VANTAGE

Multi-Discipline Supports

Administration Guide



MDS11.6

Issue 200505 Rev 0

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1 Introduction

1.1 About this guide

This manual is designed to give the administrator guidance on how to setup and configure the Framework Templates for the Multi-Discipline Supports (MDS) application. It is assumed that the administrator is an experienced user who has an understanding of the MDS application and has attended a training course.

1.2 An overview of the MDS application

The MDS application allows the user to create standard supports for pipework, cable trays, and HVAC. The application is highly interactive, enabling the user to design supports with the minimum of effort. It is also highly configurable allowing the administrator to define project related defaults to control the design of supports and to determine the range and types of ancillary support components that can be used on the project.

The standard supports in this application, which are designed using structural sections, are template driven. A default set of structural templates based on British Standard Steelwork Sections is supplied with the application. All of these templates may be configured to suit the needs of an office or project to adopt a relevant national standard for steelwork sections. (For further information see Section 9).

1.3 The administrator's role

The administrator is responsible for the initial setup of the default files associated with the MDS application. This document describes the default files that can be modified by the administrator in order to configure it to specific project requirements. Each default file is discussed in detail, with extracts and examples to help explain what aspects of the MDS application can be modified and how this can be achieved. It may be useful to have copies of the default files available when reading this guide or to have the files opened in an editor session on your workstation.

The MDS application has several associated default files and these are located in the Vantage Plant Design project defaults directory for MDS.

The default files are:

DES-SUPP-DEFS (see Section 3)

This is the main Vantage Plant Design MDS defaults file, which controls the key defaults used during support design and contains individual sections describing each support type. For the Hangers part of the MDS Application, it contains a list of available hanger configurations. The list can be configured to meet the project requirements.

DES-SUPP-PARS (see Section 4)

This default file contains parameter definitions for all ancillaries that can be modelled using design parameters in the MDS catalogue. This file is large and quite complex, but allows the

administrator to define the physical dimensions of the ancillaries to match a given vendor.

All of the supplied parameters in this file are based on:

Carpenter & Paterson Ltd.
Pipe Suspension Equipment Catalogue No 7/94;

Available from:

Carpenter & Paterson Ltd.
Head Office: Crown Works,
Welshpool,
Powys
SY21 7BQ
UK

References to the supplier figure numbers are found in the relevant sections of the file. The file allows the administrator to control minimum and maximum design values associated with certain attributes of the ancillary, and contains information used during MTO extraction by the MDS Automatic Drawing Production (the drawing production application for MDS). This information is also used during the hanger design process to determine the range of available rod lengths for a given hanger configuration.

DES-SUPP-ID (see Section 5)

This file allows the definition of how MDS locates support zones.

DES-SUPP-ALTD (see page 34)

This file allows the project to redefine the support standard code on the MDS ADP drawing.

DES-SUPP-HANG (see Section 10.2.1)

This file defines the configurations of the hangers. Each hanger's configuration has an internal name. A configuration is defined by a combination of top, middle and bottom connection types.

Where the hanger is connected to the pipe through a lug or a trunnion, the file contains a section defining which standard supports can be used for that connection.

DES-SUPP-ICONS (see Section 6)

This file controls which design icons are made available to the user.

DES-SUPP-MATR (see Section 12)

This file contains pipe material defaults used by application.

DES-SUPP-NAMES (see Section 8)

This file contains the default auto naming rules. Additional files can be created containing different sets of rules.

DRA-MDS-ABA-DEFAULTS (see Section 11)

This file contains default values for MDS ADP.

MDS-REPORT-DEFS and MDS-REPORT-HEADINGS (see Section 7)

MDS-REPORT-DEFS contains the pre-defined MDS Reports available for the Project. MDS-REPORT-HEADINGS contains the definition of a list of Alternative Report Headings that are applicable to the reports. The files work in conjunction with each other.

1.4 MDS catalogue and specification

The MDS application is supplied with a catalogue and specification. The range of bore and components in the catalogue are fixed and should be adequate for all projects. The catalogue supplied and associated specification '/MDS' must not be modified by the administrator or any other user.

2 Project setup

The recommended Project schema when using MDS in the PDMS project environment is explained in the *MDS Project Setup Guide*.

3 Design defaults DES-SUPP-DEFS

3.1 Overview

The DES-SUPP-DEFS file is the main control file for the MDS application. It allows the administrator to control the design limits within which supports can be created and determines the range of ancillaries that are available during the design process. The file also contains a description for each support type and has the facility to allow alternative support names to be used.

The file is divided into two main parts: the first part of the file describes the design defaults used by the MDS application, where each default is referenced by a keyword. The remainder of the file is divided into a number of sections that describe each support type.

This section describes each part of the default file in more detail and provides examples to help you can configure the file to suit a particular project requirement.

3.2 Design defaults

The first part of the default file contains the design defaults for MDS, which are used throughout the support design process. There are several design defaults that can be modified and each of these is prefixed with a keyword followed with the project specific value. These defaults are loaded on entry into the Design module.

Note: All values in the default file must be defined in millimetres (mm), even for imperial unit projects. All catalogue weights are stored in kg.

3.2.1 Support Application defaults

The user can modify some of the defaults on the MDS Application Defaults form (Figure 1). To access this form select **Settings >Defaults >Application…** from the MDS main menu bar.

Note: All values entered into this form are always displayed in the current format for distance units set inside Vantage Plant Design.

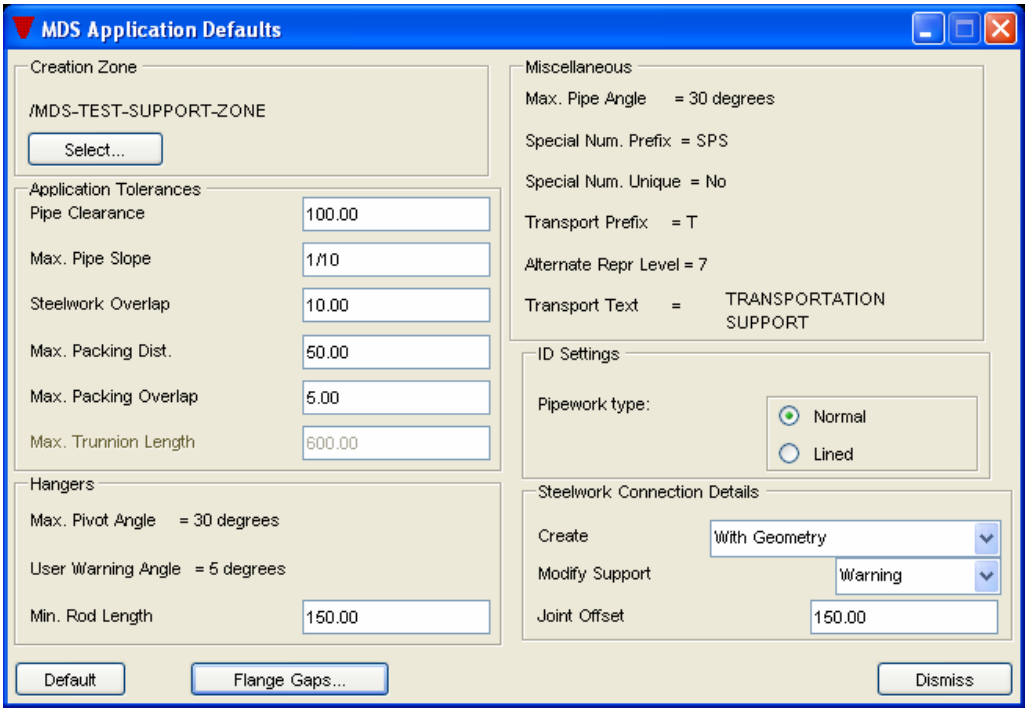
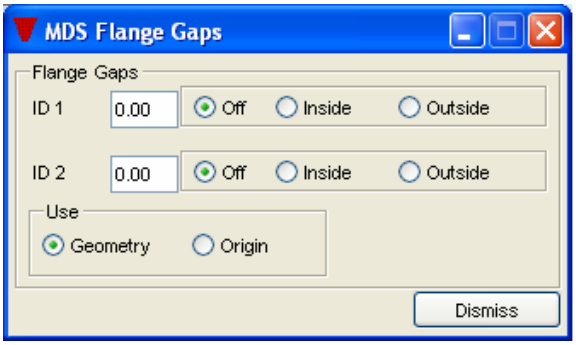


Figure 1 MDS Application Defaults form

The items on this form are self explanatory except for Flange Gaps. This function only works in 'creation by cursor' mode. The setting for this functionality is available by pressing the Flange Gaps icon. This will display the following form



Note: ID1 is the first member identified and ID2 is the second member identified (if applicable). This can make a significant difference to the structure as shown in the examples below. The positioning of the framework legs can be used with either the identified sections or gensecs geometry or the sections or gensecs origin.

The following examples show the effect of selecting the members in different orders. In Figure 2 both flange gaps are set to off. In Figure 4 and Figure 5, ID1 and ID2 have the same settings but have been selected in different orders. The same is also true for Figure 5 and Figure 6, resulting in a mirrored structure in both cases

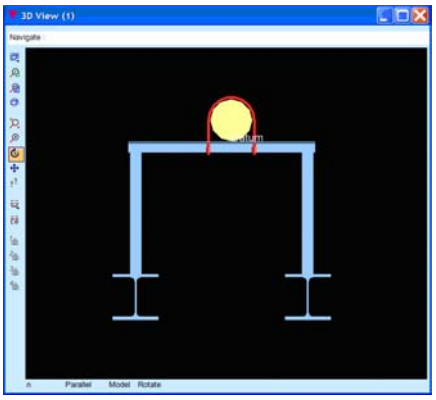


Figure 2 ID1 = off, ID2 = off

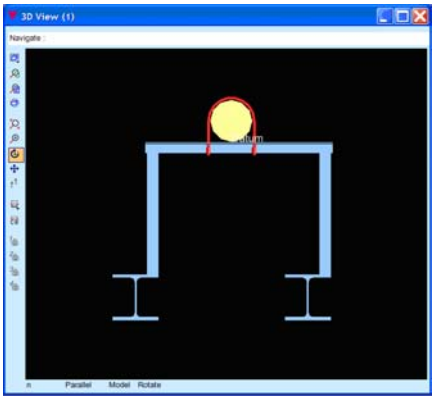


Figure 3 Left first, ID1 = Inside, ID2 = Outside

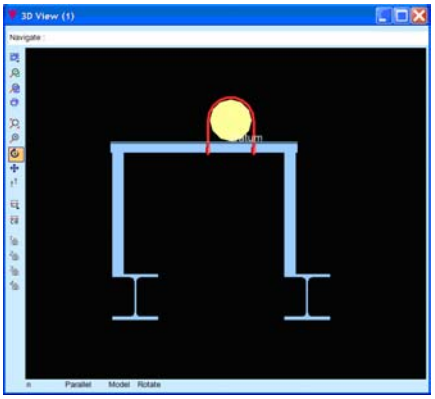


Figure 4 Right first, ID1 = Inside, ID2 = Outside

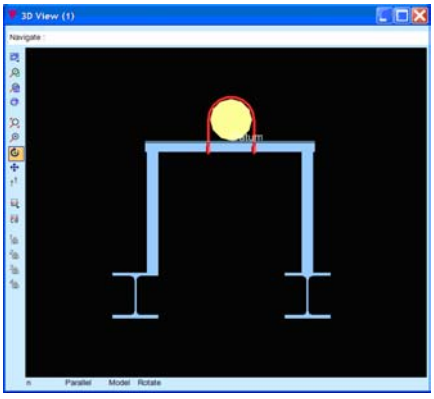


Figure 5 Left first, ID1 = Inside, ID2 = Off

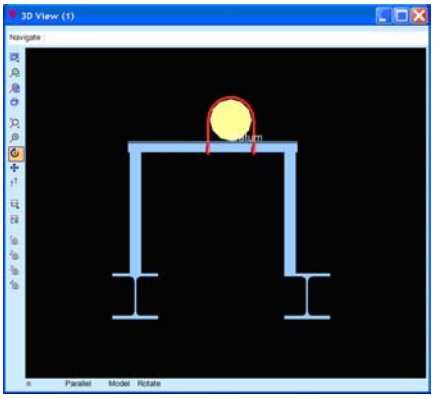


Figure 6 Right first, ID1 = Inside, ID2 = Off

3.2.2 MDSSUPPCL

Default value (mm)	Session/default file modifiable	Description
100	Session	Steelwork clearance form support attachments.

When a designer chooses to build a support using the Clearance option, this value is used to determine the clearance on both sides of the support attachment (see Figure 7).

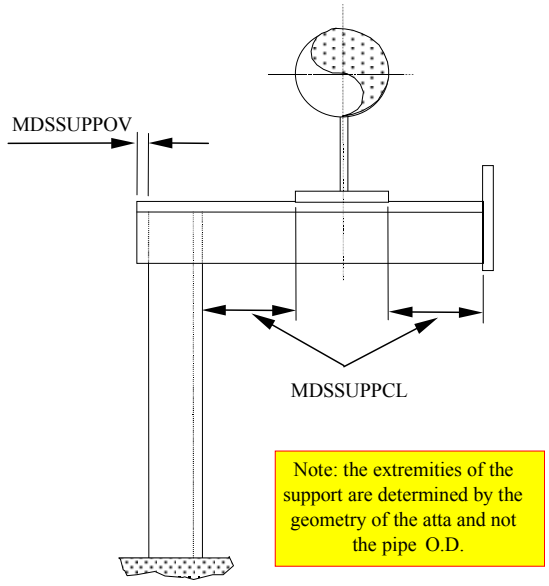


Figure 7 MDSSUPPCL and MDSSUPPOV

3.2.3 MDSSUPPOV

Default value (mm)	Session/default file modifiable	Description
10	Session	Steelwork overlap.

This value determines the overlap distance for steelwork joints on the support frameworks (see Figure 7).

3.2.4 MDSSUPPMS

Default value	Session/default file modifiable	Description
1/10	Session	Maximum allowable pipe slope for horizontal supports.

This is the slope value above which MDS creates a framework type support perpendicular to the pipe (see Figure 8). Below this slope value, MDS allows the pipe to sit at an angle relative to the vertical framework (see Figure 9).

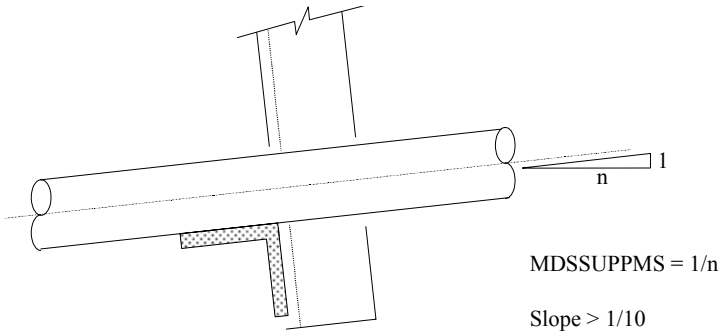


Figure 8 MDSSUPPMS slope > 1/10

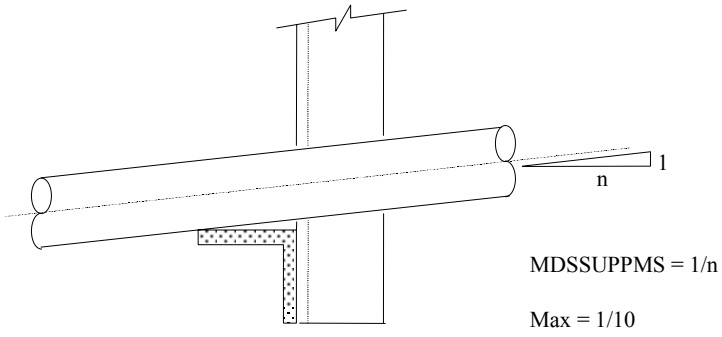


Figure 9 MDSSUPPMS slope < 1/10

3.2.5 MDSPACKDI

Default value (mm)	Session/default file modifiable	Description
50	Session	Maximum allowable packing distance (see Figure 10).

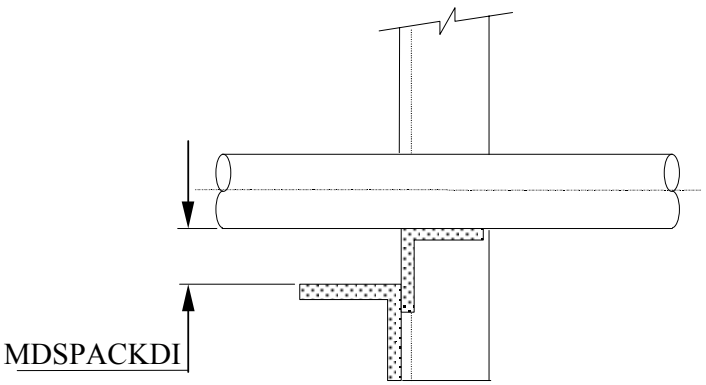


Figure 10 MDSPACKDI

3.2.6 MDSPACKMO

Default value (mm)	Session/default file modifiable	Description
5	Session	Maximum allowable packing overlap.

This is the maximum allowable overlap that can occur between a support attachment and its associated supporting steelwork (see Figure 11).

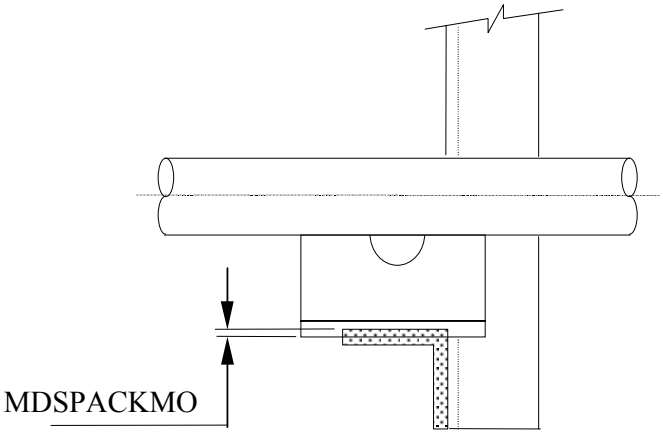


Figure 11 MDSPACKMO

3.2.7 MDSTRUNLEN

Default value (mm)	Session/default file modifiable	Description
600	Default file	Maximum trunnion length allowed. This default is used when creating trunnions on straight length or elbows.

This is only used for trunnion types TT01 to TT03; the remaining standards use the DES-SUPP-PARS file to control the minimum and maximum lengths of the trunnion.

3.2.8 MDSMAXHANG

Default value (degrees)	Session/default file modifiable	Description
30	Default file	Maximum allowable horizontal angle for pipe hangers

This default determines the maximum allowable angle in the horizontal plane with respect to the datum pipe centreline that a pipe can have in order to be added to a framework (see Figure 12).

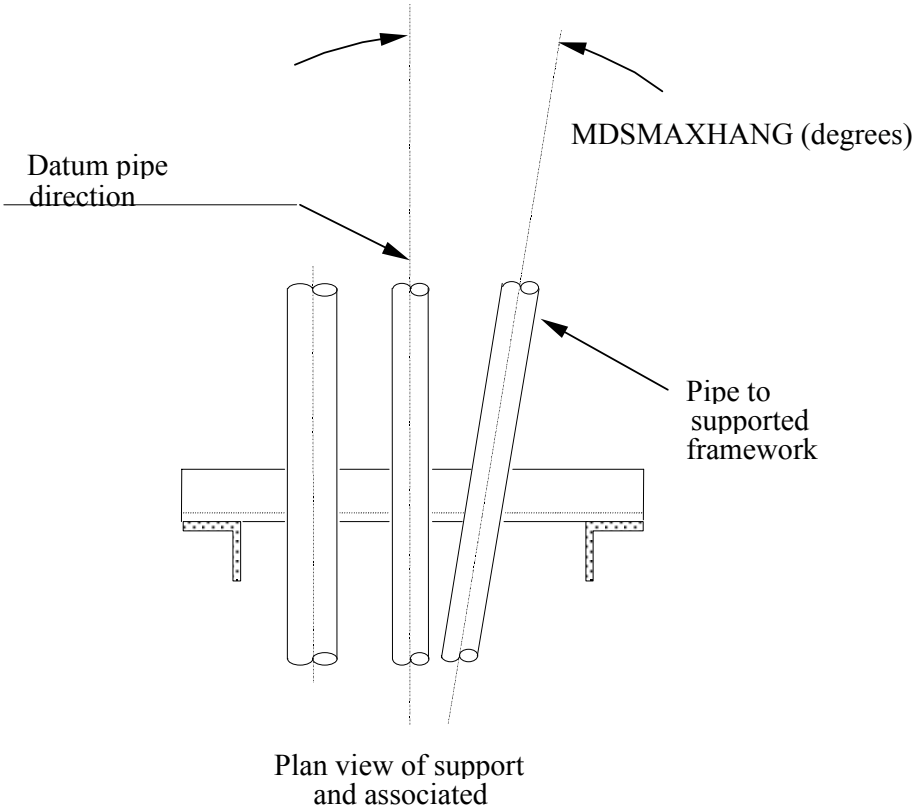


Figure 12 MDSMAXHANG

3.2.9 MDSMAXPIVA

Default value (degrees)	Session/default file modifiable	Description
30	Default file	Maximum pivot angle for pipe hangers

This default determines the maximum allowable slope for a horizontal pipe that can be supported by a hanger. If the user attempts to support a section of pipe whose slope is greater than the MDSMAXPIVA angle an error is displayed (see Figure 13).

3.2.10 MDSPIVWARN

Default value (degrees)	Session/default file modifiable	Description
5	Default file	Warning pivot angle for pipe hangers

This default is also associated with hangers and determines the angle above which a warning is displayed to the user. If the user attempts to support a section of pipe whose slope is greater than or equal to the MDSPIVWARN angle, an error is displayed but the user is allowed to continue with the design process.

Note: It is essential that the value of MDSPIVWARN is always less than the value of MDSMAXPIVA.

In the example given in Figure 13, the designer would have received a warning alert, as the slope of the pipe is greater than the MDSPIVWARN angle but less than the MDSMAXPIVA angle.

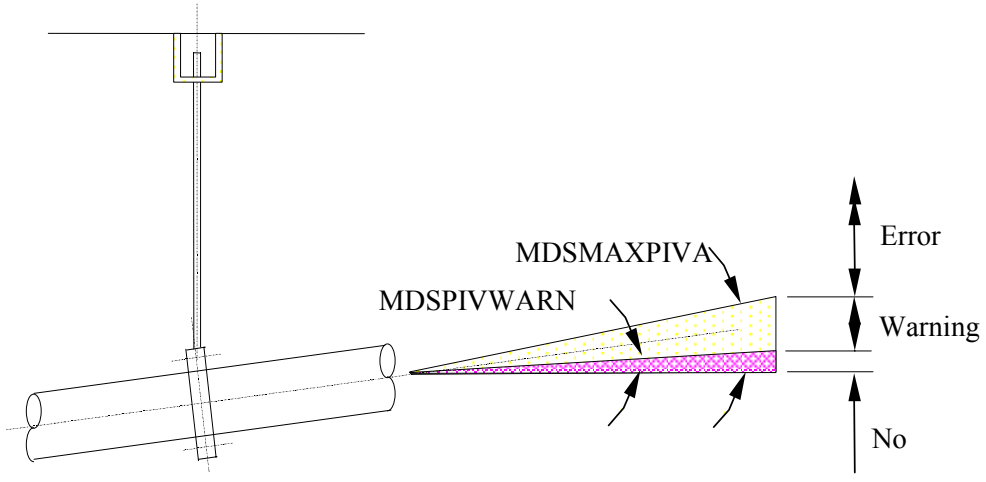


Figure 13 MDSMAXPIVA and MDSPIVWARN

3.2.11 MDSMINHANG

Default value (mm)	Session/default file modifiable	Description
150	Default file	Minimum hanger rod length for MDS information only.

3.2.12 MDSSPECPRE, MDSSPECFLA and MDSSPECON

Default value	Session/default file modifiable	Description
SPS	Default file	MDSSPECPRE: special support number prefix.
false	Default file	MDSSPECFLA: special support number unique flag.
false	Default file	MDSSPECON: special support number checker.

The MDSSPECPRE default is the special support number prefix and is used when special supports are created. The prefix is used in combination with the standard support name. It can be made to be unique within the current MDB by setting the MDSSPECFLA default to true. Setting the default value to false allows the special support number to exist at more than one support. Setting MDSSPECON to true prevents the user from proceeding until a special support number is entered.

3.2.13 MDSTRANPREF and MDSTRANISO

Default value	Session/default file modifiable	Description
T	Default file	MDSTRANPREF: transportation support prefix.
TRANSPORTATION# / SUPPORT	Default file	MDSTRANISO: transportation support text as seen on the Piping Isometric.

The default MDSTRANPREF contains the prefix string that identifies a transportation support. If the support name starts with the transport prefix, the STEX of all support attachments associated with the support will have the transportation#/support text string, contained in the default MDSTRANISO. This is appended to the support name in the Attachment Stext attribute and will appear on the relevant Piping Isometric.

3.2.14 MDSCONNS

Default value	Session/default file modifiable	Description
3	Default file	Connection to steelwork: 1 = no connections 2 = without geometry 3 = with geometry

If the Create option is set to default file setting 1, the connection icons on all support forms become inactive. If the Create option is set to default file setting 2, the create and delete connection icons become active, and the modify and force connect icons remain inactive. This is because these icons are only used for modifying joint geometry attributes. If the Create option is set to default file setting 3, then all icons become active.

3.2.15 MDSCONNSMODS

Default value	Session/default file modifiable	Description
WARNING	Default file	Modify support action.

The Connections option on the options form enables the functions to know what to do if the support is connected. This option dictates the error messages when modifying a connected support in the normal way.

Default setting available:

WARNING: a warning message is displayed, asking the user if she or he wishes to continue, every time a support is modified.

ERROR: the user will be asked to delete the connection before continuing.

CONTINUE: the user will not receive any messages before the support is modified.

3.2.16 MDSOFFSET

Default value (mm)	Session/default file modifiable	Description
150	Default file	The value used by the MDS Integrity Checker for joint eccentricity.

3.2.17 MDSLEVCHANGE

Default value	Session/default file modifiable	Description
7	Default file	The value that can be set to allow graphical additions of Design elements by their drawing level attribute.

3.2.18 MDSWEITAG

Default value	Session/default file modifiable	Description
Kgs	Default file	Defines the unit of weight on drawings.

3.2.19 MDSWEIUNIT

Default value	Session/default file modifiable	Description
1	Default file	This keyword is used in weight calculations and enables output in Lbs. All Catalogue weights are stored in the database in Kg. Set to 2.2046 for Lbs.

3.2.20 MDSTRUNNOTES

Default value	Session/default file modifiable	Description
true	Default file	Determines whether the following notes appear on isometric drawings: DO NOT CUT HOLE IN PIPE 6mm WEEP HOLE FREE TO SLIDE

3.2.21 MDSHANGIF

Default value	Session/default file modifiable	Description
MDS	Default file	Project hanger interface (4 options): LISEGA = Liscad from Lisega PSL = PSDesigner from PSL CPL = Witchhanger fro Carpenter & Paterson Ltd MDS = Standard MDS hanger application

3.2.22 MDSTRUNCODE

Default value	Session/default file modifiable	Description
5	Default file	Number of characters to be displayed in trunnion support codes standard.

3.2.23 MDSORINOT

Default value	Session/default file modifiable	Description
true	Default file	Sets what the support tag displays on the Isometric. true = PS100 ORI = N false = PS100

3.2.24 MDSFLAGAP

Default value	Session/default file modifiable	Description
0	Default file	Flange gapping value

This is the value used for flange gap control when the flange gap toggle is true on the MDS defaults form. Refer to Section 3.2.1 on page 5, for more information.

3.2.25 MPU

Default value	Session/default file modifiable	Description
1	Default file	Dataset code conversion factor. 1 = metric project 25.4 = imperial project

3.3 Form size controls

The default value of each of the keywords in Table 1 controls the number of lines of information displayed in the form.

Keyword	Default value	Form
MDSFORMFRA	10	Frameworks
MDSFORMGEN	10	Ancillaries
MDSFORMCAB	8	Cable Tray
MDSFORMHVA	4	HVAC
MDSFORMANC	10	Anchors
MDSFORMFIX	10	Fixed and Variable Hangers
MDSFORMGUI	10	Guides
MDSFORMSLI	10	Slip Units
MDSFORMSPR	3	Springs
MDSFORMTRU	10	Trunnions
MDSFORMVES	6	Vessel
MDSFORMBRA	6	Branch Reinforcements

Table 1 Form size defaults

3.4 Support type definitions

The remainder of the default file is dedicated to the definition of the support types as follows as shown in Table 2.

Type	Support Names
Misc. Ancillaries	AC series
Anchors	AN series
General Ancillaries	AT series, BT series & Pipe Rest
Branch Reinforcements	BR series
Cable Racks	CT series
HVAC	DT series
Hangers	FH series - fixed hangers
	VH series - variable hangers
Frameworks	FT series
Guides	GT series
Shear Lugs	LT series
Preliminary Supports	PR series
Stops	ST series
Slip Units	SU series
Trunnions	TT series
Vessel	VT series

Table 2 Support type definitions

3.4.1 Configuration definitions

Each of the support definitions follows a standard format as shown in Figure 14 and described below. Specials are not applicable to the above list. Hanger Configurations do not follow this definition. They are described in Section 3.4.2 on page 20.

```
FT03 \ XFT03 \ - L Bracket
up.\*\AT10A,AT10B,AT11A,AT11B,AN01*,lt*,AN04,AN05*,AT61\true
FT04 \ XFT04 \ - L Bracket
down.\*\AT10A,AT10B,AT11A,AT11B,AN01*,lt*,AN04,AN05*,AT61\true
FT05 \ XFT05 \ - L Bracket
Cantilever.\*\AT10A,AT10B,AT11A,AT11B,AN01*,lt*,AN04,AN05*,AT61\true
FT06 \ XFT06 \ - L Bracket
Cantilever.\*\AT10A,AT10B,AT11A,AT11B,AN01*,lt*,AN04,AN05*,AT61\true
FT07 \ XFT07 \ - Post.\BT*,PIPE-REST\PIPE-REST\,AN04,AN05*,AT61\true
FT08 \ XFT08 \ - Goal
post.\*\AT10A,AT10B,AT11A,AT11B,AN01*,lt*,AN04,AN05*,AT61\true
FT09 \ XFT09 \ - Support
frame.\*\AT10A,AT10B,AT11A,AT11B,AN01*,lt*,AN04,AN05*,AT61\true
```

Figure 14 Extract from DES-SUPP-DEFS default file

The format of the entries is divided into six fields of information separated by the backslash \ character. Each field is described below.

Field 1 - Application support type

All available types are present in the default file and their descriptions can be modified as required. If any of the types are not required, they can be commented out using the hash # character at the beginning of the associated line. The names used in field 1 are fixed and must NOT be modified by the administrator, as they are expected by the application and are related to specific STYPs in the MDS specification.

Field 2 - Replacement support name

This is the clients Replacement Support Name used on all forms in the application when referring to the support type defined in field 1. The Replacement Support Name is also output in place of the Application Support Type on the MDS Automatic Drawing Production drawings.

Field 3 - Support description

The text in this field is configurable to suit each Vantage Plant Design project and is only displayed to the user in the DESIGN module of Vantage Plant Design during the creation of supports. The description in field 3 will not affect any associated MTO details output in the MDS Automatic Drawing Production, as these details are stored in the MDS catalogue database.

Fields 4 and 5 - Available pipe support ancillaries

Fields 4 and 5 determine what ancillaries are available to the user when attempting to create the associated support type. Field 4 contains the list of available ancillaries and field 5 contains the list of ancillaries that are to be excluded. The combination of both of these fields results in a list of available ancillary types, which the user can select from. The administrator can make use of the familiar wildcard character * to mean any number of any characters in the selection of available types. The fields can also contain a comma separated list of ancillaries, an example of this is shown below.

To illustrate the use of fields 4 and 5 consider the following entry for FT01:

```
FT01 \ FT01 \ - Trapeze hanger with welded beam attachments.\*\AT10*,AT11*,AN01*,LT*
```

Field 4 contains the string * this means that all ancillary types should be made available to the MDS application.

Field 5, however, contains a comma-separated list of ancillaries that should be excluded from use by the MDS application. For the Application Support Type FT01, pipe support ancillary

types beginning with AT10, AT11, AN01, and LT will be excluded from the selection list when displayed to the designer in the MDS application.

In this example the effect on the list of available ancillaries is to remove all Trunnion type Pedestal Anchors and Supports, and Shear Lugs from the ancillary list, which would not be suitable for use with the Trapeze Hanger support defined in the Application Support Type FT01.

Field 6 - MTOC

This field enables settings to be applied to the MTOC attribute of components as follows:
true = material appears on the Isometric
false = material does not appear on Isometric

Modifying the replacement name (field 2) and description (field 3)

Another example of how the support type definitions can be modified is given below. In this example we shall redefine the entry for pipe shoe anchor AN02. The original entry for AN02 is shown below:

```
AN02 \ XAN02 \ - Pipe Shoe Anchor. \ * \ \
```

Let's redefine this entry as follows:

```
AN02 \ STPSANC01 \ - Standard Pipe Shoe Anchor. \ * \ \
```

The user will now see all references to AN02 in the ancillary selection form replaced by "STPSANC01 - Standard Pipe Shoe Anchor".

Modifying the available ancillary definitions

Finally let us redefine fields 4 and 5 for the FT28 framework definition, the original entry for FT28 is shown below:

```
FT28 \ FT28 \ - Beam Penetration. \ * \ AT10*,AT11*,AN01*,LT* \
```

Let's change this definition to show all ancillaries with the exception of Trunnion type Pedestals, and Shear Lugs (as shown above), and add the Reinforcing Plates to the exclusion list (as shown below):

```
FT28 \ FT28 \ - Beam Penetration. \ * \
AT10*,AT11*,AN01*,LT*,AT05,AT09 \
```

3.4.2 Hanger configuration definitions

The hanger support types are shown in Table 3 below.

Type	Hanger Codes
Fixed Hangers	FH series
Variable Hangers	VH series

Table 3 Hanger codes

Each of the hanger configurations definitions follows a standard format as shown in Figure 15.

```
FH01  \ FH T1  M1 B1 \  - Fixed Hanger NPS 3/4 - 6.
FH02  \ FH T1  M1 B2 \  - Fixed Hanger NPS 8   - 24.
FH03  \ FH T1  M1 B5 \  - Fixed Hanger NPS 1/2 - 2.
FH04  \ FH T1  M1 B6 \  - Fixed Hanger NPS 3   - 24.
FH05  \ FH T1  M2 B1 \  - Fixed Hanger NPS 3/4 - 6.

VH01  \ VH T1  M3 B1 \  - Variable Hanger NPS 3/4 - 6.
VH02  \ VH T1  M3 B2 \  - Variable Hanger NPS 8   - 24.
VH03  \ VH T1  M3 B5 \  - Variable Hanger NPS 1/2 - 2.
VH04  \ VH T1  M3 B6 \  - Variable Hanger NPS 3   - 24.
VH05  \ VH T3  M3 B1 \  - Variable Hanger NPS 3/4 - 6.
VH06  \ VH T3  M3 B2 \  - Variable Hanger NPS 8   - 24.
```

Figure 15 Hanger configuration definitions

The format of the entries is divided into three fields of information separated by the backslash \ character. Each field is described below.

Field 1 - Application hanger type

All available types are present in the default file and their descriptions can be modified as required. Each type represents a hanger configuration. If any of the types are not required, they can be commented out using the hash # character at the beginning of the associated line. The names used in field 1 are fixed and must NOT be modified by the administrator, as they are expected by the application and are related to specific STYPs in the MDS specification.

Field 2 - Replacement support name

This is the client's Replacement Support Name used on all forms in the application when referring to the support type defined in field 1. The Replacement Support Name is also output in place of the Application Support Type on the MDS Automatic Drawing Production drawings.

Field 3 - Support description

The text in this field is configurable to suit each Vantage Plant Design project and is only displayed to the user in the DESIGN module of Vantage Plant Design during the creation of supports. The description in field 3 will not affect any associated MTO details output in the MDS Automatic Drawing Production, as these details are stored in the MDS catalogue database.

4 Design defaults DES-SUPP-PARS

4.1 Overview

The DES-SUPP-PARS file contains the design parameter definitions for the ancillary support components. The file is divided into individual sections associated with each component type and contains all parameters necessary to build the component in the design database. The component descriptions can also contain rules that modify the geometry of the components in certain situations, e.g. by adding stiffening webs for pipe shoes where the height of the shoe exceeds a given value. The file also contains material descriptions, drilling or weld sizes associated with components where necessary.

4.2 Format of the file entries

Note: All values in this default file must always be defined in millimetres (mm), even for Imperial Unit projects.

A typical section from the default file is shown in Figure 16. Each section in the file starts with a header to describe the component, its pipe Nominal Bore (NB) range, and any associated vendor details. Note that most of the header records are for information only and are treated as comment lines by the MDS application. All comment lines are prefixed with the hash # character.

```
#
# -----------------
# AT01 - Pipe Shoe
# -----------------
#
#Atta           Vendor
#Type Keyword   Fig.
#---- -------   -----------
AT01 VENDOR    C&P Fig.381
#
#      Build Parameters:                                                                                    User
#                                                                                                           Editable            Alternative        Alternative
#Atta         Nom                          Design Parameters                                                 Despars             Representation     Despars         Shoe
#Type Keyword Bore  1  2   3  4  5  6 7           8              9 10 11 12 13 14 15  Number,Min,Max      Expression          Number,Value   Material
#---- ------- ---- --- --- - -- --- - -- ------------------------  -- -- -- --  ----------------    ----------------    ------------   --------------
AT01 PARAM     0   \ \ \ \ \ \ \ /CARBON/STEEL \ CS \ true
AT01 PARAM    20   60 150  6  6 100 1 0  (DESP[2] - 2 * DESP[9])  0 -1 -1  34 0 0 200 \ 2,100,350 5,50,180  \ (DESP[5] gt 100) \ 7,6 9,25 \ 2,5 \ \ \ \ \ true
AT01 PARAM    25   60 150  6  6 100 1 0  (DESP[2] - 2 * DESP[9])  0 -1 -1  34 0 0 200 \ 2,100,350 5,50,180  \ (DESP[5] gt 100) \ 7,6 9,25 \ 2,5 \ \ \ \ \ true
AT01 PARAM    40   60 150  6  6 100 1 0  (DESP[2] - 2 * DESP[9])  0 -1 -1  34 0 0 200 \ 2,100,350 5,50,180  \ (DESP[5] gt 100) \ 7,6 9,25 \ 2,5 \ \ \ \ \ true
AT01 PARAM    50   60 150  6  6 100 1 0  (DESP[2] - 2 * DESP[9])  0 -1 -1  34 0 0 200 \ 2,100,350 5,50,180  \ (DESP[5] gt 100) \ 7,6 9,25 \ 2,5 \ \ \ \ \ true
```

Figure 16 Extract from DES-SUPP-PARS default file

4.2.1 Vendor details

This record in the file tells the application that a new section is beginning and details the vendor figure number associated with the component build parameters that follow. The first part of the vendor record is the Application Support Type (Atta Type), in this case AT01. The second part of the record (everything following the type) contains the vendor figure details. If the atta type has no associated vendor details leave this part of the record blank.

4.2.2 Build parameters

The bulk of the default file is made up of the build parameters, and the format of these records is consistent for all components. Figure 16 shows a cut-down version of the build parameters for pipe shoe AT01. The format of these entries is now described in detail.

Each record is associated with a specific size of component in the catalogue, and for each record there are up to fourteen fields that can contain design data associated with that size of component. Notice that the first size of component is in fact 0 nominal bore. This line contains data that applies to all sizes of the component. In fact what follows the 0 could be appended to each of the subsequent sizes, however the line length maximum of 256 characters prevents this.

4.2.3 Format of the 0 bore component line only

These following field descriptions relate to the first build parameter line only in Figure 16 where the Nom Bore is 0.

Field 8 - Material

The component material is selected from a database.

Field 9 - Line Material

The line material can be any one of those defined in the DES-SUPP-MATR default file (see Table 7 on page 54).

Field 10 - MTOC

This field enables settings to be applied to the MTOC attribute of components as follows:
true = material appears on the Isometric
false = material does not appear on Isometric

4.2.4 Format of component lines

Field 1 - Component type, sizes and design parameters

This field is made up of four parts and is best illustrated by an example. The first field for component AT01 (NB 20mm) is shown in Figure 17.

```
#      Build Parameters:
#
#Atta         Nom                  Design Parameters
#Type Keyword Bore  1  2   3  4  5  6 7          8              9 10 11 12 13 14 15
#---- ------- ---- --- --- - -- --- - -- ----------------------   -- -- -- --  ------
AT01 PARAM    20   60 150  6  6 100 1 0  (DESP[2] - 2 * DESP[9])  0 -1 -1  34 0 0 200 \
```

Figure 17 Field 1 for AT01 with NB 20mm

The first part of the field contains the component type AT01 followed by the keyword PARAM, which identifies the record as a build parameter record to be distinct from the vendor and rod records. The third part of the field is the nominal bore of the component in millimetres (use the Vantage Plant Design equivalent Metric bore sizes for Imperial bore sizes i.e. 50mm = 2in, 150mm = 6in etc.). The remainder of the field contains the design parameters for this component in number order. So for AT01 there are fifteen design parameters used to fully define the geometry of the pipe shoe.

Expressions in design parameters

Any design parameter in field 1 can be replaced by a Vantage Plant Design expression and must be enclosed in brackets (). In the example given above, design parameter 8 is represented by the expression:

```
(DESP[2] - 2 * DESP[9])
```

This expression is evaluated during creation of the component and is re-evaluated if any of the user editable design parameters are modified during a design session.

Parameter Descriptions and Data Sets

All design parameters are detailed in the DATASET associated with the component in the MDS catalogue. The parameter descriptions can be queried on the command line in PARAGON. More conveniently you can create the ATTA component (ancillary) in design using the MDS application and view the design parameters number, data key, description and values etc. with the **Query>Properties...** form invoked from the top bar menu (see Figure 18).

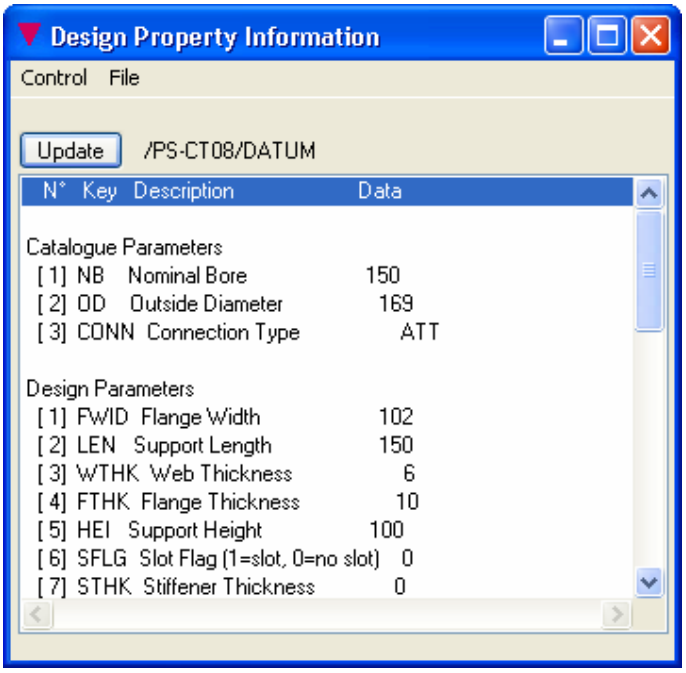


Figure 18 Design Property Information form

Field 2 - User editable design parameters

This field lists the design parameters that a user can modify during the creation or subsequent modification of a support. The field can contain a space-separated list of the editable design parameter numbers and their associated minimum and maximum values. Each entry is composed of three values separated by commas. As an example, the second field for component AT01 (NB 20mm) is shown in Figure 19.

```
User
Editable
Despars
Number,Min,Max
------------  -------
…\ 2,100,350 5,50,180 \ …
```

Figure 19 Field 2 for AT01 with NB 20mm

In the above example the Pipe Support designer is only allowed to modify two of the design parameters for AT01, these are:

Despar 2 - support length, which can take a minimum value of 100mm and a maximum value of 350mm

Despar 5 - support height, which can take a minimum value of 50mm and a maximum value of 180mm

When the designer modifies these values using the MDS application, the minimum and maximum values are checked and warning messages are displayed to the designer if the values are exceeded. The administrator must ensure suitable values are entered for these minimum and maximum values, and in particular, that the maximum value is greater than the minimum.

In some situations it may be necessary to restrict the user editable parameter to a single value, e.g. for AT01 with NB 20mm we may wish to fix the shoe height at 100mm to match the component available in a given supplier catalogue. In this case set the minimum and maximum height values to 100 as shown in Figure 20.

```
User
Editable
Despars
Number,Min,Max
------------  -------
…\ 2,100,350 5,100,100 \ …
```

Height of shoe

Figure 20 Example: height of shoe fixed at 100mm

Fields 3 and 4 - Alternative representation expression and design parameters

These fields are used to change the geometry of a component in certain situations. The MDS application checks the expression in field 3 each time the component is modified. If the expression is true, i.e. design parameter 5 is greater than 100mm, the alternative design parameters defined in field 4 are used.

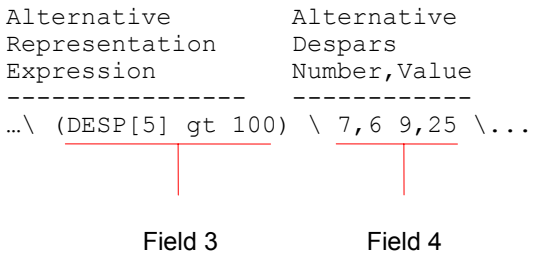


Figure 21 Alternative representation expression and design parameters

When the expression is true:

Despar 7 is set to 6mm

Despar 9 is set to 25mm

This creates web stiffeners 25mm wide and 6mm thick on the pipe shoe.

Field 5 - Shoe material

Field 6 - Component weight

No longer used. A PDMS Property controls weights.

Field 7 - Drill and weld size information

No longer used.

Fields 8 and 9

Reserved for future use.

Field 10 Shop flag information

This field controls whether the material for a shoe appears on the fabrication Isometric.

true = appears on Isometric (e.g. material for a welded shoe)
false = does not appear on Isometric (e.g. a bolted shoe)

4.2.5 TT04 trunnion

All fields are the same as those described in Sections 4.2.3 and 4.2.4 for AT01.
Figure 22 shows an extract from DES-SUPP-PARS and the exceptions to AT01 are described below.

```
TT04    VENDOR
#
#      Build Parameters:                                          User
#                                                                 Editable
#Atta         Nom  Design Parameters                               DPs
#Type Keyword Bore   1     2    3   4                             No,Min,Max
#---- ------- ---- ---   ---  --- ---  --- --- --- -- -- --   ------------------
TT04 PARAM    0   \ \ \ \ \ \ \ \ CS \ true
TT04 PARAM   50   750 130 750 40,AC18A                           \ \ \ \ \ \ \ \ \ true
TT04 PARAM   65   750 130 750 40,AC18A                           \ \ \ \ \ \ \ \ \ true
TT04 PARAM   80   750 145 750 50,AC18A                           \ \ \ \ \ \ \ \ \ true
```

Figure 22 Extract from DES-SUPP-PARS showing TT04 trunnion

Field 1 for TT04 with NB 50mm

Notice that on the 0 bore line there is no material setting for this component type.

The first part of the field contains the component type TT04 followed by the keyword PARAM, which identifies the record as a build parameter record. The third part of the field is the nominal bore of the component in millimetres (use the Vantage Plant Design equivalent Metric bore sizes for Imperial bore sizes i.e. 50mm = 2in, 150mm = 6in etc.). The remainder of the field contains the design parameters for this component in number order. For TT04 there are five design parameters used to fully define the geometry of the trunnion.

In line 2 in Figure 22, the number 50 applies to the run size of the pipe the trunnion is attached to. This is followed by 750 (the default length of the trunnion), then by 130 and 750 which are the minimum and maximum lengths for the trunnion. Finally, 40 sets the allowable bore of the trunnion and AC18A is the allowable base plate standard.

5 Design defaults DES-SUPP-ID

5.1 Overview

The DES-SUPP-ID file contains the criteria that the MDS application uses to select suitable zones for creation of support frameworks. The MDS application uses the attribute and value set in this file to determine the list of displayed zones. The file is shown in Figure 23.

```
# Multi discipline supports application default file DES-SUPP-ID
#
# Application defaults file for discipline identification
# This attribute is a zone element attribute
#
# Keyword\Attribute\Value
MDSIDSUPP\PURP\SUPP
MDSIDTRAY\PURP\TRAY
MDSIDHVAC\PURP\HVAC
MDSIDPIPE\PURP\PIPE
```

Figure 23 Default file DES-SUPP-ID

6 Design icons defaults DES-SUPP-ICONS

6.1 Overview

Depending on project requirements and conditions, it may be necessary to deactivate certain icons from the MDS toolbar. The switches to do this are listed in the defaults file DES-SUPP-ICONS and are shown in Table 4. For example, to exclude trunnions from the toolbar, change the trunnions default setting to false.

Icon	Default setting
MDS	true
GENERAL	true
CABLE	true
HVAC	true
ANCHOR	true
FIXED	true
VARIABLE	true
CONSTANT	false
GUIDES	true
SLIP	true
SPECIAL	true
SPRINGS	true
TRUNNIONS	true
VESSEL	true
BRANCH	true

Table 4 Extract from DES-SUPP-ICONS

7 Reports defaults MDS-REPORT-DEFS and MDS-REPORT-HEADINGS

7.1 Overview

The two default files MDS-REPORT-DEFS and MDS-REPORT-HEADINGS work in conjunction with each other and Heading numbers must align in both files.

MDS-REPORT-DEFS contains the pre-defined MDS Reports available for the project. In Design, the contents of this file are shown as the output file and description on the MDS reports menu accessed from Utilities>MDS Reports. The default file contains the details of each column in each of the pre-defined reports. The administrator can add to, or edit, the default file to create reports for any project or client specific requirements.

The MDS-REPORT-HEADINGS file contains the definition of a list of Alternative Report Headings that are applicable to the Reports generated from the Utilities>MDS Reports menu in Design. The contents of MDS-REPORT-HEADINGS manifest themselves on the MDS Report Headings form in Design. This is accessed by selecting Utilities>MDS Reports>User Defined from the menu on the form. The administrator can add to, or edit, the default file to create reports for any project or client specific requirements.

7.2 Defined MDS reports for the delivered project

Read the following information in conjunction with details at the top of MDS-REPORT-DEFS file.

MDS-REPORT-DEFS contains the pre-defined MDS Reports available for the Project.

Note: The maximum length of any line in this file must not exceed 256 Characters. If more than 256 characters exist, the MDS Report Utility will error on initialisation with:

```
(41,319) ERROR - Cannot access file /<%projcode>DFLTS/MDS-
REPORT-DEFS - RSE.
```

The format of the file is typically as shown in Table 5.

Fields	1	2	3	4	5
Description	Output File Name	Report Title	Heading Numbers and optional sorting, totalling and subtotalling controls in parentheses ()	Main Report Filter	List Types
Example	MDS Summary	Support Index Summary	1(),2(),3(),4(),5()	(match(name of spref,/MDS) eq 1) and (match(name of spref,/MDS/.) neq 1) or (:MDSsupptype eq FT22)	Atta stru

Table 5 Example file format

Field 1: The filename on the operating system to which the report will be sent.

Field 2: The title of the report appearing on the top of the Report.

Field 3: The required heading numbers as selected from the MDS Report Headings form. This field also controls the associated column sorting, subtotalling, and totalling options (see Section 7.2.1).

Field 4: The database extraction functions for the required data.

Field 5: The database element types to be searched for the data required in Field 4.

7.2.1 Field 3 sorting, totalling and sub-totalling options

Note: If sorting or totalling is NOT required, the options in the parentheses can be omitted from the column definition.

Field <3> also contains details of the sorting and totalling options for each column. The format of this field is described below (comma separated):

```
\ heading_number1() , heading_number2(), ... heading_numbern() \
```

The parentheses () for each heading contain the sorting and totalling options for each heading column. These options are described in Table 6 and have the following format:

```
heading_number(totalling/sorting_precedence/sort_ascending/subtot_sort
_col/subtot_values)
```

Parameter	Value
heading_number	[REAL] - refers to the column headers described in the MDS-REPORT-HEADINGS file
totalling	[BOOLEAN] - turns totalling on/off for the column. TRUE = totalling ON FALSE = totalling OFF Default empty field = FALSE
sorting_precedence	[REAL] - If this column is to be sorted, then this value determines the precedence of the sort. If the column does NOT require sorting, then this value should be ZERO (0) Default empty field = 0
sort_ascending	[BOOLEAN] This controls the order of the sort. TRUE = ascending FALSE = descending Default empty field = TRUE
subtot_sort_col	[REAL] If this column is to be subtotalled then this value determines which sorted column is to be used to determine the subtotalling. Basically each time the sorted column values change then a subtotal is output in this column. If this column does NOT require subtotalling then this value should be ZERO (0) Default empty field = 0
subtot_values	[STRING] This option controls when values in this column will be output. There are two basic options for ALL columns: ON - column values are always output. OFF - column values are not output. However, if this column has subtotalling on, a subtotal value will be output when the associated subtotal_sort_col column values changes and triggers a subtotal for this column. There are two additional value options that are relevant if subtotalling is in effect in the report: SUB - column values are only output when a subtotal is output in any column FIRST - column values are output for the first row in a group of sorted values. This option can ONLY be used if this column is being sorted (sort_precedence > 0) Default empty field = ON

Table 6 Sorting and totalling options

The data above appears in the MDS-REPORT-DEFS file in the format shown in Figure 24.

```
# Output File Name \ Report Title \ Heading Numbers \  Main Report Filter \ List Types
# Field   1>       \    <2>       \      <3>*       \       <4>           \     <5>
MDS Summary\Support Index
Summary\1(F/1/T/0/SUB),2(F/2/T/0/SUB),3(F/3/T/0/SUB),4(F/4/T/0/SUB),5(T/0/T/1/OFF)\((mat
chwild(name of spref,/MD*/*)) and (match(name of spref,/MDS/.) neq 1)) or (:MDSsupptype
eq FT22)\atta stru

MDS Overall-Index \ Overall Support Index \
9(F/1/T/0/ON),1(F/2/T/0/ON),4(F/3/T/0/ON),3,6,7,8 \ (matchwild(name of spref,/MD*/*))
and (match(name of spref,/MDS/.) neq 1) or (SKEY eq BEDP)\ atta stru

MDS Area \ Support Index by AREA \ 9(F/1/T/0/ON),1(F/2/T/0/ON),4(F/3/T/0/ON),3,6,7,10 \
(matchwild(name of spref,/MD*/*)) and (match(name of spref,/MDS/.) neq 1) \ atta

MDS Bedplate Index \ Bed Plate Index \
11(F/1/T/0/ON),12(F/2/T/0/ON),13(F/3/T/0/ON),14(F/4/T/0/ON),15(F/5/T/0/ON)
\(:MDSsupptype eq FT22) and (SKEY eq BEDP)\ stru
```

Figure 24 Extract from MDS-REPORT-DEFS

7.3 Column details

Read the following information in conjunction with details at the top of MDS-REPORT-HEADINGS file.

Note: The Mandatory number of fields/columns is 1 to 9 inclusive.

Column Num	**1**	**2**	**3**	**4**	**5**
Description	Description	Column Heading	Expression	PML Function	Justify Column
Type/Options	text	text	PDMS Expression	Name of pml Function	Left, centre or right
Example	MDS Standard	Standard	(after (name of spref ,MDS/))	mdsmatmancofg	left
Optional (O) or Mandatory (M)	Optional	Mandatory	Mandatory -either Col 3 OR Col 4 Optional -Col 3 AND Col 4		Optional Empty = left

Table continued below.

Column 1: Text that appears on the Output Report

Column 2: Text that appears on form MDS Report Headings along side the Heading number

Column 3: PDMS PML Expression

Column 4: PML Function enabling interfacing to external programmes

Column 5: Output Report column text justification

Column Num	6	7	8	9
Description	Client Code	Unset text	Client Description	Output Data Type
Type/Options	True(T) / False(F)	text	True(T) / False(F)	ASCII (A) / Numeric (N)
Example	true	Non-found	true	Numeric
Optional (O) or Mandatory (M)	Optional	Optional	Optional	Optional
	Empty = false	Empty = ---	Empty = false	Empty = ASCII

Column 6: This is the client's Replacement Support Code as defined in file DES-SUPP-DEFS.

Column 7: This column enables substitute descriptive text to be added into the report for clarification purposes (like non-found rather than ---)

Column 8: In some circumstances an office standard may have a different standard code for different steelwork sizes but the same configuration. The alternative descriptions are defined in the DES-SUPP-ALTD file.

Column 9: Defines the format of the Output Data giving either a real number or an ASCII string.

The data above appears in the MDS-REPORT-HEADINGS file in the format shown in Figure 25.

```
# M = MANDATORY
# O = OPTIONAL
# Description \ Column Heading \   Expression      \     PML Function       \    Justify
Column      \     Client Code       \    Unset Text      \ Client Description    \
Output Data Type
#     <1>     \      <2>       \       <3>         \          <4>           \
<5>           \        <6>            \        <7>         \        <8>            \
<9>
#   <Text>    \     <Text>     \ <PDMS Expression> \ <Name of PML Function> \
<Left,Centre or Right> \ <T, True or F, False> \      <Text>        \ <T, True or F,
False> \<A, ASCII or N, NUMERIC>
#  Optional=O \  Mandatory=M   \   Either <3> or <4>=M, but <3> and <4>=O   \   O(Empty
Field=Left)  \  O(Empty Field=False) \ O(Empty Field= --- \  O(Empty Field=False) \
O(Empty Field=ASCII)
#
\If True Field<8>=False \                   \ If True Field<6>=False\
```

Figure 25 Extract from MDS-REPORT-HEADINGS

8 MDS – auto naming

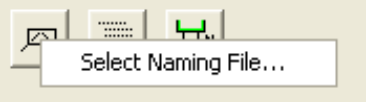
8.1 Overview

An auto naming facility is available in the project default area, which is common to multiple users. By default the DES-SUPP-NAMES auto naming file is used, but users can select any other available auto naming file with the DES-SUPP-NAMES prefix.

8.2 Usage and auto naming file selection

To select an auto naming file, the user needs to open the auto naming form. There are two ways to do this as follows:

1. Click the right hand mouse button over the auto naming button to access the following item and then click with the left mouse button to reveal the form.



or…

2. Select the **Settings>MDS AutoNaming** menu item and the form in Figure 26 is displayed.

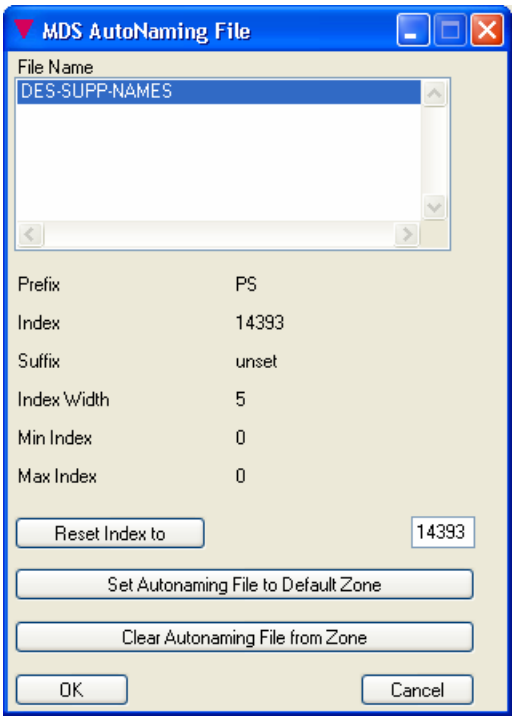


Figure 26 MDS AutoNaming form

The AutoNaming form allows the user to select a different Auto Naming file for the session or to set a different Auto Naming file, stored against the Default Zone, by pressing the Set AutoNaming File to Default Zone button. The Auto Naming file is stored in a uda named :MDSAutofile at the Zone level.

The default file uses the concept of a prefix, index, and suffix value. An example of the contents of the file is shown in Figure 27. The Administrator may change these values or create another file with the DES-SUPP-NAMES prefix.

```
# MDS Support Naming File
# Description: Default naming file
#
# The support name will be made up from the following parts
# Prefix
# Index
# Suffix
#
# These values may be expressions which will be evaluated before they
are used.
# Last will be the last index used
Prefix \ ( substring (namn of zone,1,9))
Index \ 1001
Suffix \ ( substring (namn of zone,10,1))
IWidth \5
MinIndex \1000
MaxIndex\1999
```

Figure 27 Extract from DES-SUPP-NAMES

The default file can also use an index that starts at a value named MinIndex and up to a value called MaxIndex. This allows the user to have a predefined range of support numbers. Another value stored in this file is called the IWidth. This allows a predefined format for the support number i.e. when IWidth is set to 5 the support number contains 5 numbers e.g. PS01234.

9 MDS – structural design templates

9.1 Overview

The standard supports, which are designed using structural sections, are template driven. A default set of templates, in the database site called /MDS/TEMPLATES, is supplied with the application. To make changes to templates the Administrator requires READ/WRITE access to this database.

Each standard support template type has its own zone, below which a maximum of eight (8) Structural Templates may exist. All of the supplied default templates are based on the steelwork sections available from the *British Standards for Steelwork Sections*. Users may configure the template database to suit any other National Standard for steelwork sections as required.

For details on how this can be achieved and complete instructions on how to configure the MDS application Structural Design Templates, please refer to the MDS - *Framework Templates Administration Guide*.

10 Hangers design templates

10.1 Overview

Hangers designed using supplier-specific hanger components are template driven. A default set of templates, in a PDMS SITE called /MDS/HANGERS, is supplied with the application. Each hanger configurations template has its own ZONE. Each size of a given hanger's configuration is represented by a REST component. Two sets of hanger templates are supplied with the application, one for each hanger components supplier (Grinnel and PSL).

Data sheets

Each hanger's configuration, whether fixed, variable, single or double, has an associated application standard data sheet. For some companies it might be a data sheet for the available hanger's components; in other companies it might be a data sheet for the specific hanger's configuration.

All of the application standard data sheets are accessible to the designer, either via the *MDS - User Guide* or from within Vantage Plant Design on the Create and/or Modify Support form(s) for each support type, via a View... button on the form(s).

To configure templates the Administrator requires read/write access to the hangers design templates database.

10.2 Configuration of the hangers design templates

When the application creates a hanger of a given configuration, it copies the required hanger template. In order for the application to know which template it should copy, a specific naming convention is used. Each hanger configuration has a name (e.g. FH01, VH01). As explained in the overview each zone represents a single hanger configuration. The name of the zones has the following formats:

/MDS/FH** - is used for fixed hangers (e.g. /MDS/FH01).

/MDS/VH** - is used for variable hangers (e.g. /MDS/VH01).

** denotes a two digits sequence number.

Each zone owns several REST elements. Each REST represents a hangers size for that configuration. The name of the REST templates has the following format:

/MDS/FH**/pipe_size_in_mm

For example, a REST having the name /MDS/FH01/100 represents a template for a hanger with a FH01 configuration, used for a 100mm pipe. In some cases the hanger designer may need different hanger sizes for the same pipe size. A good example of this is when a hanger is attached to a welded elbow lug. The lug may have a range of holes sizes. So, although the hanger configuration type is the same and the pipe size is the same, a lug with a larger hole will require a larger pin and a hanger with larger rods. This is handled by adding a one-letter suffix to the name of the REST and is compatible with AVEVA's standard naming convention used in the hangers catalogue for rod sizes. For example, suffix A is used for an M6 rod size, B for an M8 rod size etc. A typical template name for such a hanger may be: /MDS/FH01/100/A. This template is for hangers with the FH01 configuration, connected to a 100mm pipe and having M6 rod size.

For further information about AVEVAs naming convention, refer to the *AVEVA Conventions for Catalogues and Specifications* manual.

The range of sizes available for a given hangers configuration, as well as other specific configuration data, is set when the hangers feature of the MDS application is used for the first time in a session. The application then scans the MDS hangers template site: /MDS/HANGERS, reads the zones attributes, and saves it in memory for later use. The range of available hanger sizes for each configuration is determined from the restraints elements below the zone.

10.2.1 The hanger configurations file DES-SUPP-HANG

Each hanger configuration has its own specific design characteristics. Some of the characteristics to consider might be:

- Is it a double or single hanger configuration?
- Should the hanger be connected to a vertical or to a horizontal pipe?
- Should the pipe be insulated?
- Should the steelwork connection be a double-channel connection? What type of beams can be used for the steelwork connection?
- If it is a variable spring hanger, where is the spring located? Is it below the pipe? Is it located above the pipe but below the steelwork? Or is it located on top of the steelwork?
- Is the hanger connected to the pipe using a pipe clamp or to a welded lug

All hanger configurations are stored in a file named DES-SUPP-HANG in the project default directory. This file contains two sections. The first section defines the hanger's configuration as a combination of one to three connection types. The second section defines the standard supports that a given connection type can be connected to.

The hanger's configuration is defined as a combination of three basic components: the top, the middle and the bottom component. Based on this combination and on other attributes of the design templates and of the catalogue components, the application knows what to do with the hanger.

An example of configuration lines for the first section is shown in Figure 28

```
FH27 \ T4 , M2 , B8
FH28 \ T1 , M1 , B10
FH29 \ T1 , M2 , B10
FH30 \ T3 , M2 , B10
FH31 \ T3 , M2 , B7
FH51 \ T3 ,    , B1
VH01 \ T1 , M3 , B1
VH02 \ T1 , M3 , B2
```

Figure 28 Hangers configuration definition

An example of configuration lines for the second section is shown in Figure 29.

```
B8    \ TT21
B10   \ LT03A,LT03B,LT03C,LT03D
B13   \ AT05,AT09,AT23,AT24
B14   \
AT01,AT02,AT03,AT04,AT06,AT07,AT08,AT12,AT13,AT14,AT15,AT16,AT17,AT18,
AT19,AT20
B15   \
AT01,AT02,AT03,AT04,AT05,AT06,AT07,AT08,AT09,AT12,AT13,AT14,AT15,AT16,
AT17,AT18,AT19,AT20,AT23,AT24,AT96,AT97,AT98,AT99
B16   \ AT05,AT09,AT23,AT24
B17   \ LT03A,LT03B,LT03C,LT03D,LT03E,LT03F,LT03G,LT03H
```

Figure 29 Matching standard supports

To minimize the list of available hanger configurations, the configurations type have been developed into seven basic groups as follows:

- Single-hanger hangers connected to a beam.
- Single-hanger hangers connected to a double-channel beam.
- Double-hanger hangers connected to beams.
- Double-hanger hangers connected to double-channel beams.

11 MDS – drawing production DRA-MDS-ABA-DEFAULTS

11.1 Overview

MDS uses the standard ABA (Area Based Automatic Drawing Production) facilities to produce its hanger and framework detail drawings from Draft. Using ABA certain MDS specific elements have been added into the delivered project (MDS). In summary these are: MDS specific Sheet Templates (SHTMPLs) and their associated Views Layers and Tasks, plus some referenced Library (LIBY) elements.

MDS specifics only are documented below. For other details of the Administration of ABA see the *ABA Administration Guide*.

One of the principles of ABA is that it works on an area of the database defined by co-ordinates. MDS-ABA does not make use of this part of the functionality initially but calculates the area required around a support or hanger and then back-fills the requirement into the ABA forms.

A sample DRA-MDS-ABA-Defaults file is supplied with MDS default values.

11.2 MDS specific sheet template libraries

An example hierarchy with relevant elements and key MDS attributes is shown below.

/* World
|
LIBY
|
DRTMLB /MDS-Drawing-Templates
|
DRTMPL /MDS-ABA-3-VIEWS
|
SHTMPL /MDS-ABA-3-VIEWS/S1
|
VIEW
:MDSABAOptions
:ABAUpdate
|
LAYER
|
TASK

11.2.1 View element

The standard VIEW element has two udas associated with it that are significant to MDS. They are:

:ABAUpdate Set to true or false to control when Update Design is performed on the View. If set to false, the update is not performed when a Drawing is created but is done as specified in the owned tasks. This prevents multiple Update Designs and hence optimises drawing processing time.

:MDSABAOption This controls the Projection angle of the View: 1 = 1st angle projection and 3 = 3rd angle projection. The uda defaults to 3rd angle projection if unset.

11.3 MDS specific tasks

Each task is outlined in a separate table below. Tasks are grouped under the following headings:

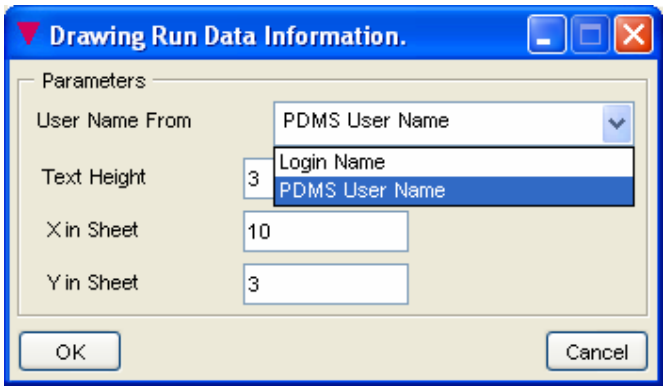
- Sheet tasks
- View tasks

New tables to be added

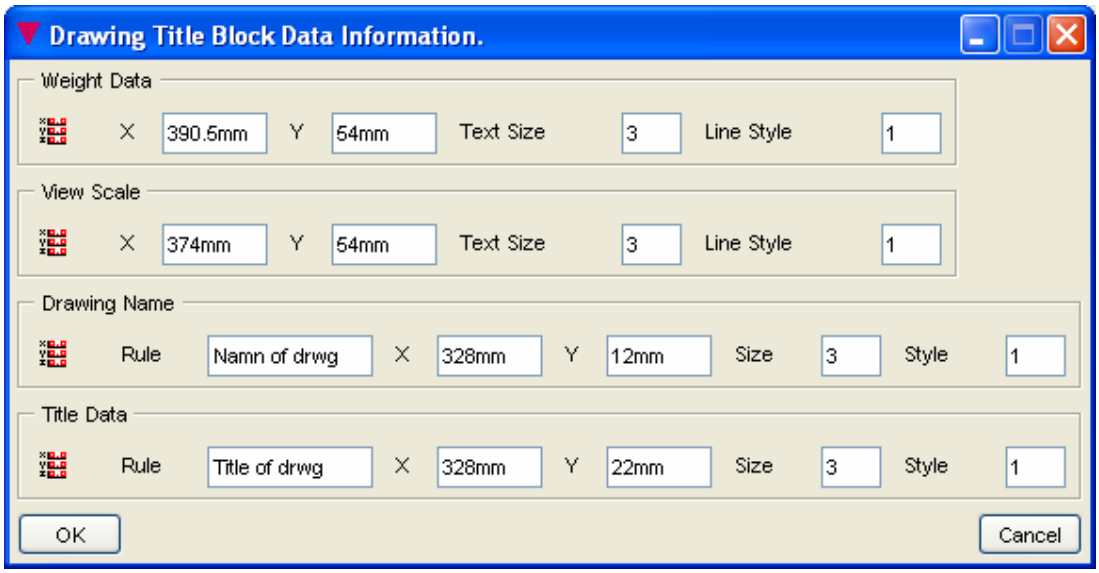
11.3.1 Sheet tasks

SheetLayout	
Task name:	mds_aba_sheet_task
Function name:	mdsabasheettask.pmlfnc
Description:	This task is mandatory for all MDS Template sheets as it sets up the sheet environment to be able to run all the other Tasks for a particular Template. It defines the Views, sets the scales, switches off the View Frames, and sets the View Type. It also gets the name of the required MDS Support.
Parameters:	None

RunData	
Task name:	mds_aba_rundata
Function name:	MdsAbaRunData.pmlfnc
Description:	This task adds run time data of the User, with options of login name or PDMS user at a predefined location, and text size to the MDS Detail Sheet.
Parameters:	Login Name (default); PDMS User Name
Form:	



TitleBlock	
Task name:	mds_aba_titleblock
Function name:	MdsAbaTitleBlock.pmlfnc
Description:	This task adds and positions Drawing Name and Title, View Scale, and Total Support Weight information to the Detail Sheet, in the given size and linestyle. Options exist to position the data explicitly using x-y co-ordinates or cursor input.
Parameters:	As shown on form
Form:	



SheetComment	
Task name:	mds_aba_comment
Function name:	mdsabacomment.pmlfnc
Description:	This task adds any Support Comment set by the designer during the Support Creation sequence. It is positioned at the bottom of the MTO Table on the Sheet.
Parameters:	None

11.3.2 View tasks

MainView

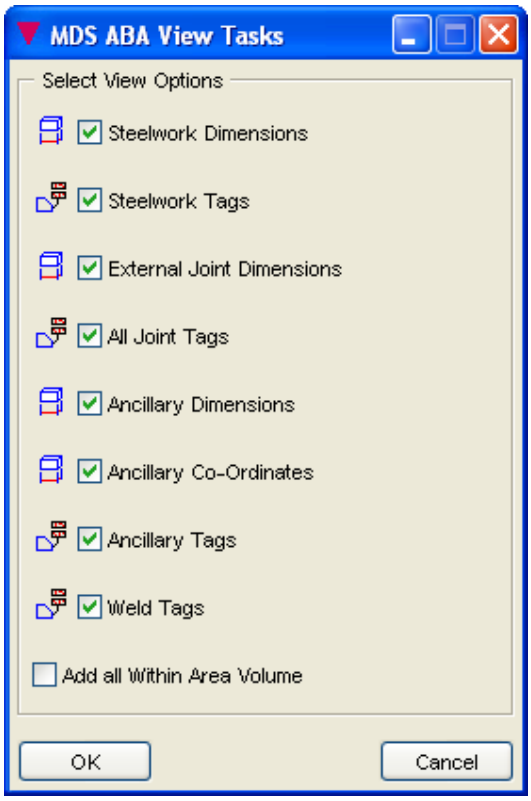
Task name: mds_aba_view_task

Function name: mdsabaviewtask.pmlfnc

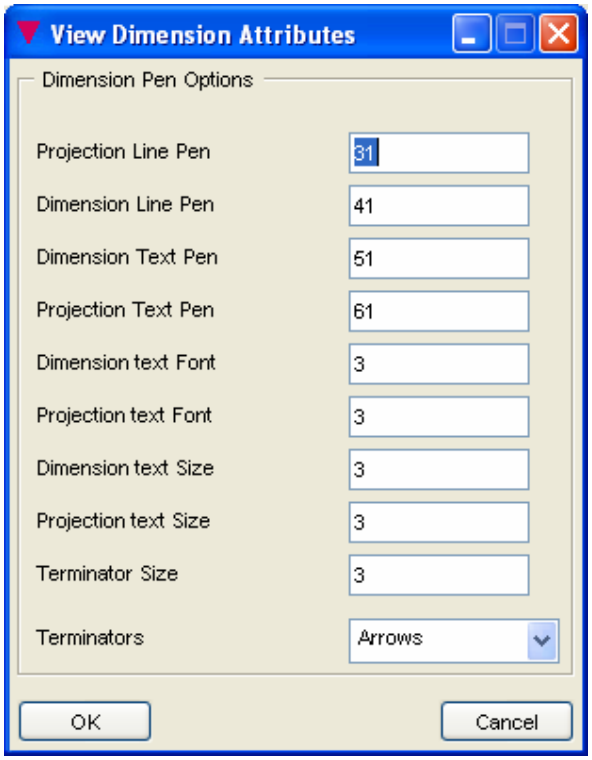
Description: This task is mandatory as it processes other View tasks although the majority of the main detail VIEWS attributes are modified in this function (task). The View Scales and the update of each detail view is carried out in the sheet function (task), i.e. !!mdsabasheettask.pmlfnc to avoid updating these Views more than necessary.

Parameters: As shown on forms

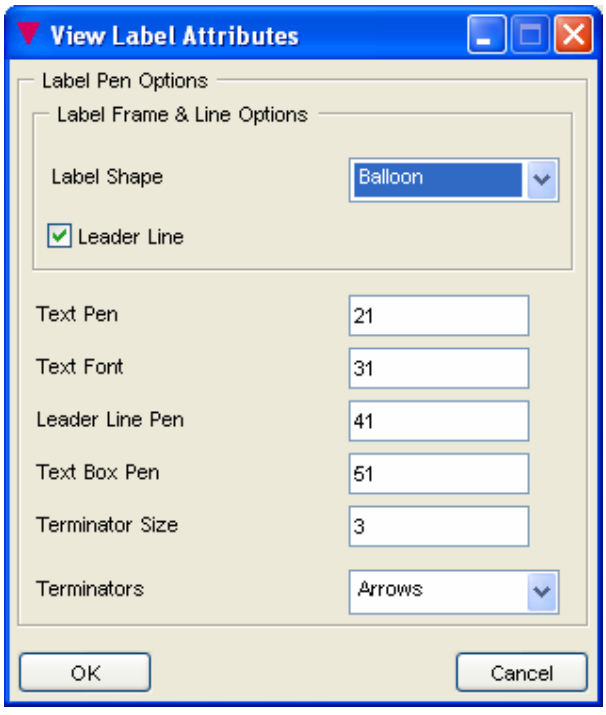
Main View Task Parameter Form:



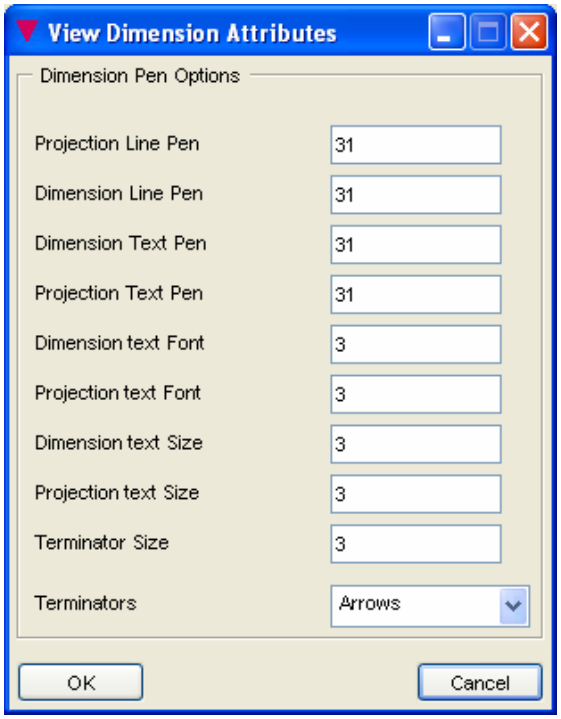
Steelwork Dimensions Options:



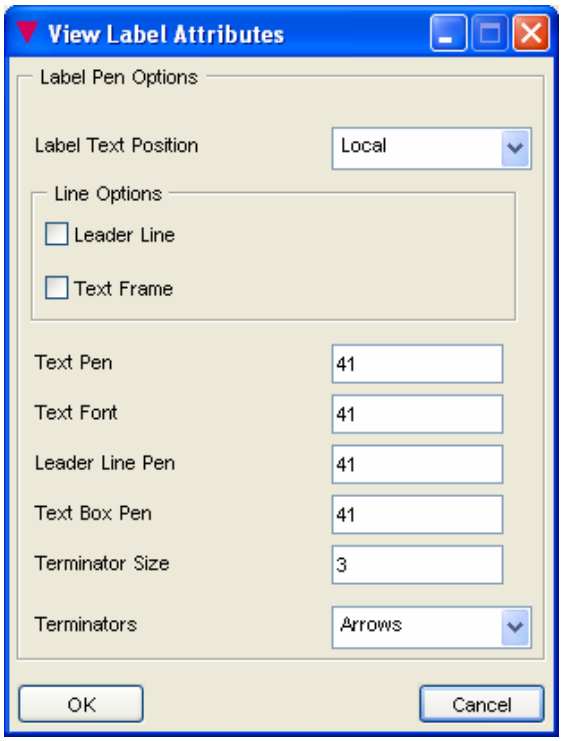
Steelwork Tag Options:



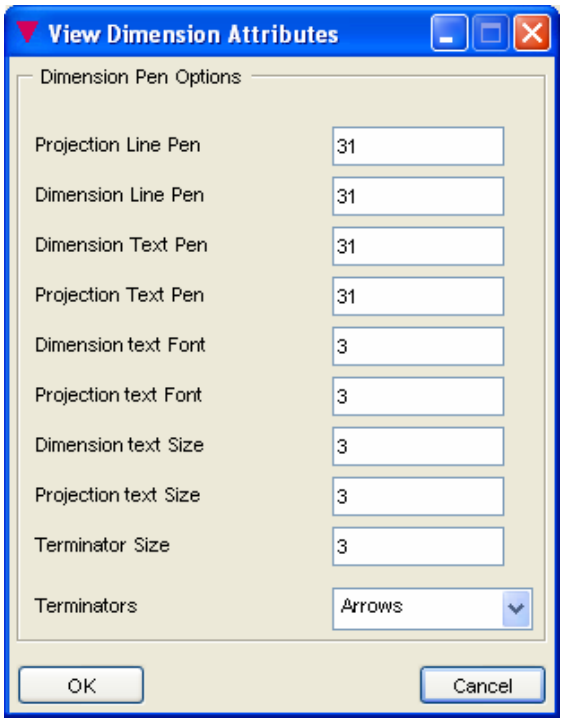
External Joint Dimensions Options:



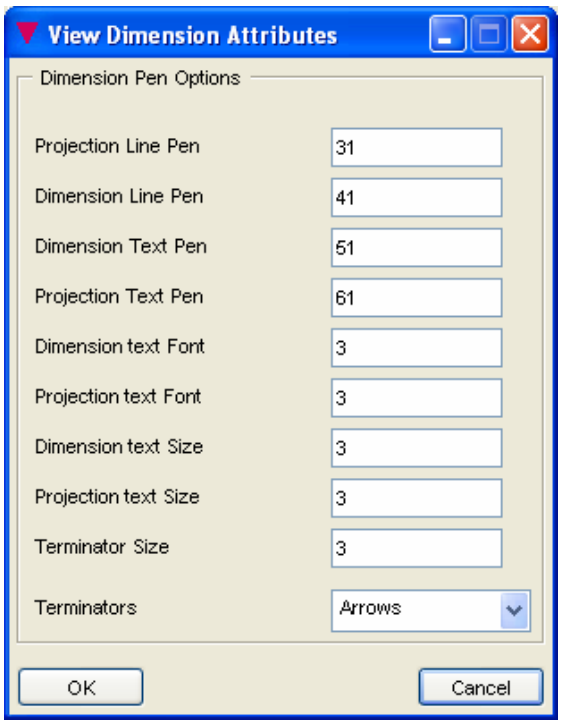
All Joint Tags Options:



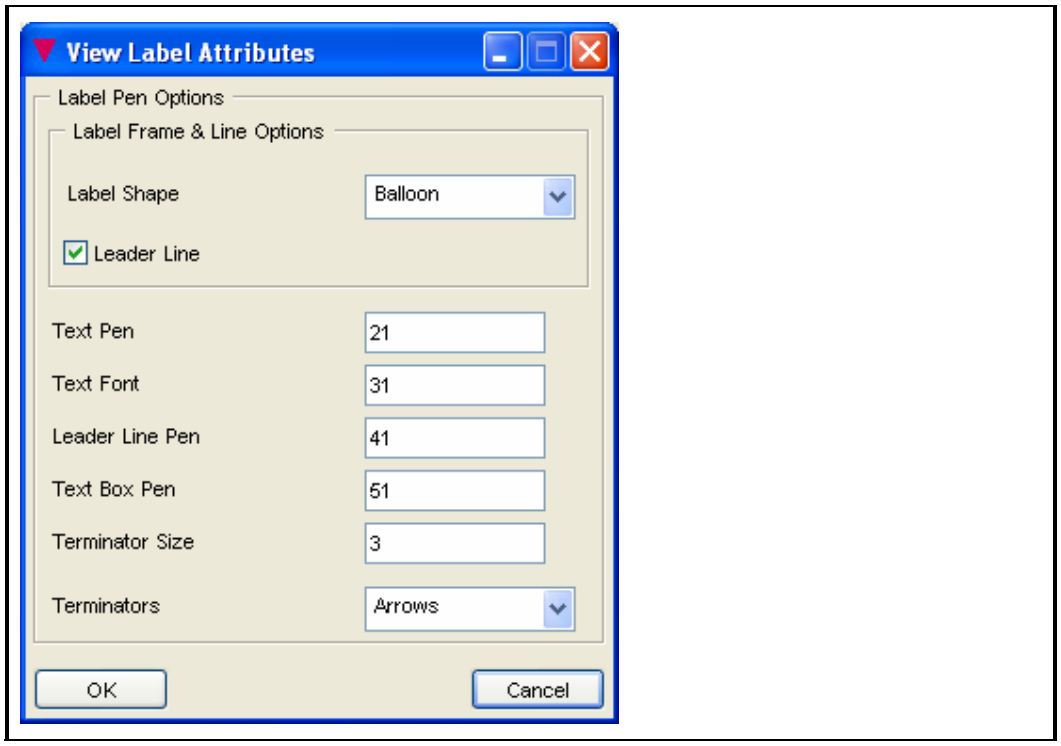
Ancillary Joint Dimensions Options:

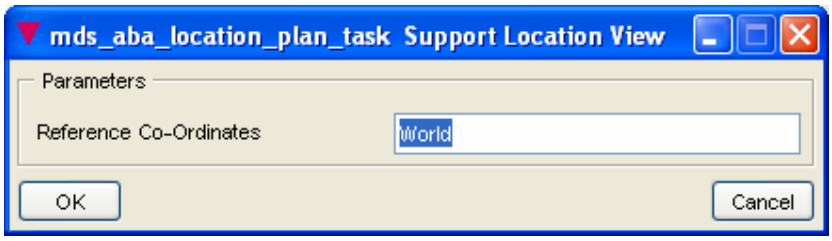


Ancillary Co-ordinates Options:



Ancillary Tags Options:


View Label Attributes
Label Pen Options
Label Frame & Line Options
Label Shape
Balloon
Leader Line
Text Pen
21
Text Font
31
Leader Line Pen
41
Text Box Pen
51
Terminator Size
3
Terminators
Arrows
OK
Cancel

Support location plan view	
Task name:	mds_aba_location_plan_task
Function name:	mdsabalocplan.pmlfnc
Description:	This task performs the following: • Creates and sizes a Location View to fit the available sheet space • Creates and positions a Datum symbol • Gets the nearest Gridline for location and adds to the View • Adds labels and dimensions to the View • Places a North Arrow The View is not necessarily to a standard scale.
Parameters:	As shown on the form
Form:	

Support material take-off of steel

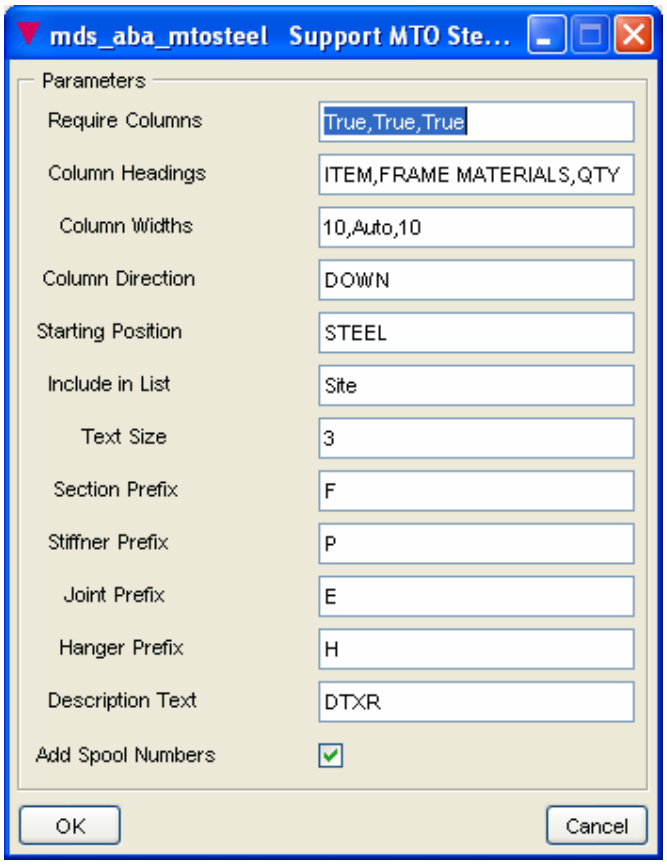
Task name: mds_aba_mtosteel

Function name: mdsabamtosteel.pmlfnc

Description: This task adds a table of steel member requirements, for the Support, to the Template Sheet. Description text can be either DTXS (stex of detref) or DTXR (rtext of stex) where the stex is a manufacturer's description and the rtext is a generic description.

Parameters: As shown on the form

Form:



Support material take-off of components

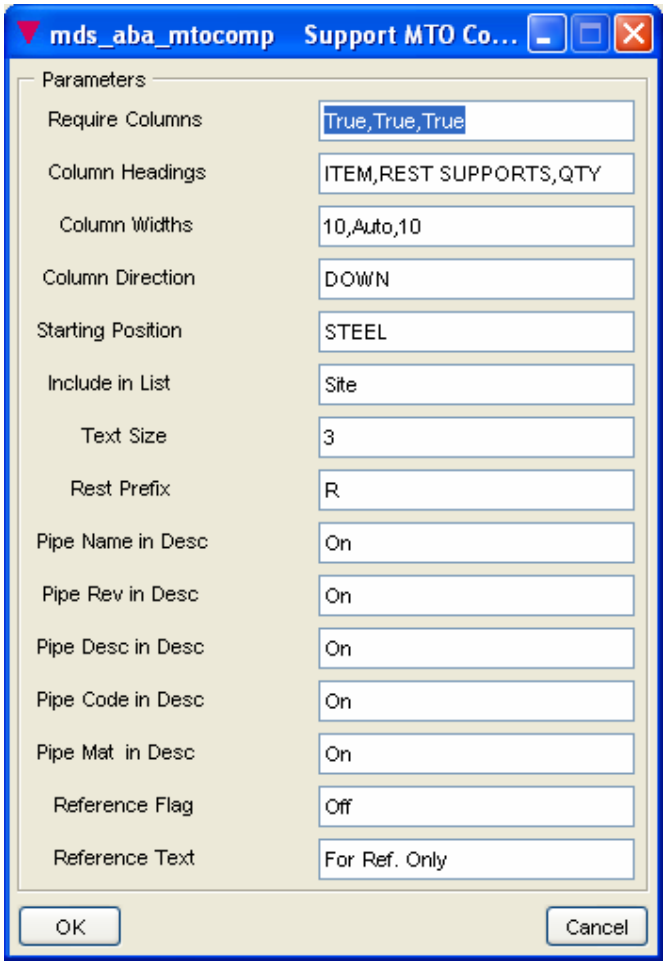
Task name: mds_aba_mtocomp

Function name: mdsabamtocomp.pmlfnc

Description: This task adds a table of Support Components requirements to the Template Sheet.

Parameters: As shown on the form

Form:



Support component tag	
Task name:	mds_aba_ancil_tags
Function name:	mdsabaanctags.pmlfnc
Description:	Adds Support Component (Ancillaries) Labels.
Parameters:	None

Support steelwork tag	
Task name:	mds_aba_steel_tags
Function name:	mdsabasteeltags.pmlfnc
Description:	Adds Support Steelwork Labels.
Parameters:	None

Support steelwork joint tag	
Task name:	mds_aba_ix_joint_tags
Function name:	mdsabasteeltags.pmlfnc
Description:	This task adds Steelwork (SCTN) internal and external joint labels to the Drawing.
Parameters:	None

12 Line material defaults DES-SUPP-MATR

This file contains the default line materials (see Table 7).

Code	Material
CS	Carbon Steel
SS	Stainless Steel
FG	FiberGlass
GV	Galvanised
PL	Plastic
CN	Cupro Nickel

Table 7 Extract from DES-SUPP-MATR

13 MDS – user plots

13.1 Overview

Users can use their own plotfiles, including logos, and client-specific information instead of the MDS plotfiles.

To do this, put the user plots into a parallel file structure, and then get MDS to search in the user area before the AVEVA area. Set the search on the MDSPLOTS environment variable, which is set in the evars.bat batch file.

Example:

```
Setenv MDSPLOTS S:\CADCENTRE\mds4.1.0\user_plots S:\CADCENTRE\mds4.1.0\pdmsui\des\mds\plot
```

End of document