

User manual

Traffic sign structures (TraSiS V4.1)

December 2020

Copyright

© The State of Queensland (Department of Transport and Main Roads) 2020.

Licence



This work is licensed by the State of Queensland (Department of Transport and Main Roads) under a Creative Commons Attribution (CC BY) 4.0 International licence.

CC BY licence summary statement

In essence, you are free to copy, communicate and adapt this work, as long as you attribute the work to the State of Queensland (Department of Transport and Main Roads). To view a copy of this licence, visit: <https://creativecommons.org/licenses/by/4.0/>

Translating and interpreting assistance



The Queensland Government is committed to providing accessible services to Queenslanders from all cultural and linguistic backgrounds. If you have difficulty understanding this publication and need a translator, please call the Translating and Interpreting Service (TIS National) on 13 14 50 and ask them to telephone the Queensland Department of Transport and Main Roads on 13 74 68.

Disclaimer

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained within. To the best of our knowledge, the content was correct at the time of publishing.

Feedback

Please send your feedback regarding this document to: tmr.techdocs@tmr.qld.gov.au

Contents

- 1 Introduction to the Manual.....1**
- 1.1 About this User Manual 1
 - 1.1.1 *The purpose of this Manual*.....1
 - 1.1.2 *Acronyms used in this User Manual*.....1
 - 1.1.3 *Referenced documents*1
- 2 Introduction to TraSiS2**
- 2.1 Menus 3
 - 2.1.1 *File menu*.....3
 - 2.1.2 *Edit menu*6
 - 2.1.3 *Help menu*8
- 3 Design procedures9**
- 3.1 Sign details entry form 9
- 3.2 Roadside environment entry form 10
- 4 Main window..... 14**
- 4.1 Technical design data..... 15
 - 4.1.1 *Support details*..... 15
 - 4.1.2 *Footing details* 23
 - 4.1.3 *Sign and stiffener details* 24
 - 4.1.4 *Post type selection* 25
 - 4.1.5 *Message box* 26
- 5 Sign storage 27**
- 5.1 Storage department 27
- 5.2 How to save a sign in a custom database 28
- 6 Clear zone..... 32**
- 6.1 Understanding clear zone 32
- 6.2 Clear zone window 33
 - 6.2.1 *Parameters* 33
 - 6.2.2 *Clear zone distance*..... 34
- 7 Printing 35**
- 7.1 Accessing the print commands 35
 - 7.1.1 *How to print design and summary forms*..... 35
 - 7.1.2 *How to print order forms*..... 39
- 8 Warnings and errors..... 40**

Tables

- Table 1.1.2 – Acronyms..... 1
- Table 8 – Warnings and errors..... 40

Figures

- Figure 2 – Installation screen 2

Figure 2.1 – Main menu.....	3
Figure 2.1.1(a) – New	3
Figure 2.1.1(b) – Open	4
Figure 2.1.1(c) – Close	4
Figure 2.1.1(d) – Save.....	4
Figure 2.1.1(e) – Save As.....	5
Figure 2.1.1(f) – Rename	5
Figure 2.1.1(g) – Delete.....	5
Figure 2.1.1(h) – Print.....	6
Figure 2.1.1(i) – Exit	6
Figure 2.1.2(a) – Sign details	6
Figure 2.1.2(b) – Environmental conditions.....	7
Figure 2.1.2(c) – Stiffener spacing	7
Figure 2.1.2(d) – Notes.....	7
Figure 2.1.2(e) – Clear zone.....	7
Figure 2.1.2(f) – Default values	8
Figure 2.1.3 – Help: About TraSiS	8
Figure 3.1(a) – Job details.....	9
Figure 3.1(b) – Roadside slope details: Define the roadside geometry	10
Figure 3.1(c) – Sign panels: Specify the details of the sign face	10
Figure 3.2(a) – Roadside environment form.....	11
Figure 3.2(b) – Wind region.....	11
Figure 3.2(c) – Soil type	12
Figure 3.2(d) – Guide to foundation strength selection	12
Figure 3.2(e) – Soil description	13
Figure 3.2(f) – Slip base	13
Figure 4(a) – Main window	14
Figure 4(b) – Data field adjustment	14
Figure 4.1.1(a) – Number of support posts	15
Figure 4.1.1(b) – Adjust number of posts	15
Figure 4.1.1(c) – Spacing between the support posts.....	16
Figure 4.1.1(d) – Adjust post spacing.....	16
Figure 4.1.1(e) – Clearance above road edge	17

Figure 4.1.1(f) – Adjust clearance above road edge	17
Figure 4.1.1(g) – Distance from carriageway	18
Figure 4.1.1(h) – Adjust distance from carriageway.....	18
Figure 4.1.1(i) – Kerb post length.....	19
Figure 4.1.1(j) – Post lengths	19
Figure 4.1.1(k) – Stub length.....	20
Figure 4.1.1(l) – Post dimensions.....	20
Figure 4.1.1(m) – Post wall thickness	21
Figure 4.1.1(n) – Post grade.....	21
Figure 4.1.1(o) – Slip base required.....	22
Figure 4.1.1(p) – Stiffener type.....	22
Figure 4.1.2(a) – Diameter of hole / screw	23
Figure 4.1.2(b) – Change footing type.....	23
Figure 4.1.2(c) – Depth of hole / length of screw	24
Figure 4.1.3(a) – Sign and stiffener details	24
Figure 4.1.3(b) – Stiffener spacing options	24
Figure 4.1.3(c) – Stiffener spacing	25
Figure 4.1.4(a) – Circular hollow section steel	25
Figure 4.1.4(b) – Rectangular hollow section steel	25
Figure 4.1.5 – Message box: warnings and / or errors.....	26
Figure 5.1(a) – Database.....	27
Figure 5.1(b) – Renaming.....	27
Figure 5.1(c) – Job management	28
Figure 5.1(d) – Storage commands.....	28
Figure 5.2(a) – Step 1.....	29
Figure 5.2(b) – Step 2.....	29
Figure 5.2(c) – Step 3.....	30
Figure 5.2(d) – Step 4.....	30
Figure 5.2(e) – Step 5.....	30
Figure 5.2(f) – Step 6.....	31
Figure 6.1(a) – Clear zone.....	32
Figure 6.1(b) – Clear zone module.....	32
Figure 6.2 – What is seen.....	33

Figure 6.2.1(a) – Road curvature	33
Figure 6.2.1(b) – Barrier distance.....	34
Figure 6.2.1(c) – Speed environment.....	34
Figure 6.2.1(d) – Annual Average Daily Traffic Flow	34
Figure 6.2.2(a) – Level terrain	34
Figure 6.2.2(b) – Actual terrain.....	34
Figure 7.1 – Printing forms available.....	35
Figure 7.1.1(a) – Print selection	36
Figure 7.1.1(b) – Print job selection: Design form.....	36
Figure 7.1.1(c) – Notes page.....	37
Figure 7.1.1(d) – Summary form	38
Figure 7.1.2 – Order form.....	39

Amendment register**December 2020**

Section	Details type
1.1.1	Editorial
2	Editorial
3.1	Editorial
5.1	Note and additional information about databases added.
5.2	New section added to explain how to save a sign in a custom created database.
8	Explanation of what to do when a sign can't be saved to the default database added.

1 Introduction to the Manual

1.1 About this User Manual

1.1.1 The purpose of this Manual

Audience

This *User Manual* is intended for designers using the TraSiS V4.1 software program for the design of roadside sign support structures.

Reader skills

The *User Manual* assumes that the reader has a basic knowledge of the sign design procedures as outlined in Transport and Main Roads' *Traffic and Road Use Management (TRUM) manual Volume 3 Signing and Pavement Marking Part 5 Design Guide for Roadside Signs*.

Expected outcome

After studying this *User Manual*, the reader should be able to:

- create a new sign structure
- understand the sign storage feature
- print forms, and
- interpret warnings and errors.

1.1.2 Acronyms used in this User Manual

The acronyms in this *User Manual* are listed in Table 1.1.2:

Table 1.1.2 – Acronyms

Acronym	Details
AADT	Annual Average Daily Traffic Flow
CHS	Circular Hollow Section
RHS	Rectangular Hollow Section
TraSiS	Traffic Sign Structures

1.1.3 Referenced documents

- [Standard Drawing SD1363 Traffic Sign – Multiple Traffic Sign Support](#)
- [TRUM Volume 3 Signing and Pavement Marking Part 5 Design Guide for Roadside Signs](#).

2 Introduction to TraSiS

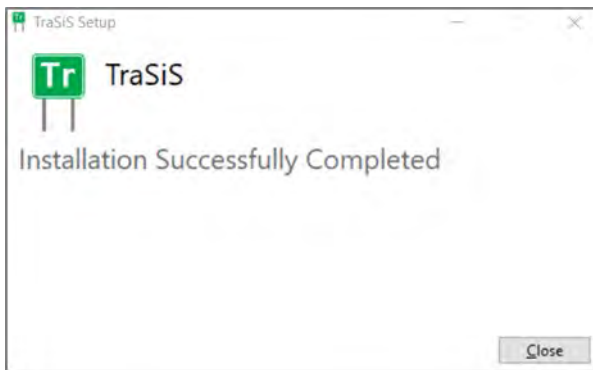
TraSiS V4.1 is a program developed by the Department of Transport and of Main Roads to assist in the design of roadside sign support structures. It is used in conjunction with TRUM Volume 3 Part 5.

Installing TraSiS

Download the TraSiS application zip file (32-bit or 64-bit options) from the Department of Transport and Main Roads website <https://www.tmr.qld.gov.au/business-industry/Road-systems-and-engineering/Software/TraSiS> to an appropriate folder on your hard drive. Extract the zipped files from that folder and run the TraSiSSetup.exe file or TraSiSSetup_x64.exe file. The program will automatically download and create a new default folder called 'TMR' in C:\Program Files (x86) located on your hard drive.

After installation is complete, you will see the screen shown in Figure 2.

Figure 2 – Installation screen



Select **Close** to begin using the program. Once the program is loaded, the **Title** bar becomes active and the main menu available.

2.1 Menus

If you are a first-time user, take some time to become familiar with the menus shown in Figure 2.1.

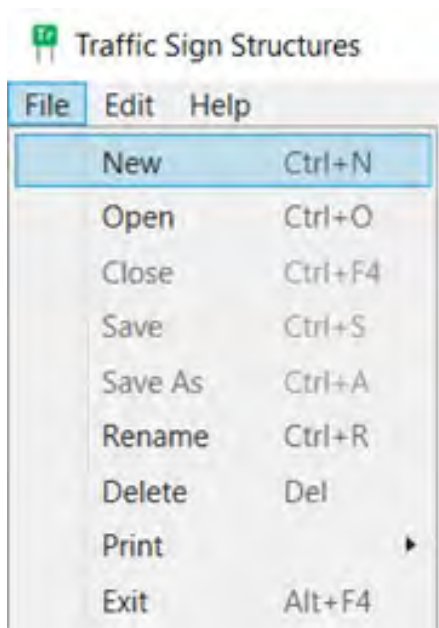
Figure 2.1 – Main menu



2.1.1 File menu

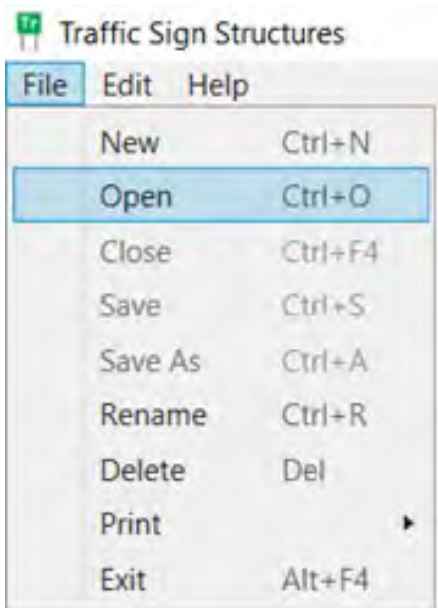
To create a new sign, select **New** as shown in Figure 2.1.1(a).

Figure 2.1.1(a) – New



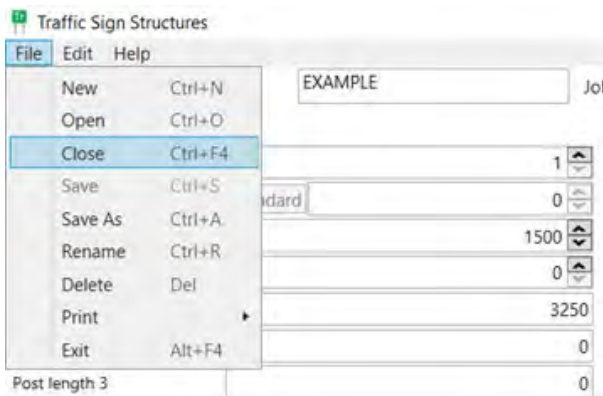
To open a file created previously, select **Open** as shown in Figure 2.1.1(b).

Figure 2.1.1(b) – Open



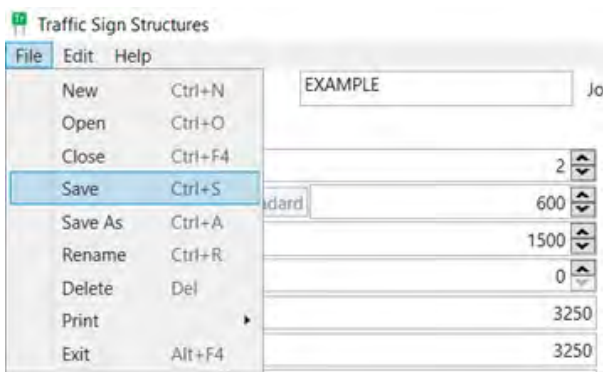
To close a current file, select **Close** as shown in Figure 2.1.1(c).

Figure 2.1.1(c) – Close



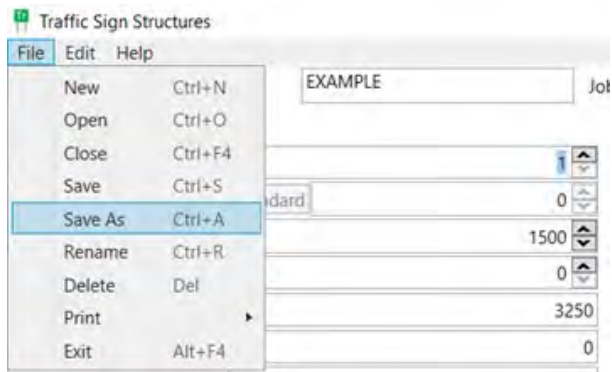
To save a current file, select **Save** as shown in Figure 2.1.1(d).

Figure 2.1.1(d) – Save



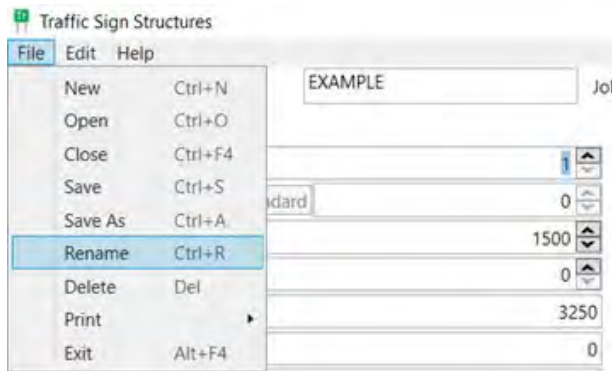
To save a new sign in the current database, select **Save As** as shown in Figure 2.1.1(e).

Figure 2.1.1(e) – Save As



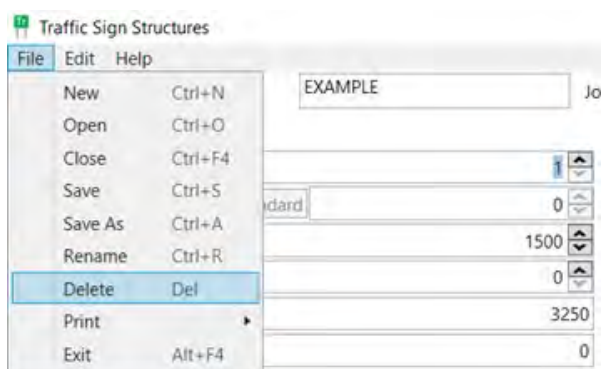
To rename a sign, job section or an entire job, select **Rename** as shown in Figure 2.1.1(f).

Figure 2.1.1(f) – Rename



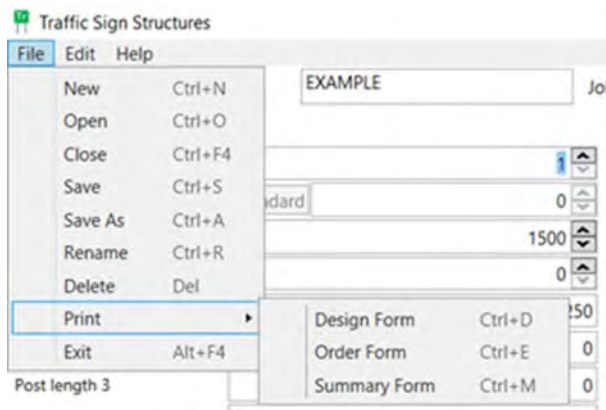
To delete a previously saved file, select **Delete** as shown in Figure 2.1.1(g).

Figure 2.1.1(g) – Delete



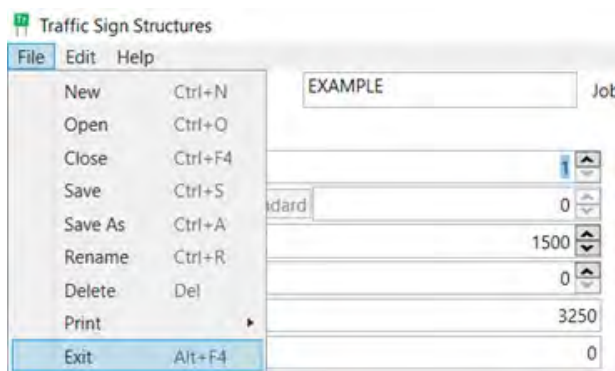
To print out a design form, order form or summary form, select **Print** as shown in Figure 2.1.1(h).

Figure 2.1.1(h) – Print



To exit the TraSiS program, select **Exit** as shown in Figure 2.1.1(i).

Figure 2.1.1(i) – Exit

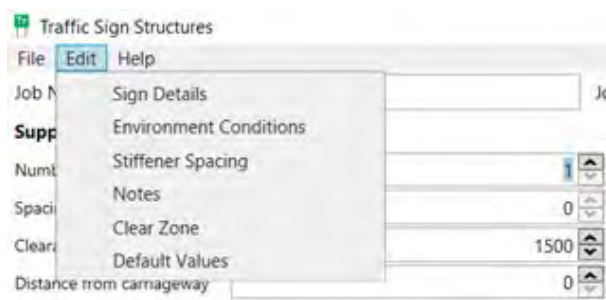


2.1.2 Edit menu

The following information is available from the **Edit** menu.

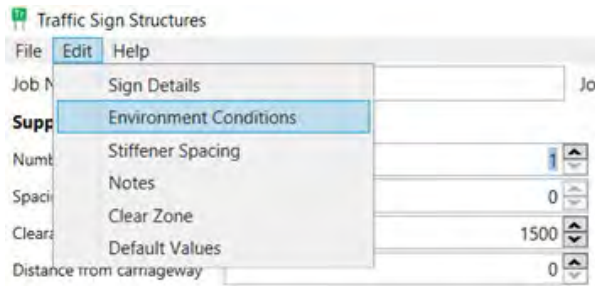
Select **Sign details** as shown in Figure 2.1.2(a) to edit the current job description, sign faces and roadside slope.

Figure 2.1.2(a) – Sign details



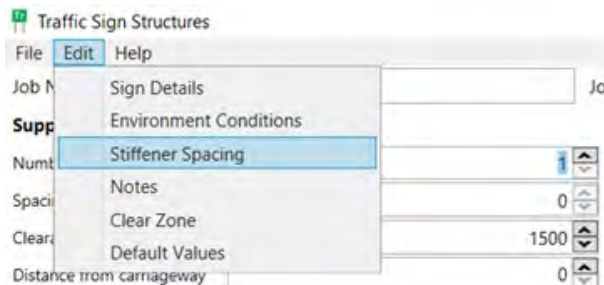
Select **Environmental conditions** as shown in Figure 2.1.2(b) to specify wind region, foundation ground type and situation risk.

Figure 2.1.2(b) – Environmental conditions



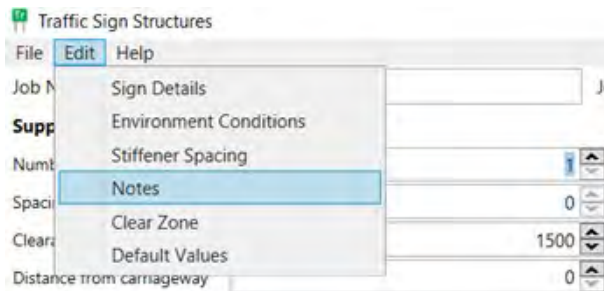
Use TRUM Volume 3 Part 5 or customised settings when selecting **Stiffener spacing** as illustrated in Figure 2.1.2(c).

Figure 2.1.2(c) – Stiffener spacing



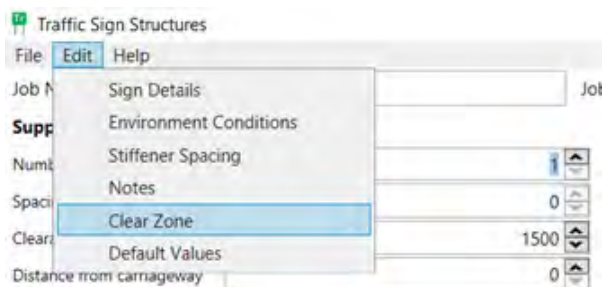
Select **Notes** as shown in Figure 2.1.2(d) to assign general comments and notes. These notes are printed with the **Design** form.

Figure 2.1.2(d) – Notes



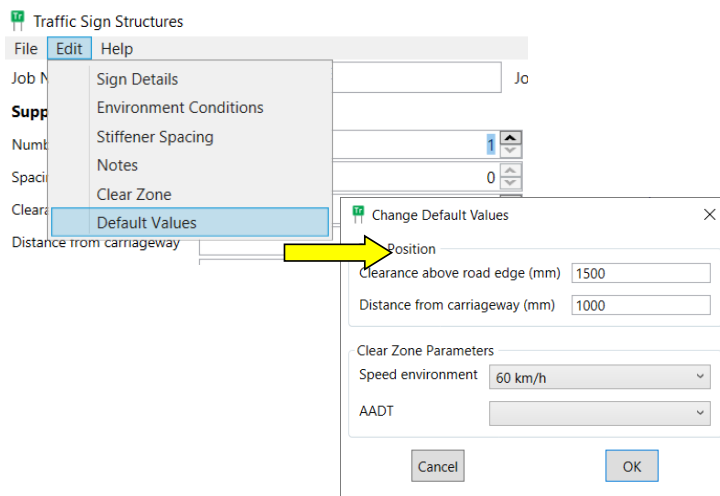
Select **Clear zone** as shown in Figure 2.1.2(e) to calculate the appropriate clear zone distance for the road.

Figure 2.1.2(e) – Clear zone



Select **Default values** as shown in Figure 2.1.2(f) to assign **Default values** to **Sign position** and **Clear zone** parameters.

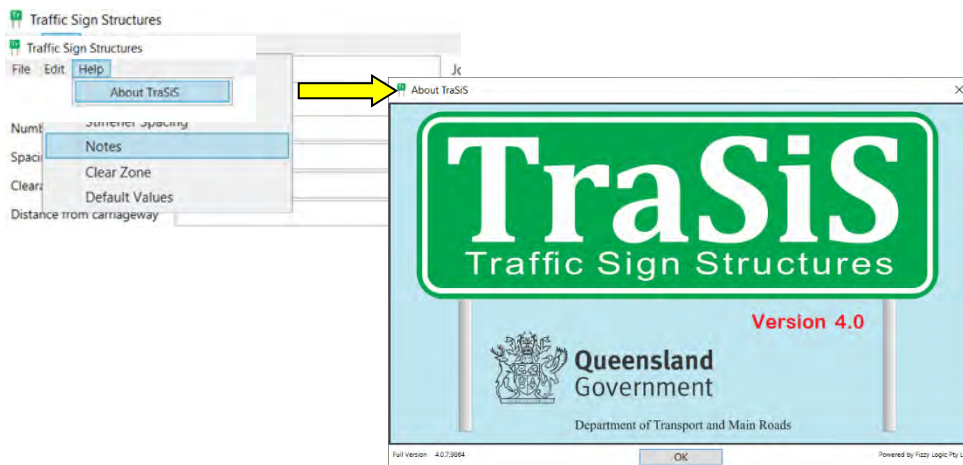
Figure 2.1.2(f) – Default values



2.1.3 Help menu

Figure 2.1.3 shows the information available from the **Help** menu.

Figure 2.1.3 – Help: About TraSiS



3 Design procedures

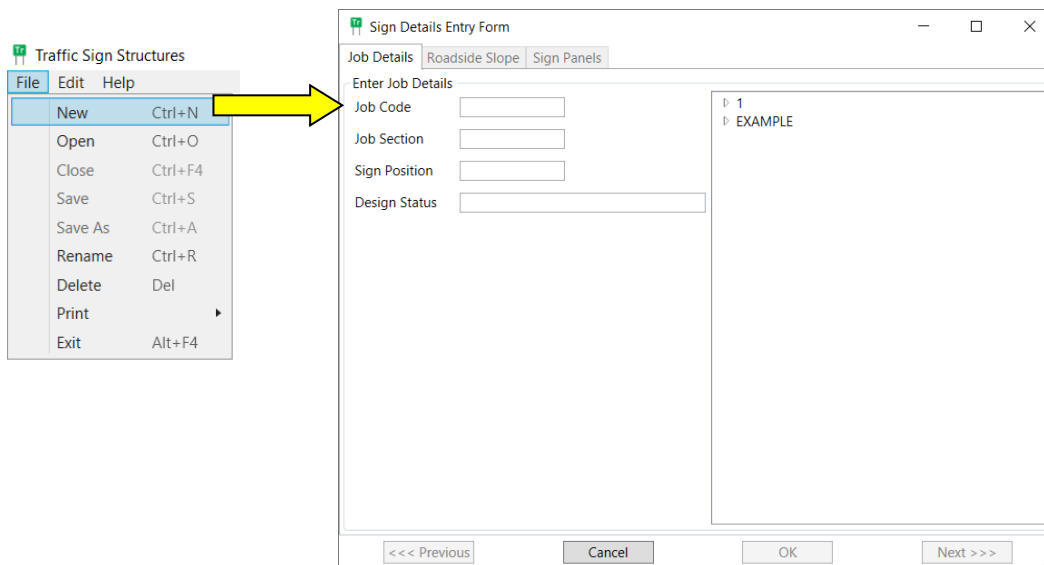
3.1 Sign details entry form

From the **File** menu or the **Main** window, select the **New** command as shown in Figure 3.1(a). This launches the **Sign details entry** form.

Three tabs will be visible:

- **Job details**
- **Roadsides slope**; and
- **Sign panels**.

Figure 3.1(a) – Job details



All information boxes must be filled in before proceeding to the next tab. Use the **Previous** and **Next** buttons to navigate between the three tabs.

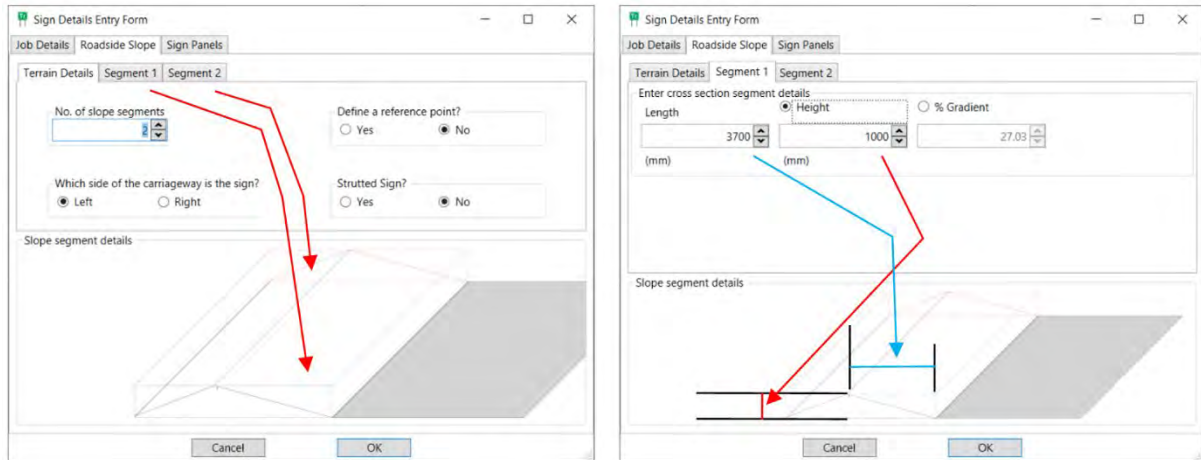
TraSiS stores all signs in a database. Each sign is distinguished by **Job section** and **Sign position** (location), allowing for simple and effective organisation of sign storage.

A **Design status** area indicates possible duplication of name allocations and validation of new design.

Up to five slope segments of variable length and height can be used to model a particular roadside cross-section. In addition, the longitudinal details of the slope segments can be specified (this is useful when examining the feasibility of strut sport signs: for example, where there are longitudinal differences in post location).

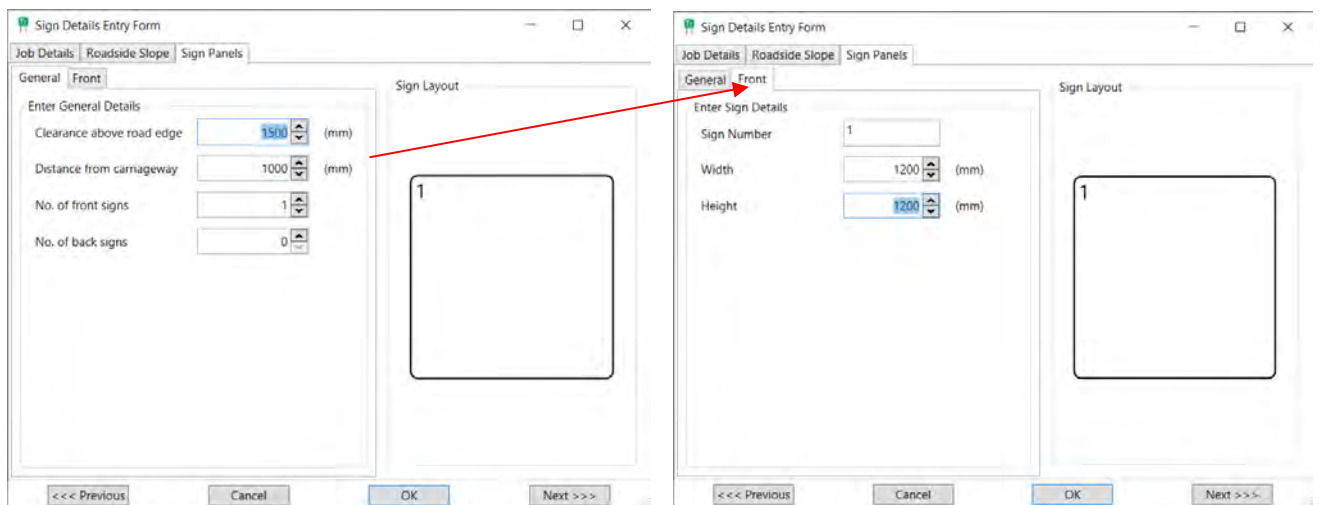
Figure 3.1(b) illustrates an example of defining the road geometry to record roadside slope details.

Figure 3.1(b) – Roadside slope details: Define the roadside geometry



A sign structure can support up to four separate panels (three facing the front and one facing the rear), each panel having individual dimensions, and road clearance. Refer to TRUM Volume 3 Part 5 for information regarding sign face design. Figure 3.1(c) illustrates specifying the details of the sign face for sign panels.

Figure 3.1(c) – Sign panels: Specify the details of the sign face



Once all sign details forms are complete, the **OK** button becomes available. Pressing the **OK** button launches the next form, **Roadside environment**.

3.2 Roadside environment entry form

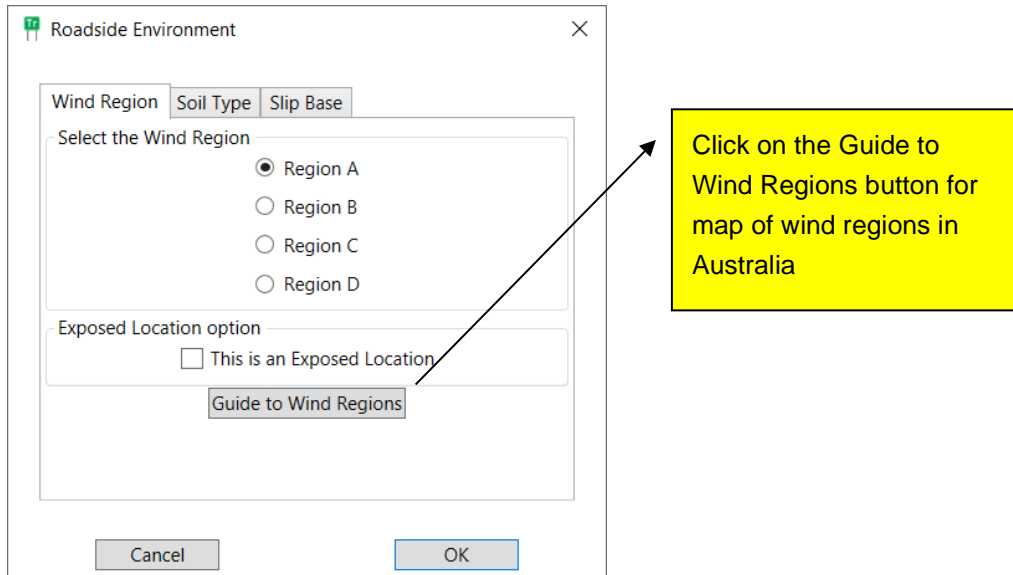
Once all **Sign details** forms are complete and the **OK** button is pressed, the **Roadside environment** form will appear, as shown in Figure 3.2(a).

Three tabs will be visible:

- **wind region**
- **soil type**, and
- **slip base**.

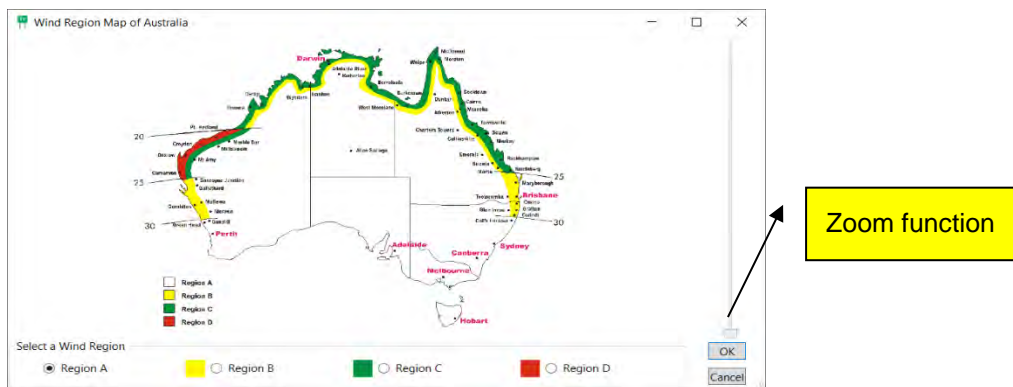
The wind regions range from A to D, A being for areas which generally experience normal wind conditions and D being for areas that are subject to severe cyclones. Select the geographic wind region in which the sign is to be built.

Figure 3.2(a) – Roadside environment form



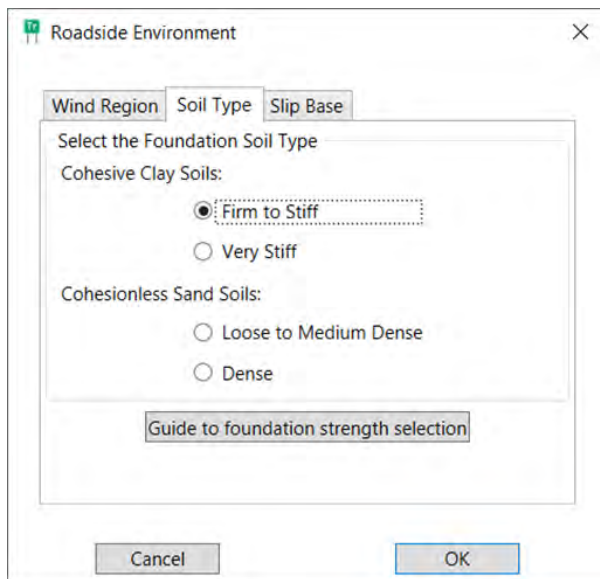
The wind region map illustrated at Figure 3.2(b) indicates the geographic regions associated with the scale. Locations that are exposed to higher winds than what is usual for the locality (for example, coastal highways) are accommodated by selecting the **Exposed location** check box. Refer to TRUM Volume 3 Part 5.

Figure 3.2(b) – Wind region



Select **Soil type** as shown in Figure 3.2(c) to record the soil type that most accurately describes the soil at the location.

Figure 3.2(c) – Soil type

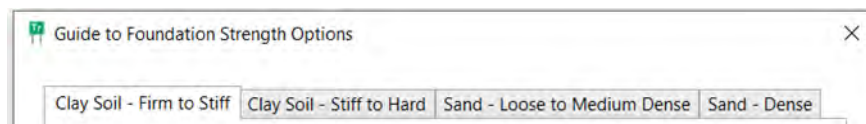


Select **Guide to foundation strength selection** as shown in Figure 3.2(d) for a description of each soil type (field and scientific identification) to help select the appropriate type.

Four tabs will be visible:

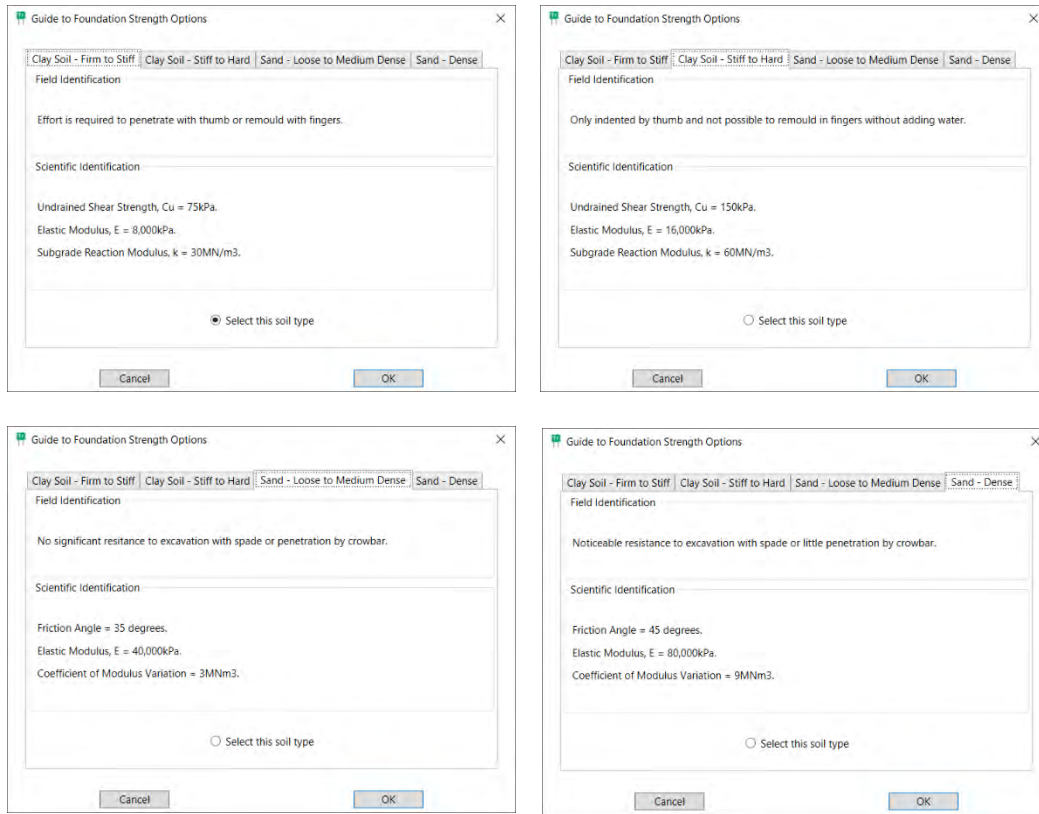
1. clay soil – firm to stiff
2. clay soil – stiff to hard
3. sand – loose to medium dense; and
4. sand – dense.

Figure 3.2(d) – Guide to foundation strength selection



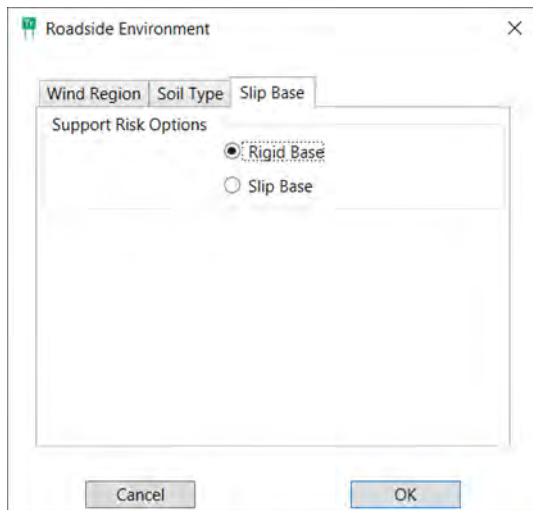
Select the soil type that most accurately describes the soil at the location as shown in Figure 3.2(e).

Figure 3.2(e) – Soil description



Select the **Slip base** tab as shown in Figure 3.2(f) to record risk options.

Figure 3.2(f) – Slip base

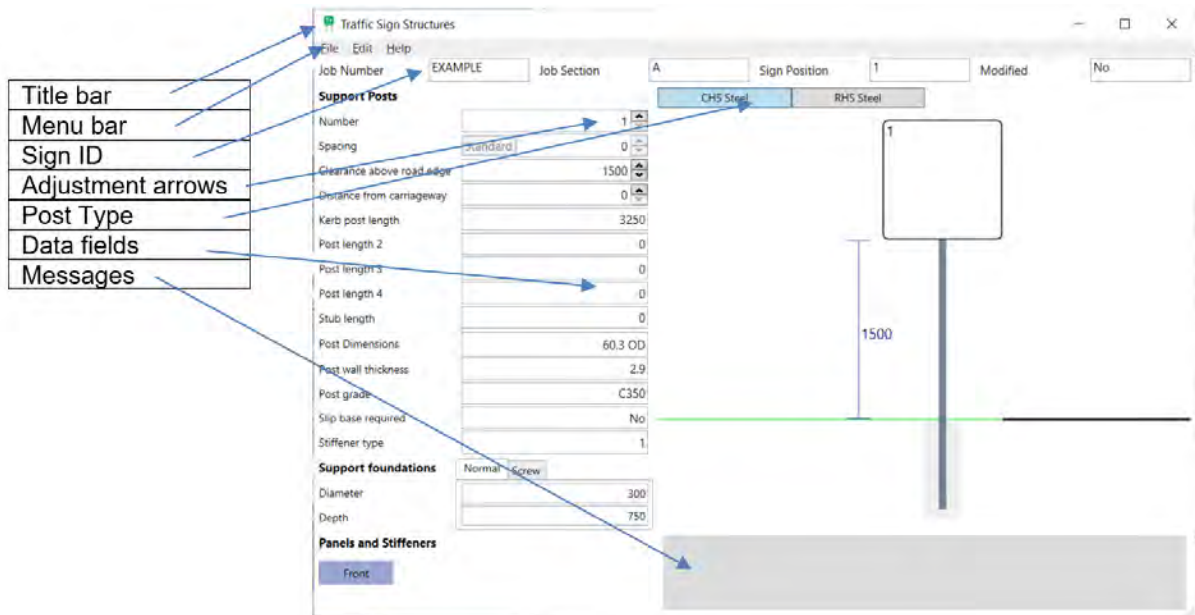


If the sign is to be erected in an area where there is a high risk of impact (that is, within the **Clear zone** distance), select **Slip base**; otherwise, select **Rigid base**. Refer to TRUM Volume 3: Part 5 for further information.

4 Main window

Figure 4(a) shows the different elements displayed in the **Main window**. The **Main window** gives a clear display of the most important elements of the sign. The left half of the screen displays technical design data, while the right half displays a graphic view of the sign in relation to the ground and road.

Figure 4(a) – Main window



Some of the data fields are variable within a certain range. Selecting the up or down arrow as illustrated in Figure 4(b) allows adjustments to that field parameter.

Figure 4(b) – Data field adjustment

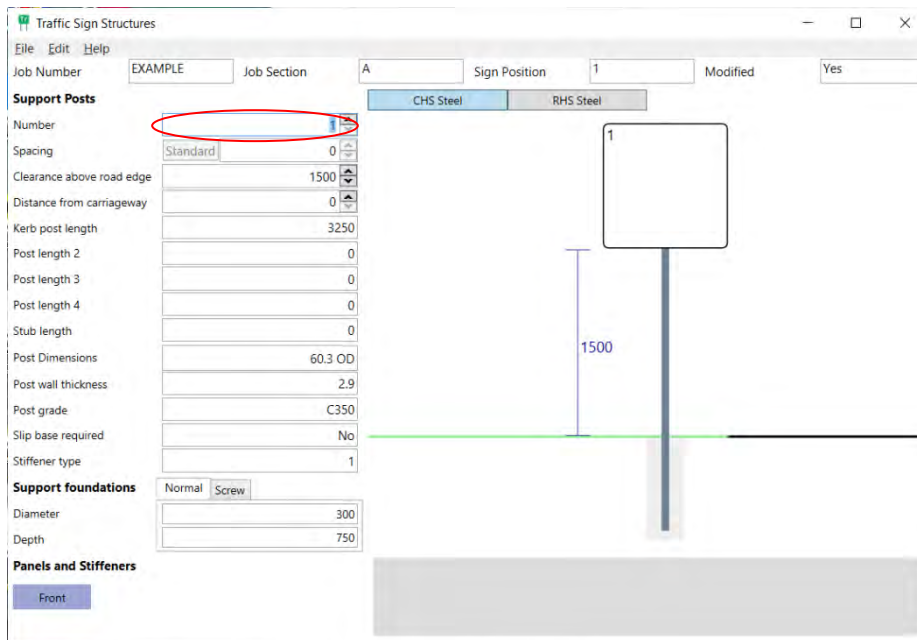


4.1 Technical design data

4.1.1 Support details

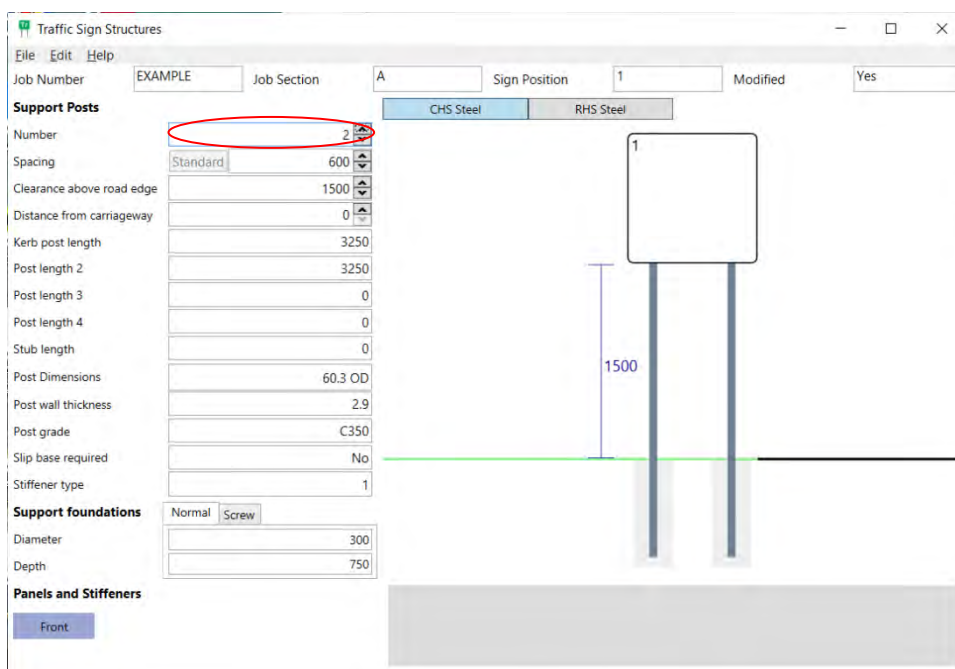
The **Number** option illustrated in Figure 4.1.1(a) details the number of support posts and is the option to select to change the number of posts that may be varied.

Figure 4.1.1(a) – Number of support posts



Highlighting and typing value or clicking the up arrow will change the number of posts, as shown in Figure 4.1.1(b). This may be varied within a certain range.

Figure 4.1.1(b) – Adjust number of posts



Post spacings will also change with post numbers, as shown in Figure 4.1.1(c). A standard **Spacing** determined by the number of posts will initially be displayed.

Figure 4.1.1(c) – Spacing between the support posts

The screenshot shows the 'Traffic Sign Structures' software interface. The 'Support Posts' section is active, displaying various configuration parameters. The 'Spacing' dropdown menu is highlighted with a red circle, showing 'Standard' selected and a value of 600. Other parameters include 'Number' (2), 'Clearance above road edge' (1500), 'Distance from carriageway' (0), 'Kerb post length' (3250), 'Post length 2' (3250), 'Post length 3' (0), 'Post length 4' (0), 'Stub length' (0), 'Post Dimensions' (60.3 OD), 'Post wall thickness' (2.9), 'Post grade' (C350), 'Slip base required' (No), and 'Stiffener type' (1). The 'Support foundations' section shows 'Normal' and 'Screw' options, with 'Diameter' (300) and 'Depth' (750) fields. The 'Panels and Stiffeners' section has a 'Front' button.

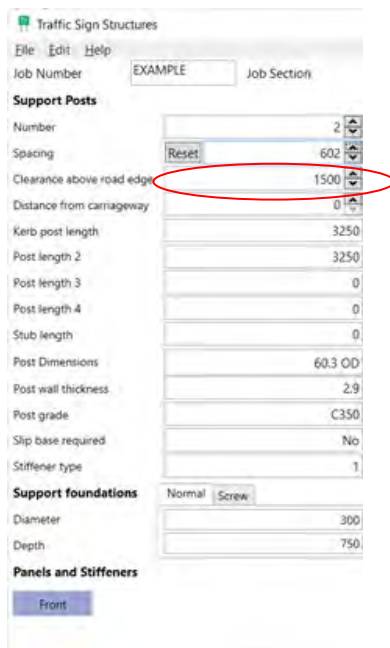
Selecting other spacings is allowed, as shown in Figure 4.1.1(d), and a **Reset** option returns to the standard spacings.

Figure 4.1.1(d) – Adjust post spacing

The screenshot shows the 'Traffic Sign Structures' software interface. The 'Support Posts' section is active, displaying various configuration parameters. The 'Spacing' dropdown menu is highlighted with a red circle, showing 'Reset' selected and a value of 602. Other parameters are the same as in Figure 4.1.1(c): 'Number' (2), 'Clearance above road edge' (1500), 'Distance from carriageway' (0), 'Kerb post length' (3250), 'Post length 2' (3250), 'Post length 3' (0), 'Post length 4' (0), 'Stub length' (0), 'Post Dimensions' (60.3 OD), 'Post wall thickness' (2.9), 'Post grade' (C350), 'Slip base required' (No), and 'Stiffener type' (1). The 'Support foundations' section shows 'Normal' and 'Screw' options, with 'Diameter' (300) and 'Depth' (750) fields. The 'Panels and Stiffeners' section has a 'Front' button.

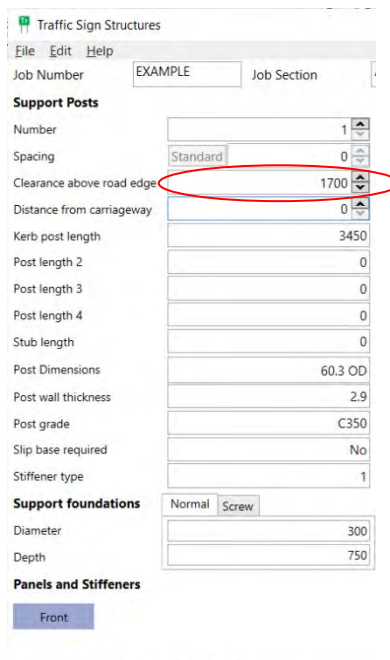
Clearance above road edge details the height of the sign from the road surface to the bottom of the sign, as shown in Figure 4.1.1(e).

Figure 4.1.1(e) – Clearance above road edge



Highlighting and typing value or clicking the arrows, as shown in Figure 4.1.1(f), will change height as required. The initial height of the sign is set according to the default settings (see Figure 2.1.2(f)).

Figure 4.1.1(f) – Adjust clearance above road edge



Distance from carriageway, as illustrated in Figure 4.1.1(g), details the lateral clearance between the part of the sign nearest to the road and the edge of the kerb, or pavement.

Figure 4.1.1(g) – Distance from carriageway

The screenshot shows the 'Traffic Sign Structures' software interface. The 'Support Posts' section is active, displaying various configuration parameters. The 'Distance from carriageway' field is highlighted with a red oval and contains the value 1500. Other parameters include Number (1), Spacing (Standard), Clearance above road edge (1500), Kerb post length (3250), Post length 2 (0), Post length 3 (0), Post length 4 (0), Stub length (0), Post Dimensions (60.3 OD), Post wall thickness (2.9), Post grade (C350), Slip base required (No), and Stiffener type (1). The 'Support foundations' section shows Normal and Screw options, with Diameter (300) and Depth (750) fields. The 'Panels and Stiffeners' section has a 'Front' button.

Highlighting and typing value or clicking the arrows will change distance as required, as shown in Figure 4.1.1(h). The initial distance of the sign from the road edge is set according to the default settings (see Figure 2.1.2(f)).

Figure 4.1.1(h) – Adjust distance from carriageway

The screenshot shows the 'Traffic Sign Structures' software interface. The 'Support Posts' section is active, displaying various configuration parameters. The 'Distance from carriageway' field is highlighted with a red oval and contains the value 2000. Other parameters include Number (2), Spacing (Standard), Clearance above road edge (1500), Kerb post length (3250), Post length 2 (3250), Post length 3 (0), Post length 4 (0), Stub length (0), Post Dimensions (50 NB), Post wall thickness (2.9), Post grade (C350), Slip base required (No), and Stiffener type (1). The 'Support foundations' section shows Normal and Screw options, with Diameter (300) and Depth (750) fields. The 'Panels and Stiffeners' section has a 'Front' button.

Kerb post length, as illustrated in Figure 4.1.1(i), refers to the length of the post nearest the kerb (not including section underneath slip base or screw footing).

Figure 4.1.1(i) – Kerb post length

The screenshot shows the 'Traffic Sign Structures' software interface. Under the 'Support Posts' section, the following fields are visible:

Number	2
Spacing	Standard
Clearance above road edge	1500
Distance from carriageway	2000
Kerb post length	3250
Post length 2	3250
Post length 3	0
Post length 4	0
Stub length	0
Post Dimensions	60.3 OD
Post wall thickness	2.9
Post grade	C350
Slip base required	No
Stiffener type	1

Below the 'Support Posts' section, there are 'Support foundations' (Normal, Screw), 'Diameter' (300), and 'Depth' (750) fields. At the bottom, there is a 'Panels and Stiffeners' section with a 'Front' button.

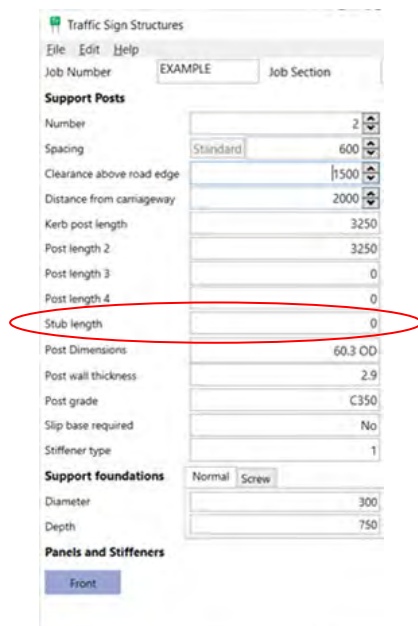
Post lengths 2, 3 and 4, as illustrated in Figure 4.1.1(j) refers to the length of the second, third and fourth nearest post to the kerb (not including section underneath slip base or screw footing).

Figure 4.1.1(j) – Post lengths

The screenshot shows the 'Traffic Sign Structures' software interface, identical to Figure 4.1.1(i). In this view, the 'Post length 2', 'Post length 3', and 'Post length 4' fields are highlighted with a red oval. The values are 3250, 0, and 0 respectively.

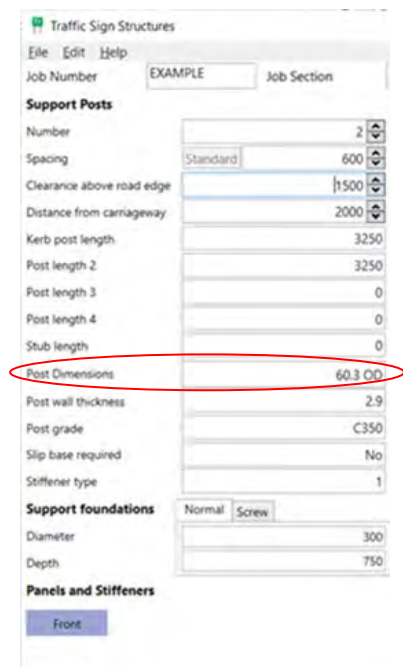
Stub length, as illustrated in Figure 4.1.1(k), refers to the length of the post stub that sits inside the screw (if a screw footing is used), or that remains below the slip mechanism (if a slip is used).

Figure 4.1.1(k) – Stub length



The **Post dimensions** option is illustrated at Figure 4.1.1(l). For Circular Hollow Section (CHS), the measurement is the external diameter of the posts. For Rectangular Hollow Section (RHS), the measurement is the rectangular cross-section of the post.

Figure 4.1.1(l) – Post dimensions



Post wall thickness, shown at Figure 4.1.1(m) refers to the thickness of the wall material.

Figure 4.1.1(m) – Post wall thickness

The screenshot shows the 'Traffic Sign Structures' software interface. The 'Support Posts' section is expanded, showing various configuration fields. The 'Post wall thickness' field is highlighted with a red circle and contains the value '2.9'. Other visible fields include 'Number' (1), 'Spacing' (Standard), 'Clearance above road edge' (1500), 'Distance from carriageway' (2000), 'Kerb post length' (3250), 'Post length 2-4' (0), 'Stub length' (0), 'Post Dimensions' (60.3 OD), 'Post grade' (C350), 'Slip base required' (No), and 'Stiffener type' (1). The 'Support foundations' section shows 'Normal' and 'Screw' options, with 'Diameter' (300) and 'Depth' (750) fields. The 'Panels and Stiffeners' section has a 'Front' button.

Post grade, shown at Figure 4.1.1(n), refers to the grade of steel used for the post.

Figure 4.1.1(n) – Post grade

This screenshot is identical to the one above, showing the 'Traffic Sign Structures' software interface. In this view, the 'Post grade' field is highlighted with a red circle and contains the value 'C350'. All other fields and settings are the same as in Figure 4.1.1(m).

Slip base required, as shown in Figure 4.1.1(o), indicates previous selection of post without **Slip Base**. This would be Yes if **Slip Base** was initially selected.

Figure 4.1.1(o) – Slip base required

The screenshot shows the 'Traffic Sign Structures' software interface. The 'Support Posts' section contains the following fields and values:

Number	1
Spacing	Standard
Clearance above road edge	1500
Distance from carriageway	2000
Kerb post length	3250
Post length 2	0
Post length 3	0
Post length 4	0
Stub length	0
Post Dimensions	60.3 OD
Post wall thickness	2.9
Post grade	C350
Slip base required	No
Stiffener type	1

The 'Support Foundations' section shows:

Diameter	300
Depth	750

The 'Panels and Stiffeners' section has a 'Front' button selected.

Stiffener type, illustrated at Figure 4.1.1(p), shows one of two types of stiffener, designated as Type 1 and Type 2.

Figure 4.1.1(p) – Stiffener type

The screenshot shows the 'Traffic Sign Structures' software interface. The 'Support Posts' section contains the following fields and values:

Number	1
Spacing	Standard
Clearance above road edge	1500
Distance from carriageway	2000
Kerb post length	3250
Post length 2	0
Post length 3	0
Post length 4	0
Stub length	0
Post Dimensions	60.3 OD
Post wall thickness	2.9
Post grade	C350
Slip base required	No
Stiffener type	1

The 'Support Foundations' section shows:

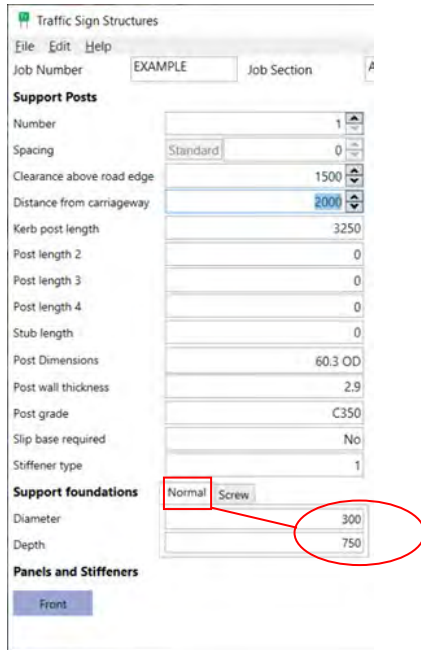
Diameter	300
Depth	750

The 'Panels and Stiffeners' section has a 'Front' button selected.

4.1.2 Footing details

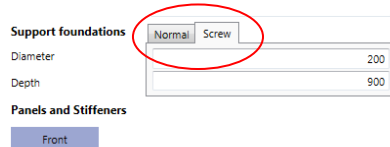
Support foundations – Normal, as shown in Figure 4.1.2(a) shows the diameter of the hole for normal concrete footings / diameter of screw.

Figure 4.1.2(a) – Diameter of hole / screw



Click the tab for **Support foundation** to launch the dialogue box. Select either *Normal* or *Screw* footing as shown in Figure 4.1.2(b).

Figure 4.1.2(b) – Change footing type



Support foundations – Screw, illustrated in Figure 4.1.2(c) shows the depth of hole from the surface to the end of the post, not including the depth of concrete underneath the post / length of screw.

Figure 4.1.2(c) – Depth of hole / length of screw

The screenshot shows the 'Traffic Sign Structures' application window. The 'Support foundations' section has two radio buttons: 'Normal' and 'Screw'. The 'Screw' button is selected and highlighted with a red box. Below this, the 'Diameter' field is set to 200 and the 'Depth' field is set to 900. The 'Depth' field is circled in red, with a red arrow pointing from the 'Screw' button to it. Other fields in the 'Support Posts' section include Number (1), Spacing (Standard), Clearance above road edge (1500), Distance from carriageway (2000), Kerb post length (2500), Post length 2 (0), Post length 3 (0), Post length 4 (0), Stub length (900), Post Dimensions (60.3 OD), Post wall thickness (2.9), Post grade (C350), Slip base required (No), and Stiffener type (1). The 'Panels and Stiffeners' section has a 'Front' button.

4.1.3 Sign and stiffener details

As shown in Figure 4.1.3(a), moving the cursor over each **Panels and stiffeners** sign box displays a small window that shows information relevant to each sign face.

Figure 4.1.3(a) – Sign and stiffener details

The screenshot shows the 'Panels and Stiffeners' section of the software. The 'Front' button is circled in red. A red arrow points from this button to a pop-up window on the right. The pop-up window displays the following details: Sign 1, Width 1000, Height 1000, Stiffeners 3, Spacing 450, and Brackets 3. Below the pop-up window is another 'Front' button.

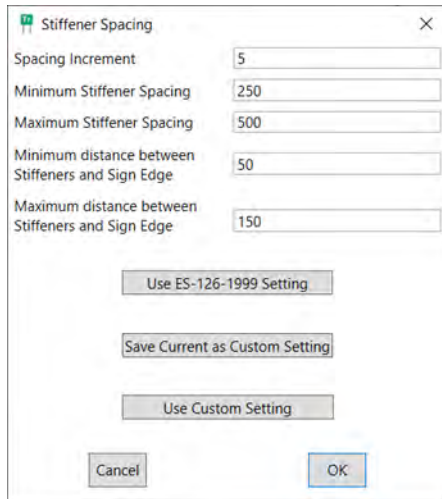
To adjust the method by which the required number of stiffeners is calculated, select **Stiffener spacing** options from the **Edit** menu as shown in Figure 4.1.3(b).

Figure 4.1.3(b) – Stiffener spacing options

The screenshot shows the 'Edit' menu of the software. The 'Stiffener Spacing' option is highlighted in blue. Other menu items include Sign Details, Environment Conditions, Notes, Clear Zone, and Default Values. The background shows the 'Support Posts' section of the software interface.

Selecting **Stiffener spacing options** from the **Edit** menu will launch the **Stiffener spacing** dialog box, shown in Figure 4.1.3(c). Spacings and distances may be varied within a certain range by clicking on the arrows.

Figure 4.1.3(c) – Stiffener spacing



TraSiS automatically calculates the most efficient stiffener configuration base on the settings in this form.

Additionally, provision is made for users to specify custom settings by adjusting the values above and selecting the lowest button of the three: **Use custom settings**.

4.1.4 Post type selection

Refer to TRUM Volume 3 Part 5 for instructions on the selection of appropriate post sections.

It is not always possible to construct a sign using a particular post type.

Support posts – CHS steel, illustrated in Figure 4.1.4(a), specifies that the post(s) be made of circular hollow section. Refer to Standard Drawing SD1363.

Figure 4.1.4(a) – Circular hollow section steel



Support posts – RHS steel, illustrated in Figure 4.1.4(b), specifies that the post(s) be made of rectangular hollow section. Refer to Standard Drawing SD1363.

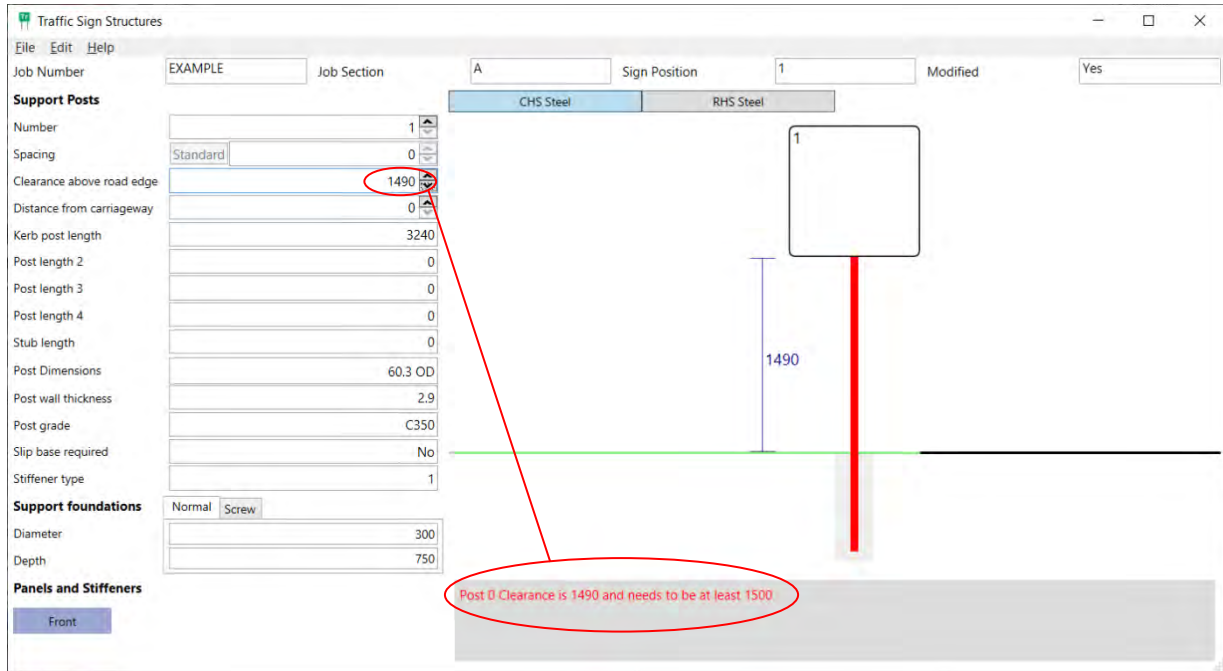
Figure 4.1.4(b) – Rectangular hollow section steel



4.1.5 Message box

The **Message box**, shown in Figure 4.1.5, displays any warning or errors regarding the structural design. Most warnings are to inform that various aspects of the sign do not meet standard guidelines. Others indicate that no standard sign structure is possible for the specified conditions. The red post signifies an error in post length.

Figure 4.1.5 – Message box: warnings and / or errors

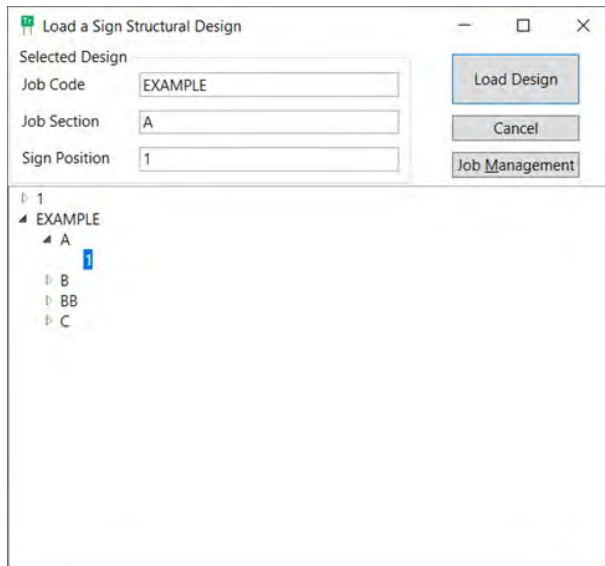


5 Sign storage

5.1 Storage department

TraSiS stores all of its signs in a database format organised by job, section and location, as shown in Figure 5.1(a).

Figure 5.1(a) – Database



To rename a *Sign*, *Job Section* or an entire *Job*, click on the required folder icon in the stored signs area, then click on the name of the file, now bolded. Type in the new name as required and click the **Rename** button, as shown in Figure 5.1(b).

Figure 5.1(b) – Renaming



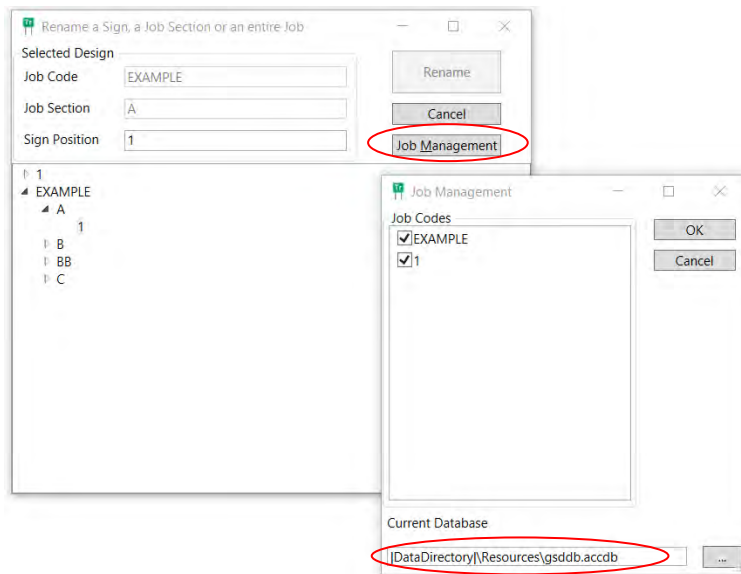
The **Job management** feature, shown in Figure 5.1(c), selects which jobs appear in the storage department windows, preventing the window from becoming crowded with older jobs.

Clicking the **Job management** button will launch a dialog box from where the job codes can be enabled (displayed in the **Load a sign structural design** box) or disabled (hidden).

Once modified, clicking the **OK** button will close the dialog box.

The **Job management** dialog box shows the particular database location and permits relocation of files.

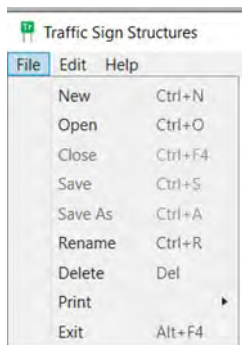
Figure 5.1(c) – Job management



The database that stores the signs can be found as a gsddb.mdb file, residing in the TraSiS directory. The sign storage commands are accessible from the **File** menu, as shown in Figure 5.1(d).

Note: The EXAMPLE database is read-only and any new signs need to be saved in a custom created database (see Section 5.2).

Figure 5.1(d) – Storage commands



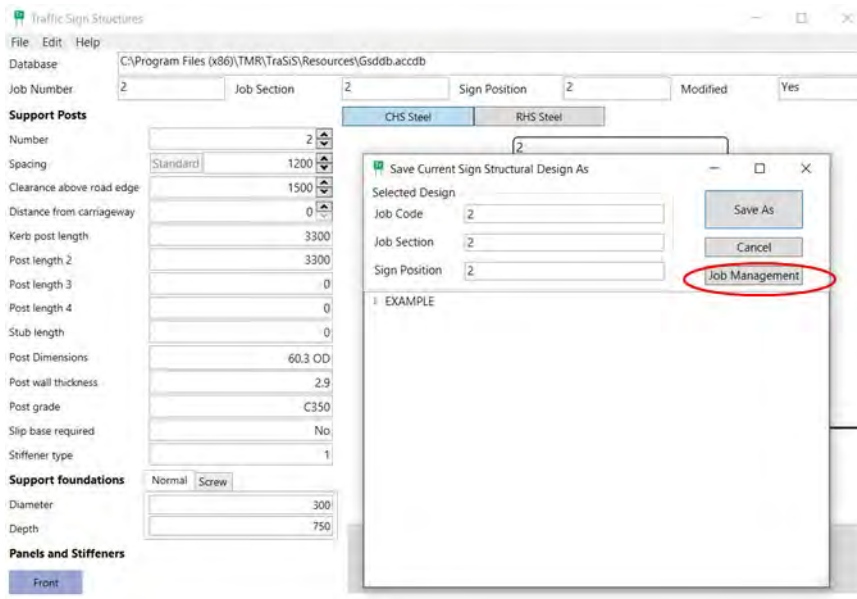
Extra databases can be developed, by copying, renaming and then editing the original database as necessary. A new database can also be created from the browse button in the job management dialogue, simply by navigating to the relevant folder and typing in the new filename. This would avoid having to copy and edit the original database.

These databases may then be retained or transferred to other locations by copying the relevant database gsddb.mdb file. Selection of a particular database can then be made from the relevant .mdb files in the TraSiS directory.

5.2 How to save a sign in a custom database

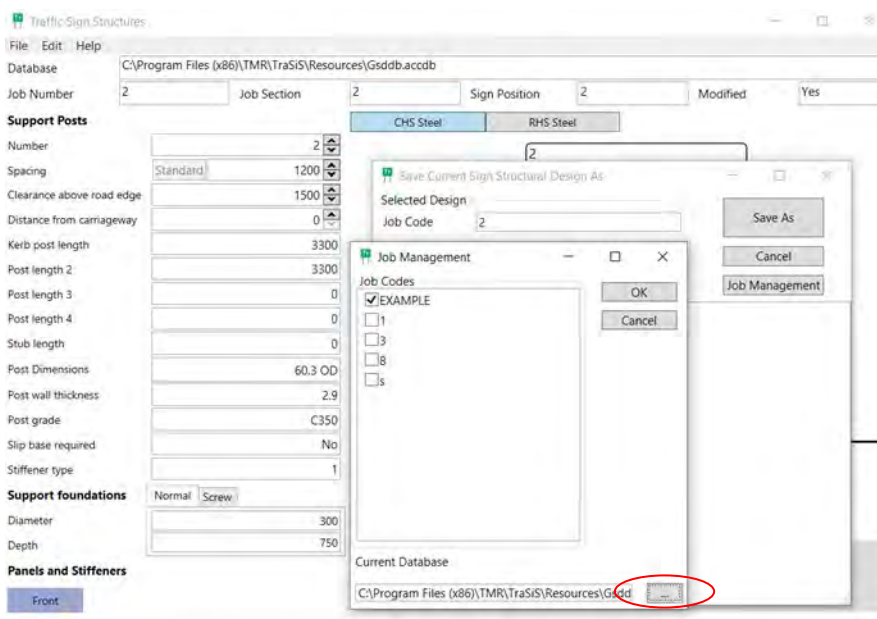
In order to save a newly created sign, click on **File, Save As, Job Management**, as shown in Figure 5.2(a).

Figure 5.2(a) – Step 1



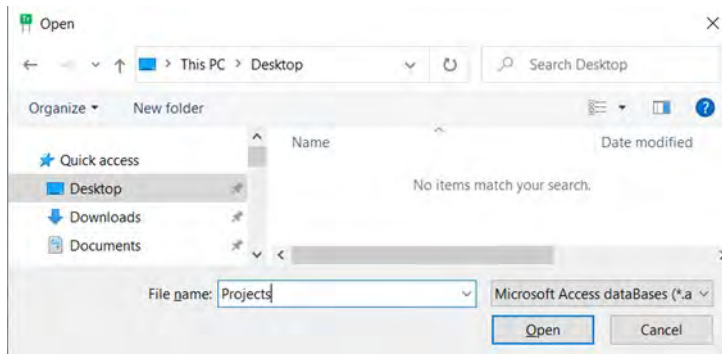
Then click on the three ("...") as shown in Figure 5.2(b).

Figure 5.2(b) – Step 2



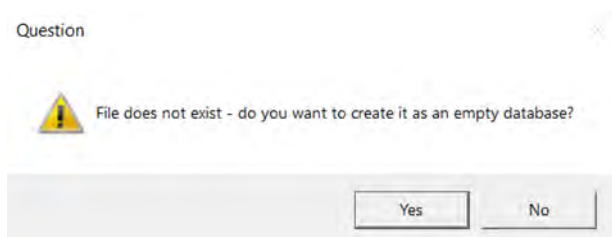
Browse to a location on your hard drive or network drive different than the location of the default database. Enter the name of the new database and click **Open**, as shown in Figure 5.2(c).

Figure 5.2(c) – Step 3



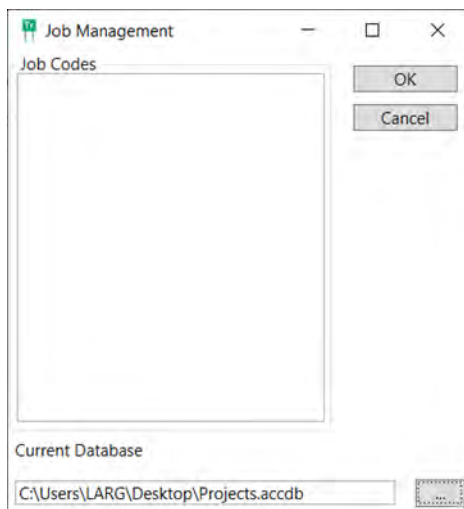
Click **Yes** on the following screen as shown in Figure 5.2(d).

Figure 5.2(d) – Step 4



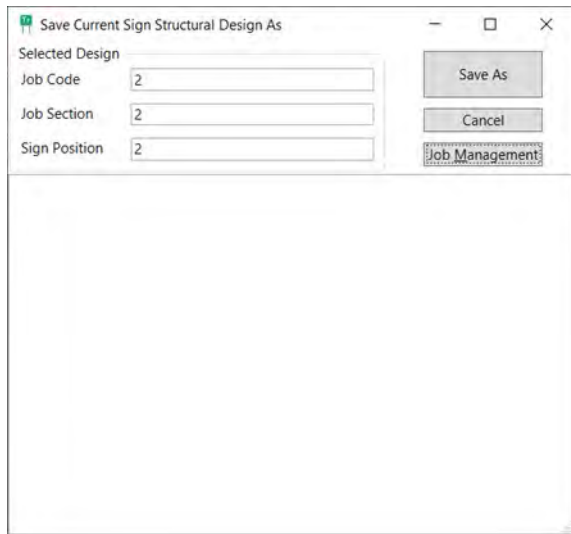
Click **OK** on the following screen as shown in Figure 5.2(e).

Figure 5.2(e) – Step 5



Click **Save As**, as shown in Figure 5.2(f) and the sign will be saved in the newly created database.

Figure 5.2(f) – Step 6



6 Clear zone

6.1 Understanding clear zone

The purpose of the **Clear zone** is to minimise the risk for errant motorists by establishing a minimum distance beside the road that must be clear of obstructions. TraSiS automatically calculates the appropriate clear zone distance for a roadside cross-section while taking into account parameters such as speed environment, road curvature and Annual Average Daily Traffic Flow (AADT). The clear zone distance is not a precise measurement; rather, it is an indicative guide to assist in the application of engineering judgement to a particular situation.

The clear zone module is launched from the **Edit** menu, as illustrated in Figure 6.1(a).

Figure 6.1(a) – Clear zone

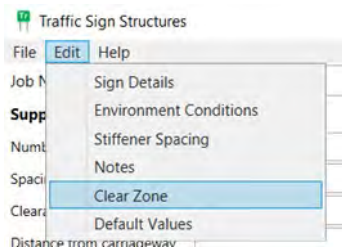
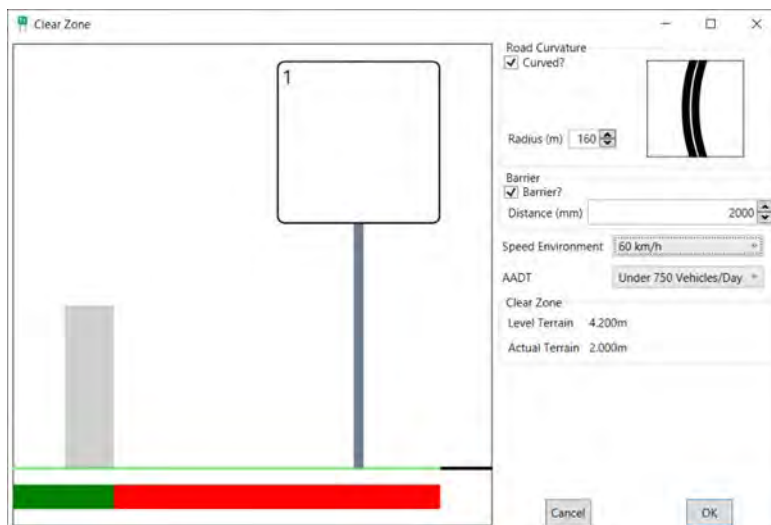


Figure 6.1(b) illustrates the clear zone module screen.

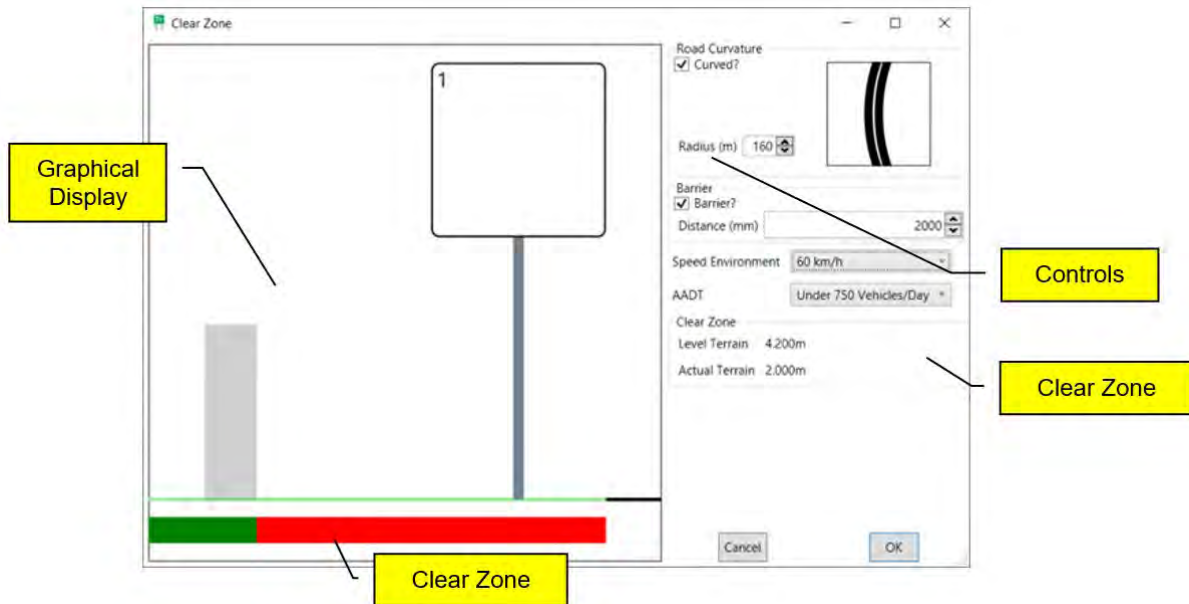
Figure 6.1(b) – Clear zone module



6.2 Clear zone window

As shown in Figure 6.2, the window is divided into two main sections; a graphical display of the roadside on the left, and a column on the right that contains controls for the clear zone parameters and other data displays.

Figure 6.2 – What is seen



6.2.1 Parameters

As shown in Figure 6.2.1(a), use the check box to indicate whether the road is on a curve or not, and if so, adjust the curve radius using the scroll bar. Road curvature with radius greater than 900 m is considered to be comparatively straight, while a minimum radius of curvature exists for each speed environment.

Figure 6.2.1(a) – Road curvature



As shown in Figure 6.2.1(b), **Barrier distance** specifies if a barrier is employed on the roadside and, if so, the distance from the roadside to the barrier that can be adjusted using the scroll bar.

Figure 6.2.1(b) – Barrier distance

Barrier
 Barrier?
 Distance (mm)

As shown in Figure 6.2.1(c), **Speed environment** is either the 85th percentile speed of all traffic on the road, or if this is unavailable, then the posted speed limit.

Figure 6.2.1(c) – Speed environment

Speed Environment

As shown in Figure 6.2.1(d), **Annual Average Daily Traffic Flow (AADT)** is traffic volume in units of vehicles per day.

Figure 6.2.1(d) – Annual Average Daily Traffic Flow

AADT

6.2.2 Clear zone distance

As shown in Figure 6.2.2(a), **Clear zone distance – level terrain** is the calculated clear zone distance for a level slope using the given parameters.

Figure 6.2.2(a) – Level terrain

Clear Zone
 Level Terrain

As shown in Figure 6.2.2(b), **Clear zone distance – actual terrain** is as **Clear zone distance – level terrain** but considers the slope details as specified for the sign location. Currently, no algorithm exists to calculate clear zone distance for sections with both cut and fill slopes; therefore, in this circumstance, TraSiS returns a message indicating that the slope section is too complicated to analyse.

Figure 6.2.2(b) – Actual terrain

Actual Terrain

7 Printing

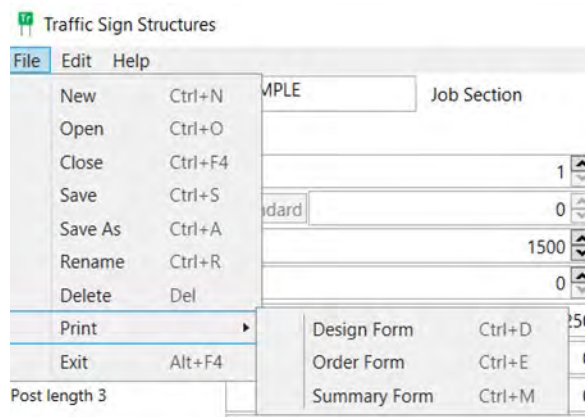
7.1 Accessing the print commands

TraSiS includes three different **Print** forms:

- **Design form**
- **Order form;** and
- **Summary form.**

As shown in Figure 7.1, select the appropriate form using the **Print** option from the **File** menu.

Figure 7.1 – Printing forms available



7.1.1 How to print design and summary forms

Clicking on one of the three options available will launch the **Print job selection** form shown in Figure 7.1.1(a). This procedure is common for printing any of the three forms; however, the procedure varies slightly from this point forward, as shown in sections 7.1.1(b)–(d).

On the **Print job selection** form to select the sign for printing, follow the steps:

1. Click the appropriate **Job code section** and **Position**.
2. Information on the **Current print status** will appear.
3. Click the **Add** button to locate the sign in the **Signs selected to print** box.
4. Click the **Print setup** button to set the printer requirements.
5. This will then launch the **Print setup** menu box.
6. Select printer settings.
7. Click **OK** to close the **Print setup** box.
8. Return to the **Print job selection form**.
9. Select **OK** to print.

Figure 7.1.1(a) – Print selection

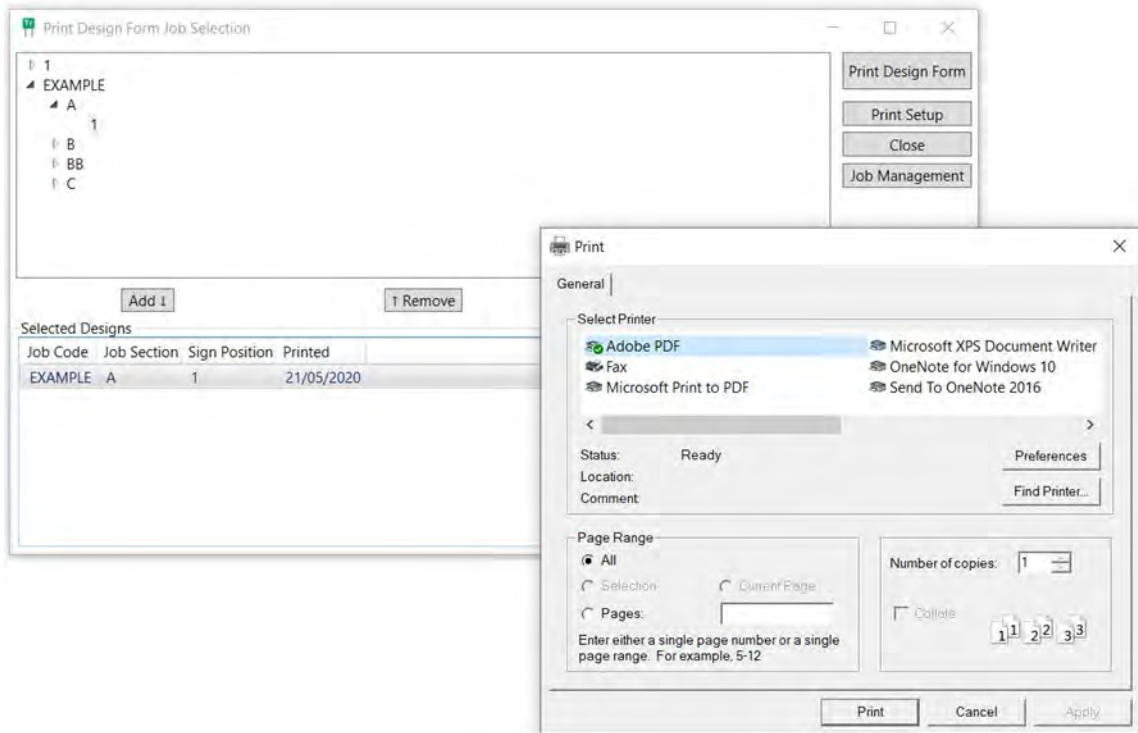


Figure 7.1.1(b) shows a sample Design form.

Figure 7.1.1(b) – Print job selection: Design form

22/05/2020 Page 1

Print Design Form Job Selection - Design Form

Job Code: EXAMPLE		Job Section: A	Sign Position: 1
-------------------	--	----------------	------------------

Location Details		Slope Details	
Wind Region	Region B	Segment Length	30000
Exposed Terrain	No	Height	0
Risk Category	Low Impact Risk		
Foundation Soil	Loose to Medium Dense Sand		
Side of Road	Left		
Distance from carriageway	0		
Road Height	1500		

Sign Face Details	
Detail	Front
Sign Code	1
Sign Width	1000
Sign Depth	1000
Sign Separation	0

Sign Stiffener Details	
Detail	Front
Stiffener Type	1
Number of Stiffeners	3
Stiffener Spacing	450
Number of Brackets	3

Support Design Details	
Support Details	
Number	1
Spacing	0
Kerb Post Length	3250
Post 2 Length	0
Post 3 Length	0
Post 4 Length	0
Stub Length	0
Post Dimensions	60.3 OD
Post Wall Thickness	2.9
Post Grade	C350
Slip Base Required	No
Footing Details	
Footing Type	Normal
Diameter	300
Depth	750

Warnings, Errors and Suggestions

TraSiS Version 4.0

Figure 7.1.1(c) shows the **Notes** page which is printed along with the **Design** form.

Figure 7.1.1(c) – Notes page

The screenshot displays a software window titled "Print Design Form Job Selection - Design Form". The window includes a header bar with the date "22/05/2020" on the left, the title "Print Design Form Job Selection - Design Form" in the center, and "Page 2" on the right. Below the header, there are three fields: "Job Code" with the value "EXAMPLE", "Job Section" with the value "A", and "Sign Position" with the value "1". The main content area is titled "Notes" and contains the text "These notes are printed as part of the design form printout". At the bottom of the window, there is a footer bar with "TraSiS" on the left and "Version 4.0" on the right.

Figure 7.1.1(d) shows the **Summary** form which contains structural data for each sign in a condensed form under the headings:

- position number
- sign code
- sign details
- stiffener details
- support details
- support length details
- stub, and
- footing details.

The form fits the details of up to 40 signs per page, arranged according to **Job**.

Figure 7.1.1(d) – Summary form

Position No.		Sign Details				Stiffener Details				Support Details				Support Length Details				Stub		Footing Details							
No.	Code	Width	Depth	Layout	Separation	Dist. from c/way	Road Height	Type	Num	Spacing	Bracket	Type	Num	Spacing	Dim	Wall	Grade	Base	Kerb Post	Post 2	Post 3	Post 4	Length	Type	Diam.	Depth	
Job: EXAMPLE Section: A																											
1	1	1000	1000	Front	0	0	1500	1	3	450	3	CH5 Steel	1	0	60.3 OD	2.9	C350	Rigid	3250						Normal	300	750

7.1.2 How to print order forms

The **Order** form shown in Figure 7.1.2 contains all data necessary to order the correct structural members:

- requisition number (see Note);
- job code, job section and sign position
- sign face details
- stiffener details
- support details
- stub details, and
- fitting details.

Note: The form fits details of up to 10 signs per page.

The print process includes a prompt for the requisition number that appears at the top of the page.

Figure 7.1.2 – Order form

22/05/2020		Print Order Form Job Selection - Order Form		Page 1
Requisition Number: 1				
Job Code	EXAMPLE			
Job Section	A			
Sign Position	1			
Sign Face Details				
Sign Code	1			
Sign Layout	Front			
Width	1000			
Depth	1000			
Area	1			
Legend Class	Various			
Legend Colour	Black CAL			
Background Class	Various			
Background Colour	White			
Stiffener Details				
Type	1			
Number	3			
Spacing	450			
Support Details				
Type	CHS Steel			
Number	1			
Dimension	60.3 OD			
Wall Thickness	2.9			
Material Grade	C350			
Kerb Post Length	3250			
Post 2 Length				
Post 3 Length				
Post 4 Length				
Base Type	Rigid			
Overhang				
Stub Details				
Type				
Number				
Dimension				
Wall Thickness				
Material Grade				
Stub Length				
Fitting Details				
Number	3			
Dimension	60.3 OD			
TraSiS				
				Version 4.0

8 Warnings and errors

TraSiS communicates warnings or errors through the **Message box**. Following are some commonly displayed warnings and errors.

Table 8 – Warnings and errors

Warning or error	Probable cause
Insufficient terrain information has been defined.	Total horizontal length of the roadside slope is less than the width of the sign face.
A combination of large sign area and/or high clearance height has resulted in no solution being found for the stated Wind region and Exposure settings.	This error generally occurs on signs with large areas and heights, especially with strut signs – not always literal.
Only one front sign is allowed for truss designs.	The user is attempting to view a truss structure for two or more sign faces.
Only normal concrete footings are allowed for truss designs.	The user is attempting to use screw footings on a truss support.
Post 2 clearance is x and needs to be at least 1500.	The minimum post clearance is required for the safety and courtesy of pedestrian traffic. Post clearance is calculated by subtracting 175mm from the road height.
Post 1 clearance is x and needs to be at least 2100.	As stated previously; however, greater clearance is required for slip base signs.
Post 2 clearance is x and needs to be less than 10,000.	The maximum post clearance for CHS and RHS posts is 10m.
Post spacing must be greater than 1500mm for slip base supports – signs less than 1700mm that require two posts may be excluded.	Post spacing is critical for only slip base signs. Note: For some situations, it may not be possible to find a suitable design that can be built inside a clear zone.
Post spacing is too wide for the smallest signs' width	For a sign panel, the minimum overhang beyond the supports is 100mm
Post 2 clearance is x and needs to be less than 3250.	The maximum post clearance for truss posts is 3250mm
Design eccentricity is too large (difference between tallest and shortest posts).	In a strut support sign, the difference in length of any two posts cannot be more than 500mm.
Cross-section data are too complicated to analyse.	When the roadside cross-section has both cut and fill slopes, this message appears in the Clear zone window.
Sign panel height is greater than twice the clearance height. A slip base design is not possible for this situation.	For slip base designs, the clearance height must be more than half the sign panel height
Sign is too wide to be handled by this program.	Sign width must be less than, or equal to 9600mm.
I can't save a sign to the default database.	The default (EXAMPLE) database is read-only and any new signs need to be saved in a custom created database (see Section 5.2)

