



USER GUIDE

v1.1 Release

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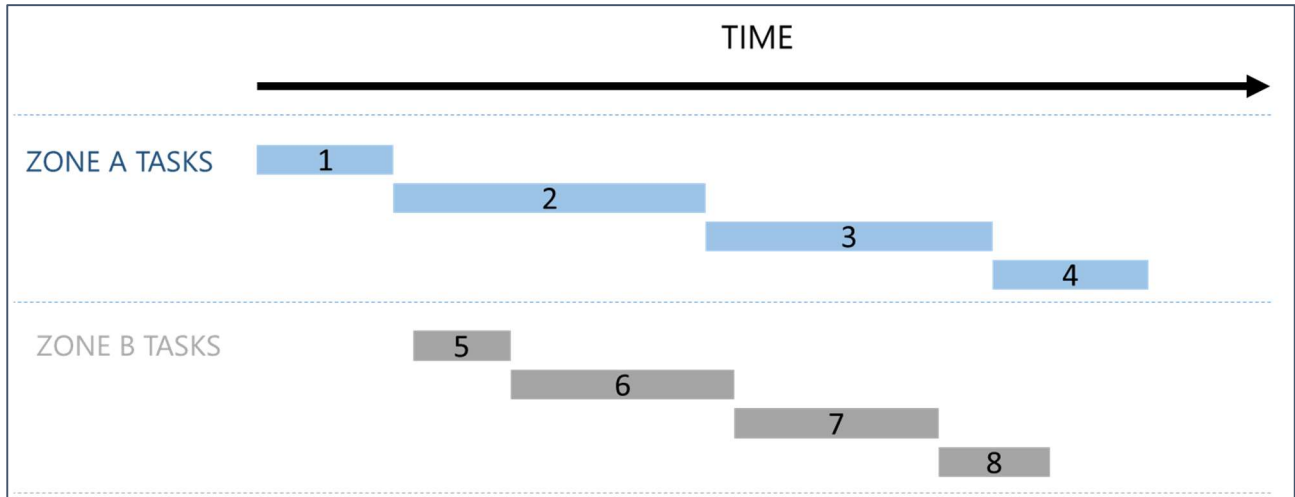
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Updates to Turbo-Chart are listed on our website: <http://www.turbo-chart.com/changelog>

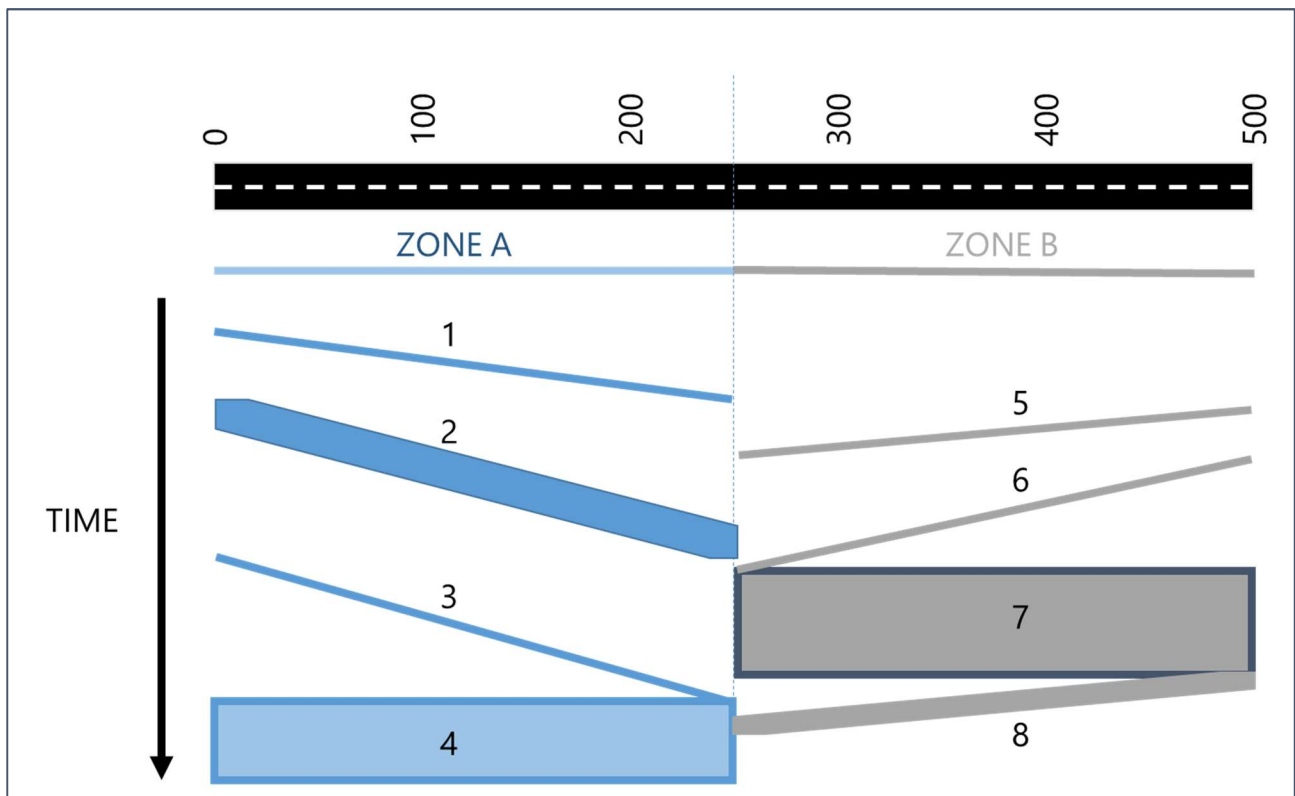
TIME LOCATION CHARTS

Time Location charts are an alternative method of presenting project schedule information for Linear Construction and Infrastructure projects. Linear projects are defined as those where works occur continuously or repeatedly over a linear alignment, and can also interact with works occurring at fixed locations along the alignment. Typical examples of Linear projects are Tunnelling, Highways, Railways, Pipelines but can also be applied to vertical high-rise building projects.

Traditional project schedule information is presented using Gantt or Bar charts, presenting schedule tasks on the vertical axis as a list, grouped by some form of Organisations such as Work Breakdown Structure (WBS) or Activity Coding. The horizontal axis of such charts is time.




By shifting the axes, appending data representing the location of the works and appending display properties to tasks, it is possible to present the same schedule data in time location format as described below:



TURBO-CHART OVERVIEW

Turbo chart was designed for planners and schedulers wanting Time Location charting that is easy to learn and use, and can produce charts quickly by working with data already prepared in leading scheduling tools (or any spreadsheet data capable tool).



- ✓ **Quick to learn:** Use Turbo Chart in hours rather than days spent learning a sophisticated scheduling tool
- ✓ **Easy to use:** without unnecessary complexity that you don't require
- ✓ **Cost effective:** avoid paying for features you don't need or that you won't use

- ✓ **Uncomplicated:** designed purely for charting and visualising your existing schedule
- ✓ **Single schedule source:** maintain scheduling data in your preferred tool like P6 or any spreadsheet/table capable tool
- ✓ **Fast:** create charts in minutes, update charts in seconds

The workflow for using Turbo-Chart is shown in the following diagram:



- **SCHEDULE** Prepare schedule data in scheduling tool, or prepare as spreadsheet data
- **IMPORT** Connect to databases, import from schedule files, or paste from spreadsheet data
- **CUSTOMISE** Prepare charts from datasets, shape codes, grid and display settings
- **REPORT** Customise multiple charts, synchronise data as schedules are updated

Turbo-Chart currently supports Importing data from the following Scheduling systems:

- **Primavera P6** Release 6 Onwards: Local P6 Databases, P6 XER files, P6 Layout data Copy and Paste (P6 Web & Remote Databases are not currently supported)
- **Microsoft Project** 2010 / 2013 /2016: *.MPP files
- **Safran Risk / Safran Project** V7 onwards
- **Asta Powerproject:** coming soon.
- Any data produced in tabular / spreadsheet Format.

TURBO-CHART SAMPLE DATA

After downloading and installing Turbo-Chart, users can download a zip file containing sample data from the **HELP** menu. The latest contents of the zip file are listed in a document within the zip file titled "TCHART SAMPLE DATA RELEASE NOTES".

The sample data is provided at a single zip file containing the following folders and files

| FOLDER | FILE | DESCRIPTION |
|----------------------|--|--|
| GENERAL | TCHART_SQLite.db | Primavera P6R15.1 SQLite Database containing sample data |
| | TCHART_WBS ACTIVITY VIEW.plf | Primavera P6R15.1 Activity Layout file |
| | TCHART_SPREADSHEET IMPORT VIEW.plf | Primavera P6R15.1 Activity Layout file |
| | TCHART_SPREADSHEET TEMPLATE.xlsm | MS Excel Spreadsheet Template for Importing Data (Macro enabled) |
| DEMO1 | TCHART_DEMO1.xer | Primavera P6R7.0 XER of Demo 1 Sample Data |
| | TCHART_DEMO1.tchart | Turbo Chart Demo 1 Sample File |
| | TCHART_DEMO1.tclib | Turbo Chart Demo 1 Shape Library File |
| | TCHART_DEMO1 TOP IMAGE.jpg | Demo 2 Sample Top Image |
| | TCHART_DEMO1 CHART.pdf | Demo 1 Chart output |
| DEMO2 | TCHART_DEMO2.xer | Primavera P6 R7.0 XER of Demo 2 Sample Data |
| | TCHART_DEMO2.tchart | Turbo Chart Demo 2 Sample File |
| | TCHART_DEMO2.tclib | Turbo Chart Demo 2 Shape Library File |
| | TCHART_DEMO2 SPREADSHEET.xlsm | MS Excel Demo 2 Data for Importing (Macro enabled) |
| | TCHART_DEMO2 TOP IMAGE.jpg | Demo 2 Sample Top Image |
| | TCHART_DEMO2 CHART.pdf | Demo 2 Chart output |
| HIGHRISE DEMO | Turbo Chart HIGH RISE DEMO.tchart | Turbo Chart High Rise Sample File |
| | Turbo Chart High Rise Demo Shape Library.tclib | Turbo Chart High Rise Sample Shape Library File |
| | HIGHRISE Acts.xlsx | MS Excel High Rise Sample Data for Spreadsheet Importing |
| METRO TUNNEL | TURBO CHART METRO TUNNEL EXAMPLE.xer | Primavera P6 R7.0 XER of Metro Tunnel Sample Data |
| | METRO TUNNEL.tchart | Turbo Chart Metro Tunnel Sample File |
| | Metro Tunnel Shapes.tclib | Turbo Chart Metro Tunnel Shape Library File |
| | METRO_SCHEMATIC2.png | Metro Tunnel Sample Top Image |
| | Metro Tunnel Highlights.tchiliter | Metro Tunnel Highlighter File |
| | METRO TUNNEL ANNOTATIONS.tcgraphics | Metro Tunnel Annotations File |
| | STANDARD PAGE LAYOUT.tcpagelayout | Turbo Chart Standard Page Layout File |
| | METRO PAGE LAYOUT.tcpagelayout | Turbo Chart Metro Tunnel Page Layout File |

*.tchart data contains all the information to produce Charts from Turbo Chart, including:

- Task (Activity) data
- Shape Libraries
- Top Images
- Highlighters
- Annotations
- Datasets
- Multi-Chart Definitions

Select **FILE > OPEN** within Turbo Chart to open and access the sample data

PREPARING PRIMAVERA P6 SCHEDULE DATA

Creating Additional Data Fields

The additional location and display data to be added to tasks for producing Time Location charts in Turbo-Chart, require activity User Defined Fields (UDFs) to be populated. The following are the activity UDFs required:

| UDF Field | Field Type | Required? | Used for |
|----------------|------------|-----------|--|
| Start Position | Numeric | Yes | Defining the start position (along the project alignment) for the task |
| End Position | Numeric | Yes | Defining the end position (along the project alignment) for the task |
| Shape Code | Text | Yes | Used to generate the display shape, colours etc on the chart |
| Filter Code | Text | No | A secondary code for filtering purposes (not mandatory) |

Add these UDF fields to the activity layout used for schedule preparation by modifying the activity layout columns:

The screenshot shows the Primavera P6 software interface. The 'Columns' dialog box is open, showing the 'Available Options' list on the left and the 'Selected Options' list on the right. The 'Selected Options' list includes 'SHAPE CODE (LPS_SHAPE_CODE)', 'START LOC. (LPS_START_POSITION)', and 'END LOC. (LPS_END_POSITION)'. The 'User Defined Fields' dialog box is also open, showing the mapping of these fields to specific UDFs: SHAPE CODE (LPS_SHAPE_CODE), START LOC. (LPS_START_POSITION), and END LOC. (LPS_END_POSITION).

Populate Additional Data Fields

For schedule tasks to be displayed upon the Time Location charts, populate the UDF fields with the required data. When complete, press F10 to commit data to the P6 Database if required.

The screenshot shows the Primavera P6 software interface. The 'User Defined Fields' dialog box is open, showing the mapping of UDFs to specific fields: LPS_END_POSITION (Number), LPS_FILTER_CODE (Text), LPS_SHAPE_CODE (Text), and LPS_START_POSITION (Number). The 'Time Location' chart is also visible, showing the resulting schedule data for various activities, including 'PROCURE TUNNELLING SUPPORT', 'CONSTRUCTION - STATION 1', 'CONSTRUCTION - STATION 2', and 'TUNNELLING'.

Preparing P6 Layout for Spreadsheet Import

It is possible to create a layout within P6 that allows for spreadsheet copy and pasting into Turbo-Chart, the layout needs to identify the following

| Name | Description | ShapeCode | FilterCode | Start | End | Start Date | Finish Date |
|------|---------------------------------------|-----------|------------|----------|----------|------------|-------------|
| 2020 | Access to Station 7 | ACCESS | | 32530.00 | 32930.00 | | 14-Feb-19* |
| 2290 | Station 7 Site Establishment | SITEEST | | 32530.00 | 32930.00 | 14-Feb-19 | 25-Feb-19 |
| 1090 | Review & Approve Station 1 Design | DES_REV | | 2610.00 | 3010.00 | 07-Mar-19 | 20-Mar-19 |
| 2100 | Review & Approve Station 7 Design | DES_REV | | 32530.00 | 32930.00 | 07-Mar-19 | 20-Mar-19 |
| 2300 | Station 7 Utilities Relocations | UTILITIES | | 32530.00 | 32930.00 | 26-Feb-19 | 20-Mar-19 |
| 2010 | Access to Station 6 | ACCESS | | 26200.00 | 26400.00 | | 04-Apr-19* |
| 2310 | Station 7 Piling | | | | | 21-Mar-19 | 12-Apr-19 |
| 2230 | Station 6 Site Establishment | | | | | 04-Apr-19 | 15-Apr-19 |
| 2320 | Station 7 Excavation | | | | | 13-Apr-19 | 24-Apr-19 |
| 2330 | Station 7 Prepare Base for TBM Launch | | | | | 25-Apr-19 | 06-May-19 |
| 2240 | Station 6 Utilities Relocations | | | | | 16-Apr-19 | 08-May-19 |
| 1030 | Access to Station 1 | | | | | | 22-May-19* |
| 2360 | TBM 2 Assembly, Testing | | | | | 07-May-19 | 29-May-19 |
| 1230 | Station 1 Site Establishment | | | | | 23-May-19 | 03-Jun-19 |
| 3040 | TBM2 Tunnelling STATION 7 to XP92 | | | | | 30-May-19 | 10-Jun-19 |
| 1040 | Access to Station 2 | | | | | | 17-Jun-19* |
| 3030 | TBM2 Tunnelling XP92 to XP91 | | | | | 11-Jun-19 | 19-Jun-19 |
| 2340 | Station 7 Structural Works | | | | | 07-May-19 | 21-Jun-19 |
| 1250 | Station 1 Utilities Relocations | | | | | 04-Jun-19 | 26-Jun-19 |
| 1610 | Station 2 Site Establishment | | | | | 17-Jun-19 | 27-Jun-19 |
| 3020 | TBM2 Tunnelling XP91 to XP90 | | | | | 20-Jun-19 | 28-Jun-19 |
| 3010 | TBM2 Tunnelling XP90 to XP89 | | | | | 29-Jun-19 | 05-Jul-19 |
| 1110 | Review & Approve Station 2 Design | DES_REV | | 7200.00 | 7400.00 | 27-Jun-19 | 10-Jul-19 |

| Column Heading | P6 Data Field | Data Type |
|----------------|---------------------------|----------------|
| Name | Activity ID | Text Values |
| Description | Activity Name | Text Values |
| ShapeCode | P6 UDF for Shapes | Text Values |
| FilterCode | P6 UDF for Filters | Text Values |
| Start | P6 UDF for Start Position | Numeric Values |
| End | P6 UDF for End Position | Numeric Values |
| Start Date | Start | Date Format |
| Finish Date | Finish | Date Format |

P6 Schedule Data Preparation Tips

- Not all schedule tasks require populating, only those to be displayed
- Values used for Start and End location should be in the direction the work will occur, ie Start value can be greater than the End value.
- Saving layouts specific for Time Location charting that includes the Turbo-Chart fields can assist in Schedule preparation

IMPORTING SCHEDULE DATA INTO TURBO-CHART

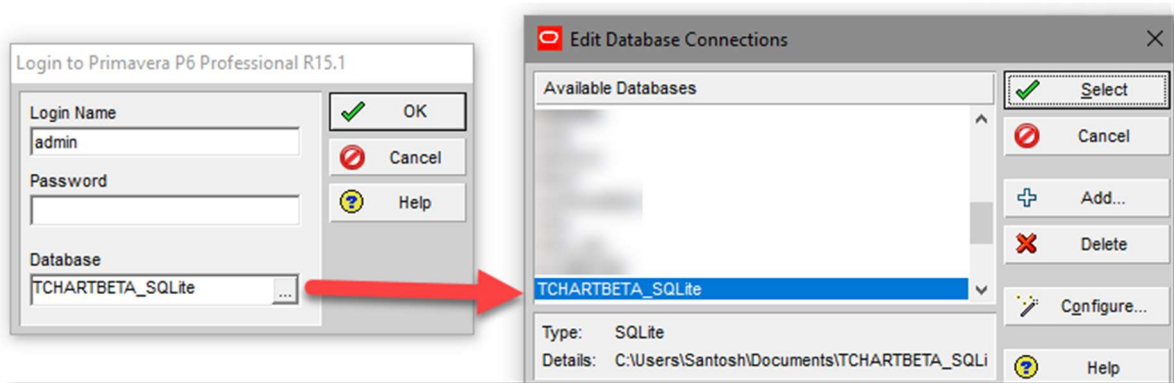
Once schedule data is prepared, it can be imported into Turbo-Chart as a dataset, note that Turbo-Chart can contain multiple datasets. Data can be imported by either:

- Connecting directly to the scheduling system (eg Primavera P6 Database)
- Connecting to Data exported from the scheduling System (eg. Primavera P6 XER file)
- Connecting to via Web Services (Eg. Primavera P6 Cloud Databases)
- Pasting Spreadsheet data into a Turbo-Chart Dataset.

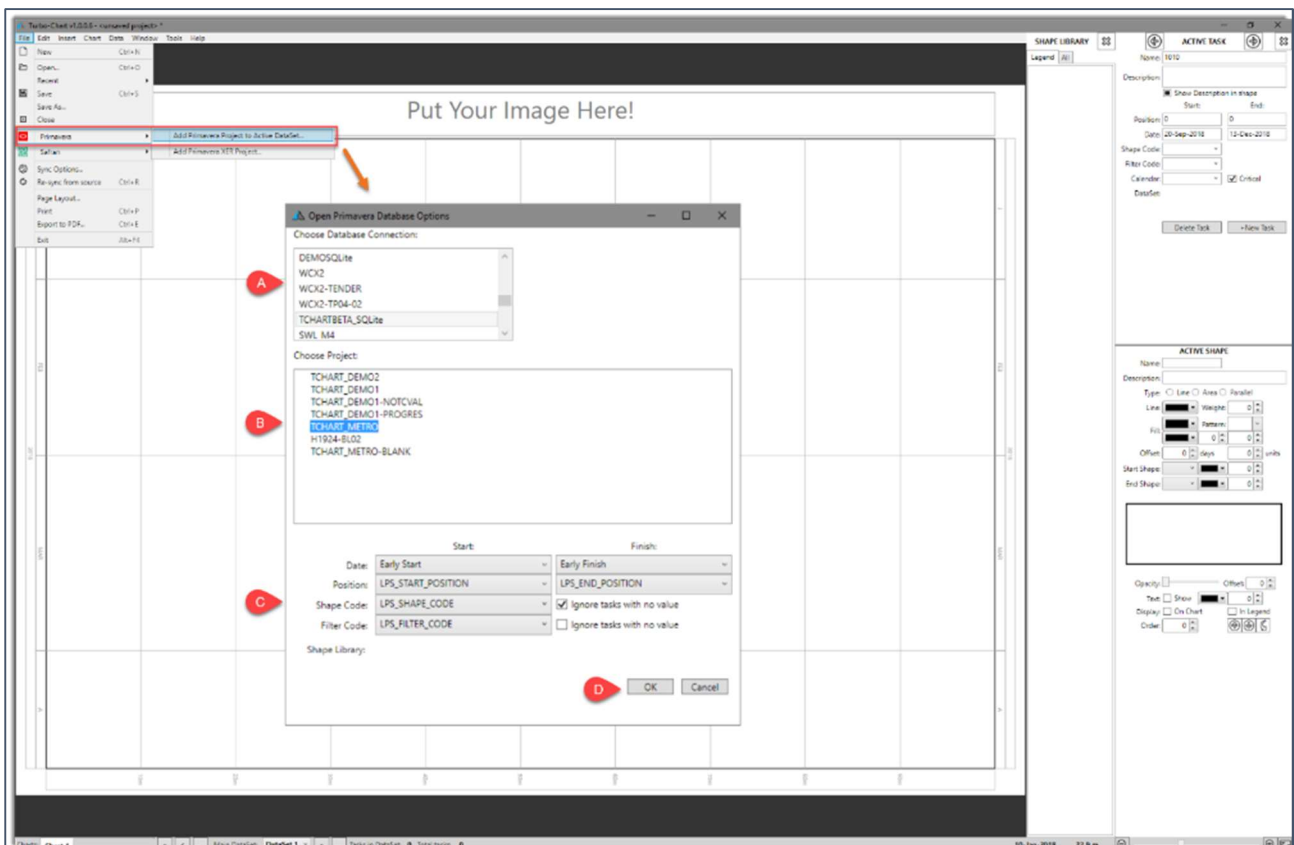
Connecting to a local P6 Database

For local Primavera P6 database, after launching Turbo-Chart, select **File > Primavera > Add Primavera Project to Active Dataset**

- A. Select Database connection – Requires the P6 Client to be installed. Connections listed will be the same as connections selectable from the P6 Client. **Note** Users will require that the P6 Database allows read-access to the database, that may require Privileged user passwords



- B. Select project to import
C. Map data fields containing data

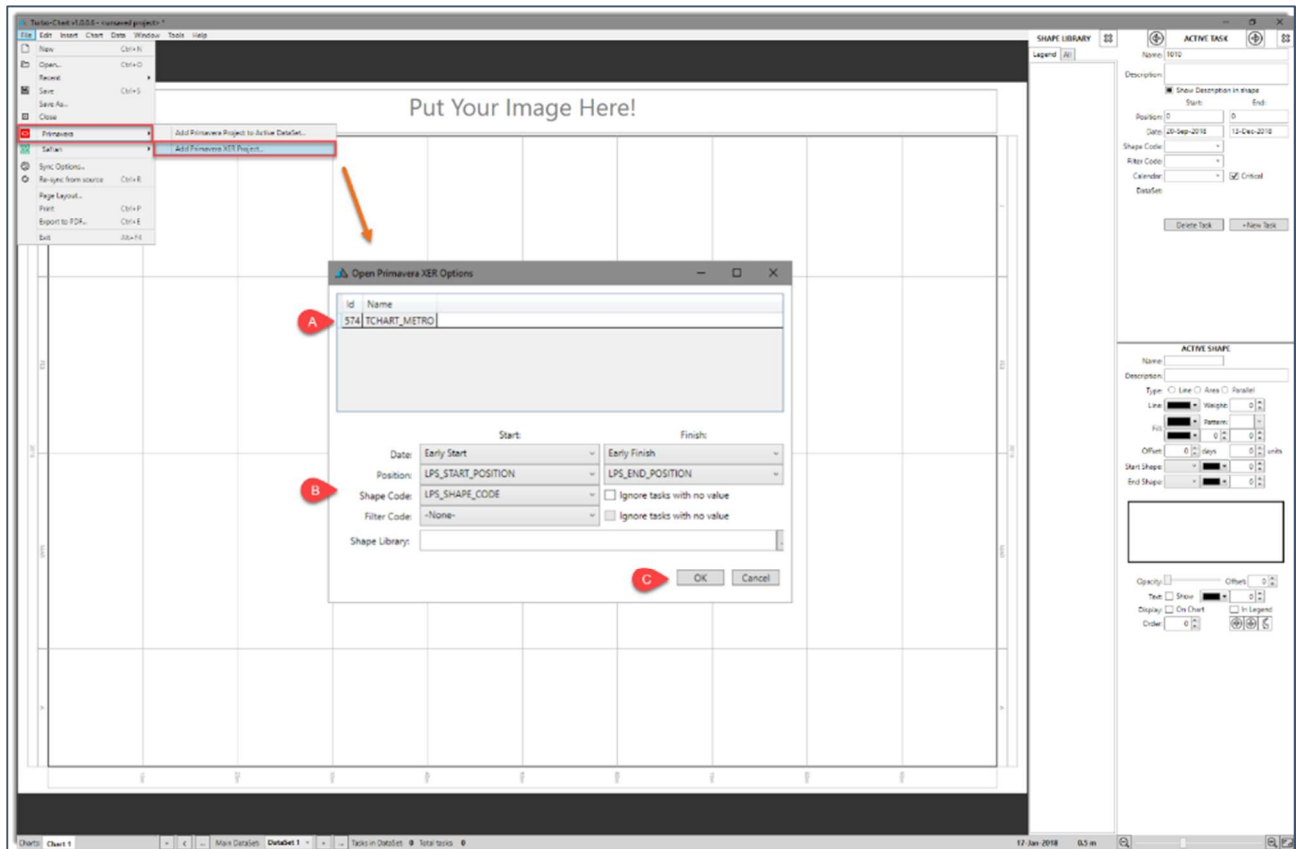


- D. Press ok for data to be imported from P6 as a new dataset

Importing from P6 XER file

To import from an XER file, after launching Turbo-Chart, select **File > Primavera > Add Primavera XER Project** and locate the XER file to import, or select **File > Open** and change the file type to **XER**

- A. Select the Project to import
- B. Map data fields containing data

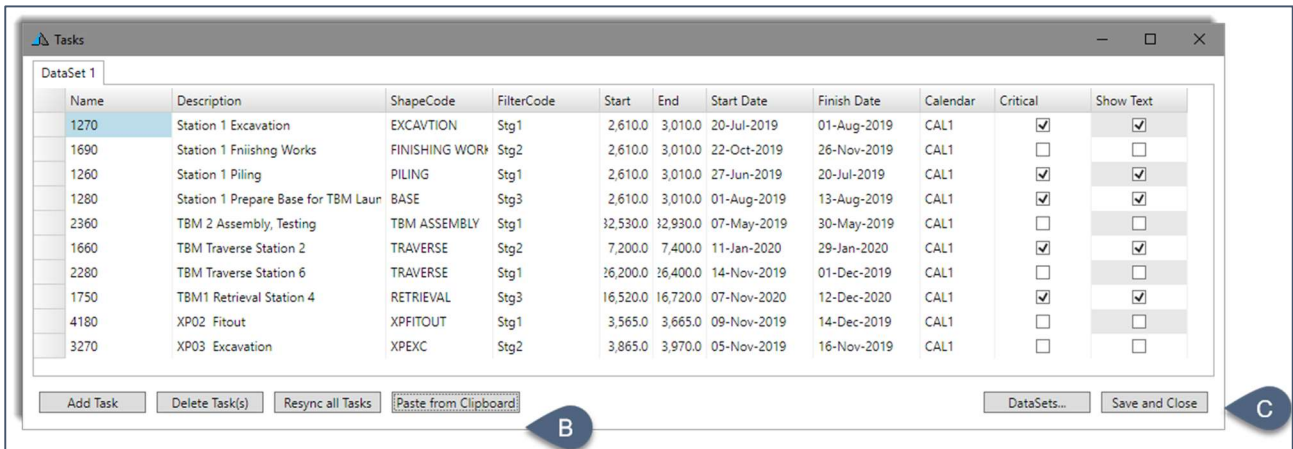


- C. Press ok for data to be imported from the P6 XER as a new dataset

Importing from Spreadsheet Data

To import from spreadsheet data, after launching Turbo-Chart, select **Data > Tasks** to view the task list for the selected Dataset.

- A. Copy the spreadsheet data from the source (including headers) to clipboard
- B. Select **Paste from Clipboard** to paste the data

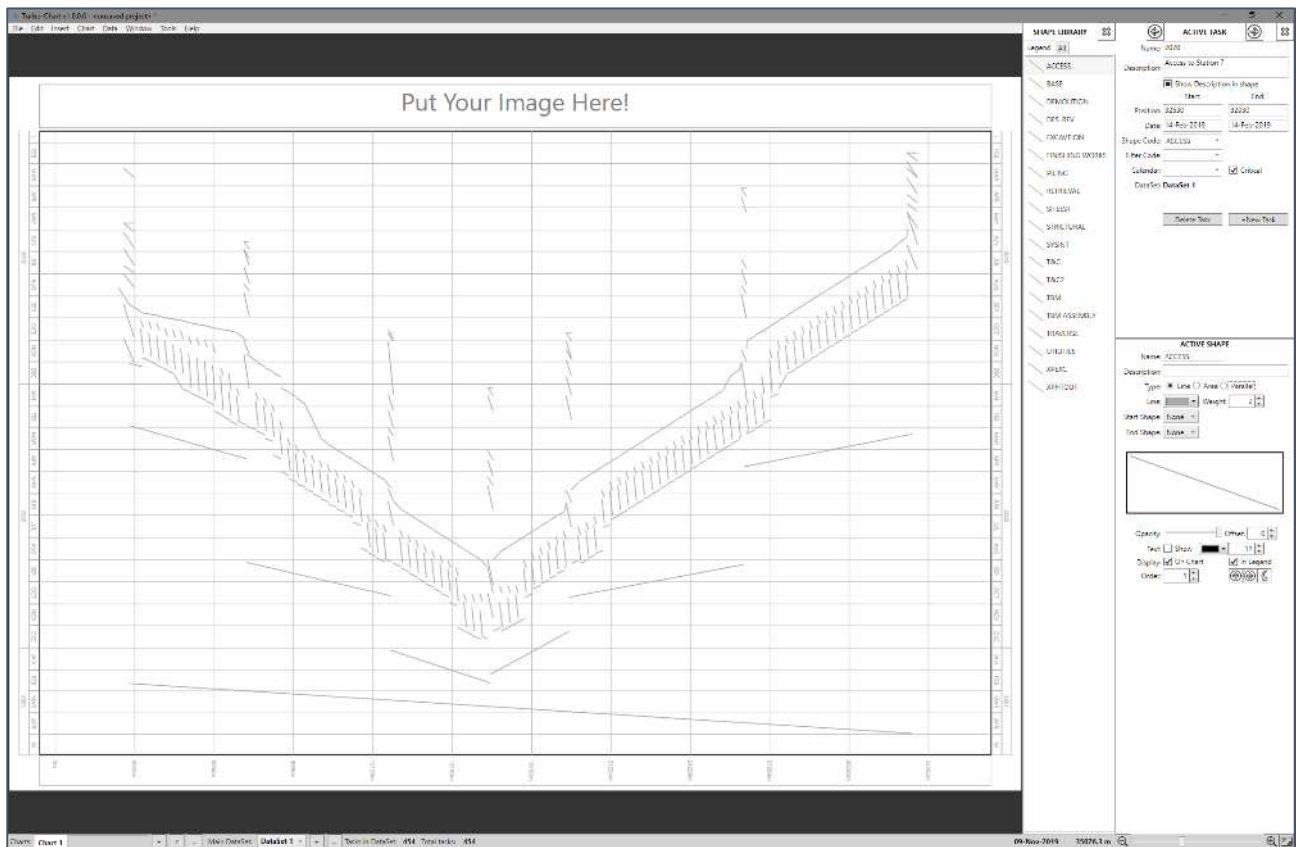


- C. Select **Save and Close** to save the Turbo-Chart file with pasted spreadsheet data.

Post Importing

After importing from data, the chart may require fitting to view the extents by location and dates of the imported data. Press CTRL+F5 to fit chart to imported data, or select **Chart > Best Fit** for options to fit only time or location axis.

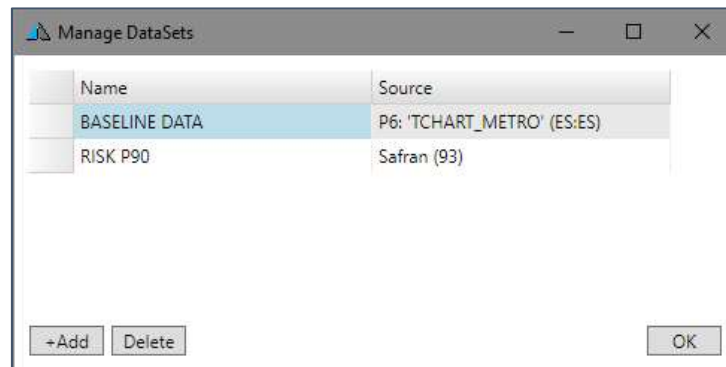
The Imported data without any customisation will appear as such, and will be ready for customisation



Managing Datasets

Datasets in Turbo-Chart are used to store the task data that has been imported, pasted or manually developed within Turbo-Chart. Each dataset can have its own source, that may be from varying scheduling systems, or may represent a snapshot of the same project.

Turbo-Chart files can contain multiple Datasets from any source. To view the source for any dataset, select **Data > Datasets** from the menu to view the name and source of each dataset.



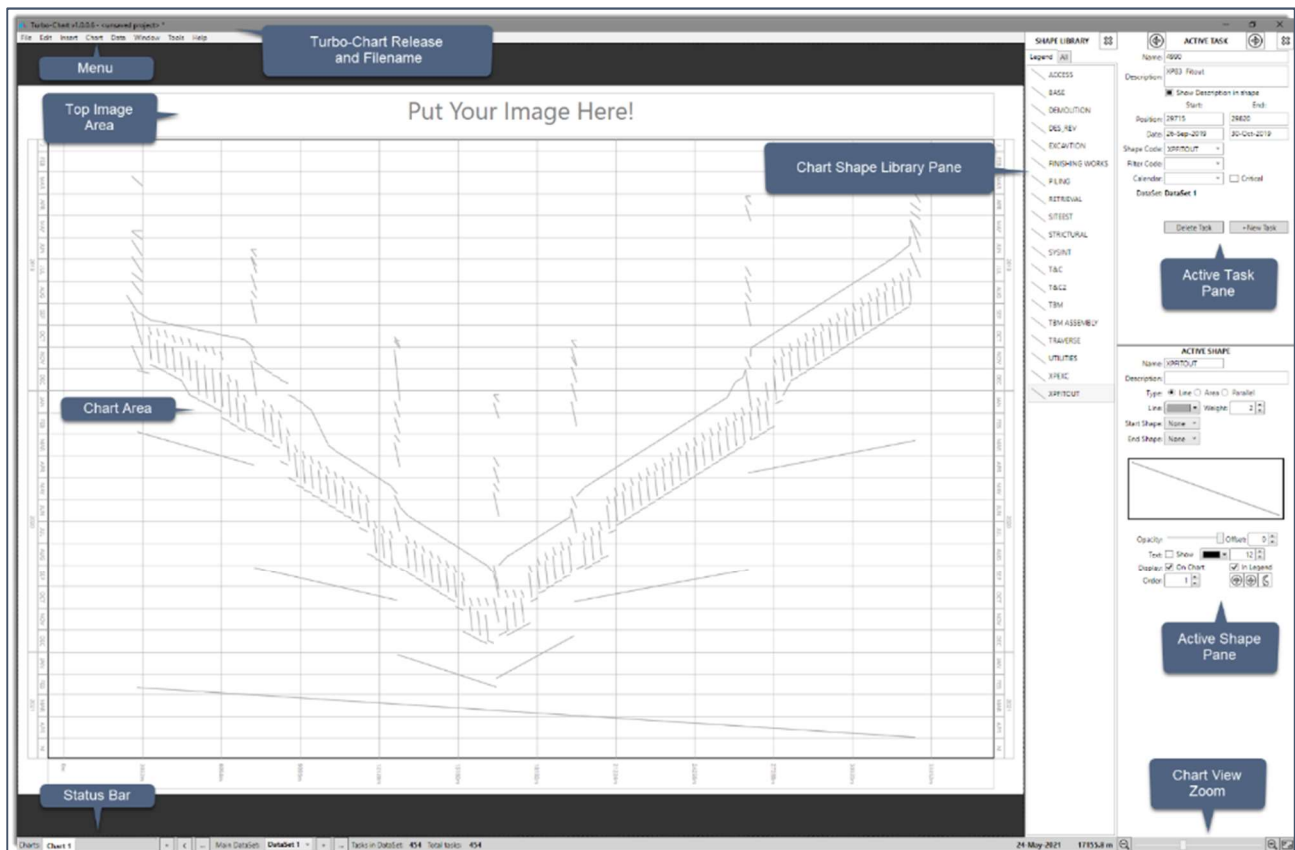
To modify any datasets name, click in the Name cell and edit. Use the **+ADD** and **Delete** buttons to create new datasets or to delete existing datasets. Further uses for datasets are detailed in this guide section “Adding datasets from updated spreadsheet/XER files”

Tips on Importing and Managing Datasets

- The task contents of any dataset can be viewed by selecting **Data > Tasks**
- Once data is imported into a dataset, any further imports require a new dataset to be added and selected.
- If a Dataset indicates a source, then the dataset can be synchronised (updated)
- If no source is shown, the dataset can only be updated manually, or by overwriting using the Spreadsheet Paste function
- Connection to databases allow existing datasets to be updated via Synchronisation
- Spreadsheet import requires headers that match the required format. Refer to the Sample data for a template XLS file.
- Spreadsheet pasting into existing data will overwrite fields where the “name” field is matched. If no existing name match exists, a new task will be added to the dataset.

NAVIGATING AROUND TURBO-CHART

Turbo-Chart consists of the following main areas of the Application window:



Turbo-Chart Release and Filename

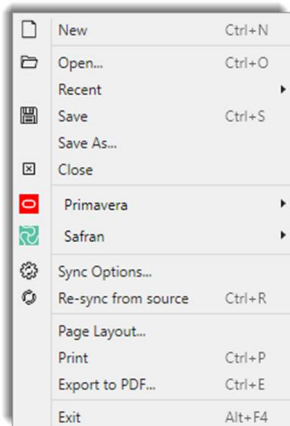
The top bar of the Turbo-Chart application window will show the current release of Turbo-Chart being used (Update options will be presented when launching Turbo-Chart if connected to the Internet and a later release is available).

The current filename of the Turbo-Chart file being used will also be shown, with an Asterisk (*) indicating unsaved changes exist for this file.

Menu

Additional functionality for Turbo Chart can be accessed from the menus as shown below:

File Menu



Edit Menu



Insert Menu

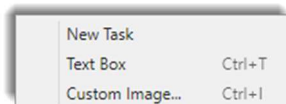
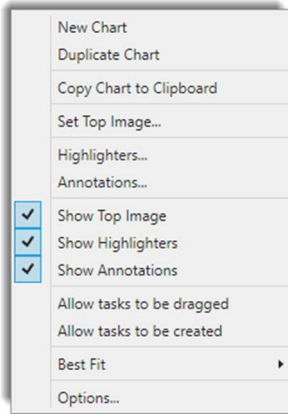
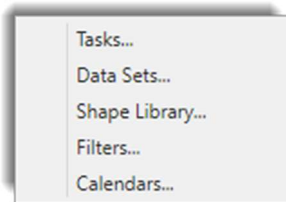


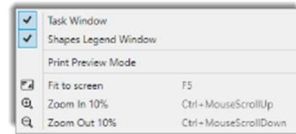
Chart Menu



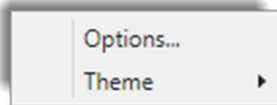
Data Menu



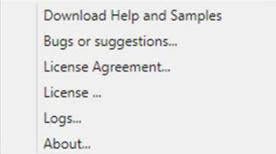
Window Menu



Tools Menu



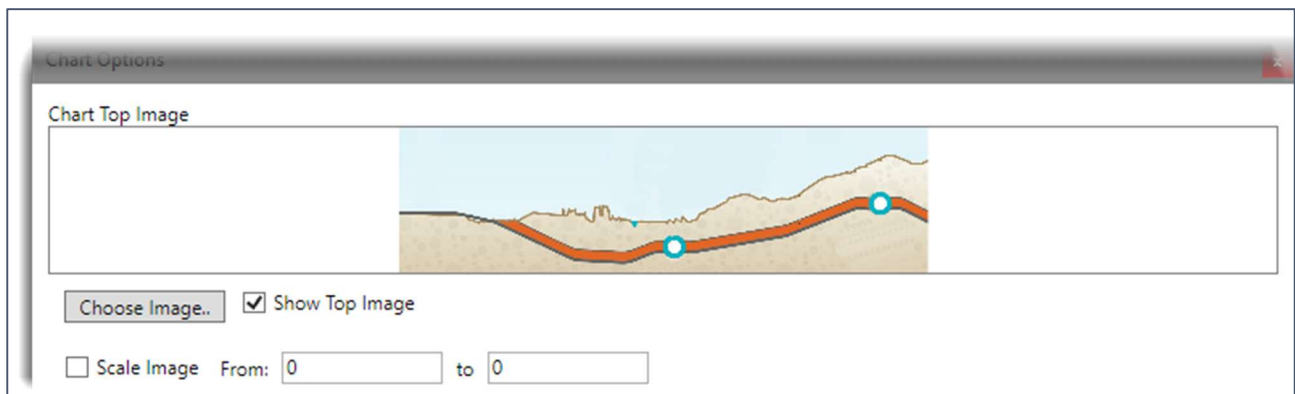
Help Menu



Top Image Area

Top images allow a graphic to be placed at the top of each chart to assist in representing the linear alignment of the project. Any *.png or *.jpg graphic image can be used, with best results obtained from a graphic that has a width:height ratio of 6:1 or more. Other images will be scaled to fit. Images can be added by either:

- Double Clicking on the top image area and selecting an image
- Selecting **Chart > Options** from the menu and setting options in the Chart Top Image area of the Chart Options



The Chart Options also sets the image to be displayed or not. And to fix the image extents within specified location values. **NOTE:** options for top images are chart specific, and may be changed for each chart in the current Turbo-Chart file.

Chart Area

The chart area displays the imported schedule tasks. Holding the mouse over any task provides key information about the task. Selecting a task also activates the **Active Task Pane** and **Active Shape Pane** with details of the selected task.

A number of options regarding the chart can be accessed by selecting **Chart > Options** from the Menu. **NOTE:** options for chart area are chart specific, and may be changed for each chart in the current Turbo-Chart file.

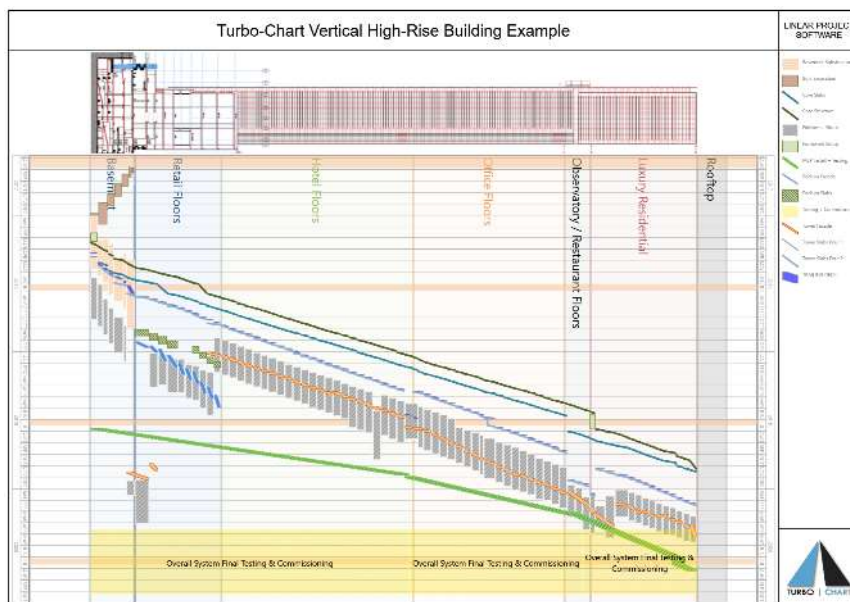
Chart Orientation allows the Chart to be **Horizontal** with the location axis being horizontal and time vertical, or, **Vertical** with the location axis running down the page and time in a horizontal. Similar to how a Gantt chart may appear.

Chart Options

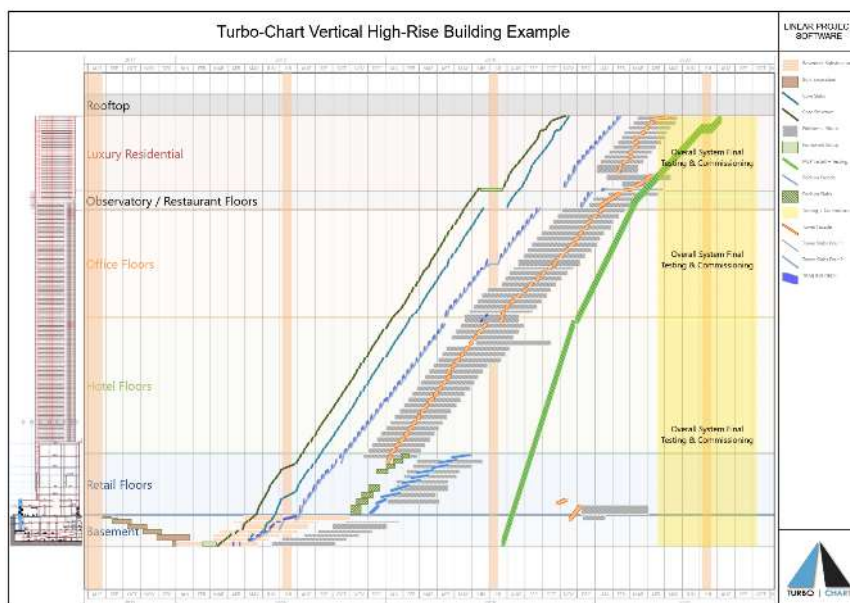
Chart Orientation

☒ Horizontal Chart (X:Distance, Y:Time)
 ☐ Vertical Chart (X:Time, Y:Distance)

Horizontal Chart Example:



Vertical Chart Example:



Timeline options configure the date axis:

☐ Scale Image
 From: 0 to 0

Timeline

Units: months

☒ Left ☒ Right

Background:

Text: 12

Year Line: 1

Month Line: 1

Week Line: 1

Position

Position options configures the Location axis:

Year Line: Month Line: Week Line:

Position

Units: ☐ Top ☒ Bottom Background Text

Line:

Prefix: Suffix: ☐ Reverse Axis

Range

Range options configures the location and date ranges to be displayed for the chart. Selecting Best Fit will ensure that all data contained within the dataset will be displayed:

Prefix: Suffix: ☐ Reverse Axis

Range

Dates From: To:

Pos'n From: To:

Options

Options allows critical tasks (defined as Total Float as zero or less) to be highlighted:

Pos'n From: To:

Options

☐ Highlight Critical Tasks

DataSets

Dataset Display options allow multiple datasets to be displayed, with options for the colour blending, transparency and location offset to be applied to the other datasets:

☐ Highlight Critical Tasks

DataSets

Main DataSet:

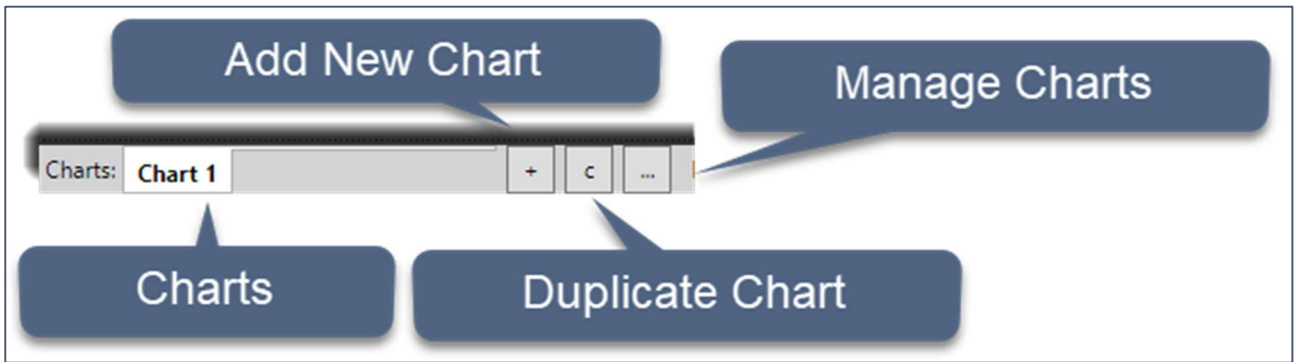
2nd DataSet: Blend 0% Opacity 0% Offset:

3rd DataSet: Blend 0% Opacity 0% Offset:

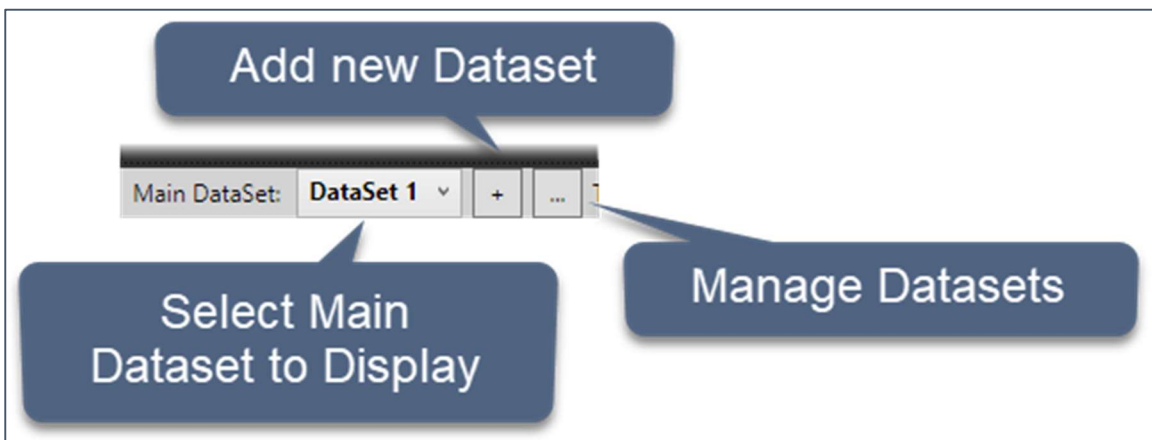
Status Bar

The status bar allows quick access to chart and dataset options, and provides general information.

Chart Options to create new charts, duplicate existing or manage charts, to rename or delete:



Dataset options to select the displayed dataset, add new datasets or manage datasets, to rename or delete

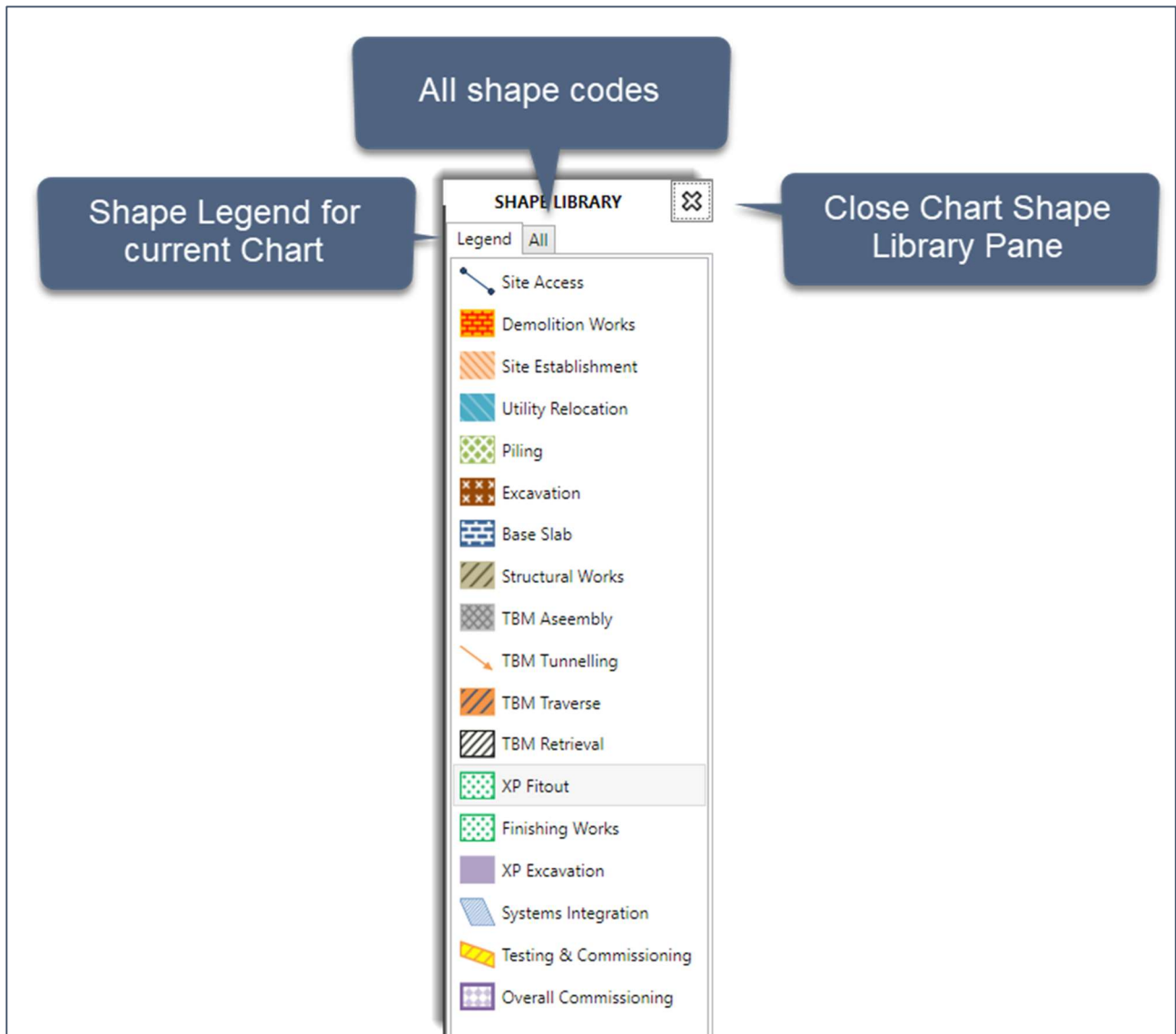


Additional information on the number of tasks and the location/date position of the mouse on the chart are also shown:



Chart Shape Library Pane

The chart shape library pane contains two tabs. The **Legend** tab presents the list of Shape codes to be displayed on the selected chart legend in Print Preview mode. **Note** options for legends are chart specific, and may be changed for each chart in the current Turbo-Chart file. The **All** tab lists all shape codes being used by all datasets contained in the current Turbo-Chart file.



Selecting an item in this pane, enables configuration of the shape code in the **Active Shape Pane**. To view the Chart Shape Library Pane once closed, select **Window > Shapes Legend Window**

Active Task Pane

The Active Task pane provides information about tasks that have been selected in the main Chart Area. Changes can be made to the values for tasks, and any modification to imported data will be highlighted in red.

The screenshot shows the 'ACTIVE TASK' pane with the following fields and controls:

- Task Selection Buttons:** Indicated by a callout pointing to the navigation icons (back, forward, and close) at the top of the pane.
- Imported Task Information:** Indicated by a callout pointing to the task details fields.
- Delete and Add New Tasks:** Indicated by a callout pointing to the 'Delete Task' and '+New Task' buttons at the bottom.

Task Details:

- Name: 4960
- Description: XP80 Fitout
- ☒ Show Description in shape
- Start: 28805
- End: 28905
- Position: 28805
- Date: 17-Oct-2019
- Shape Code: XPFITOUT
- Filter Code:
- Calendar:
- ☐ Critical
- DataSet: DataSet 1

Buttons: Delete Task, +New Task

Task selection buttons cycle through the next task on the chart in order of the date within the same shape code ("i.e. Across the chart, and then down the chart), and then progresses to the next Shapecode.

Tasks may also be deleted or created using the respective buttons.

Note All Task information can also be viewed by selecting **Data > Tasks** from the menu.

Active Shape Pane

When a task is selected in the Chart Area, or a ShapeCode is selected in the Chart Shape Library Pane, the details of the selected ShapeCode are displayed, from which modifications to details of that shape code can be made.

The screenshot displays the 'ACTIVE SHAPE' configuration window. It includes fields for 'Name' (XPFITOUT) and 'Description' (XP Fitout). The 'Type' is set to 'Area'. The 'Line' section shows a blue line with a weight of 2. The 'Fill' section shows a purple fill with a cross-hatch pattern and a weight of 4. The 'Start Shape' and 'End Shape' are both set to 'None'. A preview window shows a rectangular area with the specified fill and line. The 'Opacity' is set to 100% and 'Offset' is 0. The 'Text' section has 'Show' checked and a font size of 12. The 'Display' section has 'On Chart' and 'In Legend' both checked. The 'Order' is set to 1. A callout box points to the 'Legend' section, stating 'Legend arrows to set Order and position of Shape Legend'.

ShapeCode Details

ShapeCode Details (Chart Specific)

Legend arrows to set Order and position of Shape Legend

Note

- All ShapeCode information can also be viewed by selecting **Data > Shape Library** from the menu.
- Changing any shape property will affect all tasks across all charts using that ShapeCode
- Clicking the Legend removes the Active Task Pane, and only Active Shape Pane is selectable

Tips on Creating ShapeCodes in 2 Steps

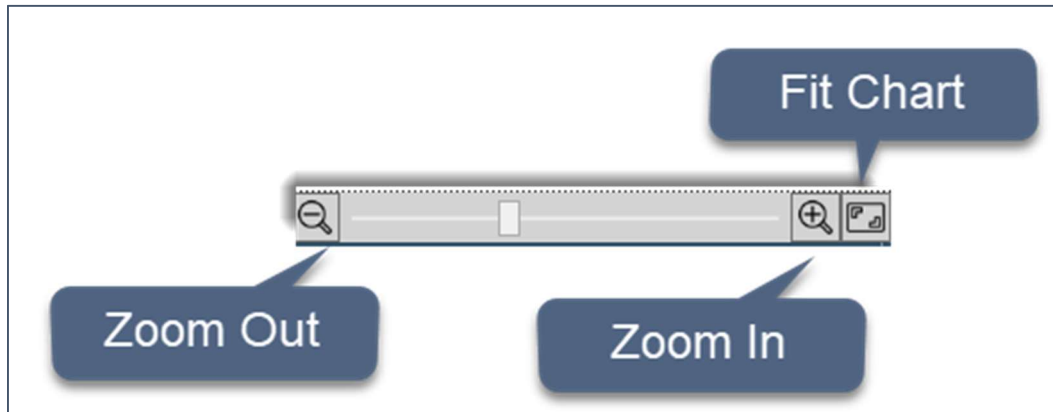
- Click on a task with a ShapeCode you want to copy
- In the Active Task Pane, Edit the Shape code

A New Shape code is created and assigned the selected task. that replicates the previously selected shape code settings

Chart View Zoom

Use the magnify buttons or slider bar to zoom in or out of the chart. Select **Fit Chart** to fit the entire chart onto the screen. Scrolling across the chart can also be achieved using the following actions:

- Holding CTRL+Mouse Wheel up/down to zoom in and out
- Mouse Wheel Moves Chart up and down if zoomed In.
- Holding SHIFT+Mouse Wheel to move left/right
- Hold ALT + Mouse Wheel to move up/down
- Click CTRL + Mouse on the timeline or location axis and move the mouse to zoom the ranges
- Click and Drag using Mouse on the timeline or location axis to shift the ranges



CUSTOMISING CHARTS

After importing data into Turbo-Chart, Time Location charts can be prepared by customising the following elements:

- **Shape Library:** display definitions for Shape Codes and to assigned tasks
- **Top Image:** insert a graphic used as reference against the location axis
- **Highlighters:** add text or shaded areas within set location and date ranges
- **Annotations:** add text or graphic annotations to the chart

Customising Shape Library

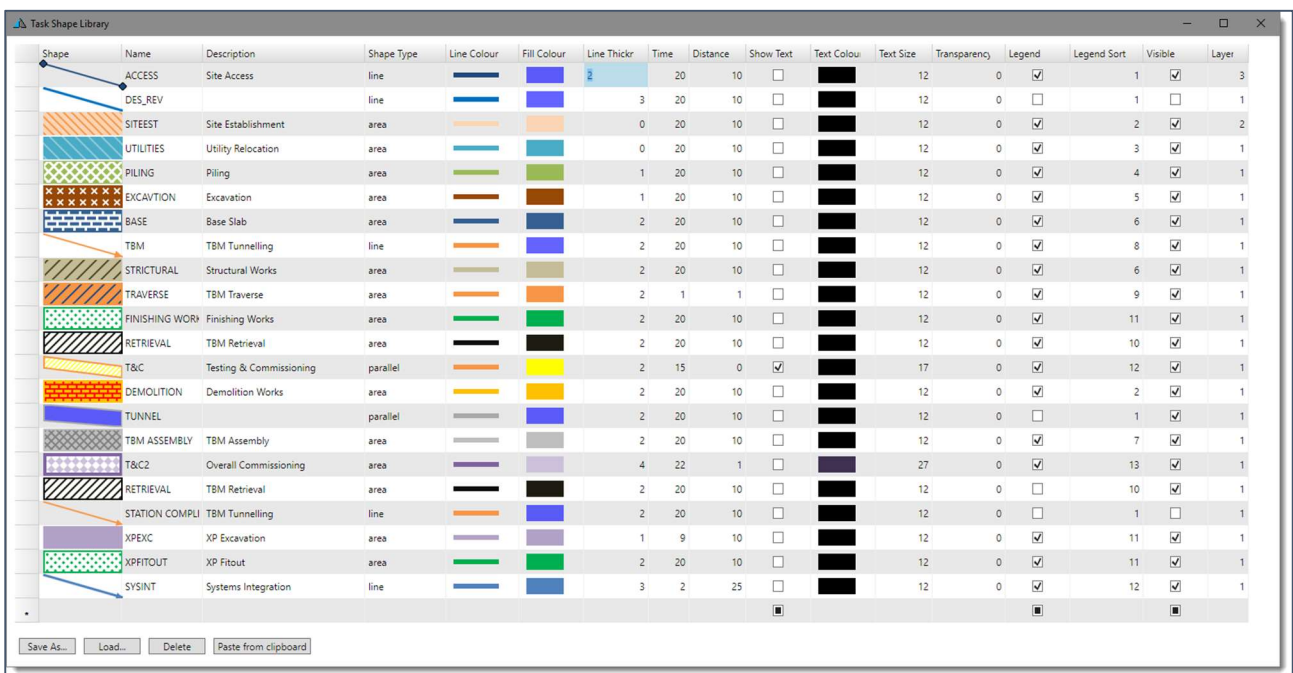
The shape library defines the properties applied for each ShapeCode in the dataset and to the tasks that are assigned to the respective ShapeCodes. These properties include:

- Shape description: text used in the chart legend (default is the shape code value)
- The shape type: Line, area or parallel
- Shape display settings for colour, line weight, fill patterns and start/end shapes

After importing data, there are three methods of customising the shape library

METHOD ONE: SHAPE LIBRARY

Select **DATA > Shape LIBRARY** from the menu to view the shape library window, from which all imported Task shape codes are displayed:



| Shape | Name | Description | Shape Type | Line Colour | Fill Colour | Line Thickr | Time | Distance | Show Text | Text Colour | Text Size | Transparency | Legend | Legend Sort | Visible | Layer |
|----------------|-------------------------|-------------|------------|-------------|-------------|-------------|------|----------|-------------------------------------|-------------|-----------|--------------|-------------------------------------|-------------|-------------------------------------|-------|
| ACCESS | Site Access | | line | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 3 |
| DES_REV | | | line | | | 3 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input type="checkbox"/> | | <input type="checkbox"/> | 1 |
| SITEEST | Site Establishment | | area | | | 0 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 2 |
| UTILITIES | Utility Relocation | | area | | | 0 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| PILING | Piling | | area | | | 1 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| EXCAVATION | Excavation | | area | | | 1 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| BASE | Base Slab | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| TBM | TBM Tunnelling | | line | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| STRUCTURAL | Structural Works | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| TRAVERSE | TBM Traverse | | area | | | 2 | 1 | 1 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| FINISHING WORK | Finishing Works | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| RETRIEVAL | TBM Retrieval | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| T&C | Testing & Commissioning | | parallel | | | 2 | 15 | 0 | <input checked="" type="checkbox"/> | | 17 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| DEMOLITION | Demolition Works | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| TUNNEL | | | parallel | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| TBM ASSEMBLY | TBM Assembly | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| T&C2 | Overall Commissioning | | area | | | 4 | 22 | 1 | <input type="checkbox"/> | | 27 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| RETRIEVAL | TBM Retrieval | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| STATION COMPLI | TBM Tunnelling | | line | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input type="checkbox"/> | | <input type="checkbox"/> | 1 |
| XPEXC | XP Excavation | | area | | | 1 | 9 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| XPFITOUT | XP Fitout | | area | | | 2 | 20 | 10 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |
| SYSINT | Systems Integration | | line | | | 3 | 2 | 25 | <input type="checkbox"/> | | 12 | 0 | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | 1 |

The Shape library window also allows saving and loading of Shape Library files, for exchanging with other Turbo-Chart files and users.

Shape Library values can also be copied and pasted into a spreadsheet for bulk data entry, either single rows of the shape library by selecting the left most cell, or selecting the entire shape library in the top left cell. Column headers must be included when copying from Spreadsheet and using the **Paste from clipboard** option.

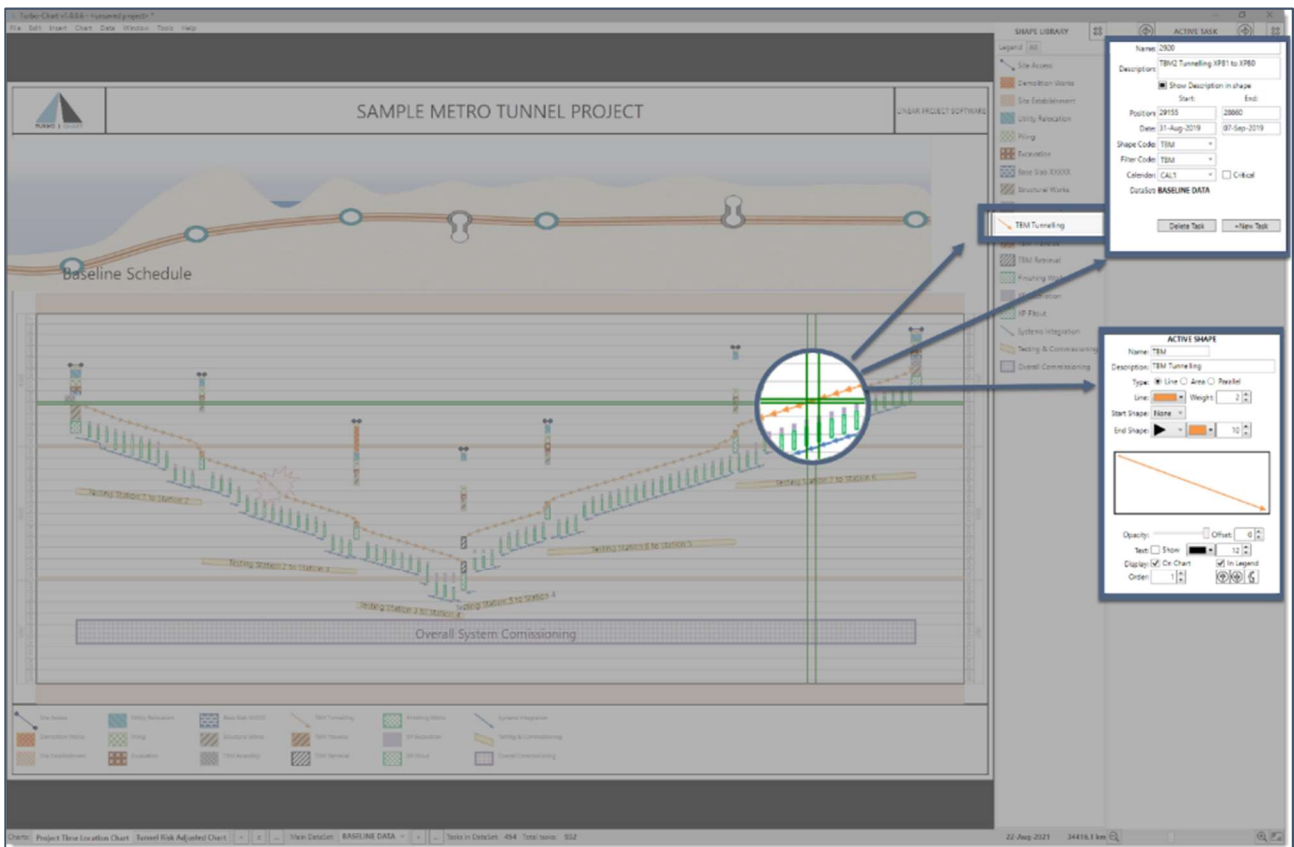
METHOD TWO: SELECTING CHART SHAPE LIBRARY LEGEND PANE

If the Chart Shape Library is not visible select **Window > Shapes Legend Window** from the menu

Selecting any Shape Library item from either the **Legend** or the **All** tabs of the Chart Shape Library Pane will display the selected ShapeCode Properties in the **Active Shape Pane**. From this screen, select the ShapeCode Details to apply to all charts, and the ShapeCode details that apply to only the selected chart on display.

METHOD THREE: TASK SELECTION

On the main chart area, selecting any task using the mouse will enable the task details in the **Active Task Pane** and the corresponding ShapeCode for that task in the **Chart Shape Library Pane** and **Active Shape Pane**



Specific tasks can also be selected by opening the Tasks listing by selecting **Data > Tasks**, choosing the required dataset tab and selecting the required task. Clicking the table headers also provides options for sorting and filtering.

Dataset Tabs

Header Filtering Options

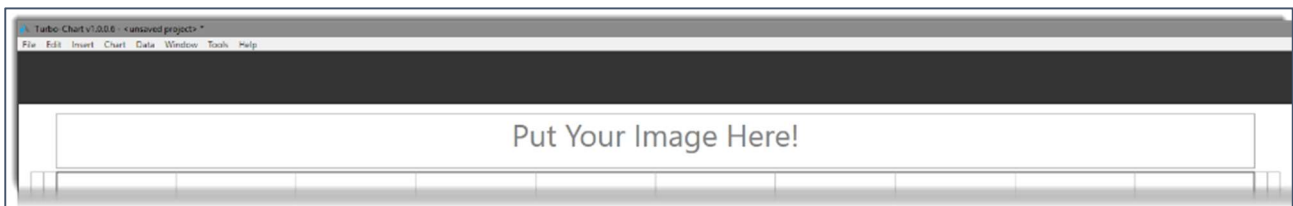
| Name | Description | ShapeCode | FilterCode | Start | End | Start Date | Finish Date | Calendar | Critical | Show Text |
|------|-----------------------------------|------------|------------|----------|----------|-------------|-------------|----------|-------------------------------------|-------------------------------------|
| 1030 | Access to | ACCESS | ACCESS | 2,610.0 | 3,010.0 | 23-May-2019 | 23-May-2019 | CAL1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 1040 | Access to | ACCESS | ACCESS | 7,200.0 | 7,400.0 | 17-Jun-2019 | 17-Jun-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1050 | Access to | ACCESS | ACCESS | 12,710.0 | 12,910.0 | 23-Oct-2019 | 23-Oct-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1990 | Access to | ACCESS | ACCESS | 16,520.0 | 16,720.0 | 06-Jan-2020 | 06-Jan-2020 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2000 | Access to | ACCESS | ACCESS | 19,510.0 | 19,710.0 | 22-Oct-2019 | 22-Oct-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2010 | Access to | ACCESS | ACCESS | 26,200.0 | 26,400.0 | 04-Apr-2019 | 04-Apr-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2020 | Access to | ACCESS | ACCESS | 32,530.0 | 32,930.0 | 14-Feb-2019 | 14-Feb-2019 | CAL1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3230 | Overall Sy | RETRIEVAL | RETRIEVAL | 2,810.0 | 32,730.0 | 16-Apr-2021 | 25-Jun-2021 | CAL1 | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| 1090 | Review & | DES_REV | DES_REV | 2,610.0 | 3,010.0 | 07-Mar-2019 | 21-Mar-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1110 | Review & Approve Station 2 Design | DES_REV | DES_REV | 7,200.0 | 7,400.0 | 27-Jun-2019 | 11-Jul-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1130 | Review & Approve Station 3 Design | DES_REV | DES_REV | 12,710.0 | 12,910.0 | 17-Oct-2019 | 31-Oct-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2070 | Review & Approve Station 4 Design | DES_REV | DES_REV | 16,520.0 | 16,720.0 | 02-Apr-2020 | 16-Apr-2020 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2080 | Review & Approve Station 5 Design | DES_REV | DES_REV | 19,510.0 | 19,710.0 | 14-Nov-2019 | 28-Nov-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2090 | Review & Approve Station 6 Design | DES_REV | DES_REV | 26,200.0 | 26,400.0 | 11-Jul-2019 | 25-Jul-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 2100 | Review & Approve Station 7 Design | DES_REV | DES_REV | 32,530.0 | 32,930.0 | 07-Mar-2019 | 21-Mar-2019 | CAL1 | <input type="checkbox"/> | <input type="checkbox"/> |
| 1270 | Station 1 Excavation | EXCAVATION | EXCAVATION | 2,610.0 | 3,010.0 | 20-Jul-2019 | 01-Aug-2019 | CAL1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

Buttons: Add Task, Delete Task(s), Resync all Tasks, Paste from Clipboard, DataSets..., Save and Close

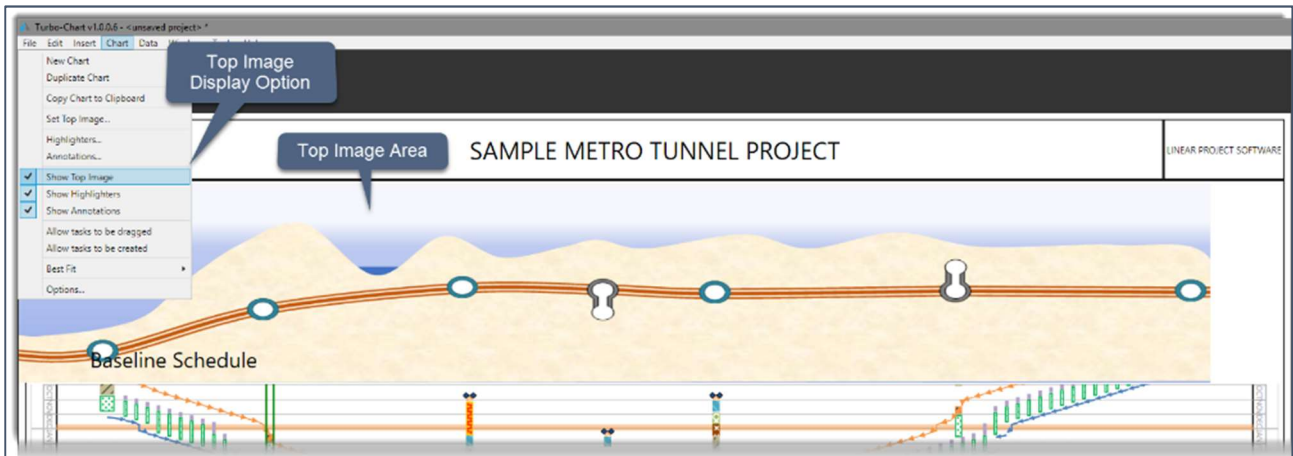
Top Image

The top image area of the chart allows a PNG or JPG graphic to be associated with the location axis of the main chart area. Graphics can be used to assist in representing the linear alignment of the project using long sections, aerial photos or schematic representations.

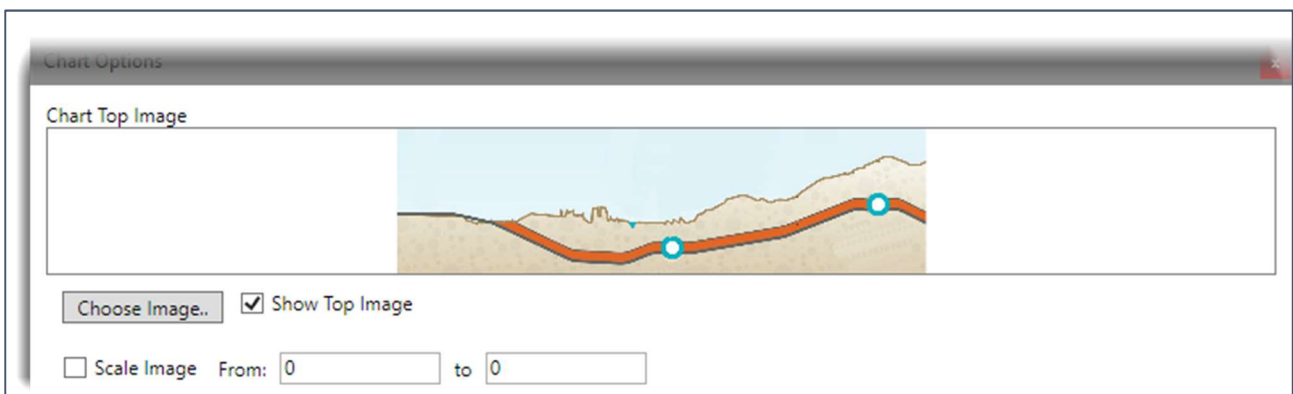
To add a top image, double click mouse in the area labelled “Put Your Image here” and select the graphic file to be added. For best results, the graphic should have a width to height ratio of 6:1 or greater.



To view or turn off the top image select **Chart > Show Top Image**



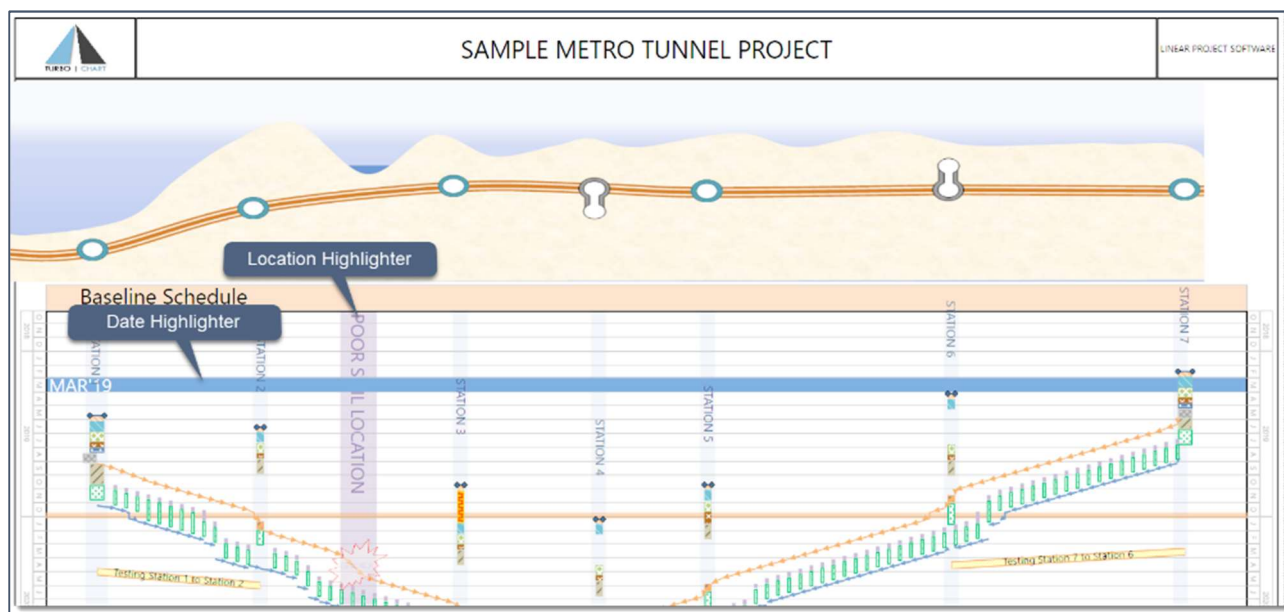
The top image can also be scaled and set to specific location values and remain fixed to those values if the location ranges are adjusted by selecting **Chart > Options** from the menu and setting options in the Chart Top Image area of the Chart Options



NOTE Top Image and Top Image options are specific to each chart.

Highlighters

Highlighters are used to add custom lines or shaded areas to the chart, and can be used to represent specific locations, dates or ranges of either. **NOTE** Highlighters displayed are specific to each chart in the Turbo-Chart file.



To modify Highlighters, select **Chart > Highlighters** to view the Highlighters options window

| Name | Display Text | Start Pos | End Pos | Start Date | Finish Date | Line Colour | Line Thickness | Fill Colour | Opacity | Text Colour | Text Size |
|-----------|--------------------|-----------|-----------|-------------|-------------|-------------|----------------|-------------|---------|-------------|-----------|
| STATION 1 | STATION 1 | 2,500.00 | 3,100.00 | | | | 0 | | 0.25 | | 12 |
| STATION 2 | STATION 2 | 7,100.00 | 7,500.00 | | | | 0 | | 0.25 | | 12 |
| STATION 3 | STATION 3 | 12,600.00 | 13,000.00 | | | | 0 | | 0.25 | | 12 |
| STATION 4 | STATION 4 | 16,400.00 | 16,800.00 | | | | 0 | | 0.25 | | 12 |
| STATION 5 | STATION 5 | 19,400.00 | 19,800.00 | | | | 0 | | 0.25 | | 12 |
| STATION 6 | STATION 6 | 26,100.00 | 26,500.00 | | | | 0 | | 0.25 | | 12 |
| STATION 7 | STATION 7 | 32,400.00 | 32,800.00 | | | | 0 | | 0.25 | | 12 |
| POOR SOIL | POOR SOIL LOCATION | 9,500.00 | 10,500.00 | | | | 0 | | 0.5 | | 30 |
| MARCH19 | MAR 19 | | | 01-Mar-2019 | 31-Mar-2019 | | 2 | | 1 | | 30 |

A Save As... B Load... C Add Date Highlighter D Add Location Highlighter E Delete

- The Highlighters option window also allows saving and loading of Highlighter files, for exchanging with other Turbo-Chart files and users
- Highlighter values can also be copied and pasted into a spreadsheet for bulk data entry, either single rows of the Highlighter by selecting the left most cell, or selecting all highlighters in the top left cell. Column headers must be included when copying from Spreadsheet and using the Paste from clipboard option
- Use the **Add Date Highlighter** or **Add Location Highlighter** to add new rows for highlighters
 - Date Highlighters contain no location values and will span over all locations on the chart
 - Location Highlighters contain no date values and will span over all dates on the chart
 - A Date highlighter line can be drawn by keeping the Finish Date cell value blank
 - A Location Highlighter line can be drawn by keeping the End Position cell value blank
- Select **Delete** to delete a highlighter row
- Press ok to close the highlighter options window

Annotations

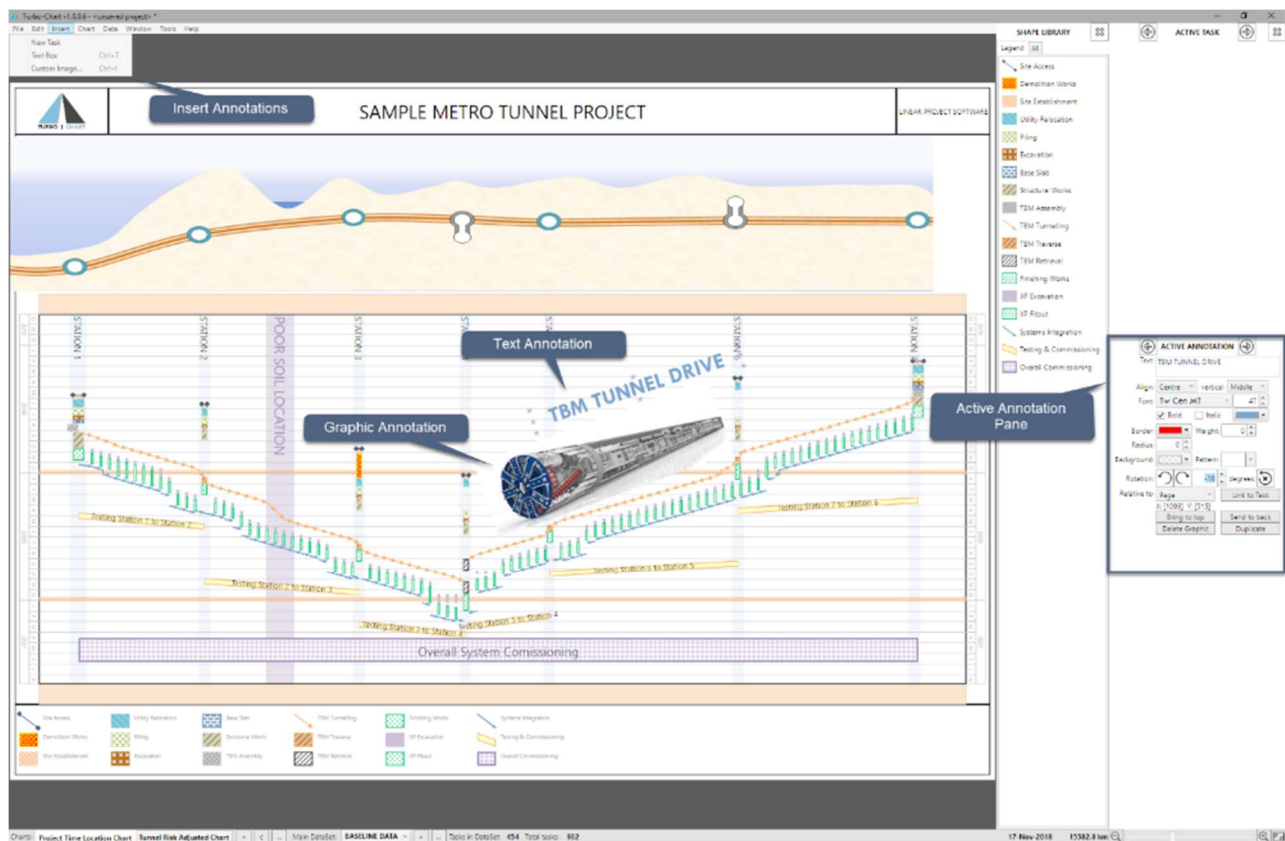
Annotations are used to add text or graphical elements to the chart, that can be positioned relative to:

- A position on the chart (ie does not move with date or location range changes)
- A position by date and location (ie moves with date or location range changes)
- A position relative to a specified task (ie moves as tasks dates or position changes)

NOTE Annotations displayed are specific to each chart in the Turbo-Chart file.

To view or switch off chart annotations select **Chart > Show Annotations** from the menu.

To add a new annotation, select **Insert** from the menu and select to insert a **text box** or a **Custom Image** (and then select the image file to be annotated). Alternatively, copy text or graphical elements from other applications and paste onto the chart using CTRL+V.



Select any annotation and modify its properties in the Active Annotations Pane

Annotation Text properties

Text: TBM TUNNEL DRIVE

Align: Centre vertical: Middle

Font: Tw Cen MT 47

☒ Bold ☐ Italic

Border: Red Weight: 0

Radius: 0

Background: Pattern:

Rotation: -18 degrees

Relative to: Page

Link to Task

Send to back

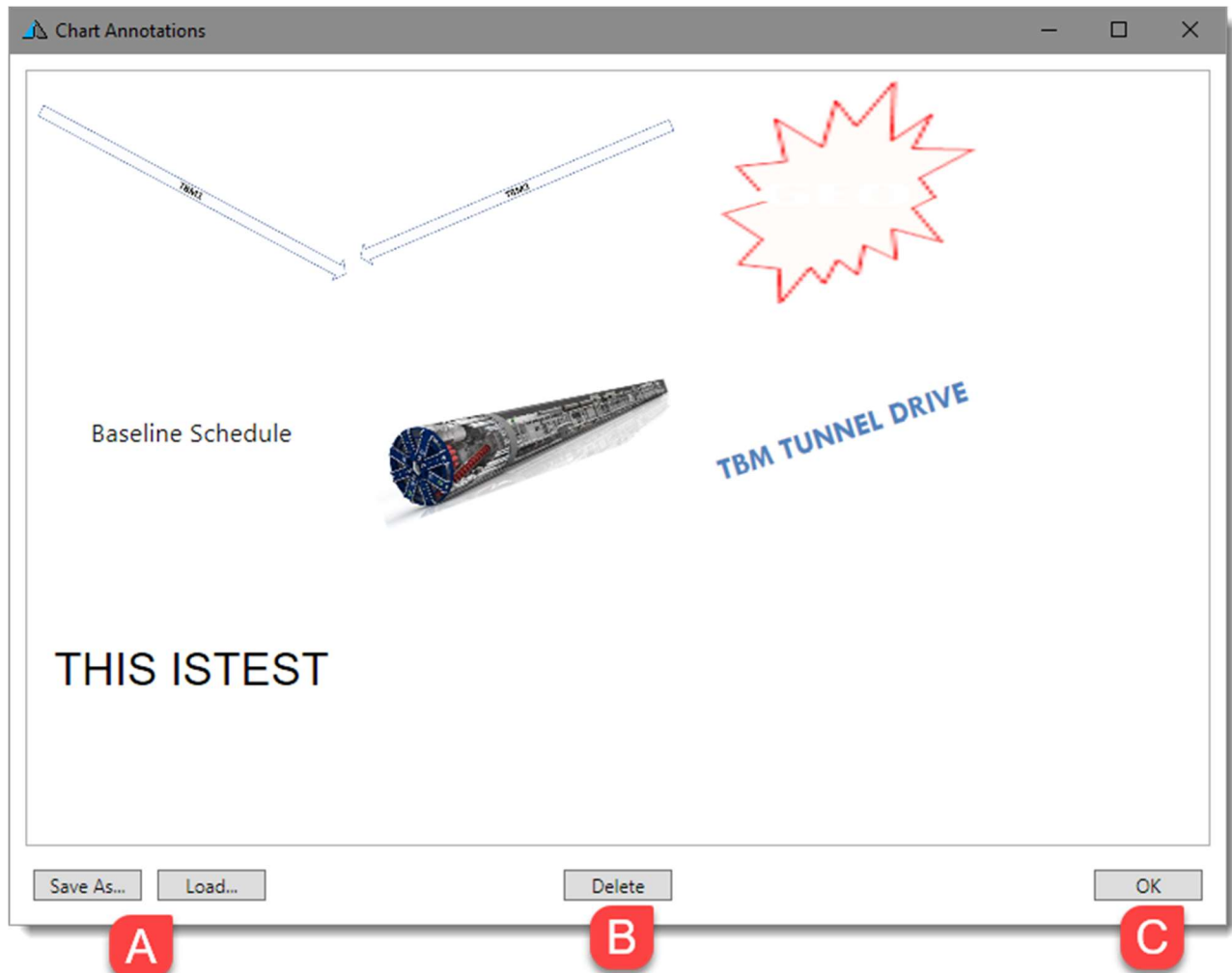
Duplicate

Annotation Properties

Annotation Positioning

To adjust positioning, select the required **Relative to** option and then position the annotation onto the required position on the chart. If **Relative to Page** is selected, then select **Link to Task** and click on the required task.

All annotations displayed on a chart are also viewable by selecting **CHART > ANNOTATIONS**



- A. Save and load sets of annotations, for exchanging with other Turbo-Chart files and users
- B. Delete an annotation by selecting it from the annotations window and selecting **Delete**
- C. Press ok to close the annotations window and return to the main chart

Time Location Chart Reporting with Turbo-Chart

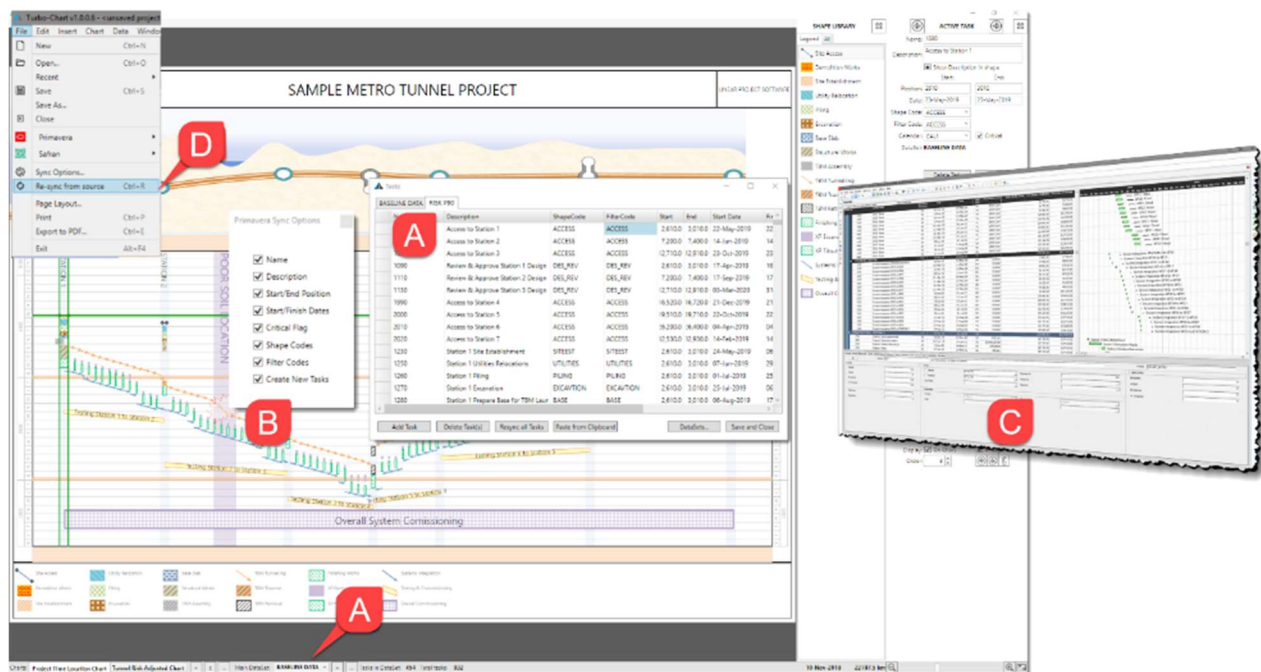
Once Data has been imported and a chart has been customised. Turbo-Chart includes a number of Time Location chart reporting features.

Synching data to a P6 database when connected

When connected directly to data from a P6 database, updates to the source project can be synchronised with the data contained in Turbo-Chart. **Note** importing data creates a new dataset, whereas synchronising updates an existing dataset.

Steps to synchronise data:

- Select the dataset to synchronise by selecting the required dataset tab from the **Data > Tasks** window or by selecting the Dataset from the status bar
- Select the data synchronisation options from the **File > Sync Options**. **Note:** selecting the option to “Create new tasks” will import any new tasks in the source project.
- After making schedule updates in P6, perform actions to commit data (eg. “F9” Scheduling) or press F10 to commit data to the P6 database
- In Turbo-Chart, select **File > Re-Sync from Source** or press **Ctrl + R**

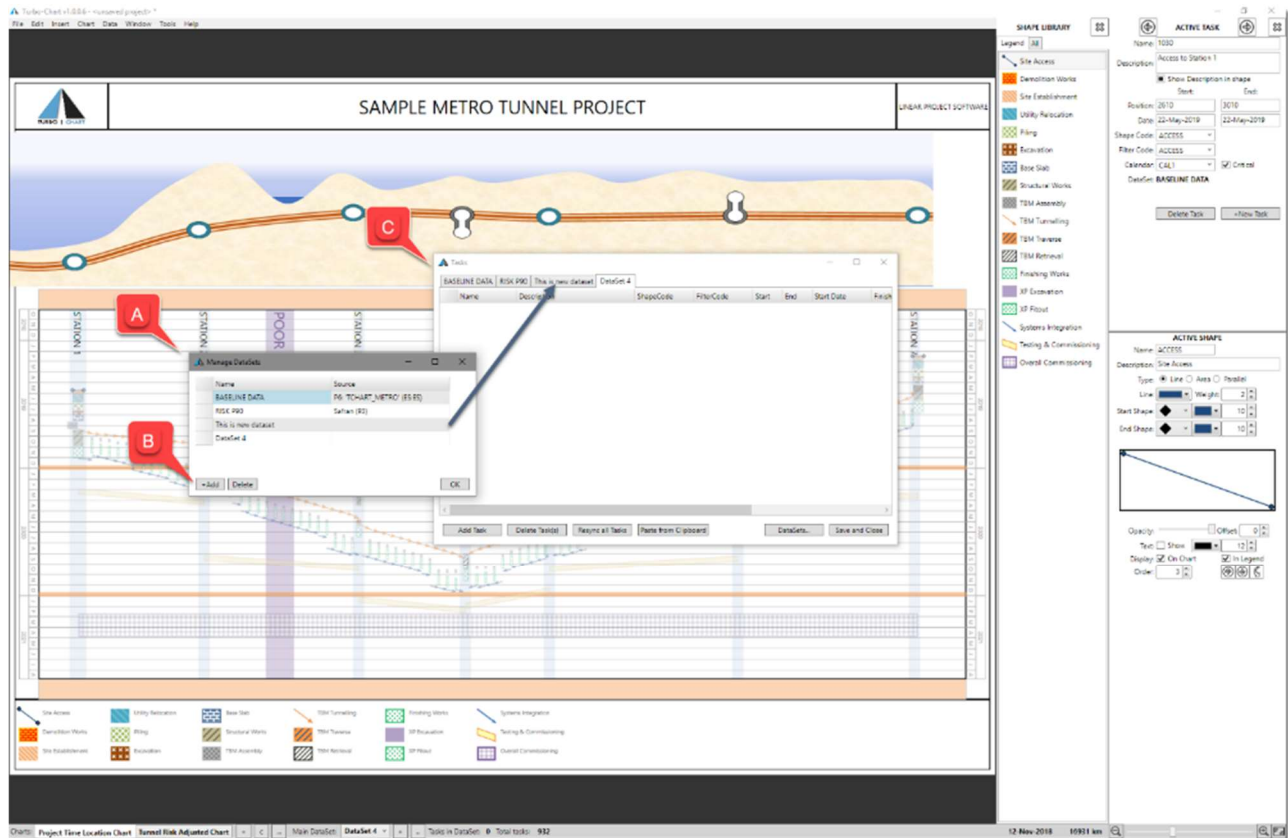


Adding datasets from updated spreadsheet/XER files

If synchronising is not an option available for the data to be used, new data from schedules can be imported as additional datasets. Turbo-Chart can contain as many datasets for displaying on Time Location charts as required by the user. Steps to create and populate additional datasets:

- Open the dataset options from **Data > Datasets**
- Select **+Add** to create a new dataset, rename this dataset to something easily identifiable
- Open the Tasks window from the menu by selecting **Data > Tasks**. Select the tab for the new dataset
- Import from source data as per usual into the newly created dataset

Note: If pasting data, pasted data updates where names match, or a new task will be added

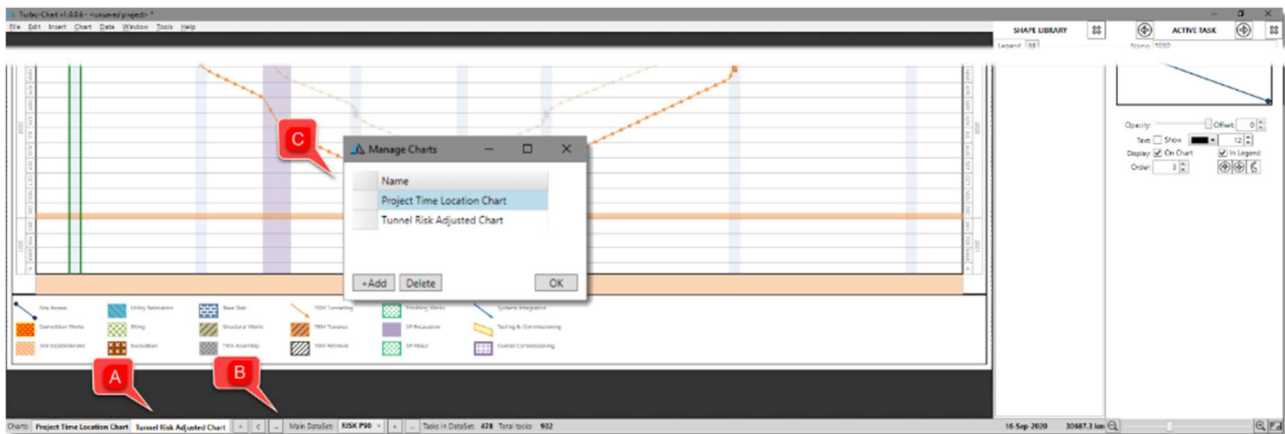


Duplicating Charts

An existing chart can be duplicated and customised to present alternative ShapeCodes from the shape library, different date and time ranges, different sets of highlighters and annotations or different datasets.

Steps to duplicate charts are:

- Select the chart to duplicate by clicking on the chart tab in the status bar,
- Select **Chart > Duplicate Chart** from the menu or click on **"C"** on the status bar. **Note** A new chart without any customisation can be selected by clicking on the **"+"** symbol.
- To modify the name or to delete an existing chart, select the **Chart Windows** button

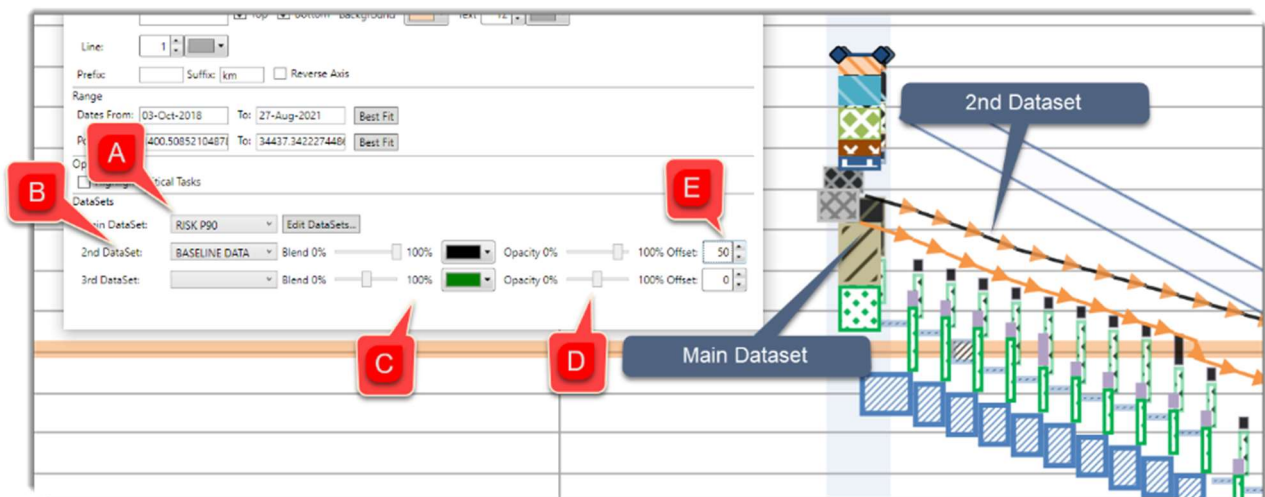


Displaying Multiple Datasets

Turbo-Chart can display multiple datasets on a single chart. This feature can be used to compare upto two additional datasets (eg, Baseline vs forecast). All datasets use the common shape library coding and use a common set of location values.

To display multiple datasets on a chart, select **Chart > Options** from the menu and select the options in the **Datasets** section of the chart options window:

- Select the Main dataset to display (use the Edit datasets option to rename if required)
- Select the 2nd and if required 3rd dataset to display.
- Select a colour and a percentage of blending to that colour for additional dataset
- Select the percentage of opacity (transparency) to apply to additional datasets
- If required select a value to offset/shift the additional datasets on the location axis. Displaying additional datasets with offsets, transposes the selected dataset by a a set location value (positive or Negative). This enables comparisons between datasets to occur where task sets are closely aligned by dates or locations but not to be completely overlapped.



Page Layouts and Print Previews

Page Layouts allow the addition of text boxes, images etc around the main chart area. The printing layout can be viewed by enabling Print Preview by selecting **Window > Print Preview Mode**. **Note** that legends for charts are only printed when using Print Preview Mode, and the page Layout being used is applied to all charts in the Turbo-Chart file.

To modify the Page Layout, select **File > Page Layout** from the menu



SET PAGE SIZE AND ORIENTATION

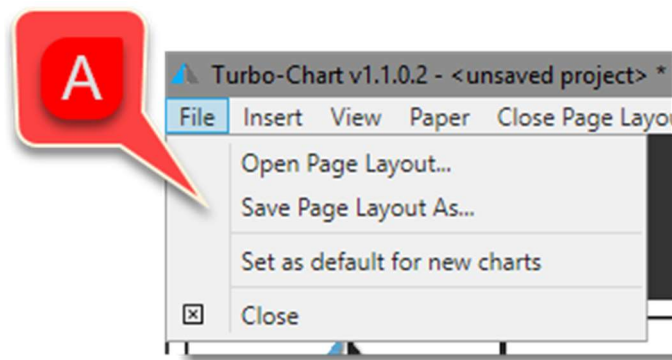
From the page layout menu select **Paper > Paper Size** or from the Layout Pane Select **Paper Size**

From the page layout menu select **Paper > Orientation** or from the Layout Pane Select Paper Orientation

All Margins and Positions of annotations for page layouts are based on values set from the Left/Right and Top/Bottom margins of the page, to ensure the page layout remains acceptable if page size or orientation is modified.

SAVING AND OPENING PAGE LAYOUTS

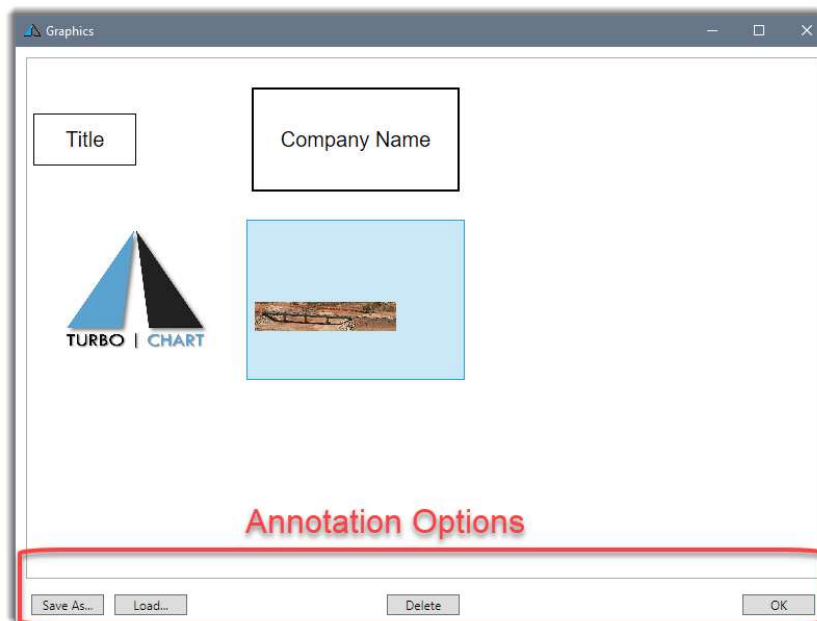
From the **File** menu, page layouts may be saved by selecting “**Save Page Layout**” and saving the resulting *.tcbpagelayout file onto an accessible directory.



Similarly select “**Open Page Layout**” to use a previously saved page layout file.

ANNOTATIONS | GENERAL

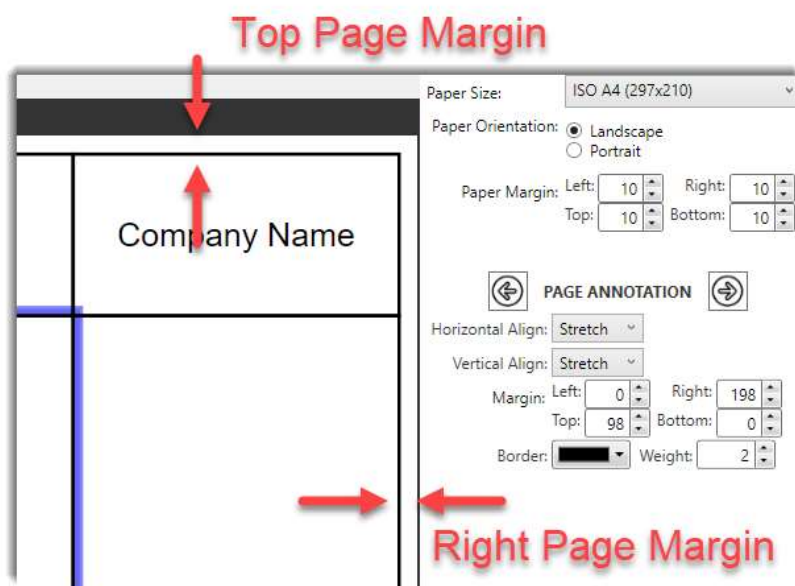
Annotations are text blocks or graphics added to a page layout in addition to the chart and legend. All Annotations saved with the current layout can be viewed by selecting **View > Annotations**



Any annotation (except the Legend and Main Chart) can be deleted by selecting the text block or graphic and then clicking on **Delete**. Press **OK** to close.

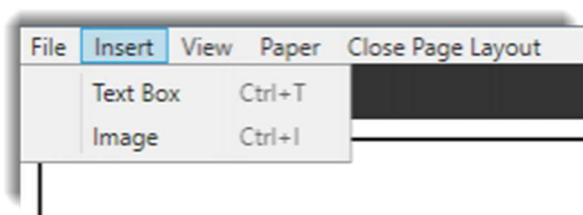
ANNOTATIONS | DEFINE PAGE MARGINS

All annotation size and positions are defined relative to the page size in pixel values. Page margins set the boundaries within the page size from which all other annotation objects are offset.



ANNOTATIONS | ADDING NEW TEXT BLOCK OR GRAPHICS

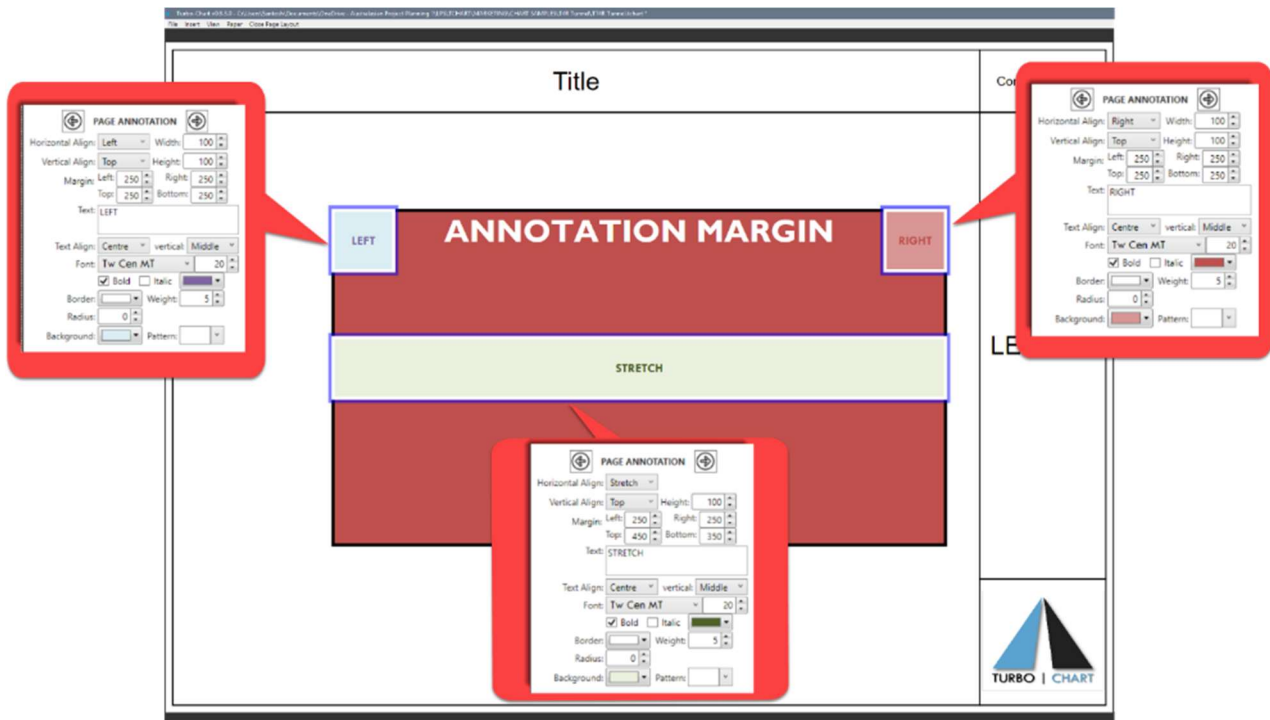
1. From the menu select INSERT then click on textbox or Image



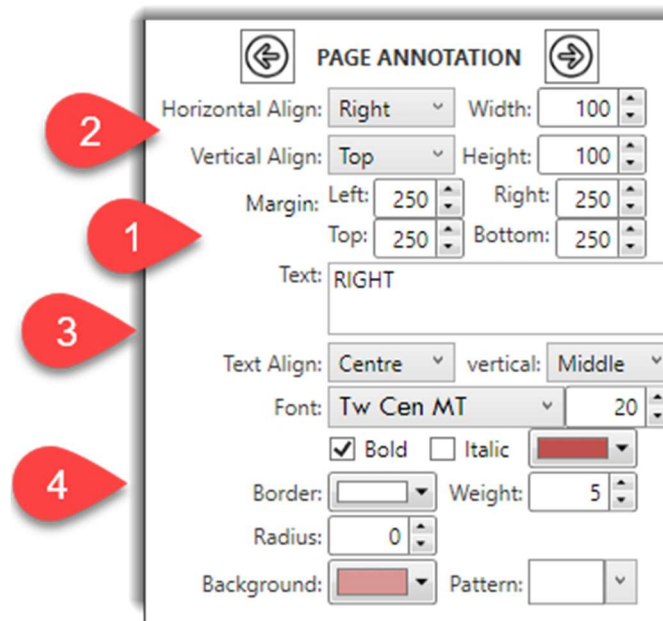
2. If Image is selected, select the image file from the file explorer window
3. Select the text block or image by clicking on it inside the layout screen, the annotation details will be displayed on the layout pane

ANNOTATIONS | POSITION AND SIZE

Text blocks and Graphics are positioned by specifying their own margins (within the page margin).



Each annotation is then aligned horizontally or vertically. If **STRETCH** option is selected, the annotation size will be automatically expanded to fit within the margins specified. If the alignment is set to a value other than stretch ie. Vertically **TOP/BOTTOM** or horizontally **LEFT/RIGHT**, then the option to set the annotation width or height is available.

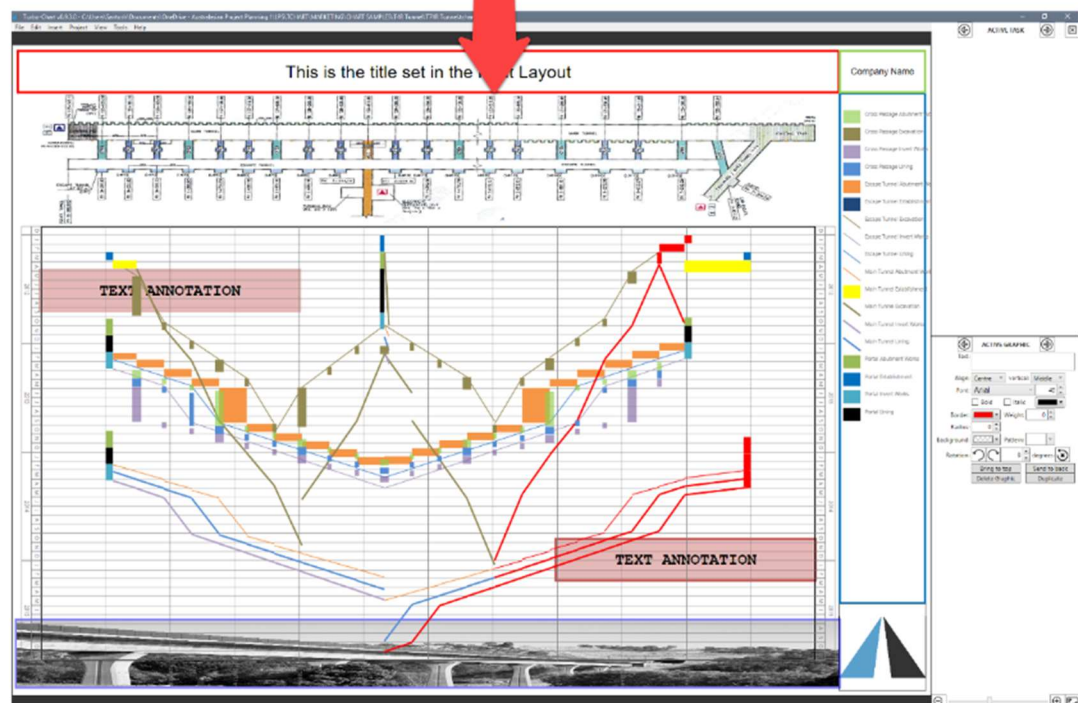
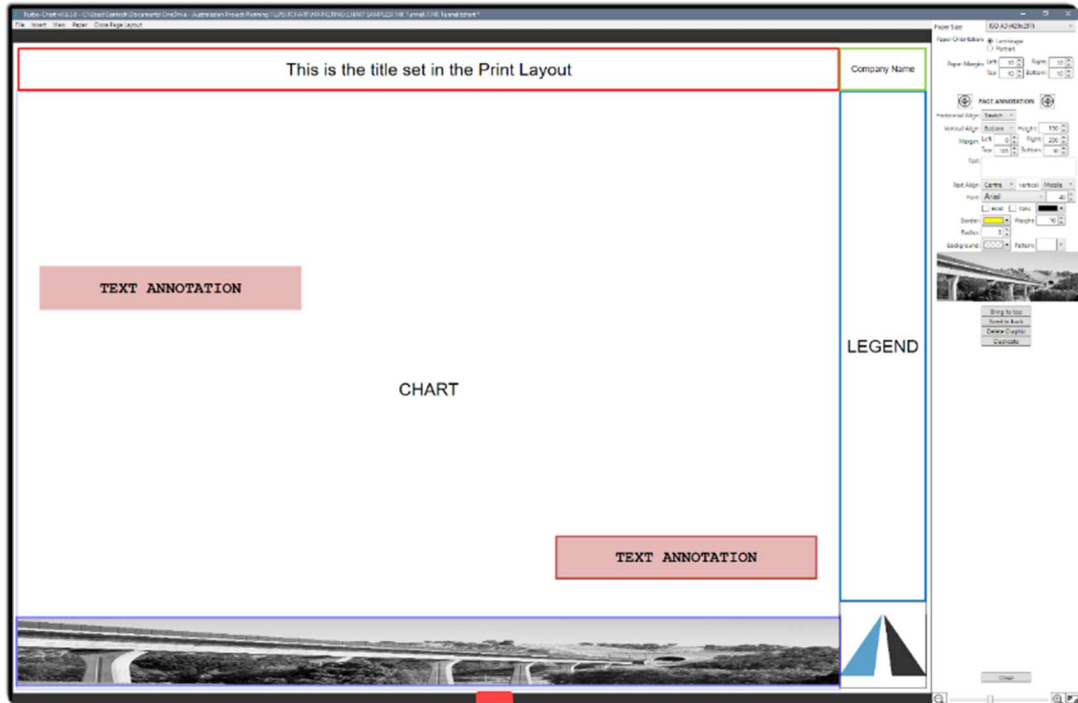


1. Define the annotation margin, this sets the area within which the text block or image will be positioned
2. Select how the annotation will be positioned within the margin area:
 - Stretch will fill the horizontal/vertical area within the margin
 - Right/Left will align correspondingly, and allow setting the annotation width
 - Top/Bottom will align correspondingly, and allow setting the annotation height
3. Define text and text properties, image annotations can include text placed over the image
4. Set other properties for the annotation including border and background colours etc.
5. Click on **CLOSE** to return to the chart view, or select **CLOSE PRINT PREVIEW** from the menu

LAYOUTS | PREVIEWING

The chart view does not by default display annotations from the chart layout. To view the layout select **VIEW>PRINT PREVIEW**. **Note** that:

- Chart Text and Graphics may be modified in Chart View, Layout annotations (text and images) cannot be modified from the print preview.
- In Print Preview the legend is displayed as per the print preview (the VIEW>LEGEND setting does not apply in print preview)



PRINTING

Turbo Chart offer two options for exporting Chart or Layout

- As an image file by selecting **EDIT>COPY VIEW TO CLIPBOARD** and pasting into other applications
- Export as a PDF file by selecting **FILE>EXPORT to PDF**.

Saving/Exchanging Turbo-Chart files

Turbo-Chart files are saved as *.tchart files and contain all the information to produce Charts from Turbo-Chart, including:

- Task (Activity) data
- Shape Libraries
- Top Images
- Highlighters
- Annotations
- Datasets
- Multi-Chart Definitions

In addition to the whole Turbo-Chart file, individual elements of Turbo-Chart can also be exchanged via files:

- *.tchart Turbo-Chart Data file
- *.tclib Turbo-Chart Shape Library file
- *.tchiliter Turbo-Chart Highlighter file
- *.tcgraphics Turbo-Chart Annotations File
- *.tcpagelayout Turbo-Chart Page Layout File

FURTHER HELP

The Latest release of Turbo-Chart and Changes to releases are listed on:

<http://www.turbo-chart.com/changelog>

The Turbo-Chart website contains a knowledgebase containing articles, guides and videos that provide additional reference material:

<http://www.turbo-chart.com/knowledgebase/>

Any further queries can be addressed via email to:

support@linearprojectsoftware.com



<http://www.turbo-chart.com>

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Table 1