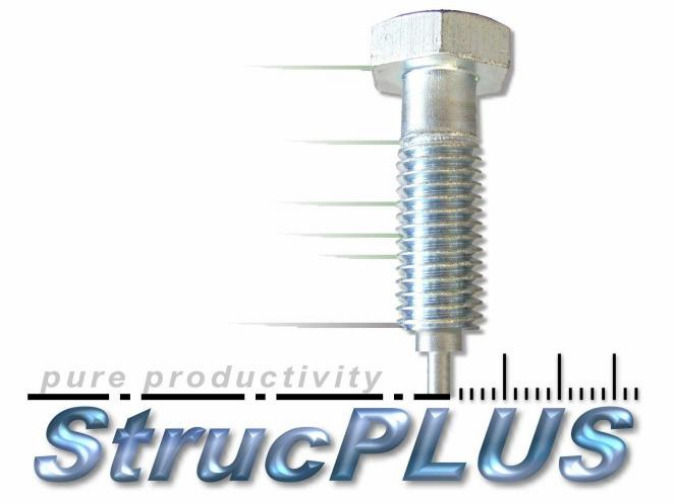


INTRODUCTION

Struc Plus Application Software is an add on drafting package offering a general purpose set of programmes to provide powerful tools and macros specifically related to the preparation of Consulting Engineering-type structural drawings.

This package specifically addresses commonly drawn structural entities and via user input adapts these to alleviate the everyday chore of redrawing regular details or manipulating previously stored blocks.

This package may not draw all details or plan entities to within 100 per cent of the intended appearance but the user can expect to have up to 90 per cent of a requirement on the screen with all the correct layering, colors and linetypes within a minute or two.

The speed and ease with which the entities and details can be prepared and modified using **Struc Plus** software tools and macros offer a phenomenal advantage over the CAD "out-of-the-box" electronic pencil method.

ABOUT THE AUTHOR

Peter Coburn started his drawing career with Brickell Moss Rankine & Hill as a trainee structural design draftsman in their Wellington, New Zealand office, detailing reinforced concrete, structural steelwork and timber for multistory commercial and residential buildings. Mr. Coburn studied part-time studies for the New Zealand Certificate of Engineering, which he passed in 1975.

In 1977 Peter Coburn joined Rankine & Hill's Melbourne office through an arrangement with the NZ partnership as their leading structural design draftsman. In 1979 he was promoted to Chief Draftsman to administer a team of 35 technical staff involved on major multi-discipline projects throughout Australasia.

Mr. Coburn joined Scroggie Consulting Engineers in 1984 as their Chief Draftsman/Project Coordinator in control of all CAD operations and was subsequently appointed an Associate Director twelve months later.

Peter decided to try his hand at self-employment in July 1986 and commenced a number of successful years as a contract drafter.

Over his drafting career Mr. Coburn has documented over 850 storeys of high-rise construction, 10 shopping centres, 15 multi-level heavy industrial projects and countless smaller residential, commercial, industrial and institutional projects.

Peter's CAD background spans back to 1984, having used and programmed such systems as Arplan, DOGS, PCDOGS, and AutoCAD Release 10, 11, 12, 13 & 14. 2000- 2009 His CAD and programming skills have all been self taught.

The concept and commencement of this software began in early 1989. Beta testing was undertaken in a work place environment by a major Australian based Consulting Engineer who now use a national corporate licence. With 5000 programming hours and 10000 hours of Beta testing the package was released for sale in May 1993.

From time to time additional programmes are added/altered/upgraded/debugged and these do not necessarily reflect the exact functions as documented in this User Manual.

SETTING UP A DRAWING

To setup a drawing sheet select **SPTools**..., **Struc Plus Setup**... and either Title Block Setup or Drawing Setup.

This needs to be done to start a drawing, alternatively Open an existing drawing (which has not previously been created using Struc Plus) and select **SPTools**... and **Reset Scale**... before any Struc Plus function to enable correct usage of any Struc Plus programme.

If a Title Block Setup is selected, then this automatically 'inserts' a pre-defined title block drawing. These drawings are normally in the installed directory and need to be edited by the purchaser to include his/her address, phone numbers, logo, and attributes, etc. The name of these files needs to be maintained.

This program now includes both the option for a horizontal and vertical title block.

KEYSON.BAT FILE CUSTOMISATION

The following Key redefinitions are applicable to the DOS version of AutoCAD only. More functions can be assigned, by adding more prompt commands into this file and assigning an AutoCAD command to it, it is then possible to have a total of 48 keys available via the extended key set. The ASCII character set definitions for these keys are listed in your MS-DOS Manual.

If you run AutoCAD through a “CAD.BAT”, for example, be sure to re-assign these altered keys back to themselves in the KEYSOFF.BAT file.

A printout of the supplied KEYSON.BAT file is as follows;-

echo on	
prompt $e[0;60;'"zoom W";13p	F2 - 'Zoom W
prompt $e[0;61;'"zoom P";13p	F3 - 'Zoom P
prompt $e[0;62;"VA";13p	F4 - Zoom E (without Regen)
prompt $e[0;63;'"zoom E";13p	F5 - Zoom E
prompt $e[0;133;"XTG";13p	F11 - Xtgold
prompt $e[0;134;"SM";13p	F12 - Bylayer Side Menu
cls	
@echo off	
prompt pg	

COLOR ASSIGNMENT

The default colors adopted by **Struc Plus** has been based upon the ISO standard of colors and pen intensities as follows:-

0.18 - green, 0.25 - white, 0.35 - yellow, 0.50 - red, 0.70 - cyan and 1.00 - blue.

The default colors can be altered to suit individual project or office requirements by altering the pen assignments in the SPTOOLS…STRUC PLUS SETUP…COLORS…

The color assignments being used by Struc Plus are stored in the SPCOLOR.INI file, this file can be copied to different directories and altered to suit multiple configurations.

LAYER ASSIGNMENT

A layering convention has been established and it was decided not to draw using the "color/linetype bylayer method" as the default. This was done to minimise the number of layers per drawing and to then enable the user to easily construct a multiple number of drawings per file, i.e. - First Floor Concrete Profile Plan, First Floor Bottom Reinforcement Plan, First Floor Top Reinforcement Plan all in the same file with common layers, or even have the facility to be overlay, via external references other drawings such Building Services drawings without a clash of layering.

The default layering can be altered to suit the AutoCAD BYLAYER method, individual project or office requirements by altering the layer assignments in the SPTOOLS…STRUC PLUS SETUP…BYLAYER LAYER… or BYENTITY LAYERS…

The layer assignments being used by Struc Plus are stored in the SPLAYER.INI and BYLAYER.INI files, these files can be copied to different directories and altered to suit multiple configurations.

OTHER DEFAULTS

Drafting standards, units and structural layer defaults are also found from the SPTOOLS…STRUC PLUS SETUP… pull down menu location. These settings are saved to *.INI which is then read in as the office standard during the next time you load Struc Plus.

TEXT AND DIMENSION ASSIGNMENTS

The default text font adopted by **Struc Plus** has been based upon the ISO3098B standard of colors and pen intensities as follows:-

0.18 - green, 0.25 - white, 0.35 - yellow, 0.50 - red, 0.70 - cyan and 1.00 - blue.

The default colors can be altered to suit individual project or office requirements by altering the pen assignments in the SPTOOLS…STRUC PLUS SETUP…TEXT AND DIMS…

The color assignments being used by Struc Plus are stored in the SPTEXT.INI file, this file can be copied to different directories and altered to suit multiple configurations.

STRUC PLUS BUTTONS

The definition for the pointer device buttons can be altered from SPTools…Struc Plus Setup…SPMenu…

At the head of this file are a number of Menu Devices, ***BUTTONS1 which defines the use of the pointer device buttons (tablet puck only). ***BUTTONS2, ***BUTTONS3 and ***BUTTONS4 are also permitted devices and can activated using the SHIFT + BUTTON, CTRL + BUTTON or CTRL + SHIFT + BUTTON respectively.

Additionally, a Menu Device ***AUX1 defines the use of the pointer device buttons (mouse only). ***AUX2, ***AUX3 and ***AUX4 are also permitted devices and can activated using the SHIFT + BUTTON, CTRL + BUTTON or CTRL + SHIFT + BUTTON respectively.

Simply edit the required line (button location) to suit your needs. If you prefer the <ENTER> function to be active from your '2' button change the **$P0=*** to **;** (semi-colon). If using a mouse with AutoCAD you will need to edit the settings under ***AUX1. Exit and save this file and from AutoCAD Command: MENU <ENTER><ENTER>.

Under AutoCAD R13 or R14 for Windows only, Command: MENU and reload the Template *.MNU file.

STRUC PLUS SUPPLIED SOURCE CODE

A number of the Struc Plus programmes are supplied in source code format (readable), these files are the programmes that the author has recognised as being those which may require modification to suit those offices who do not wish to use the Struc Plus standards. These files contain the programmes activated from the SPTools pulldown menu. Modification of these will require referral back to Struc Plus, as a detailed description of their contents will extend to many pages.

HOW DO I USE THE STRUC PLUS RESET SCALE ROUTINE?

The **Reset Scale** routine is provided to allow the user to draft in any scale that he/she desires on any drawing. Once the initial drawing setup has been decided upon and the **Struc Plus Setup** executed, the drawing plot scale sheet size and scale is established. Once this is complete it is assumed that the majority of this drawing will be drawn at this scale.

It is important to note that, like AutoCAD, all objects are originally drawn at a scale of 1:1 using Struc Plus, however the Reset Scale routine merely sets a series a Setvars and Dimvars that need to change to draw the text and dimensions height to the correct relative height to suit the anticipated plot scale.

For example, John Citizen has used Struc Plus to setup an A1 sheet at a scale 1:100, he commences drawing a concrete frame which he reinforces using the Struc Plus programmes, he notes that the actual height of his 2.5mm text Lists as 250 high. There is sufficient room on this drawing to draw beam elevations, John clicks on **Reset Scale** and selects a scale of 1:20 to draw these beams. After drawing these beams in elevation and a number of sections, John notes that his 2.5mm text on these details lists as 50 high. John zooms back to a full drawing using the F4 key (command: VA) and once again clicks on **Reset Scale** and selects the original plot scale of this drawing, 1:100. Before selecting **OK** he clicks the **[X] Re-scale Objects?** to be active. After clicking **OK** the beam elevations and sections are required to be the selected objects, a base point is selected and the selected objects are then proportionally scaled to be 1:20 on this base 1:100 drawing.

Paper Space users need not click on **[ ]Re-scale Objects?**, as the scaling process is done with the Paper Space Zoom X/Xp in each individual view port.

ALIASES

Alias	Command	Alias	Command	Alias	Command
A	ARC	**AR**	SPARRAY	**B**	BREAK
BH	BHATCH	**BL**	BLOCK	**C**	CIRCLE
CF	CHAMFER	**CH**	CHANGE	**CL**	COLOR
CO	COPY	**CP**	COPY	**D**	DIST
DDA	DDATTE	**DDC**	DDCHPROP	**DDE**	DDEDIT
DDG	DDGRIP	**DDI**	DDINSERT	**DDL**	DDLMODE
DDM	DDMODIFY	**DDV**	DDVPOINT	**DI**	DIVIDE
DMS	DIMSCALE	**DO**	DONUT	**DT**	DTEXT
E	ERASE	**EX**	EXTEND	**EXP**	EXPLODE
F	FILLET	**FF**	FILTER	**H**	HATCH
I	INSERT	**L**	LINE	**LA**	LAYER
LI	LIST	**LS**	LTSCALE	**LT**	LINETYPE
M	MOVE	**ME**	MEASURE	**MI**	MIRROR
ML	MLINE (SP13)	**MU**	MENU	**MS**	MSPACE
MV	MVIEW	**O**	OFFSET	**OO**	OOPS
P	PAN	**PE**	PEDIT	**PL**	PLINE
PO	POLYGON	**PS**	PSPACE	**Q**	QUIT
R	REDRAW	**RG**	REGEN	**RP**	RTPAN (SP13)
RZ	RTZOOM (SP13)	**S**	SAVE	**SC**	SCALE
SL	SELECT	**SO**	SOLID	**T**	TRIM
TB	SPTOOLBOX	**TR**	TRACE	**U**	UNDO
V	VIEW	**VP**	VPORTS	**VS**	VSLIDE
WB	WBLOCK	**XL**	XLINE (SP13)	**XR**	XREF
XTG	XTGOLD	**Z**	ZOOM		

HOTKEYS

Hotkey	Description	Hokey	Description
ALOF	All Layers Off (ex-current)	**ALON**	All Layers On
HOFF	Hatch Off or Frozen Options		
LOF	Freeze Selected Layer(s)	**LOM**	Turn Off Selected Layer(s)
LOT	Thaw All Frozen Layers	**N**	Running Osnap to None
OE	Running Osnap to Endp	**OEI**	Running Osnap to Int/Endp
OI	Running Osnap to Intersection	**ON**	Running Osnap to None
ONE	Running Osnap to Near	**PP**	Previous Icon Menu
PT	Turn various on for plotting	**SA**	All settings to selected entity
SBL	Break Line	**SM**	Side Menu BYLAYER selection

ST	Stretch with auto crossing	**TM**	Tilemode Toggle
U0	Sets UCS back to World	**U1**	Restores UCS 1
U2	Restores UCS 2	**U3**	Restores UCS 3
U4	Restores UCS 4	**U5**	Restores UCS 5
VA	Restores View All	**V0**	Restores View 0
V1	Restores View 1	**V2**	Restores View 2
V3	Restores View 3	**V4**	Restores View 4
V5	Restores View 5	**V6**	Restores View 6
V7	Restores View 7	**V8**	Restores View 8
V9	Restores View 9	**ZA**	Zoom All
ZD	Zoom Dynamic	**ZE**	Zoom Extents
ZP	Zoom Previous	**ZW**	Zoom Window
ZV	Zoom Vmax	**X**	Dist Near and perpendicular

Dimensioning Hotkeys

Hotkey	Description	Hotkey	Description
DH	Horizontal	**DV**	Vertical
DL	Leader	**DA**	Aligned
DAN	Angular	**DD**	Diameter
DDR	Radius	**DC**	Continue
DR	Rotated	**DB**	Baseline

TABLET MENU OVERVIEW

The **Struc Plus** menu definition file has been designed for use with a digitiser tablet and this is seen as an optional extra. As future AutoCAD upgrades are expected to phase out the use of tablets and place more emphasis on pull down, icon menus and toolbars, this development software has accordingly followed these lines.

The philosophy behind the customisation of the tablet areas of the standard AutoCAD menu is to maintain the basic standard configuration and to add-on current and future development into the "Tablet 1 Area", the 3D area of the "Tablet 2 Area" and to "tune" the existing commands on the remainder of the tablet areas to speed up the everyday drawing functions.

The left area of "Tablet Area 1" includes a suite of commonly used general drafting tools and these are explained in more detail in Chapter 8.

The remaining "Tablet Area 1" has been divided into three sub-areas - General Drafting, Concrete and Steelwork. When any of these boxes under this area is selected, the appropriate pull down menu on the screen is activated, with optional slide facility, for a more visual and descriptive choice of programmes.

The file "SPTABLET.DWG" is a drawing of the Struc Plus tablet menu. This can be plotted out to form the tablet template.

The **Struc Plus** tablet Menu Area layout is as follows:-

<table>
<tr><td colspan="3">Menu Area 1
25 Columns x 9 Rows</td></tr>
<tr><td>Menu Area 2
11 Columns x 9 Rows</td><td>Screen
Menu</td><td>Menu Area 3
9 Columns x 13 Rows</td></tr>
<tr><td colspan="3">Menu Area 4
25 Columns x 7 Rows</td></tr>
</table>

PULLDOWN MENU OVERVIEW

Similarly to the philosophy behind the Tablet Customisation the **Struc Plus** software maintains the basic layout and functions of the first eight pull down menu facilities as supplied with the CAD software. A small number of additional smarter selections have been added under the relevant menus.

This manual does not intend to educate the user of the **Struc Plus** software on the function of standard CAD commands, as a knowledge of CAD basics is assumed but not absolutely essential.

SPDETAILER MODULE

All documentation for this module is only provided in electronic format and can be found in either Word97 or PDF format on the CD in the SPMANUAL folder.

This documentation is also found in the OnLine User Manual, which can be installed from the HTML flder on the CD.

SPTOOLS

Reset Scale… - allows the operator to drawing entities at a different scale on the drawing than the original drawing setup selection, optional toggles on the below dialogue box allow for automatic scaling of entities, variable LTSCALE and Associate dimension.

Model Scale… - allows the operator to drawing entities at a different scale on the drawing other than the original drawing setup selection by completely rescaling the entire model space drawing to the new detail's scale. Not to be used in Paper Space.

Toolbar… - Struc Plus 13 for Windows only SPTools Toolbar.

LAYERS

Layer Control - 'DDLMODES command

Change Layer - change selected entities to match a layer of a selected object

Change All - change all properties of selected entities to match that of a target object

Rename Layer - Simple Old Layer, New Layer Routine

Xref Layer ID - identifies the layer from an Xref file.

Set All - sets the current settings to match that of a selected entity

Pick Current - changes the current layer to match that of a selected entity

Pick Layer Off - turns off a layer, which contains the selected entity

Freeze a Layer - freezes a layer, which contains the selected entity

Thaw All Layers - thaws all layers

All Layers On - turns all layers on (except those frozen)

All Layers Off - turns all layers off (except current layer)

PEN SETTINGS

Pen Toolbox -Provide access to a pen, linetype and draw combination in the current layer.

Drain - creates a "drainage" layer. Three lines are drawn in total representing a stormwater drain line, two 0.25mm outer lines of the drain and a 0.50mm dashed polyline with a width equal to the drain diameter. Option invert levels, drain diameter and grade text can be drawn along the drain line.

Fence - a complex linetype with user definable alpha/numeric symbols drawn inside the break lines. All entities are drawn on the current layer.

Slab Joints - creates a "JOINTS" layer and selects a 0.35mm pen in a pre-defined linetype to draw the relevant slab on ground joint linework and text. Text placed as:-
C.J. to denote construction joint
D.J. to denote doweled joint
K.J. to denote keyed joint
S.C.J. to denote sawcut joint

Scabble Line - draws a 0.25mm "corrugated" linetype representing a scabble joint.

Set All - sets the current settings to match that of a selected entity

Hatch - a range of pre-defined hatch settings are provided. These settings automatically select the "HATCH" layer and the 0.18mm color. Hatch types include
Close 45 - hatch lines at 45 degrees and 0.45mm apart
Wide 45 - hatch lines at 45 degrees and 1.00mm apart
Close Cross 45 - cross hatch lines at 45degrees and 0.45mm apart
Wide Cross 45 - cross hatch lines at 45degrees and 1.00mm apart
Dots - dots hatch

CHANGE ENTITY

The following Change Entity options are to be used when the drafter is using the “Byentity” method of drawing, any selection will alter the properties to match that menu option with the layer remaining unaltered. The first eight colors and the most common linetypes are provided from this menu. If any other options are require use the DDC (DDCHPROP) Hotkey.

Change All - change all properties of selected entities to match that of a target object

Change Entity - utilizes the AutoCAD '"filter" command to change a nominated selection set.

Change Color - after a selection set has been returned the command prompts of "Old Color:" followed by "New Color:" require numeric color replies.

TEXT SETTINGS

2.5 Text, 3.5 Text, 5.0 Text, 7.0 Text & 10 Text - automatically sets the text height and pen assignments as predefined within the UTILITY.LSP configuration file.

User Defined - Operator defined text height, pen selection is automatically used from the assignments as predefined in the UTILITY.LSP configuration file.

Angle Text - after firstly selecting the text parameters, i.e. 2.5 Text, two points on the drawing are required parallel to the orientation of the typed input.

Arc Text - places text around a selected arc using the current text settings and layer.

Text Under - after firstly selecting the text parameters, i.e. 2.5 Text, the user is required to indicate the text to place text under prior to typing.

Add Underline - prefixes the "%%U" symbol to all selected text, therefore adding (or deleting) the underline.

Shadow Box - introduces a Windows style box around selected points.

Chtext . . . - loads and runs the AutoCAD R11supplied CHTEXT.LSP.

Match Text - loads and runs the AutoCAD supplied CHTEXT.LSP, with additional preset prompts, which require "Old String:" and "New String:" responses. Beware that if the same old string is encountered in one line of text, all occurrences are altered.

Edit Attribute - AutoCAD DDATTE

Edit Text - AutoCAD DDEDIT.

Substitute Text - alters the first selected text to match that of the second text selection

Swap Text - swaps the first line of text selected with the second line of text.

All Text to ISO - changes all text on the current drawing to “ISO”

Import Text - reads and places the contained file into the current drawing and using the existing text settings.

Change Text Case - routine to alter the case sensitivity of selected text

Export Text - writes the selected text to an ASCII text file to hard disk. Please note the text lines are written to the file in the order selected or in the order originally placed in the drawing. Usually it is more consistent to select each line of text individually in the order that it is intended to be in the output file.

DIMENSIONS

All dimension functions from the SPTOOLS menu automatically select the text height, pen and linetype as are predefined in the UTILITY.LSP configuration file.

Curved Leader - freehand style leader line

R12 Leader - AutoCAD R12 style leader option for AutoCAD R13 users.

All other dimension functions are standard AutoCAD DIM commands with the exception that the pre-defined colors, layers and text heights are adopted.

DRAWING TOOLS

@ Functions

Vert Line - select after the "Line" command, this functions issues the "@0," string enabling the user to input the vertical length only.

Horz Line - select after the "Line" command, this functions issues the "@xxx,0" string enabling the user to input the horizontal length only.

Angle Line - select after the "Line" command, this functions issues the "@xxx<x," string enabling the user to input the length and angle only.
Note that the @ functions also work with most Edit functions.

Arrow Tools - useful arrow tools are provided as shown on the following page.

Add Length - Lengthens a selected line by a nominated length.

Copy Rotate - "Copy" a selected object with an included rotation angle.

Current Offset - "Offset" command in the current pen, linetype and layer.

Double Offset - "Offset" command in the current, linetype and layer placed equidistant about the selected line.

Move Rotate - "Move" a selected object with an included rotation angle.

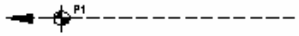
Rectangle - Optional method of drawing a rectangle

Pick Snap Angle - places the cursor snap angle parallel with a selected line.

Snap Angle = 0 - Returns snap angle to 0.

The "Multiple" function menu issues multiple AutoCAD commands until a *Cancel* is returned.

ARROW LINE



ADD ARROW

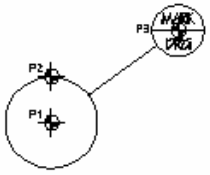
ARROW

DOUBLE ARROW EXTENT

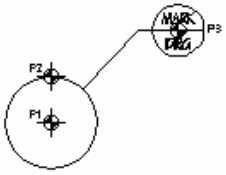
SINGLE ARROW EXTENT

SECTION FLAGS

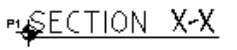
SECTION BUBBLE



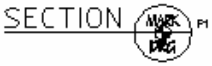
DETAIL BUBBLE 1



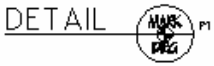
DETAIL BUBBLE 2



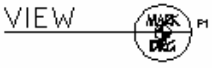
SECTION X-X



SECTION TAG



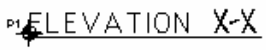
DETAIL TAG



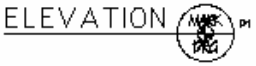
VIEW TAG

TAG ADD 1

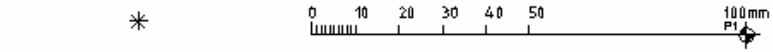
TAG ADD 2



ELEVATION X-X

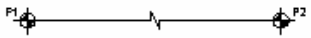


ELEVATION TAG



ASTERISK

BAR SCALE

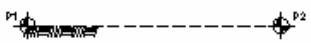


BREAK LINE

CENTRE LINE

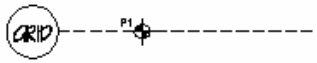
CIR-CROSS

CLOUD



DIRT

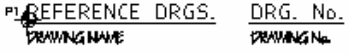
FFL MARKER



GRID BUBBLE

NORTH POINT

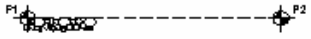
PROJECT NORTH



REFERENCE DRAWINGS

REVISION TRIANGLE

RL MARKER



RUBBLE

SPOT LEVEL

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SYMBOLS

PRELIMINARY DRAWING
NOT TO BE USED FOR CONSTRUCTION PURPOSES
P1

PRELIMINARY DRAWING LABEL

ISSUED FOR TENDER PURPOSES ONLY
P1

ISSUED FOR TENDER LABEL

ISSUED FOR CONSTRUCTION
P1

ISSUED FOR CONSTRUCTION LABEL

FOR CONTINUATION REFER DRAWING No. DRG No.
P1

FOR CONTINUATION LABEL

ISSUED FOR CERTIFICATION
NOT TO BE USED FOR CONSTRUCTION PURPOSES
P1

ISSUED FOR CERTIFICATION LABEL

AS BUILT DRAWING
P1

AS BUILT LABEL

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - DRAWING LABELS

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - BEAM SCHEDULE

INSERTION POINT

MARK	MAIN REINFORCEMENT			LIGATURE SPACING				REMARKS
	SUPPORT		SUPPORT	TYPE	LEFT	REMAINDER	RIGHT	LIG COVER	

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - R.C. BEAM TYPES

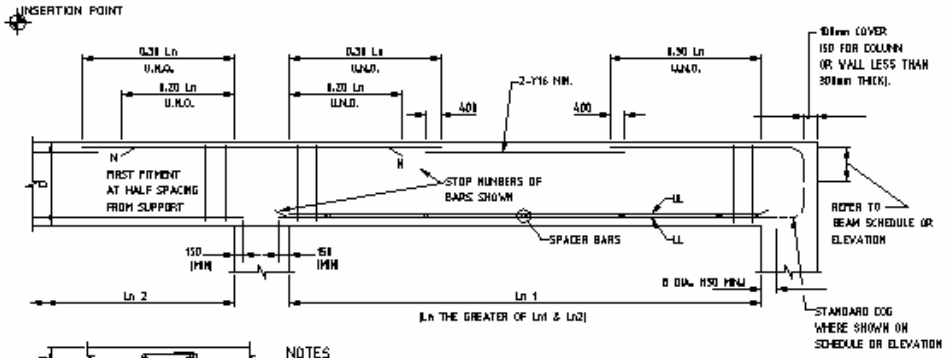
CONVENTIONAL BEAM TYPES

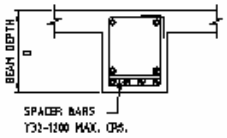
STRUC PLUS

PROGRAMME INFORMATION SHEET

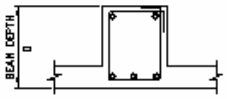
SPTOOLS - SCHEDULES - R.C. BEAM TYPES

CONVENTIONAL BEAM TYPE KEY DIAGRAM





DOWNTURNED BEAM



UPTURNED BEAM

NOTES

1. FOR REINFORCEMENT DIMENSIONS ETC. SEE BEAM SCHEDULE/ELEVATION.
2. BEAM DIMENSIONS GIVEN AS DEPTH x WIDTH.
3. ALL BEAMS ARE DOWNTURNED UNLESS NOTED UPSTAND.
4. BARS ARE TO BE IN ONE LAYER UNLESS SPECIFICALLY NOTED UPPER LAYER (U.L) OR LOWER LAYER (L.L)
5. SPACER BARS ARE NOT SHOWN ON BEAM SCHEDULE/ELEVATION.
6. BARS AT SLAB LEVEL NEED NOT BE CONFINED TO THE BEAM WIDTH. IF NECESSARY THEY MAY SPREAD INTO THE SLAB WITH 41mm MINIMUM CLEARANCE.
7. BEAM FITMENTS ARE NOTED AS FOLLOWS:- NUMBER OF FITMENTS SIZE AND SPACING FROM SUPPORT TO BEAM CENTRE LINE. WHEN ONLY SIZE AND SPACING IS NOTED THE FITMENTS SHALL BE SPACED THROUGHOUT THE BEAM LENGTH. ALL FITMENTS SHALL BE CLOSED TIES. MULTIPLE FITMENTS SHOWN THUS
8. PROVIDE Y16-300 OR Y12-2N EACH FACE FOR BEAMS GREATER THAN 754mm DEEP.
9. DETAILS SHOWN ABOVE APPLY UNLESS SHOWN OTHERWISE ON BEAM SCHEDULE/ELEVATION.
10. REFER ALSO TO STANDARD NOTES.

TYPICAL REINFORCED CONCRETE BEAM DETAILS

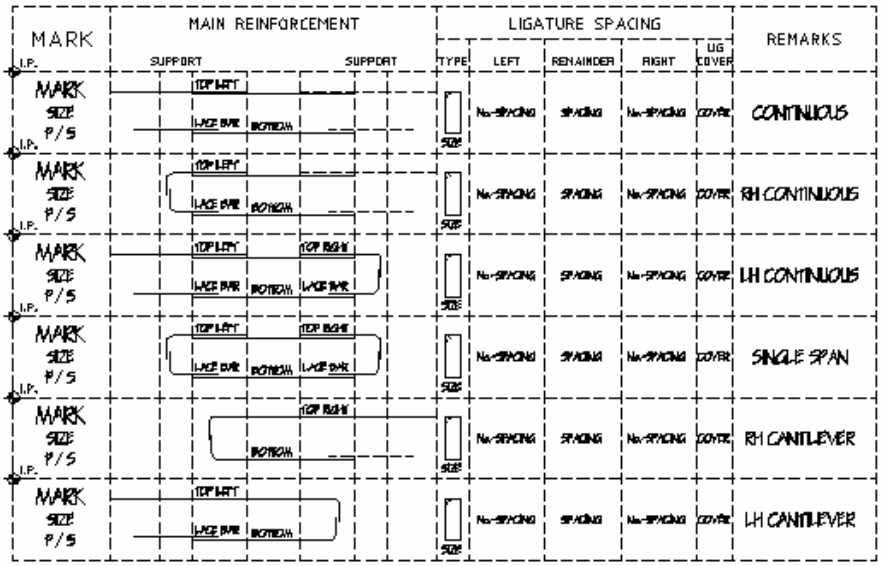
(NTS)

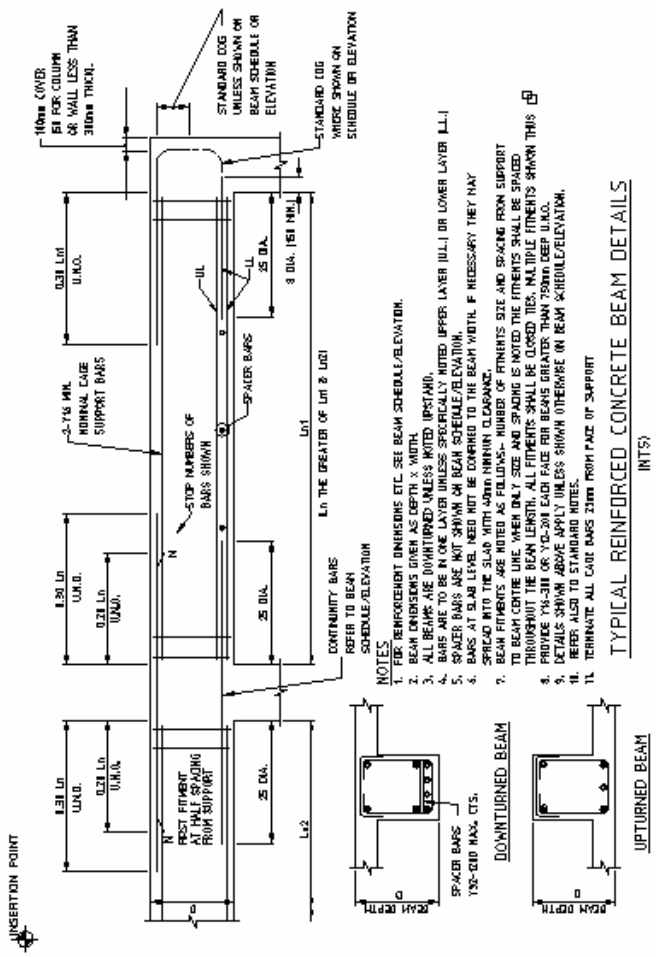
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - R.C. BEAM TYPES

LACE BAR BEAM TYPES





TYPICAL REINFORCED CONCRETE BEAM DETAILS

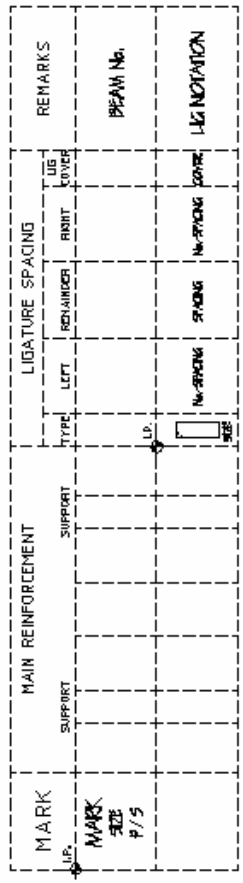
(NTS)

LACE BAR BEAM TYPE KEY DIAGRAM

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - R.C. BEAM TYPES



BEAM SCHEDULE NOTES

1. BEAMS RUNNING NORTH-SOUTH VIEWED LOOKING TO THE WEST. BEAMS RUNNING EAST-WEST VIEWED LOOKING TO THE NORTH.
2. BEAM DIMENSIONS GIVEN ARE OVERALL DEPTH x WIDTH.
3. BEAM BARS AT SLAB LEVEL MAY BE SPREAD INTO THE SLAB IF NECESSARY AT 40mm MIN. CLEAR SPACING IF APPROVED BY THE ENGINEER.
4. PROVIDE Y12-200 OR Y16-300 EACH FACE CONTINUOUS (500 LAP, SIDE FACE REINFORCEMENT) FOR BEAMS GREATER THAN 750mm DEEP UNLESS NOTED OTHERWISE.
5. (P) DENOTES PRIMARY BEAMS.
6. (S) DENOTES SECONDARY BEAMS.
7. (a)PRIMARY BEAN REINFORCEMENT TO BE LAID:
   TOP BARS IN UPPER LAYER | REFER STD NOTES
   BOTTON BARS IN LOWER LAYER | FOR COVER
   (b)SECONDARY BEAM REINFORCEMENT TO BE LAID :
   TOP BARS IN LOWER LAYER | REFER STD NOTES
   BOTTON BARS IN UPPER LAYER | FOR COVER

   - PLACE TOP SECONDARY BARS IN UPPER LAYER WHEN NO INTERFERENCE OCCURS WITH PRIMARY BEAN REINFORCEMENT.

   - WHERE BOTTON BARS IN SECONDARY BEAMS CLASH WITH BOTTOM BARS IN PRIMARY BEAMS @BEAMS OF THE SAME DEPTH),CRANK SECONDARY REINFORCEMENT AS SHOWN ON SCHEDULE.
8. THIS DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DETAIL SD.. AND STANDARD NOTES ON DRAWING S...
9. -D- - DENOTES DURABLE CONCRETE - REFER STANDARD NOTES ON DRAWING No. S..

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - TOOLS

COLUMN SCHEDULE

LEVEL \ MARK	COL. No.	COL. No.	COL. No.
FLOOR MARK			
SIZE (N-SxE-W) REINFORCEMENT TYPE GRADE (MPa) FLOOR MARK			
SIZE (N-SxE-W) REINFORCEMENT TYPE GRADE (MPa) FLOOR MARK			
SIZE (N-SxE-W) REINFORCEMENT TYPE GRADE (MPa) FLOOR MARK			
TOP OF FOOTING			
FOOTINGS — SIZE (N-SxE-W)			
FOOTINGS — DEPTH			
FOOTINGS — REINFORCEMENT N-S / E-W			
FOOTINGS — R.L. U/S FOOTING			

INSERTION POINT

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - RC COLUMNS

COLUMN SCHEDULE

LEVEL \ MARK	A1	A2	A2
ROOF			P2
SIZE (N-SxE-W) REINFORCEMENT TYPE GRADE (MPa) LEVEL 1			
SIZE (N-SxE-W) REINFORCEMENT TYPE GRADE (MPa) GROUND	INSERTION POINT		
SIZE (N-SxE-W) REINFORCEMENT TYPE GRADE (MPa) BASEMENT	COLUMN SIZE REINFORCEMENT TYPE GRADE	INSERTION POINT	P3
TOP OF FOOTING			P1
FOOTINGS — SIZE (N-SxE-W)		FOOTING SIZE	
FOOTINGS — DEPTH		DEPTH	
FOOTINGS — REINFORCEMENT N-S		REINFORCEMENT	
FOOTINGS — REINFORCEMENT E-W		REINFORCEMENT	
FOOTINGS — R.L. U/S FOOTING		UNDERSIDE R.L.	

COLUMN NOTATION FOOTING NOTATION BARS

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - COLUMN NOTATION

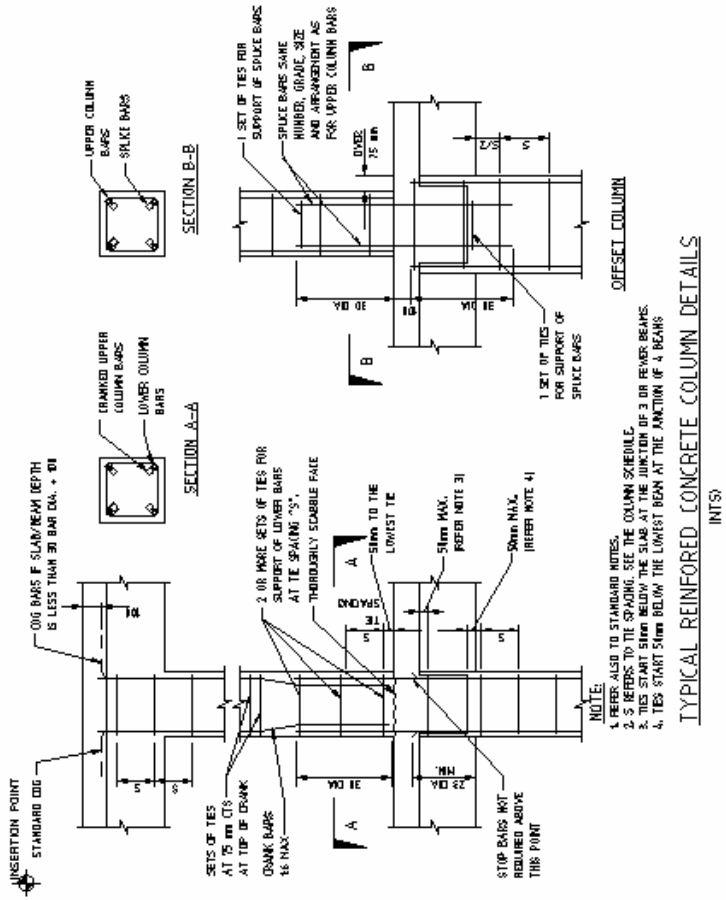
COLUMN SCHEDULE NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH STANDARD DETAILS AND NOTES ON DRG S1.
2. BAR NUMBERS SHOWN IN COLUMN SECTIONS ARE INDICATIVE ONLY.
3. FOOTING REINFORCEMENT PRIMARY DIRECTION MAY BE EITHER N-S OR E-W.
4. FOOTING DIMENSIONS ARE TYPICALLY N-S x E-W. FOR SKEWED FOOTINGS REFER TO PLANS FOR ORIENTATION.
5. THE LEVEL SHOWN ON THIS COLUMN SCHEDULE ARE INDICATIVE ONLY.
6. FOR ALL REDUCED LEVELS TO FLOOR SLABS, TOP OF COLUMN, ETC., REFER TO ARCHITECT'S DRAWINGS.

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - COLUMN LEGEND



TYPICAL REINFORCED CONCRETE COLUMN DETAILS

(NTS)

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - COLUMN KEY DIAGRAM

INSERTION POINT

PAD FOOTING SCHEDULE			
PAD TYPE			
SIZE (N-S x E-W)			
DEPTH			
REINFORCEMENT N-S E-W			
R.L. TOP OF FOOTING			

PAD FOOTING SCHEDULE		INSERTION POINT	
PAD TYPE		TYPE	
SIZE (N-S x E-W)		SIZE	
DEPTH		DEPTH	
REINFORCEMENT N-S E-W		REINFORCEMENT REINFORCEMENT	
R.L. TOP OF FOOTING		TOP R.L.	

PAD FOOTING NOTATION

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - PAD SCHEDULE

INSERTION POINT

TYPICAL WALL REINFORCEMENT SCHEDULE			
WALL THICKNESS (mm)	ALTERNATIVE REINFORCEMENT BARS		FABRIC
	HORIZONTAL	VERTICAL	
150	Y12-200 C	Y12-200 C	F102 C
200	Y12-200 E.F. U.N.O.	Y12-200 E.F. U.N.O.	N.A.
MINIMUM SPLICE LENGTHS U.N.O.			
BAR SIZE	HORIZONTAL	VERTICAL	
Y12	500	500	
Y16	650	650	
C - DENOTES CENTRAL E.F. - DENOTES EACH FACE			

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPTOOLS - SCHEDULES - WALL REINF'T

OFFICE STANDARDS

Office Standards - is a site specific facility to allow the integration of your office's library of standard details, etc., into the Struc Plus menu. None of the pre-defined standards are supplied with Struc Plus, as all sites have already established a library of details. This is a menu file, which can be edited to include your own details.

This is auuplied as a partial menuload for Struc Plus 14 only.

TITLE SHEETS

Title Sheets - automatically inserts the selected sheet size into the current drawing if not executed at the SETUP menu. See Note 1.

TABLET . . .

Tablet . . . - AutoCAD tablet command.

STRUC PLUS SETUP...

Colors... - sets the Struc Plus variables which allows a drawing session to draw in nominated colors.

ByEntity Layers... - sets the Struc Plus variables which allows a drawing session to draw in nominated Layers.

ByLayer Layers... - sets the Struc Plus variables which allows a drawing session to draw in nominated Layers.

Text and Dims... - sets the Struc Plus variables to determine text and dimension settings.

Standards... - sets the Struc Plus variables to determine concrete, steelwork and units standards to be used.

Structural Layers... - sets the Struc Plus variables to determine layer names for structural entities.

SPConfigure... - link to the Utility.lsp configuration file.

SPMenu... - link to the Struc Plus Menu file

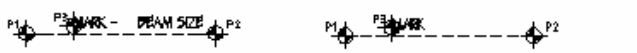
Title Block Setup - allows the user to set up a drawing with the insertion of a standard title block and to a nominated scale. Note the title block inserted is one of six standard blocks supplied with Struc Plus and will require editing to reflect your company's logo and address, etc. The 0.25mm "L" in each corner denotes the trim line of the cut sheet. See Note 1.

Drawing Setup - allows the user to set up a drawing to a nominated scale. The 0.25mm "L" in each corner denotes the trim line of the cut sheet.

Struc Plus Help.. displays the Struc Plus Help File

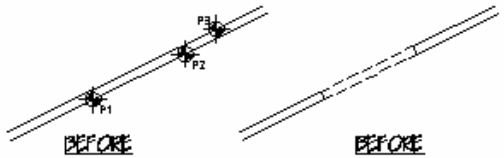
Note 1. - Title Sheets

These pre-defined blocks being inserted into the current drawing are able to be editted by the user to reflect your company's logo, address and telephone numbers. These files are found in the Struc Plus directory and are xxTITLE.DWG (metric) and xSHEET.DWG (imperial).

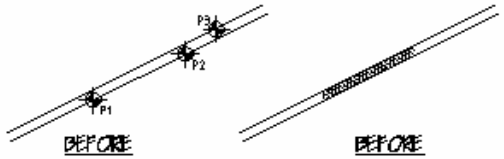


BEAM NUMBERS

STEEL BEAM NUMBERS



DOOR BREAK

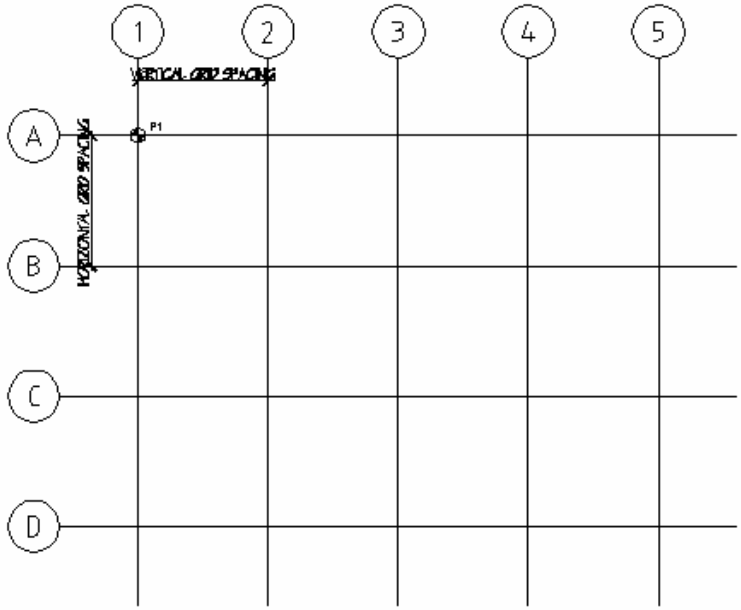


WALL INSULATION

STRUC PLUS

PROGRAMME INFORMATION SHEET

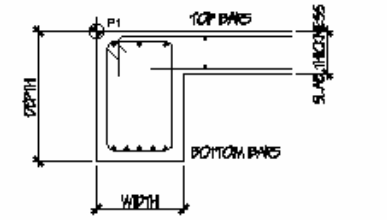
SPGENERAL - MISCELLANEOUS



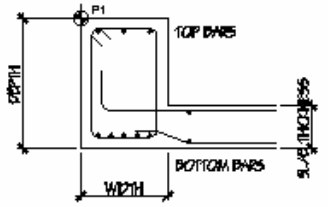
STRUC PLUS

PROGRAMME INFORMATION SHEET

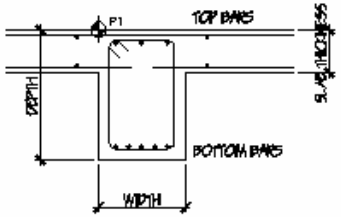
SPGENERAL - GRID LAYOUT



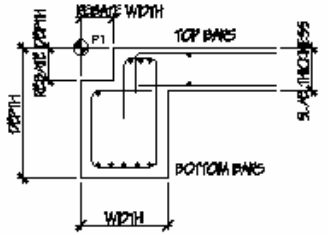
DOWNTURN EDGE



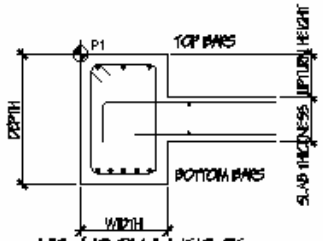
UPTURN EDGE



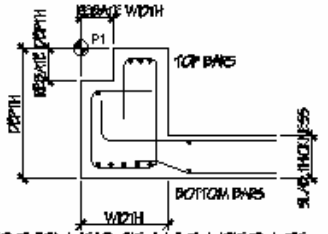
INTERNAL DOWNTURN



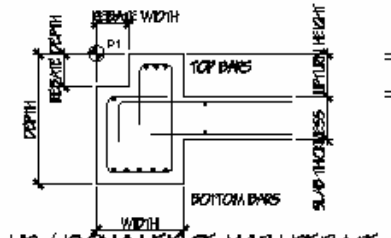
DOWNTURN EDGE WITH REBATE



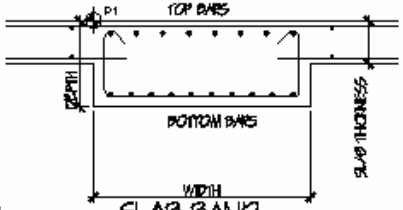
UP / DOWN EDGE



UPTURN EDGE WITH REBATE



UP / DOWN EDGE WITH REBATE

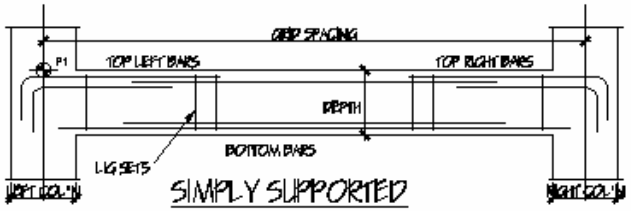


SLAB BAND

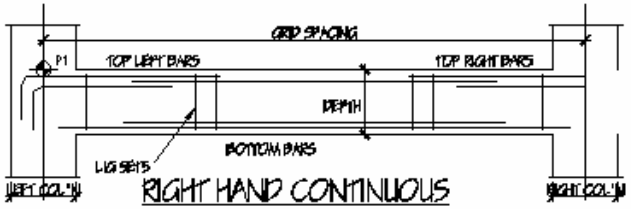
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - R.C. BEAMS - SECTIONS

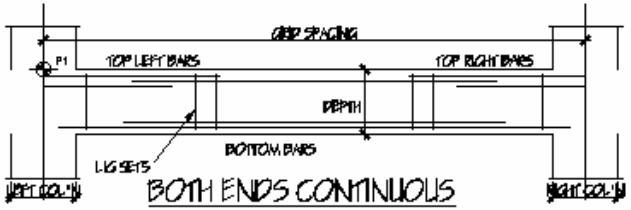


SIMPLY SUPPORTED



RIGHT HAND CONTINUOUS

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.



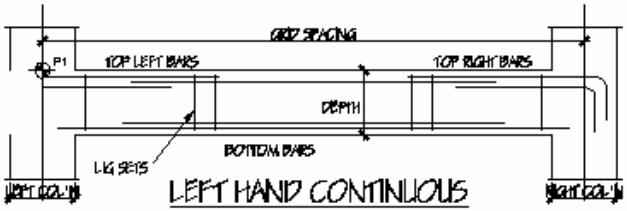
BOTH ENDS CONTINUOUS

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.

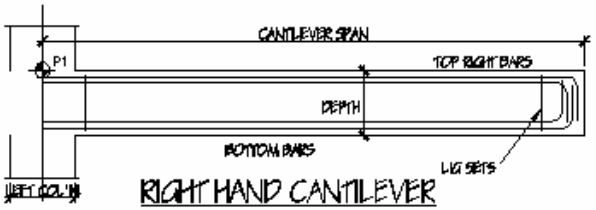
STRUC PLUS

PROGRAMME INFORMATION SHEET

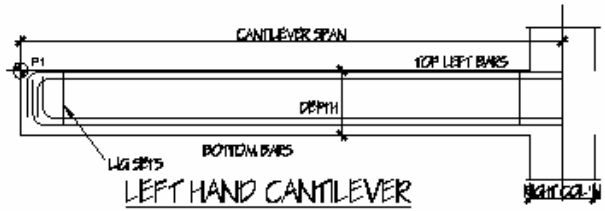
SPCONCRETE - R.C. BEAMS - ELEVATIONS 1



LEFT HAND CONTINUOUS



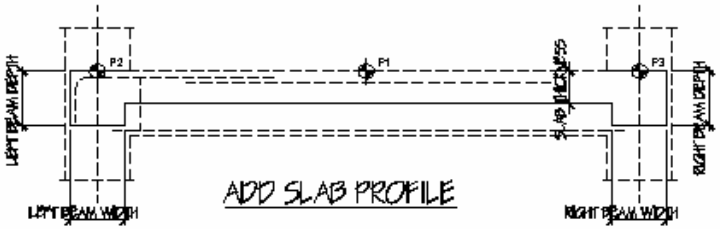
RIGHT HAND CANTILEVER



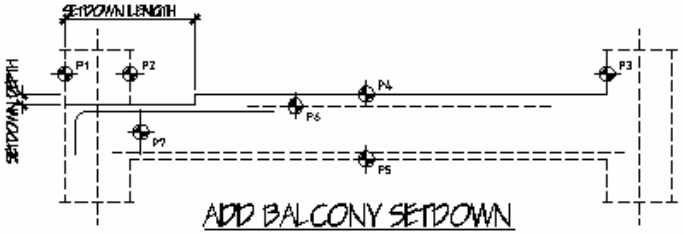
LEFT HAND CANTILEVER

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.

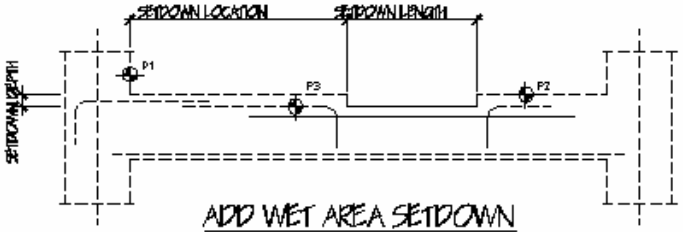
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - R.C. BEAMS - ELEVATIONS 2



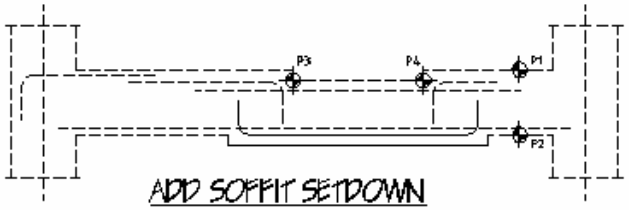
ADD SLAB PROFILE



ADD BALCONY SETDOWN

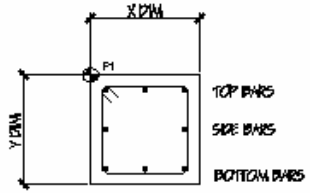


ADD WET AREA SETDOWN

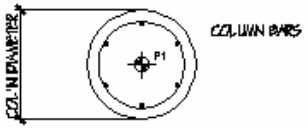


ADD SOFFIT SETDOWN

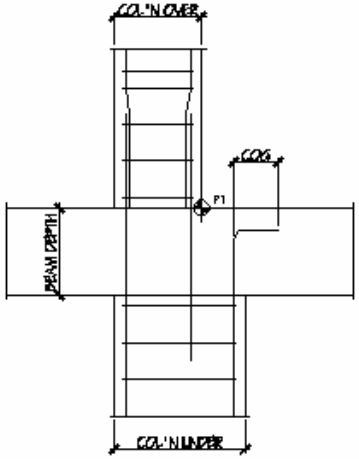
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - R.C. BEAMS - SETDOWNS



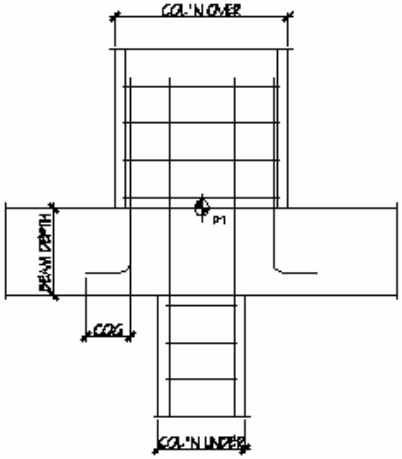
RECTANGULAR COLUMN



CIRCULAR COLUMN



COLUMN SLICE DETAIL 1

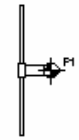


COLUMN SLICE DETAIL 2

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - R.C. COLUMNS



CAST IN FERRULE

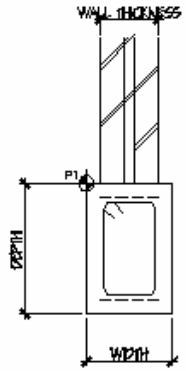
CHEMSETS

DYNABOLTS/ TRUBOLTS

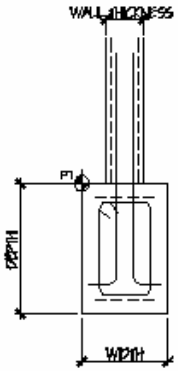
STRUC PLUS

PROGRAMME INFORMATION SHEET

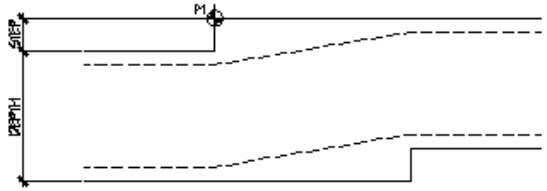
SPCONCRETE - CONCRETE INSERTS



STRIP FOOTING WITH
MASONRY WALL OVER

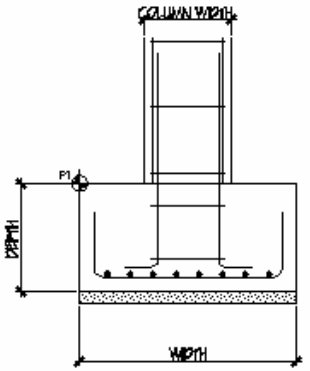


STRIP FOOTING WITH
R.C. WALL OVER

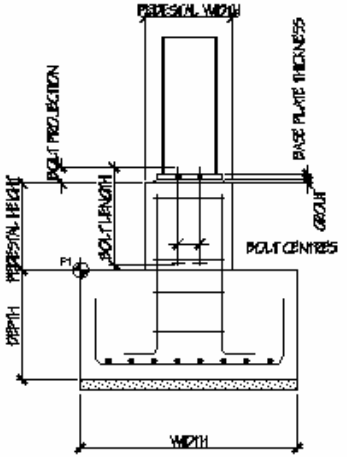


STRIP FOOTING STEP

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - FOOTINGS - STRIP FOOTINGS

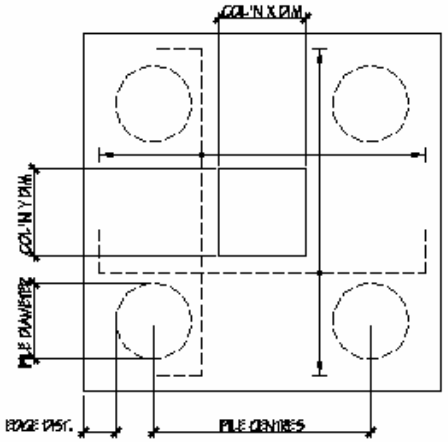


PAD FOOTING WITH
R.C. COLUMN OVER

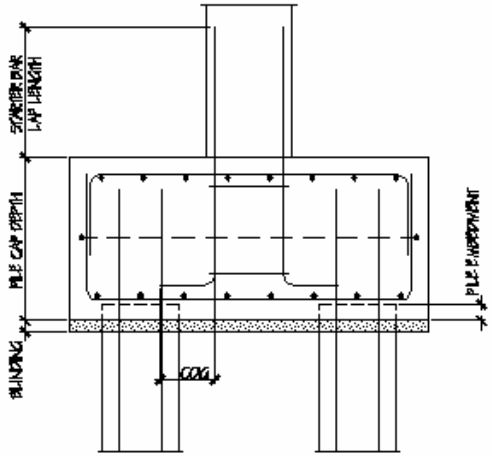


PAD FOOTING WITH
STEEL COLUMN OVER

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - FOOTINGS - PAD FOOTINGS

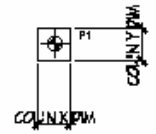


PILE CAP PLAN

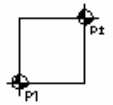


PILE CAP SECTION

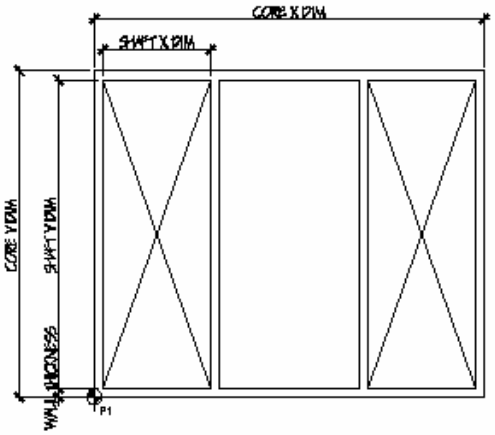
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SfConcrete - Footings - Pile Caps



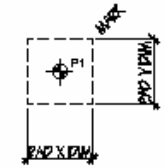
COLUMNS



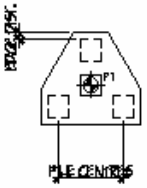
COLUMN CENTROID



CORE PLAN

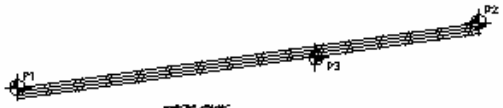


PAD FOOTINGS



OPTIONS FOR GROUPS OF ONE TO TWELVE PILES.

PILE CAPS

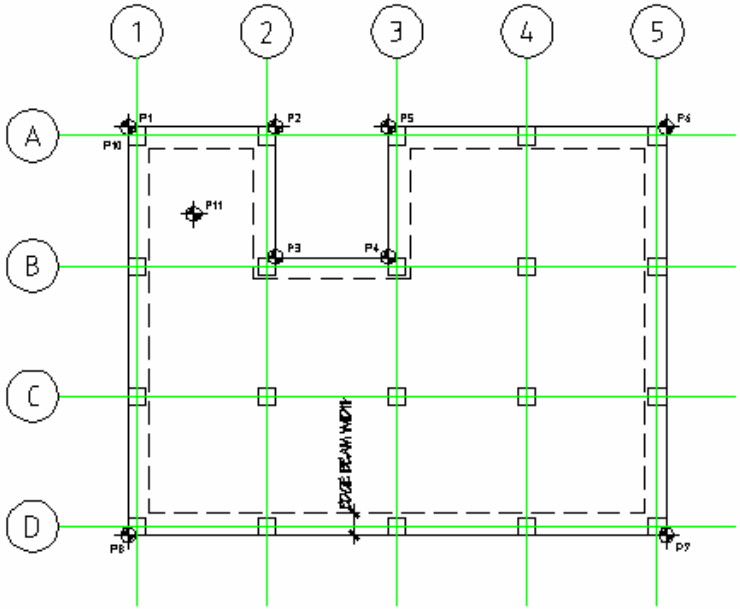


BEFORE

AFTER

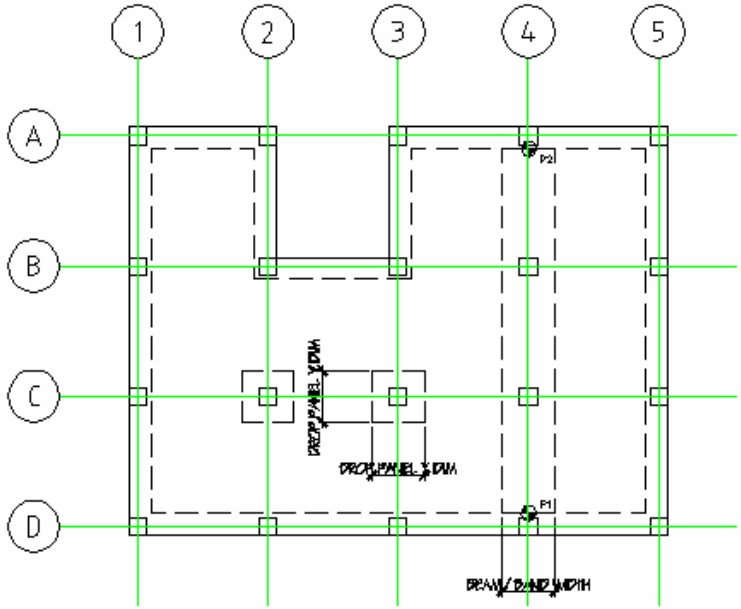
STRIP FOOTINGS

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SfConcrete - Framing - Column / Cores



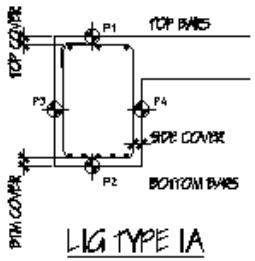
SUSPENDED SLAB OUTLINE

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - FRAMING - SUSPENDED SLAB

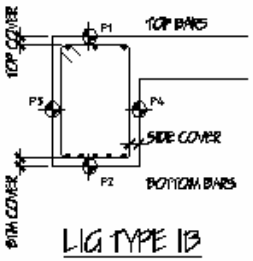


SUSPENDED SLAB INTERNAL PROFILE

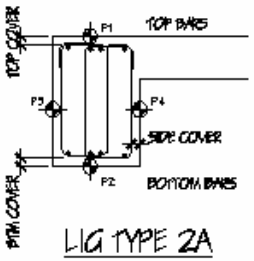
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - FRAMING - SUSPENDED SLAB



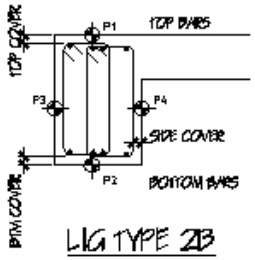
LIG TYPE 1A



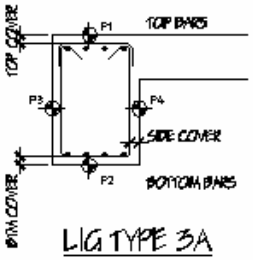
LIG TYPE 1B



LIG TYPE 2A



LIG TYPE 2B



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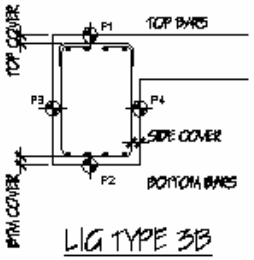
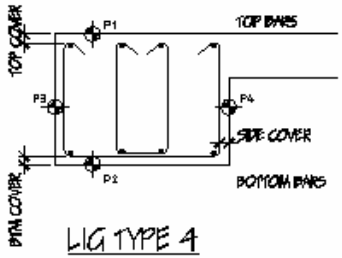
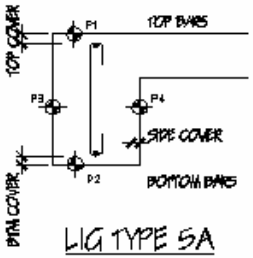


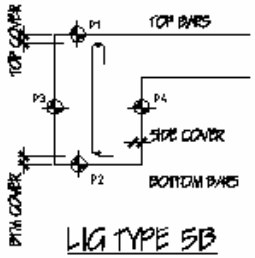
LIG TYPE 3B



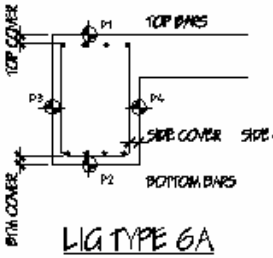
LIG TYPE 4



LIG TYPE 5A



LIG TYPE 5B



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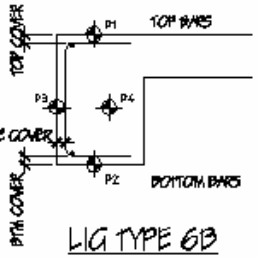
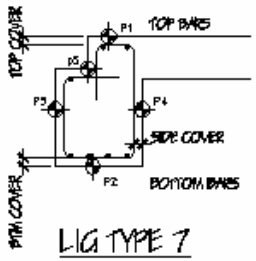


LIG TYPE 6B

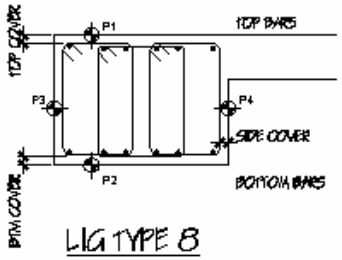
STRUC PLUS

PROGRAMME INFORMATION SHEET

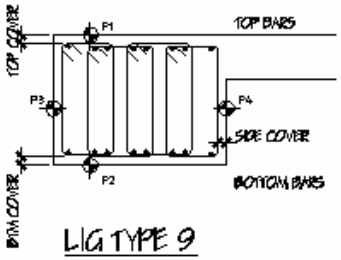
SPCONCRETE - LIGATURES



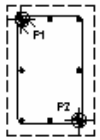
LIG TYPE 7



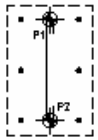
LIG TYPE 8



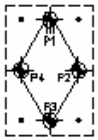
LIG TYPE 9



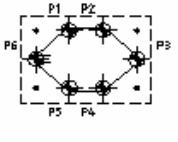
OUTER COLUMN TIE



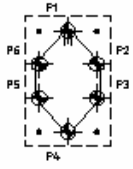
TWO BAR TIE



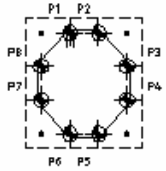
DIAMOND TIE 1



DIAMOND TIE 2



DIAMOND TIE 3

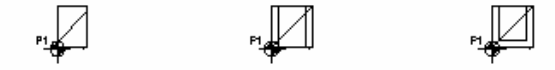


DIAMOND TIE 4

STRUC PLUS

PROGRAMME INFORMATION SHEET

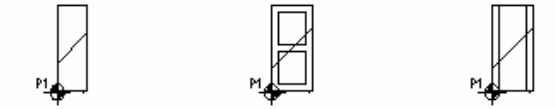
SPCONCRETE - LIGATURES continued



SOLID BLOCK HOLLOW BLOCK BOND BEAM

BLOCK SECTION

BRICK SECTION

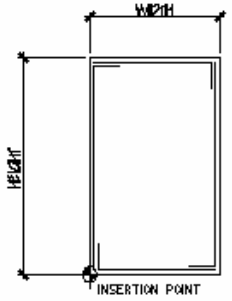


SOLID BLOCK HOLLOW BLOCK BOND BEAM

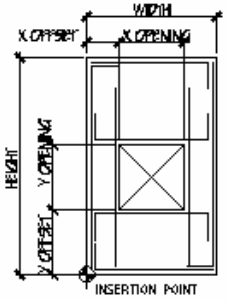
BLOCK PLAN

BRICK PLAN

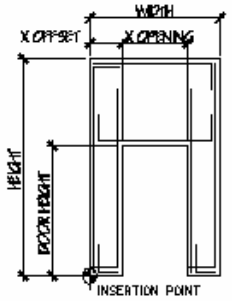
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - MASONRY



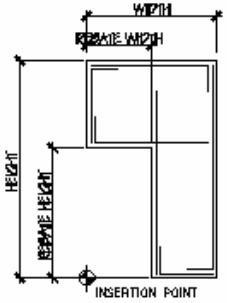
PLAIN PANEL



PANEL WITH OPENING

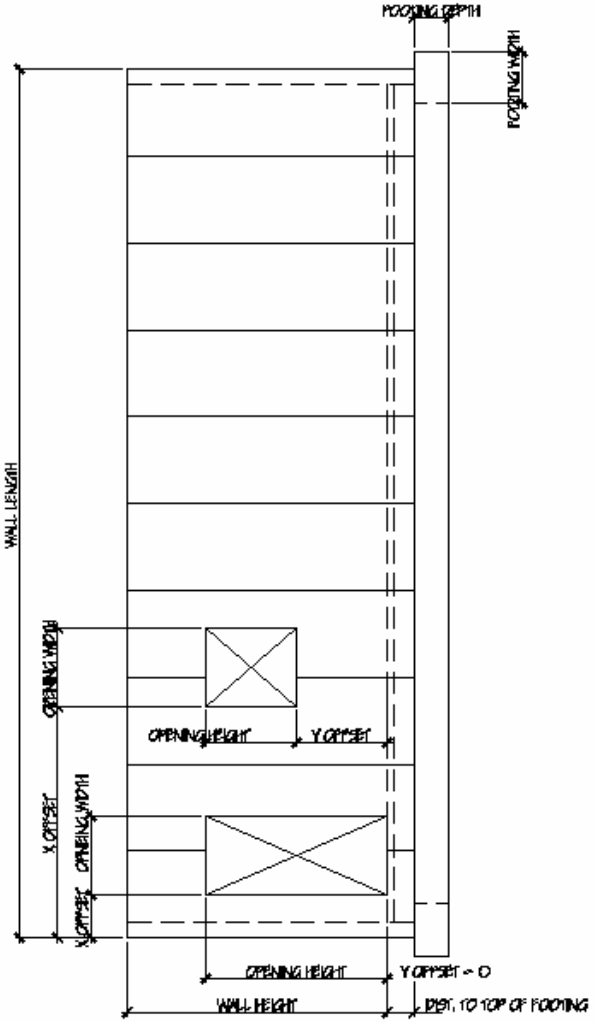


PANEL WITH DOOR



PANEL WITH REBATE

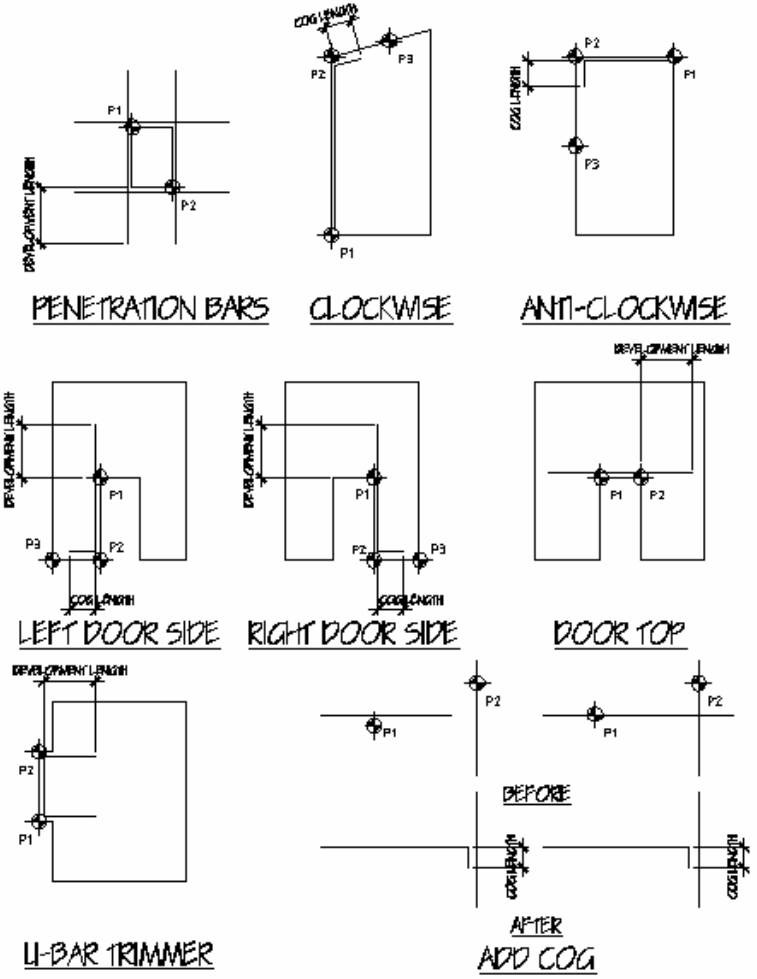
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPPRECAST - DESIGN DRAWINGS



STRUC PLUS

PROGRAMME INFORMATION SHEET

SPPRECAST - TILT UP ELEVATION

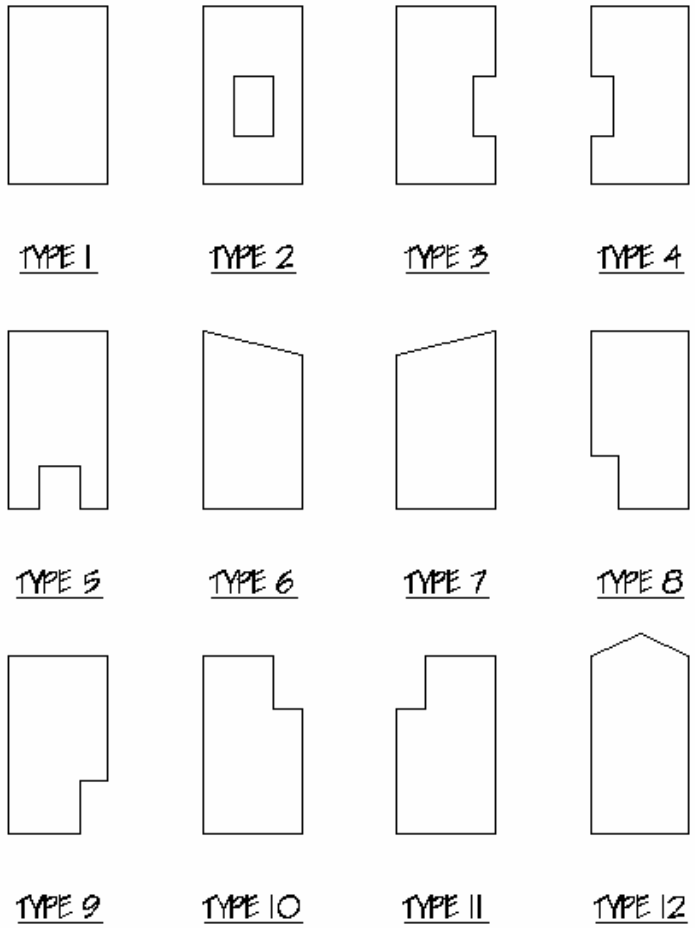


PANEL SHAPES - PROGRAMME WILL AUTOMATICALLY PLACE EDGE TRIMMER BARS FOR THE SAME SHAPE CODES AS PER PC SHOP DRAWING PROGRAMME SHAPE CODES

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPPRECAST - TRIMMER BARS

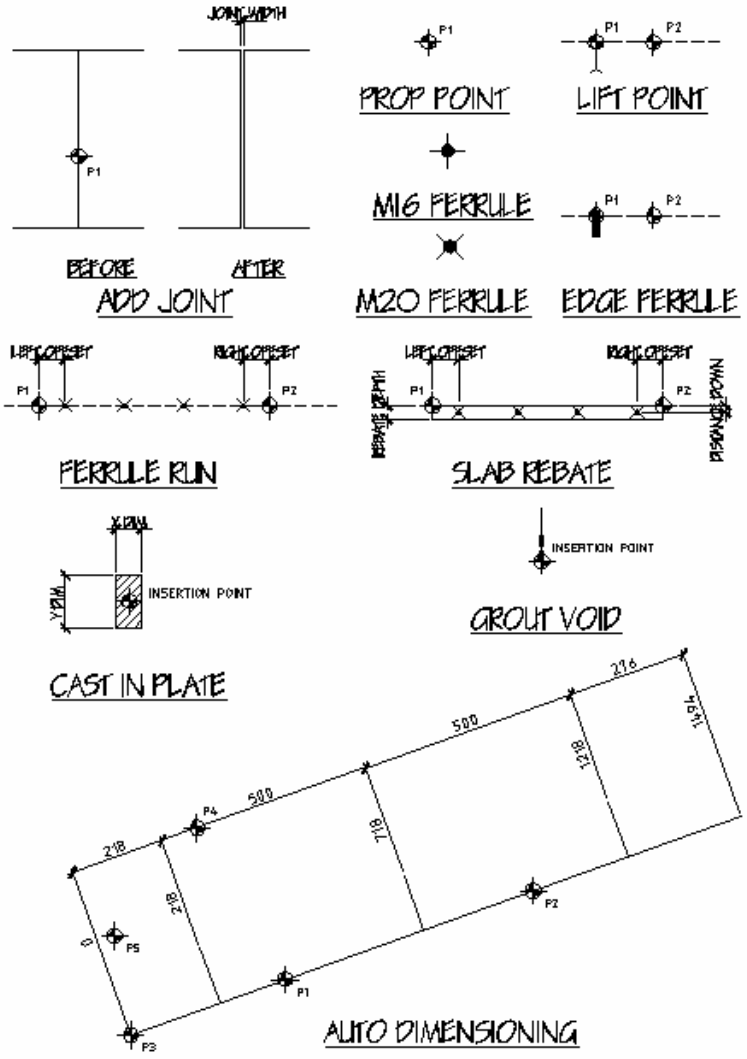


TYPE 13 - COMBINATION OF TYPES 1 TO 12

STRUC PLUS

PROGRAMME INFORMATION SHEET

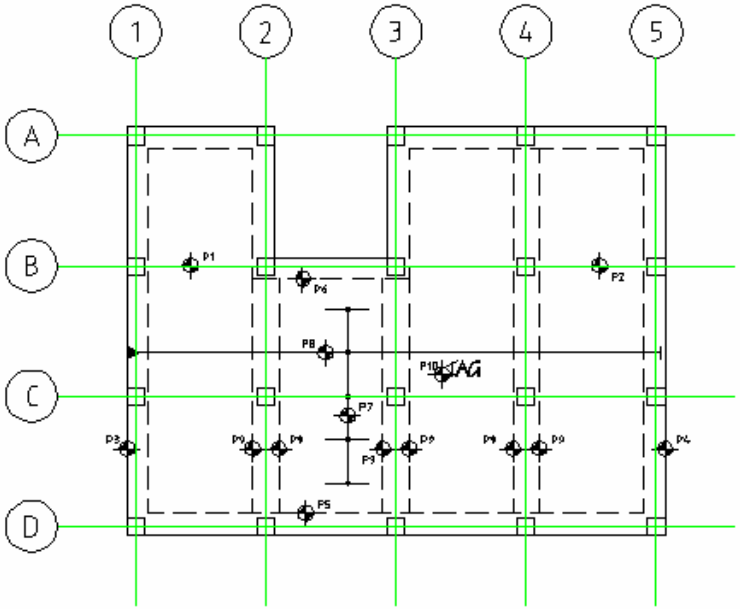
SPPRECAST - SHOP DRAWING SHAPE CODES



STRUC PLUS

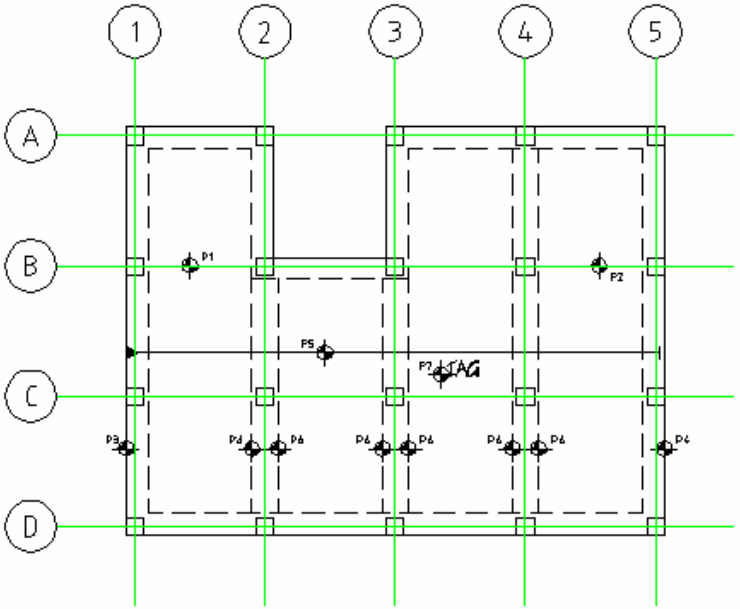
PROGRAMME INFORMATION SHEET

SPPRECAST - SHOP DRAWING TOOLS



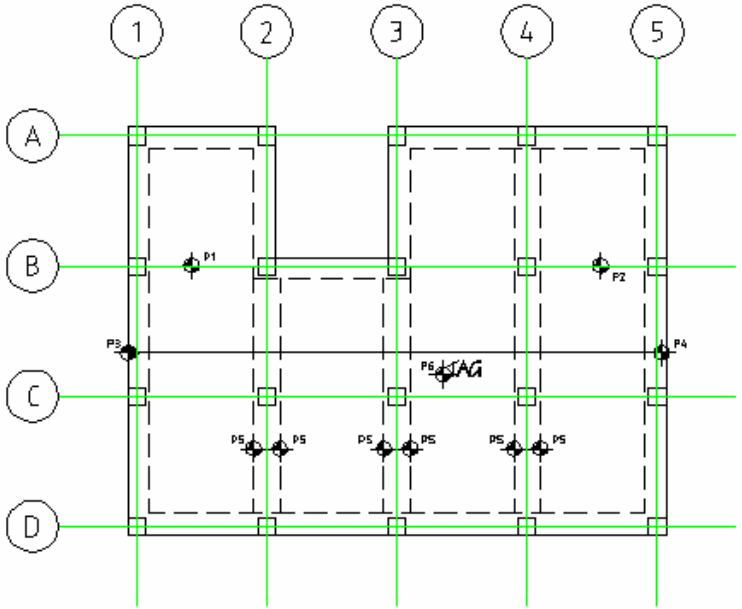
PRESTRESSING PLAN LAYOUT

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - PRESTRESSING - PLAN LAYOUT

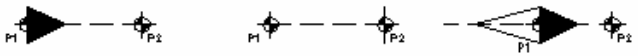


PRESTRESSING SINGLE TENDON

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - PRESTRESSING - TENDON



PRESTRESSING ADD OFFSETS



LIVE END

DEAD END

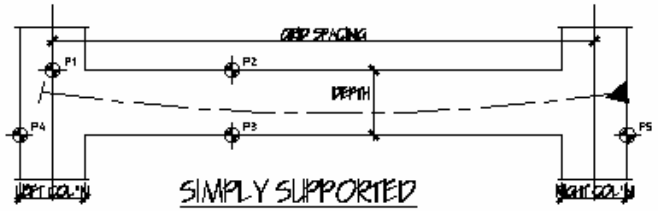
DEAD END

SLAB POCKET

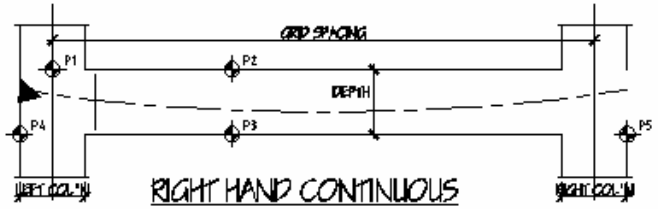
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - PRESTRESSING - ADD OFFSETS

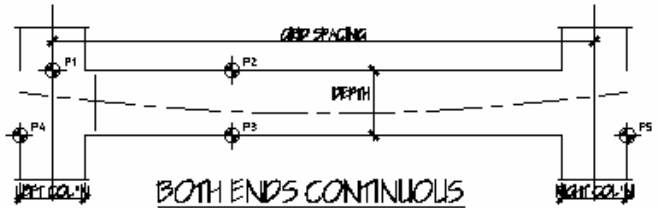


SIMPLY SUPPORTED



RIGHT HAND CONTINUOUS

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.



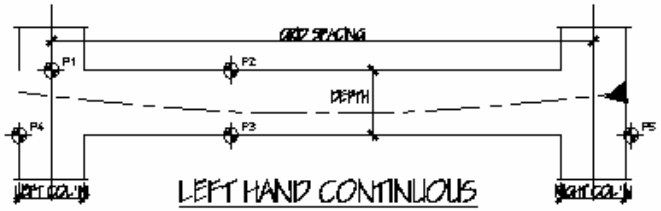
BOTH ENDS CONTINUOUS

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.

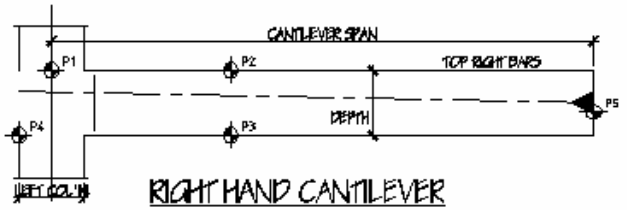
STRUC PLUS

PROGRAMME INFORMATION SHEET

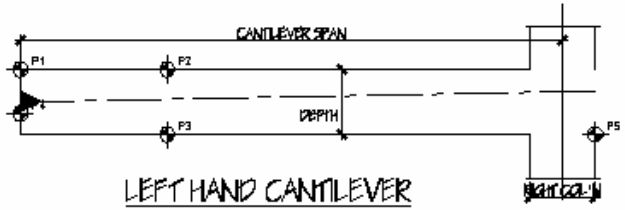
SPCONCRETE - PRESTRESSING - ELEVATIONS I



LEFT HAND CONTINUOUS



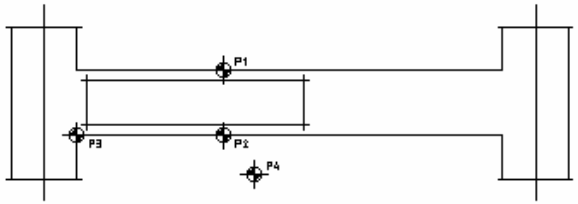
RIGHT HAND CANTILEVER



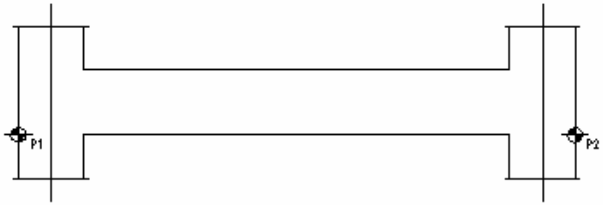
LEFT HAND CANTILEVER

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - PRESTRESSING - ELEVATIONS 2



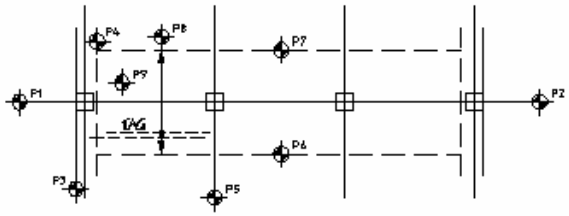
SHEAR LIGS



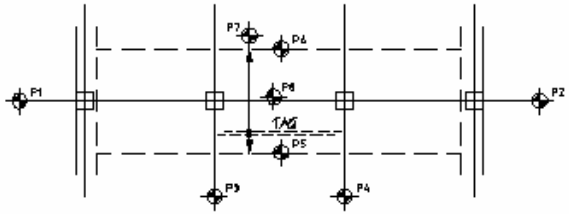
OFFSET SCHEDULE

RUNNING DISTANCE	P3	
PROFILE HEIGHT		

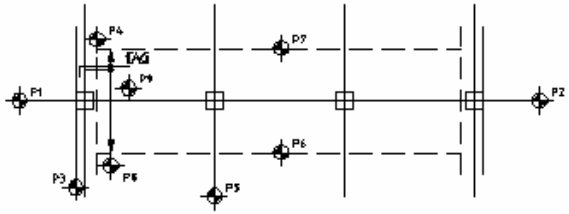
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - PRESTRESSING - ELEVATIONS 3



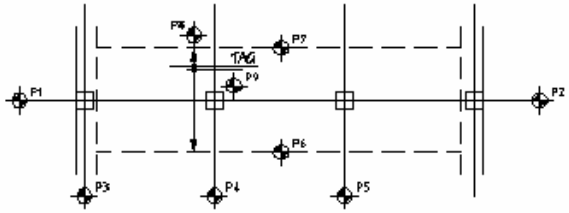
BAND BOTTOM END BAR



BAND BOTTOM INTERNAL BAR

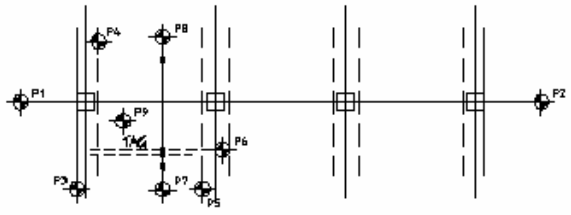


BAND TOP END BAR

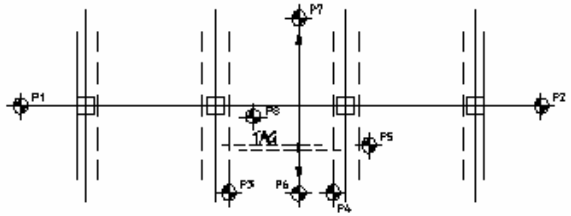


BAND TOP OVER BAR

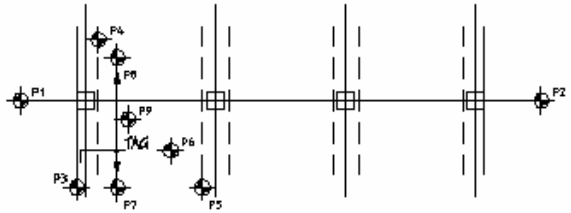
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - BANDED SLAB



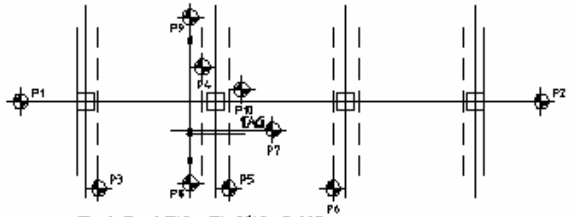
SLAB BOTTOM END BAR



SLAB BOTTOM INTERNAL BAR

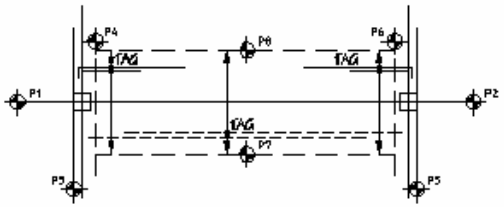


SLAB TOP END BAR

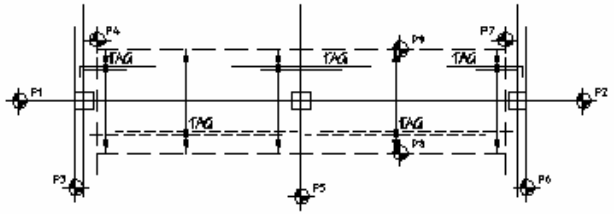


SLAB TOP OVER BAR

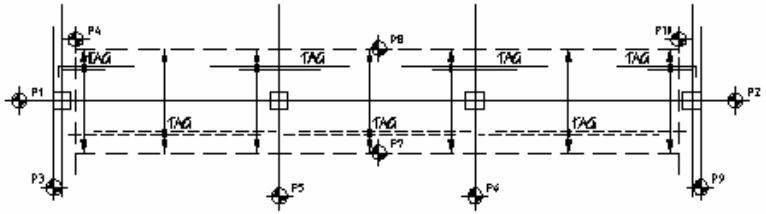
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - BANDED SLAB



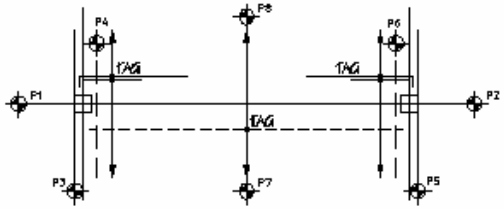
BAND RUN - SINGLE SPAN



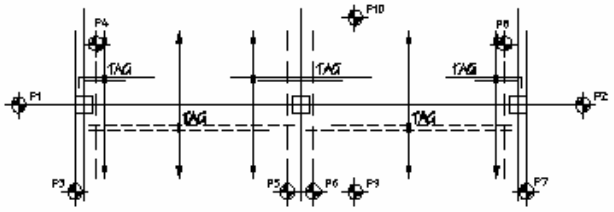
BAND RUN - DOUBLE SPAN



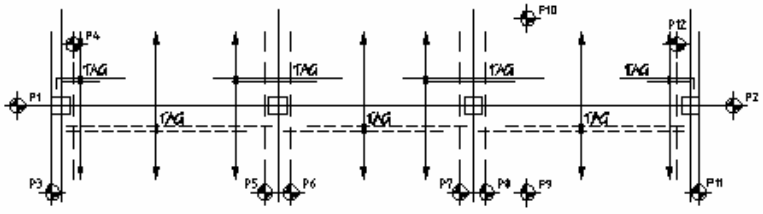
BAND RUN - MULTIPLE SPANS



SLAB RUN - SINGLE SPAN



SLAB RUN - DOUBLE SPAN



SLAB RUN - MULTIPLE SPANS

STRUC PLUS
PROGRAMME INFORMATION SHEET
SPCONCRETE - REINFORCEMENT - BANDED SLAB

BANDED SLAB KEY DIAGRAM

TYPICAL BANDED SLAB DETAILS

(N.T.S)

NOTES

1. FOR REINFORCEMENT SIZE & NUMBER SEE PLANS.
2. ALL TOP & BOTTOM DISTRIBUTION BARS NOT SHOWN ON PLAN TO BE Y10-400 CTS. LAPPED 510mm WITH MAIN BARS
3. DETAILS ABOVE APPLY UNLESS SHOWN OTHERWISE ON PLANS
4. FOR PRIMARY AND SECONDARY DIRECTIONS OF REINFORCEMENT SEE PLANS.
5. REFER ALSO TO STANDARD NOTES
6. BUILDER IS TO PROVIDE ADEQUATE BAR CHAIRS OR SUPPORT CAGES TO SUPPORT TOP REINFORCEMENT AT THE CORRECT CTS.
7. Ls IS THE GREATER OF TWO CONSECUTIVE SPANS Mg Ls1 & Ls2
8. BARS MAY BE ADJUSTED SIDEWAYS TO AVOID COLUMN BARS.

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - REINFORCEMENT - BANDED SLAB

SLAB BOTTOM END BAR

SLAB BOTTOM INTERNAL BAR

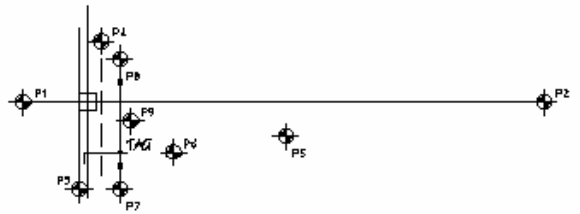
SLAB TOP END BAR (P)

SLAB TOP OVER BAR

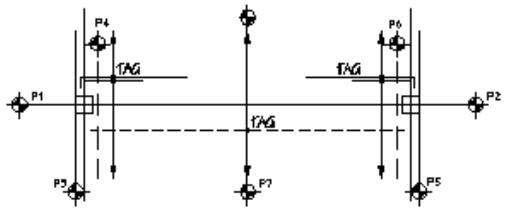
STRUC PLUS

PROGRAMME INFORMATION SHEET

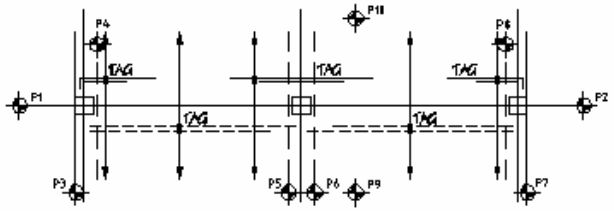
SPCONCRETE - REINFORCEMENT - 1 & 2 WAY SLAB



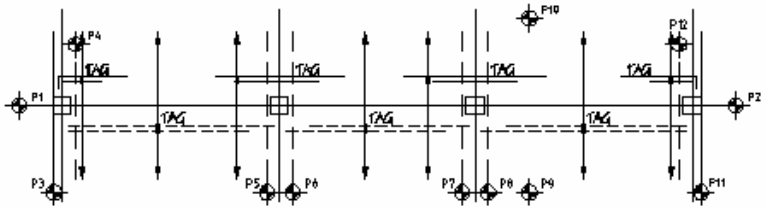
SLAB TOP END BAR (S)



SLAB RUN - SINGLE SPAN

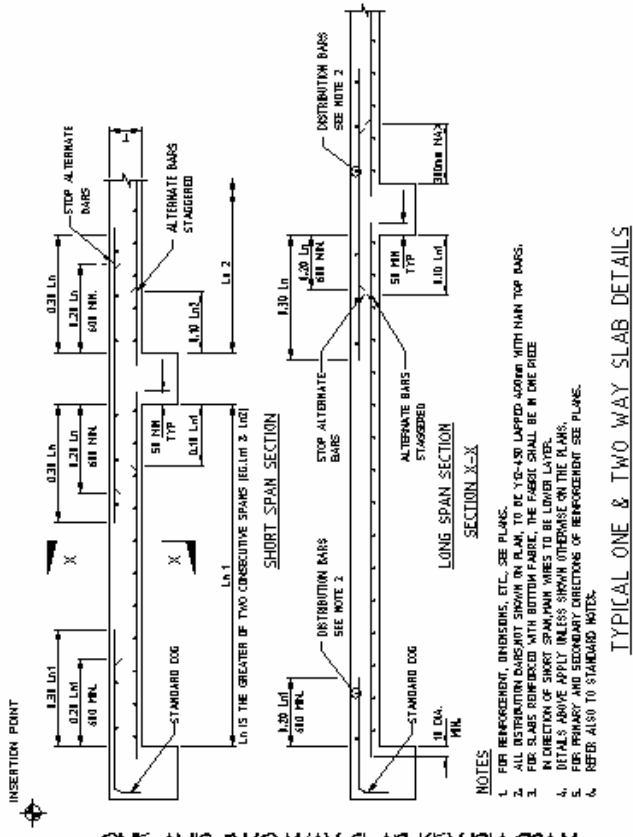


SLAB RUN - DOUBLE SPAN



SLAB RUN - MULTIPLE SPANS

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - 1 & 2 WAY SLAB



ONE AND TWO WAY SLAB KEY DIAGRAM

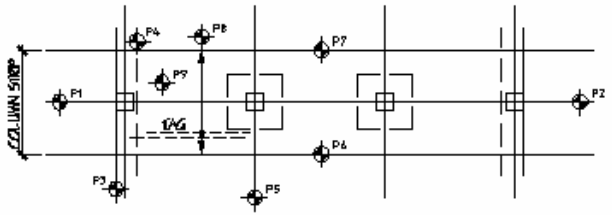
TYPICAL ONE & TWO WAY SLAB DETAILS

(NTS)

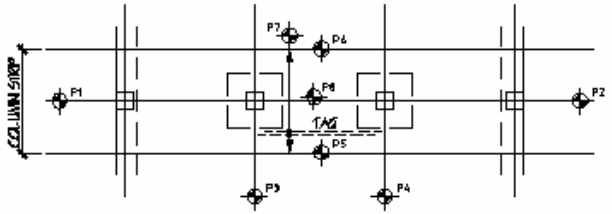
NOTES

1. FOR REINFORCEMENT, DIMENSIONS, ETC., SEE PLANS.
2. ALL DISTRIBUTION BARS NOT SHOWN ON PLAN, TO BE Y8-450 LAPPED 400mm WITH MAIN TOP BARS.
3. FOR SLABS REINFORCED WITH BOTTOM FABRIC, THE FABRIC SHALL BE IN ONE PIECE IN DIRECTION OF SHORT SPAN, MAIN WIRES TO BE LOWER LAYER.
4. DETAILS ABOVE APPLY UNLESS SHOWN OTHERWISE ON THE PLANS.
5. FOR PRIMARY AND SECONDARY DIRECTIONS OF REINFORCEMENT SEE PLANS.
6. REFER ALSO TO STANDARD NOTES.

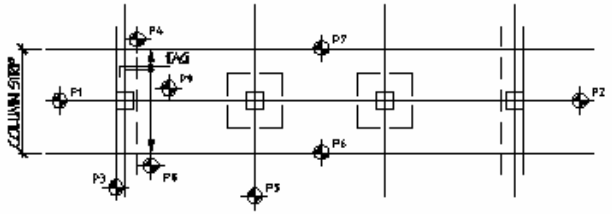
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - 1 & 2 WAY SLAB



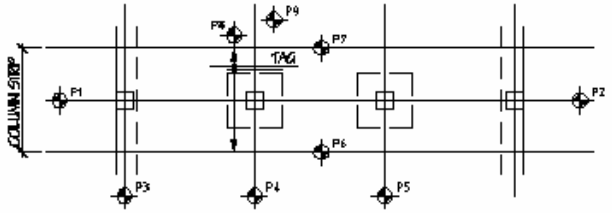
COLUMN STRIP BOTTOM END BAR



COLUMN STRIP BOTTOM INTERNAL BAR

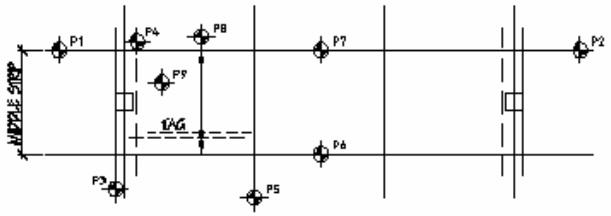


COLUMN STRIP TOP END BAR

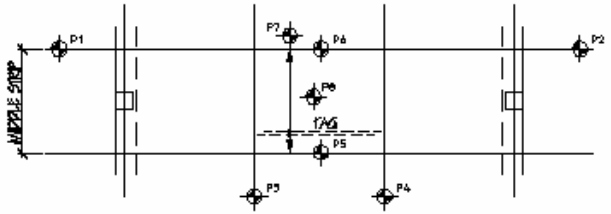


COLUMN STRIP TOP OVER BAR

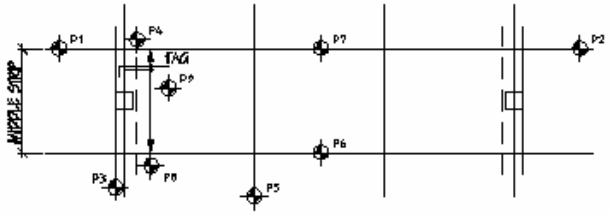
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - FLAT SLAB



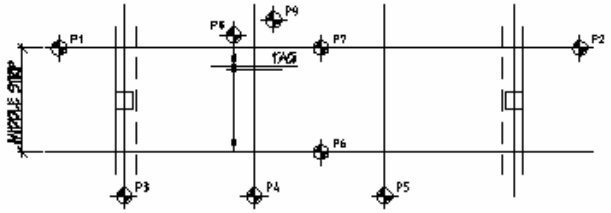
MIDDLE STRIP BOTTOM END BAR



MIDDLE STRIP BOTTOM INTERNAL BAR

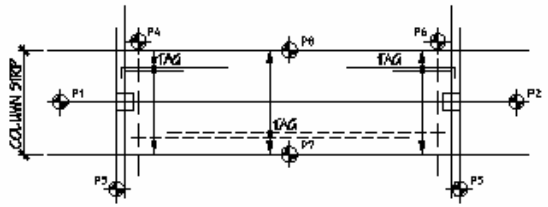


MIDDLE STRIP TOP END BAR

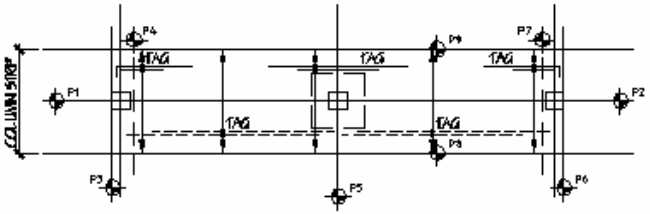


MIDDLE STRIP TOP OVER BAR

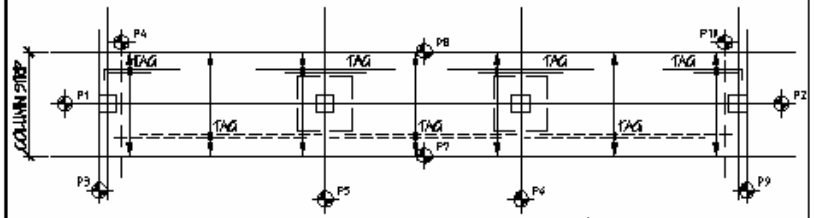
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - FLAT SLAB



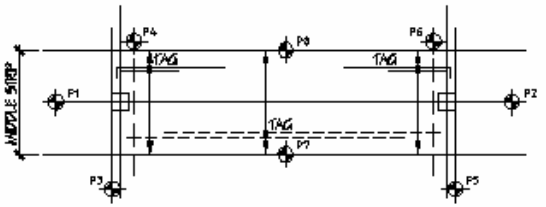
COLUMN STRIP RUN - SINGLE SPAN



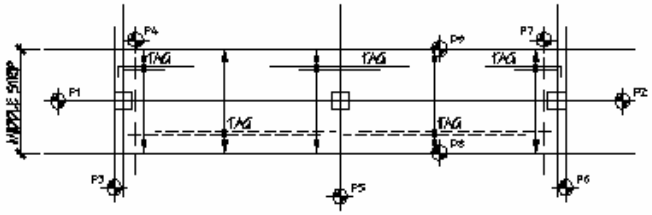
COLUMN STRIP RUN - DOUBLE SPAN



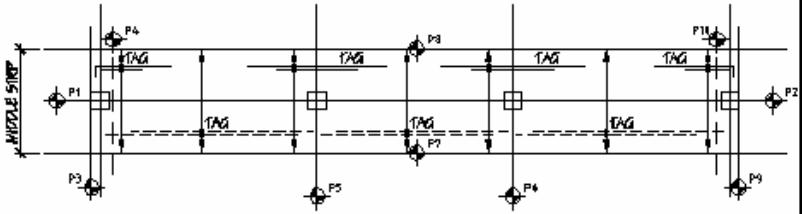
COLUMN STRIP RUN - MULTIPLE SPANS



MIDDLE STRIP RUN - SINGLE SPAN

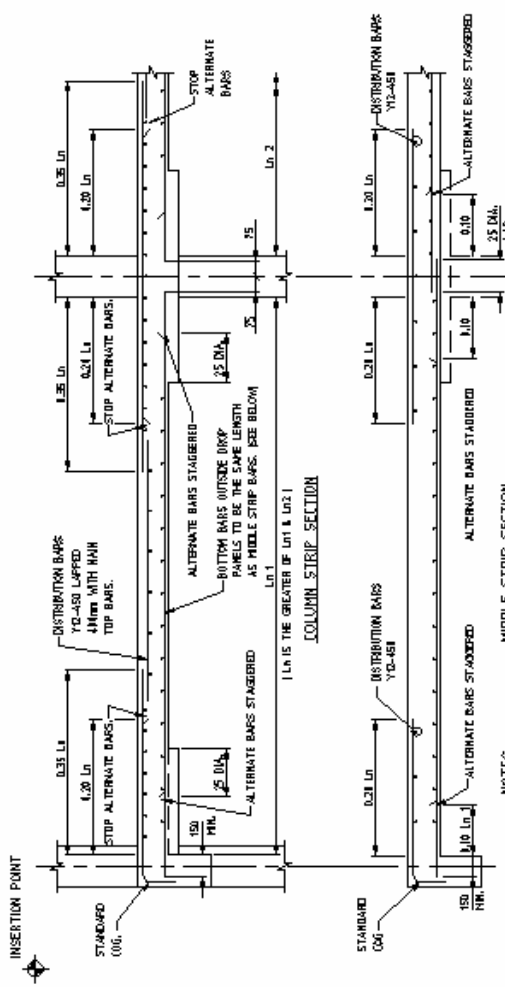


MIDDLE STRIP RUN - DOUBLE SPAN



MIDDLE STRIP RUN - MULTIPLE SPANS

STRUC PLUS
PROGRAMME INFORMATION SHEET
SPCONCRETE - REINFORCEMENT - FLAT SLAB



FLAT SLAB KEY DIAGRAM

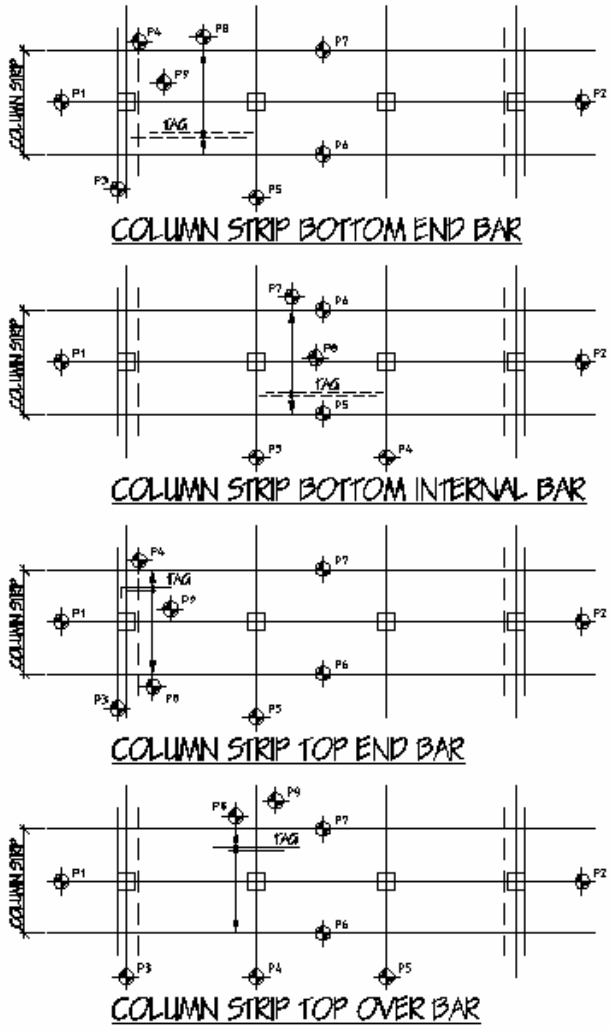
TYPICAL FLAT SLAB DETAILS
(NTS)

NOTES
1. FOR REINFORCEMENT, SIZES & NUMBERS, SEE PLANS.
2. BARS ARE TO BE EVENLY SPACED WITHIN THEIR RESPECTIVE STRIP WIDTHS AS DIMENSIONED ON PLANS.
3. LONG AND SHORT BARS ARE TO BE PLACED ALTERNATELY, ODD BARS ARE TO BE LONG BARS.
4. DETAILS ABOVE APPLY UNLESS SHOWN OTHERWISE ON PLANS.
5. TOP DISTRIBUTION BARS NOT SHOWN ON PLAN TO BE Y12-450 LAPPED 450mm WITH MAIN TOP BARS.
6. FOR PRIMARY AND SECONDARY DIRECTIONS OF REINFORCEMENT SEE PLANS.
7. REFER AL30 TO STANDARD NOTES.

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - REINFORCEMENT - FLAT SLAB



COLUMN STRIP BOTTOM END BAR

COLUMN STRIP BOTTOM INTERNAL BAR

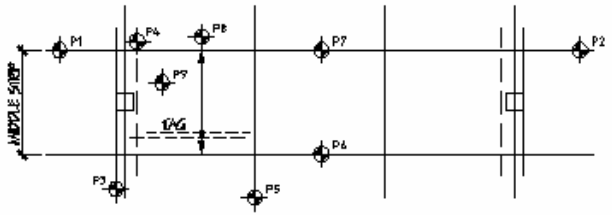
COLUMN STRIP TOP END BAR

COLUMN STRIP TOP OVER BAR

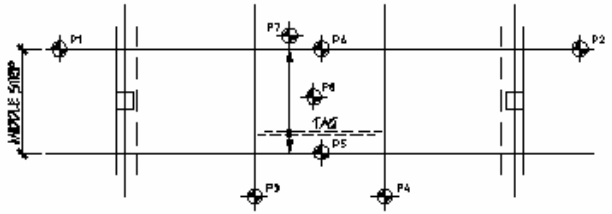
STRUC PLUS

PROGRAMME INFORMATION SHEET

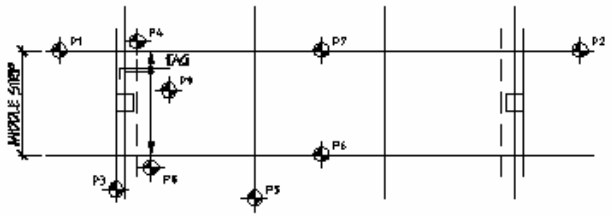
SPCONCRETE - REINFORCEMENT - FLAT PLATE



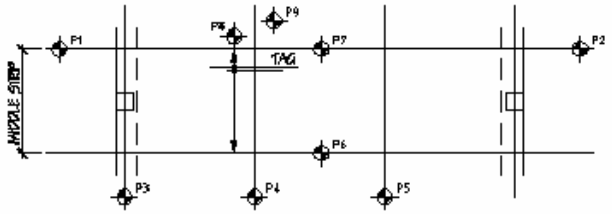
MIDDLE STRIP BOTTOM END BAR



MIDDLE STRIP BOTTOM INTERNAL BAR

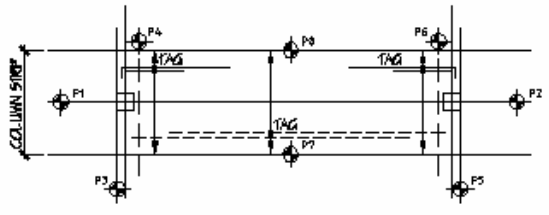


MIDDLE STRIP TOP END BAR

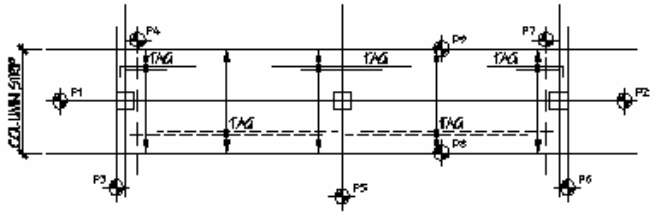


MIDDLE STRIP TOP OVER BAR

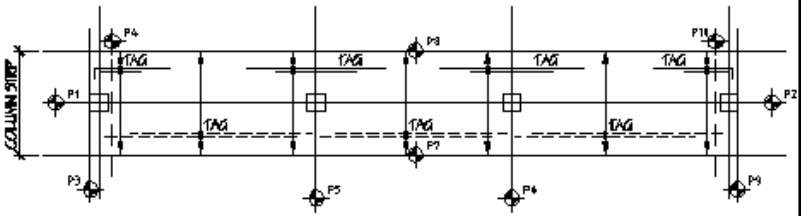
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - FLAT PLATE



COLUMN STRIP RUN - SINGLE SPAN

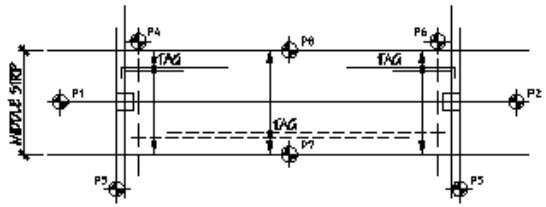


COLUMN STRIP RUN - DOUBLE SPAN

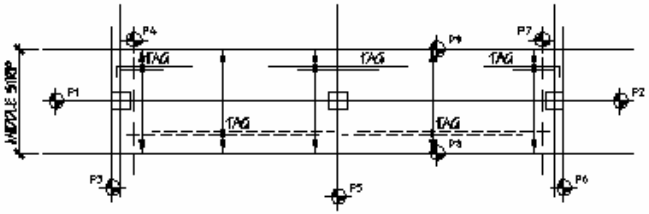


COLUMN STRIP RUN - MULTIPLE SPANS

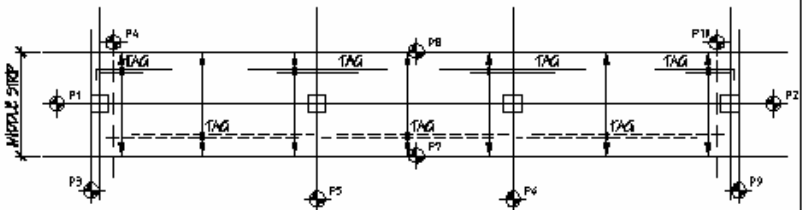
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - FLAT PLATE



MIDDLE STRIP RUN - SINGLE SPAN

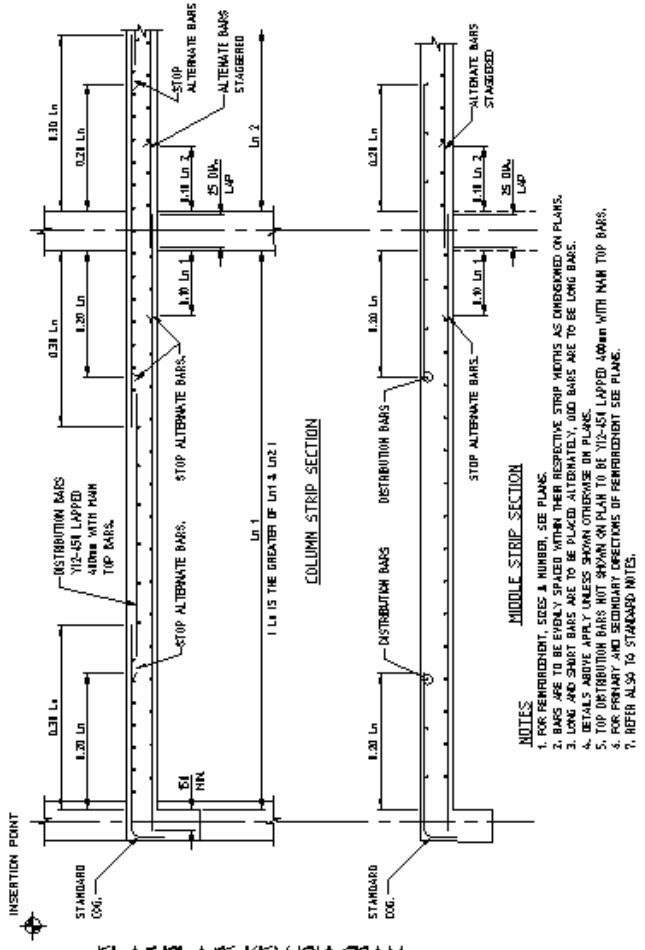


MIDDLE STRIP RUN - DOUBLE SPAN



MIDDLE STRIP RUN - MULTIPLE SPANS

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - FLAT PLATE

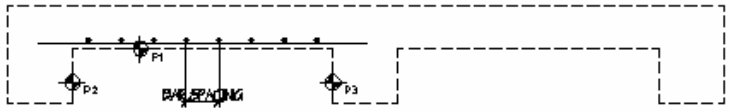


FLAT PLATE KEY DIAGRAM

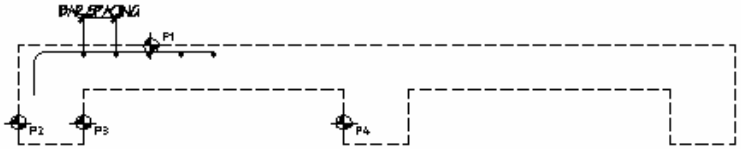
NOTES
1. FOR REINFORCEMENT, SIZES & NUMBER, SEE PLANS.
2. BARS ARE TO BE EVENLY SPACED WITHIN THEIR RESPECTIVE STRIP WIDTHS AS DIMENSIONED ON PLANS.
3. LONG AND SHORT BARS ARE TO BE PLACED ALTERNATELY, ODD BARS ARE TO BE LONG BARS.
4. DETAILS ABOVE APPLY UNLESS SHOWN OTHERWISE ON PLANS.
5. TOP DISTRIBUTION BARS NOT SHOWN ON PLAN TO BE Y12-450 LAPPED 400mm WITH MAIN TOP BARS.
6. FOR PRIMARY AND SECONDARY DIRECTIONS OF REINFORCEMENT SEE PLANS.
7. REFER ALSO TO STANDARD NOTES.

TYPICAL FLAT PLATE SLAB DETAILS
(NTS)

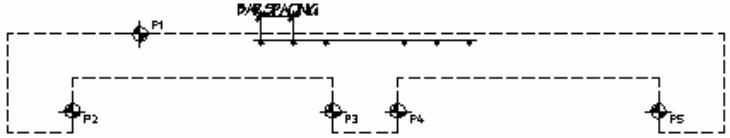
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - REINFORCEMENT - FLAT PLATE



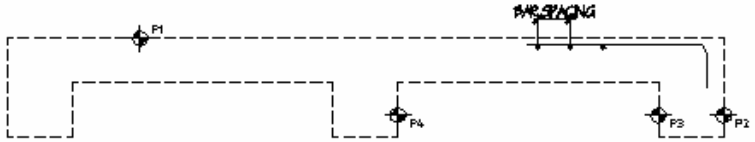
SECTIONS - BOTTOM BARS



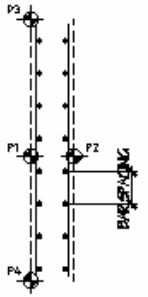
SECTIONS - TOP FIRST BARS



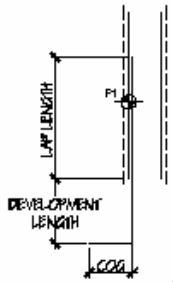
SECTIONS - TOP INTERNAL BARS



SECTIONS - TOP LAST BARS



WALL REINFORCEMENT



WALL STARTERS

STRUC PLUS

PROGRAMME INFORMATION SHEET

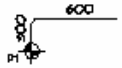
SPCONCRETE - REINFORCEMENT - ADD ONS

TEXT - SINGLE BEAM LIG

TEXT - DOUBLE BEAM LIG

TEXT - SINGLE BAND LIG

TEXT - DOUBLE BAND LIG



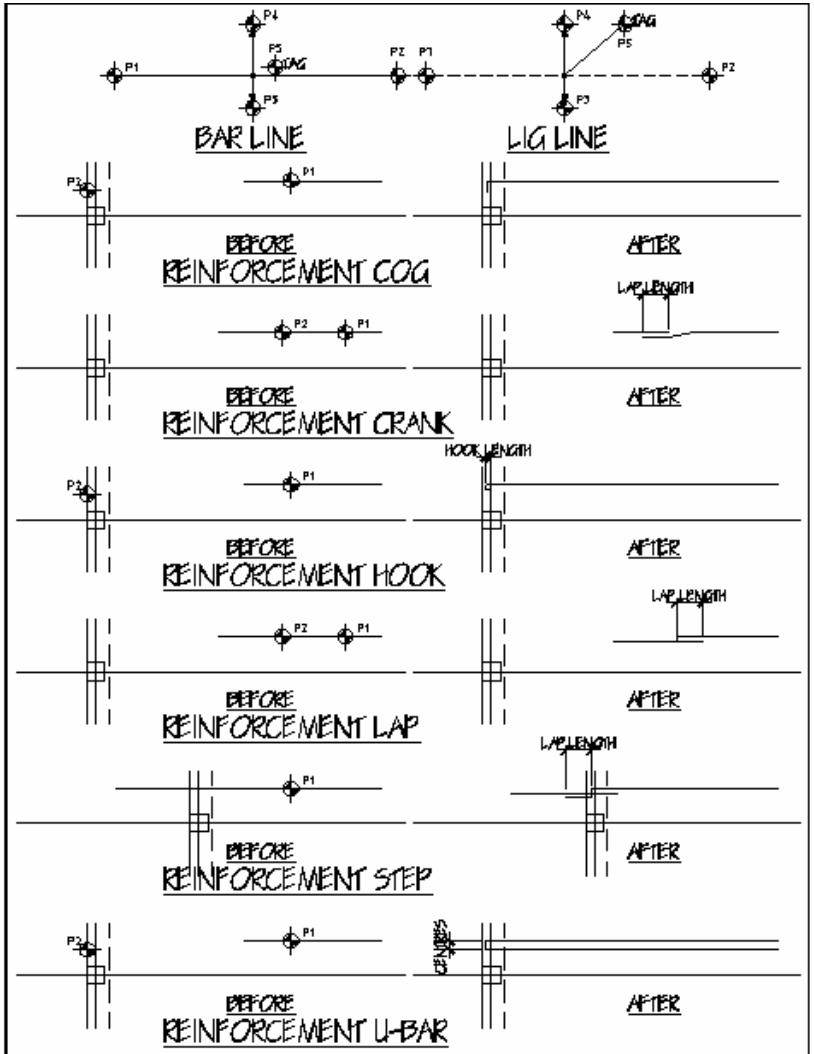
TEXT - COG TEXT

TEXT - U-BAR TEXT

STRUC PLUS

PROGRAMME INFORMATION SHEET

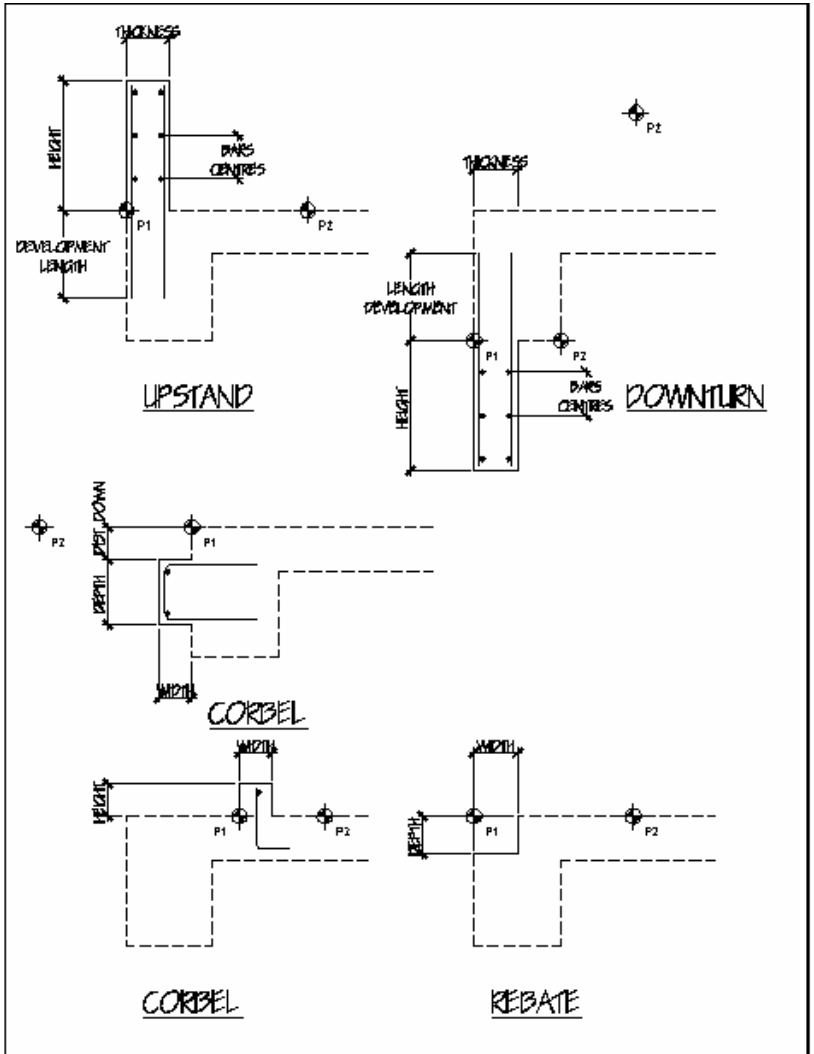
SPCONCRETE - REINFORCEMENT - ADD ONS



STRUC PLUS

PROGRAMME INFORMATION SHEET

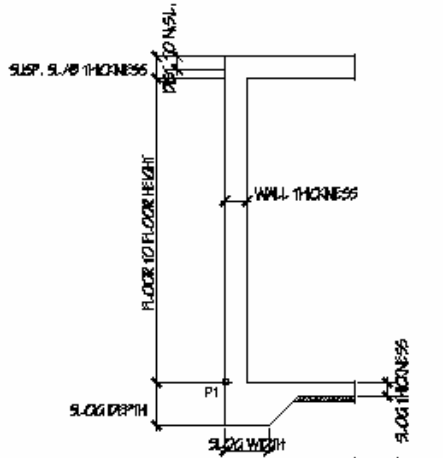
SPCONCRETE - REINFORCEMENT - ADD ONS



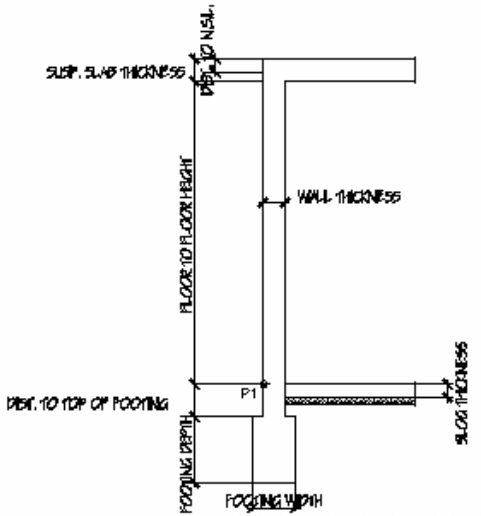
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - R.C. ADD ONS

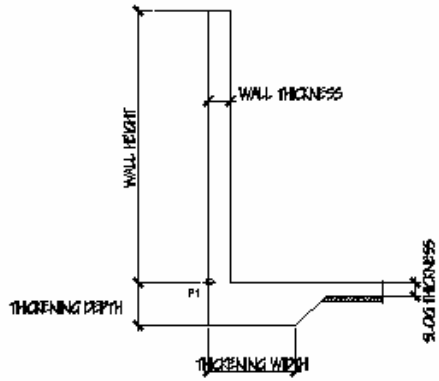


R.C. SIMPLY SUPPORTED 1

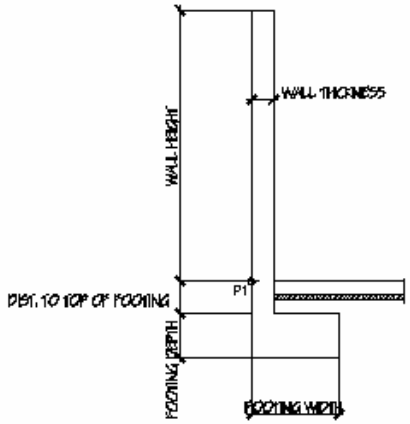


R.C. SIMPLY SUPPORTED 2

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - RETAINING WALLS 1

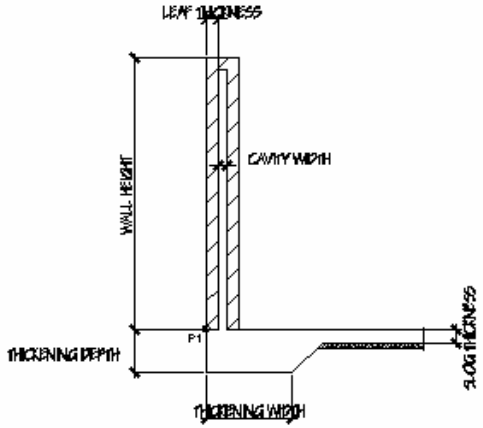


R.C. CANTILEVER 1

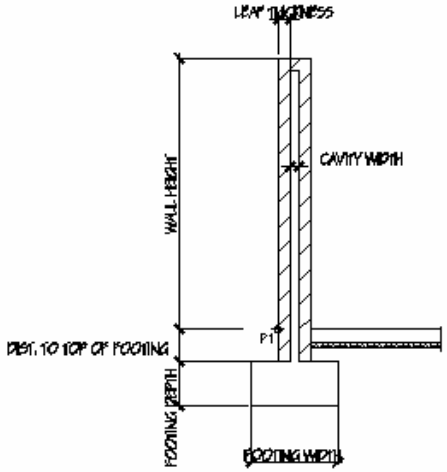


R.C. CANTILEVER 2

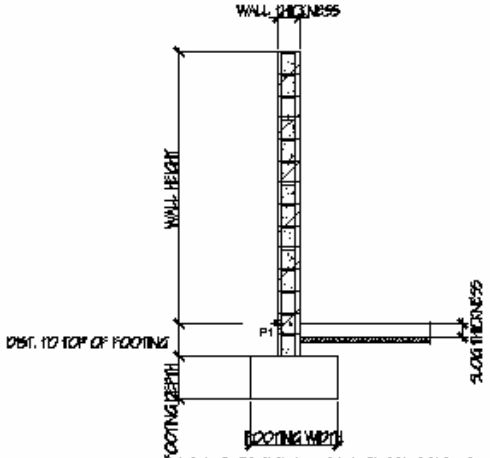
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - RETAINING WALLS 2



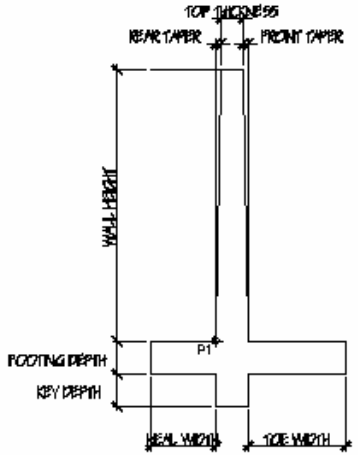
MASONRY CANTILEVER 1



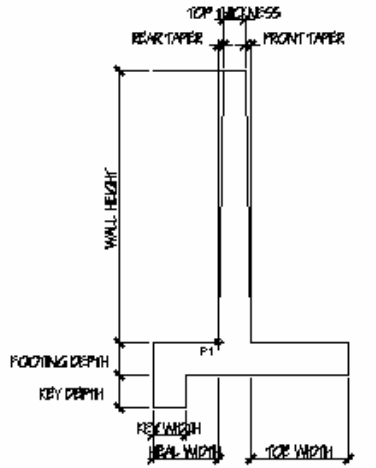
MASONRY CANTILEVER 2



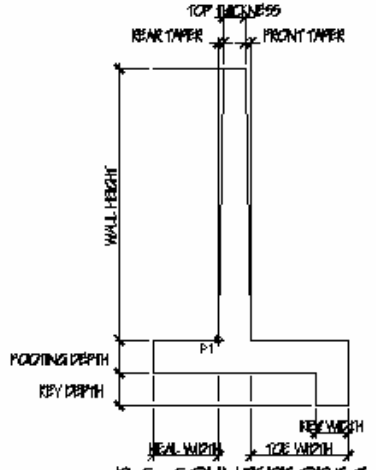
MASONRY CANTILEVER 3



R.C. COUNTERFORT 1



R.C. COUNTERFORT 2

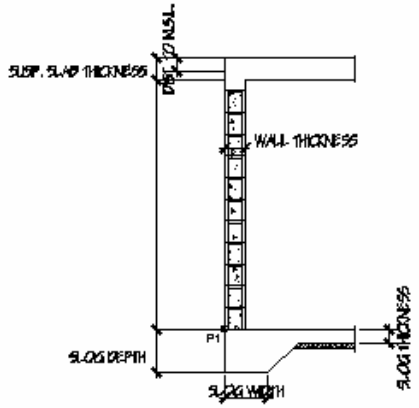


R.C. COUNTERFORT 3

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - RETAINING WALLS 5

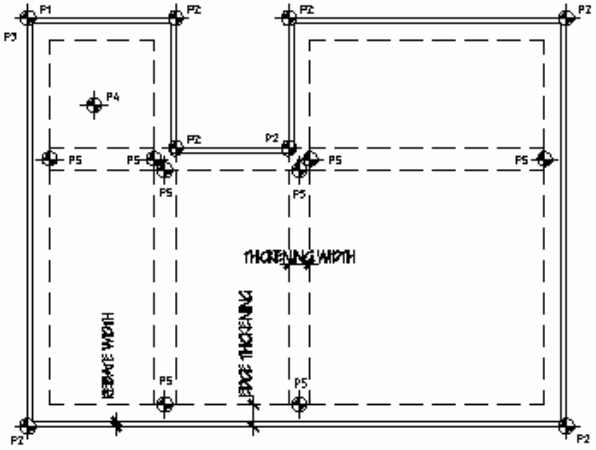


SIMPLE MASONRY

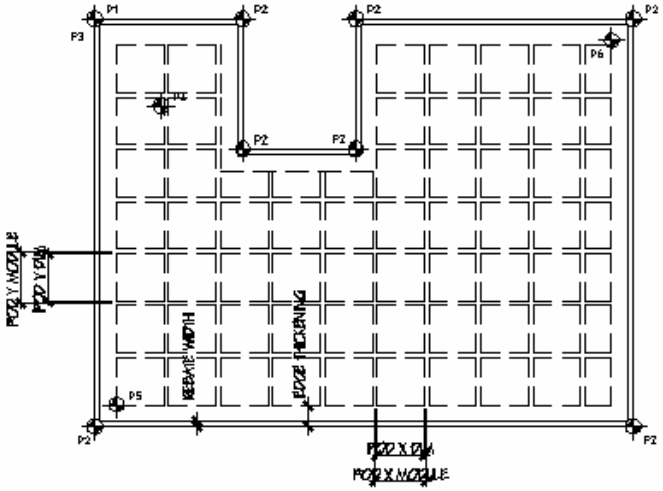
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - RETAINING WALLS 6

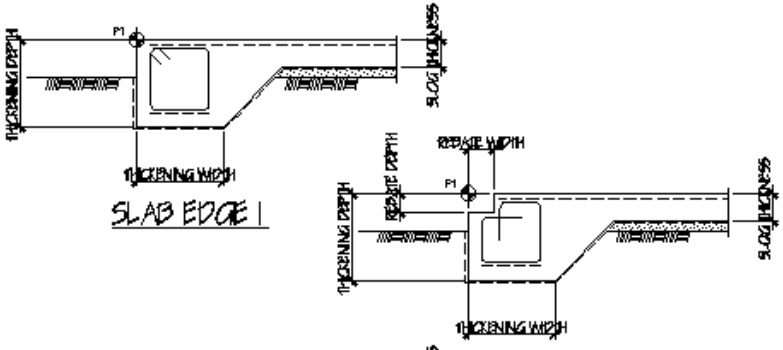


SLAB ON GROUND OUTLINE



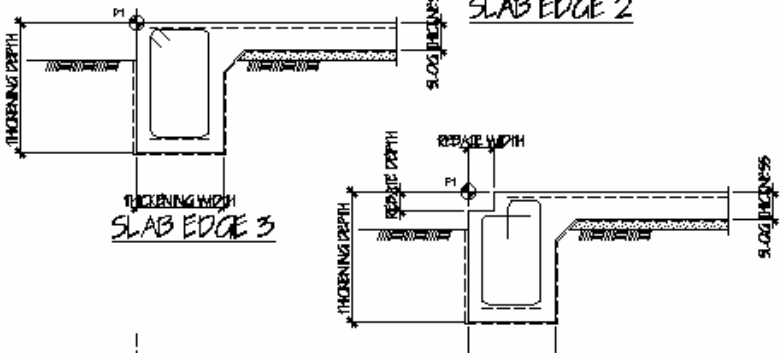
SLAB ON GROUND WAFFLE POD

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - SLAB ON GROUND 1



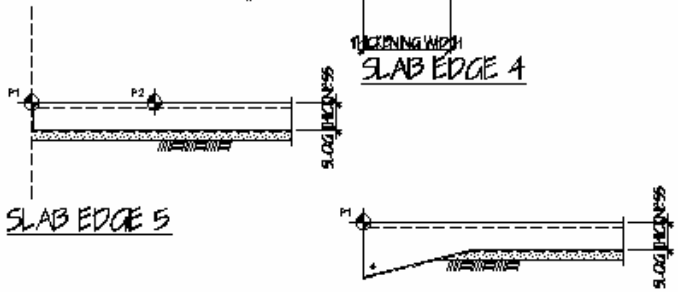
SLAB EDGE 1

SLAB EDGE 2



SLAB EDGE 3

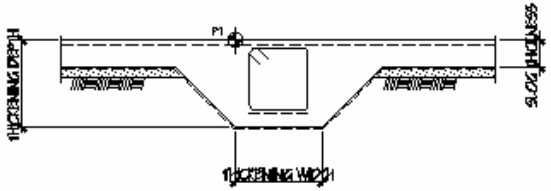
SLAB EDGE 4



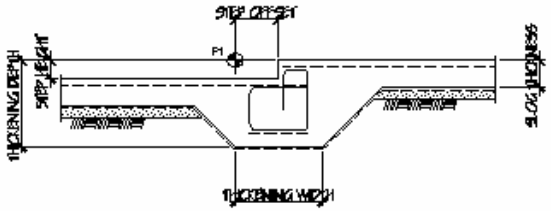
SLAB EDGE 5

SLAB EDGE 6

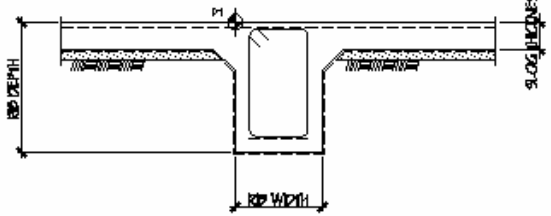
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - SLAB ON GROUND 2



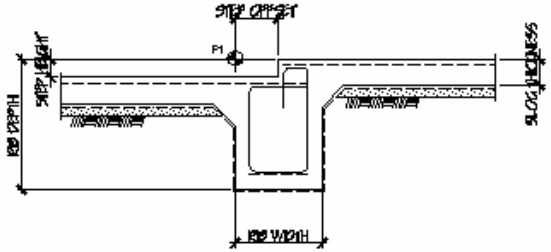
INTERNAL RIB 1



INTERNAL RIB 2

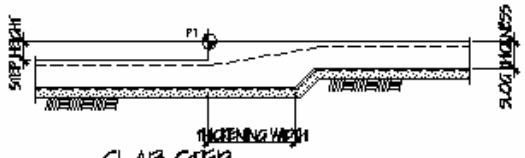


INTERNAL RIB 3

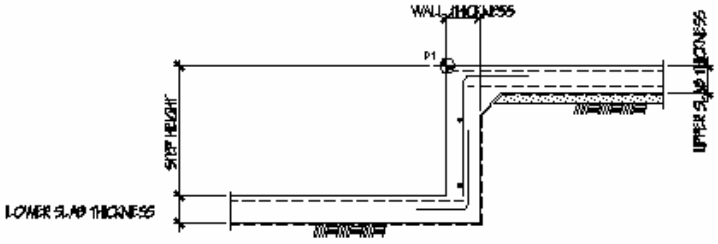


INTERNAL RIB 4

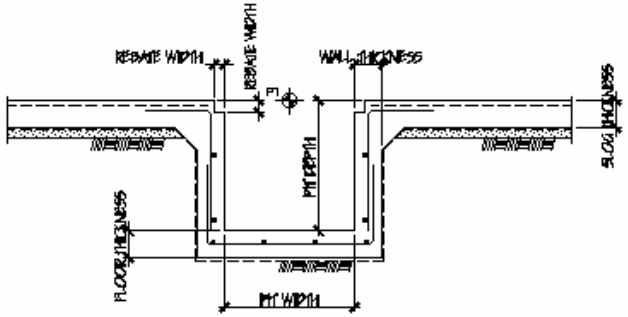
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - SLAB ON GROUND 3



SLAB STEP

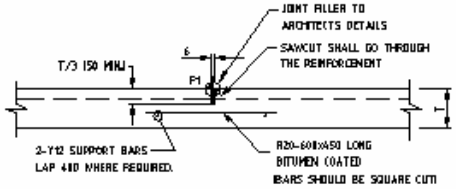


SLAB / WALL STEP



SUMP PIT

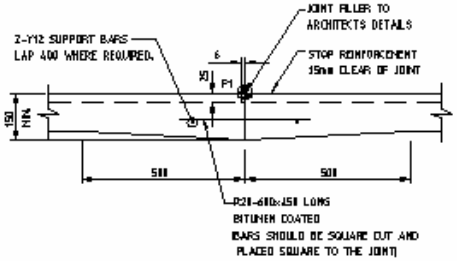
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - SLAB ON GROUND 4



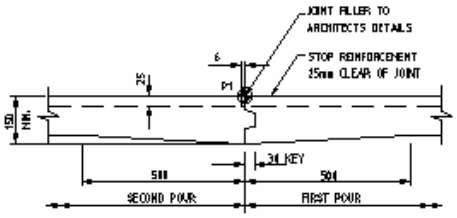
NOTES

1. SAWCUT WITHIN 24 HOUR PERIOD AFTER CONCRETE IS POURED UNLESS AGREED OTHERWISE BY THE ENGINEER.
2. REFER ALSO STANDARD NOTES.

SAWCUT JOINT



DOWELED JOINT

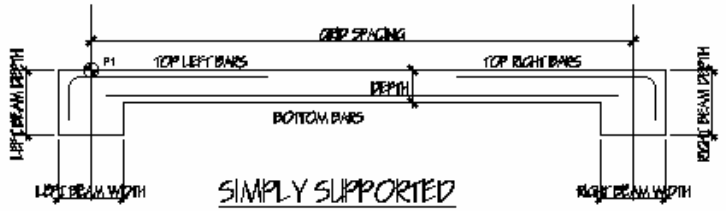


KEYED CONSTRUCTION JOINT

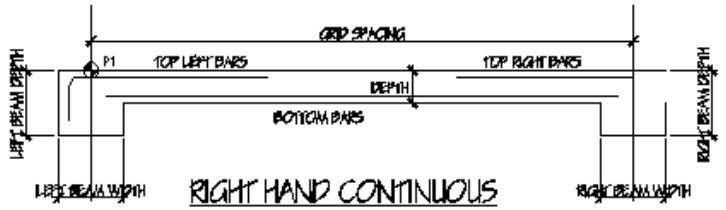
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - SLAB ON GROUND 5

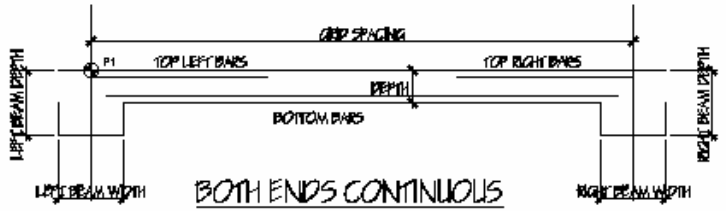


SIMPLY SUPPORTED



RIGHT HAND CONTINUOUS

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.



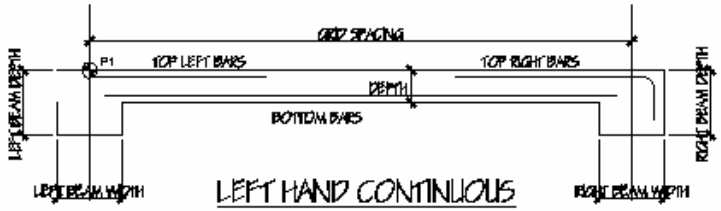
BOTH ENDS CONTINUOUS

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.

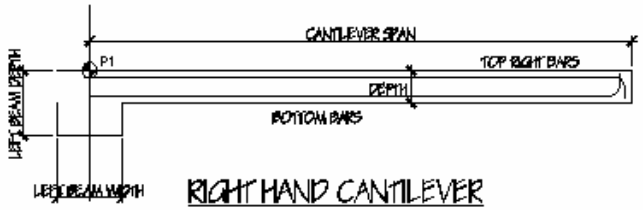
STRUC PLUS

PROGRAMME INFORMATION SHEET

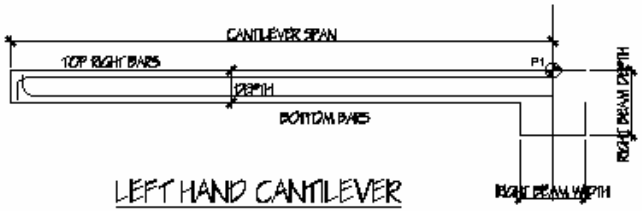
SPCONCRETE - SLAB SECTIONS 1



LEFT HAND CONTINUOUS



RIGHT HAND CANTILEVER



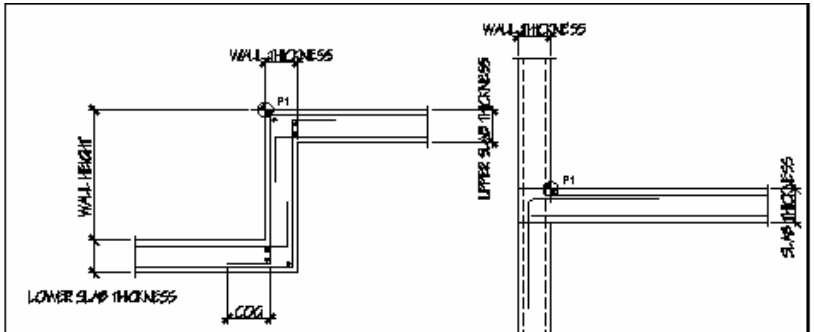
LEFT HAND CANTILEVER

PROGRAMME LOOPS UNTIL EITHER
LEFT HAND CONTINUOUS OR
RIGHT HAND CANTILEVER SELECTED.

STRUC PLUS

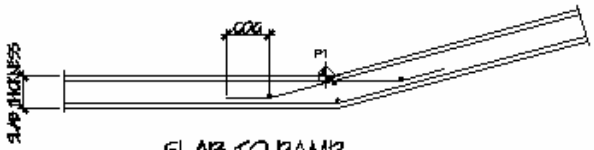
PROGRAMME INFORMATION SHEET

SPCONCRETE - SLAB SECTIONS 2

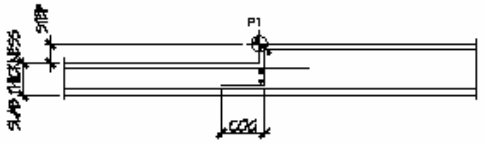


SLAB DOWNTURN

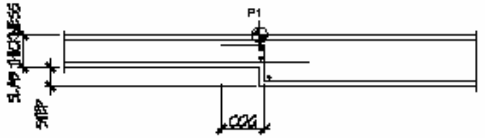
SLAB TO WALL



SLAB TO RAMP



SLAB STEP

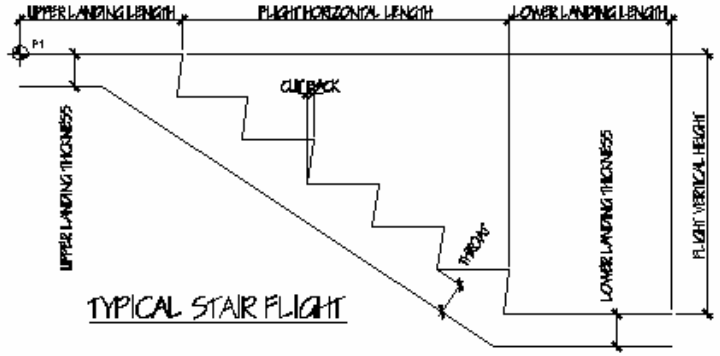


SOFFIT STEP

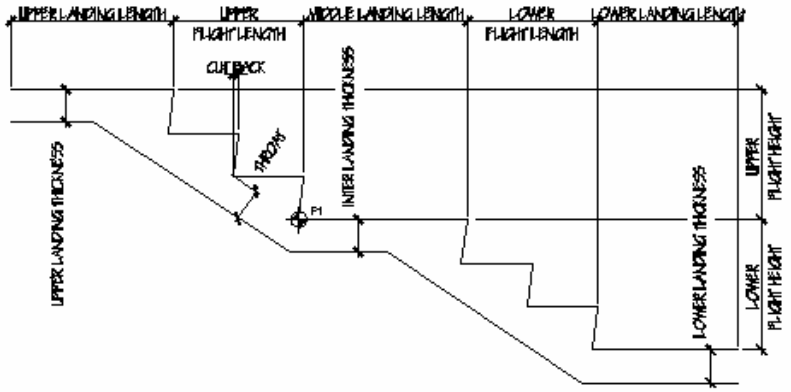
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - SLAB SECTIONS 3

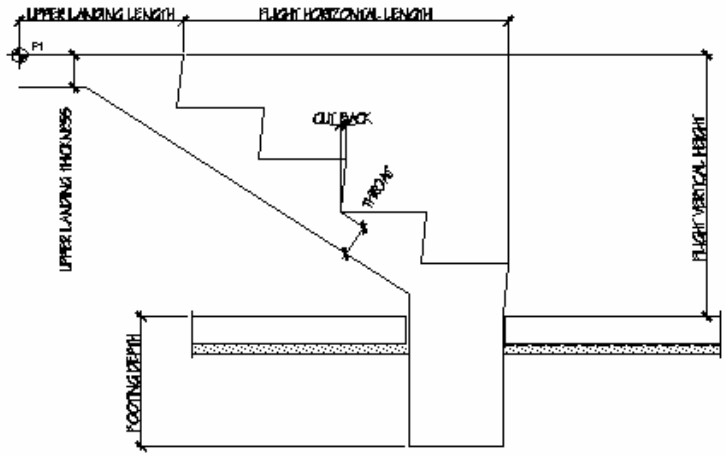


TYPICAL STAIR FLIGHT

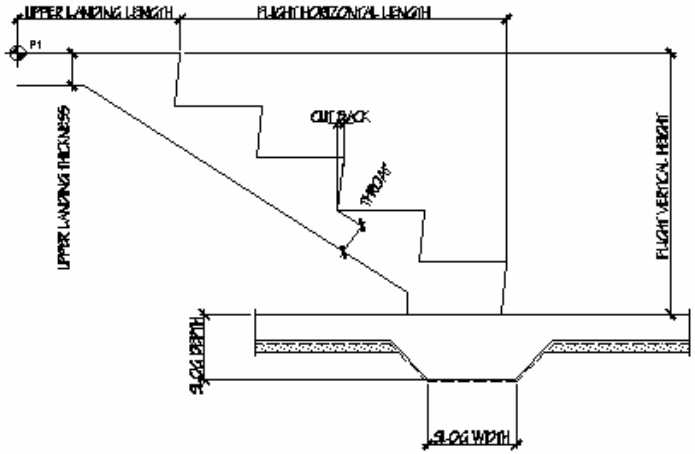


TYPICAL DOUBLE STAIR FLIGHT

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - STAIRS 1

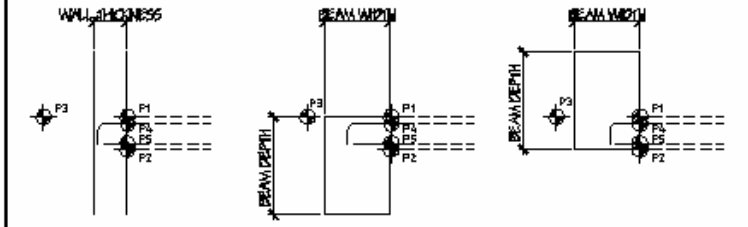


TYPICAL FIRST STAIR FLIGHT WITH PEDESTAL FOOTING

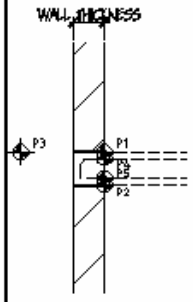


TYPICAL FIRST STAIR FLIGHT WITH SLAB THICKENING

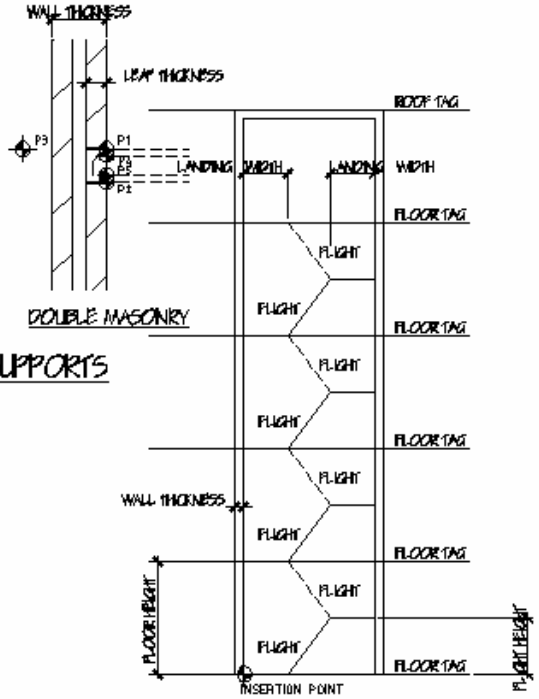
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPCONCRETE - STAIRS 2



CONCRETE WALL DOWNTURN BEAM UPSTAND BEAM



SINGLE MASONRY



DOUBLE MASONRY

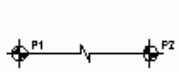
TYPICAL STAIR SUPPORTS

STAIR KEY DIAGRAM

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCONCRETE - STAIR 3

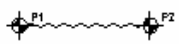


BREAK LINE

CAMBER TAG

CONCRETE

GROUT

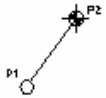


SCABBLE LINE

SLAB LINE

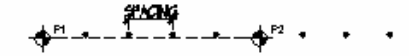
SPLICE LINE

STEP

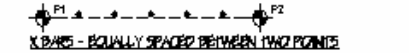


BAR TAG

BAR DOT

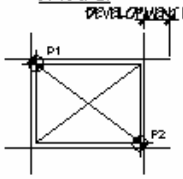


X BARS - XXX SPACING BY INDICATING START POINT AND DIRECTION



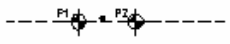
X BARS - EQUALLY SPACED BETWEEN TWO POINTS

MAX. No. BARS - AT NOMINATED SPACING BETWEEN TWO POINTS

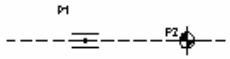


PENETRATION REINFORCEMENT

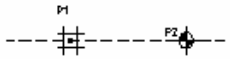
LINE OF REINFORCEMENT



REINFORCEMENT BAR



RECTANGULAR FABRIC



RECTANGULAR FABRIC

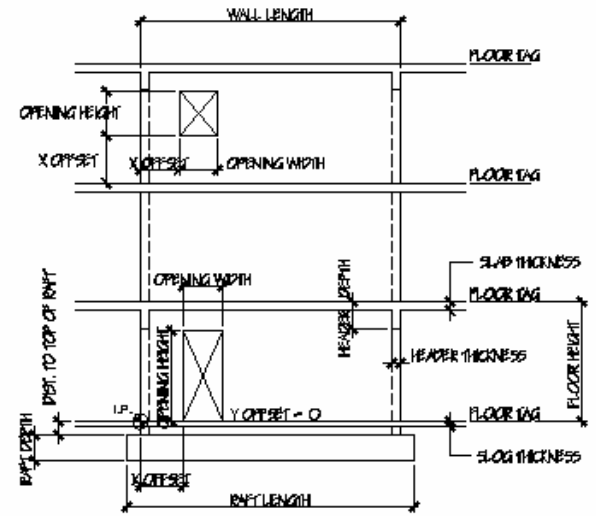
CENTRE BULB WATERSTOP

REAR GUARD WATERSTOP

STRUC PLUS

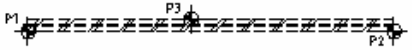
PROGRAMME INFORMATION SHEET

SPCONCRETE - SYMBOLS



CORE WALL ELEVATION

WALL PLAN

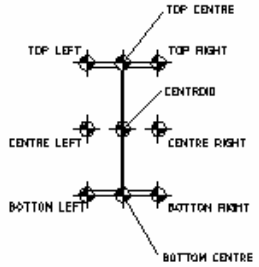


WALL HATCH

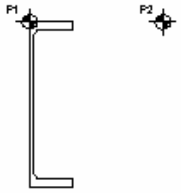
STRUC PLUS

PROGRAMME INFORMATION SHEET

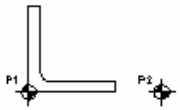
SPCONCRETE - WALLS



UNIVERSAL SECTION



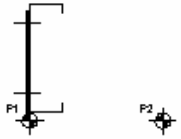
CHANNEL SECTION



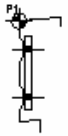
ANGLE SECTION

SHS / RHS SECTION

CHS SECTION



PURLIN SECTION



FASCIA PURLIN SECTION

CUT TEE SECTION

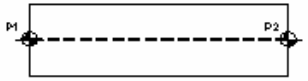
STRUC PLUS

PROGRAMME INFORMATION SHEET

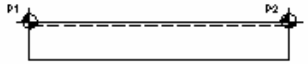
SPSTEEL - MEMBERS - IN SECTION

UNIVERSAL SECTION - ELEVATION

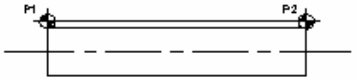
CHANNEL - ELEVATION



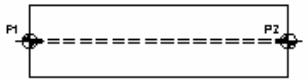
UNIVERSAL SECTION - PLAN



CHANNEL - PLAN



ANGLE - PLAN



CUT TEE - PLAN

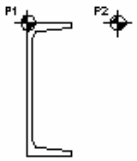
CUT TEE - ELEVATION

TUBE - ELEVATION

STRUC PLUS

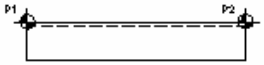
PROGRAMME INFORMATION SHEET

SPSTEEL - MEMBERS - PLAN/ ELEVATION

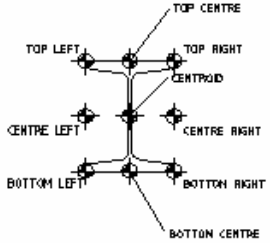


TFC - SECTION

TFC - ELEVATION

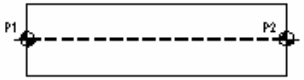


TFC - PLAN



JOIST SECTION

JOIST - ELEVATION

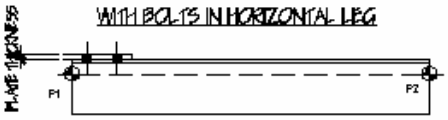


JOIST - PLAN

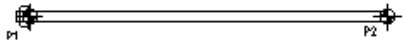
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - MEMBERS - BRITISH MEMBERS

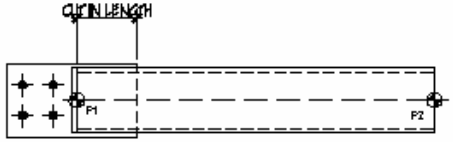


ANGLE BRACE



ROD BRACE

CHANNEL BRACE

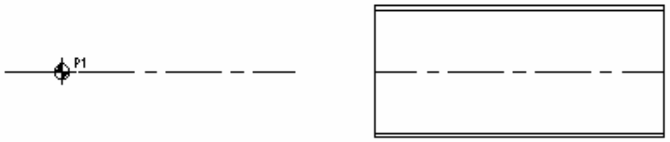


TUBE BRACE

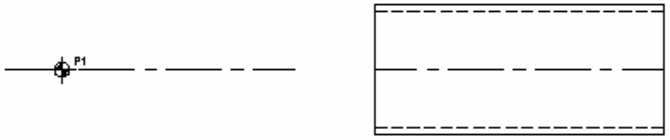
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - MEMBERS - BRACING MEMBERS



UNIVERSAL MEMBERS



CHANNEL MEMBERS

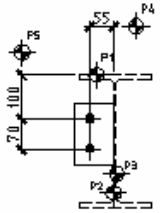
ANGLE MEMBERS

TUBE MEMBERS

STRUC PLUS

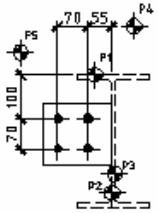
PROGRAMME INFORMATION SHEET

SPSTEEL - CONVERTER



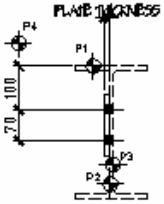
WSP ELEVATION I

DIMENSIONS OPTIONAL



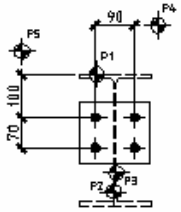
WSP ELEVATION I

DIMENSIONS OPTIONAL



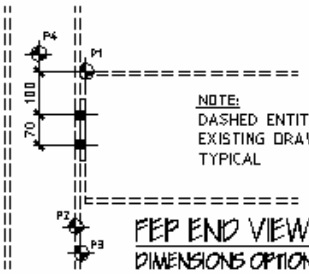
WSP END VIEW

DIMENSIONS OPTIONAL



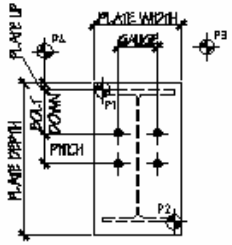
FEP ELEVATION

DIMENSIONS OPTIONAL



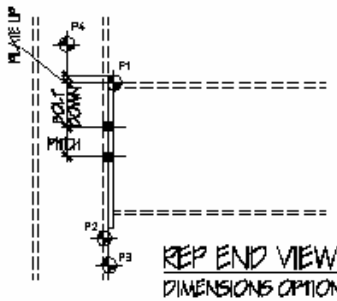
FEP END VIEW

DIMENSIONS OPTIONAL



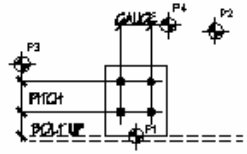
REP ELEVATION

DIMENSIONS OPTIONAL



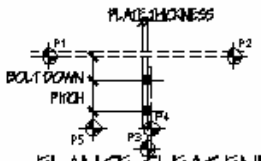
REP END VIEW

DIMENSIONS OPTIONAL



FLANGE CLEAT ELEVATION

DIMENSIONS OPTIONAL



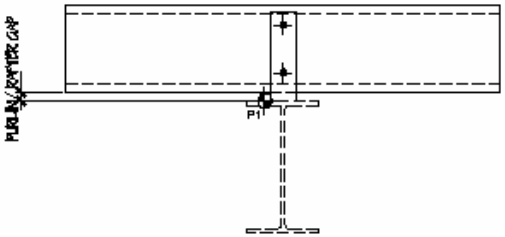
FLANGE CLEAT END VIEW

DIMENSIONS OPTIONAL

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - CLEATS



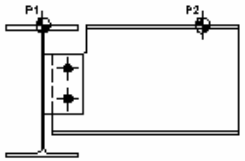
PURLIN CLEAT

PLAN ELEVATION

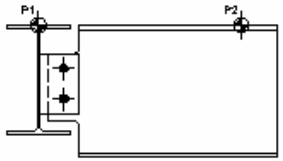
DETAIL

BOLTS

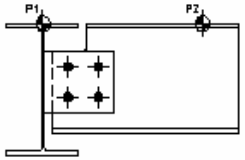
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPSTEEL - CLEATS continued



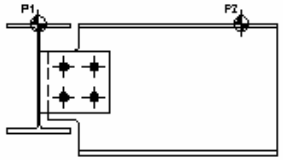
BEAM TO BEAM 1
TEXT IS OPTIONAL



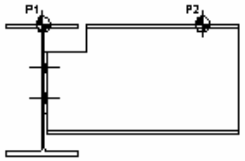
BEAM TO BEAM 2
TEXT IS OPTIONAL



BEAM TO BEAM 3
TEXT IS OPTIONAL



BEAM TO BEAM 4
TEXT IS OPTIONAL



BEAM TO BEAM 5
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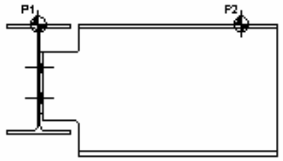
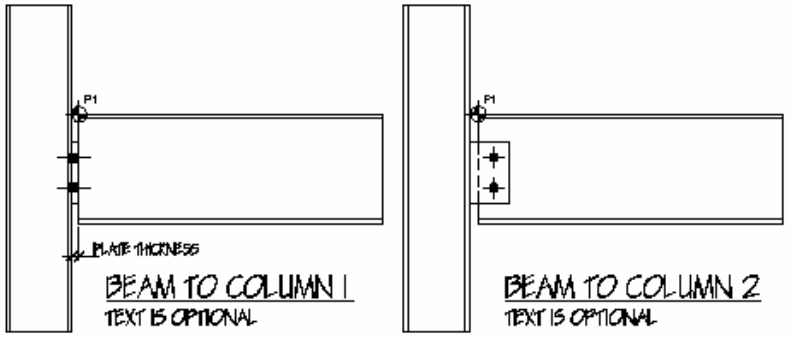


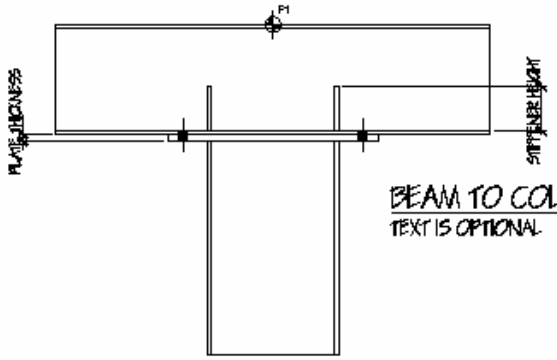
BEAM TO BEAM 6
TEXT IS OPTIONAL

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPSTEEL - CONNECTIONS - BEAM TO BEAM



BEAM TO COLUMN 1
TEXT IS OPTIONAL

BEAM TO COLUMN 2
TEXT IS OPTIONAL



BEAM TO COLUMN 3
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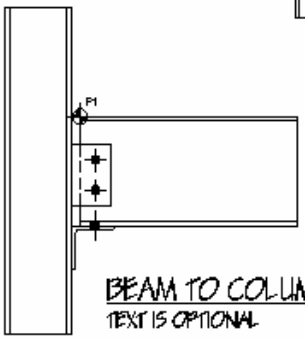
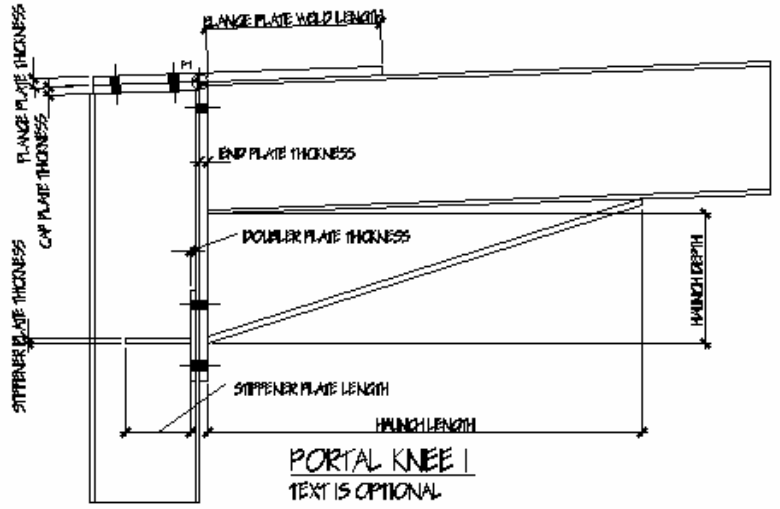


BEAM TO COLUMN 4
TEXT IS OPTIONAL

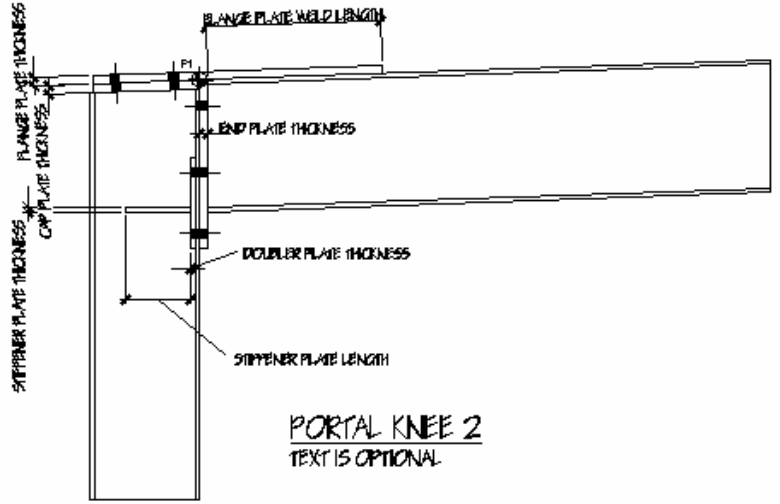
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - CONNECTIONS - BEAM TO COL'N



PORTAL KNEE 1
TEXT IS OPTIONAL

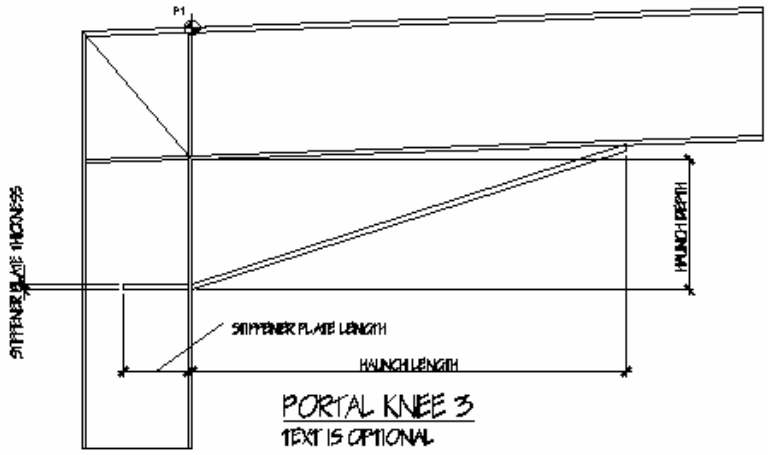


PORTAL KNEE 2
TEXT IS OPTIONAL

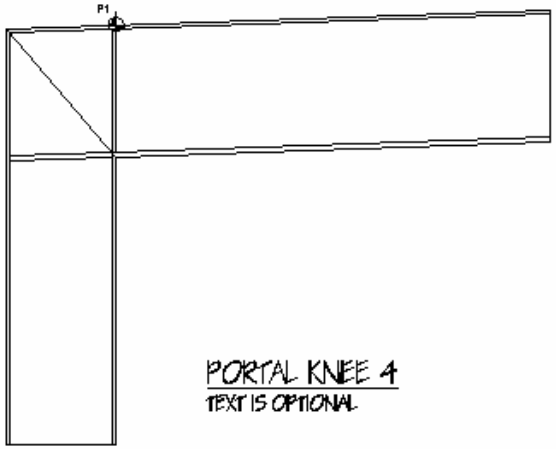
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - CONNECTIONS - PORTAL KNEES



PORTAL KNEE 3
TEXT IS OPTIONAL

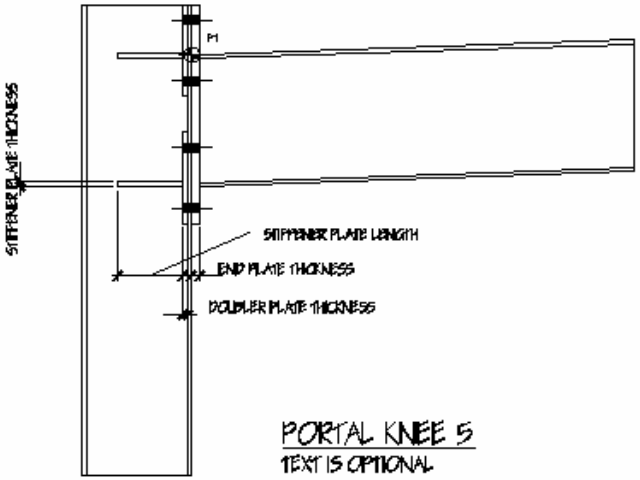


PORTAL KNEE 4
TEXT IS OPTIONAL

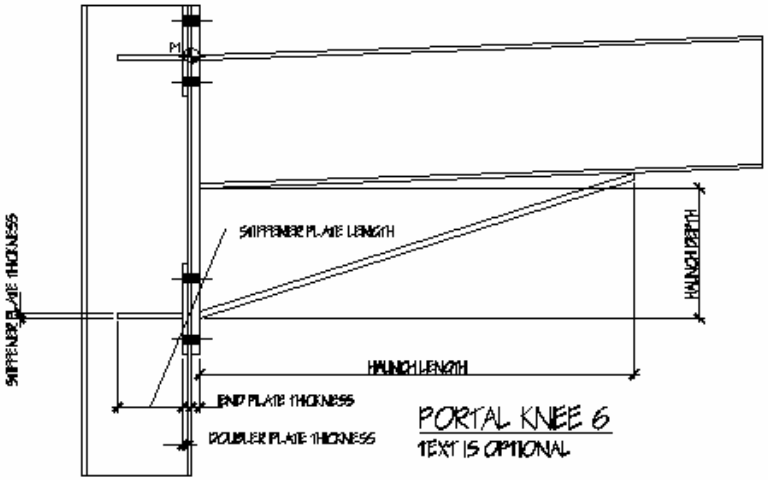
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - CONNECTIONS - PORTAL KNEES



PORTAL KNEE 5
TEXT IS OPTIONAL

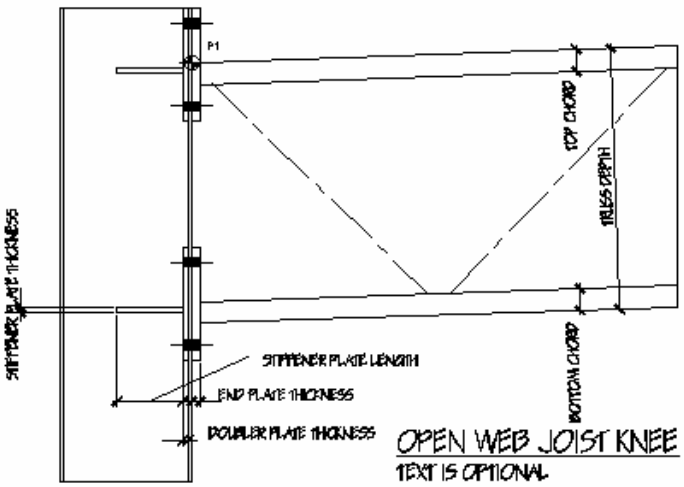


PORTAL KNEE 6
TEXT IS OPTIONAL

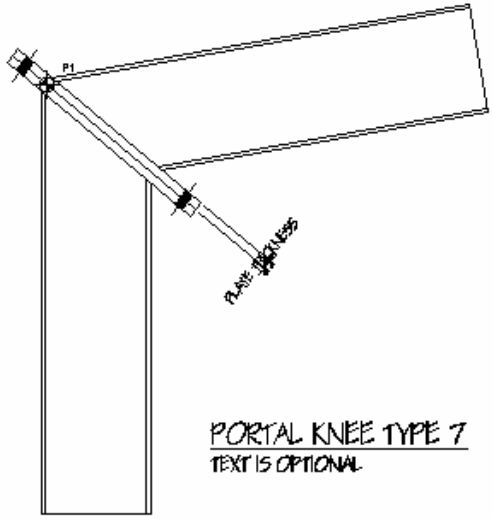
STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - CONNECTIONS - PORTAL KNEES



OPEN WEB JOIST KNEE
TEXT IS OPTIONAL

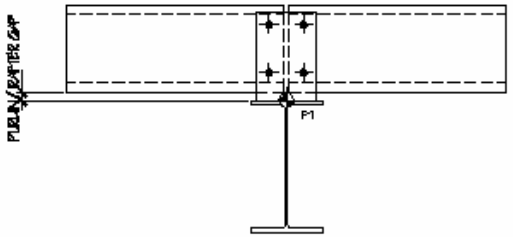


PORTAL KNEE TYPE 7
TEXT IS OPTIONAL

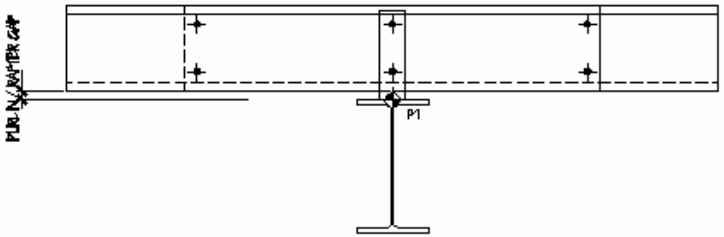
STRUC PLUS

PROGRAMME INFORMATION SHEET

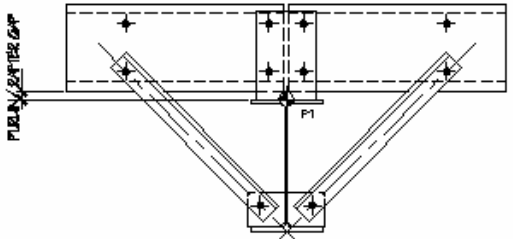
SPSTEEL - CONNECTIONS - PORTAL KNEES



PURLIN TO BEAM 1
TEXT IS OPTIONAL



PURLIN TO BEAM 2
TEXT IS OPTIONAL

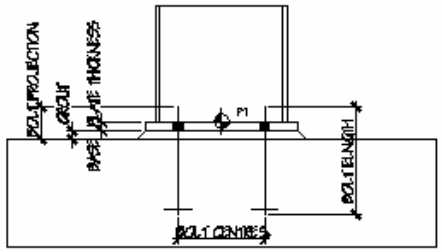


FLYBRACE DETAIL
TEXT IS OPTIONAL

STRUC PLUS

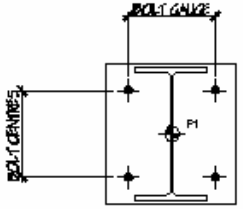
PROGRAMME INFORMATION SHEET

SPSTEEL - CONNECTIONS - PURLIN DETAILS



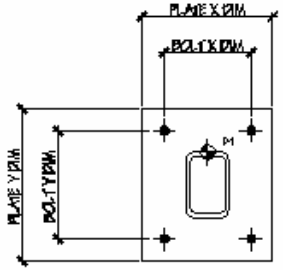
BASE PLATE ELEVATION

TEXT IS OPTIONAL



BASE PLATE PLAN

TEXT IS OPTIONAL



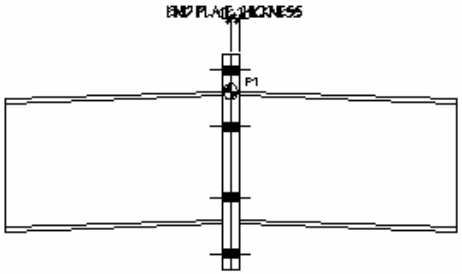
TUBE BASE PLATE PLAN

TEXT IS OPTIONAL

STRUC PLUS

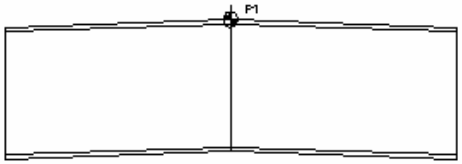
PROGRAMME INFORMATION SHEET

SPSTEEL - CONNECTIONS - BASE PLATES



BOLTED RIDGE DETAIL

TEXT IS OPTIONAL



WELDED RIDGE DETAIL

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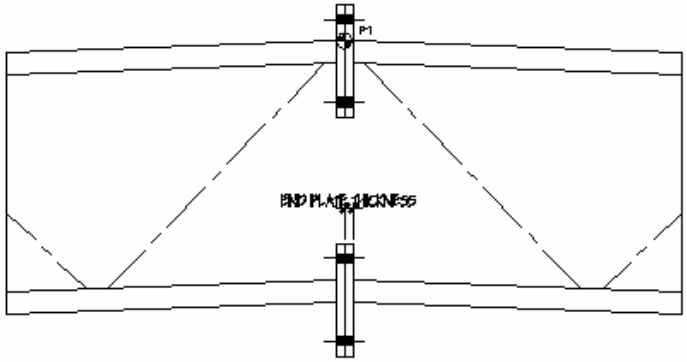


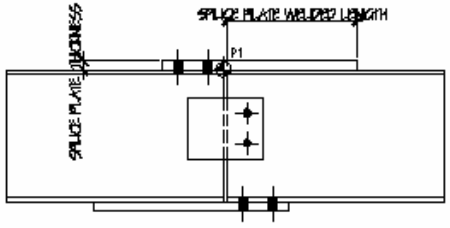
OPEN WEB JOIST RIDGE DETAIL

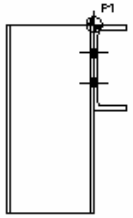
TEXT IS OPTIONAL

STRUC PLUS

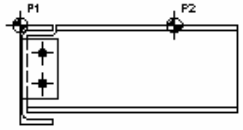
PROGRAMME INFORMATION SHEET

SPSTEEL - CONNECTIONS - RIDGE DETAILS



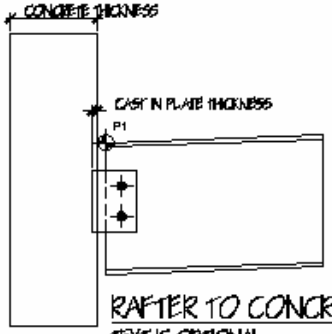


BEAM SPLICE DETAIL
TEXT IS OPTIONAL

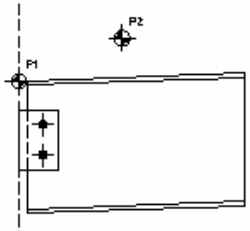


CHANNEL TO CHANNEL
TEXT IS OPTIONAL

END WALL GABLE RAKER DETAIL
TEXT IS OPTIONAL



RAFTER TO CONCRETE
TEXT IS OPTIONAL



ADD RAFTER DETAIL
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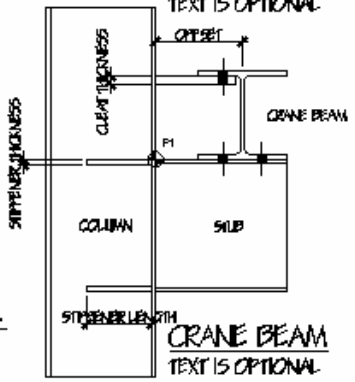
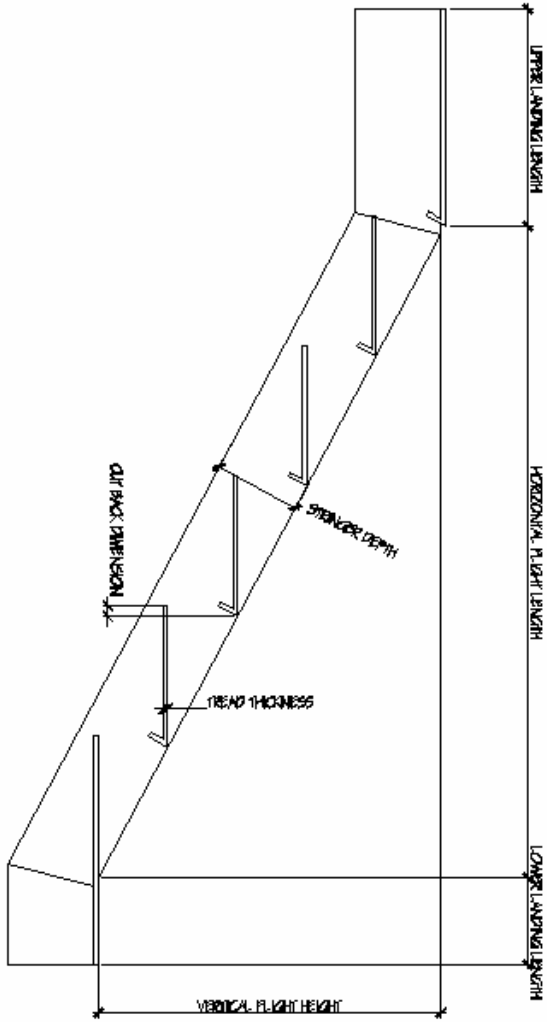
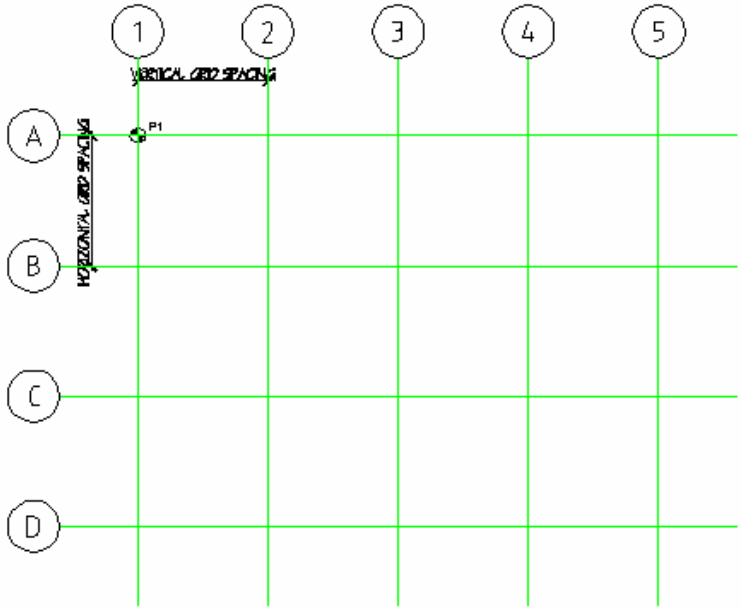


CRANE BEAM
TEXT IS OPTIONAL

STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPSTEEL - CONNECTIONS - MISCELLANEOUS



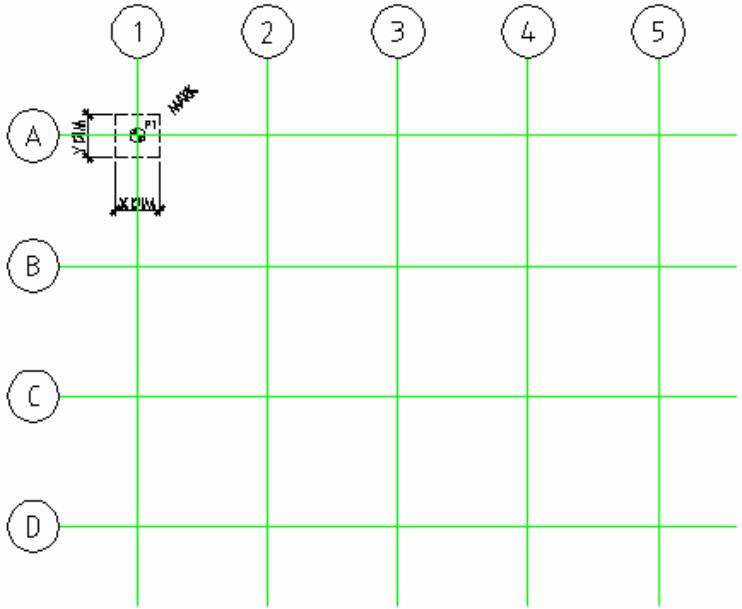
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPSTEEL - STAIR SECTION



STRUC PLUS

PROGRAMME INFORMATION SHEET

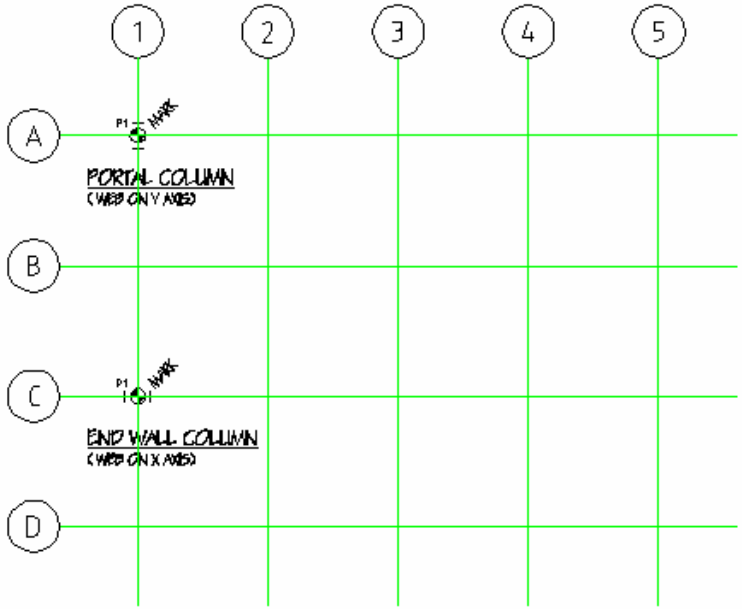
SPSTEEL - FRAMING - GRID LAYOUT



STRUC PLUS

PROGRAMME INFORMATION SHEET

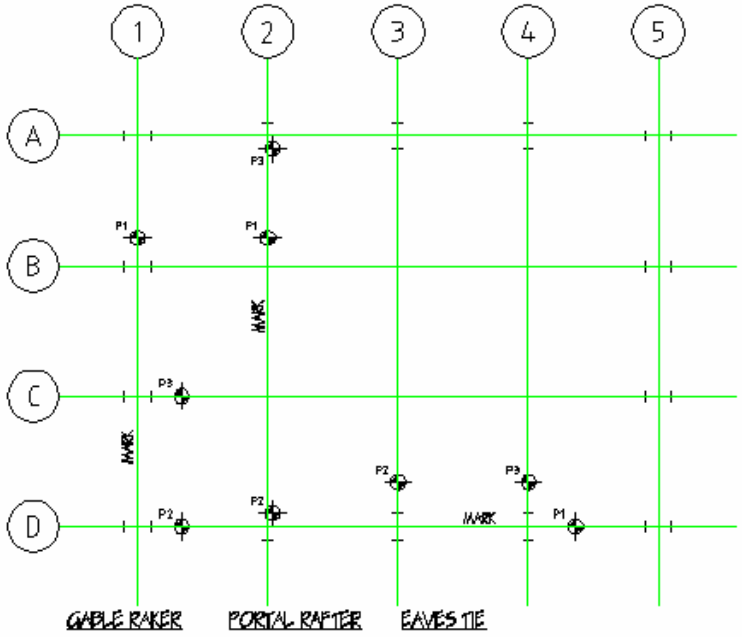
SPSTEEL - FRAMING - PAD FOOTINGS



STRUC PLUS

PROGRAMME INFORMATION SHEET

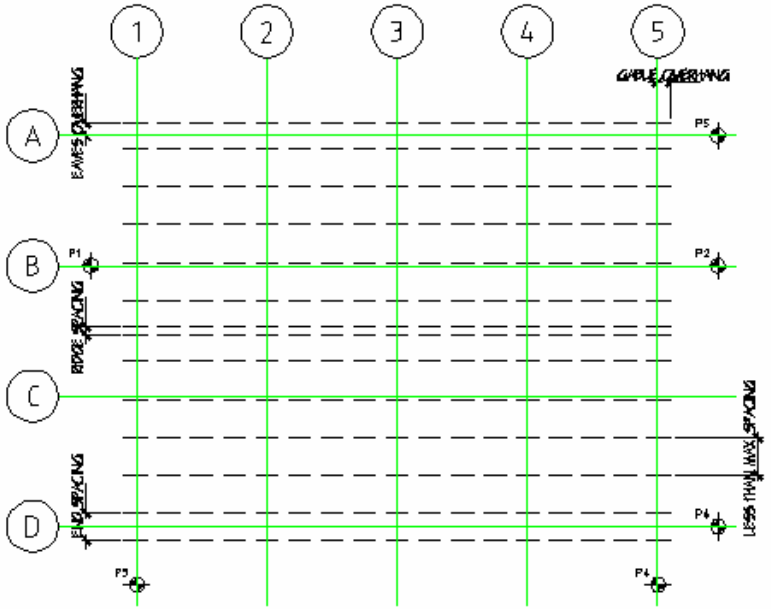
SPSTEEL - FRAMING - COLUMNS



STRUC PLUS

PROGRAMME INFORMATION SHEET

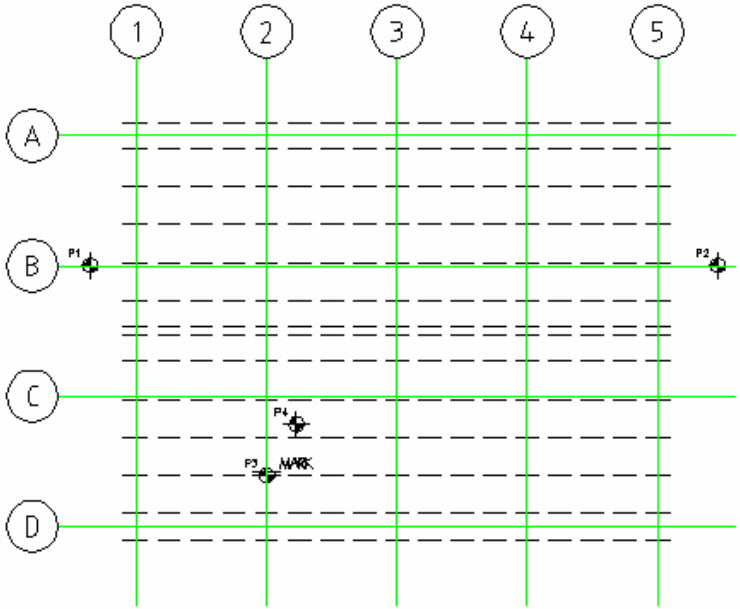
SPSTEEL - FRAMING - RAFTERS



STRUC PLUS

PROGRAMME INFORMATION SHEET

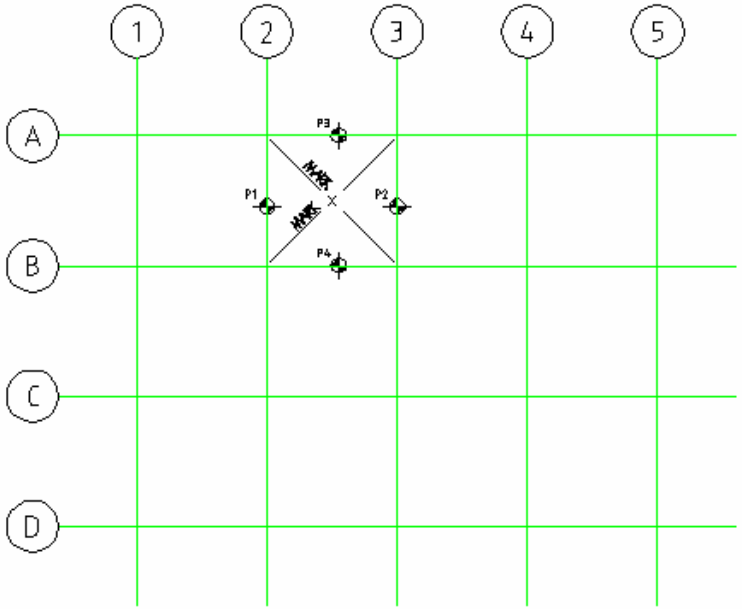
SPSTEEL - FRAMING - PURLINS



STRUC PLUS

PROGRAMME INFORMATION SHEET

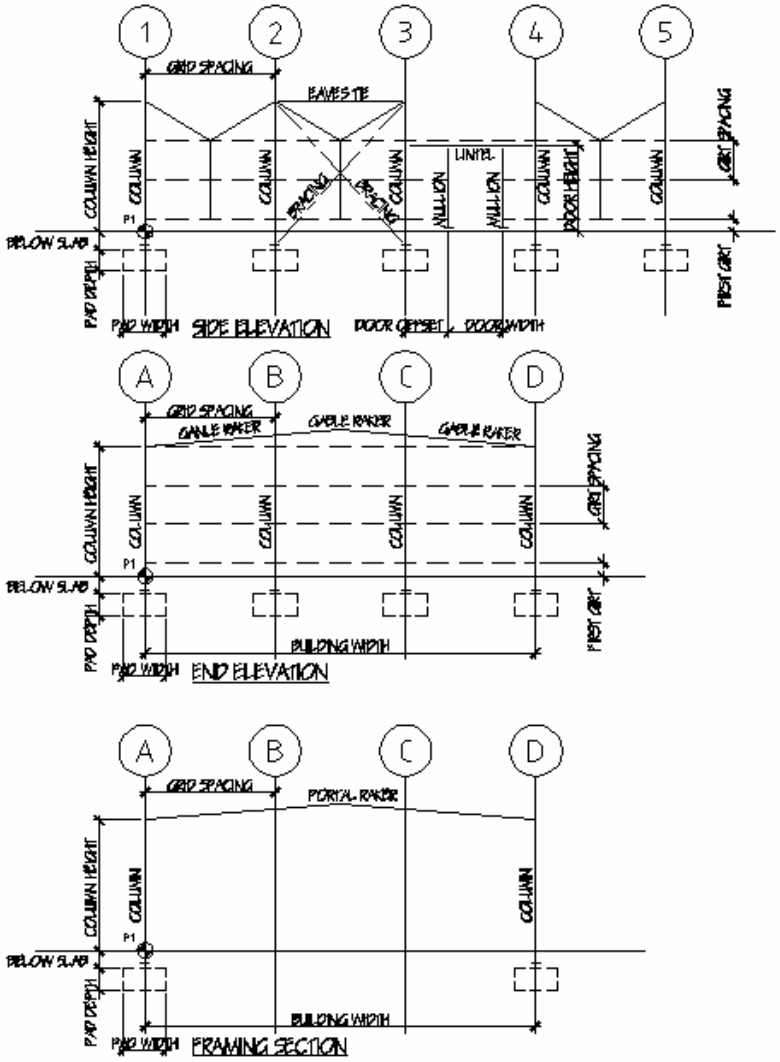
SPSTEEL - FRAMING - FLYBRACES



STRUC PLUS

PROGRAMME INFORMATION SHEET

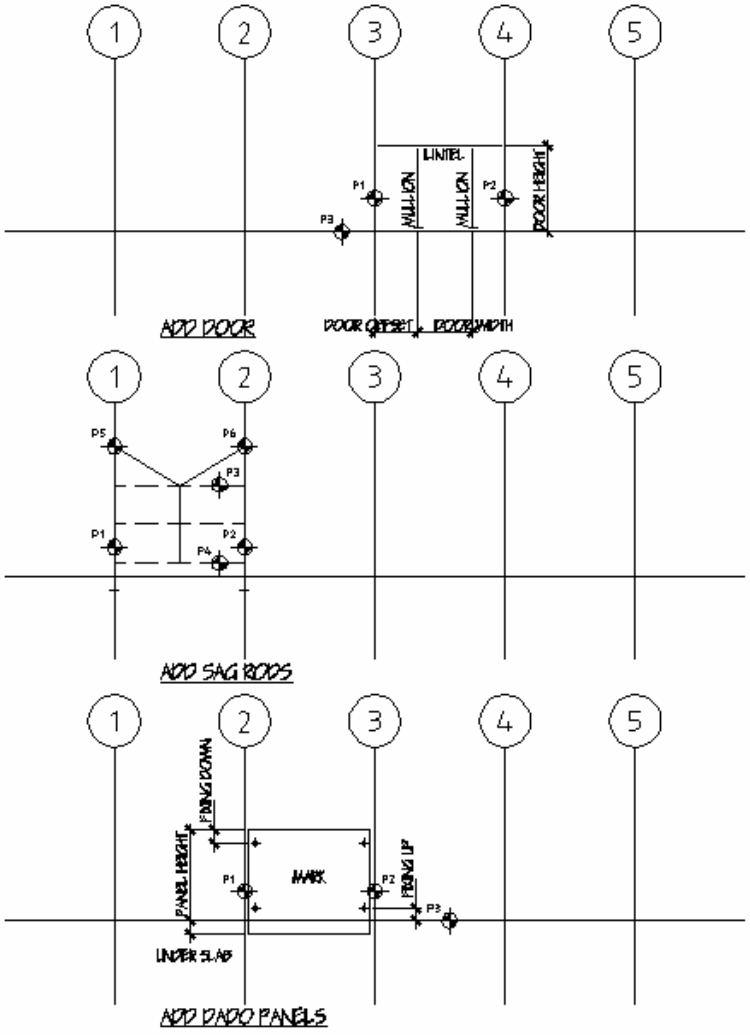
SPSTEEL - FRAMING - ROOF BRACING



STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - FRAMING - ELEVATIONS



STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - FRAMING - ELEVATIONS

P3

STEELWORK MEMBER SCHEDULE

MARK	SIZE	REMARKS

P3

STEELWORK TONNAGE

MARK	SIZE	No. OFF	WEIGHT (T)
C1	610UB101	1	0.364
C2	310UB40	1	0.144
R1	530UB82	1	0.911
R2	310UB40	1	0.206
TOTAL TONNAGE			1.624

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - FRAMING - EXTRACT SCHEDULE

INSERTION POINT

STEELWORK MEMBER SCHEDULE		
MARK	SIZE	REMARKS

STEELWORK MEMBER SCHEDULE		
MARK	SIZE	REMARKS
MARK	SIZE	REMARKS

INSERTION POINT

MEMBER SCHEDULE NOTATION

INSERTION POINT

STEELWORK MEMBER REFERENCE SCHEDULE			
MARK	SIZE	CONNECTION REFERENCE EACH END	REMARKS

STEELWORK MEMBER REFERENCE SCHEDULE				
MARK	SIZE	CONNECTION REFERENCE EACH END		REMARKS
MARK	SIZE	LEFT REF.	RIGHT REF.	REMARKS

INSERTION POINT

REFERENCE SCHEDULE NOTATION

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - SCHEDULES - STEEL MEMBERS

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPSTEEL - SCHEDULES - STEEL REFERENCE

CONNECTION SCHEDULE NOTATION

STRUC PLUS

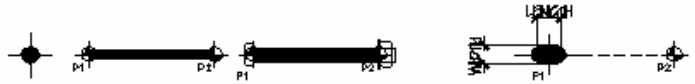
PROGRAMME INFORMATION SHEET

SPSTEEL - SCHEDULES - STEEL CONNECTION

STRUC PLUS

PROGRAMME INFORMATION SHEET

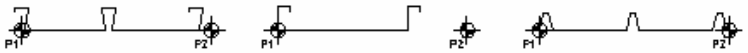
SPSTEEL - SCHEDULES - STEEL COLUMNS



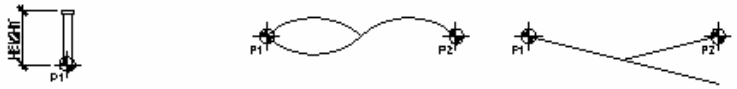
PLAN ELEVATION DETAIL

BOLTS

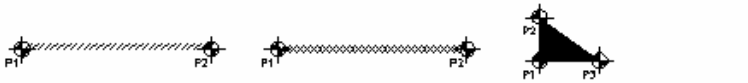
SLOTTED HOLE



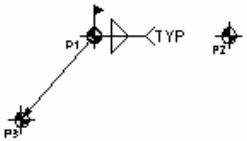
BONDECK CONDECK OTHER CLADDING



STUD CHS BREAK SHS BREAK

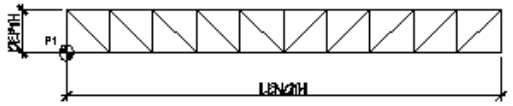


CFW LINE FSBW LINE CFW SECTION

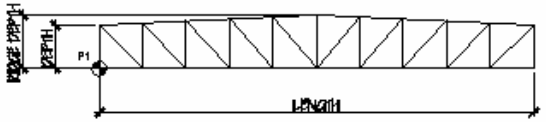


WELD SYMBOLS
GENERAL & RESISTANCE

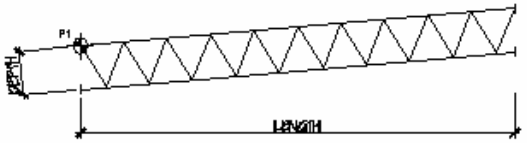
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPSTEEL - SYMBOLS



PARALLEL CHORDS

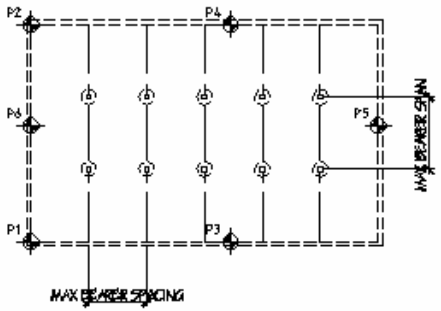


GABLE CHORD TOP

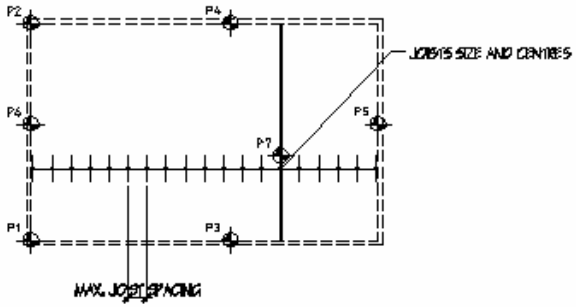


OPEN WEB JOIST

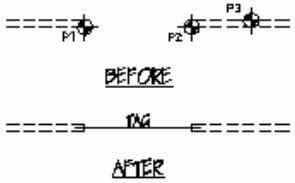
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPSTEEL - TRUSSES



STUMP / BEARER LAYOUT

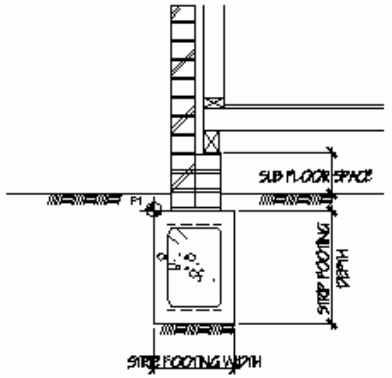


FLOOR JOISTS

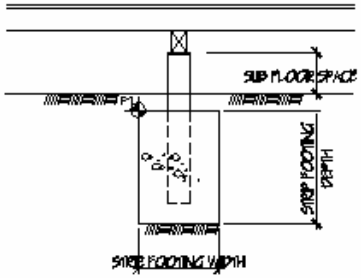


LINTEL PLAN

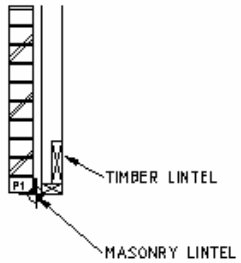
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPTIMBER - TIMBER PLANS



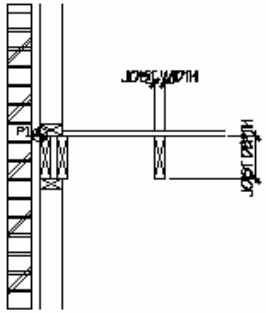
BASE BRICKWORK DETAIL



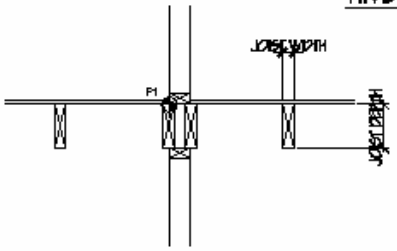
CONCRETE STUMP DETAIL



BRICK VENEER LINTEL DETAIL



TIMBER JOIST TO WALL DETAIL



TIMBER JOIST TO INTERNAL WALL DETAIL

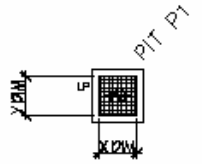
STRUC PLUS	PROGRAMME INFORMATION SHEET
	SPTIMBER - TIMBER DETAILS

INSERTION POINT

STORMWATER PIT SCHEDULE							
PIT No.	RL TOP OF PIT	DEPTH OF PIT	IL INLET	IL OUTLET	PIT SIZE	PIT TYPE	COVER TYPE

STORMWATER PIT SCHEDULE							
PIT No.	RL TOP OF PIT	DEPTH OF PIT	IL INLET	IL OUTLET	PIT SIZE	PIT TYPE	COVER TYPE
INSERTION POINT							
PIT No.	RL TOP OF PIT	DEPTH OF PIT	IL INLET	IL OUTLET	PIT SIZE	PIT TYPE	COVER TYPE

PIT SCHEDULE NOTATION



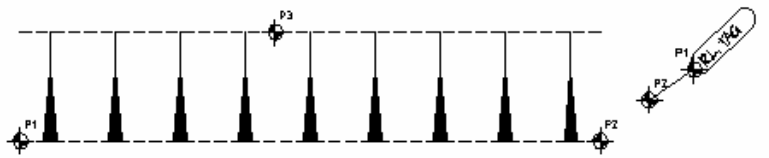
STORMWATER PITS IN PLAN

STORMWATER DRAIN LINES

STRUC PLUS

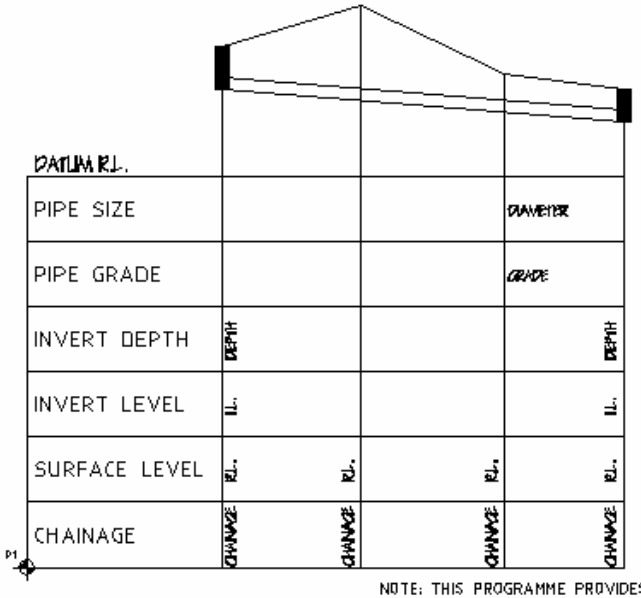
PROGRAMME INFORMATION SHEET

SPCIVIL - STORMWATER PLANS



PIT SCHEDULE NOTATION

SPOT LEVEL



NOTE: THIS PROGRAMME PROVIDES OPTIONS TO DRAW TO A SPLIT VERTICAL/HORIZONTAL SCALE. PLACEMENT OF PITS IS OPTIONAL.

LONGITUDINAL SECTION

STRUC PLUS

PROGRAMME INFORMATION SHEET

SPCIVIL - MISCELLANEOUS TOOLS

TUTORIAL

The following exercises should be undertaken as a training schedule as part of the learning process in using **Struc Plus** software in both Reinforced Concrete and Steelwork fields of Structural Engineering. These exercises do not cover every programme available within this package but covers a broad spectrum of it's facilities.

The following exercises can be undertaken on an A1 drawing at the scales as noted and each exercise should take no more than 30 minutes for the first time user and no more than 15 minutes for an experienced operator.

Figures S1 to S8 have been drawn by the author on A1 sheets and reduced solely to fit into this manual, therefore DO NOT SCALE the illustrations. All information required to draw the tutorials are explained with dimensions and sizes given. At least 95% of all exercises are drawn by using the Struc Plus programmes

FIGURE S1.

Turn on your computer and Run CAD (with Struc Plus active) in the usual manner.

At the File Menu select NEW drawing to begin a new drawing, give this new drawing a name, ie. FIGS1.

At the bottom of the SPTools… pulldown menu, Struc Plus Setup… select either a "TITLE BLOCK SETUP" or "DRAWING SETUP" depending on your preferences and indicate an A1 drawing at a scale of 1:100 followed by "OK" as confirmation.

The start of a plan normally involves the creation of the building grid, to draw this the SPMacro…, SPGeneral… "Grid Layout" can be executed. The grid spacings for this building are 6000mm for the vertical grids and 6000mm for the horizontal grids. Beware of the number of grids required to draw this grid layout as the number requested excludes the first line. Give each grid line a label and indicate the insertion point which is always the top left grid intersection for this programme (try coordinates 7500,24500 to land in the same location as Figure S1).

The rectangular concrete columns shown on all but four grid intersections are 500mm x 500mm square, these can be drawn from SPMacros…, SPConcrete… Framing… "Columns" programme. Pen colors, linetypes and layering are all automatic. As the columns are all the same for the entire plan it may be easier to draw only one via the programme and array that column to the rest of the building (deleting the non-required columns in the core location).

The Core Plan can be executed from the same pulldown menu as the columns under the "Core Plan" programme. The building core has the following dimensions:-
East-West length - 8400
North-South length - 8300
Wall thickness - 200
Insertion point at bottom left corner (try coordinates 18300,11350 for the same appearance as Figure S1).
Shaft East-West opening - 2500
Shaft North-South opening - 2500
X offset - 200, Y offset - 200
Shaft East-West opening - 2500
Shaft North-South opening - 2500
X offset - 200, Y offset - 2900
Shaft East-West opening - 2500
Shaft North-South opening - 2500
X offset - 200, Y offset - 5600
Shaft East-West opening - 2600
Shaft North-South opening - 7900
X offset - 2900, Y offset - 200
Shaft East-West opening - 2500
Shaft North-South opening - 2500
X offset - 5700, Y offset - 200
Shaft East-West opening - 2500
Shaft North-South opening - 2500
X offset - 5700, Y offset - 2900
Shaft East-West opening - 2500
Shaft North-South opening - 2500
X offset - 5700, Y offset - 5600

The Pad Footings can be executed from the same pulldown menu as the Columns and the Core Plan programme from the "Pad Footings" selection. The building pad footings have the following dimensions:-
Pad P1 - 1500 x 1500, Pad P2 - 2000 x 2000, Pad P3 - 1000 x 1000

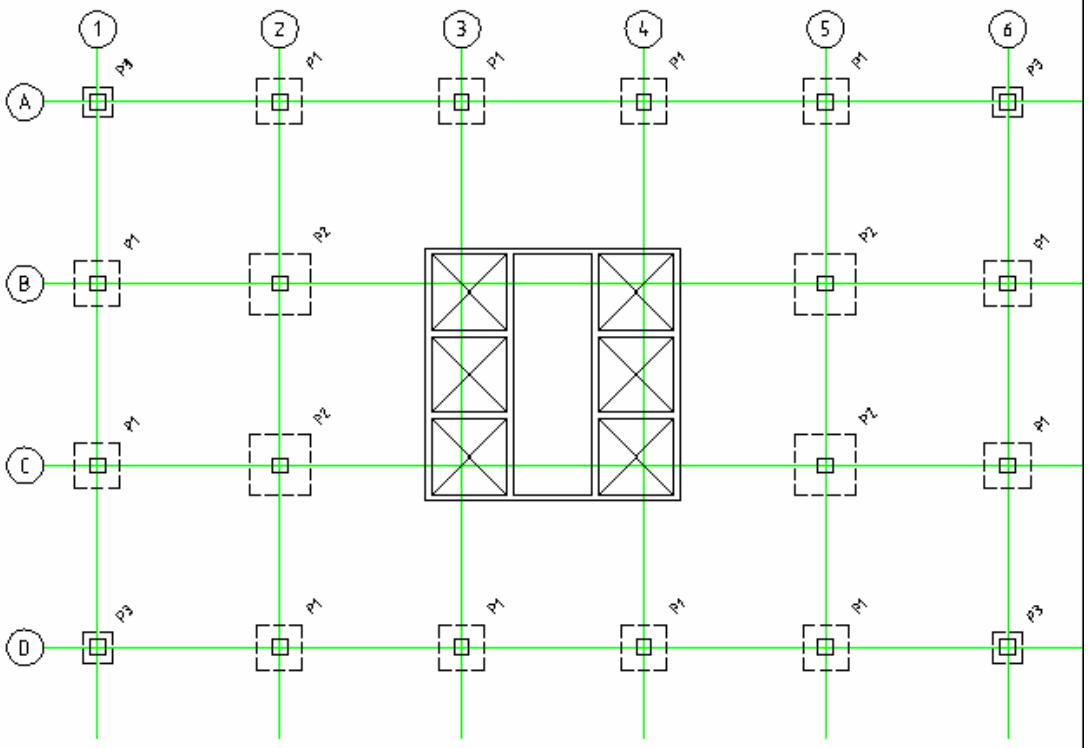
The drawing as shown in Figure S1 should now be on your screen and complete.

If this exercise took longer than expected then now is probably an appropriate time to take a break, if so Save the drawing file before having a break.

STRUC PLUS

PROGRAMME INFORMATION SHEET

STRUC PLUS TUTORIAL - FIGURE S1



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STRUC PLUS TUTORIAL - FIGURE S2

COLUMN SCHEDULE

LEVEL \ MARK		A1	A2	A3	A4	A5	A6
ROOF							
LEVEL 1	SIZE (N-SxE-W)	600 x 600	600 x 600	600 x 600			
	REINFORCEMENT	8Y16	8Y20	8Y20			
	TYPE	A	A	A			
	GRADE (MPa)	25	25	25			
GROUND	SIZE (N-SxE-W)	600 x 600	600 x 600	600 x 600	600 x 600	600 x 600	
	REINFORCEMENT	8Y20	8Y24	8Y24	8Y20	8Y20	
	TYPE	A	A	A	A	A	
	GRADE (MPa)	32	32	32	25	25	
BASEMENT	SIZE (N-SxE-W)	600 x 600	600 x 600	600 x 600	600 x 600	600 x 600	600 x 600
	REINFORCEMENT	8Y24	8Y28	8Y28	8Y24	8Y24	8Y20
	TYPE	A	A	A	A	A	A
	GRADE (MPa)	40	40	40	32	32	25
TOP OF FOOTING							
FOOTINGS	SIZE (N-SxE-W)	1500 x 1500	2000 x 2000	2000 x 2500	1500 x 1500	1500 x 1500	1800 x 1800
	DEPTH	500	700	700	500	500	500
	REINFORCEMENT N-S	6Y20	10Y20	10Y20	6Y20	6Y20	5Y20
	REINFORCEMENT E-W	6Y20	10Y20	10Y20	6Y20	6Y20	5Y20
	R.L. U/S FOOTING	-1.50	-1.50	-1.50	-1.50	-1.50	-1.50

FIGURE S2.

Turn on your computer and Run CAD (with Struc Plus active) in the usual manner.

At the File Menu select NEW drawing to begin a new drawing, give this new drawing a name, ie. FIGS2.

At the bottom of the SPTools… pulldown menu, Struc Plus Setup… select either a "TITLE BLOCK SETUP" or "DRAWING SETUP" depending on your preferences and indicate an A1 drawing at a scale of 1:1 followed by "OK" as confirmation.

From the Schedules… submenu of SPTools… select the "Column Schedule" programme. The relevant information for this drawing is self contained within Figure S2.

The column size, reinforcement, type and concrete strength are selected from "Column Notation" programme.

The footing size, reinforcement, and R.L. are selected from "Footing Schedule Notation" programme.

The column bar shapes and splice locations are selected from "Column Schedule Bars" programme.

The drawing as shown in Figure S2 should now be on your screen and complete.

If this exercise took longer than expected then now is probably an appropriate time to take a break, if so Save the drawing file before having a break.

FIGURE S3.

Turn on your computer and Run CAD (with Struc Plus active) in the usual manner.

Open drawing FIGS1 and Saveas FIGS3. As the basics for this drawing are the same as Figure S1, we don't need to redraw this. If however you have not saved or kept Figure S1 you will need to redo that exercise.

Erase any irrelevant information not required for this drawing, i.e. pad footings.

The Suspended Slab Profile can be executed from SPMacros…, SPConcrete…, Framing… as "Suspended Slab". Draw slab outline by indicating the top left corner of column A1 followed by the top left corner of column A6, bottom right corner of column D6 and finally the bottom right corner of column D2. For convenience the edge beam is 500mm wide. The internal slab profile includes 2400mm slab bands on grids 2 & 5 and 1800mm wide bands on grids 3 & 4 either side of the core.

The section markers have been retrieved from SPTools…, Symbols… submenu "Sect. Bubble".

From SPMacros…, SPConcrete…, Reinforcement… select "Banded Slab". Individual bars can be placed into the relevant spans of each band, however, this is tedious, so lets use "Band Run" and reinforce all the bands using this programme (except that on Grid 5 - see below)

Oddly enough the band on Grid 5 requires post-tensioning as the superimposed loads from a plantroom are excessive. The "Plan Layout" programme can be accessed from SPMacros…, SPConcrete… Prestressing… Menu area. The tendons are to be placed in the slab band at 600mm centres. Offsets at high and low points are as nominated on Figure S3.

Finally the beam numbers along grid A can be placed by using the "Beam numbers" programme under the "General Macros" menu.

The drawing as shown in Figure S3 should now be on your screen and complete.

If this exercise took longer than expected then now is probably an appropriate time to take a break, if so Save the drawing file before having a break.

FIGURE S4.

Turn on your computer and Run CAD (with Struc Plus active) in the usual manner.

At the File Menu select NEW drawing to begin a new drawing, give this new drawing a name, ie. FIGS4.

At the bottom of the SPTools… pulldown menu, Struc Plus Setup… select either a "TITLE BLOCK SETUP" or "DRAWING SETUP" depending on your preferences and indicate an A1 drawing at a scale of 1:1 followed by "OK" as confirmation.

From the Schedules… submenu of SPTools… select the "Beam Schedule" programme. The relevant information for this drawing is self contained within Figure S2.

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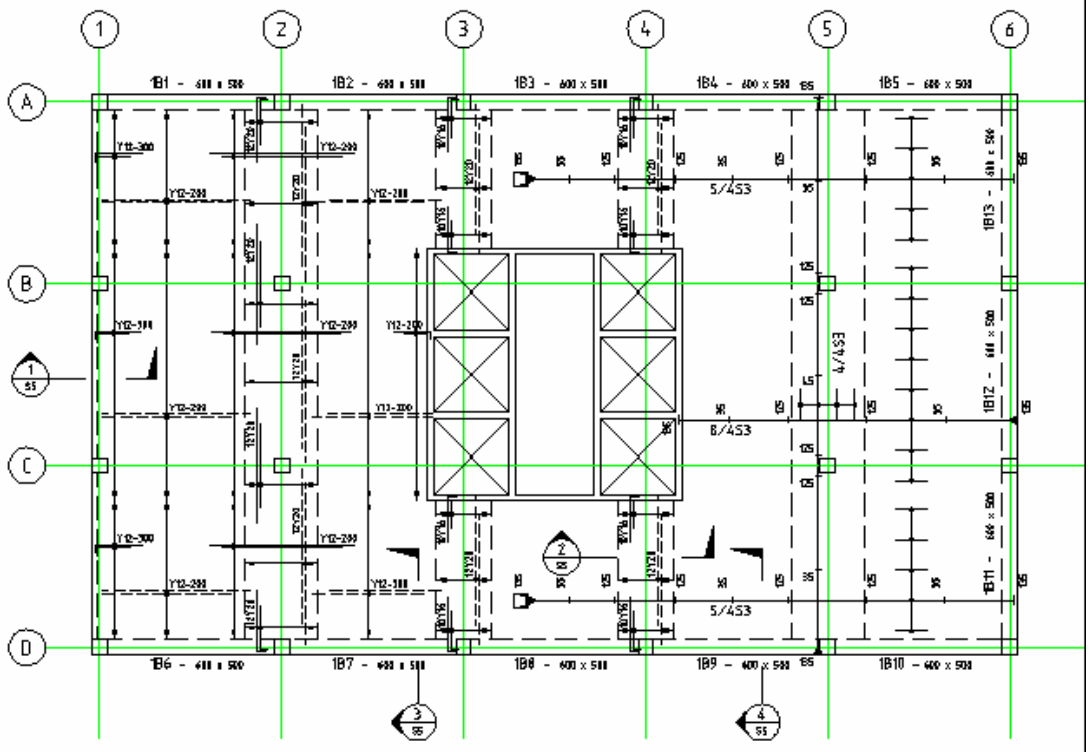
STRUC PLUS TUTORIAL - FIGURE S3



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STRUC PLUS TUTORIAL - FIGURE S4

MARK	MAIN REINFORCEMENT			LIGATURE SPACING					REMARKS
	SUPPORT		SUPPORT	TYPE	LEFT	REMAINDER	RIGHT	LIG COVER	
1B1 600 x 500 P	3Y20	4Y20		Ytz		300	R-200	40	
1B2 600 x 500 P	4Y20	5Y20		Ytz	R-200	300	R-200	40	
1B3 600 x 500 P	4Y20	5Y20		Ytz	R-200	300	R-200	40	
1B4 600 x 500 P	4Y20	5Y20		Ytz	R-200	300	R-200	40	
1B5 600 x 500 P	4Y20	4Y20	4Y20	Ytz	R-200	300		40	

The beam types are "Conventional Bars" and the relevant information for the beams is self contained within Figure S4.

The drawing as shown in Figure S4 should now be on your screen and complete.

If this exercise took longer than expected then now is probably an appropriate time to take a break, if so Save the drawing file before having a break.

FIGURE S5.

Turn on your computer and Run CAD (with Struc Plus active) in the usual manner.

At the File Menu select NEW drawing to begin a new drawing, give this new drawing a name, ie. FIGS5.

At the bottom of the SPTools… pulldown menu, Struc Plus Setup… select either a "TITLE BLOCK SETUP" or "DRAWING SETUP" depending on your preferences and indicate an A1 drawing at a scale of 1:20 followed by "OK" as confirmation.

Section 1 on this drawing is a 200mm thick retaining wall with a floor to floor height of 3000mm. All other information required to draw this section can be read from Figure S5. The programme to draw this can be executed from the SPMacros…, SPConcrete…, Retaining Walls… and "RC Simple 1" selection.

The section markers have been retrieved from SPTools…, Symbols… submenu "Sect. Bubble".

Section 2 on this drawing is through a 350mm x 1800mm slab band. This section can be drawn by running the "Slab band" selection from the SPMacros…, SPConcrete…, RC Beams… As the ligature arrangement is a non standard type from this programme the standard internal band reinforcement must be erased and the "Beam Type 4" programme executed from the SPMacros…, SPConcrete…, Ligatures… sub menu to place the desired internal ligature arrangement.

Section 3 on this drawing is through a 600mm x 500mm edge beam. This section can be drawn by running the "Downturn Edge" selection from the SPMacros…, SPConcrete…, RC Beams… Bar placement is as for the beam schedule on Figure S4.

Section 4 is simply a matter of a "Copy" command on the already drawn Section 3. The 200mm wide x 450mm high upstand on the beam edge can be added by selecting the "Upstand" function from SPMacros…, SPConcrete…, RC Beams… RC Add Ons… menu.

Section 6 can be drawn by running the "Slab edge 1" selection from the SPMacros…, SPConcrete…, Slab On Ground…

The drawing as shown in Figure S5 should now be on your screen and complete.

If this exercise took longer than expected then now is probably an appropriate time to take a break, if so Save the drawing file before having a break.

FIGURE S6.

Turn on your computer and Run CAD (with Struc Plus active) in the usual manner.

Open drawing FIGS1 and Saveas FIGS6. As the basics for this drawing are the same as Figure S1, we don't need to redraw this. If however you have not saved or kept Figure S1 you will need to redo that exercise.

Erase any irrelevant information not required for this drawing, i.e. pad footings, columns and core plan.

All the steelwork framing on this drawing is drawn from the SPMacros…, SPSteelwork…, Framing… menu.

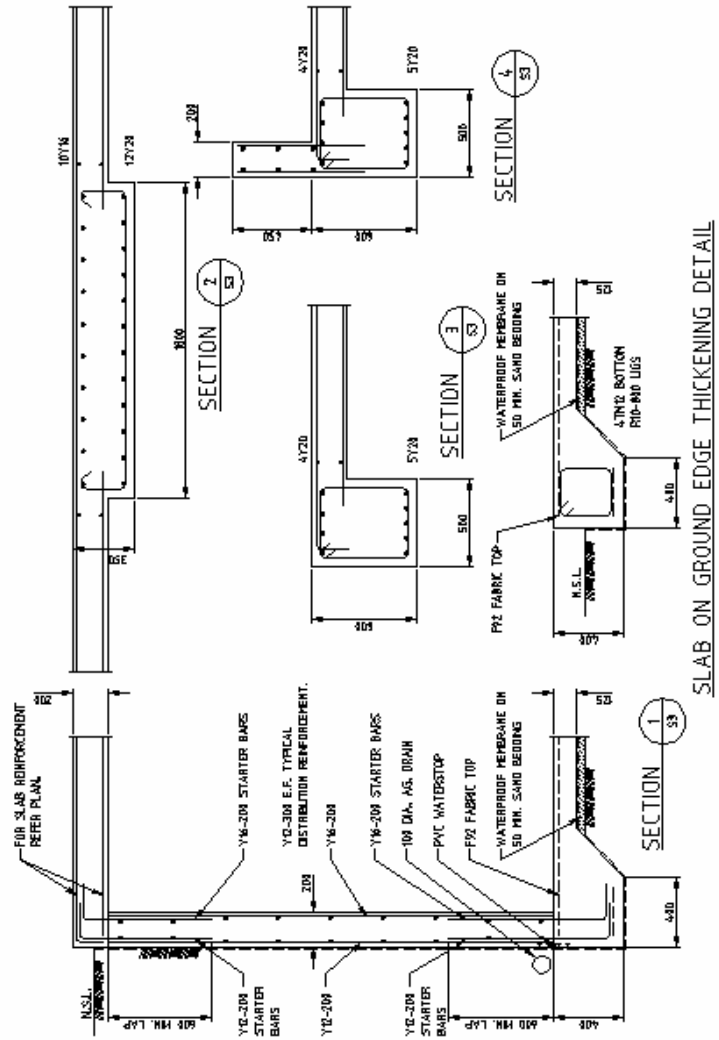
The "Columns" C1 are 530UB82 portal columns and the end wall mullions C2 are 310UB40. Column heights are 3600mm and 4000mm respectively.

Portal rafters and eaves ties are placed by using the "Rafters" programme. Rafter R1 is a 460UB67 and eaves tie R2 a 310UB40.

The roof purlins are at 900mm maximum spacing with a 750mm end span spacing and 300mm centres at the ridge. The eaves and gable overhangs are 400mm. The "Purlins" programme will place all the purlins, bridging and flybracing on this plan.

The roof bracing can be placed in the relevant roof bays by using the "Roof Bracing" programme.

The South Elevation is drawn by executing the "Side Elevation" programme and drawn as shown on Figure S7 with 6000mm bay sizes, member marks as shown and a door in the third bay of 2500mm wide x 3000mm high and placed 1000mm from grid



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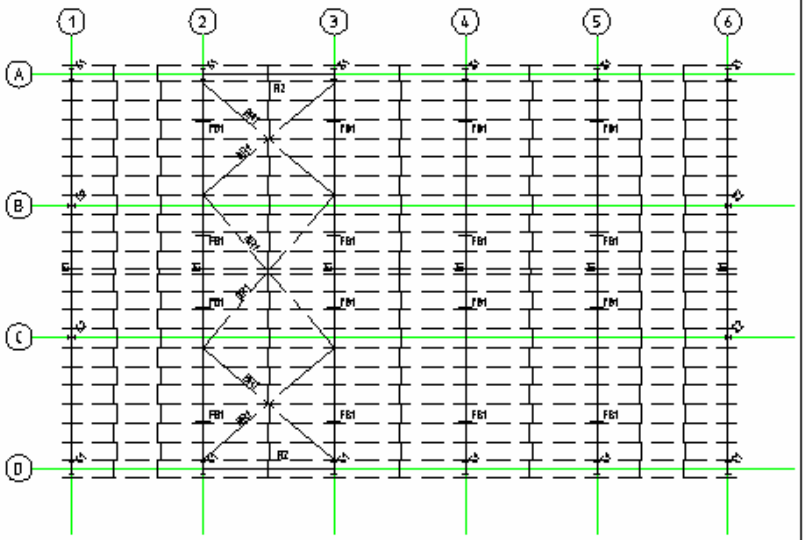
STRUC PLUS TUTORIAL - FIGURE S5



STEELWORK MEMBER SCHEDULE		
MARK	SIZE	REMARKS
C1		-
C2		-
B1		-
R1		-
BR1		-
FB1		-
M1		-
L1		-

STEELWORK TONNAGE

MARK	SIZE	No. OFF	WEIGHT (T)
C1	533UB93	12	3.543
C2	310UB40	4	0.641
B1	460UB67	6	7.024
R2	310UB40	2	0.499
TOTAL TONNAGE			11.656

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STRUC PLUS TUTORIAL - FIGURE S6

3. Pads are 300mm below slab level and are 600mm deep x 1000mm wide. Girts are at 900mm maximum spacing and the first girt is 200mm from the slab level.

The Extract Schedule programme can be used to generate the Steelwork member Schedule and the Tonnage of this frame extracted if required.

The drawing as shown in Figure S6 should now be on your screen and complete.

If this exercise took longer than expected then now is probably an appropriate time to take a break, if so Save the drawing file before having a break.

FIGURE S7.

Turn on your computer and Run CAD (with Struc Plus active) in the usual manner.

At the File Menu select NEW drawing to begin a new drawing, give this new drawing a name, ie. FIGS7.

At the bottom of the SPTools… pulldown menu, Struc Plus Setup… select either a "TITLE BLOCK SETUP" or "DRAWING SETUP" depending on your preferences and indicate an A1 drawing at a scale of 1:20 followed by "OK" as confirmation.

The "Portal Knee 1" programme is accessed from the SPMacros…, SPSteelwork…, Connections… The rafter and column sizes are as per Figure S6, with a roof pitch of 5 degrees, the plates are all 20mm thick with the flange plate weld length on the rafter of 600mm required. A 12mm full length stiffener plate is required at the haunch base. Weld symbols (if required) can be added to the detail by using the programmes under the "Steelwork" "Symbols" menu. The purlin and girt are both 200mm deep and along with the fascia purlin can be placed on the detail by selecting the relevant section from the "Members" area of SPSteelwork… The roof and wall cladding is drawn via CAD commands. The grid line is drawn via an CAD command and the "Grid Bubble" placed from SPTools…, Drawing Tools….. The eaves tie is placed on the grid line by selecting the "Universal Sections" programme under the "Members" area of SPSteelwork. The cleat connecting this beam to the column can be placed by executing the Cleats…, "WSP End" programme.

The bolted ridge connection can be drawn by selecting the "Connections" menu and executing the "Bolted Ridge" programme. The rafter and column sizes are as per Figure S6, with a roof pitch of 5 degrees, the plates are all 20mm thick with the flange plate weld length on the rafter of 600mm required. A 12mm full length stiffener plate is required at the haunch base. Weld symbols (if required) can be added to the detail by using the programmes under the "Steelwork" "Symbols" menu. The purlin and girt are both 200mm deep and along with the fascia purlin can be placed on the detail by selecting the relevant section from the "Members" area of SPSteelwork…

The base plate elevation connection can be drawn by selecting the "Connections" menu and executing the "Base Plate Elev." programme. The column has a 560mm x 20mm base plate and the holding down bolts are at 400mm centres with a 75mm projection and an overall length of 500mm. The base plate grout is also 20mm thick. The girt is 200mm deep.

The base plate plan connection can be drawn by selecting the "Connections" menu and executing the "Base Plate Plan" programme. The column is a 530UB82 with the holding down bolts at 100mm x 400mm centres.

The typical purlin cleat and flybrace details can be drawn the relevant of SPSteelwork…, Connections… programmes.

The drawing as shown in Figure S6 should now be on your screen and complete. Save the file. Congratulations you have completed the Struc Plus Tutorial.

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STRUC PLUS TUTORIAL - FIGURE S7