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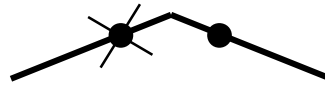
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Overview - These slides cover the following Welding topics -

■ **Weld Depiction**

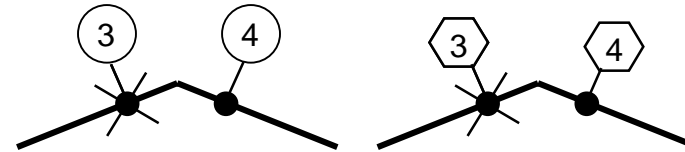


■ **Weld Numbering Systems**

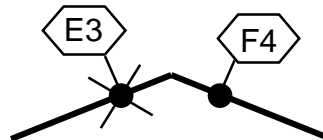
FAB1 FAB2 ER3 FAB4 ER5

FAB1 FAB2 ER1 FAB3 ER2

■ **Weld Number Enclosure Styles**

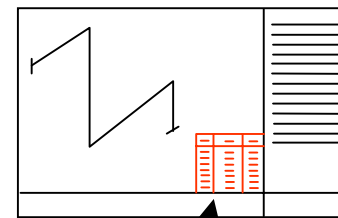


■ **Weld Number Prefixes**

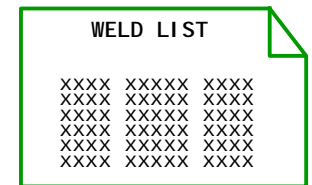


■ **The Weld Definition File**

This is a data input file for
the production of

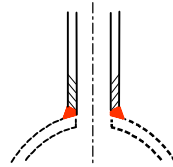


A plotted Weld Summary **and** A Printed Weld Summary listing



Welding Topics ...Contd.

■ Weld Types



■ Reinforcement Pads



Welding output features are controlled in a variety of ways :-

1) By Option Switches

O.S. 53 O.S. 54 O.S. 75 O.S. 77 and O.S.78 in the options file

- these control a wide variety of Welding features

2) For Weld Number Prefixes

Records -130 to -136 in the options file

3) For User Dictated Starting Weld Numbers

Record -97 in the options file

4) For the Weld Summary Box on the isometric or a Printed Weld

..Summary listing - By control data in the Welding Definition File

The .WDF file (-120 Record in the options file)

Option Switches O.S. 53 O.S. 54

Plotted Iso | System | Material List | **Welding** | Dimensioning | Iso Style | Iso Content | Specials

WELD PLOTTING/NUMBERING ? 53/54

Welds to be numbered	Welds to be Plotted			
	All Welds	Fab Only	Site/Offshore Only	None
All Welds	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fab/Site Only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fab Only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Site Only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Offshore Only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
None	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

☐ Plot all Welds and show implied Site Welds as Fab. ?

Weld Numbering Sequences

Number Welds from 1 on :
☒ Each Pipeline ☐ Each Drawing
☐ Spool Iso Weld Nos. match Full Iso Weld Nos.

Number Welds from 1 for :
☒ All Welds ☐ Each Weld Type

Text Height for Weld Numbers
☐ Small-1.5 mm ☐ Medium-1.8 mm ☒ Large-2.1 mm

Plot Weld Summary Box

Support Weld Numbering Sequence

Page 1 of 3

This is the Options Editor selection screen for O.S. 53 and O.S. 54 under Welding

Option Switches O.S. 75 and O.S. 77

Plotted Iso | System | Material List | **Welding** | Dimensioning | Iso Style | Iso Content | Specials

WELD NUMBERING ? **75** **WELD NUMBERS at SO FLANGES and PADS** **77**

Fabrication Shop Welds
☒ Plot Weld Nos. ☐ Add Weld Prefix to Weld Number
 Local Circle (Text Size from Switch 53)

Field Welds
☒ Plot Weld Nos. ☒ Add Weld Prefix to Weld Number
 Diamond Ended Box (Text Size from Switch 4)

Offshore Welds
☒ Plot Weld Nos. ☒ Add Weld Prefix to Weld Number
 Dynamically Sized Circle (Text Size from Switch 53)

☐ One Weld Number at Slip-On Flanges
☒ Two Weld Numbers at Slip-On Flanges
 Two Extra Welds added at Reinforcement Pads

☒ Generate PAD Item Code and Show Symbol on Iso.
☒ One Weld Number at 'Y' type Fittings
☐ Two Weld Numbers at 'Y' type Fittings

Page 2 of 3

**This is the Options
Editor selection
screen for O.S. 75
and O.S. 77**

Weld Numbering Systems

Weld Numbering can be done in different ways :-

- Per Drawing or Per Pipeline
- One Weld Number Sequence for all types of Weld - or a separate Weld Numbering Sequence for each (Fabrication, Erection and Offshore)

Weld Numbering Sequences

Number Welds from 1 on :

☐ Each Pipeline ☒ Each Drawing

Number Welds from 1 for :

☐ All Welds ☒ Each Weld Type

One Weld Number Sequence for all Weld types - or individual Weld Number Sequences

Weld Numbers Per Drawing or Per Pipeline (With Per Drawing - the Weld Numbers will start at 1 on each new isometric)

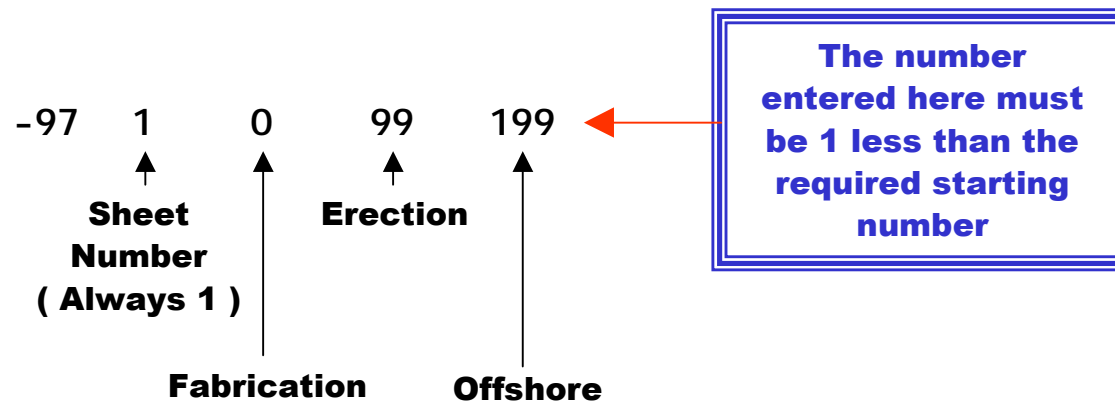
This is the Options Editor selection screen for O.S. 53

User Dictated Starting Weld Numbers

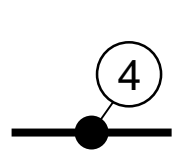
This feature permits different type of Welds to be numbered within their own ranges - e.g.

Fabrication Welds	1 - 99	(Start at 1)
Erection Welds	100-199	(Start at 100)
Offshore Welds	200-299	(Start at 200)

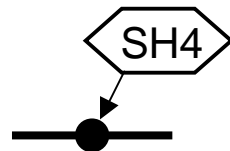
This is done with a -97 record in the options file



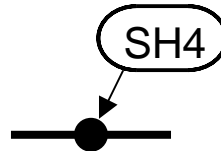
These are the available Weld Number Enclosure Styles



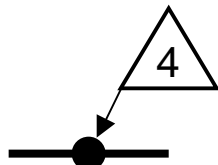
**Local
Circle**



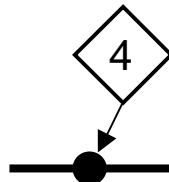
**Diamond
Ended Box**



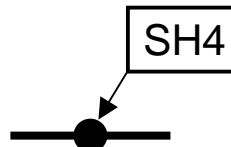
**Round
Ended Box**



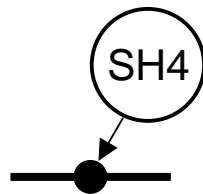
**Triangular
Enclosure**



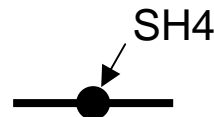
**Diamond
Enclosure**



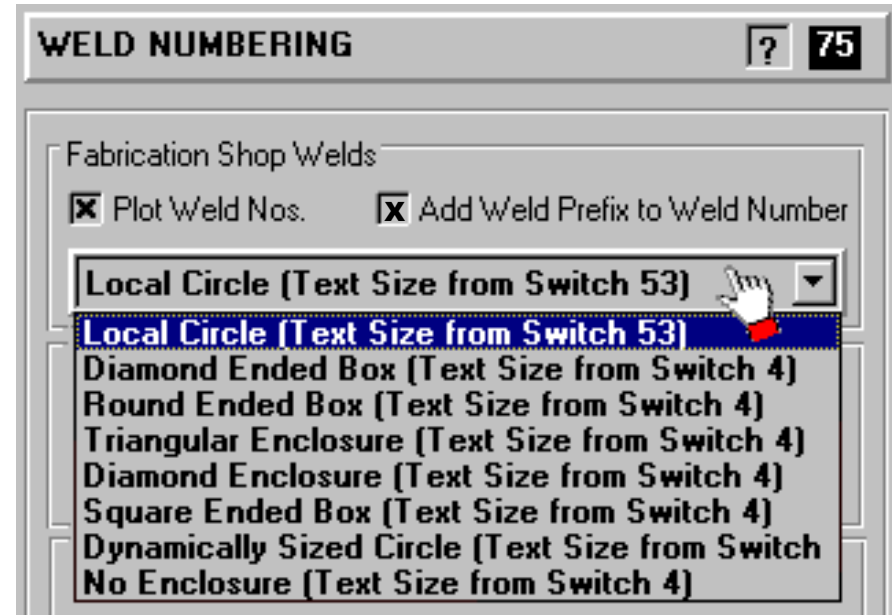
**Square
Ended Box**



**Dynamically
Sized Circle**



**No
Enclosure**



**This is the selection panel you see in the
Options Editor for O.S.75 in Welding for
setting the Enclosure Shape
The example shown is for Fabrication
Shop Welds but there are additional
panels for Erection and Offshore Welds**

Weld Number Prefixes - Are controlled in 2 places -

1) The Weld Number Prefix Text is defined in the Weld Prefixes Section of the Welding Definition File (WDF) - following the weld category keyword -

GENERAL Weld Number Prefix Text

FABRI CATION Weld Number Prefix Text

ERECTION Weld Number Prefix Text

OFFSHORE Weld Number Prefix Text

SUPPORT-FABRI CATION Weld Number Prefix Text

SUPPORT-ERECTION Weld Number Prefix Text

SUPPORT-OFFSHORE Weld Number Prefix Text

e.g.

WELD-PREFIXES

FABRI CATION F

ERECTION E

SUPPORT-FABRI CATION SF

SUPPORT-ERECTION SE

Note that the keyword GENERAL is used for all categories of weld number prefix

2) They are switched on in the Options Editor selection screen for O.S. 75

WELD NUMBERING [?] 75

Fabrication Shop Welds

☒ Plot Weld Nos. ☒ Add Weld Prefix to Weld Number

Diamond Ended Box (Text Size from Switch 4)

Field Welds

☒ Plot Weld Nos. ☒ Add Weld Prefix to Weld Number

Round Ended Box (Text Size from Switch 4)

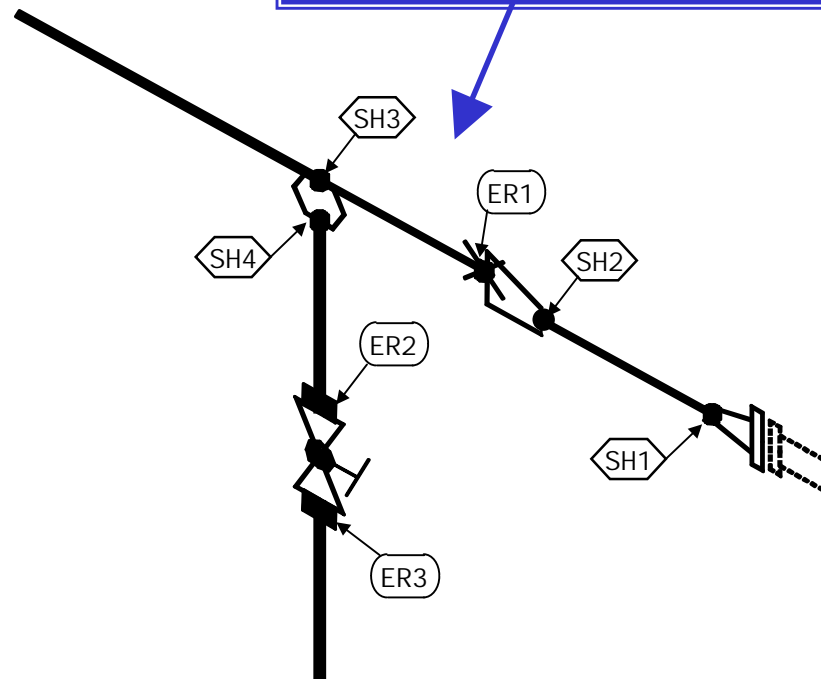
Offshore Welds

☒ Plot Weld Nos. ☒ Add Weld Prefix to Weld Number

Dynamically Sized Circle (Text Size from Switch 4)

Weld Number Prefixes - Contd.

Then the Weld Prefix
identification
on the isometric would
look like this -



The Welding Definition File

**A User Defined Weld Summary Box
output on the isometric looks
like this -**

WELD NO.	SI ZE I NS.	TYPE	CATEGORY	LOCATI ON
SH1	1	SW	SHOP	1-6
SH2	3	BW	SHOP	3-9
ER3	3	BW	FI ELD	4-9
SH4	4	BW	SHOP	6-11
ER5	4	BW	FI ELD	8-11
SH6	3	BW	SHOP	12-9

This is a 'STYLE 2'
line / column based type of
Weld Summary Box

**It's produced from input data like
this in the .WDF control file**

```

WELD-BOX-HEADINGS
WELD  SI ZE
      NO.  I NS.    TYPE    CATEGORY
WELD-BOX-DATA-I TEMS
'WELD-NO'      4    L
'N. S. '      10    N
'WELD-TYPE'    19    L
'WELD-CAT'     27    L
'WELD-LOCATI ON' 37    L
    
```

- and by using the Options Switches Editor to
select the 'Plot Weld Summary Box' option in
O.S. 53



**The .WDF Input file is named in the
files section of the options file with a
record like this -**

-120 FULL.WDF

WDF Input Data - Valid Data Items in the WDF for outputting to the Weld Summary Box on the isometric are -

E. g.

'WELD-NO' N J

'N.S.' N J

'WELD-TYPE' N J

'WELD-CAT' N J

'THICKNESS/RATING' N J

'WELD-SPEC' N J

'WELD-REM' N J

'WELD-ACTION' N J

'WELD-LOCATION' N J

'WELD-NO' 4 N

'N.S.' 14 L

'WELD-TYPE' 22 L

'WELD-CAT' 32 L

'THICKNESS/RATING' 38 L

'WELD-SPEC' 46 L

'WELD-REM' 52 L

'WELD-ACTION' 62 L

'WELD-LOCATION' 72 L

**N =
output
column
position**

**J = justification
(L for Left
R for Right
or
N for Number)**

**You may
only list
this item if
you are
using a CIF**

Printed Weld Summary File -

It's produced from input data like this in the .WDF control file

WELD-SUMMARY-TITLES

WELD-SUMMARY-COLUMN-HEADINGS

SPOOL ID	REV	WELD NO.	SIZE (INS)	WELD CATG.	WELD TYPE	WELD ACTION
----	---	----	-----	-----	-----	-----

WELD-SUMMARY-DATA-ITEMS

```
' SPOOL-ID' 1 L
' REVISION' 16 L
' WELD-NO' 21 L
' N. S. ' 26 L
' WELD-CAT' 35 L
' WELD-TYPE' 41 L
' WELD-ACTION' 47 L
' WELD-LOCATION' 57 L
```

- and by having an entry like this in the options file -

```
-125 /C: \P-900\OUTPUT\REPORTS\WELD-SUMM.WLD ! Weld Information File
```

You can also print Welding information to an output file like this

SPOOL ID	REV	WELD NO.	SIZE (INS)	WELD CATG.	WELD TYPE	WELD ACTION
----	---	----	-----	-----	-----	-----
6"-ASC-6900-A	1	1	6"	S	BW	MANUAL
6"-ASC-6900-A	1	2	6"	S	BW	MANUAL
6"-ASC-6900-A	1	3	6"	S	BW	AUTO
6"-ASC-6900-A	1	AT1	6"	F	FW	MANUAL
6"-ASC-6900-A	1	AT2	6"	F	FW	MANUAL
6"-ASC-6900-A	1	4	6"	S	BW	MANUAL
6"-ASC-6900-B	1	5	6"	S	BW	MANUAL
6"-ASC-6900-B	1	6	6"	S	BW	AUTO
6"-ASC-6900-B	1	7	6"	S	BW	AUTO
6"-ASC-6900-B	1	FI 8	6"	F	BW	MANUAL
6"-ASC-6900-B	1	21	6"	S	BW	MANUAL
6"-ASC-6900-B	1	22	6"	S	BW	AUTO
6"-ASC-6900-B	1	FI 23	6"	F	BW	MANUAL

WDF Input Data Valid Data Items for outputting to the Printed Weld Summary File are -

Unique Name

Notes

' PROJECT-IDENTIFIER'	-9
' BATCH'	-10
' AREA'	-10
' PIPELINE-REFERENCE'	-6
' SPOOL-ID'	
' N. S. '	
' DRG'	
' REVISION'	-8
' DATE-DMY'	-14
' PIPING-SPEC'	-11
' WELD-NO'	-67 record or Program generated
' WELD-CAT'	AText -414 (S) -415 (F) or -416 (O)
' WELD-TYPE'	
' WELD-SPEC'	-68
' WELD-REM'	-79
' WELD-LOCATION'	
' WELD-ACTION'	AText -517 (MANUAL) or -518 (AUTOMATIC)
' THICKNESS/RATING'	A -141 CIF file is needed for this - part of the CIM
' -600' to ' -699'	Any -600 series data item may be nominated
' -900' to ' -999'	Any -900 series data item may be nominated
' WELD-ATTRIBUTE0' to ' WELD-ATTRIBUTE10'	(PCF Use)

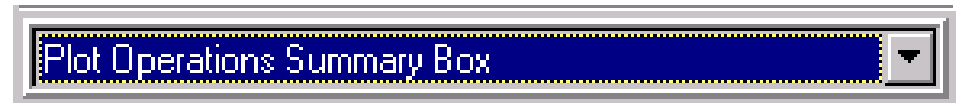
There's also a 'Style 3' type of plotted Weld Summary Box that looks like this -

WELD OPERATIONS			
WELD NO.	SIZE	WELD TYPE	SCHEDULE
1	8"	BW	30
2	6"	BW	40
3	6"	BW	40
4	2"	SW	80

The Headings and Enclosure Lines are made part of the backing sheet

This type of Weld Summary box may only be used in conjunction with a User Defined backing sheet

Use the Options Switches Editor to select the 'Plot Operations Summary Box' option in O.S. 53



WELD OPERATIONS				
WELD NO.	SIZE	WELD TYPE	SCHEDULE	
1	8"	BW	30	
2	6"	BW	40	
3	6"	BW	40	
4	2"	SW	80	

Y121

3.8 SPACING

X256 X288 X338 X389

2.4 MM HIGH TEXT

The .WDF control file looks like this -

```

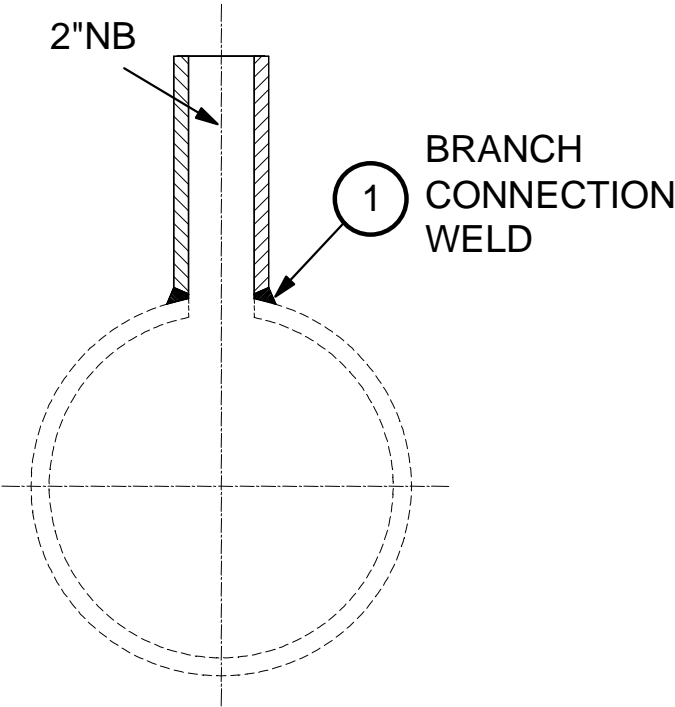
WELD-INFO-CONTROLS
CONTINUOUS-DOWN
START-POSITION 256.0 121.0
VERTICAL-SPACING 3.8
TEXT-HEIGHT 2.4
MAXIMUM-ENTRIES 18
    
```

```

WELD-INFO-DATA-ITEMS
'WELD-NO' 256.0
'N. S.' 288.0
'WELD-TYPE' 338.0
'THICKNESS/RATING' 389.0
    
```

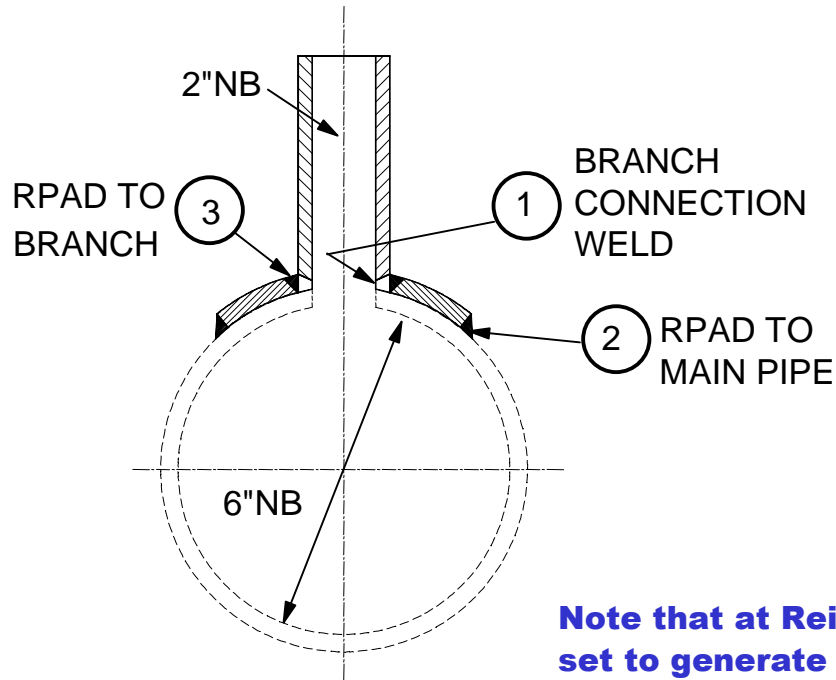
The data items are placed in the boxes by the program using X-Y co-ordinate data that's specified in the .WDF like this

Weld Types - 90° Set On Branch



Weld No	Size	Default Weld Type	AText No
1	2"	SOB	-422

Weld Types - 90° Reinforced Set On Branch

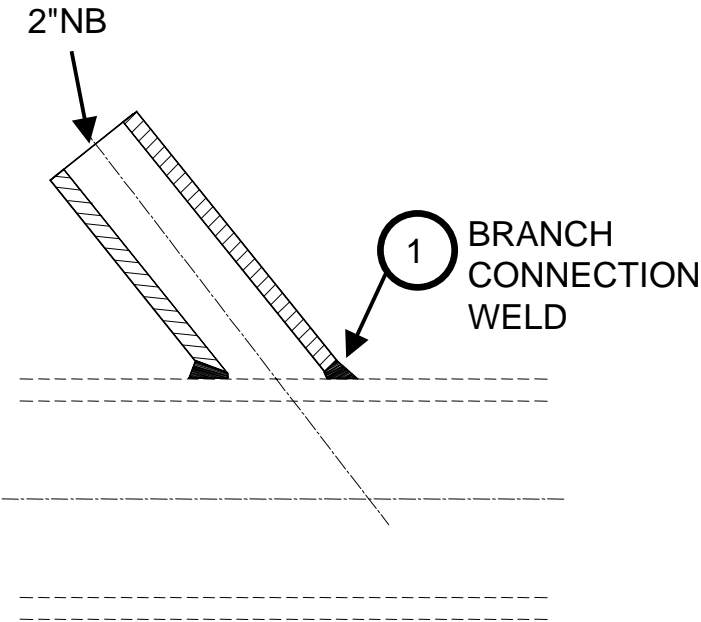


Weld No	Size	Default Weld Type	AText No
1	2"	Blank	-522
2	6"	LF	-508
3	2"	L4	-509

Note that at Reinforced Set On Branches like this - ISOGEN can be set to generate either 3 weld numbers as shown above - or just 2 weld numbers

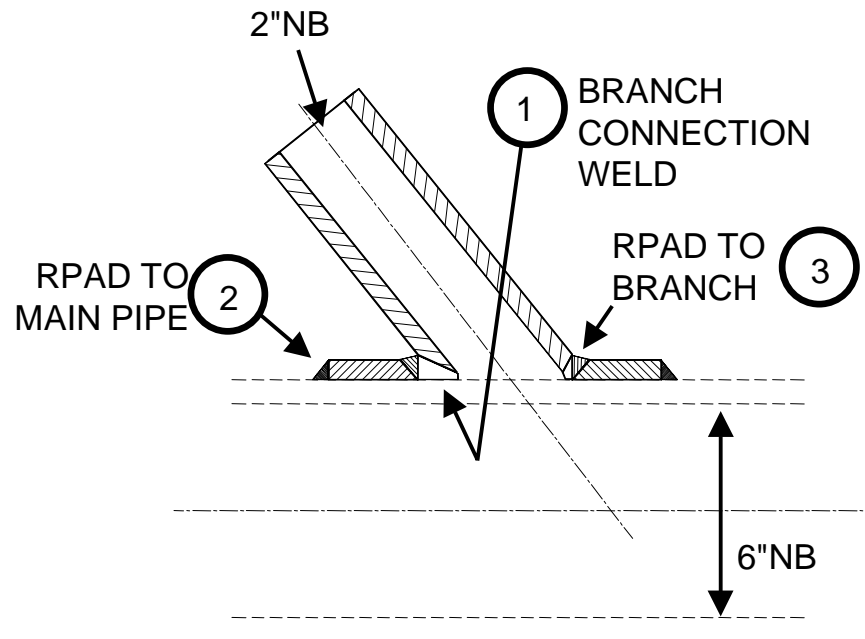
When the setting is for only 2 weld numbers - the weld numbers provided will be 1 and 2 above - that is, weld number 3 will be omitted

Weld Types - Angled Set-On Branch



Weld No	Size	Default Weld Type	AText No
1	2"	Blank	-524

Weld Types - Angled Set On Branch Reinforced



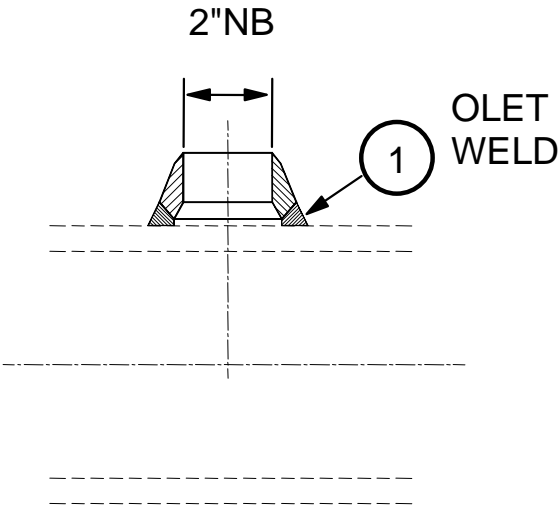
Weld No	Size	Default Weld Type	AText No
1	2"	Blank	-523
2	6"	Blank	-526
3	2"	Blank	-527

Note that at Reinforced Set On Branches like this - ISOGEN can be set to generate either 3 weld numbers as shown above - or just 2 weld numbers

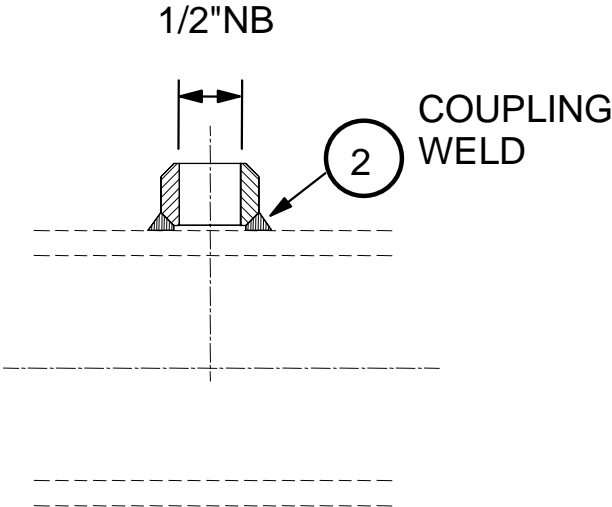
When the setting is for only 2 weld numbers - the weld numbers provided will be 1 and 2 above - that is, weld number 3 will be omitted

Weld Types

Olet

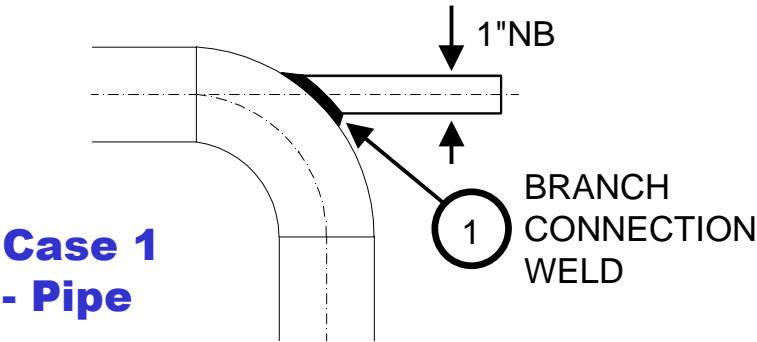


Half Coupling

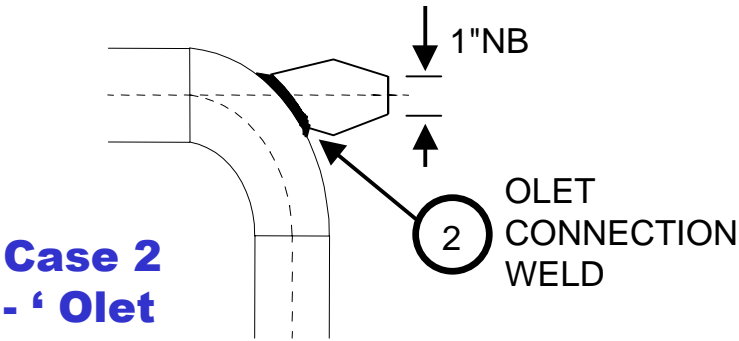


Weld No	Size	Default Weld Type	AText No
1	2"	LET	-423
2	1/2"	CC	-525

Weld Types - T Bend / T Elbow Connections

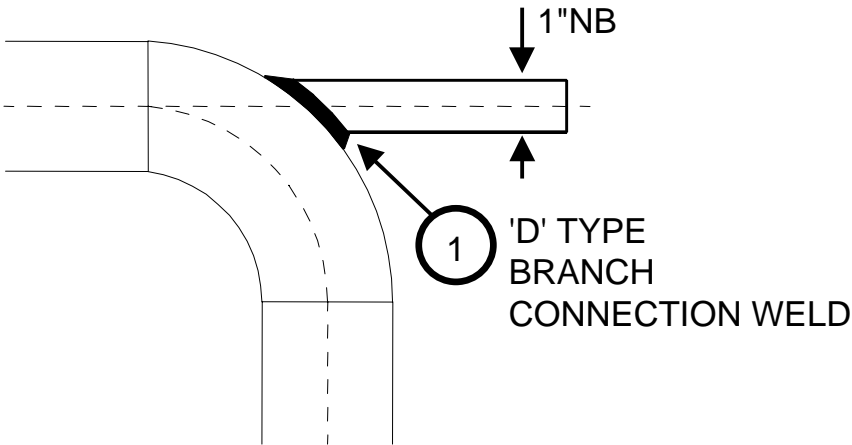


Weld No	Size	Default Weld Type	AText No
1	1"	Blank	-524



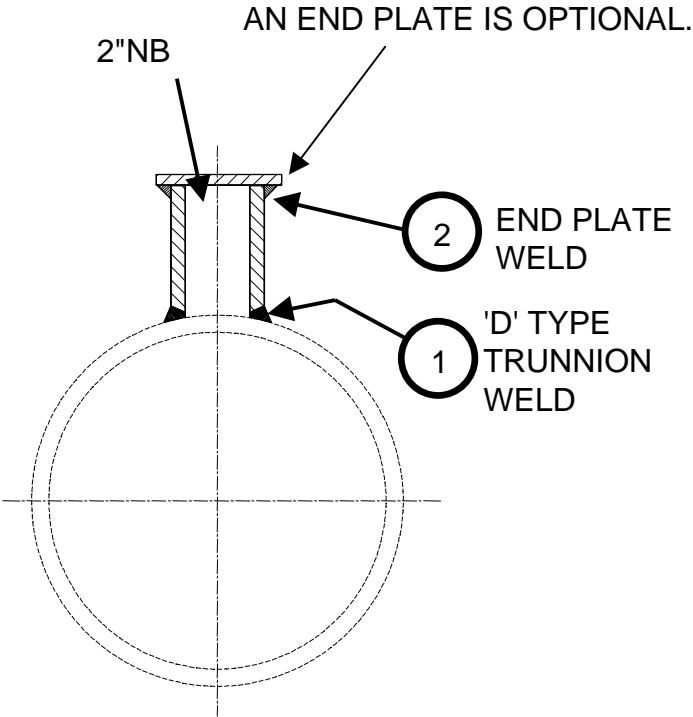
Weld No	Size	Default Weld Type	AText No
2	1"	LET	-423

Weld Types - Trunnion Support Dummy T Bend



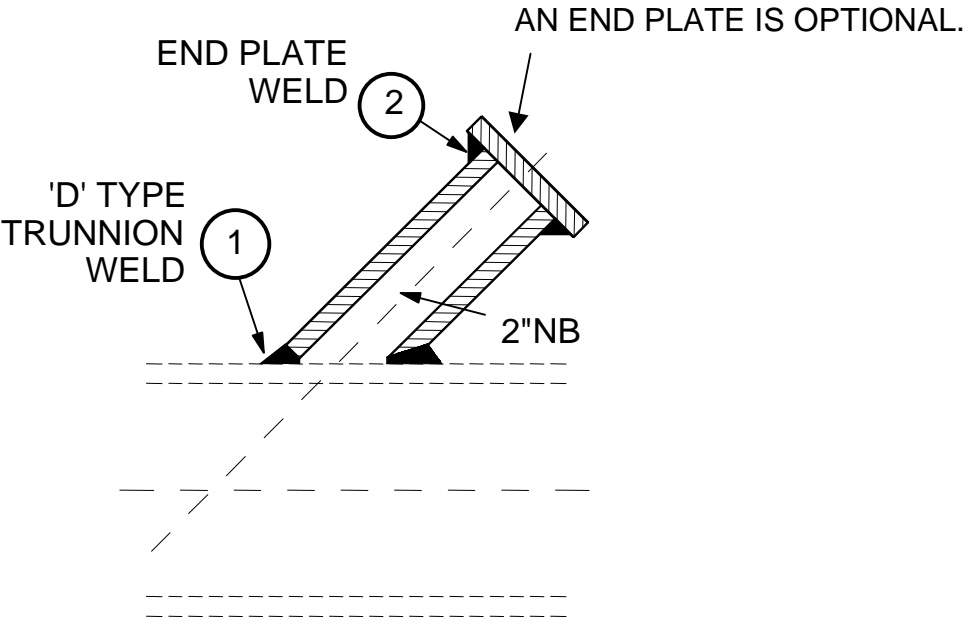
Weld No	Size	Default Weld Type	AText No
1	1"	Blank	-528

Weld Types - Trunnion Support Un-Reinforced



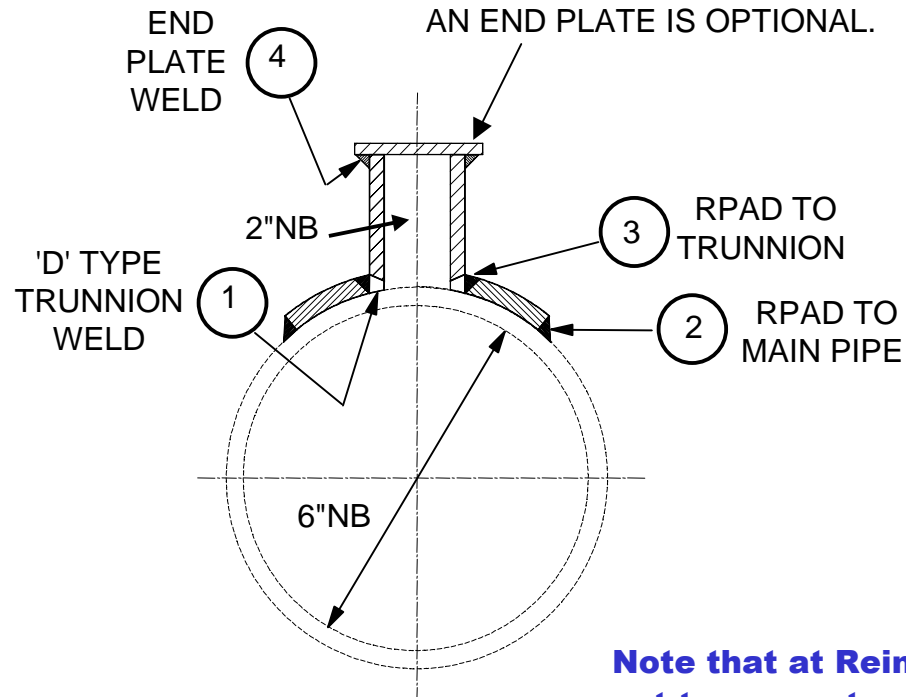
Weld No	Size	Default Weld Type	AText No
1	2"	Blank	-529
2	2"	-	-

Weld Types - Trunnion Support Angled Un-Reinforced



Weld No	Size	Default Weld Type	AText No
1	2"	Blank	-530
2	2"	-	-

Weld Types - Reinforced Trunnion Support

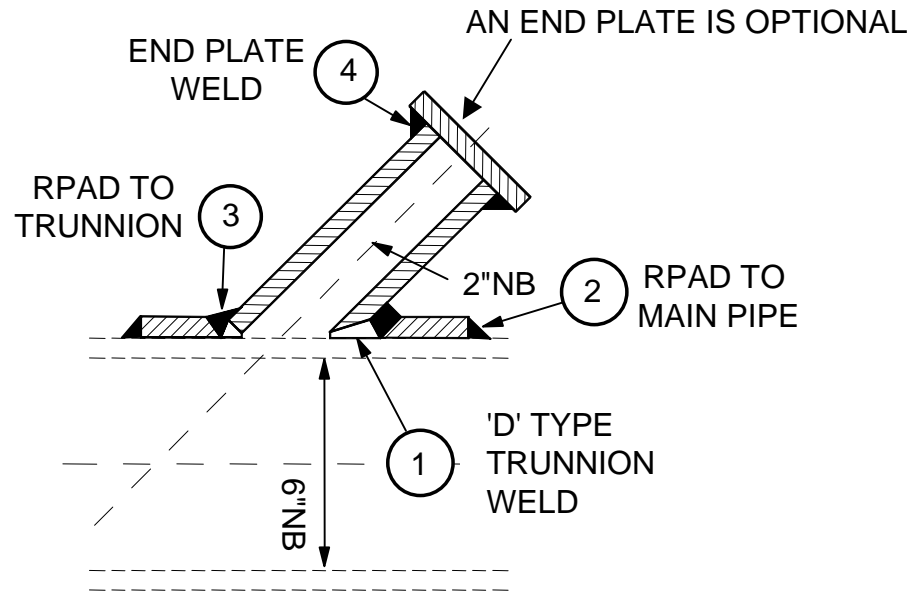


Weld No	Size	Default Weld Type	AText No
1	2"	Blank	-531
2	2"	LF	-508
3	2"	L4	-509
4	2"	CF2	-

Note that at Reinforced Set On Branches like this - ISOGEN can be set to generate either 4 weld numbers as shown above - or just 3 weld numbers

When the setting is for only 3 weld numbers - the weld numbers provided will be 1, 2 and 4 above - that is, weld number 3 will be omitted

Weld Types - Reinforced Trunnion Support Angled



Weld No	Size	Default Weld Type	AText No
1	2"	Blank	-532
2	6"	Blank	-526
3	2"	Blank	-527
4	2"	CF2	-

Note that at Reinforced Set On Branches like this - ISOGEN can be set to generate either 4 weld numbers as shown above - or just 3 weld numbers

When the setting is for only 3 weld numbers - the weld numbers provided will be 1, 2 and 4 above - that is, weld number 3 will be omitted

Tack Welds

Tack Welds can be used to indicate welded on components that are loosely attached during Fabrication - with the final Weld being done on Site with some kind of Site Weld

The SKEYs for Tack Welds are -

Where the Final weld is a Site Weld - WST

Where the Final weld is a Field Fit Weld - WFT

Where the Final weld is an Offshore Weld - WOT

Where the Final weld is an Offshore Field Fit Weld - WOFT

Tack Welds can generate 2 weld numbers - one for the Tack Weld and one for the final Site Weld

If you don't want Tack Welds to have a weld number -

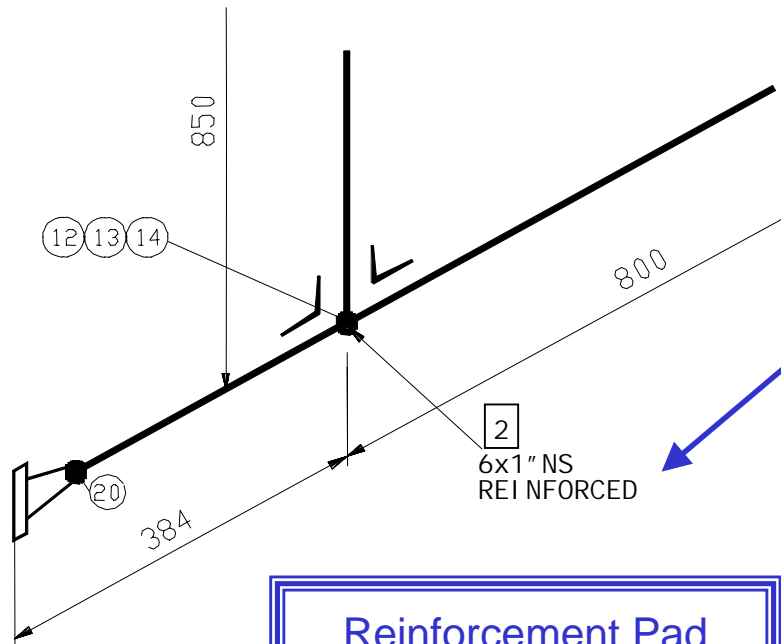
1. Click this box in the Options Editor

or

2. Set Option Switch 77 Position 5 = 1



Reinforcement Pads



The word **REINFORCED** is controlled by AText number -219

Reinforcement Pad details are controlled by O.S. 77 of the Welding Section of the Options Editor

WELD NUMBERS at SO FLANGES and PADS **77**

☐ One Weld Number at Slip-On Flanges
☒ Two Weld Numbers at Slip-On Flanges
Two Extra Welds added at Reinforcement Pads ▼
☒ Generate PAD Item Code and Show Symbol on Iso.
☒ One Weld Number at 'Y' type Fittings
☐ Two Weld Numbers at 'Y' type Fittings