version 7.0

Now you are ready use the software in demo mode. No more than 10 tasks may be saved and printed, but all the features of TILOS may be evaluated.

If you have received a Product-ID and a serial number to activate the permanent or temporary licence then select **Licence TILOS with serial number** and continue with step 5.

If your company has already installed a network licence and you want to use this, then select the option: Connect to existing Licence Path and select the path to the licence in the following dialog.

5 If you have got a Product-ID and a serial number, you may select the first option Licence TILOS with Serial Number and press: Next.

Select Licence Path	
D:\TILOS\License TILOS7	
Product-ID:	
TFS-01298-08CB5D	
	-

Select the Licence path (full access rights required) and type in your Product-ID and press: Next until you get the following screen:

6 Enter the serial number, your company name and your email address.

Online Activation						
Enter Your Serial Number						
G27AN-77AcE-2zD6I-DWJe5-404tN-9qkh7						
Where to find your Serial Number?						
Enter Your Name/Company						
Enter Your E-Mail Address						

Press: Next to start registering.

7. Start the activation by pressing the Activate now button.

-	The product has to be activat	ed online.
505 505	Please provide a connection t	o the internet and activate it <u>Proxy setting</u>
	Activate now	Cancel

In case your internet connection is working with a Proxy server click on Proxy settings and set the correct values. Contact your network administrator for details.

If have a valid internet connection and a correct serial number your software will now be registered for your computer or for the network.

Veb Activation	
Online Activation wa	s successful.
	Close

8. Online validation

After the activation is completed, an online validation is performed. This will be executed every 6 months for checking the licence parameters.



Press the option Activate now to activate the software on your computer.

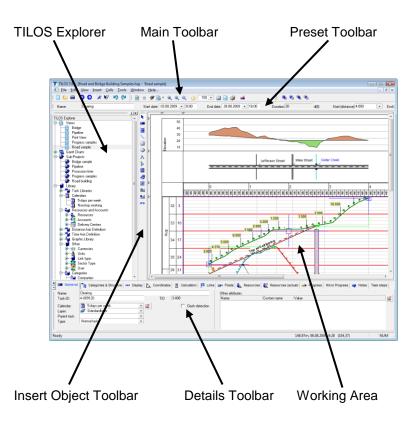
If activation was successful, then the following screen will be shown:

Neb Activation	
Online Verification wa	as successful.
	Close

Licensing is completed.

Global Concept

Please read this section before you start using the software. It will help you to learn how to use TILOS effectively.



In the **Working Area** you will perform operations on plans and data. You will find there one or more opened dialog windows. To open a new window, use the menu command **Window – New Window**.

- In general, the Working Window will present one window in maximized state. If you have more windows open:
 - organize them with the menu command Window Cascade.
 - switch between windows with Window 1...n (Alt + F plus the number).
 - closing the last window will close the file.
- The contents of the windows you open are stored in the History. You may switch between individual windows with the History Go Forward and History Go Back buttons. O The TILOS Explorer contents will not be updated in the process.

In the **TILOS Explorer** you will find all the tools needed for using the program. The TILOS Explorer is organized by a structured tree like in Windows explorer.

- 1. **Views**: These are the views you have created for the project file. A view consists of cells containing tasks, graphics, rulers and diagrams.
- 2. Gantt Charts: Gantt charts are used to monitor the project in relation to the time or distance axis. Gantt charts can be embedded into a cell of any view, but can be also shown as a separate chart. See inside the TILOS Explorer the folder 'Gantt Charts' all Gantt charts that have been created for a project. One Gantt chart represents one or more sub-projects inside the current file.

Double click on the Gantt Chart Folder opens a list of all Gantt charts in the Main Window.

• ×	Ē	_			
TILOS Explorer		Na	ame	Default View	+
i → → Views			Bridge		
Gantt Charts		Ħ	Pipeline		X
Bridge			Progress samples		
Pipeline	\mathbf{X}		Road sample (default)	✓	
Progress samples					
Road sample (default)					
. Sub-Projects	۲				
Elibrary	Ν				

Double click on an individual Gant chart object (sub entry) opens the Gantt Chart in the Main Window.

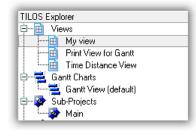
Facts on the Gantt Charts:

- A Gantt chart can have an unlimited number of rows.
- On each row several tasks can be placed. If tasks overlap in time with other tasks of that row, TILOS adjusts the row so that all tasks are visible.
- The text panel shows the information about the tasks and can be placed left or right of the Gantt Chart.
- Traditionally, the Gantt chart time axis is horizontal, but Gantt charts embedded to cells can also have vertical time axis.
- Tasks created in the Time Distance view or by importing data in the Sub-Project gets added at the end of the Gantt Chart.

Gantt chart display modes:

To organize a Gantt Chart there are two modes to display the tasks of the current project. You can display it in a Grouped or Not grouped Mode. Further information can be found in the TILOS help system, in Reference Manual – Gantt Charts.

- 3. **Sub-Projects**: Here you will find individual construction or planning phases. From here you may also access task tables and bar charts.
- 4. Library: Here you may edit the system's base data. A **double click** on an element in the **TILOS Explorer** displays the attributes of this object in the Working Area. The focus is now on the Working Area.



Only if the Explorer has the focus, new items may be added. This is indicated by a frame in the item's background.

The latest activated object is selected in the TILOS Explorer. This is not refreshed when you switch between individual windows with History – Go Back and History – Go Forward.



The Preset Toolbar has 3 functions:

- If you create a new object, you may set its default values for the new object.
- If you create a task, then you may select a template, from which the task is created.
- If you select a task, you may control and change its major data like Name and Coordinates.

The **Details Toolbar** shows the properties of the active object in the Working Area. The properties presented in this window changes accordingly to the changes in the object.

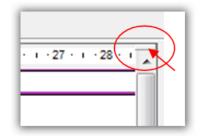
To obtain a maximum-sized view of the plan, you may minimize the Explorer and the Details Toolbar by clicking on the icons depicted below; the button on the right closes the window – you may restore the closed window with the menu item: View – Toolbars – Details Toolbar (Ctrl + Q).



The TILOS Explorer and the Details Toolbar are placed on the left and at the bottom edge in their standard position. However, you may place them at any position in the screen. Press CTRL+Shift and click on the header and drag it into the desired position. Appropriate docking positions will be suggested with graphical symbols. Restore closed dialogs with the menu command View – Toolbars - Reset all toolbars.

Splitting the Working Window

If there is an active view in the Working Area, you may divide the window into partial views so that you are able to view different parts of the plan. In this way you are able to view the rulers, distance graphics as well as the schedule.



Each partial view has its own horizontal and vertical scrollbars.

Creating and editing objects

Create new objects by:

1. Adding **objects** with the **Insert Objects Toolbar** icons. Select an object icon and draw the object in the Working Area.

Tasks may only be placed in time-distance cells and Gantt Chart Cells.

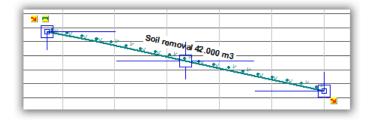
- 2. The F3 key. This places a new element in the table you have selected.
- 3. The Right Mouse Button (context menu) operation **Add**. This works only on folders in the explorer.

- In general, you may also copy and paste almost all elements with CTRL + C and CTRL + V.
- 5. In tables, you may always add new rows with **F3**. For some tables dedicated buttons will be available.
- To add multiple objects of the same type one directly after the other you may use the Lock Insert Tool option. If you select this option, you will be able to add multiple objects without selecting the object icon each time.

Selecting and editing objects

To edit an object it has to be selected first. Place the cursor on the object so that the object is displayed within a grey frame. Now **click** the Left Mouse Button to select the object. You will see the object positioning tools (pin point squares) displayed.

Note: If many objects are close to each other, you may also use the **Alt + Click** to switch through the objects and to select the one you want to edit.



1. Graphical editing of objects

Big square: with these you may move the entire object

Small squares: use them to change the start and end coordinates

Lines at the pin points: with these you may move object pin points in one direction.

- 3. For a selected object you may edit its properties in the **Details Toolbar**.
- 4. **Object order**: If two or more objects overlap, you must decide which object is on top.
 - Set the background of the top object as transparent so that the overshadowed object may be seen through it.
 - Change the order of objects within a layer with the buttons



- Change the order of layers if the objects are placed in different layers.

Time settings

Time data may be entered in **calendar time** or **working time**. Select in Tools / Options in the tab Project the default units how durations should be displayed and edited.

Time units				
Tasks and links:	Default unit	-		
Default working time unit:	e d(8)	-		
Default calendar time unit	le ed	-		
Append default time unit to tokens				

Basic Planning with TILOS

Creating a project

TILOS, like any other software, uses its specific files for data storage. A TILOS file always has the extension hsp. Additionally, temporary data files with the extensions .hsw and .log are used.

To create a new project, use a template file. Template files contain definitions of calendars, lines etc., which you can use in the new project. Using templates with predefined objects saves additional work to create these new objects. Template files have the extension .hst.

- 1 Create a new project from a template project
- Solution Open TILOS from the Start Menu Start Programs TILOS7 TILOS7.
- Select File New ... from the menu to create a new project

TILOS 7.0	×
🗅 New project 🄀 Open project	
(Find more templates) Tilos Template (US Formats).hst	
Tilos Template.hst	
Track Building Template.hst	
Choose template for new project	
,	
	OK Cancel

- Select a **template** file and click **OK**. The new project data will now be applied. The following samples are based on the **Tilos Template**.
- In the dialog presented below, set the distance and time coordinates for the new project.

The dialog always prompts today's dates. In order to have the same results as in the samples data, set the start date to 01/03/2010 and the end date to 22/07/2010.

New Sub-Project Settings				
Project name: My First Project				
Set distance and time prope	erties for sub-projects and views			
Distance unit	📼 m 🔻			
Start (distance)	-200			
End (distance)	4.200			
Start date	01.03.2010 • 0:00			
End date	22.07.2010 • 0:00			
Time unit	● d(8h) -			
Calendar for view	🗾 5-days per week 💽 💌			
	Apply	Skip		

With **Apply**, you will adjust all the views and sub projects in the template to the specified coordinates.

If you press **Skip**, the specified data will be ignored and the default settings defined in the template will be applied. You need to use file save then to save your project, wizard is cancelled.

- Select a file name in the **Save as...** to save your new project with the specified file name.
- If you now want to edit the basic project settings, open the menu item Tools – Options where you may set the project distance and time range.

Standard template defaults:

► Two pre-defined calendars:

" **5-days per week**" is a 5-day calendar with 8 working hours for every work day and with weekends off work.

" Nonstop working" is a 7-day calendar with 24 working hours per day.

To change or define new ones, select in the Explorer Library - Calendars.

- Pre-defined Lines and Line ends can be used for simple graphical lines and in task templates. To add new Lines, go to the Library item: Graphic Library – Vector lines. There you are able to see all the existing line types and you may add new ones.
- Task templates for creating new tasks

A task template contains:

- Presentation (Line, Rectangle, Parallelograms, etc.)
- Line patterns
- Auto text annotations
- Data field definitions
- Task calculation values
- Resource and cost assignments.

New templates are added in Library – Task Libraries – Task Templates or directly from any task using Right Mouse Button - Save As Template.

Creating tasks

As soon as you have created the project, you may start the proper planning.

- Select a view in the Explorer by double-clicking on it. This opens the view in the main window. Open the Time Distance View.
- While working with it, always use the working window in the maximized view to provide optimum working conditions.
- ▶ How to create and edit views, see chapter: *Creating a new view*.
- Select the **Insert Task** tool to create a task.
- Select the template you want to use for your new task.

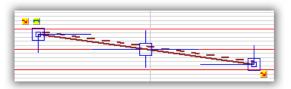
This can be selected in the **Preset toolbar** or by single click to a task template in the **Explorer** under Library / Task Templates.

TILOS 7.0 - [Getting Started Project After Exer File Edit View Insert Cells Tools		
🗋 🗁 🗃 🥝 😧 🤆 校 🗘 🖓	_	। 🕫 📴 ॰ 🔍 🔍 🍳 🌖 100 🗉 🛄 🏥 🎯 🖬
TILOS Explore Views Prix Vew to Gant The Distance View Gant Charts Gant Charts Gant Charts Chart View (deta.t) Chart View (deta		1 -2 -3 -4 -5 -1 -7 0 R R R R R R R 1 -2 -2 -2 -2 -2 -2 1 1 -2 -2 -2 -2 1 10 8 -2 -2 -2 1 10 8 -2 -2 1 10 8 -2 -2 1 10 8 -2 -2 1 10 8 -2 -2 1 10 8 -2 -2 1 15 -2 -2 -2 1 15 -2 -2 -2 1 15 -2 -2 -2 1 15 -2 -2 -2 1 15 -2 -2 -2 1 15 -2 -2 -2 1 15 -2 -2 -2 1 18 -2 -2 -2 1 18 -2 -2 -2 1 18 -2 -2 -2 1 10 </td

➤ You will find more details on task templates in the chapter *Defining Library Items / Task Templates*. If the library does not contain the required task style, you may create a task without a template.

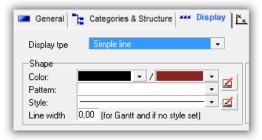
Set template to "None" in the combo list box on top of the list box or use any other template and change data later for the task individually.

Place the cursor in the position where the task should start and drag the pointer to the task end position. A line will be drawn automatically.



On releasing the mouse button, the task stays selected and may be changed now.

- The line will be automatically broken on weekends and holidays (no work), showing no work progress. This may be changed using the display settings for the cell. Select the cell and change calendar option in the tab Display of the cell.
- To control Snapping, settings can be changed in Tools / Options, in the tab Snapping. Snapping in distance can be based on a constant value, but also be based on grid lines.
- Set the Name of the task in Tab General of the Details Toolbar or in the Preset Toolbar.
- If you want to change the line presentation, select the tab **Display** in **Details Toolbar**.



Changing the figures for the task does not effect the data in the template, although the task is still linked to the template. The different task types are explained in the appendix.

Tab Calculation: Every task may have the Quantity or Work rate values assigned. These will determine the task's duration. You may use the following models:

Quantity: If Quantity is the calculated value, then it is calculated based on Work rate and duration.

Work rate: If Work rate is the calculated value, then it is calculated based on Quantity and duration.

Duration: If Duration is the calculated value the duration is calculated based on the Quantity and Work rate. Advanced options using profiles can also be set.

- Every task has a Layer assignment. Layers determine both the in-depth arrangement of objects and their visibility. The layer assignment for new tasks is the default layer if no layer was defined in the library for this template.
- The calendar assignment will be done according to the default calendar set in *Tools -Options*. If there is already a calendar assigned on template level, it will be used. On the **General** tab you may change the calendar setting for the task.
- In case you want to add multiple tasks immediately one after the other, you may use the Lock Insert Tool option. When you do this, the Add task button remains active even after adding a task.

If you want to change the default template, you must de-select the newly added task. Press ESC to de-select a task. You will now see the preset toolbar showing the list of task templates.

Splitting tasks

An existing task may be split into 2, 3 or more tasks of a certain length. Select a task and press the Right Mouse Button and select the Option **Task Creation** and the **Split** function.

💷 Split Task				? 💌
Method:	by distance			•
Distance: 4.00	00		[4.000, 0]	
☐ Keep tas ☐ Put new ☐ Split ann ☑ Link task ☐ Syr	ummary around task :k progress group tasks to the same bar otations	line		v
			ОК	Cancel

Select the method in which way you want to split the tasks and enter where you want to split the task (distance or time coordinate).

Split annotation will assign to the first task the annotations pinned at the start of the original task and to the last task the annotations pinned at the end of the original task. Otherwise the annotations will be copied and applied to both tasks.

Copy tasks to a new location

An existing task or a whole selection of tasks may be copied by giving a new location, where the same work should be executed to.

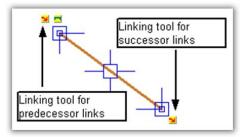
Select one or more tasks and press the Right Mouse Button and select the Option **Task Creation** and there the **Copy Tasks** function.

Copy options Sub-Project	💁 Main				•
Method:	by Coordina	ates			•
Start:	Absolut 0	te	•	Relative 0	
End: Equatio	0 on: [-	0	-
	ate				
Start:	28.09	.2009	•	0:00	
Start: Put new tas Selected tasks	28.09	me bar line		1	×
Start:	28.09 ks to the sa Task-ID			1	×

Linking tasks

If you have defined a sequence of tasks and you want its logical dependencies to be kept even if one of the tasks is moved, you may easily ensure that by defining task links.

1. Click on a task you want to be linked in order to select it. At the start and end of the task you are able to see the linking tool icons.



- 2. Click on the linking tool (at the start or end) and drag the link to another task.
- 3. Release the mouse button when you see the anchor symbol appear over the target task. You may place the link at the start or end of the target task.



- 4. Select the time-distance cell and click on the **Reschedule tasks** icon
 so that the system can recalculate the tasks' time data.
- ► To define the link's **lead/lag**, select the link in the view and set the value on the **Task link** tab of the properties window.

The link will remain selected and its properties will be displayed on the **Task** Link tab of the **Details Toolbar**.

Successor: Top soil stripping	•
Link type: Start - Start - Extra time lag 0.00 💿 dí8h) -	
	ynchronize speed
Lag: 8,50 🛛 d(8h) 👻 🎒 🔽 Consider task shape	pdate train setup on reschedule
Link category: Default	

Link category

This option allows you to assign links to a category, by which the shape and color of the link is defined. Link category also allows you to exclude tasks from reschedule.

Calculate lag by

This option allows you to calculate the lag between 2 tasks, which is normally entered by the user. Different options are supplied. Please refer to the help system for more information.

Synchronize successor distance

This option allows you to calculate the distance coordinates of the successor based on those from the predecessor. Also start and end can be completely synchronized.

Synchronize successor speed

This option may be set only when both tasks have **Duration** as the calculated value. In that case, the **Work rate** fields in both tasks will be synchronized. **Work rate** and **Quantity** must be greater than 0 for both tasks.

Keep Distance to predecessor

Activate the option and define the lag in distance coordinates. From this, and considering the gradient of the two tasks, Tilos will calculate the necessary time lag and update it automatically while rescheduling if the tasks' speed is changed.

- Alternatively, you may add or edit links on:
 - The Links & Constraints tab, displayed when you select a task in the view. You

may define here the predecessor and successor tasks.

- The links list for the sub project.

- Select 2 or more tasks and then use the Right Mouse Button function: Link unlinked tasks.

- On the Links & Constraints tab you may also set the constraints. Constraints are tasks' fixed Start and End dates (times). They will be adjusted while rescheduling only within the set constraints.
- Unlinked tasks do not change their coordinates when you use the reschedule algorithm. They only interact with the report date. All not started tasks are moved beyond the report date. See more information at: Tools - Options in Tab Task.

Layers

Every object, either task or annotation, has an assigned layer. The layers define:

- Whether the objects are displayed in the view.
- Whether the objects are printed.
- The z-order of objects, which controls overlapping and visibility of objects in the same position.
- Select the cell itself (Click into cell, where no object is placed) and select the tab Layer.

Layer	Display	Active	Print	Default	Annotation default	74
Top Text layer	Chopidy	ACOVE	1 100	Derduk	Annotation deradat	- 4
	v v	v d	v v			
Layer 1	V	v.	<u>v</u>		U	_
Layer 2		v				1
Standardlayer	✓	1	✓			
Help ruler	v	1	1			
Calendar laver	đ	đ	đ	0		

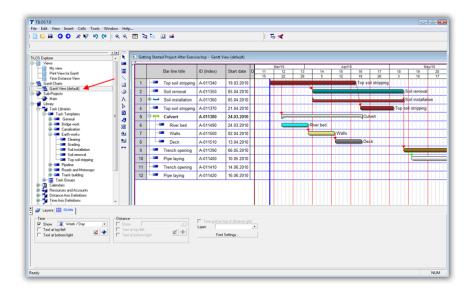
To set the sequence of layers, move the layers line up or down in the list using the arrows on the right side.

New objects are always inserted in the default layer. To place new objects in a different layer, you have to change the default layer first or directly change the layer after creating an object.

Viewing task in the Gantt chart

Project data can also be viewed as a Gantt chart.

- Click on + Symbol ahead of the Gantt charts folder in the TILOS Explorer to expand the list with existing Gantt chart views.
- Double click in entry Gantt view to open the Gantt chart in your main window.



To create new Gantt charts, use a right mouse click on folder Gantt charts in the explorer and select the menu entry: New Gantt chart. In the next dialog the sub projects displayed in that Gantt chart are listed. ► To create new tasks in the Gantt chart works in the same way as in the time distance diagram.

View tasks in the task list

Project data can also be viewed as a task list:

- Click on + Symbol ahead of the Sub-Project folder in the explorer to expand the list with existing sub projects.
- Double click in entry Gantt view to open the sub project details in working area.
- Select the folder task list.

TILOS Explorer	Name	Task-ID	Duration	Start date	Performed	Start I
	Top soil stripping	A-011340	23	19.03.2010		8:00
My view	Soil removal	A-011350	24	05.04.2010	0	8:04
Print View for Gantt	🔅 Soil installation	A-011360	24	05.04.2010	0	8:04
Time Distance View	Top soil stripping	A-011370	9	21.04.2010		12:00
	E	A-011380	21	24.03.2010		8:00
	Trench opening	A-011390	27	06.05.2010	0	14:1
Gantt View (defacit)	Pipe laying	A-011400	27	10.05.2010	0	14:11
	Trench opening	A-011410	13	14.06.2010	0	14:1
Main 🥌	Pipe laying	A-011420	13	16.06.2010	0	14:11
∰ Library ⊕¶ Task Libraries	Top soil stripping	A-011340-00	2	17.03.2010	V	8:00
Distance Axis Definitions Time Axis Definitions Graphic Libraries Other						
🖬 📲 Time Axis Definitions 🖶 🦓 Graphic Libraries			/			
Time Axis Definitions Graphic Libraries Graphic Libraries Graphic Contract Library Contract Library Custom Palette Task Notes	< ۲۰۰۰ General Task List				inks 🕵 Resource	ces at a Me

- ▶ In the tab Task links you can get a list of all links inside the sub project.
- ▶ In the tab Resources, you can view all assigned resources.

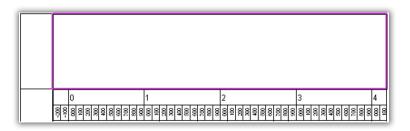
Exercise

In the following section a time distance plan will be created. Please use the project, which you have created in the previous chapter.

⁴⁰ Open the time distance view in the folder Views.

Adding distance graphics

In the highlighted cell below, we can add distance graphics. If you have prepared a sketch showing the site you may directly insert this here. In the template the cell above of the distance scale is already defined as a distance cell. Now we insert a prepared picture into it.



1 Inserting picture

- Select the 🥏 Insert Graphic Object tool from the Insert Object Toolbar.
- Set the Figure scaling in the Preset toolbar to Horizontal.

This ensures that on changing distance scales or showing only part of the project this graphic will always be adjusted.

Figure scaling:	Horizontal	 Alignme 	ent: Bottom / Left	-
-----------------	------------	-----------------------------	--------------------	---

Position the mouse at the position where you want to insert the graphic, press the left mouse button and drag the mouse to draw a rectangle where you want to position the picture. Release the mouse and the **Insert Graphic Object** dialog appears.

	? 🗙
🎝 Tunnel	
ОК	Cancel
	Tilos logo

Select the option: **Insert graphic from file** to import a file and press OK. The windows file explorer opens.

Select the file "Road map.jpg" in the folder Addon of your TILOS data installation. (Please refer to system options, tab Configuration to find out where your data installation is located)

	Jefferson street	Miles street Rhein	
		l I	
0 1		2	3
	R R 9 8 8 2 8 8	8 8 8 8 8 8 8 8 8	8 9 8 8 9 8 8 9 8

Select the file tab **Figure Position** and check the Option: Keep proportion.

This will make sure, that your object always keeps the same proportion. The size is controlled only by the distance scale, based on Scale "Horizontal" setting after inserting. The name is changed to Distance, as distance axis is horizontal.

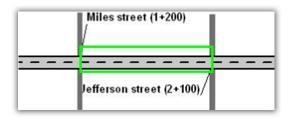
🛃 Graphic	properties X Fig	ure Position					
Name	Road map		Layer:	🗲 Standardlayer	•	Object ID:	8.338
	Pinpoint	Start	End	Length		🔲 Adjust on	change of direction
Distance	0	3.790	0	-3.790	_	🔽 Keep prop	portions
Metric	0,00%	418,34mm		-431			
Scaling:	Distance	-				Adj	ust position

2 Synchronize picture with scale

If the picture is not selected, select it.

- Select the file tab **Figure Position** and press the Button: **Adjust position**.
- Position the cursor on Miles street, press the left mouse button and drag the mouse to Jefferson street.

A ruler band is created between Miles street and Jefferson street.



On releasing the mouse the following dialog appears.

Adjust Figure Position	ted area
Start (distance):	1.200
End (distance):	2.100
ΟΚ	Cancel
ОК	Cancel

Enter the station numbers from both streets, which are known from drawing and press enter.

Press Ok and the graphic gets adjusted.

₽	Jefferson street Miles street Rhein	P
0 1	2 3	
	2 R B B B B B B R R B B	

As this action changes horizontal scale of the picture, it changes height as well. So you might have to adjust the cell height too.

Note:

Later in the exercises, you will find a topic about inserting symbols and other objects in the distance cell.

Inserting a distance grid

In the template there is already a constant grid every 1 000 m set. A second grid for non constant values is prepared, which is controlled by a distance profile. So we just need to fill the profile with the data from our project.

Profiles.

Select the profile Station point for Grids with a double click.

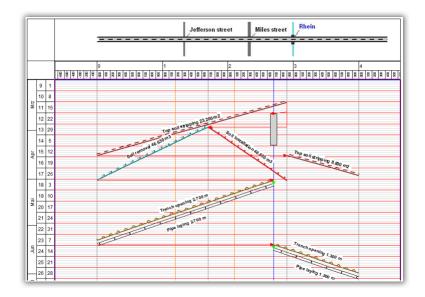
Name: Description	Station points	
Distance	Name	Туре
Distance 0	Name Start	Type
0	Start Crossing Start Fill	K Border Crossing Border
0 1.200	Start Crossing Start Fill	K Border Crossing Border
0 1.200 1.700	Start Crossing Start Fill	K Border Crossing Border
0 1.200 1.700 2.100	Start Crossing Start Fill Crossing River	Border Crossing Border Border Crossing

- Enter the values according the picture above (Use + Button to create a new line and enter the data).
- The data can also be imported using the Import and Column Setup button. The data for that grid is stored in the xls file Road map.xls in the add-on folder of application data of your Tilos installation.

A lesson how to import this data will follow later.

Inserting Tasks

Create the attached time distance plan based on the data in the tables.



Task list

Task	Name	Template	Start.Date	End.Date	Duration	Start.Dista	End.Dist
1	Top soil stripping	Top soil stripping	15.03.2010	16.04.2010	24	2900	0
2	Soil removal	Soil removal	30.03.2010	03.05.2010	24	1700	0
3	Soil installation	Soil installation	30.03.2010	03.05.2010	24	1700	2900
4	Top soil stripping	Top soil stripping	16.04.2010	29.04.2010	9	2900	4000
5	Culvert	Culvert	22.03.2010	09.04.2010	15	2650	2750
6	Trench opening	Trench opening	03.05.2010	09.06.2010	27	2700	0
7	Pipe laying	Pipe laying	05.05.2010	11.06.2010	27	2700	0
8	Trench opening	Trench opening	11.06.2010	30.06.2010	13	2700	4000
9	Pipe laying	Pipe laying	15.06.2010	02.07.2010	13	2700	4000

For instructions how to insert tasks, see chapter Inserting tasks. Do not care about start and end dates. You can draw the tasks according to the picture above. Reschedule will later give exact dates and schedule.

The dates in table are taken after reschedule of final project. So do not worry if they differ from your input.

The task templates to select in the preset toolbar can be located in different subdirectories (e.g. Earth works and Canalisation)

Mar Insert task 1

Select the tab Calculation

Set **Calculate quantity by** to **Task length**. Enter in the field **Quantity factor** the value 8 and select the distance unit m for meters, so you get calculated 8 m2 per m of task length, in total 23.200 m2.

With the new quantity and predefined work rate the duration gets calculated.

If you do not want the task duration to be calculated, set calculate to $\ensuremath{\textbf{None}}.$

Mrs Insert task 2

Set Quantity to 45.630 m3 Duration gets calculated from quantity and work rate Mark Insert task 3

Select tab General: Set Type to Hammock.

Select tab Categories & Structure: Set **Keep own Distance Coordinates**. This ensures, that the Hammock does NOT take the distance coordinates from the assigned tasks. It keeps its own location.

Add a line to Tasks in Hammock grid and select task: Soil removal

Select tab Calculation, change **Set quantity by** to **Sub tasks**. The quantity is now calculated.

As this task is a hammock, both the tasks are not connected. The hammock monitors the Soil removal task.

Mrs Insert task 4 in same manner as task 1.

Quantity is smaller than in task 1 based on shorter length.

- Mr Insert task 5
- Insert task 6 and 7 by the function Insert Task Group.
 - Select Insert Task Group tool.
 - Draw a ruler band where tasks are executed
 - Select the group Canalisation and maybe correct coordinates

📒 Insert Task Gro	up 🕄 🔀
Task group: Description:	Canalisation
Distance coordin	ates
Method	: by Coordinates
Start:	2.700 💌
End:	0
Time coordinates	
Start date	06.05.2010 • 0:00
	OK Cancel

You have now created 2 tasks.

Select task 6 and 7 by clicking with the mouse

Press Right Mouse Button Menu item Task creation / Copy Tasks.

🖶 Copy Tasks	To New Lo	cation		? 🔀
-Copy options				
Sub-Project	💁 Main 🛛			-
Method:	by Coordina	ates		-
	Absolut	e	Relative	
Start:	2.700		▼ 2.700	
End:	4.000		▼ 4.000	
Equatio	n:			-
Destination da Start: Put new tas Selected tasks	30.06.		• 0:00	X
Name	Task-ID	Start (Distau	End (distance)	
Trench openii		2.650		
Pipe laying	A-011400	2.650	-50	
			OK	Cancel

Enter the coordinates for the new tasks: 2700 and 4000.

Linking tasks

Select task 1

Create a link by the dragging link symbol from start of task 1 to start of task 2.

A Start-Start link has been created.

Calculate lag by	Distance to st	uccessor		•
Distance units	200	💶 m	•	
Extra time lag	0,00	🕒 d(8)	-	
	🔲 Reflect sha	ъре		

Set option: **Calculate lag by** to **Distance to successor**. And enter 200 m for the distance value. This keeps the production sequence between the two tasks always at a distance of 200 units.

Select task 2

Create a link by dragging the link symbol from the end of task 2 to the start of task 6.

A Finish-Start link has been created.

Select task 1

Create a link by dragging the link symbol from the start of task 1 to the start of task 5 (Culvert).

A Start-Start link has been created. Enter a time lag of 5 days.

Link								
Predecessor:	💶 Top soil strippin	g		-	-	Calculate lag by	Working time	-
Successor:	🖂 Culvert			-				
Link type:	Start - Start			-]			
Lag:	2,00	۹	d(8)	-	<i>i</i>			
Link category:	Standard]			
Layer :	🚄 Standardlayer			-				

Select task 6

Create a link by dragging the link symbol from the end of task 6 to the start of task 8.

A Finish-Start link has been created.

Trench opening and pipe laying are already linked.

Start the reschedule to see the results.

If tasks are very close to one another, the neighboring tasks may get linked to one another, when dropping link end with the mouse.

In this case check the links predecessor and successor by selecting the link and check its attributes in the details toolbar.

You may also create links by:

Select a task and select tab Links & Constraints in the details toolbar. Here you may create a predecessor or a successor for the task.

Select the sub project link list and create a new link by selecting both, predecessors and successors.

Annotating tasks

Note: Apart from tasks, you may also insert independent graphic objects for illustration and explanation purposes in to the plan.

Adding a text annotation to task 1: Top soil stripping.

Select the Insert Text tool in the Insert Object toolbar.

L File Edit	View Insert (Cells T	ools Wi	ndow	He	p																
🗋 📁 🔛	00 × K	? 🎝	6	B =	4	r 📴	-	Q,	Q	۹ ،)	100 _	•		3	i 🛛	4				1	o 💌
Scaling:	Both axes 💌		Alignm	ent Bol	tom /	F.	•		Fon	Arial		-	8	•	B	/	<u>U</u>	s -	A		-	
			<u> </u>			• 1	• 1 •	• 1 •	2 .	· 3 ·	· 4		5 - 1 -	· 6 ·	1 - 7	1.1.1	8 ·	i - 9	- 1 -	10 · ·	+ 11 +	1 - 12
ILOS Explorer				•	É		Feb	7	15													
Views					17		L R	8	22													
Prin	View for Gantt				1.5			9	1													
Tim	view t View for Gantt e Distance View			\mathbf{x}	12			10	8													
🛛 🗮 🖬 Gantt D	harte							-	15													
	tt View (default)			_	1					_					-	-			-	-		
				0	14			12	22	-					_		-		حب			
🗔 🕢 Mai				A	ż		\vdash	12	29						-	-	-		-	-60	=	
- Library				1	12			14	5							m3	120	مسعد		~	insta	
🗄 📲 Tas	k Libraries						Apr	15	12					wa14	5.65						~	ation
	endars				T₽		<	16	19			Sol	remo	1				_	_		linstal	É

Select the presets in the Preset Toolbar.

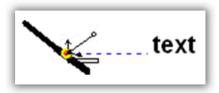
One of the most important settings is scaling on the tab Figure Position.

Set scaling to none.

Select **Horizontal** or **Vertical** or **Both axis** if you want the object to be automatically adjusted to the changes of the ruler scales.

For text objects, we recommend the use of "none" as scaling. For graphic objects like pictures, sketches or rectangles, we recommend you use scaling with the axis. Object keep its position when scales are changed.

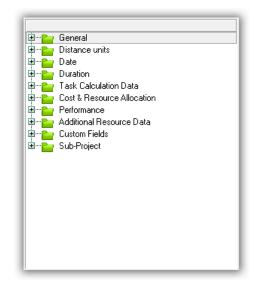
- Place the cursor where you want to set the text near by the task.
- Link the object to the task 1 dragging the object's pin point (the red point) to the task centre area. The icon changes. Now release the mouse. The text gets connected with the task.



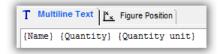
Select the tab Text. Delete current entry or overwrite it.

T	Multiline Text
Te	xt

Press the F8 Key and select in section General the entry Name and press Enter.



- Enter a space character, press F8 again and select the entry Quantity in group Task calculation data and press Enter.
- Enter a space character, press F8 again and select the entry Quantity unit in group Task calculation data and press Enter.



The text box should look like this. You may also enter free text information.

Activate the option: **Apply slope of task**. This always sets the angle to be the same as the task angle.

Angle:	0,00	Apply slope of task	🔲 Manual size
--------	------	---------------------	---------------

- Deactivate the option Manual size. TILOS will always calculate the correct size of the text box.
- Move the text nearer to the line.



General tips for annotation:

- The object remains selected and you may edit its settings in the Details Toolbar.
- Note: If the pin point is outside the visible cell area, the object gets hidden. You may access them by changing view range or via the tab: Other Objects.

Structuring tasks

In this sequence, we plan sub tasks to detail the works for the culvert.

- Select task Culvert
- Use Right Mouse Button menu Structure / Convert to Summary Task to create a summary task from Culvert.
- Use Right Mouse Button menu Open Summary in Gantt Chart to show the summaries sub tasks in a Gantt chart. In a new window on top of the previous, an empty Gantt chart is displayed.

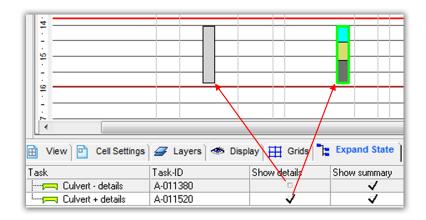
The display settings for the Gantt chart are taken from the default view.

- Select the **Insert Task** tool to create a task.
- Select the template River bed under the folder Task template / Canalisation / Culvert.
- Draw a task with 7 days duration.

Repeat the same for the task templates **Walls** and **Deck**. Your plan should look like:

ſ						h	lar/10			Apr/1	0	
		Bar line title	ID (Index)	Start date	D	11	12	13	14	15	16	17
14						15	22	29	5	12	19	26
L	1	Culvert	A-011380	24.03.2010								Ivert
Г	2		A-011490	24.03.2010					River be	d		
Г	3	···· Malls	A-011500	02.04.2010				Ç		Walls	6	
	4	Deck	A-011510	13.04.2010							De De	eck

- Select all 3 tasks by click on each with Ctrl key pressed.
- Use Right Mouse Button menu Link unlinked tasks to create links between the tasks.
- Close the Gantt chart by clicking on the window close button. The summary task gets updated based on the detailed data.
- For selected summary a "+" symbol is visible. Click on that to expand the summary task in order to view the details.



Note: The display of a summary can also be controlled from the ime distance cell. In the tab Expand state, the tree can be expanded and collapsed for each summary independently.

Printing

Print a view

With TILOS, you may print plans in almost any size and orientation. In the view, you may display your plan in the desired time and distance scale while keeping their appropriate proportions.

1. Open the view which should be printed. (Tilos Explorer)

ame: Columns	My view				Prin Rows	t form for Gantt C	hart	View Text Fields	
Column	Name	Hidden	Size [cm]	+	Row	Name	Hidden	Size [cm]	
0			0,53		0			0,53	
1			1,88	×	1			5,69	
2			16,27		2			1,88	Ξ
3			12,54		3			2,49	
4			0,58		<u> </u>			12,28	

The view dimensions are presented on the **Cell system** tab active for a selected view.

- With the menu command *File Print setup* select the printer. Select the desired paper size and orientation settings. The view will remember these settings for the future.
- 3. Click on the icon **Print Settings**.

TILOS 7	.0 - [Getting Started Pr	oject After Exercise.hsp - My view]	
🔝 File	Edit View Insert O	Cells Tools Window Help	
🗋 🗁	🖩 🔇 🖸 ⊁ K	? 🎝 🖓 🖻 🗄 🛷 🔂 -	🔍 🔍 🌖 🔟 🖵 🛄 🖶 🎯 🖬 🛛 🌄 🦿
1			Print Settings

Print Settings
✓ Show pagination
Print zoom: 100 💌
Print on one page
Print pages: 1 x 1
Page margins:
Left 0,00 cm Top 0.00 cm Right 0,00 cm Bottom 0,00 cm
Printer setup
OK Cancel

Select the option Show pagination. If required select a print zoom.

Press OK.

You will now see the view's printout pages. The blue lines show the page divisions. If you cannot see the whole of the chart change the view zoom.

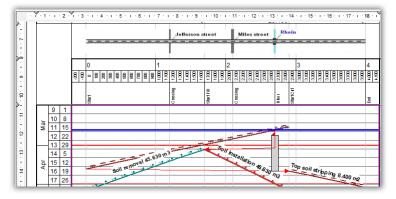
4. Adjust the print size to the paper format. You have the following print options:

Changing the print zoom: By changing the print zoom, you automatically change the print size. Be aware that this changes the size of the lines and text involved.

If you enter the values in the **Print pages** fields directly, the **Print zoom** will be adjusted automatically.

Changing the paper size: Change the printer's paper size to obtain a new page division. For large format plotters you may format paper size to obtain maximum printout area.

Change the height and width of rows and columns graphically (by dragging row/column border lines) or numerically (on the **Cell system** tab). This changes the ruler scale but the scaling of lines and texts is being kept.



5. Start printing by clicking on the printer icon.

Print a Gantt chart

Printing the Gantt chart works differently.

First you have to select a print form (a TILOS view) in which the Gantt chart gets inserted. This view gets used as a Border form for the printing process.

- 1. Open the Gantt chart view from the folder Gantt Charts.
- 2. Use the Right Mouse Button function: Print Gantt Preparation.

Width scaling Height scaling (rows)	Fit print form to chart • All Rows on one page •
Print form	•
	Set default printer for view

- 3. Select the Width scaling: **Fit chart to print form** keeps the size of the form and changes the scale of the Gantt chart to fit into the form. **Fit form to chart** keeps the scale from Gantt chart and changes the print forms width.
- 4. Select the Height scaling: **All rows on one page**. The print form height gets adjusted, so that all rows are visible. Multi pages: The selected row height is kept from screen display and TILOS splits the print into as many pages needed for the printout.
- 5. Select a print form.
- 6. Click on next button.

If only one page is generated, this is directly shown in the preview and can be printed.

		Bar line title	ID (Index)	Start date	Duration	End date	9	M: 10	ar/10 11	12	42		Apr/10 15		17	18	May 19		21	22	Ji 23	un/10 24			J 27	ul/10 28
		Dar nine title	ID (Index)	Start uate	Duration	Lifu date	1	8	15	22	29	5	12	19		3	10	17	24	31	7	14	25	28	5	12
1	📼	Top soil stripping	A-011340	19.03.2010	23	20.04.2010									soil	_										
2		Soil removal	A-011350	05.04.2010	24	06.05.2010						_					Soil r	emo	val							
3	÷	Soil installation	A-011360	05.04.2010	24	06.05.2010						_		1			Soil i	nsta	latio	n						
4		Top soil stripping	A-011370	21.04.2010	9	04.05.2010								Ċ		Top	o soi	strij	oping							
5	₽-₽	Culvert	A-011380	24.03.2010	21	21.04.2010				7				٦Cı	Ivert											
6	[River bed	A-011490	24.03.2010	7	01.04.2010						River	bed													
7	[Walls 	A-011500	02.04.2010	7	12.04.2010					Ç	_	Wal	ls												
8	4	Deck	A-011510	13.04.2010	7	21.04.2010							-	De	eck											
9	· · · · · · ·	Trench opening	A-011390	06.05.2010	27	14.06.2010										Ċ							nch (·		
10		Pipe laying	A-011400	10.05.2010	27	16.06 0		1														ÐР	ipe l	aying		
11	📶	Trench opening	A-011410	14.06.2010	13	01.0 10																<u> </u>			Trend	
12	2	Pipe laying	A-011420	16.06.2010	13																	Ç	_) Pip	e la
	ct: Bas d: 28.0	ed on TILOS temp 3.2010	late 4 release																	1	M	N	105) I E	кbа	.u

Electronic transfer

If you want to transfer a plan electronically, print it with the PDF Printer instead of printing with a physical printer. We suggest Acrobat Destiller (www.acrobat.com) or eDocPrinter (www.iteksoft.com).

You will find a demo version of the eDocPrinter on the installation CD.

Importing tasks

Tasks, links and also resources can be imported into TILOS using various interfaces. Both import and export are done based on a wizard with 4 Steps:

1 Decision on exchange type

You can import ASCII, XML and XLS data.

2 Decision on data source

Possible formats are: Clipboard or File. For the export to Excel, this entry is used as template, while there is always a new file created.

3 Decision on exchange profile

For XML, the profile contains the rules for exchange and is stored using an XML file that you have to select. For all others, select an existing profile stored on your computer.

4 Decision on sub project scope

If sub project information is part of your data setup, then the setting here is ignored or even skipped.

ASCII Text Import

1 Prepare a new project inside TILOS

Create a new project without tasks in the same way as you did at the beginning of the training session in the chapter: **Creating a project**.

2 Copy data to clipboard

- Open in the folder Add-on of your TILOS Data directory the Excel file Road map.xls.
- Select the tab Tasks
- Select the rows with the tasks and press Ctrl + C to copy the data into your clipboard.

3 Prepare import

- Select the Menu option: File / Import.
- Select in step 1 of the import wizard the Option ASCII.
- Select in step 2 of the import wizard the Option **Clipboard**. The content of the clipboard is shown in the preview.
- Select in step 3 of the import wizard the profile **Basic data**.
- Doing multiple imports, you can directly move to step 4 of the wizard with the next button and skip point 4 of this description.

4 Check and edit profile setting

In step 3 of the Import Wizard, click on the edit button to check the setting for the import.

lame Basic data		
tem	Select	
🗦 🗝 Library Data		
Accounts		
Resources		
Categories		
≟ P Schedule		
🖨 🚛 Tasks	₄ √	
🔐 Planned Resources		
Actual Resources		
Links		
Micro Progresses		

Make sure that the task line is checked to import tasks.

- Click on the edit button to check the setting from the task import. The line task needs to be selected.
- ▶ Make sure that you have the same sequence of fields set.

😤 Exchange Settings						
Available fields			Selected fields			
Item	•		Item	Order	^	
Task-ID *		>	Task-Update-Field		1	۲
Task-Global unique ID *	=		Name		2	_
Barline-ID		>>	Task template name		3	_
Barline Name			Start.Date		4	
Barline Text 1			End.Date		5	
Barline Text 2		<	Start.Distance		7	
Barline Text 3			End.Distance		8	
Barline Text 4		<<			_	
Barline Text 5						

The entries are sorted based on the order number giving the column number of the value inside the clipboard. There can also be gaps inside that list.

- Close this dialog using the OK Button.
- ⁶⁶ Check that the task update field is set to Task-ID.

Exchange options		
Task-Update-Field	Task-ID	•
Distance unit:	— m	•
Use equation		

This value corresponds with the field Task Update Field in the field list. Only this can be used for identifying and updating tasks.

4 Set the project scope

Select the sub project to which you want to import your data.

Project scope	3	
Single sub-projecti		
Sub-Project	Selected	
Sub-Project	✓	

If the sub project is part of the task field selection, then this setting here is ignored. This allows to import to multiple sub projects in one import run.

Press the finish button, your data gets imported.

5 Checking the data

- Select a view in the TILOS Explorer by double-clicking it. This opens the view in the main window.
- If some tasks are not visible in your view, you can adjust the view range with the right mouse function View range.

📉 Adjust View Range			? 🔀
 Adjust View Range To Sub-Pro Adjust view range to visible tas 			
✓ Time Expand to next full	Week		•
Expand to next full	1000		▼ m
		ОК	Cancel

MS Excel Import

Note: In the demo version the xls module is activated. In full version, it has to be licensed.

1 Prepare a new project inside TILOS

Create a new project in the same way as you did at the beginning of the training session in the chapter: **Creating a project**.

2 Start the Import

- Select the Menu option: File / Import.
- Select in step 1 of the import wizard the Option XLS.

3 Select the Import file

Select in step 2 of the import wizard, the file you would like to import.

Please select the sample file **Primavera TILOS Export.XLS** in the data folder TILOS7-Data\Exchange\Samples.

This file contains tasks and relationships.

Please refer to the Oracle Primavera help for more information how to create this file.

4 Select the profile

- Select in step 3 of the import wizard the profile **Primavera TILOS Export**.
- This profile is adjusted to the content of the xls file above.

5 Check and edit profile setting

Click on the edit button to check the setting for the import.

Name Primavera Import Sample		
Item	Select	
🖻 🗝 Library Data		
Accounts		
Resources		
Categories		
🗄 📷 🔁 Schedule		
🕂 🚛 Tasks	→ √	
🔐 Planned Resources		
🛄 👬 Actual Resources		
	→ √	
Micro Progresses		

Make sure that the Tasks and Links are checked.

Click on the edit button to check the setting from the task import. The line Tasks needs to be selected. ▶ Make sure that you have the same sequence of fields set.

ltem	Order	^		
Task-Update-Field		1		
Name		4	Selected fields	
Start.Date		5	Item Or	der
End.Date		6	Predecessor-ID	
Start.Distance		- 7	Successor-ID	
End.Distance		8	Туре	
Task template name		9	Lag	



Field setup for Links

• Check, that the formats match with settings.

Exchange options	
Task-Update-Field	Task-ID 🔹
Distance unit:	- m -
Use equation	Y
Format	
Decimal separator	,
Date format	dd.mm.yyyy hh:nn
Number of headlines	2 🔹
Separator	; Use tabulator

Primavera always exports 2 column heading lines.

6 Set the project scope

Select in step 4 of the wizard, the sub project to which you want to import your data.

Project scope	
Single sub-project	
Sub-Project	Selected
	· · · · · · · · · · · · · · · · · · ·

If the sub project is part of the task fields selection, then the setting is ignored here. This allows the import to multiple sub projects in one import run.

Press the finish button, your data is now imported.

MS Project Import

Note: In the demo version, the MS Project module is activated. In the full version, it has to be purchased separately.

1 Prepare a new project inside TILOS

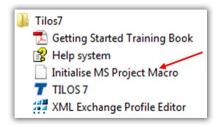
Create a new project in the same way as you did at the beginning of the training session in the chapter: Creating a project.

2 Initialising MS Project TILOS Export Macro

If you have already initialised the MS Project TILOS data exchange, then continue with step 3.

Data Exchange with MS Project is based on XML data exchange. For this you need a macro to be installed inside MS Project.

Select the Windows TILOS Start-Menu option: TILOS / Initialise MS Project Macro.



This will start MS Project and install the Macro. This installs a Menu entry "**TILOS7 exchange**".

Enter the values for the default time units.

Working unit:	Elapsed unit:	
d	ed	

In English version: d for a working day and ed for elapsed day.

In German version: T for a working day and ft for elapsed day.

3 Opening a project file in MS Project

Open inside MS Project the file TILOS Sample project.mpp in the folder

"... \ProgramData\TILOS\TILOS7-Data\Exchange\Samples".

- Select the Menu option: TILOS7 exchange.
- Select the option: **Export data to xml file**, the dialog XML Export appears.

XML Export Select XML profile file:		
	7-Data\Exthange\Profiles\MS Project TILOS7 OnlyTask Profile.xml	
RelationshipsNo Progress		
Select XML output file:		
	TILOS7-Data\Exchange\Samples\MS Project export.xml	*

- Select the XML profile by clicking on the button and select the profile: **MS Project TILOS7 OnlyTask Profile.xml** from the folder **...\ProgramData\TILOS\TILOS7-Data\Exchange\Profiles**. This contains the rules for the data exchange. In this case, for calendar, task and relationships.
- Select the data file. As no data file exists, just enter a new name in the file explorer, e.g. MS Project Export.xml.
- Press next to export the data.

4 Importing the data into TILOS

- Select the Menu option: File / Import.
- Select in step 1 of the import wizard the Option XML.

Select the sample file you have created above: **MS Project Export.xml** in the data folder TILOS7-Data\Exchange\Samples.

Select in step 3 the same profile you used for exporting the data from MS Project: MS Project TILOS7 OnlyTask Profile.xml from the folder ...\ProgramData\TILOS\TILOS7-Data\Exchange\Profiles.

6 Set the project scope

Select in step 4 of the wizard the sub project to which you want to import your data.

Project scope			
Single sub-project			
Sub-Project	Selected		
🈰 Main		√	

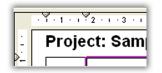
If the sub project is part of the task fields selection, then this setting here is ignored. This allows the import to multiple sub projects in one import run.

Press the finish button, your data is now imported.

Creating a New View

A view is a presentation of project data. The view is organised in a cell system. The cell system may be sized free like in Excel® by changing row and column size.

This can be done using the mouse by dragging the little triangles in the rulers or with the view tab by giving each row or column the size directly.



The size may be entered in cm or inches. This may be changed in the Tools-Option dialog.

To create new rows or columns, use the view tab of the details toolbar (visible, when you have only a cell selected and no object inside), select a row or column and press the plus button. A new row after the selected line is being inserted. The first and last row or column are the borders, these may not be removed.

Alternatively, you may insert rows and columns by selecting a cell and use the Cells menu, Right mouse or View Toolbar. The new item is inserted after the selected one. If you want insert a row or column at the beginning of the cell system, select the border cell.

Cell Settings

The cell only organised the view to the data. In each cell, you may insert data only as a reference to existing data. There are 5 different cell types:

► Time distance cell: This cell type is used to show a time distance diagram. The cell content combo list shows only sub-projects.

🗎 View 🎦	Cell Settings 🥃 Layers 🚳	Display H
Name: Cell type: Cell content:	Project Time Distance Cell 2 Main	(2, 4) • (*
Axis	Time vertical	•

- Gantt chart cell: This cell type is used to show project data as a Gantt chart within a view. The cell content combo is de-activated, choose the Sub-Projects with the Select Sub-Projects icon. The axis shows the TIME, like used in Gantt charts
- Location Gantt chart cell: This cell type is used to show project data as a bar chart within a view. The cell content combo is de-activated, choose the Sub-Projects with the Select Sub-Projects icon. The axis shows the LOCATION.
- Distance cell: This cell type is used to show distance related data only, where no time information applies, such as distance sketches, diagrams or scales. The cell content combo list shows only distance graphics. They are similar to sub-projects, but they have no time axis and can only store graphical objects inside, but no tasks.
- Time cell: This cell type is used to show time related data only, where no distance information applies, such as diagrams or scales. The cell content combo list shows only time graphics. They are similar to sub-

projects, but they have no distance axis and can only store graphical objects inside, but no tasks.

Graphic cell: This cell type is used to show graphic data only, where no time and distance information applies, such as company logos and stamps in border cells. The cell content combo list shows only graphics. They are similar to sub-projects, but they have no distance and no time axis and can only store graphical objects inside, but no tasks.

Adding content to a cell

To display an existing cell content in the cell, select a cell type and the requested cell content.

To create a NEW cell content (Distance graphic or Time graphic or graphic), click on the Cell wizard icon right to Cell type.

🗎 View 🗎	Cell Settings	
Name:		(1, 2)
Cell type:	Empty	- *
Cell content:		v

Select the cell type to create and set the name. On demand, you may already insert an object into the items created. Based on cell type, different items are offered.

In this way, planning is independent from the presentation. Within one project, you can have different views (days planning mode/ hours planning mode and partial views for selected distance sections). The system's flexibility is practically unlimited.

View range

For each cell, you may set the visible area of the project in the cell settings tab:

× <u>×</u>	Distance[m]	Relative[m]	Date	Time
Start	-200	-200	01.03.2010 💌	0:00
End	4.200	4.200	06.08.2010 🝷	0:00
Length	4.400		474,00	d(8)
Units/cm	270	m 🔹	15	ed 🔹
	Distance a:	kis descending	Time axis desc	ending

The scale is calculated by width of the cell and the cell ranges applied.

If you have a complex cell system and change the range of the main central time distance cell, then you also need to adjust the surrounding cells. This involves the changing of the range for many cells.

Master cell concept

If you set a master cell for a cell, then the coordinates are automatically adjusted, in case the coordinates from the master cells are changed.

Name:	Time Ruler	(1, 4)	Ľ <u>×</u>	Distance[m]	Relative[m]	Date	Time
Cell type:	Time Cell	- 🗶	Start	0	0	01.03.2010 -	0:00
Cell content:	Week and Month	- 😰	End	1	1	06.08.2010 -	0:00
Axis	Time vertical		Length	1		474,00	d(8)
Time master cell:	Project< (2,4)>	-	Units/cm	0	m –	15	ed 🗸
Distance master cell:		-		Distance a	ixis descending	Time axis descr	endina

For this time cell, the time ranges may no longer be changed as it is set by master cell.

Click on the icon Show view Map to fill the cells with colors denoting their types and name of content.

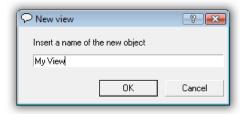
	1	
	Sketch by Symbols/Sketch by Symbols	
	My distance scale/My distance scale	Mzard1
Time Ruler/Week and Month	Project/Main	Bar Chart Wizard1 Resource Bar Chart Wizard1
Tir		3ar Chart W

If there is an arrow from one cell to another, this shows that this cell has assigned a master cell. The master cell is the cell where the arrow ends.

Exercise

In this exercise, we create a new view to show the project data in a different way as in the view you have been using before.

1. Create a new view

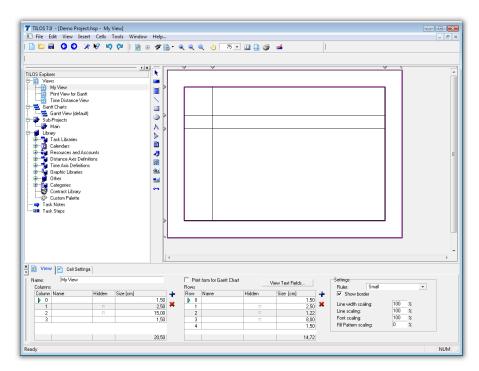


- Click in the **TILOS Explorer** over the item **Views** on the right mouse button and select **New View**.
- Enter a name for your view and press OK. The new view is created.
- Select the new view and double click to show it in the working window.

TILOS 7.0 - [Demo Project.hsp - My View] Image: File Edit View Insert Cells Tools Window Image:		R R R J 100 - U 🖶 🎯 🛋 🕴	- 8 ×
IDS Explore IDS Explore IDS Explore IDS Explore The Verse to card The Verse to card The Detractor Verse IDE Detracto		· · · · · ·	
View Cell Settings			
Name: My View		Print form for Gantt Chart View Text Fields Settings:	
Columns Column Name Hidden Size [cm]	+	Rows Name Hidden Size [cm]	
0	1,50	1.50	
	15,00 ¥	↓ 0 1 0 1.00 x 1 0 800 x Line vidih scaling 100 x 2 1.50 x Fill Patern scaling 100 x Fill Patern scaling 0 x x x x	
	18,00	11,00	

2. Create Cells

- Select the first line in the Grid **Columns** in the **View tab** and press the + symbol to create a new column.
- Select the first line in the Grid **Rows** in the **View tab** and press the + symbol twice to create two new rows.



Size the columns and rows, until your view looks like above. This may be done either by changing the field **Size** in grid or graphically by dragging the cell size within the rulers.

Time-distance cell settings

Use the cell system created in the previous steps. You will now place tasks i.e. specific construction operations in the time-distance cell.

1. Setting the cell content

- Select the big cell by clicking in it (row 3 and column 2).
- Select to the Cell settings tab of the Details Toolbar.

🗎 View 🎦 Cell	Settings 🖉 Layers 🐟	Display 📕
Name: Cell type: Cell content: Axis Time master cell: Distance master cell:	Time Distance Cell Main Time vertical	(2, 3) • (%) • (2) •

- Set the field **Cell type** to Time-distance cell.
- Select an existing Sub-project in the field **Cell content**. New sub projects are added in the Explorer.
- Set the **Axis direction** to Time vertical.

The **View range** is set by the projects coordinates, but may be changed at any time to show only a part.

<u>👗</u> Distance[m]	Relative[m]	Date	Time
Start -200	-200	14.02.2010 -	0:00
End 4.200	4.200	06.08.2010 🔹	0:00
Length 4.400		519,00	d(8)
Units/cm 270	m 🔹	14	ed 🔻
🔲 Distance ax	is descending	Time axis desce	nding
E	Start -200 End 4.200 Length 4.400 Jnits/cm 270	Start -200 -200 End 4.200 4.200 Length 4.400	Start -200 14.02.2010 ▼ End 4.200 4.200 06.08.2010 ▼ Length 4.400 519,00 ↓ Jnits/cm 270 m ▼ 14

2 Set display attributes

On the tab **Display** tab select the calendar and display options for the selected Time Distance Cell of the view.

Calendar display Calendar: 2 5-days per wee	ek ▼
Calendar Display:	Settings
	Settings

- Select a calendar that is used to display the weekend and holiday shading.
- Use Per Day for long projects over months or years. The task lines will not break within the daily working time patterns (e.g. working breaks at night).
- Use Exactly for short and detailed views over 2 or 3 days. The task line gets broken with the daily working time patterns (broken for the night breaks)

Select the Edit button and check the option: Collapse weekends

Day definition	Visible	Collapse	Background:	Line Color	Pattern	
10-hours day	✓					
16-hours day	✓					
24-hours day	1					
8-hours day	1					
Bank holiday	1					
No Work Day	1					
Possion non work	1					
Weekend	4					

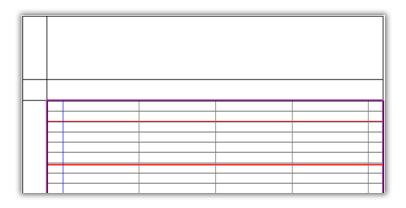
This will hide the green lines for the weekend and also collapses the weekend time from the time axis.

3. Defining a grid

Now, set the grid on the Grids tab. Select an existing grid definition Week / Month for time and: Every 1000 for distance or define your own grid.

🗎 View 🖻 Cell Settings 🚄 Layers ⋖	Display 🖽 Grids 🕞 Expand State	e 🤰 Other Objects 📥 Micro Progress
Time Show Week / Month Text at top/left Text at bottom/right	Distance ✓ Show ↔ Every 1000 Text at top/left Text at bottom/right	Time grid on top of distance grid Layer: Finds Font Settings

Your cell system should look like this.



Adding a time ruler

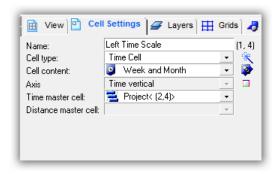
For the time scale we use an already existing time scale.

1 Preparing the cell

Select the cell left of the main cell by clicking in it.

1	

Select the Cell Settings tab.



Set Cell type, Cell content and Master cell as in the picture above. Now your cell looks like this:

ľ	28	
l	9	
	12	
l	19	
l	26	
l	e	
l	0	

2 Change existing ruler

- Mrs Click into the cell.
- Instead of the cell, the object inside gets selected.

Chart Dennis	on Chart Position 🚇 De			
Line name	Expression	Every	Unit	From date
	{Month (mmmm)}	1	Month	08.06.2009
	{Calendar week}	1,00	Week	08.06.2009
	{Day (d)}	1,00	Week	08.06.2009

By double clicking on a line, you may edit the settings.

If you make changes here, be aware, that all other views, where this Time graphic is used are changed as well.

Adding a distance ruler

This exercise creates a new scale based on a new cell content.

- 1 Preparing the cell content
 - Select the cell above the main cell by clicking in it.



AP Open the Cell wizard on the Cell settings tab 🕅.

Cell Wizard		? <mark>×</mark>
Create New Cell Content for Time cell Insert times cale Insert resource bar c Insert histogram Insert profile diagram		
 Distance cell Insert distance scale Insert resource bar c Insert histogram Insert profile diagram 	hart	
C Graphic cell		
Time master cell : Distance master cell: Name:	🔁 < (2,3)> My Distance Scale	· ·
	Create	Cancel

Note:

Scales, resource bar charts, histogram and profile diagrams are items, that are managed by a multi chart object. In one multi chart object you may insert as many scales or histograms as you wish. The wizard will insert just the first one.

✓ In the group "Cell type to create", select **Distance cell** and check **Insert distance ruler**.

In the **Distance master cell** field select the previously defined timedistance cell. If your view contains only one Gantt chart cell or Time distance cell, then this master cell is pre-selected.

In the Name field enter a name for the cell.

2 Setting the scale line properties

Now select the newly added distance ruler by clicking on it.

thart Definition	Chart Position	Define Dista	ance Scales
Name	Expression	Every	Distance unit
	{General}	200	m

One line has already been created.

Double click on this line to open the Distance scale line properties.

🔏 Distance Scale Lin	e Properties		? 🗙
Line name: Expression for text disp {General}			Visible
Insert text tokens by u General Every: Distance unit: Width: Height: Apply view range	1000 m v 0,60 0,60	Text Placement: Alignment: Rotation: Font: Size: Font Color Formatting:	After line Centre Control After line Character Arial Arial Color text by sector color BZU
Additional Options Zero-point	0		
Apply equations Equation:	Show only eq	uatios	• 🗹 🕇
 Distance profile 			• 🗹 🕇
C Sector profile	Display only p	rofile values by sector color	- 🗹 🕇
Presentation Line width: Line Color Background	0,00 •		
		[<u>O</u> K <u>C</u> ancel

Set the field: Every to 1000, which means 1 line every 1000 m.

Expression {General} means, that the General distance token unit is used. Delete this entry. Press F8 and select in Section **Distance units** the entry **km**. For more information on distance units, please refer to the help system.

March Press OK and the scale will look like this.



3 Creating a new scale line

Create a new line in the ruler by pressing the plus button.



Set the field: Every to 100, which means 1 line every 100 m.

 \checkmark Expression: Select ${\bf m}$ in ${\bf km},$ which means the fraction part of ${\bf m}$ in one km.

- Set Text size to 6
- Set Rotation to Vertical



Maybe you need to expand the cell width. Just drag the lower triangle down to expand the cell height.

4 Adding a special non linear scale with text information

Create a new scale line in the same way as before.

Additional Options Zero-point	0
Equation:	• 🗹 🕇
	Show only equatios
 Distance profile 	🕅 Station points 💽 🗾 🛨
C Sector profile	🕼 Sector Profile Properties 💽 🗹 🕂
	 Display only profile values Color sectors by sector color

- Select the option: Distance profile and select the Profile **Station points**.
- Deactivate the option: Color sectors by sector color.
- Check the option: Display only profile values. This hides regular values.
- Expression: Press F8 and select from Group Station points the entry Name.
- Set Text size to 6
- Set Rotation Vertical
- Set **Height** = 1,20
- Set Alignment to Bottom
- Press OK and the ruler will look like this.

Γ	1	0								1									2										3										4
Ę	Ŗ	•	₿	R	B	₿	8	B	8		8	Ē	Ē	1.60	1,000	1.700	1800	1200	2000	2.100	220	2300	2.60	2500	2.600	2.700	28	288		3.10	320	330	3.6	339	3.600	3.700	380	3,900	₿
Γ												Ē								F								Ħ											
		Start										C 1065				Start				CIOSS						RNer		Starto											B

Distance scale in the time distance cell

All scales we have used so far are based on a chart object that covers the whole cell area. You may also insert a chart object directly into any cell like other graphical objects.

1 Create a multi chart object

- 🧬 Select Insert Distance Diagram Object 🔛
- Draw a rectangle where you want to place the object, e.g. at the bottom of the time distance cell.

Now you may select the first chart line inside this object.

Soli rei	New Diagram	stion	ac Ton . ? ■ X	stripping 8.40
	Select a chart type			
	Distance scale		•	
	Name			
	Distance scale			
- AA				
<u> </u>			_	Pch -
		OK	Cancel	^{hch} opening
				Di Carto da
				Pipe laying
_				

Select the chart type: Distance scale and press OK.

2 Position chart inside the cell

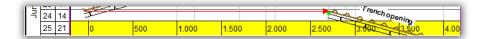
Select the Chart Position tab.

🕍 Chart Defi	nition Chart Po	sition	Define Distand	ce Scales		
Name	Multi Chart			Align to:	End of visible cell area	-
Start	15.07.2010	▼ 4:46	351	✓ Time/distance	e range from view	
End	27.07.2010	▼ 12:02	3.461	Expand to ce	ll width/height	
Layer	🚄 Help ruler	•		🔽 Adjust last ch	art to multi chart width	

Set the option: **Time/distance range from view.** This will expand the object to the cell width.

Set Align to "End of visible cell area".

► This will keep this ruler all the time visible on the screen, whenever the time distance cell is visible on the screen.



Additionally, in this example, another background color is selected.

If you do not want to print this scale, assign a special layer to this object. For this layer set the options "Active" and "Print" off.

Layer	Display	Active	Print	Default
Top Text layer	✓	✓	✓	
Standardlayer	✓	✓	✓	
L1	✓	✓	✓	
L2	✓	✓	✓	✓
Help ruler	✓			
-				

For more information about layers, please refer to the help system.

Create a distance cell with sketches from symbols

- 1 Preparing the cell with a new cell content
 - Select the Cell over the distance scale.
 - Select the Cell Settings tab.

🗎 View 🖻 🤇	Cell Settings	
Name:		(1, 2)
Cell type:	Empty	• 米
Cell content:		

Set Cell Wizard button

Cell Wizard	-21	x
Create New Cell Content for Time cell Insert times cale Insert resource bar ch Insert histogram Insert profile diagram	nart	
Distance cell Insert distance scale Insert resource bar ch Insert resource bar ch Insert histogram Insert profile diagram Graphic cell	nart	
Time master cell : Distance master cell: Name:	Project< (2,4)> Sketch by symbols Create Cancel	▼

Select Distance cell as content to create.

Set **Name** = Sketch by symbols.

The master cell is filled automatically.

If you insert graphical objects in the distance scales, they should always be scaled to the distance axis. On changing the scale, the objects also change their size on the screen.

If you change the cell height (metric axis), the objects should be adjusted to new cell height, select "Both axis".

Before drawing the object, this may be set in the Preset Toolbar under the Explorer.

Figure scaling:	Horizontal	-	Alignment: Top / Left	•

Note: Before inserting the object, we do not know about axis orientation, so the possible scaling options are: Horizontal, Vertical, Both axis or None.

If you wish to change later, use the Figure Position tab.

<u>Px</u> Figure	e Position							
Name	Street		Layer:	✓ L2	 Object ID: 8.358 	-Box position		
	Pinpoint	Start	End	Length	Adjust on change of direction	• TL	C TC	C TR
Distance	0	160	1.880	1.720	Keep proportions	COL	C CC	C CR
Metric	0,00%	193,49mm		279		C BL	C BC	C BR
Scaling:	Distance	•			Adjust position			

2 Insert symbols by mouse

Select the tool Insert Graphic Object

Select the symbol to insert in the Insert Graphic Object Dialog.

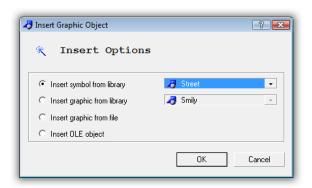
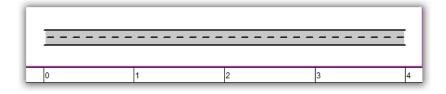


Figure scaling should be set as shown above.

Draw a rectangle in the range of the street, from 0 to 4000.



This object was placed on layer L2. Deactivate this layer and set L1 to be the default layer.

Layer	Display	Active	Print	Default
Top Text layer	✓	✓		
Standardlayer		✓		
L1		✓	✓	V
L2			✓	
System		✓		

Now enter other symbols:

	Jefferso	on street Miles	s street Cedar creek	
		<u> </u>		
0	1	2	3	4

Symbol	Start	End	Name
Crossing street	1190	1210	Miles Street
Crossing street	2080	2020	Jefferson Street
Crossing creek	2690	2710	Cedar creek
Culvert	2680	2720	

Enter the name in the field Name in the tab Figure position. This updates the text annotation on the symbol.

3 Insert symbols by import

Delete the objects created in the previous example except for the symbol street. As this is on another layer anyway, to deactivate you just use Ctrl A and Press the delete key.

Start MS Excel. Open the file "Road map.xls" in folder Add-on of your TILOS installation and select the sheet Distance symbols.

Symbol name	Name	Start	End	Height % Start	Height % End
Crossing street	Jefferson stre	1190	1210	10	90
Crossing street	Miles street	2080	2120	10	90
Crossing creek	Cedar creek	2690	2710	10	90
Culvert	Culvert	2680	2720	40	60
Street		0	4000	45	55

Select line 3 to 6 and copy this to the clipboard.

Move back to TILOS and select the Right Mouse Button in the distance cell.

	Import Symbols From Clipboard	
	Import Symbols From Sectors	
۲	Zoom In	
	Zoom Out	

Make sure, that the field sequence is set as shown above to match the data in the clipboard.

Name	Column Number	Import
Symbol name	1	✓
Name	2	✓
From distance	3	✓
To distance	4	✓
From distance (relative)	3	
To distance (relative)	4	
Height of begin(in %)	5	✓
Height of end(in %)	6	✓
Layer name	7	
Preview of clip)	board	

Press **OK**, and the data is imported.

 Jefferson street	Miles street Cedar creek

Adding and Enhancing distance grids

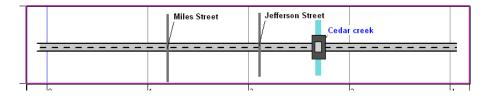
The goal of this exercise is to add a distance grid to the distance graphic.

- 1 Select the cell over the scale by clicking in it.
- 2 Select the Grids tab.

🗎 View 🖻 Cell Settings 🚄	Layers	Grids 🛃 Other Objects	
Time Show Text at top/left Text at bottom/right	•	Distance ✓ Show ⇒ Every 1000 ☐ Text at top/left ☐ Text at bottom/right	• 2 +

Select the distance grid: Every 1000 from grid combo list.

⁴⁰ Check the Option Show for displaying the grid.



The same grid as shown in the main plan is now visible in the distance cell.

3 Add further lines to that grid.

Click the edit button under the grid selection combo list.

Add another grid line set by pressing the + button.

Distance Grid Properties							? 🖻
Name: Every 1000 Show distance in relative cr	pordinates						
Name	Visible	Start (distance)	End (distan	Show text	Entire distance	Repeat every	Dis 斗
All 1000	✓	0	0		✓	1.000	m
Station points	✓	0	0		✓	0	m X
e [III							•
					Ok	C4	ancel

4 Grid parameters

⇒ Distance Grid Line Properties							
Text expression: Station points							
	Insert text tokens by using F8 key.						
Repeat every:	0	Distance unit: 📼 m	•				
Line Color Style:	• •	Line width: 0,00					
Start(Distance):	Entire distance	End(distance): 0					

- Text expression: Press F8 to select the field Name from Group Station points. This will print the name of the grid line.
- Activate the option **Show text**.

Equation: Distance profile:		• 🗹 🕇
 Distance prome. 	V Station points	- 🗹 🕂
	Color lines by sector color	
C Sector profile		- -
	1	
	Display only profile valuesVisible	

Select the profile "Station points" in the field "Distance profile" which we created for the ruler.

Activate the option **Display only profile values**.

Activate the option: Color lines by sector color

Γ		Jefferson street Miles street	
	0 1	2 3 4	Ť
₿₽		1200 11100 110000 110000 110000 110000 110000 110000 110000 110000 110000 1100000 11000000	1.10
	Start	Crossing StantFill Crossing River StantCut	

The additional grid is printed in the distance as well as in the main cell, since the same grid is applied in both cells.

Optionally you may select the grid text option for each cell.

Distance	
Show ⇒ Every 1000	-
🔲 🗖 Text at top/left	
Text at bottom/right	

Adding distance diagrams (Elevation)

- 1 Prepare a cell for the diagram
 - Click in any cell of a view.
 - Select the Views tab in the Details Toolbar.

E	🗎 View 📴 Cell Settings 🖉 Layers 🖽 Grids 🛃 Other Objects										
10	Name: My view Print form for Gantt Chart View Text Fields Columns Rows										
L	Column	Name	Hidden	Size [cm]	4	Row	Name		Hidden	Size [cm]	^ +
Ŀ	0			0,53		0		×		0,53	
Ŀ	1			1,88	×	1				1,88	- x
Ŀ	2			16,27		2				2,49	
L	3			0,58		3				12,28	

 \checkmark° Select the first row in the grid rows and press + to create a new row in the cell system.

Select the cell over the time distance diagram in that row.

2 Insert diagram

Select the Tab Cell Settings, where you will find the Cell Wizard to create a new cell content.

🗎 View 🖻 🤇	cell Settings	
Name:		(1, 2)
Cell type:	Empty	→ ※
Cell content:		v

Cell Wizard		? 💌
Create New Cell Content for Time cell Insert times cale Insert resource bar ch Insert histogram Insert profile diagram	nart	
 Distance cell Insert distance scale Insert resource bar ch Insert histogram Insert profile diagram 	nart	
C Graphic cell		
Time master cell : Distance master cell: Name:	Project< (2,4)> Elevation	
	Create	Cancel

- Select Distance cell
- Select Insert profile diagram
- Name = Elevation
- APP Press Create

The multi chart object is created and now you may enter the properties for this diagram.

3 Entering diagram lines (Elevation profile)

- Click in the cell of the new created diagram and select the tab: **Define Profile Diagram**.
- Press to create a new diagram line.

Name	Elevation	Profile Value	Land	oad 🔸 🗾 ·
🔽 Show graphic				
🗌 Show table val	lues			
Show distance	coordinate	-		
Format	1 2	+		
Show relative	distance coordinate	-		
	<u> </u>			
Show support	lines			
Graphic attributes				
	1,50	I∎ F	Fill area below line	
Line width				
Line Color	-		-ill between other line	
Line Color Style	· ·	F	•	
Line Color	• • 1,00	F	ill between other line	
Line Color Style	1 ,00		•	

- Name = Elevation
- Uncheck option: Print support lines to points
- $_{\text{Max}}$ Line width = 1.50
- Color = Brown
- Set Fill between other line
- Set fill color to light brown

4 Creating a profile and importing data

There is no profile with the data, so we first have to create one.

Press **h** and the dialog **Distance Profile Properties** opens.

ame: escription	Elevation of land and road	Pro	file-ID		Equation:
					Work rate time unit: Image: bit is a constrained of the second of the
stance	Land	Road	Cut	Fill	Calculate quantity

- Name = Elevation of land and road
- Press the button Import and column settings

Didei :	System name	Custom name	Show	Column number	Column name	Import	
1	Distance	Distance	 Image: A second s	1	A	✓	4
2	Distance relative	Distance relative		2	В		
3	Name	Name		3	С		
4	Description	Description		4	D		
	Туре	Туре		5			
6	Value1	Land	v	2			
7	Value2	Road	1	3	С	✓	
8	Value3	Cut	1	4	D	✓	
9	Value4	Fill		5		v	=
10	Value5	Value5		10	J		-
11	Value6	Value6		11	K		
12	Value7	Value7		12			
13	Value8	Value8		13	м		
14	Value9	Value9		14	N		
15	Value10	Value10		15	0		
16	Speed	Speed		16	P		
17	Quantity	Quantity		17	Q		
18	Work rate %	Work rate %		18	R		
19	Absolute work rate	Absolute work rate		19	S		
	Station area	Station area		20	Т		
21	Non-work	Non-work		21	U		Ŧ
	e not visible rows lew of clipbo	pard	Import / E>	port caption names		Set defa	ıł

Set the fields like above. It is important to check Show and Import fields as well the column number for import.

Start MS Excel and open the file "Road map.xls" in the folder Add-on of the TILOS installation and select the sheet Elevation.

Station	Land	Road	Cut	Fill
0	28	25		
100	31	25	500	
200	32	24,6	2680	
300	34	24,2	3440	
400	36	23,8	4400	
500	35	23,4	4760	
600	37	23	5120	
700	37	22,6	5680	
800	32	22,2	4840	
900	30	21,8	3600	
1000	28	21,4	2960	
1100	25	21	2120	
1200	22	20,6	1080	
1300	23	20,2	840	
1400	24	19,8	1400	
1500	21	19,4	1160	
1600	20	19	520	
1700	19	18,6	280	
1800	17	18,2		200
1900	17	17,8		500

Select all data cells in that sheet (without the header line.)

Press Import to import the data.

Distance	Land	Road	Cut	Fill
0	28,00	25,00	0,00	0,00
100	31,00	25,00	500,00	0,00
200	32,00	24,60	2.680,00	0,00
300	34,00			
400	36,00	23,80	4.400,00	0,00
500	35,00	23,40	4.760,00	0,00
600	37,00	23,00	5.120,00	0,00
700	37,00	22,60	5.680,00	0,00
800	32,00	22,20	4.840,00	0,00
900	30,00	21,80	3.600,00	0,00
1.000	28,00	21,40	2.960,00	0,00
1.100	25,00	21,00	2.120,00	0,00
1.200	22,00	20,60	1.080,00	0,00
1.300	23,00	20,20	840.00	- 0.00

Press OK to close the profile dialog.

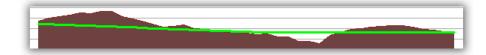
- Select the value to display: Select the value Land, which is the custom name for Value 1.
- Press OK to close the diagram dialog. Your diagram should look like this:



5 Diagram with road elevation

Now we repeat step page before to create the line for road height.

- Select the inserted chart and select the tab **Profile Diagram Definition.**
- 🖉 Press 🛨 to create a new diagram line.
- Name = Elevation road
- Juncheck option Print support lines to points
- Set Line width = 1.50
- Set Color = Green
- Set fill color = Light green
- Set Profile to name of profile you just created
- Set Value = Value2



6 Shading area between the lines for cut and fill

The diagram display may be expanded to also show cut and fill sections. Sections, where the road is below the land line are printed in different color than those, where the road line is above the land line.

Select the inserted chart and select the tab **Profile Diagram Definition**.

Select the 1st diagram and press the button **Edit Profile** or double click on the line in the grid.

The Profile Line Diagram Properties dialog is opened.

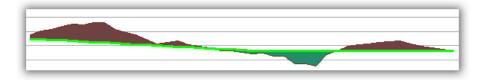


Select the Option: Fill between other line

M Press OK

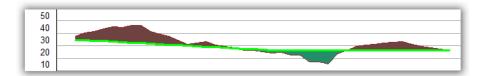
Repeat the same for the 2nd diagram

Now the diagram will appear as shown in the following picture.



The brown color shows the cut areas, the green color, the fill areas.

- 7 Adding a legend to the diagram
 - Select the diagram
 - Select the tab Chart Definition and press button Display Settings.
 - Set Option Print top legend.
 - Set Option Legend outside.
 - See Execute Menu Cells / Connect Cells / Left



The scale now shows the height above ground.

Adding distance diagrams (quantities)

- 1 Adding another diagram showing the cut and fill
 - Select the diagram created above.

Select the tab **Chart Definition** and press the button **Insert** to create a new diagram.

Select the chart type Distance histogram and name it.

💷 New Diagram	[? 🗙
Select a chart type		
Distance histogram		•
Name		
Cut and Fill		
	OK Ca	ancel

- Fill and press OK
- If you do not see your new diagram, you might need to re-size the cell and make it a little wider.

2 Create a diagram line

Select the new diagram and select the tab **Define Histogram**.

مر Press 🖿 to create a new diagram line.

Profile Data				? 🔀
General Name: Data source: Value: Show as: Group	Drofile • Profile • Cut • Show value in summary Y axis Bar • Group 1 •	Presentation ✓ Show graphic ✓ Show value ✓ Fill area under line	Foreground Background Pattern	•
Data source se Profile M Elevation Function Weighted Sur	of land and road	1 +		

Set name = Cut

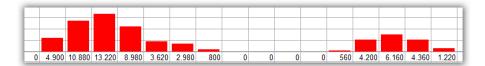
Set Data source = Profile

Select the profile you have created before (Elevation of land and road).

Set Value = Value3 (Cut)

Set Group = Group 1

M Press OK.



3 Changing the slice value

Select the new diagram and select the tab **Define Histogram**.

Press the Button **Display Settings**.

Set the slice value: **Every** = 250 in group.

Interval		
Every	250	
Distance unit	💶 m	•
Interval by c	listance profile	

M Press OK.

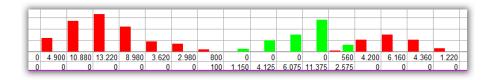
The compartments are now wider and show values for each compartment. If the space is still too small, you may rotate the description axis.

4 Create next diagram line for Fill.

Repeat step 2, but use

Set Value = Value4 (Fill)

Set Group = Group 2



5 Changing the Interval by distance

Select the new diagram and select the tab **Define Histogram**.

Press the button **Display Settings**.

Check the option **Interval by distance profile** in Interval. This allows you to slice the chart at given station points, summing the values between the different stations.

Interval		
Every	250	
Distance unit	= ⊐ m	w.
✓ Interval by c ✓ Elevation c	listance profile of land and road	- 🗹 🛨

 \checkmark Select the profile with the name Cut and Fill sections. (This already exists in the template, if not, you need to create it).

Distance	Name	Туре
0	Start	🕺 Border
1.700	Start Fill	🛃 Border
2.900	Start Cut	🛃 Border
4.000	End	🛃 Border

M Press OK.

45.380		16.500
0	25.400	

6 Stacking and grouping

Select the new diagram and select the tab **Define Histogram**.

- Press the button **Display Settings**.
- Set the option Stacking
- Set the option Grouping and select type "Mirrored at zero line".

•	
acked diagram	
t	▼ tacked diagram

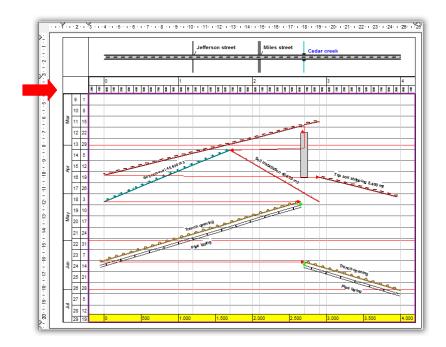
45.380	0	16.500
0	25.400	

Cut (Group1) is printed in positive direction and fill (Group 2) is printed in negative direction.

Border with company logo

Graphic cells are not related to time or distance values. All objects are measured in mm or inch (Options).

Around the cell system, there is one big cell. This may be defined as graphic cell.



1. Prepare cell

Start Click in the outline cell.

Select the **Cell settings** tab in the Details Toolbar.

Select the Cell wizard. 🕅

Select cell type Graphic cell in the section Cell to create.

In the Name field enter a name for the cell.

 \checkmark Enhance the section at the bottom of the page with the little triangles in the rulers.

27 5								laying	1
F 28 12	2								
29 19	a 0	500	1.000	1.500	2.000	2.500	3.000	3,500	

2 Select the Insert Graphic tool 7 from the Insert Toolbar.

And Check the default setting in the Preset Toolbar.

Scaling:	None	•	Alignment Bottom / F 👻

(Scaling: None and Alignment: Bottom/Right)

Alignment bottom right ensures, that if you change the size of the inner cell, the objects in the border will keep its position relative to the right and bottom border.

Draw a rectangle where you want to add the graphic

 \checkmark° Select the file to insert graphic from file selector: "Company.bmp" in the Add-on folder.

Select the tab "Figure position" and set the option: "Keep proportion". This keeps the original ratio between width and height of the logo stored in the file.

3 Select the Insert Multiline Textfield if from the Insert Toolbar.

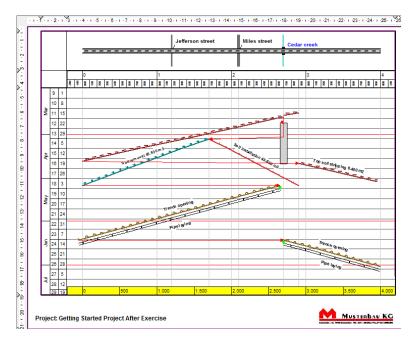
Check the default setting in the Preset Toolbar. Alignment: Bottom / Left as the text goes to the left side.

- Drag a line where the text should be placed
- Select the tab Single Line Text to edit the text content.



Project name} may be inserted by using F8 key and returns the project name entered in the options.

Your finished plan should look like this:



Working with costs and resources

TILOS has 3 different resource types:

- Permanent resources are resources that can be used on further tasks after they have finished the work on others. As soon as a resource is no longer needed for a task, it is available for another task. These are mainly employees, workers or equipment.
- Consumable resources are mainly materials built in the project.
- Component Resources behave like permanent resources, but allocating them means they are allocated also automatically to other resources which control their consumption.

The cost of the resources is assigned to accounts. Direct assignments to the accounts may be done too.

Assigning resources

We will now assign some resources and accounts to tasks. We enter resources from the context of the task list.

Assigning resources

1 Select task list for editing resources

Double click on Sub-Project Main in the TILOS Explorer.



.see Select the tab Task List in the working window.

2 Assigning resources to top soil stripping

- Select task 1: Top soil stripping.
- Select tab Resources.
- Click on the + tool to add resources.
- Select the resources to assign.

esource structure		
Resource	Add	
🔅 🗝 01 Labour		
- a Assistant	√	
	V	
Specialist		
🗐 📲 02 Machines		
😭 Caterpillar	1	
Caterpillar +		

Kee Close the dialog with OK.

Set Model to Allocation for all 3 resources and Input value = 1.

lame	Cost centre	Model	Role	Input value	Supply	Delivery centre	Effort	Unit	Allocation	Private cc	Unit cost		~
😭 Assistant	Labour	Allocation		1,0000			180,0000	h	1,00		35	+	-
🔋 Operator	Labour	Allocation		1,0000			180,0000	h	1,00		35	30	
😭 Caterpillar	Machines	Allocation		1,0000			180,0000	h	1,00		60	E.	

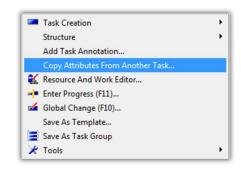
TILOS now calculates Effort and the costs.

In the tab Calculation you may see a summary of the costs.

Cost:	23.400	per u	mit 1,	08	
Income	e: 0 pe:	r unit	: 0,00		

 \checkmark° Select task 4: Topsoil stripping (2) - Here we want to assign the same resources.

Right Mouse Button: Copy Attributes from Another Task...



Select the task from which you want to copy data to the selected tasks.

Check the option: Resource data.

😼 Copy Task Attribut	es	? 💌
Source Task: 🛛 📼	Top soil stripping	•
Copy options Display Details Category data	☐ Annotation ✓ Resources	
	ОК	Cancel

Press Ok and the resources are copied.

3 Assigning resources to soil removal

- Select task 2: Soil removal
- Press the right mouse button
- Select the entry 能 Resource And Work Editor.

This dialog allows you to edit task data, resource allocation data and resource library data in one dialog.

- Set the value Set work rate by to **Resource calculation** in group Task data. This means the work rate is calculated by resources.
- 🎤 Select 🛨 and insert the following resources:
 - Excavator +
 - Truck +

ype	Model	Rate	Supply	Effort	Unit	Allocation	CostFlow	Expenditure [EUR	(T) (
Excavator +	Allocation	1,0000		250,0000	h	1,00	Expenditure	15.000,00	
- 🔐 Truck +	Allocation	1,0000		250,0000	h	1,00	Expenditure	11.250,00	X

- Set Model for Excavator+ to **Units/Time (Driving Task)** and set Input value to 240 (m3 / h). Set Allocation to the value 1.
- Set Model for Truck+ to Units/Time and set Input value to 40 (m3 / h). The system calculates now that 6 excavators are needed.

Whenever you change the data of the excavator, the task and the truck allocation will get updated.

TILOS also calculates the assignment of the operators as they are part resource.

3 Soil installation

Select task 3: Soil installation

- Select tab Resources
- Click on 🛨 to add resources
- Select the resources to assign
- Caterpillar + (Allocation, 1)
- Steel rollers in folder Rollers (Allocation, 1)
- Operator (Allocation, 2)

4 Culvert

- Select task 5: Culvert
- Select tab Resources

🖉 Click on 🔩 to add costs

Select Accounts	
ccount structure	
Name	Selected
€\$ Default cost centre	
€\$ Income	0
€\$ Labour	0
€\$ Machines	0
€\$ Material	0
€§ Others	3

- Select the account: Others and press OK.
- M Change Model to Cost fixed and Input value to 40.000 Euro.

6 Trench opening

- Select task 6: Trench opening
- Select tab Resources

Resources are already allocated, as they were assigned to the task group.

Assigning Income as fixed cost

- 1 Multi cost assignment
 - Select all tasks
 - Click on Right Mouse Button: Global Change (F10).
 - Select in Global change dialog: Replace Resource Data.
 - Select the 🥵 tool to add costs.

iort name	Model	Input Value	Supply	Effort	Unit	Allocation	Private co	Unit cost	Currency	Cost flow	Expenditure (EL	J 🕂
come	Cost / Unit	1,00000							EUR	Income		
		.,		1		-			1			-€\$
												*
Vincetion dat		111										Þ
			1									•
Allocation dat	Cost / Unit]									F
Model nput value				Private cost		(8)		Creat	e annotation			•
Model	Cost / Unit		F Cost		Income	(ES)	UR •	Creal	te annotation			Þ
rfodel nput value	Cost / Unit				Income]	e annotation			•

- Set the defaults:
- Model = Cost / Unit
- KAP Cost flow = Income
- Press Assign to assign the data to all selected tasks.

2 Single cost assignment

Now you can go to each task and change the assignment. This way is faster, than making an assignment for each task individually.

- Select task
- Select tab Resources
- Manage assignment of account Income

No	Task	Model	Input value
1	Top soil stripping	Cost / Task work unit	1,30
2	Soil removal	Cost / Task work unit	3,50
3	Soil installation	Cost / Task work unit	0,60
4	Top soil stripping	Cost / Task work unit	1,30
5	Culvert	Cost fixed	45.000,00
6	Trench opening	Cost / Task work unit	6,35
7	Pipe laying	Cost / Task work unit	40,00
8	Trench opening	Cost / Task work unit	6,35
9	Pipe laying	Cost / Task work unit	40,00

3 Task cost statistic

Click on Right Mouse Button - Dashboard (F12)

If there is a task selected, then you see the cost of the single task

Using the green arrow up, you may get the overview on the whole sub project.

In a later lesson (enter progress), we will return to this screen.

Evaluating resources

In this chapter, we are creating a resource usage bar chart, a combined histogram showing a number of allocated hours of people per month and cost versus income.

Resource usage bar chart

1 Preparing the cell system

- So Open the time distance view we have been working before
- Select the time distance cell
- Select Menu Cells / Column / Add Column
- Select the new cell right of time distance chart
- Select the Cell Wizard on the Tab Cell Settings
- Set Create a new time cell content and insert a resource usage bar chart

Cell Wizard	? 💌
Create New Cell Content for Time cell Insert times cale V Insert resource bar ch Insert histogram Insert profile diagram	nart
C Distance cell C Insert distance scale C Insert resource bar ch C Insert histogram C Insert profile diagram	iart
C Graphic cell	
Time master cell : Distance master cell: Name:	Project< (2,4)>
	Create Cancel

- Mame: Diagrams
- Mress Create
- The diagram is created, now we assign what to display.

2 Set the resources to display

- Click into the cell again to select it
- Select the tab Define Resource Bar Chart

Image: Second											
Resource bar chart						Edit color codes	Generate report lines		Sub-Projects:		
	lues from table	Resource	Include sub entr	Color code	Numeric format	Factor		a [Sub-project	Active	
First					0,##		1,00	T	Main		1
Second	0		D		0,##		1,00	×			

Press the button Generate report lines

Sub-Projects To Include Sub-Projects To Include Main ✓ Main ✓ Filter Filter Vildcard searching (?, *, (a-d)) Color code Step 1 to 10 ✓ Delete existing lines OK Cancel	🚦 Generate Resour	ce Bar Charts Line			? X
Sub-Project ^ Active Main ✓ Main ✓ Filter			·		
Main ✓ Filter Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Step 1 to 10 ✓ Delete existing lines					
✓ Wildcard searching (?, *, [a-d]) □ Case sensitive searching Color code			<		
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Wildcard searching (?, *, [a-d]) Case sensitive searching Color code Image: Step 1 to 10 Image: Step 1 to 10 Image: Step 1 to 10					
Color code Step 1 to 10 Color code	Filter				
Color code Image: Step 1 to 10 Image: Delete existing lines					
Step 1 to 10 ▼ ✓ Delete existing lines	🗖 Wildcard sea	ching (?, *, [a-d])	🗖 Case sensiti	ve searchir	ng
Step 1 to 10 ✓ Delete existing lines	Color code				
✓ Delete existing lines					•
UK Cancel	I velete existing lir	les		_	o 1
			UK		Lancel

Select the sub-projects to evaluate

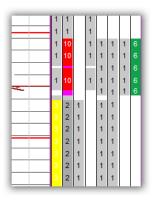
If there is only 1 sub project, this is pre selected

Filter code: This allows you to include only special resources.

Select the color code for the numbers.

See Click OK

The chart is populated.



3 Adding a legend

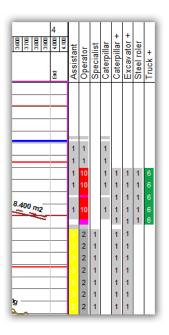
On top of the chart in the other cell, we now want to add a legend. First we have to combine the cell with the current one.

Select the cell with the chart just created.

- Menu Cells / Connect Cells / Up (Repeat this twice to connect 2 rows).
- Select the cell
- Select tab Chart definition
- Press the button: Display Settings
- Set options: Print top legend and Legend outside

	5	? 🔀
Line color Line style Line width	• • • • • • • • • • • • • • • • • • •	Select Font 🗛
 Print top legend Width Print bottom leg Width Legend outside Rotate scale te 	2,50 rend 2,00 (Cell system)	
	 ОК	Cancel

On demand, also glue next upper cell to get more space for the legend.



To hide or show the histogram, select hidden on the tab "Chart Definition". Here you may also set other formats.

Resource diagram

- 1 Adding diagram labor hours per month
 - Select the chart cell with the resource usage bar chart.
 - Select the tab Chart definition.

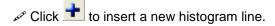
Chart Definition Chart Position Jefine Histogram					
Chart lines Name	Description	Hidden	Width	4,00	Display Settings Select Cell
					+ ▲

- Select the + tool to insert a new histogram. The dialog Chart Line Type appears.
- Select the type "Time histogram".

💷 New Diagram	? 🗙
Select a chart type	
Time histogram	•
Name	
Time histogram	
	OK Cancel

APP Press OK

Select the tab "Define Histogram".



2 Histogram line settings

set the following values:

Resource Dat	a	2 🔀
General Name: Data source: Value: Data source Filter Show as: Group	Estour Hours Resource Effort Estimate V Bar Sum up values Group 1 V	Presentation Presentation • Show yaphic Foreground • Show yable Background • Fill area under line Pattern •
Data source se Sub-Projects Project Main	Active	Filter by delivery centre assignment: Select resources
		OK Cancel

Name = Labor hours

- Datasource = Resource
- Value = Effort
- Data Source = Estimate
- Sub project = Main
- APPress select resource and select the resources to be evaluated.
- APP Press OK

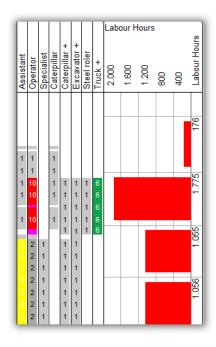
Press the button Display in the Tab Define Histogram.

Histogram Settings	? 💌
Name Labour Hours	
Description	
Interval Every 1	Graphic presentation
Unit Month -	Suppress zero values
	Factor 1,00

Set the Interval to Every 1 Month.

Are Press OK

Your chart should look like the following picture:



You may change the cell width to get more space for the histograms.

You may change the proportion between the diagram by dragging the separation line between the diagrams.

Cost diagram

The goal is to get a bar diagram showing cost and income and also how cost is split to the accounts.

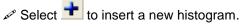
You should have done the previous exercise already in order to be able to create diagrams

1 Create the diagram

Select the chart cell we have edited before.

Select the tab Chart definition.

🕍 Chart I	Definition Chart Po	sition D	fine Histogram			
Chart lines Name	Description	Hidden	Width	[•	Display Settings
INGINE	Description		WIGHT	4,00	Î	Select Cell
						001000 001
						▶ ▲
				[=	
					Ŧ	業 ▼



Select the type "Time histogram".

💷 New Diagram		? <mark>×</mark>
Select a chart type		
Time histogram		•
Name		
Time histogram		
	ОК	Cancel

M Press OK

2 Create first diagram: Labor cost

listogram definition					Display Setting
Name	Data source	Description	Show graphic	Group	Dispidy Setting
					Edit Histogram
					+
					XV

- Select the tab "Define Histogram".
- Select 🛨 to insert a new histogram line.
- Name = Labor costs
- Datasource = Accounts
- Value = Cost

- Mar Data Source = Estimate
- Sub project = Main
- Select account = Labor

Account Data	1	? 🗙
General Name: Data source: Value: Data source Filter Show as: Group	Accounts	Presentation ▼ Show graphic Foreground Show value Background ▼ Fill area under line Pattern ▼
Data source se	ttings	
Sub-Projects		Filter by delivery centre assignment:
Project	Active	Select account
Main	✓	E\$ Labour E\$ Labour

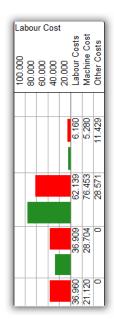
3 Machine costs

- Repeat step previous step but set:
- Select account = Machines

4 Other costs

- Repeat step previous step, but set:
- Select account = Others

If you close the Histogram properties dialog, your diagram should look like this:



4 Stacking the bars

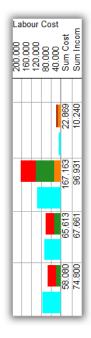
On selected histogram, select tab Histogram definition and press button Display Settings

Select the option: Stacking

- Select the option Grouping with "Side by side"
- Select the option Show value table for stacked.
- For Enter Bar label (Sum Cost and Sum Income)

I Histogram Settings Name Labour Cost		?
Description		
Interval Everu 1	Graphic presentation	
Init Month -	Number format	0
	Suppress zero v	
Interval by distance profile	Suppress currer	-
	Factor	1,00
Stacking	Bar width %	80
 ✓ Stacking ✓ Grouping 	No. of grid lines	5
Side by side	Background	· ·
	Legend text color	· ·
Show value table for stacked diagram	Grid line color	•
Bar label (Group 1) Sum Cost	Value table in L	ne Color
Bar label (Group 2) Sum Income	🗌 Rotate Text	
Line label (Group 1) Line label (Group 2)		
Settings Axis Summary axis		
Minimum 0,00 0,00		
Maximum 0,00 0,00	ОК	Cancel

🖉 Press OK

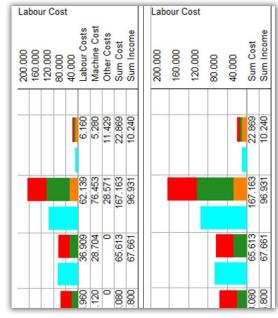


7 Reducing text lines

Select the histogram.

" Uncheck the options: **Show value table** in the last column for each line of the histogram.

Histogram definitio	n			Display Settings
Show graphic	Grouping	Show as	Show value table	Display Settings
~	Group 1	Bar	· · ·	5 B 10 1
1	Group 1	Bar		Edit Histogram
1	Group 1	Bar	0	
4	Group 2	Bar		+ -



The following example shows results without or with activated option **Show value table.**

Export data to Clipboard

1 Export

Select the histogram by clicking with the mouse into it.

Press Right Mouse Button and select the option: Export data to clipboard.

2 Import to Excel

So Open Excel and paste the data into an Excel spreadsheet.

	C17	- (*	f_{x}		
	Α	В	С	D	E
1	Date	Ammount			
2	01.03.2010	0			
3	01.04.2010	100000			
4	15.05.2010	100000			
5	01.06.2010	100000			
6	15.07.2010	150000			

Diagrams from external data

The goal is to get a diagram showing a cost flow evaluated in other programs to compare with internal TILOS data.

1 Create the diagram

- Select the chart cell we have edited before.
- Select the tab Chart definition.

4,00	4,00 Select Cell	4,00 Select Cell
		→ (A)

Select 🛨 to insert a new histogram.

Select the type "Time histogram".

💷 New Diagram	? 💌
Select a chart type	
Time histogram	•
Name	
Time histogram	
	OK Cancel

🖉 Press OK

2 Define Histogram lines

Chart Definition	Chart Position	e histogram			
Histogram definition				_	Display Settings
Name	Data source	Description	Show graphic G	irou	
					E dit Histogram
					+
					×
•					

Select the tab "Define Histogram ".

Select the 🛨 to insert a new histogram line

- Name = Payments
- Datasource = Profile
- Value = Value1
- Set Show value in summary Y axis
- Set Show as = Line

General Name: Data source: Value: Show as: Group	Payments Pholie Value 1 ✓ ✓ Show value in summary Y axis Line ✓ Sum up values Group 1	Presentation Show graphic Show value Fill area under line	Foreground Background Patern Line width Style	• • • • • • • • • • • • • • • • • • •
Data source se Profile V Payments Function Weighted Sur	agreed 💽	⊿ +		

3 Creating a profile

Click to create a new profile

Name = Payments agreed

Name	Payments agreed		Profi	Profile-ID Profile type			e: Time profile			-
Description										
Value1 =	1 djachob									
Name	Date	^ Time	Work rate	Description	Value1	Value2		Value3		
Name	Date 01.03.2010	^ Time	Work rate 100,00	Description		Value2	0,00		0,00	
Name				Description		0,00			0,00	
Name	01.03.2010	0:00	100,00	Description		0,00 0,00	0,00			
Name	01.03.2010	0:00	100,00	Description	100.00	0,00 0,00 0,00	0,00 0,00		0,00	3

Values: These values depend on project start date.

Calculate the figures based on the start of your project.

DateValue	
01.03.2010	0
01.04.2010	100 000
15.05.2010	100 000
01.06.2010	100 000
15.07.2010	150 000

Press OK to close the dialog.

Press OK to close the Histogram Line Properties.

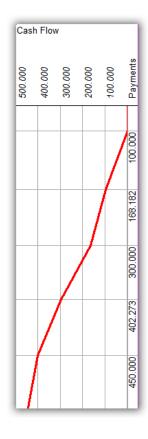
4 Set slice values

Press the button Display Settings in Define Histogram tab

Histogram Settings		? 💌
Name Cash Flow		
Description		
Every 1	Graphic presentation	
Unit Month -	Number format 0	
Interval by distance profile	Suppress currency	
	Factor 1,00	

Set the interval to Every 1 Month.

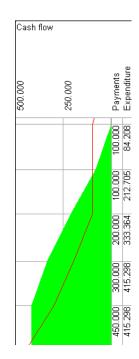
APR Press OK



5 Adding the cost flow to compare cost flow and payments

- Select the Define Histogram tab
- Click on to insert a new histogram line
- Name = Total cost to date
- Datasource = Accounts
- Value = Cost
- Data Source = Estimate
- Show as Line
- Set Sum up values
- Set Fill area under line
- Sub project = Main
- Accounts = Labor, Machine, Material and Others
- Group = Group 2

Account Data	3	? 💌
General Name: Data source: Value: Data source Filter Show as: Group	Fotal cost to date Accounts Cost Estimate ▼ Line ▼ Group 2	Presentation Foreground Show value Background Fill area under line Pattern Line width 0.00 Style V
Data source se		
Sub-Projects		Filter by delivery centre assignment:
Project	Active	Select account
Main	√	E\$ Labour E\$ Labour E\$ Material E\$ Material E\$ Machines E\$ Machines E\$ Michines E\$ Others



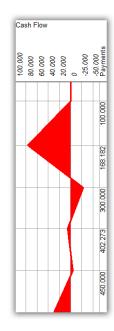
7 Grouping

Select the Define Histogram tab.

Select the button Display Settings.

Grouping
Balance 🔹
Show value table for stacked diagram

Are Press Ok



The curve is now showing the difference between payments and cost flow.

Baseline and Progress

Baselines serve the purpose of comparing different project states in TILOS. Therefore, any saved project baseline may be compared to a current project course. This way, changes may be directly visualised.

Creating a baseline

- 1 Select the sub project, for which you want to create a baseline.
 - Select the tab Baselines.
 - Click on to create a new baseline.

So	op soil strippir oil removal	ID 3.303	Master Task-ID A-011340	Selected	Has b	
So				0		Select all
		3.304	A-011350			Unselect all
	oil installation		A-011360			
To	op soil strippir		A-011370			
Cu		3.307	A-011380		0	
Tr	rench openin;	3.308	A-011390		0	
Pi	ipe laying	3.309	A-011400		0	
Tr	rench opening	3.310	A-011410		0	
Pi	ipe laying	3.311	A-011420			
 W			A-011470		•	
- = Ri			A-011490			
 W			A-011500			
L	eck	3.320	A-011510			

Set the name of the baseline.

Mar Press OK to create the baseline.

Entering progress

TILOS has different progress modes implemented.

Progress Methods

Simple progress methods:

- Percentage The progress is entered as a percentage value directly. The progress can be directly entered in the middle section of this tabulator in the field **Progress**.
- Quantity The progress is entered using the quantity. The progressed quantity set in relation to the quantity gives the percentage completed value. The progress can be directly entered in the middle section of this tabulator in the field Quantity done.
- Steps The progress percentage completed is calculated based on the progress of the task steps. The progress can only be entered in the tabulator Steps.

1 Setting and displaying the report date.

- Select the sub project for which you want to set the report date in the Explorer / Sub projects.
- M Press Right Mouse Button and select Edit sub project.

General	Task List	Task	Dependency	💻 Ba	selines 🍡	Task links 🔒 R	esources and Mer	rge 🗬 Task No	tes	
lame:	Main									
ub-Project-ID	010									
	Distance I	Relative	Date		Time					
itart	-200	-200	01.03.2010	*	0:00					
nd:	4.200	4.200	22.07.2010	-	0:00	Adjust distan	ce by file new wizar	d and sub-project o	defaults	
		Report date:	22.03.2010	-	16:00		y file new wizard an			
	Default dat	e for actuals:	01.03.2010	•	0:00	✓ Evaluate in a	ross project statistic	\$		
asks:	14					Equation:			•	
ther objects:	20									
escription										

- ^{x^o} Change the report date to 22.03.2010 16:00.
- APP Press OK.
- Select the cell, which contains the tasks, that you want to progress.
- Select the tab Display.
- Set Checkbox: Report date line.
- Set Checkbox : Progress Information.

The report date is shown as blue line:

		
Instan		

2 Entering progress

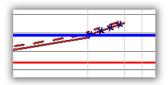
- Select task 1: Top soil stripping
- Press Right Mouse Button: Enter Progress

Dates			1			
Report date:		22.03.2010 -	16:	00 Method	Dista	ince
Start date:		17.03.2010	8:0	0	F	Performed
End date:		22.03.2010 -	16:	00	□ Work	break
Progress						
Quantity		Percent	age		From	To
3.839,99	m2	16,55	%	Planned progress:	2.900	2.420
				Relative:	2.900	2.420
1.600,00	m2	6,90	%	Actual progress:	2.900	2.700 🗡
Progress	for who	ole progress group		Belative:	2.900	2.700

This task measures progress in distance.

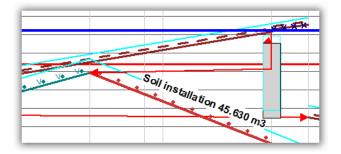
The start was delayed by 2 days and the achieved progress is 2700.

- Set start date = 17.03.2010
- Set Actual progress field to = 2700
- M Press OK.



The task gets split into a performed task and into a not performed part.

- 3 Showing baseline
 - AP Click in the time distance cell to select it. Select the Tab Display.
 - Activate the Checkbox Baseline tasks.



The difference between original schedule and updated is shown.

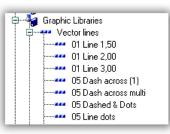
Defining line styles

All line styles in TILOS may be user defined. They may be built from lines, graphics and text elements.

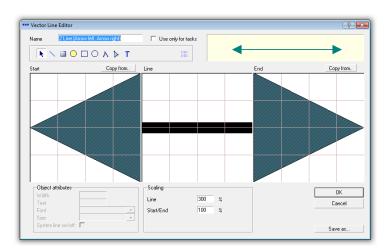
A TILOS line consists of the main line and line endings. Both may be user defined. If a line end is not defined, the missing line section will be filled with the basic line pattern.

You may also create new line styles direct from the context of tasks or where you use them. Remember the **Save as** option.

1. Open Library – Graphic Libraries – Vector lines.



2. Add a new line by Right Mouse Button on the Entry Vector lines or select an existing style and press **F3**.



3. Double-click on an entry to get the Vector Line Editor.

Now you change the settings of this line style or create a new entry using the **Save as** button.

- 4 To add new objects to the line style, select a tool and draw the object into one of the 3 sections.
- Select System lines when you want to insert a simple line across the edited segment. Normally a line is printed in a way, that many little segments along the line are printed. This system line is printed separately from start to the end of the whole line. Therefore, print quality is much better.

A system line may only be inserted and moved horizontally. It cannot be sized. If you start inserting, it is immediately expanded to the whole length of the compartment.

- The line width may be set after selecting an object. For filled objects, no line width may be set.
- For text attributes, you may enter font and text size used.
- The line color will be defined later, when you use the Vector line.
- Scaling % factor defines the size of symbols to be displayed in the views when printed. Technically, this means the width of a print segment along the line. This does not effect the lines, only objects and text information.
- Line Ends are defined in the same way. You may copy existing line endings to a line style.

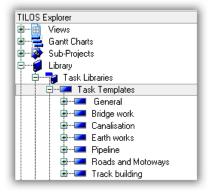
Task templates

All tasks in TILOS are based on task templates. These define:

- Presentation type (Line, Rectangle, Parallelogram, etc.)
- Line patterns
- Annotations with auto text
- Definitions of data fields
- Resources and costs

Task templates are organized in **TILOS Explorer –Library – Task Libraries** – **Task Templates.**

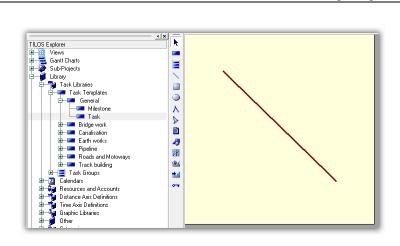
1. Click on the Library item under which you want to add a new sub item.



2. Press Right Mouse Button menu to add a new Sub-Template.

Alternatively press F3 to add a new item on the same level.

3. Double-click on the new element which will now appear in the working window to change the settings.



Use the tabs to enter now the data for the task template as you do for tasks.

4. Tab Task Template

Task Template	General 🏗 Categories & Structure 🚥 Display 📓 Calculation 📼 Floats 🕵 Resources Task steps
Name:	Task
Template-ID	gen.ta Sort field
Sub-index:	ta Parent 💶 General 💌
🗌 Inclu	de in legend Adjust Task To Task Template

Name or Template-ID may be used to identify the task template.

In the task template tree, the name may be shown or alternatively you may add the Template-ID in front of the name. This can be set in Tools - Options.

5. Tab General

In this tab you may set basic data for the task.

Calendar: If you set a calendar, this will be used for the task created. If it is not set, the default calendar will be used.

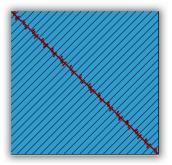
The same rule applies also for layers.

7. Tab Display

ask Template	💶 General 📜 Categ	ories & Structure	Display	Calculation = Float	s 🚉 Resour	rces Task steps
Display tpe	Simple line	•				Milestone graph
Shape			Task line			
Color: Pattern:	• /		Style: Color:		<u> </u>	
Style:			Loior. 📕		·	
Line width	0,00 (for Gantt and if no :		🗌 Align line syn	nbols		

The different type of tasks and their attributes is described in the appendix in section task types.

The shape appears in the selected style.



► The task line (the diagonal) may be disabled for figure objects.

LE L. L. L. F.	
Hide task line	

► If there is no appropriate style for the line in the library, select the entry none and press the edit button. You will be asked, if you would like to create a new line style.

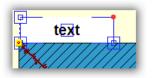
You may also select any existing line style and press the edit button. If you do not want to change the existing line style, make a copy of the existing style first and then start editing.

		Use only for tasks	ես եմ եմ							
Start	Copy from.	Line	End	Copy from.						
			▝▐							
			V							
Object attributes Width		Scaling		ОК						
Text		Line 10		Cancel						
Font Size	▼ ▼	Start/End 10	0 %							

8. Task templates may include text annotations as well.

Create a new **text object 1** and draw it close to a task.

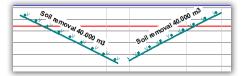
Link the **Pin point** to the task (**Start, Centre** or **End**) by dragging the red button to the start, centre or end position of the task. Release the mouse, if the shape of the cursor changes.



On the **Text** tab enter the text. You may combine plain text with variables. To open the variable list, press **F8**.

If the text has to keep the task's orientation, check Apply slope of task.

If you want the text position to be adjusted while flipping the task coordinates, check the options **Adjust on change of direction**. This will change the text alignment from left to right and change positive distance into negative (see picture below).



Otherwise the text would be placed after the task.

Defining calendars

Calendars are used for:

- View presentation
- Calculating the task duration in relation to work time. Every task may use one calendar. Default calendars for new tasks are set in *Tools -Options*.

A calendar consists of:

1 **Time types** with minutes precision (Work or Non work). Set the presentation color and pattern for the presentation in a view.

Time type name	^ Background	Foreground	Pattern	Working	ID	
Holiday					Holiday	-
Non Working					Non Working	
Overtime				v	Overtime	
Weekend					Weekend	
Working				1	Working	

2 **Day definitions**: This defines the working and non working time within days. The Day definition refers to the Time types, defining if the selected time span is a working time or not.

Set the presentation color and pattern for the presentation in a view.

Index	Name	/	Background	Line Color	Color in calendar vie	Pattern	
W10h	10-hours day						
W16h	16-hours day						
W24h	24-hours day						- 1
W8h	8-hours day						
Holiday	Bank holiday						
NoWorkDay	No Work Day						
PossessionNoWrol	Possion non work						
Weekend	Weekend						
From	То	Time type					
	To 7:00	Time type Non Working					
0:00							
0:00 7:00 12:00	7:00 12:00 13:00	Non Working Working Non Working					
From 0:00 7:00 12:00 13:00 18:00	7:00 12:00	Non Working Working					

3 **Week definition:** In the simple calendar definition, you set up which days of a week are working days and which are non-working days.

This is done on behalf of the Day Definitions.

	Week	Definition Day Definitions	
ek definition	1		
ło	^ Day definition	Day name	
	1 8-hours day	Monday	
	2 8-hours day	Tuesday	
	3 8-hours day	Wednesday	
	4 8-hours day	Thursday	
	5 8-hours day	Friday	
	6 Weekend	Saturday	_
	7 Weekend	Sunday	

If you select the **Advanced calendar interface** in **Tools - Options**, you may add more complex work definitions, like periodically changing working times in winter and summer, or a 14 day shift with 10 days working and 4 days free. Please refer to the help system.

4 Setting exceptions

	aic	nda			1	cepti		V	Veel	De	tiniti	n	Day	De	finiti	ons																			
ame					/s pe	r wee	эk														(Calend	ar ID												Œ
-	_)1(nuar	_	•	_		Feb			-	-	_	Ma	ch	-	_	_	Ar	vil	_	-	_	M	211	-	_	_	_	Jur		_	-	_	1	_
lon	Jai			18	25		01			22	_				15	22	29			12	19	26	191		: 10	17	24		ocar	07	14	21	28	1	
ue			12				02		16								30			13						18			01	08					
/ed			13		27		03		17							24				14		28		05		2 19				09					
hu		07	14				04		18	25				11				01	08	15		29		06		20				10					
ri	01	08	15	22	29		05	12	19	26			05	12	19	26		02	09	16	23	30		07	14	21	28		04	11	18	25			
at	02	09	16	23	-30		06	13	20	27			06	13	20	27		03	10	17	24		0	08	15	i 22	29		05	12	19	26			
un	03	10	17	24	31		07	14	21	28			07	14	21	28		04	11	18	25		0	2 09	16	5 23	30		06	13	20	27			
	Ju						Auc						Sep	otem				00	tobe					over					De	cemt					
lon			12						09							20				11						i 22					13				
ue			13		27				10						14	21	28			12			0			23	30			07		21			
/ed			14						11								29			13						24				08					
hu	01		15						12								30			14			0			25				09					
ri .		09							13					10				01		15			0			26				10			31		
at					31				14							25				16			0			27				11					
un	U4	11	18	25			01	08	15	22	23		05	12	19	26		- JU:	10	-17	24	31	U	14	- 21	- 28	_		05	12	19	26]	
Sele Date Wee	¢	d Da	lte					Da	ay de	efini	ion:				lear	Exc	eption		¥]		uick as efault c		efiniti	on:		-	Assign Impo					•		

Select one or more days by clicking the days with the mouse. To select multiple days, keep the ctrl key pressed.

Select a day definition in the group Selected date and this gets assigned to all selected days.

Select Clear Exception if you want to remove the special settings from that day.

Exceptions are printed in the color set in the day definition.

When you close the dialog, the tasks and views will be adjusted to the new calendar settings.

Appendix

Task presentation types

Presentation	Description								
	Triangle upper								
	At the start of the task, the whole distance area is closed for other tasks. The closed segment is reduced in line with the progress of construction works.								
	Extra Values:								
	Lead/lag distance								
	Time range (set before the start)								
	Triangle lower								
	Along with the progress of construction works, the distance segment closed for other tasks increases, which prevents starting other tasks. Extra Values:								
	Lead/lag distance								
	Time range (set before the end)								
N	Simple line								
	No limitations. Other tasks may be started throughout the task range.								
	Parallelogram work time								
	The distance after completing the task is closed for other tasks for a defined working time. Extra Value: Time range								
	Rectangle A complete closure of a distance segment in a defined time interval. Only after completing the task, further works may be carried out in this area.								
	Extra Value: Full block: Progress may only be given in % or Quantity, but no longer distance related.								
N	Steps								
	The closure is identical as in the case of the rectangle, but it is divided into smaller units. Extra Value: Steps								
	Parallelogram (time and distance)								
	The distance segment is closed for other activities before and / or after completing the task for a defined time.								
	Extra Values: Lead (distance), Time range								
	Parallelogram (distance)								
	The location segment is closed for other activities before and / or after completing the task.								
	Extra Value: Lead/lag								
	For more details on training options, see the on-line help.								
	Parallelogram calendar time								
	For a defined calendar period, the distance after the task is closed for other activities.								
	Extra Value: Time range								

Task calculation models

Quantity, Work rate, Duration and Length of a task are correlated. The calculation models enable you to choose how other data will be adjusted when some data is changed.

Calculation model	Formula					
Quantity	The Quantity data field is inactive;					
	Quantity will be calculated as Work rate * Duration					
Work rate	The Work rate data field is inactive;					
	Work rate will be calculated as Quantity / Duration					
Duration	The Duration is inactive and may not be changed graphically;					
	Duration will be calculated as Quantity / Work rate.					
Duration (Profile speed)	Duration is inactive and will be calculated with the help of profiles, supplying speed data from a profile line. This generates a segmented task line.					
Duration (Profile data)	Duration is inactive and will be calculated with the help of profiles, supplying Quantity and Work Rate data. This generates a segmented task line.					
Duration (Setup time)	Duration is inactive and will be calculated. This method allows you to add at the beginning and end of Setup time.					

Quantity can also be calculated from distance data. In this case, in the Work model, the Work parameter will not be calculated – the task Length will be calculated instead. So, changing the task duration will prolong / shorten the task.

Resource allocation calculation models

All resource and cost allocations depend on the model and input value. All other parameters are calculated based on these.

Cost model allocations

They apply for assigning direct costs based on accounts.

Model	Cost calculation	Description
Cost fixed	= Input value	Fixed amount of money
Cost / unit	= Input * Quantity	The amount of money is calculated on the basis of quantity
Cost/Hour	= Input * Duration (h)	The amount of money is calculated on the basis of task duration and input per hour
Cost/Day	= Input * Duration (wd)	The amount of money is calculated on the basis of the task duration and input per day
Cost/Month	= Input * Duration (m)	The amount of money is calculated on the basis of the task duration and input per month

Consumable resources

Model	Calculation	Description
Quantity	Effort = Input Cost = Effort * Unit cost	Fixed quantity. Effort equals = quantity.
Quantity / unit	Effort = Input * Quantity Costs = Effort * Unit cost	Quantity is calculated from task Quantity.
Quantity/Hour	Effort = Input * Duration(h) Costs = Effort * Unit cost	Quantity is calculated from task Duration and the Input per hour
Quantity/Day	Effort = Input * Duration(wd) Costs = Effort * Unit cost	Quantity is calculated from task Duration and Input (Quantity per day)
Quantity/Month	Effort = Input * Duration(m) Costs = Effort * Unit cost	Quantity is calculated from task Duration and Input (Quantity per month)

Permanent resources

For all allocations, you may input one parameter, that is differently interpreted based on the allocation model of the resource.

Model	Calculation	Description
Allocation	Effort = Input * Duration Allocation = Input Costs = Effort * Unit cost	Fixed allocation of permanent resources, the effort is calculated on the basis of task duration and the input of resources.
Effort/ Unit	Effort = Input * Quantity Allocation = Effort / Duration Costs = Effort * Unit cost	The Effort is calculated from quantity and input value (Effort per time).
Hours	Effort = Input Allocation = Effort / Duration Costs = Effort * Unit cost	Effort is given in hours.
Days	Effort = Input Allocation = Effort / Duration Costs = Effort * Unit cost	Effort is given in days.
Months	Effort = Input Allocation = Effort / Duration Costs = Effort * Unit cost	Effort is given in months.
Units/Time	Effort = Quantity / Input Allocation = Effort / Duration Costs = Effort * Unit cost	The Effort is calculated from quantity and the input value (Quantity / time)
Cargo	Allocation = Quantity / Input Effort = Allocation * Duration Costs = Effort * Unit cost	The number of necessary wagons for the transport gravel (work value) is calculated.
Units/Time (Driving Task)	Allocation = User input Effort = Allocation * Duration Costs = Effort * Unit cost	The entered Input gives the production rate of 1 resource. Additional Allocation may be entered. Work rate = Sum of UnitsPerTime * Allocation for all the rows with this model .