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## Overview

Parts of the isometric may be User customised to control appearance :-

- Pipe - Thickness
- Elbows and Bends - Square or Round shape
- In-Line Fittings - Scale & Thickness
- Dotted Sections of Pipe - Thickness
- Un-Dimensioned Branches - Scale & Thickness
- Miscellaneous Items (Text, Frame, Hatching, Etc.) - Thickness
- Comprehensive Layer Control

This Drawing Control Information is held in the Data Definition File DDF which is a -123 record in the .OPT Options File

Facilities not listed in the DDF will use default drawing values (See slide No. 23 for details)

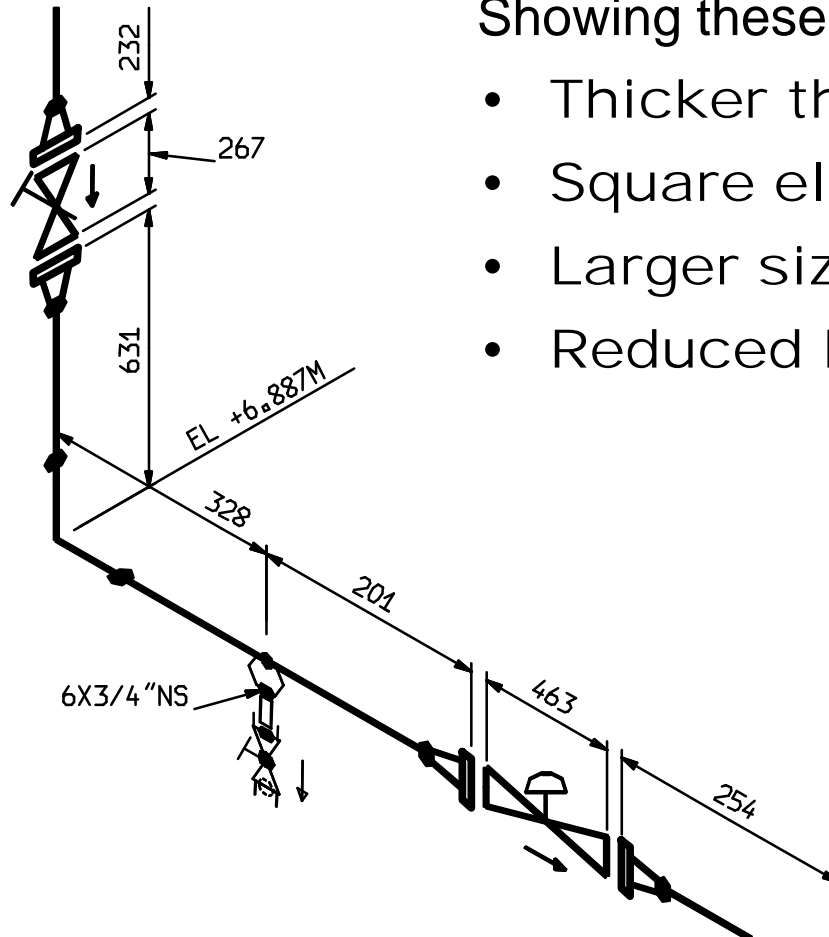


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In addition to these Drawing Control Features - the DDF is also used to  
control other ISOGEN facilities -

These are listed on slide No. 23

## A Sample Isometric



Showing these Drawing Control Features :-

- Thicker than standard main pipe
- Square elbows
- Larger size fittings than standard
- Reduced Branch Scaling

## File Sections - for Drawing Control Features

### ISOMETRIC-DEFINITION

PIPELINE-ATTRIBUTES

PIPELINE-ATTRIBUTES-SPECIAL

PIPELINE-ATTRIBUTES-DOTTED

BEND/ELBOW-REPRESENTATION

FITTINGS-GENERAL

FITTINGS-SPECIAL

FITTINGS-UNDIMENSIONED-BRANCHES

MISC-ITEMS

LAYER-NAMES

These are the  
sub-section Identifiers

The use of any sub-section is optional - where none is listed, default values will be used for that section



## A Sample DDF

### ISOMETRIC-DEFINITION

#### PIPELINE-ATTRIBUTES

N. S. INCH

N. S. RANGE 0 2 THICKNESS 4 0.75 LAYER 5

N. S. RANGE 2.5 \* THICKNESS 7 1.00 LAYER 5

#### PIPELINE-ATTRIBUTES-DOTTED

SPECIAL-STATUS THICKNESS 7 1.00 LAYER 5

PIPELINE-CONTINUATION THICKNESS 7 1.00 LAYER 5

#### FITTINGS-GENERAL

N. S. INCH

N. S. RANGE 0 \* THICKNESS 3 0.50 LAYER 10 SCALE 150

#### FITTINGS-SPECIAL

INSTRUMENTS LAYER 10 SCALE 120

VALVES LAYER 10 SCALE 120

VALVES-ANGLE LAYER 10 SCALE 120

VALVES-3WAY LAYER 10 SCALE 120

VALVES-4WAY LAYER 10 SCALE 120

FILTERS LAYER 10 SCALE 120

FLANGES LAYER 5 SCALE 130

NOZZLE LAYER 50 SCALE 130

WELDS THICKNESS 4 0.35 LAYER 45 SCALE 100

Contd....



## A Sample DDF ....Contd.

### FITTINGS-UNDIMENSIONED-BRANCHES

N. S. INCH

N. S. RANGE 0 \* THICKNESS 4 0.75 LAYER 10 SCALE 75

### BEND/ELBOW-REPRESENTATION

BEND ROUND

ELBOW SQUARE

### MISC-ITEMS

DIMENSION-TEXT THICKNESS 1 0.3 LAYER 15

DIMENSION-LINES THICKNESS 1 0.3 LAYER 20

MATERIAL-LIST LAYER 25

FRAME-TEXT LAYER 30

ISO-TEXT LAYER 35

WELD-BOX LAYER 40

Contd....

## A Sample DDF ....Contd.

### LAYER-NAMES

```
5  ' PIPE'
10 ' FITTINGS'
15 ' DIM-TEXT'
20 ' DIM-LINES'
25 ' MAT-LIST'
30 ' FRAME-TEXT'
35 ' ISO-TEXT'
40 ' WELDBOX'
45 ' WELDS'
50 ' NOZZLE'
```



## Sub-Section Details - PIPELINE-ATTRIBUTES section

This section is used define 'tube' based items -

- Pipe
- Elbows
- Bends
- Tees
- Crosses    Etc.

Definable Data -

PIPE BORE UNITS

N. S. *data* - where data = INCH or MM

PIPE BORE RANGE

N. S. RANGE *min-bore* *max-bore* - where bores can be integer or whole numbers. E.g. 1    1.0    1.5    10    10.0 or \*

( \* is used in the last bore position to denote up to maximum bore limit)

Contd....

Sub-Section Details - PIPELINE-ATTRIBUTES section

Definable Data - ...Contd.

PIPE THICKNESS

THICKNESS *data1 data2*` - where *data1* is a pen number as used by MicroStation - and *data2* is an actual thickness expressed as a whole number in mm's as used in DXF plot files

PIPE LAYER

LAYER *data* - where *data* is a whole number



## Sub-Section Details - PIPELINE-ATTRIBUTES-SPECIAL section

The data in this section is exactly the same as that for **PIPELINE-ATTRIBUTES** on the previous page - but the information here is only used for Special Status piping (which is shown in dotted format on the isometrics)

Sub-Section Details - PIPELINE-ATTRIBUTES-DOTTED section

Definable Data -

This section is used to define Thickness & Layer attributes for the three categories of pipe that are shown Dotted in ISOGEN -

**SPECIAL-STATUS**

**PIPELINE-CONTINUATION**

**DRAWING-SPLIT-POINTS**

**THICKNESS** *data1 data2*` - is a pen number as used by MicroStation - and *data2* is an actual thickness expressed as a whole number in mm's as used in PostScript and DXF plot files

**LAYER** *data*

Contd....

---

Sub-Section Details - PIPELINE-ATTRIBUTES-DOTTED section ...Contd.  
Notes

- 1) N. S. RANGE does not apply to this section - all bores are drawn identically
- 2) Data entered in this section for SPECIAL-STATUS overrides any entered in the PIPELINE-ATTRIBUTES-SPECIAL section

## Sub-Section Details - BEND/ELBOW-REPRESENTATION section

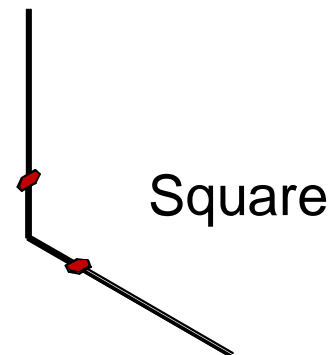
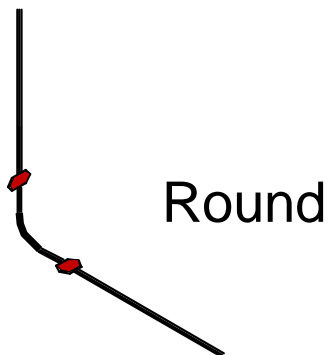
This section is used to define how Bends and Elbows are to be depicted -

Definable Data -

**BEND** *data*

**ELBOW** *data*

Where data can be **SQUARE** or **ROUND** (The default is **ROUND**)



## Sub-Section Details - FITTINGS-GENERAL section

This section is used to define the following data items for FITTINGS

(Flanges, Valves, Instruments, 'Olets, Welds, etc.) -

- N.S. - BORE UNITS
- N.S.RANGE - BORE RANGE
- THICKNESS - PLOTTED FITTING THICKNESS
- LAYER - DRAWING LAYER
- SCALE - PLOTTED SIZE OF FITTING

Contd....



Sub-Section Details - FITTINGS-GENERAL section

Definable Data -

BORE UNITS

N. S. data - where data = INCH or MM

BORE RANGE

N. S. RANGE min-bore max-bore - where bores are integer or whole numbers. E.g. 1 1.0 1.5 10 10.0 or \*  
( \* is used in the last bore position to denote - up to maximum bore limit)

THICKNESS

THICKNESS data1 data2 - where data1 is a pen number as used by MicroStation - and *data2* is an actual thickness expressed as a whole number in mm's as used in AutoCAD DXF plot files

Contd....



Sub-Section Details - FITTINGS-GENERAL section ...Contd.

Definable Data - ...Contd.

LAYER

LAYER data - where data is a whole number

SCALE

SCALE data - where data is a whole number of 2 or 3 digits that represents the required increase or decrease to the basic 100% standard symbol size for all types of fittings.

e.g. Set 125 for a 25% **increase** in scale

Set 90 for a 10% **decrease** in scale

## Sub-Section Details - FITTINGS-SPECIAL section

This section is similar to FITTINGS-GENERAL - except it is used to define Scale, Thickness or Layer for **specific** component types only

e.g. To **increase** the scale of WELDS to an overall value of 145% when the scale of all other Fittings as defined by FITTINGS-GENERAL is 125% -  
Set

**FITTINGS-SPECIAL**  
**WELDS SCALE 116**

The value set is only 116 and not 145 because part of the overall 145% value is obtained from the 125% value in the FITTINGS-GENERAL section and therefore -

Final value set =  $145/125 \times 100 = 116$

Contd....

## Sub-Section Details - FITTINGS-SPECIAL section

...Contd.

The following Fitting types may be specified as FITTINGS-SPECIAL

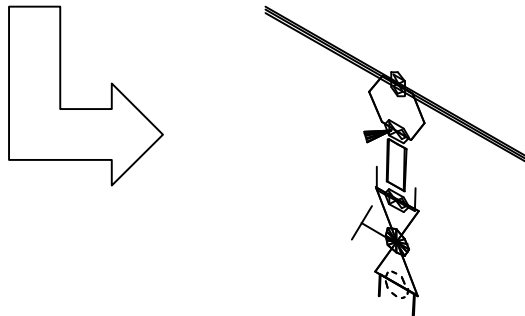
O LETS	I NSTRUMENTS
SUPPORTS	WELDS
COUPLI NGS	CAPS
UNI ONS	FLANGES
F I L T E R S	P I P E - B L O C K S
SAFETY-DI SC	TRAPS
REDUCERS	VALVES
VALVES-ANGLE	VALVES-3WAY
VALVES-4WAY	NOZZLE
END-CONNECTORS	HYGENI C-CONNECTORS
MI SC-COMPONENTS	MI SC-COMPONENT-PLUG
MI SC-COMPONENT-RESTRI CTOR	MI SC-COMPONENT-SLI PPLATE
MI SC-COMPONENT-SLI PRI NG	MI SC-COMPONENT-SPECBLI ND

If nothing is set in this section for a particular component or if no FITTINGS-SPECIAL data is set at all - then the values in FITTINGS-GENERAL are used

## Sub-Section Details - FITTINGS-UNDIMENSIONED-BRANCHES section

This section allows you to control the Thickness, Layer & Scale of all non-pipe components contained in an un-dimensioned branch

- thus



Note - to use this facility the Branch Dimension Suppression facility controlled by O.S. 81 must be used

See slide No. 6 for example input data



## Sub-Section Details - MISITEMS section

This section allows you to control the Thickness & Layer of the following parts of the isometric -

DI MENSION-TEXT

DI MENSION-LINES

I SO-TEXT

SPEC-BREAKS

SKEWS

HATCHING

LAGGING

TRACING

FRAME

FRAME-TEXT

WELD-BOX

MATERIAL-LIST (Styles 1 & 2 only)

See slide No. 6 for example input data

## Sub-Section Details - LAYER-NAMES section

This section allows you to assign Layer Names to represent the ISOGEN Layer Numbers which are referred to as numbers in the various sub-sections of the DDF

These Layer Names may then be used in target 2D Draughting Systems e.g. In AutoCAD & MicroStation

See slide No. 7 for example input data

Note - A maximum of 50 names may be set

## Program Defaults

Providing a -123 Data Definition File is set - in the absence of any other controlling data - the following default values will be applied -

Element	Thickness	Layer
Pipe (Inc. Elbows & Tees Etc.)	3 (0.6 mm)	1
All Fittings (Flanges, Valves, Etc.)	2 (0.25 mm)	2
Drawing Text & other Misc. Items	1 (0.1 mm)	3
Drawing Frame		
Frame Text	1 (0.1 mm)	4
Weld Box, Etc.		
Dotted Items	1 (0.1 mm)	5
Material List	1 (0.1 mm)	6

This is a list of further Sections that may be used in the DDF -

These are for extra non-drawing features in ISOGEN, but which if used, are controlled by the DDF -

I N T E R A C T I V E - E D I T - C O L O U R S

D E T A I L - S K E T C H

I N F O R M A T I O N - N O T E

E N C L O S U R E - B O X - V A R I A T I O N

S T A N D A R D - B E N D - R A D I U S

S T A N D A R D - B E N D - L E N G T H S

P I P E L I N E - R E F E R E N C E - L O C A T I O N - D E F I N I T I O N

P I P E H E A D E R - A T T R I B U T E S

H E A T T R E A T M E N T / N D E - F I L E U S E - D E F I N I T I O N

S P O O L - I N F O R M A T I O N - F I L E

See the following slides for details -



## Sub-Section Details - INTERACTIVE-EDIT-COLOURS section

The colours displayed on the ISOGEN Probing screen may be customised by the User - this permits the different editing actions and functional data items to be shown on the screen in characteristic colours -

For example :-

- The cursor cross **+** used in Probing activities may be set to a User defined colour
- Erection, Fabrication and Offshore items may all be displayed in different colours
- The background screen colour may be set

Contd....

Sub-Section Details - **I N T E R A C T I V E - E D I T - C O L O U R S** section ....Contd.

Sample input data -

**I N T E R A C T I V E - E D I T - C O L O U R S**

DRAWI NG-SPLI T-POI NT    7

DRAWI NG-DEFAULT    10

FABRI CATI ON    5

ERECTI ON    3

OFFSHORE    14

Where customised Colouring like this is not done by the User, default Colours will be used

Contd....

Sub-Section Details - INTERACTIVE-EDIT-COLOURS section ....Contd.

Permissible Data Items -

BACKGROUND *data*

DRAWING-DEFAULT *data*

DRAWING-SPLIT-POINT *data*

EDIT-CONFIRMATIONS *data*

ERECTION *data*

FABRICATION *data*

FLOW-ARROW-SYMBOL *data*

OFFSHORE *data*

REF-DIMENSION-POINT *data*

SPECIAL-WELD *data*

WELD-POSITION-FINAL *data*

WELD-POSITION-INITIAL *data*

Where *data* is a number in the range 1 to 15

Contd....

## Sub-Section Details - INTERACTIVE-EDIT-COLOURS section ....Contd.

### Colour Numbers

0	Black	8	Dark Grey
1	Blue	9	Light Blue
2	Green	10	Light Green
3	Cyan	11	Light Cyan
4	Red	12	Light Red
5	Magenta	13	Light Magenta
6	Brown	14	Yellow
7	White	15	Intense White

### Notes.

- Because of the way the Editing System operates, Red, White and Intense White must not be used for the screen background
- The floating cursor cross + which is White and the 'Zoom In' cross hairs which are Red are fixed colours which cannot be changed
- When changing from the default Colour system - Users must accept responsibility to ensure that all things are visible under all conditions

Contd....

## Sub-Section Details - INTERACTIVE-EDIT-COLOURS section ....Contd.

### Default Colours

<u>Purpose</u>	<u>Colour</u>	<u>DDF Attribute</u>
Erection components	Cyan	ERECTION
Fabrication components	Green	FABRICATION
Offshore components	Red	OFFSHORE
Frame, Dimensions, Text, etc.	Green	DRAWING-DEFAULT
+ Cross symbol at Drawing Split point 'Action' confirmations. E.G. Colour of the	Light Blue	DRAWING-SPLIT-POINT
X location cross during <b>'Add a Site Weld'</b>	Intense White	EDIT-CONFIRMATIONS
Initial location X Cross symbol at Site, Fabrication or Offshore weld before final confirmation	Intense White	WELD-POSITION-INITIAL
Final location X Cross symbol at Site, Fabrication or Offshore weld following confirmation	Red	WELD-POSITION-FINAL
X Cross symbol at Special Site weld	Magenta	SPECIAL-WELD
+ Cross symbol at probed-in Reference Dimension point when adding any type of weld in pipe	Yellow	REF-DIMENSION-POINT
Screen Background	Black	BACKGROUND
Flow Arrow	Red	FLOW-ARROW-SYMBOL

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Sub-Section Details - DETAIL-SKETCH

&

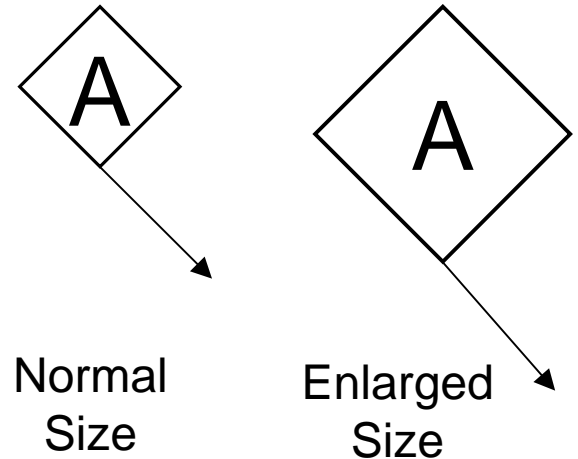
INFORMATION-NOTE

These two sections define the data for Detail Sketches and Information Notes

These subjects are fully described in their own individual slide sets - to which you should refer for information

## Sub-Section Details - ENCLOSURE-BOX-VARIATION

This section contains control values that are used to define an enlarged Spool Identification Enclosure Box like this



The data for this would be -

**ENCLOSURE-BOX-VARIATION**  
**SPOOL-ID**    @\$@@@?@@@\$@@

These are the Control Characters -

@    Space

\$    Create new line

?    Insertion point of variable Spool I/D character ( 'A' in above example)

## Sub-Section Details - STANDARD-BEND-RADIUS section and STANDARD-BEND-LENGTHS

These two sections allow weld elbows in Piping to be changed, at the Fabricators discretion, into pulled bends

This is done in accordance with sets of rules that are specified in these two sections of the DDF

For details of these rules and the data format required - refer to the section 'BW ELBOW TO BEND DATA' in the ISOGEN Manual



Sub-Section Details -

## **PIPELINE-REFERENCE-LOCATION-DEFINITION** section

When an external Pipeline Attributes file is being used - this section tells ISOGEN which IDF record to use as the key field selector, and what -900 series record the value is to be loaded into

In the example below - it is the -6 record that is to be searched for in the Pipeline Attributes file to find a match, and the contents of the -6 are then loaded into a -900 record

## **PIPELINE-REFERENCE-LOCATION-DEFINITION**

**RECORD-ID -6 -900**

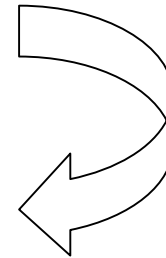
Alternatively, if the key record to be read was the -45 and loaded into a -901 record then the entry would look like this -

**RECORD-ID -45 -901**

## Sub-Section Details - PIPEHEADER-ATTRIBUTES section

The ATTRIBUTES function permits the Fabricator to add-in Pipe Attribute data that does not exist in the IDF - and have that information appear on the isometric in an area of the Drawing Frame - like this

CLIENT	COMBINOCO LTD.
JOB NO.	12800/1
P&ID DRAWING NO.	A100-58



For this function to operate, control information specifying precisely what attributes are to be edited in needs to be set up

Such Attributes may be set using TextPos I.D. numbers in the range -900 to -999

Contd....

## Sub-Section Details - PI PEHEADER-ATTRIBUTES section ....Contd

Sample input data -

### PI PEHEADER-ATTRIBUTES

-900	' Job No. (7)'	6	F
-901	' P&I D Drawing No. (7)'	25	F
-902	' Client (14)'	12	F
-903	' Operating Temp Deg. C (5)'	5	
-904	' Operating Press BarG (5)'	5	
-905	' Test Pressure BarG (5)'	5	
-906	' X-RAY %AGE (4)'	4	
-907	' Fabrication Code (6)'	6	
-908	' Hydro Test (1)'	1	
-909	' Cleaning Code (8)'	8	
↑↑	↑↑	↑↑	↑↑
TextPos	Attribute	Field	Fixed
I.D.	Name (appears on	Width	Value
Number	the Probing screen)		Attributes

Contd....

## Sub-Section Details - PIPEHEADER-ATTRIBUTES section ....Contd

Note that the Attributes -900 to -909 listed on the previous page may be either Fabricator Defined or Pipeline Attributes that are obtained from an 'external' Pipeline Attributes file - in the DDF both types are defined here in the same way

However, Attributes obtained that are to be obtained from an 'external' Pipeline Attributes file are also listed in the PIPELINE-ATTRIBUTE-FILE section of the Function Definition File (FDF)

Attributes obtained from an 'external' Pipeline Attributes file will be shown in colour blue on the Probing screen - whereas the Fabricator Defined Attributes (that do not appear in the FDF) will be shown in colour black

The rules for PIPEHEADER-ATTRIBUTES in an 'external' Pipeline Attributes file are fully described in their own individual slide set - to which you should refer for information

## Sub-Section Details - HEATTREATMENT/NDE-FILEUSE-DEFINITION section

This section of the DDF is used to extract Heat Treatment and Non-Destructive Examination data from the 'external' Heat treatment file

The rules for HEATTREATMENT/NDE-FILEUSE-DEFINITION are fully described in their own individual slide set - to which you should refer for information

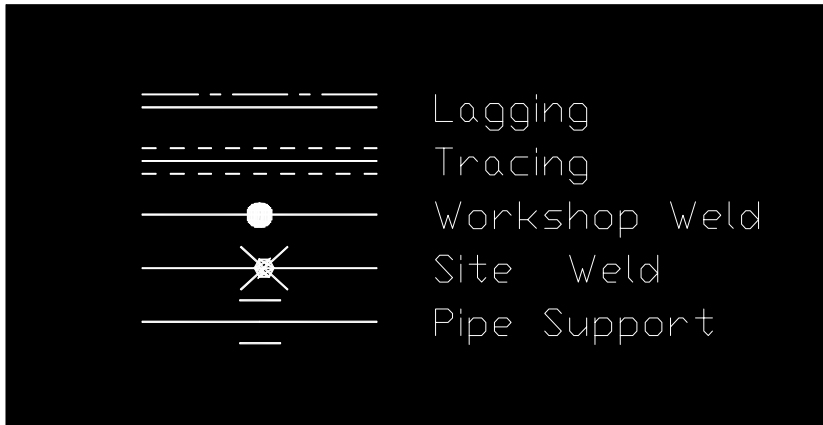
## Sub-Section Details - SPOOL-INFORMATION-FILE section

This section of the DDF is used to define the content and layout of the Spool Information File

The rules for the SPOOL-INFORMATION-FILE are fully described in their own individual slide set - to which you should refer for information

ISOGEN now allows the User to position symbol shapes, original only displayed on the standard drawing frame, onto a user defined backing sheet.

## Sample Isometric Output



## Sample DDF Input

```

SYMBOL-KEYS
SYMBOL-OPTION SPECIAL
SYMBOL-INFORMATION SKEY 01HG      TEXT 'Pipe Support'
SYMBOL-INFORMATION SKEY WS        TEXT 'Site Weld'
SYMBOL-INFORMATION SKEY WW        TEXT 'Workshop Weld'
SYMBOL-INFORMATION SKEY TRACING    TEXT 'Tracing'
SYMBOL-INFORMATION SKEY LAGGING    TEXT 'Lagging'
TABLE-LAYOUT
START-POSITION      25.0    20.0
TEXT-HEIGHT         2.5
VERTICAL-SPACING    5.0
MAXIMUM-ROWS        5
PIPE-LENGTH         20
TEXT-OFFSET-X       25
SYMBOL-SCALE        100
SYMBOL-SELECT       FIXED
    
```

A new section has been introduced into the DDF to allow this feature to operate. Sub-Section Details - **SYMBOL-KEYS**. For more details see separate slide set - 'Symbol Shapes - Frame Positioning'.

**Introduced in ISOGEN release V8.11.0**