Plant Design-to-STAAD.Pro Interface

(for AVEVA's E3D/PDMS)

1.0 Introduction

This interface is used to extract the data from E3D/PDMS structural model to carry out the structural analysis using an external stress analysis software namely STAAD.Pro. However it must be stressed here that only geometry, support condition and sectional properties of the structural model are transferred. Loads and analysis type are not transferred at this time. The material properties are not transferred directly from E3D/PDMS at this point of time. However a feature is given outside of E3D/PDMS to map and transfer material properties to STAAD.Pro.

The transfer of data takes place in two phases. In the first phase PML2 is used to extract the data and write the same to a neutral file. In the second phase an external program is used to read the neutral file and to create the STAAD.Pro input file.

2.0 Installing Program

To install PD2STPRO on Windows OS, extract the ZIP file downloaded to a temporary directory and Run the program "SETUP.EXE" and follow the instructions as they appear on the screen. After installing the program, follow the steps given below to configure the product with PDMS/E3D.

- The environment variables required by E3D/PDMS are also required for PD2STPRO. The PDMS environment must exist as outlined in the appropriate E3D/PDMS Installation Guide.

- Load E3D/PDMS and enter the Lexicon Module as a user who has Read-Write access to DICT Database and run the datal macro STProUDA.DAT for PDMS or STProE3DUDA.DAT for E3D, to create the user defined attribute (UDA) Ax, Ay, Az, Ix, Iy, and Iz for SCTN and GENSEC (valid for E3D) elements.

Configuring with PDMS

- Add the path of the installed directory to the "pmllib" path of the PDMS. For Example SET PMLLIB=%1\pmllib d:\PD2STPRO\Setup\PDMS (assuming PD2STPRO is installed in the directory d:\ PD2STPRO)

- Add the line "SET PDMS2STPRO=d:\PD2STPRO\Setup\PDMS" (assuming PD2STPRO is installed in the directory d:\PD2STPRO) in the PDMS evars.bat or Windows Environmental variable.

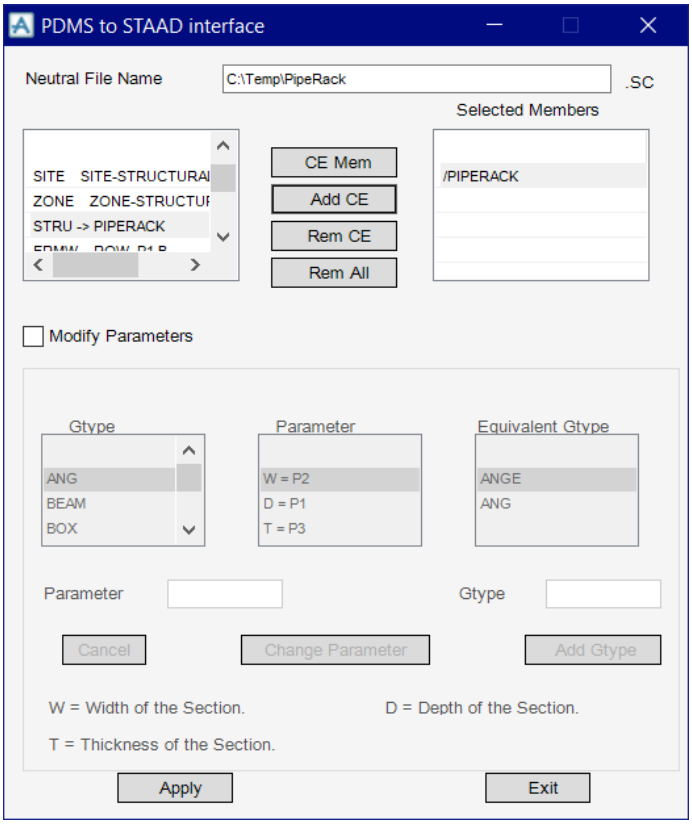
Configuring with E3D

- Add the path of the installed directory to the "pmllib" path of the E3D. For Example SET PMLLIB=%1\pmllib d:\PD2STPRO\Setup\E3D (assuming PD2STPRO is installed in the directory d:\ PD2STPRO)

- Add the line "SET PDMS2STPRO=d:\PD2STPRO\Setup\E3D" (assuming PD2STPRO is installed in the directory d:\PD2STPRO) in the E3D evars.bat or Windows Environmental variable.

3.0 Neutral File Extraction

1. To use the Interface, type “show !!PDMS2ST” from the command line mode to invoke the Interface. The following form appears.



1. Enter the name of the neutral file you want to create in the textbox “Neutral File Name” and press the “Apply” button in the form.

2. Add the ZONE/STRUC/FRMW/SBFR you want to transfer to STAAD.Pro, using “Add CE” button.

3. Use the “CE Mem” to add members of SITE/ZONE and then use the button “Remove” to exclude few from them, if needed.

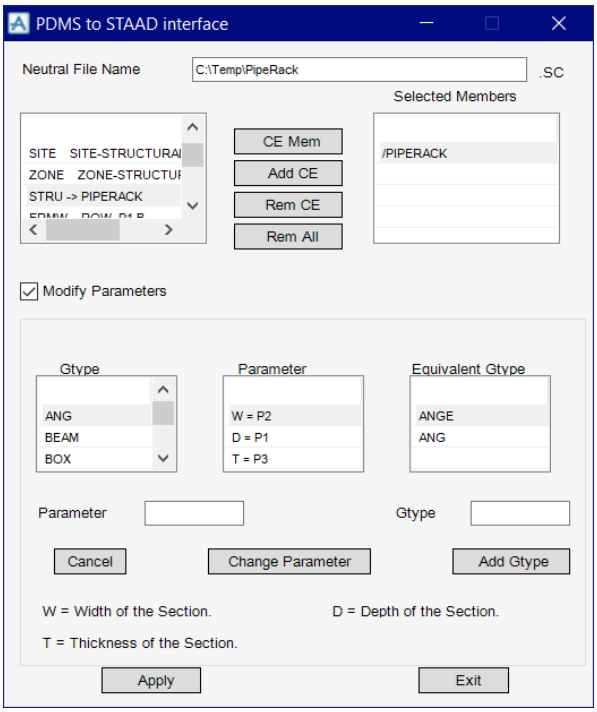
4. Since the sections (SCTN) are catalogues items in E3D/PDMS and are referenced in DESIGN module via Specification reference, program extracts the dimensions of different type of sections via parameters. The Catalogues supplied by AVEVA for various standards such as British, AISC, etc., are designed to have parameters in a specific fashion. This fashion is considered as a guideline in extracting the dimension from E3D/PDMS Design module using PML2. The details are listed in Appendix A. If the user has added their own section catalogues with parameters in a different fashion compared to that of specified by AVEVA (Refer Appendix A), then the user can specify the equivalent parameters dynamically (interactively) before each transfer using the button “Modify”. If you feel that changing the parameters before each transfer as a complicated work and if the different sections modeled in different portion of the plant have same parameters in catalogue for a particular type, then you can change the equivalent parameters directly (onetime for that project) without using the interactive tool. Refer Appendix A for details.

5. Turning ON the option “Modify parameters” will enable the form for editing. The details are listed below:

a. GTYPE is used to identify the different type of sections. For example, I Section is identified by the GTYPE “BEAM”, “DINI”, “JISI”, etc. The valid GTYPE considered by the program are listed in List box “GTYPE” as shown in figure below.

b. The list box “Parameters” shows the parameter numbers used for different type of sections are the dimensions required for STAAD.Pro and their legends are shown in the bottom of the form as shown in figure below. For example, for ANGLE Section, WIDTH is extracted from parameter 2, DEPTH is from Parameter 1 and THICKNESS from Parameter 3.

c. If you have entered the GTYPE for sections in the PARAGON as other than what is specified by AVEVA, then you could map the user defined GTYPE with the AVEVA specified GTYPE using the option “Equivalent GTYPE”. By doing so, the program shall identify these sections correctly and transfer the same to STAAD.Pro. For example, if you want to add a GTYPE “ANGLE” which is not in the valid GTYPE list and if it equivalent to “ANG”, then highlight the value “ANG” from the GTPE list box, fill the GTYPE Text box with value “ANGLE” and press the button “Add GTYPE” as shown in the figure below.



6. The details of transfers will be reported in a log file. The user should check this file before converting the neutral file to STAAD.Pro input file. Refer Appendix D for list of error messages with their meanings.

3.1 Features of PML2 Program

1. Only “SCTN” and “GENSEC” elements are transferred. Hereafter, these are referred as element.

2. If the element acts as a bracing member or is a truss member, then it is advised to fill the attribute “FUNCTION” of the element as “BRACING MEMBER” or “TRUSS MEMBER”, so that the member will be treated as a truss member in STAAD.Pro or else it will be treated as a SPACE member having axial, bending and torsional stiffnesses.

3. If “JOISTART” attribute of an element is available then the position of the node owning it shall be taken as the position of the starting node of the element. Similarly “JOIEND” attribute determines the position of the end node. If “JOISTART” or “JOIEND” attribute is not set, then “POSS” and

"POSE" attributes of the element determine the position of the start node and end node respectively.

4. A node shall be created in STAAD.Pro corresponding to each secondary node present in an element.

5. To transfer support condition, fill the attribute "FIXITY" for the "PNOD" or "SNOD". The syntax for writing the fixity condition should be in accordance with STAAD.Pro syntax for support, or else it will be ignored and free support condition will be assumed. Refer Appendix C for known FIXITY syntax.

6. It is very important to have the PLINE with name "NA" for an element to determine the position of the member line in space for the structural analysis and also the offset of the element at start and end nodes. The PLINE "NA" should represent the actual neutral axis as defined by engineering mechanics, and not just any line along the "SCTN" element. Refer Appendix A for Neutral Axis position for different type of sections.

   Note: The program will generate an error, if the PLINE with name "NA" is not available for that element.

7. The Name of the "MATREF" attribute is transferred as the name of the material for the element.

8. GTYPE is used to identify the different type of profiles (such as channel, Isection etc) and their properties. The valid GTYPEs for different profiles are listed below for reference.

Profile Type	**Valid GTYPE**
I Section	BEAM, DINI, ISB, JISI, PFI and TFI
T Section	TEE, DINT, IST, PFT and TFT
Angle Section	ANG, ANGL and ISA
Channel Section	BSC, DINU, ISC, JISU, PFC and TFC
Rectangular hollow Section (Includes square hollow section also)	BOX, RTUB and BOXG
Rectangular solid section	FB, RECT and FBAR
Circular hollow Section	TUBE, DTUB, CTUB and GTUB
Circular solid section	CSS, RBAR
Generic Section	Gtype other than those listed above

   If it is required to transfer an element with GTYPE different from those listed above, an Equivalent GTYPE can be specified corresponding to the type of profiles (such as I section, channel section etc.). For example. the GTYPE "ANGE" can be treated as an angle section by specifying "ANG" or "ISA" as an Equivalent GTYPE. The program then takes the properties accordingly. Refer Appendix - A for more details.

9. For user-defined sections, such as built-up sections, fill the attributes Ax, Ay, Az, Ix, Iy and Iz. Refer Appendix A for more details.

10. The orientation of the profile member in STAAD.Pro is done by considering the definition of orientation in STAAD.Pro and the axes directions in E3D/PDMS. For correct orientation of the member in STAAD.Pro, the E3D/PDMS user should use the local axis convention as given in Appendix – B.

4.0 Limitations

1. Only one-dimensional structural members are transferred, not 2-dimensional plate or shells or any other 3-dimensional members.

2. Only straight prismatic sections are transferred and not tapered members.

3. For different sections, one has to strictly follow the local axis definition given in Appendix-B of this manual while creating the catalogue in E3D/PDMS. Otherwise the orientation of the “SCTN” element in E3D/PDMS will not be reflected properly in STAAD.Pro.

4. Material properties are not transferred directly. Only material description from E3D/PDMS Material reference (MATREF) is transferred and material properties are then extracted from the material database (built into this Interface) using the material description. Refer Appendix-A and B in PD2STPRO.pdf for more details on mapping DB.

5. The current version of the interface does not transfer loads.

6. Analysis type is not transferred.

5.0 Reference

5.1 Relevant DB elements and attributes

The information required to carry out a stress analysis are stored in E3D/PDMS as attributes for various elements. This interface extracts some of these data and creates the neutral file and subsequently the STAAD.Pro input file is created. This section lists the DB elements and attributes which are relevant to this interface.

5.2 Structural profile section

The most important DB elements are the Section (SCTN) element and Generic Section (GENSEC) element. The paragraphs below give an account of the attributes of the Section (SCTN) element and Generic Section (GENSEC) element, which are used for the extraction of data.

5.2.1 Design Parameter (Desparam)

This attributes holds the physical dimensions of the section (SCTN) element, which are set in the design module.

5.2.2 Function

To identify members, which can carry only axial load e.g. bracing members, truss members etc. The function attribute can be set as “Bracing member” or “Truss member”.

5.2.3 Material Reference (MATREF)

This provides the name of the material used for the section (SCTN) element, which is used to get material properties from the mapping database.

5.2.4 Start Release and End Release (Srelease and Erelease)

This provides the member release condition at the end node and start node of the section (SCTN) element.

5.3 Primary node and secondary node

Both types of node are associated with joint start or joint end of section (SCTN) element. These nodes define the start node, end node, and intermediate nodes of sections

5.3.1 Fixity

This attribute provides information about external support.

5.4 Catalogue Reference (CATREF)

Catalogue reference contains the following attributes, which are of importance.

5.4.1 Name

It holds the name of the section in E3D/PDMS against which the STAAD.Pro name is mapped in the section database if specification reference (SPREF) name is not present in the database.

5.4.2 GTYPE

Through this attribute the generic type of the profile is identified.

5.4.3 Pstref

This attribute contains information about the P-lines.

5.4.4 Param

This attribute contains catalogue parameters, which are used to store the physical dimensions of the profile element.

5.5 Specification reference (SPREF)

5.5.1 Name

It holds the name of the section against which the STAAD.Pro name is mapped in the section database. This name has the precedence over the “CATREF” name in the section database.

Appendix A

Valid GTYPEs

Through the GTYPE ("GTYPE" attribute of the "CATREF" of a section element) the PML2 identifies the profile type and looks for the relevant properties for that particular profile type. The list given in Section 4.1 gives the valid GTYPEs, which can be used for different profiles. The present version of the software transfers eight profile types as listed in Section 4.1. Any profile type other than those listed, will be treated as a "GENERAL" section in STAAD.Pro. For successful transfer of such section the user has to fill user-defined attributes Ax, Ay, Az, Ix, Iy, and Iz. Section 1.4 gives the procedure to create these attributes. Assuming that local z-axis is the longitudinal axis of the section, Ax is the shear area of the section in local x-axis direction. Ay is the shear area in the local y-axis direction. Az is the sectional area in the local z-axis direction. Ix, Iy, and Iz are the moment of inertia of the section about local x-axis, local y-axis, and local z-axis respectively. The forth-coming section lists the assumed catalogue profiles and the local axis directions associated for different GTYPEs.

How to add equivalent GTYPEs ?

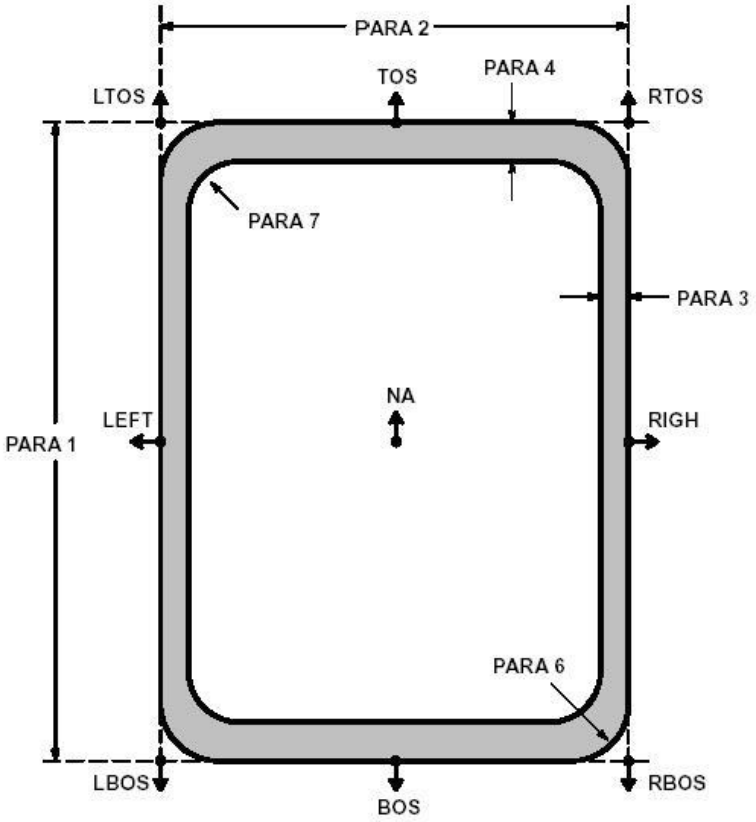
User can add Equivalent GTYPEs and map with a valid GTYPE. The Equivalent GTYPE will be treated exactly the way the parent GTYPE is treated. The Eequivalent GTYPE can be added in two ways, one through the GUI and the other by changing the content of the file, which controls the GTYPE list. Addition through GUI (Explained in Section 2.4 b) is not permanent and is dynamic.

To add Equivalent GTYPE(s) permanently, navigate to the directory where this software is installed; open the directory "PD2STPRO\Setup". Open the file "GTYPEList.txt". Each line of this file contains three values. The first value is the valid GTYPE as listed in 4.1.8. The other two values are equivalent GTYPEs. Replace any one/two of the two Equivalent GTYPE(s) with the new Equivalent GTYPE(s) and save the file. Please note the Equivalent GTYPE should not have any special character such as space, comma (","), semicolon (";"), etc. Only two Equivalent GTYPEs per valid GTYPE are allowed. Any attempt to add more than two Equivalent GTYPE will result in error.

GTYPEs and catalogue profiles

The following pages illustrate the GTYPE's considered and the PLINES used for extracting the information from different types of sections. It is advised that at least these P-lines should be created correctly (as shown in the figures). If these P-lines are not created then the user should specify proper parameters for different dimensions of a profile before creating the neutral file. To know how to specify parameters refer point no 6 of section 3.0 and topic "Parameter" in Appendix – A.

Generic Type : BOX

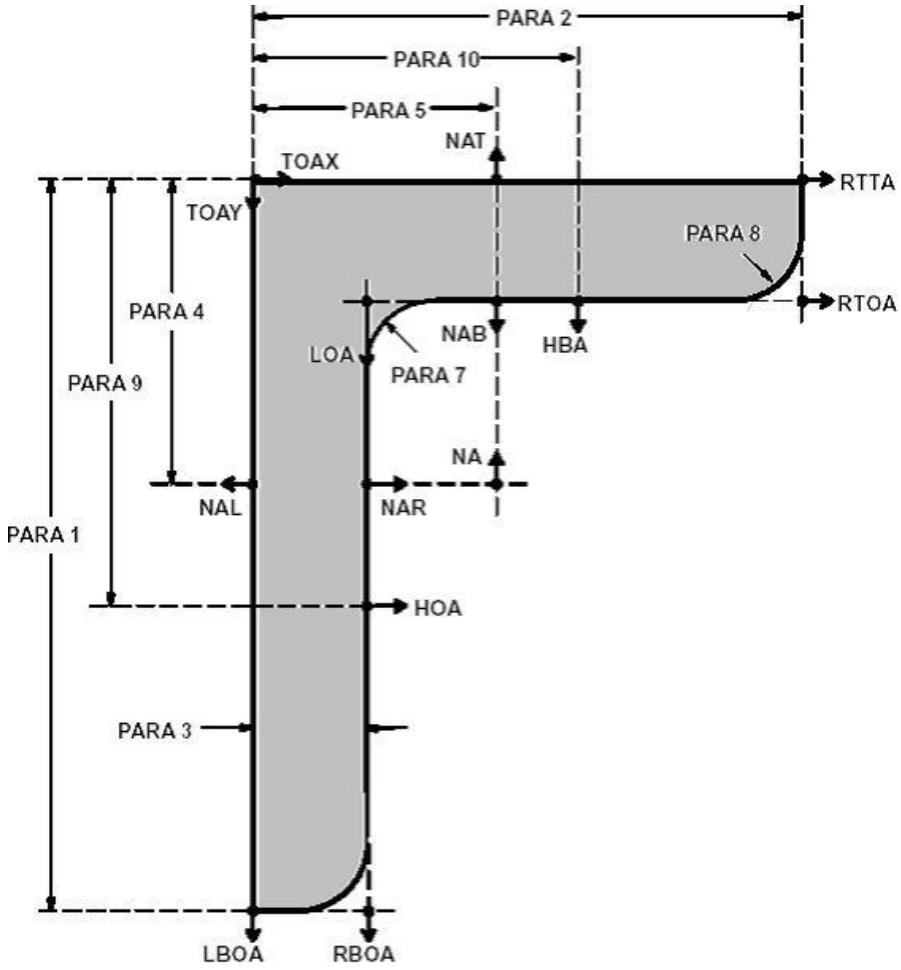


P-lines used

LTOS RTOS

LBOS NA

Generic Type : ANG, ISA

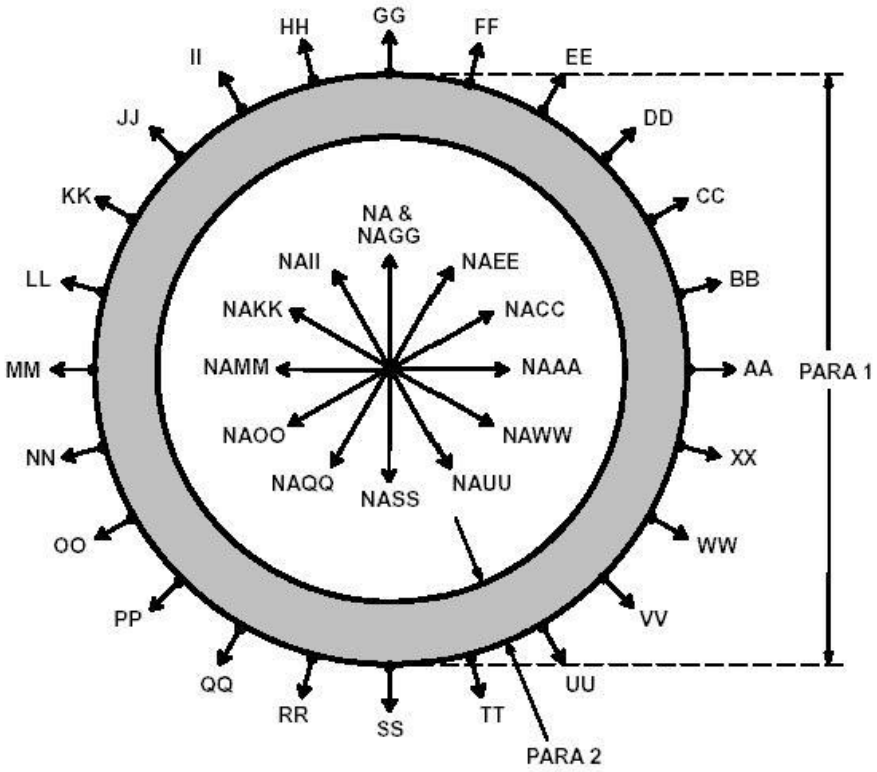


P-lines used

TOAX RTTA NAR

LBOA NAL NA

Generic Type : Tube , GTUB, DTUB

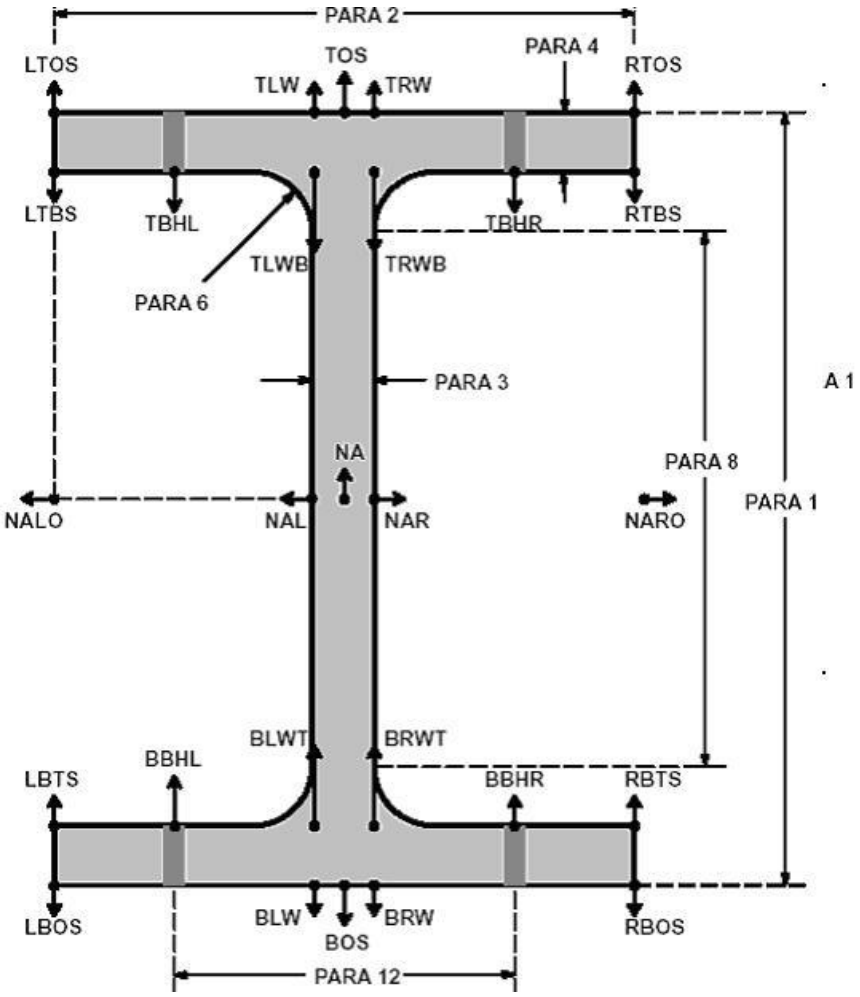


There are three types of P-line:
S **AA-XX every 15 degrees round the circumference**
S **NAAA-NAWW every 30 degrees from the centre**
S **NA equivalent to NAGG**

P-lines used

GG SS

Generic Type : BEAM

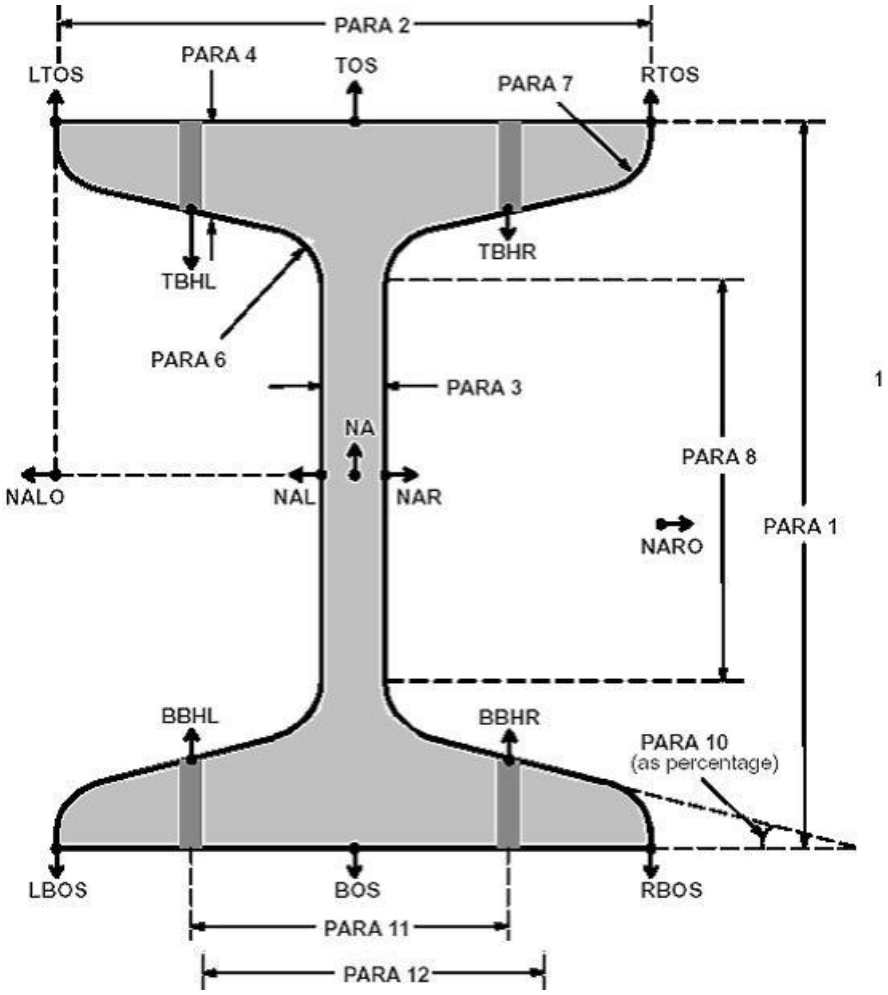


P-lines used

TOS LTOS RTBS NAR

BOS RTOS NAL NA

Generic Type : DINI, ISB, JISI

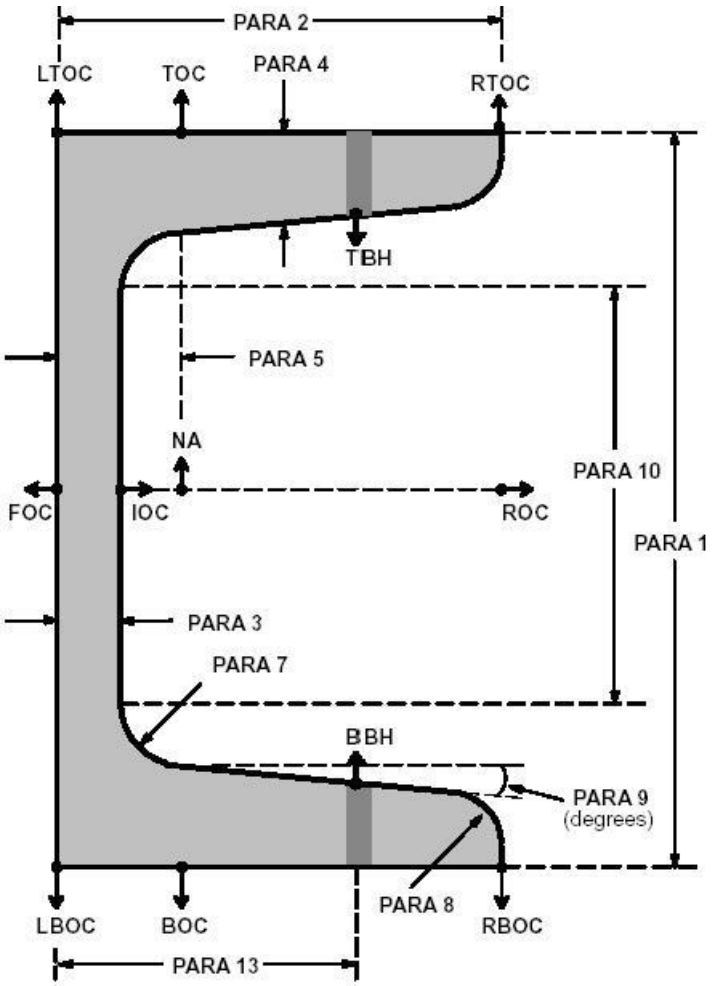


P-lines used

LTOS TOS NAL NA

RTOS BOS NAR

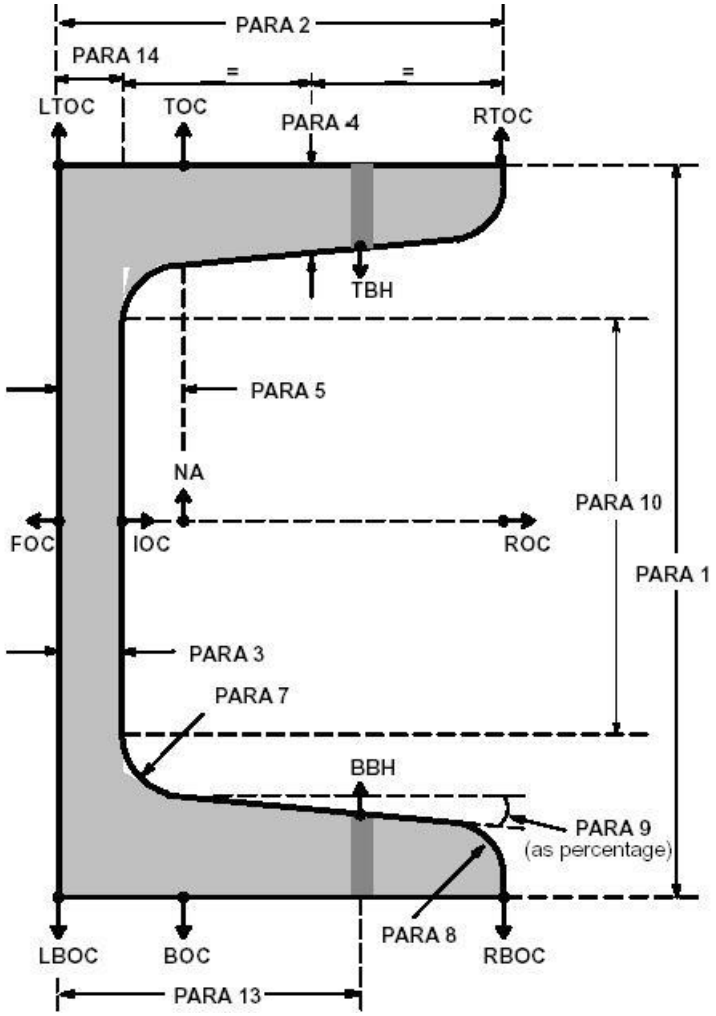
Generic Type : BSC, ISC, JISU



P-lines used

LTOC	RTOC	IOC
LBOC	FOC	NA

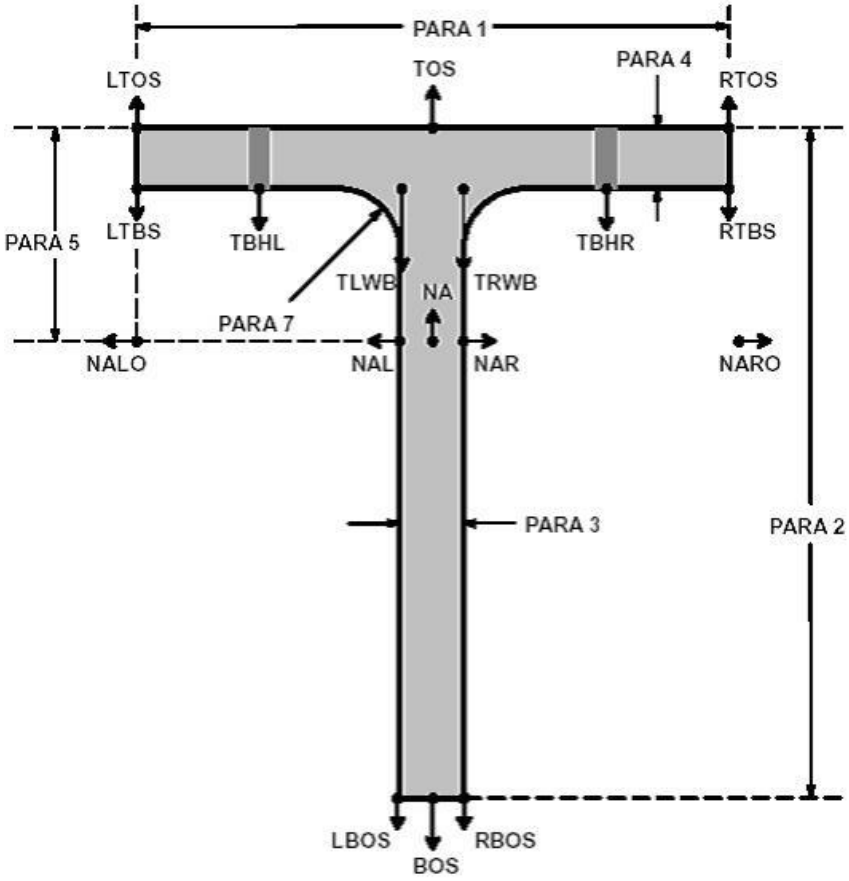
Generic Type : DINU



P-lines used

LTOC	RTOC	IOC
LBOC	FOC	NA

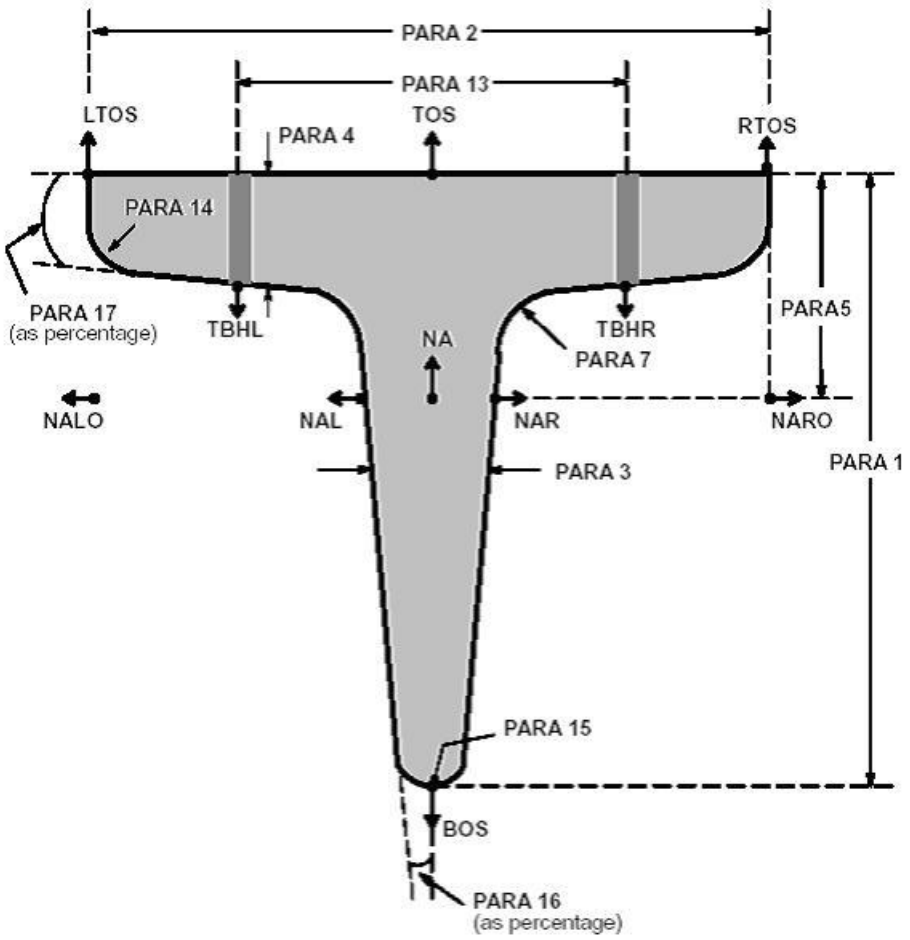
Generic Type : TEE



P-lines used

TOS	LTOS	RTBS	NAR
BOS	RTOS	NAL	NA

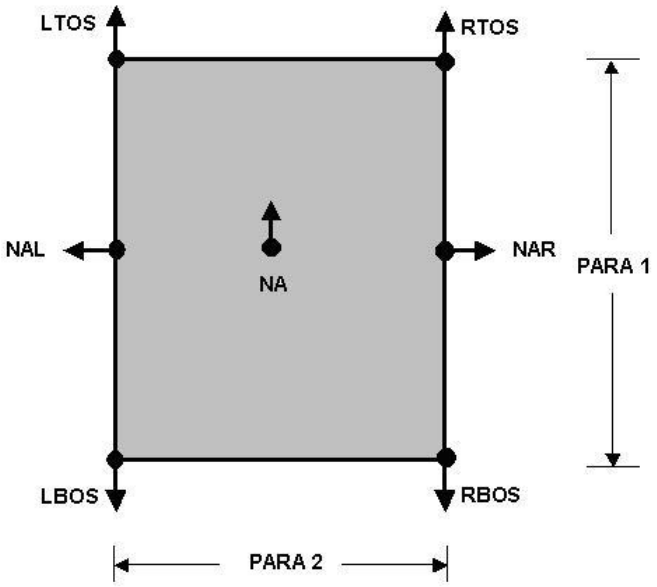
Generic Type : DINT, IST



P-lines used

TOS	LTOS	NA
BOS	LBOS	

Generic Type : FB

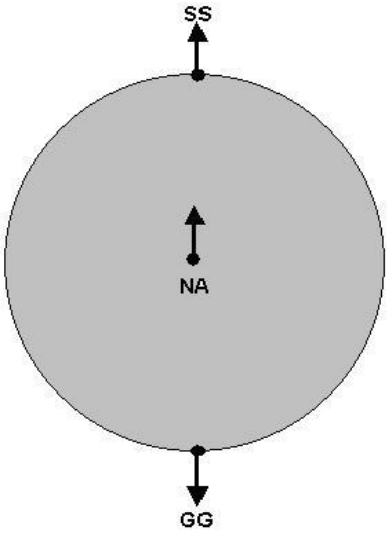


P-lines used

RTOS LTOS NA

RBOS LBOS

Generic Type : CSS



P-lines used

SS NA

GG

Parameter

Program first checks for the valid PLINES for different type of sections as listed above graphically for PDMS or listed below in Tables 1A and 1B for both PDMS and E3D. If PLINES are not set or have different names, then the program uses the Catalogue Parameter or Design Parameter numbers specified for each GTYPE as listed in the table below to extract the dimensions.

Table 1A: Extraction of Dimensions from PDMS for Section Elements (SCTN)

Product Name	Generic Type (Gtype) of CATREF	Section Type	Dimension Description	Distance between Plines or Catalogue Parameter
PDMS	BOX	Hollow Rectangular Section	Width of Section	LTOS & RTOS
			Depth of Section	LTOS & LBOS
			Thickness	Para 3
PDMS	ANG, ISA	Angle	Width of Section	TOAX & RTTA
			Depth of Section	TOAX & LBOA
			Thickness	NAL & NAR
PDMS	TUBE, GTUB, DTUB	Hollow Circular Section	Diameter	GG & SS
			Thickness	Para 2
PDMS	BEAM	I Section	Width of Section	LTOS & RTOS
			Depth of Section	LTOS & LBOS
			Thickness of Web	NAL & NAR
			Thickness of Flange	RTOS & RTBS
PDMS	DINI, ISB, JISI	Tapered I Section	Width of Section	LTOS & RTOS
			Depth of Section	LTOS & LBOS
			Thickness of Web	NAL & NAR
			Thickness of Flange	Para 4
PDMS	BSC, ISC, JISU, DINU	Channel Section	Width of Section	LTOC & RTOC
			Depth of Section	LTOC & LBOC
			Thickness of Web	FOC & IOC
			Thickness of Flange	Para 4
PDMS	TEE	TEE Section	Width of Section	LTOS & RTOS
			Depth of Section	TOS & BOS
			Thickness of Web	NAL & NAR
			Thickness of Flange	RTOS & RTBS
PDMS	DINT, IST	TEE Section	Width of Section	LTOS & RTOS
			Depth of Section	TOS & BOS
			Thickness of Web	NAL & NAR

Product Name	Generic Type (Gtype) of CATREF	Section Type	Dimension Description	Distance between Plines or Catalogue Parameter
			Thickness of Flange	Para 4
PDMS	FB	Flat Bar	Width of Section	LTOS & RTOS
			Depth of Section	LTOS & LBOS
PDMS	CSS	Solid Circular	Diameter	SS & GG

Table 1B: Extraction of Dimensions from E3D for Section (SCTN) and Straight Generic Section (GENSEC)

Product Name	Generic Type (Gtype) of CATREF	Section Type	Dimension Description	Distance between Plines or Catalogue Parameter
E3D	BOXG	Box Girder	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness	Para 5
E3D	RTUB	Hollow Rectangular Tube	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness	Para 5
E3D	ANGL	Equal and Unequal Angle	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness	LTOP & IFAT
E3D	CTUB	Hollow Circular Section	Diameter	GG & SS
			Thickness	Para 2
E3D	RBAR	Solid Circular Section	Diameter	LTOP & RTOP
E3D	PFI	Parallel Flanged I Section	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness of Web	NAL & NAR
			Thickness of Flange	RTOS & RBOS
E3D	TFI	Tapered Flanged I Section	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness of Web	NAL & NAR

Product Name	Generic Type (Gtype) of CATREF	Section Type	Dimension Description	Distance between Plines or Catalogue Parameter
			Thickness of Flange	Para 6
E3D	FBAR	Flat Bar	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
E3D	PFC	Parallel Flanged C Section	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness of Web	LMID & IMID
			Thickness of Flange	RTOP & ITFR
E3D	TFC	Tapered Flanged C Section	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness of Web	LMID & IMID
			Thickness of Flange	Para 6
E3D	PFT	Parallel Flanged TEE Section	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness of Web	NAL & NAR
			Thickness of Flange	Para 6
E3D	TFT	Tapered Flanged TEE Section	Width of Section	LTOP & RTOP
			Depth of Section	LTOP & LBOT
			Thickness of Web	NAL & NAR
			Thickness of Flange	Para 6

Table 2: Extraction of Dimensions using Catalogue or Design Parameter

GTYPE	Parameter (P for catalogue parameter, D for design parameter) W=Width, D=Depth or Diameter, TF = Flange Thickness, TW = Web Thickness or Thickness
ANG	W=P2,D=P1,TF=P3
ISA	W=P2,D=P1,TF=P3
BEAM	W=P2,D=P1,TF=P4,TW=P3
DINI	W=P2,D=P1,TF=P4,TW=P3
ISB	W=P2,D=P1,TF=P4,TW=P3
JISI	W=P2,D=P1,TF=P4,TW=P3
BSC	W=P2,D=P1,TF=P4,TW=P3
DINU	W=P2,D=P1,TF=P4,TW=P3
ISC	W=P2,D=P1,TF=P4,TW=P3
JISU	W=P2,D=P1,TF=P4,TW=P3
TEE	W=P1,D=P2,TF=P4,TW=P3

GTYPE	Parameter (P for catalogue parameter, D for design parameter) W=Width, D=Depth or Diameter, TF = Flange Thickness, TW = Web Thickness or Thickness
DINT	W=P2,D=P1,TF=P4,TW=P3
IST	W=P2,D=P1,TF=P4,TW=P3
BOX	W=P2,D=P1,TF=P3
TUBE	D=P1,TF=P2
DTUB	D=P1,TF=P2
GTUB	D=P1,TF=P2
FB	W=P2,D=P1
CSS	D=P1
BOXG	W=P2,D=P1,TF=P5
RTUB	W=P2,D=P1,TF=P5
ANGL	W=P2,D=P1,TF=P6
CTUB	D=P1,TF=P5
RBAR	D=P1
PFI	W=P2,D=P1,TF=P6,TW=P5
TFI	W=P2,D=P1,TF=P6,TW=P5
FBAR	W=P2,D=P1
PFC	W=P2,D=P1,TF=P6,TW=P5
TFC	W=P2,D=P1,TF=P6,TW=P5
PFT	W=P2,D=P1,TF=P6,TW=P5
TFT	W=P2,D=P1,TF=P6,TW=P5

How to modify parameters?

Appendix – A (Parameter) gives the list of default parameters used for different dimensions for different profiles. The user can change the parameters listed above to suit their needs. Parameters can be changed in two ways, one through the GUI and the other through changing the content of the file containing these data. The first method is dynamic and lost longer till the application is closed, whereas the second method is a permanent change and more suitable for the project with different standard of profiles/user defined profiles in different portion of the plant with same catalogue parameter for same category (such as I Section, Channel, Angle, etc) of section. For example, different portion of plant could have different standard (including user-defined) of I Section with same catalogue parameters such P1 for depth, P2 for Depth etc.,

Section 2.4.a gives the procedure to modify the parameters through the GUI. To change the parameters permanently, open the file “PD2STPRO\Setup\ParaList.txt”, for each valid GTYPE there is a line in the file, which contain information about the parameter and the associated dimension of the GTYPE. E.g. the third line of the file is: “BEAM, W=P2, D=P1, TF=P4, TW=P3;”. “BEAM” means the GTYPE “BEAM”, W=P2 implies width of the section is equal to catalogue parameter 2 and so on. Given below are the meanings of the symbols used to denote different dimensions.

W = Width of the section

D = Overall depth of the section (Outer diameter of the section for tube and diameter for circular section)

T = Thickness of the section

TF = Thickness of flange

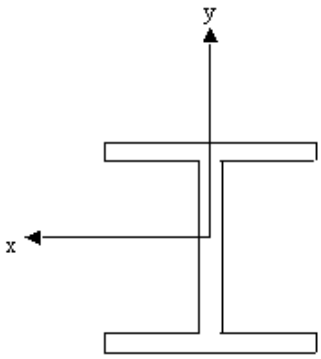
TW = Thickness of web or Thickness

To assign the width of the GTYPE “BEAM” to design parameter 2 instead of catalogue parameter 2(which is the default value) replace “W=P2” by “W=D2” and save the file. Now the default width of the GTYPE “BEAM” is design parameter 2.

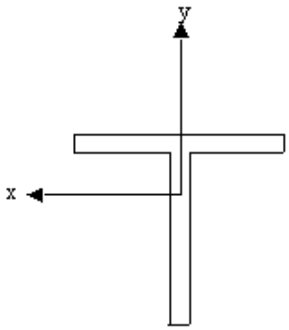
Appendix B

Local axis system in E3D/PDMS

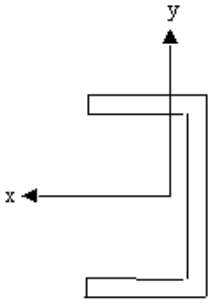
The elements transferred from E3D/PDMS are orientated in STAAD.Pro based on E3D/PDMS local axis directions and STAAD.Pro definition of orientation. While doing so it is assumed that, inside E3D/PDMS the user follows the default local axis convention used in E3D/PDMS, which is illustrated below for reference.



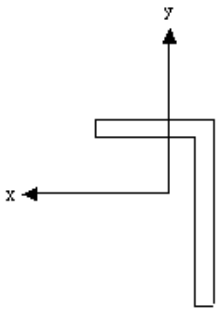
I-section
(viewing in the +ve local z-axis direction)



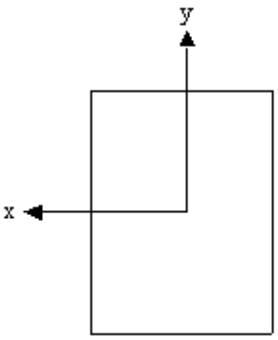
Tee section
(viewing in the +ve local z-axis direction)



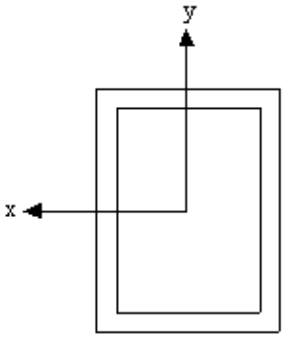
Channel section
(viewing in the +ve local z-axis direction)



Angle section
(viewing in the +ve local z-axis direction)



Rectangular section
(viewing in the +ve local z-axis direction)



Box section
(viewing in the +ve local z-axis direction)

Appendix c

Syntax for filling FIXITY attribute of PNOD and SNOD

a. FIXED

b. PINNED

c. FIXED BUT <Release-Spec> [Spring-SPEC]

Release-Spec

FX, FY, FZ, MX, MY & MZ

Spring-Spec

KFX <f1>, KFY <f2>, KFZ <f3>, KMX <f4>, KMY <f5> & KMZ <f6>

Examples

FIXED BUT FX MZ

FIXED BUT MZ KFX 50.0 KFY 75.

Appendix D

Error messages in the error file

1.'Catref is Unset for <section DBREF>. The element has not been transferred.'

Description: The catalogue reference for <section DBREF> is unset.

2. 'WARNING : Section <section DBREF> has been transferred as a non-standard user defined section.'

Description: The GTYPE (“GTYPE” attribute of the catalogue reference of the <section DBREF>) of the <section DBREF> is neither a valid GTYPE nor an equivalent GTYPE of a valid GTYPE. If the section profile is one of the eight listed profile type(Refer section 4.1.8) then add the GTYPE as an equivalent GTYPE. If not ignore the message.

3.'ERROR : Section <section DBREF> has "ZERO" width. Check list of PARAMETER.'

Description: <section DBREF> is having zero width. Proper parameter has to be set for the GTYPE(“GTYPE” attribute of the “CATREF”) before transferring.

4. 'ERROR : Section <section DBREF>has "ZERO" depth. Check list of PARAMETER.'

'ERROR : Section <section DBREF> has "ZERO" flange thickness. Check list of PARAMETER.'

'ERROR : Section <Section DBREF> has "ZERO" web thickness. Check list of PARAMETER.'

'ERROR : Section <Section DBREF> has "ZERO" diameter. Check list of PARAMETER.'

Description: Same as 3

5. 'ERROR : For section <section DBREF>' Ax = 0.'

Description: The GTYPE of the <section DBREF> is neither a valid GTYPE nor an equivalent GTYPE of a valid GTYPE and the user defined attribute “Ax” is not set. Ignore the message if it is intended to provide the property in the mapping DB.

6. 'ERROR : For section <section DBREF>' Ay = 0.'

'ERROR : For section <section DBREF>' Az = 0.'

'ERROR : For section <section DBREF>' Ix = 0.'

'ERROR : For section <section DBREF>' Iy = 0.'

'ERROR : For section <section DBREF>' Iz = 0.'

Description: Same as 5

6. 'WARNING : Section <section DBREF> has same start and end node.'

Description: The “JOISTART” and “JOIEND” attribute of <section DBREF> is owned by same node.