

# ProtaDetails 2021



# **Quick Start Guide**

For support & training please contact

Support : asiasupport@protasoftware.com Training : asiasales@protasoftware.com

www.protasoftware.com



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## 1. Introduction

Thank you for choosing **ProtaDetails** – a revolutionary automated detailing, drawing management & structural component design program which enables you to:

- > Create automated detail and general arrangement drawings from ProtaStructure models
- Produce quantity take-off and reinforcement schedules
- Sheet management using multiple files
- Create and modify structural details rapidly with intelligent objects & templates
- > Run component design and detailing such as Retaining wall, Pile cap, Stair etc.
- > Output to latest versions of industry standard CAD formats in DWG & DXF

This Quick Start Guide aims to get you up and running quickly. The focus will be on creating automated member and plan drawings. You should be able to learn the fundamental features of **ProtaDetails** in around half an hour.

## 2. Opening a ProtaStructure Project

In ProtaStructure Quick Start Guide, we have analyzed and designed a simple model. We will open the same model in ProtaDetails to produce all the reinforcement details and general arrangement drawings.

- > In **Prota**Structure, ensure the <u>Quick Start Model</u> is opened.
- ➢ Go to Drawings & Reports tab → Click ProtaDetails

ProtaDetails will launch as a separate program. You may close ProtaStructure.

Alternatively, you may launch **Prota**Details from the desktop directly.

Launch ProtaDetails 2021 on your desktop

The Open Project dialog will appear (this is identical to that of ProtaStructure open project dialog)

roject Data Folder:  Users\Vocuments\Pro	taData2021\	QSG_1	Made Bv:			
Choose / Create Folder	Explore		Checked by:			
All Projects	All Releases		Member	Concrete	Rebar	Steel
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Most Recently Used Projects	A-Z O Date		Shearwall	C30/37	Grade 500 (Type 2)	
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- Under the Project Data Folder, pick Choose / Create Folder
- Select the same Data Folder where the 'Quick\_Start\_Model...' which you have saved the model.
- Select the project and click OK



If you want to open the sample completed model, then choose the default **ProtaData2021** folder as **data folder** and open "Quick\_Start\_Guide\_Concrete\_Complete".

## 3. User Interface

The main components and toolbars of **Prota**Details user interface are as shown below.

		in drop down menu				Horizontal To	olba	rs	
Protectetals - Start - Quick, Star File Edit View Format Details Details Drawing Macros Search Detail Drawing Macros Search Details Column Application Plans Si Column Application Plans Si Column Application Plans Si Column Application Plans Si Storey Beam Elevation D Details & Drawin & Macros	t_Guide 1] Tools	Draw Dimensions Modify Setting	s ProtaStructure Design Library Detail Library ProtaStructure Design Library Detail Library ProtaStructure Design Library Detail Library ProtaStructure Design Library Detail Library Learning Resource Prota The List Start Screen / Drawing View	I ↔ S ♥ ⊗ ♥   11   ∰ ፼   16 20   12   9   • • • • • • • • • • • • • • • • • • •		<i>≝</i>		Right-click on any icons to expose the toolbar choices	ne
		Command I	rdDisplay POLAR ORTHO GRID LINEWEIGH		> >	Draw CommandLine			Unit & Scale

The shortcut toolbars are automatically laid out according the your screen size and resolution.

- All commands can be run from the main dropdown menu.
- Shortcut toolbars can be re-positions by simply click, drag & dock to the final position.
- Right-clicking on any of the command will expose the toolbars choices (you can on / off).
- You can type in the command directly in the command box at the bottom. Command shortcuts can be set via Settings → Options → Command Aliases

Search Settings	۵		
	-	Alias	Command
> 💿 ProtaStructure Environment	<b>_</b>	REC	s 🗖 c
v 😰 ProtaDetails Environment		3drotate	Rotate3D
Display		3f	Face
Mouse and Cursor		3r	Rotate3D
Default Line Weight		а	Arc
Command Aliases		aa	Area
Object Snap		ar	ArrayRectangular

When a new project is opened, the Start Screen will appear with the following options :

- Auto Generate Details (Detail Drawing Manager) Automated batch generation of all reinforcement details of reinforced concrete members and general arrangement drawings
- Start By Creating a New Drawing Open up a new blank drawing with file name Drawing1.dwg)
- Open Project Drawing from list Open previously generated & saved project drawings



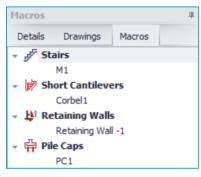
## **Details tab**

Details		巾
Details	Drawings	Macros
R De	tail Drawing	Manager
	port DWG/D	-
) 📅 Fo	rm Plans	
⊢ 🛄 Co	lumn Applic	ation Plans
) 🛉 Co	lumn Elevat	ion Drawings
- 🏢 Sh	earwall Elev	ation Drawings
<b>→</b> 用	St: 1 (+3.00	m, Sim:2,3)
	✓ GW1	
	GW2	
	GW3	
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## **Drawings tab**

Drawings	i i	4						
Details	Drawings	Macros						
- Form	Plan1.dwg							
+ Fo	rm Plans							
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Co	lumn Elevation	S						
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Pa	d Footings							
Bei	am Elevations							
Str	ip Footings							
Co	umn Rebar De	tails						
Co	Column Link Details							
Colun	nn Applicatio	n_ST_1_1.dwg						
Colun	nn Applicatio	n_ST_2_1.dwg						
Colun	nn Applicatio	n_ST_3_1.dwg						
Colun	nn Applicatio	n_ST_4_1.dwg						
Colun	nn Elevation	L.dwg						
Colun	nn Schedule:	L.dwg						

## Macro tab



The **Details** tab lists & organizes all the possible structure details, eg. Form Plans (layout) that can be produced.

Clicking on the triangle preceding the text will expand the list to expose more details.

✓ A tick means that particular detail has been inserted in a drawing

**Green** colored member labels means the member is successfully designed (**Red** = Fail & **Amber** = Analysis out of date)

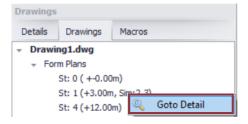
This allows you to easily keep track of and manage details in an efficient manner.

The **Drawing** tab list & organizes all drawings (dwg) files that has been created & what details the drawings contain.

Once a particular drawing has been created & details inserted, it will be added in the list. Clicking on the triangle preceding the main folder will expose more details.

This allows you to easily keep track of and manage drawings in an efficient manner.

If you right-click on a drawing detail, there is option to "Goto Detail" which will locate and zoom in to that detail.



The **Macros** tab lists all the engineering design macros that have been used & created.

If you right-click on a macro, there are additional options to **Edit**, **Delete**, **Goto Detail** & **Open Drawing** directly.

Details	Drawings	Macros	
- 🖉 St	airs		-
	M1		Edit
- 🎢 Sh	ort Cantilev	ers 🗙	Delete
- 💾 Re	taining Wall	s 🔍	Goto Detail
	Retaining Wa	-1 📂	Open Drawing



## **Setting tab**

Before creating any details, it is recommended that you review **Settings** (top menu) such as **Layers** as this directly affects the final output. All the layers, materials, member settings are directly inherited from the ProtaStructure model.

			Description	Name	Color	Opacity	Lin	е Туре	Line Width	Font	Text Height (mm
	Settings and Parameters Manager		- 🗹 Axis								
	Settings and Parameters Manager		Axis Line (Dir 1)	SANOTGRID_E	Blue			CENTER2	1		
TP.	1		Axis Line (Dir 2)	SANOTGRID_E1	253			CENTER2	1		
-	Layers and Text Styles		Axis Label (Dir 1)	SANOTGRID_T	253					Arial Narrow	5
-			Axis Label (Dir 2)	SANOTGRID_T1	253					Arial Narrow	5
	Materials		Axis Circle (Dir 1)	SANOTGRID_T2	Blue			SOLID	1		
5			Axis Circle (Dir 2)	SANOTGRID_T3	253			SOLID	1		
			🖌 Ghost Axis Line	SANOTGRID_E2	254					Arial Narrow	5
		_	- 🗹 Column								
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41	Beam Settings		Column Size Label	5COLNT2	178					Arial Narrow	2.5
			Transfer Column	SCOUNSTOP_E	Blue			HIDDEN2	1		
		-	Transfer Column Hatch	SCOUNSTOP_E2	190			HIDDEN2	1		
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0	options		Column Drop	5COUNDROP_E	Blue			HIDDEN2	1		
			Column Auxiliary Line	Column Aux Line	Red			SOLID	1		
			Column Auxiliary Text	Column Aux Text	178					Arial Narrow	2.5
			- 📃 Column (Detail)								

**Settings** (top menu)  $\rightarrow$  **Options** contains many other settings such as **Display**.

Options					
1		Co	lor	Size / Options	
> 🚺 ProtaStructure Environment	Background Color		White		
🗸 🙆 ProtaDetails Environment	Foreground Color		White		
Display	Cross Hair		210, 210, 210		
Mouse and Cursor	Object Snap		Blue		
Default Line Weight	Grip Color		240, 122, 15		
Command Aliases	Pick Box		Black		
Object Snap	Selecting Window Color		Red		
Other	Selecting Cross Color		0, 128, 0		
	Polar Track		128, 255, 255	Edit	
> Project Preferences	Grid		Black	Edit	
₩ Unit and Format	Rubber Band Color		210, 210, 210		
	Reference Cross Color		Blue		
Stairs					
Retrofit Wall					
> Steel Settings					
Analytical Model Settings	Theme: Custom	<ul> <li>Layers and Styles</li> </ul>	]	Curve Re	esolution: 1000
			1		Show Grips 🗸
Scales	This will replace the existing of You can do further customize	color settings with selected theme. ation using the 'Layer Settings' dialo	DQ.		Show Grips V
> 💥 Rebar			-		
	<b>T</b>				

Click on the triangle to expose more options. Click on Scales to examine all the default scales used.

Search Settings	٩		
		Scale (1/)	Coeff.
> 👍 Foundation	Drawing	50	
🔊 Stairs	Column Schedule	20	2.5
🛄 Retrofit Wall	Column Elevations	20	2.5
Steel Settings	Column Application	20	2.5
> Analytical Model Settings	Beam Detail	25	2
	Pad Footing Detail	25	2
Scales	Retaining Wall Detail	25	2
> 🔆 Rebar	Line Type	100	0.5
🗢 🗁 Plan Details	Culvert Plan	50	1

You may change any of the settings before creating the details. Settings that are saved in **ProtaDetails** will automatically apply to the same project in **ProtaStructure** (as both share the same project files).



# 4. Draw All Model Details

The quickest way to create all the details in one go is to go to use the **Auto Generate Details** function in the **Start Screen**.

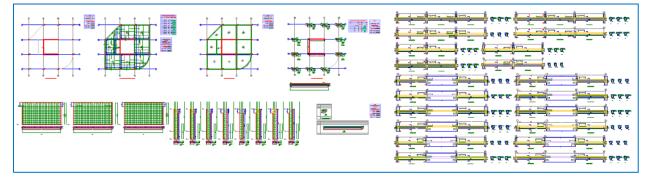
> Alternatively, go to **ProtaStructure** (top menu)  $\rightarrow$  **Details Drawings Manager** 

Prot	taStructure	
⊠	Detail Draw	ings Manager

A dialog will appear, giving you options to include or exclude the various details. Each detail has further option when it is selected.

Draw Details  St: 0 (+0.00m)  St: 1 (+3.00m, Sim:2,3)  St: 2 (+6.00m, Sim:1,3)  St: 3 (+9.00m, Sim:2,1)  St: 4 (+12.00m)  Deselect All	Form Plan      Column Application      Column Elevation      Column Schedule      Beam Elevation      Draw On Separate Files	(\) (\) (\) (\) (\) (\) (\) (\) (\) (\)			Show Dimensions Pad Footing Strip Footing Slab Hole Din Column Dime Shearwall Dir Form Plan Sit Hatch Colum	Dimensions nensions nensions de Dimensions ns\Shearwalls	Column Loads
	Tinsert To Sheet To Sheets Side by Side Generate Sheet List		rt Quantity Table rt Model Info	📄 Insert T	o Sheet Ine Sheet List	Sher	et: A0_Prota.dxf Scale: 1/ 50 Cancel

- > Choose the details you want to produce by checking on the various options
- > Uncheck Draw On Separate Files (so all details are inserted to a single drawing file)
- > Click Draw & all the details including the plan drawings will be created



- *Close* the drawing file by clicking on the **X** icon of the drawing
- = ×

When prompted to save, pick NO



While this method is the quickest way to insert all the details, it may not be suitable in a real project to insert all the details into a single drawing. In the following sections, we will insert various details into different drawing files to demonstrate how details and drawings can be managed systematically.

# 5. Creating Plan / Layout Detail

We will now create the plan details of the project and insert it in a new drawing.

- $\succ$  Go to File (top main menu) → New Drawing to start a new drawing
- > Double-click on **Detail Drawing Manager** at the top of the **Details** tab

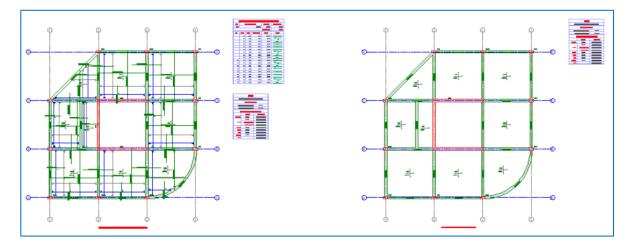
Details	Draw Details			
Details Drawings Macros	<ul> <li>✓ St: 0 (+0.00m)</li> <li>✓ St: 1 (+3.00m, Sim:2,3)</li> <li>✓ St: 2 (+6.00m, Sim:1,3)</li> </ul>	Form Plan     Column Application     Column Eevation	Options Options 2 Options 3 Show Rebars	Show Dimensions
	✓ St: 3 (+9 00m, Sim 2, 1) ✓ St: 4 (+12.00m) Deselect All	Column Schedule	V Top Rebars V Top Rebars V Top Rebars V Top Rebars Slab Hole / Drop Rebars V Mat Foundation Stand Bar	Pad Footing Dimensions     Ship Footing Dimensions     Sub Hole Dimensions     Column Dimensions     Sheewall Dimensions     Form Plan Side Dimensions
Shearwall Elevation Drawings     Hit Shearwall Elevation Drawings     E Storey Beam Elevation Drawings		Draw On Separate Files Insert To Sheet Draw Sheets Side by Side		Display Column Loads Column Loads
		Generate Sheet List	Insert Model Info	te Sheet List Scale: 1/ 50 Draw Cancel

A dialog showing options to show slab reinforcement bars, member dimensions & hatching columns will be shown. Foundation plan showing raft, footing & pile caps (if any) will be shown in **St:0** 

## > Ensure that **all Storeys** & **Form Plan** are selected

You can multiple select or deselect by holding down the CTRL key & left click continually.

- $\succ$  Go to **Options 2 & 3** tab and review all the additional settings → **Draw**
- > Click anywhere in the drawing to insert the plans detail



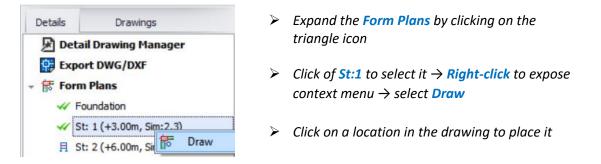
Go to File (top main menu) → Save Drawing As



- Change the File Name to 'Plan Layout' and then click OK
- Alternatively, to quickly generate Form Plans only :

Details Drawings Macros	Select Form Plans
Detail Drawing Manager	➢ Right click → Draw Form Plans
Export DWG/DXF     Export DWG/DXF     Form Plans     Column App	

For information, if you would like to insert the plan detail of a particular storey :

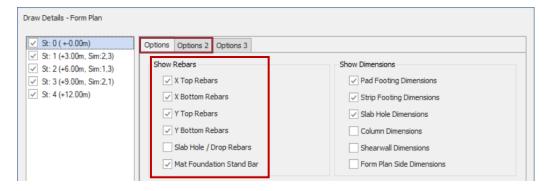


**Tip** : The **green tick** next to the storey indicates the detail has been inserted in a drawing. 2 nos. of green ticks indicate the detail has been inserted twice.

## 6. RC slab cross sections with reinforcement detailing

Reinforced slab cross section can be created with reinforcement detailing. In **Prota**Details, cut sections anywhere along the layout plan drawing and position it anywhere within the drawing sheet.

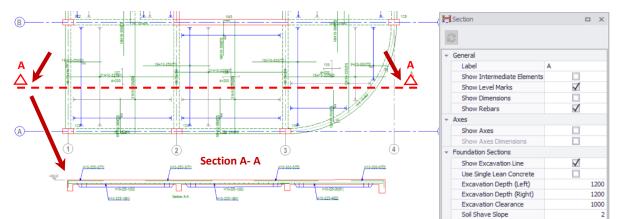
- Firstly, the slab reinforcements must be shown on the plan layout. If not, then ensure the following :
  - > In **Prota**Structure, ensure that all the slabs reinforcement has been designed using slab strips.
  - ➢ Go to Drawings & Reports tab → Launch ProtaDetails
  - In ProtaDetails, generate the Form Plan drawing ensuring options to Show Rebars are checked



**Tip** : More slab detailing options are available tin the **Options 2** tab.



- ➢ Go to Detail Library (top menu) → Pick Plan Sections 1
- > Alternatively, in the **Command** line at the bottom, type "FormSection"
- > In the Section dialog, input / select the preferred options
- > Draw a "section cut" line by clicking on 2 points on the plan view



Click on the desired location to place the section detail

Tip : Click (orthogonal) icon at the bottom to ensure the line is exactly horizontal/vertical.

# 7. Creating Column & Wall Schedules

We will now produce the column/wall schedules in a new drawing.

- > Go to File (top main menu)  $\rightarrow$  New Drawing to start a new drawing
- > Double-click on **Detail Drawing Manager** at the top of the Details tab

Form Plan Column Application Column Elevation Column Schedule	Filter Options	Columns 🔽 Shea	rwalls 🗸 Retr	ofit Walls	Display Ax	is Labels 🗌	
Beam Elevation	~ St: 1 (+:	3.00m, Sim:2,3)				*	
	GC1	GC2	GC3	GC4	GC5		
	GC6	GC7	GC8	GC9	GC 10		
	GW1	GW2	GW3				
	St: 2 (+6.00m, Sim:1,3)						
	1C1	1C2	1C3	1C4	1C5		
	106	1C7	1C8	1C9	1C10		
	1W1	1W2	1W3				
Draw On Separate Files						Select All	
Insert To Sheet							
Draw Sheets Side by Side	Insert Quantity Table		Insert To S	Sheet	Select Sheet		
Generate Sheet List	Insert Mode	Insert Model Info		SheetList	Scale	: 1/ 20	

Check Shearwalls to include shear walls too

Go to the **Options** tab

Pick Column Schedule  $\rightarrow$  Filter tab dialog allows you choose which columns/walls to be included.

By default, all columns of all storeys are selected.

If you would like to re-choose particular columns / walls, simply hold down the **CTRL** key and then pick on individual columns & walls.

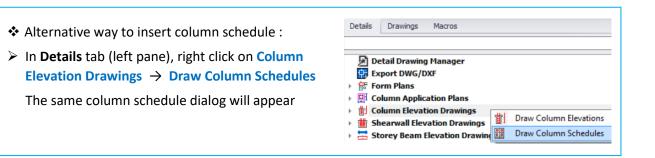
You can also hold down the SHIFT key  $\rightarrow$  Pick the first element  $\rightarrow$  Pick the last element  $\rightarrow$  all elements in between will be selected as well.



🗹 Draw Column Insertion Axes		V Print Column Labels Belov	v the Table			
Dimension Column Insertion	Axes	Print Storey Labels Above	e the Column			
Vite Axes Labels On Section	ı	Group Similar Columns				
V Dimension Column Section		Draw Bottom Section For	Slanting Column			
Center Column Labels and Tex	ts in Cell	earrow Create Seperate Tables for Columns and Shearwalls				
Draw Seperator Lines Between	n Label Texts	Show Link Details				
V Print Column Insertion Axis La	bels	Similar Storey Note:	AS BELOW			
🗹 Draw Column Vertical Seperat	or Lines	Link Count:	Hide			
🔲 Draw Outline of Change in Col	umn Size					
Insert Quantity Table	🗌 Ins	ert To Sheet	Select Sheet			
Insert Model Info	Cor.	erate Sheet List	Scale: 1/ 20			

The Options tab contains more settings that controls the output & presentation of the drawing. The newer options are explained below :

- Group Similar Columns columns with same section size and rebars will be grouped together
- Draw Bottom Section for Slanting Column Adds additional bottom section cut for slanting column
- Draw Outline of Change in Column Size if column changes sizes between storeys, the outline lower column will also be drawn.
- 2,84,04,04,0-3,0-2,84,0 Codes de 2(55), Euroade 1(55), Euroade3 (55 Soil Parameters 32.2 (48.00 T 200.00 etal Proceties (D C3037 Grade 500 (Type) Grade SOD (T)ge Long, Web Reb Grade 500 (Type 2 Grade 500 (T)ge 2) C3037 Grade 500 (Type 2 C 30.3 Grade SCO (Type) Frade 500 (Type 2 C 30 31 Grade 500 (Type 2) Grade 500 (Type 2) 8-248-3 14120 AS BELOW 2(48) 162 \$250.05
- > Click **Draw** & Click on a location in the drawing to place it (as shown below)





# 8. Creating Column Elevation Details

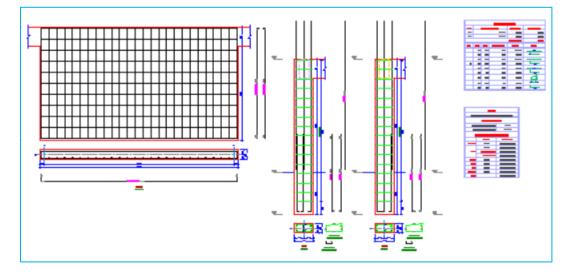
We will now insert the column elevation details in the same drawing.

> Double-click on **Detail Drawing Manager** at the top of the Details tab

ay Axis Labels 🗌
n n
U
Select All
A0_Prota.dxf
Scale: 1/ 20
Scale

- ➤ Alternatively, right click on Column Elevation Drawings → Draw Column Elevations
- > In the Column Elevation dialog, check only Column Elevation
- ➢ Go to Options tab to review more settings → Draw
- Click on a location in the drawing to place the detail

All the columns & wall elevation details and the quantity table will be created as shown below



We will now insert the combined column elevation spanning multiple storeys.

- **Expand Column Elevation Drawings**
- $\blacktriangleright$  Expand ST: 1  $\rightarrow$  Select 1C1 or GC1

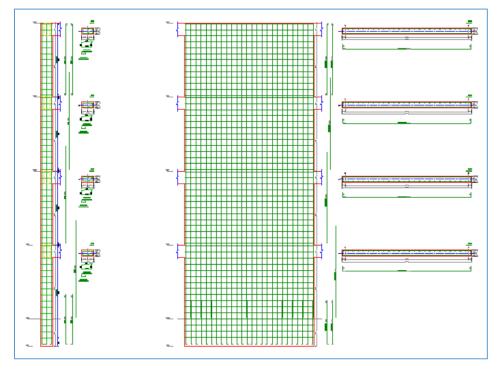


➢ Right click → Draw Column Elevation (Through Storeys)

Details Drawings Macros	Select Storeys
<ul> <li>Detail Drawing Manager</li> <li>Export DWG/DXF</li> <li>Form Plans</li> <li>Column Application Plans</li> <li>Column Elevation Drawings</li> <li>St: 1 (+3.00m, Sim:2,3)</li> </ul>	Storeys           St: 0 (+0.00m)           St: 1 (+3.00m, Sim:2.3)           St: 2 (+6.00m, Sim:1.3)           St: 3 (+9.00m, Sim:2.1)           St: 4 (+12.00m)
<ul> <li>✓ 1C2</li> <li>✓ 1C3</li> <li>✓ 1C3</li> <li>✓ 1C4</li> </ul>	OK Cancel

Note individual column elevation and schedules options are available in the menu.

- > In Select Storey dialog, ensure all Storeys is selected  $\rightarrow OK$
- Click on a location in the drawing to place the detail
- Expand Shearwall Elevation Drawings
- $\succ \text{ Expand ST: } 1 \rightarrow \text{ Select } 1W1 \text{ or } GW1$
- > Repeat the same steps to insert the detail for the wall (as shown below)



- Go to File (top main menu) → Save Drawing
- > Change the File Name to Column Schedule & Elevation and then click OK



# 9. Creating Column Application Plans

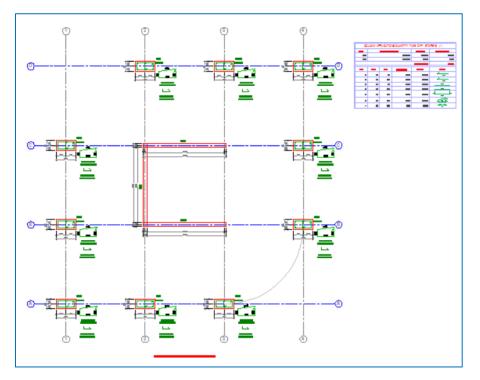
The column application plan shows the column reinforcement on the plan layout view. The columns will need to be drawn to a bigger scale than the plan view in order to show the reinforcement clearly.

- $\succ$  Go to File (top main menu) → New Drawing to start a new drawing
- > Double-click on Detail Drawing Manager at the top of the Details tab
- ➤ Alternatively, right click on Column Application Plans → Draw Column Applications

Draw Details - Column Applica ♥ St: 1 (+3.00m, Sim:2.3) ♥ St: 2 (+6.00m, Sim:1.3) ♥ St: 3 (+9.00m, Sim:2.1) ♥ St: 4 (+12.00m)	tion		
Deselect All	Insert Quantity Table	Insert To Sheet	Sheet: A0_Prota.dxf
	Insert Model Info	Generate Sheet List	Scale: 1/ 20
			Draw Cancel

▶ Ensure that all storeys are selected  $\rightarrow$  Pick Draw  $\rightarrow$  Click a location to place the detail

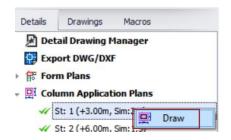
The below shows an example of column application plan.





- ➢ Go to File (top main menu) → Save Drawing
- > Change the File Name to 'Column Application Plan' and then click OK

For information, if you would like to insert column application plan of a particular storey :



- Expand Column Application Plans
- Select a particular Storey
- ▶ Right click on the storey  $\rightarrow$  **Draw**

# **10.Creating Beam Elevation Details**

We will now insert the beam elevation details in a new drawing.

 $\succ$  Go to File (top main menu) → New Drawing to start a new drawing

Details         Drawing         Mac           Search	iger Plans awings Drawings on Drawings	Beam Elevations (All Axes)		In the Details tab → righ Elevation Drawings Pick Draw All Beam Elev			am.
Draw Details - Beam Elevation					Select Sheet		×
✓       St: 0 (+0.00m)         ✓       St: 1 (+3.00m, Sim:2.3)         ✓       St: 2 (+6.00m, Sim:1.3)         ✓       St: 3 (+9.00m, Sim:2.1)         ✓       St: 4 (+12.00m)	Filter         Options           A         3           3         1           C         B           2         D           @1         @3	1B1 - 1B2 - 1B19 - 1B17 - 1B           2B1 - 2B2 - 2B19 - 2B17 - 2E           3B1 - 3B2 - 3B19 - 3B17 - 3E           +B1 - 4B2 - 4B19 - 4B17 - 4E           1B3 - 1B15 - 1B13           2B3 - 2B15 - 2B13           3B3 - 3B15 - 3B13           4B3 - 4B14 - 4B13           1B5 - 1B4           2B5 - 2B4           3B5 - 3B4           4B5 - 4B2           4B5 - 4B4           2B5 - 2B4           3B5 - 3B4           4B5 - 4B2           2B6 - 2W1 - 2B12	814 814		Sheet List A0_Prota.dsf A0_Prota.dsf A1_Prota_Horizonta A2_Prota.dsf A2_Prota.dsf A3_Prota.dsf A3_Prota_2.dsf A3_Prota_Horizonta A3_Prota_Joff A3_	al.dxf al.dxf BEAM ELEVAT	TIONS
Deselect All	Select All			Select All	Number Of Sheets:		1 🐥
	Insert Quantity Table		: To Sheet ate Shee		Alignment: Prefix:	Start No:	Suffix: Cancel

- Check the option to insert the Insert Quantity Table
- > Check Insert to Sheet  $\rightarrow$  Pick Sheet  $\rightarrow$  Choose A0\_Prota.dxf in Sheet list
- ◆ You can save your own sheet in C:\Users\[User]\Documents\ProtaLib\Sheets.

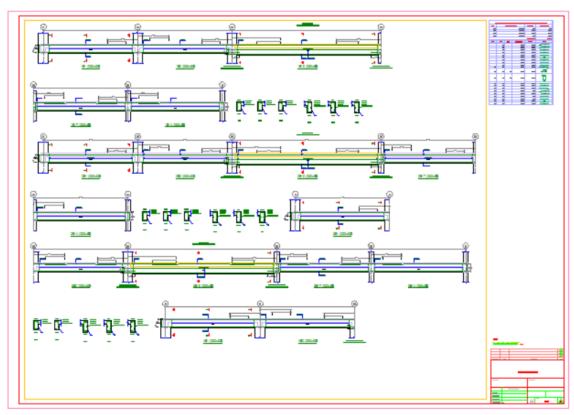
By default, beams detail wider than the sheet will be auto-truncated from sheet border.

Go to Options tab



Draw Details - Beam Elevation	Filter Options	
<ul> <li>✓ St: 1 (+3.00m, Sim:2,3)</li> <li>✓ St: 2 (+6.00m, Sim:1,3)</li> <li>✓ St: 3 (+9.00m, Sim:2,1)</li> <li>✓ St: 4 (+12.00m)</li> </ul>	Beam Detail Settings           ✓ Insert Concrete Beam Schedule           Draw Each Storey On a Separate File	Beam Axes Wider Than Sheet         Truncate The Closest Axes From Sheet B         Repeat Previous Span in Cropped Piece         Min. Truncation Width         4000 mm
Deselect All		Distance to Sheet Edge 1000 mm Horizontal Spacing Between Elevations 1000 mm Vertical Spacing Between Elevations 1000 mm
	Insert Quantity Table	Insert To Sheet Generate Sheet List Scale: 1/ 25 Draw Cancel

- > Pick how to truncate under **Beam Axes Wider Than Sheet** by select from drop down :
  - Don't Truncate even if beams details are out of sheet border
  - Truncate from Sheet Border
  - Truncate The Closest Axes from Sheet Border will ensure truncation only at axes
- > Check the **Option** to insert the **Insert Concrete Beam Schedule**
- $\succ$  Click **Draw**  $\rightarrow$  Click a position in the drawing to insert all the beam elevation details





The Concrete Beam Schedule shows the beam reinforcement in tabular format (as below)

U U U U U U U U U U U U U U U U U U U															
	Concrete Beam Rebar Schedule:[1]														
		Beam			Тор	Reinforceme	ents	Bot	tom Reinforcem	ents	Links Side Bars Rema			Remarks	
	Width	Depth	Span	-			D: 14			D: 14			D: 11		o:
Mark	(mm)	(mm)	(mm)	Туре	Left	Center	Right	Left	Center	Right	Left	Center	Right		Similar
1B1	250	500	5000	E1		2H16	3H13		3H13		H10-300	H10-300	H10-300		
1B2	250	500	5000	INT	2H16	2H13	3H25		3H13		H10-300	H10-300	H10-300		
3B19	250	600	7890	INT	3H25	3H16	3H25		3H16		H10-200(T)	H10-200(T)	H10-200(T)	H20	
3B17	250	500	5000	INT	3H25	3H13	3H13		3H13		H10-300	H10-300	H10-300		
3B14	250	500	5000	E2	3H13	2H13			3H13		H10-300	H10-300	H10-300		

#### Save the drawing file as 'Beam Elevations'

#### Inserting beam details individually

If you only want to insert a particular beam axis:

Expand the Storey ST:1

Details		
Details	Drawings	Macros
Det	ail Drawing M	lanager
Exp	ort DWG/DXF	
For	m Plans	
F 🔤 Coli	umn Applicati	ion Plans
🕨 🎁 Coli	umn Elevation	n Drawings
🕨 🎁 She	arwall Elevat	ion Drawings
- 🗮 Sto	rey Beam Ele	vation Drawings
- 月 :	St: 1 (+3.00m,	Sim:2,3)
	🗸 1B1 - 1B2 -	1819 1817 1814
	1B10 - 1B11	

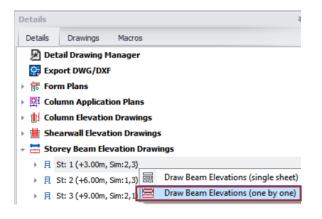
The beams will be listed along the design & detail axes; similar to the way it is presented in ProtaStructure beam design.

- Select any of the beams, eg. 1B1-1B2...
- $\succ$  Right click  $\rightarrow$  **Draw**
- > Click the position to insert the detail in the drawing space.

A green tick will appear next the beam axes to indicate the beam detail has been inserted.

## Inserting beam details one by one

To insert the beam details of all axes of a particular storey in a batch mode:



- Select St:1
- $\blacktriangleright$  Right click  $\rightarrow$  **Draw Beam Elevations (one by one)**
- Click the position to insert the 1<sup>st</sup> beam detail in the drawing space
- Continue to click successively to position the other beams
- Press Esc to end the process prematurely



# 11. Search a Member Detail or Text

There are search functions quickly find, filter & locate a member detail or text, example beam 1B1.

## How To Use Search in Treeview :

- ➢ Go the Details tab
- Input a member label, e.g. 1B2 in the box

Only the details with the exact name match will located & displayed. You can then draw out this detail only.

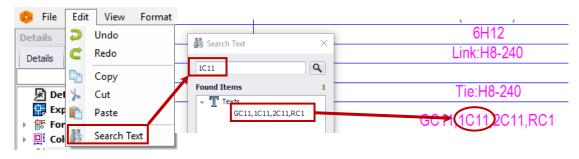
Detail	s Di	rawings	Macro	s			
1B2							
👻 🗮 Storey Beam Elevation Drawings							
-	用 St:	1 (+3.0	0m, Sim:2	)			
	-44	1B2 - 1B	31	Draw			

 $\blacktriangleright$  Right-click  $\rightarrow$  Draw

This is very useful if you only want to draw out a particular detail, not all of them.

After drawing details or objects in the drawing, you can use the new text search function to locate it.

## How To Use Text Search :



- > Go to Edit → Search Text (CommandLine: SearchText)
- ▶ In the Search Text dialog, type the **text**, eg. 1C11  $\rightarrow$  Enter
- > Double-click on the found items & it will be located & zoomed into focus

You can use this function to search for all texts in primitive entities and intelligent objects as well.

## 12. Drawings

The **Drawings** tab keeps track of various details that have inserted and also the drawing files created. This will enable you to manage your project details and drawings in a systematic and efficient manner.

ProtaDetails - [Quick_Start_Guide_Conc				
😕 File	Edit	View	Format	То
Drawings 4				
Details	Drawin	ngs M	acros	
Beam Elevation.dwg				
▶ Form Plan.dwg				
<ul> <li>Column Schedule &amp; Elevation.d</li> </ul>				
For	Form Plans			
Column Applications				
Colu	umn App	lications		
	ımn App ımn Elev			
		ations	o Detail	

- Click on the **Drawings** tab to review all the drawing files saved and what the details they contain
- > Click on triangle icon to expand or collapse the details
- Verify that all details have been inserted

To locate a member detail in a drawing :

- > Ensure that the drawing is opened
- > Locate the member by drilling down the triangle

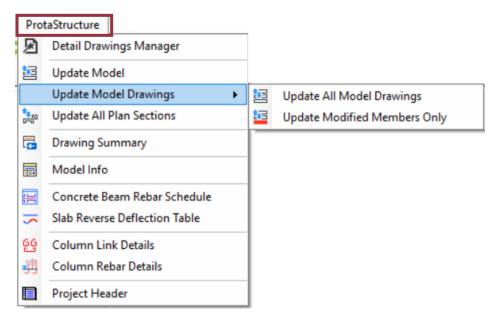
 $\blacktriangleright \quad \text{Right-click } \rightarrow \textbf{Goto Detail}$ 

The member detail will be located and zoomed into focus in the drawing.



# 13. Drawing Management

There are functions to draw and update the details which are accessible from **ProtaStructure** tools (top menu) :



**Update All Model Drawings** – updates all the model drawings without checking if anything has changed in ProtaStructure model. This is a forced update. All the drawn items are forced to be regenerated.

**Update Modified Members Only** – checks and gives a summary of all the members modified in ProtaStruture. If you choose to continue you get only modified members to update.

Update All Plan Sections - updates all the sections of the plan view that are manually created.

Drawing Summary - creates a table of drawing file names and their respective detail components.

Model Info - Inserts a table showing project information summary such as materials & parameters.

**Concrete Rebar Schedule** – Inserts the concrete rebar schedule of a particular storey.

Column Link Details – Draws the link details for columns & the Quantity Table

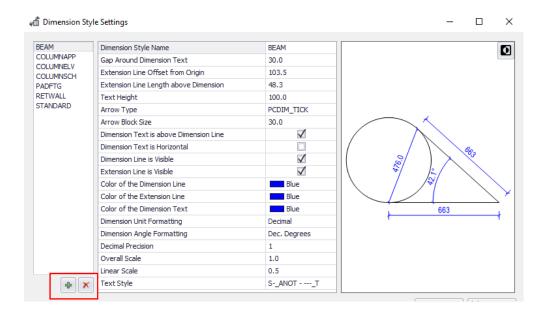
Column Rebar Details – Draws the main reinforcement column details & the Quantity Table



# **14. Dimension Styles Interface**

Dimension styles can be edited using this interface and can be saved along with the project

- > You can find it under **Formats** (top menu) > **Dimension Styles**
- > All the necessary dimension styles for detail generation will come predefined
- Use "+" and "x" buttons to add/remove dimension styles
- Edit them as you wish. When you click "Ok" they will be saved in the project data. There is no need to save project or drawing explicitly.



# 15. Multiple selection of Tables for report generation

Any table drawn in ProtaDetails can be converted to a report and generated via the Report Manager.

## How To Use:

- Select a table or multiple select tables (hold down CTRL)
- ➢ Right-click → Add to Report
- ➢ Give it a title → OK
- The report will be created

This particular report will also be added in the report repository **Report Manager** in ProtaStructure (under Other Structural Members)

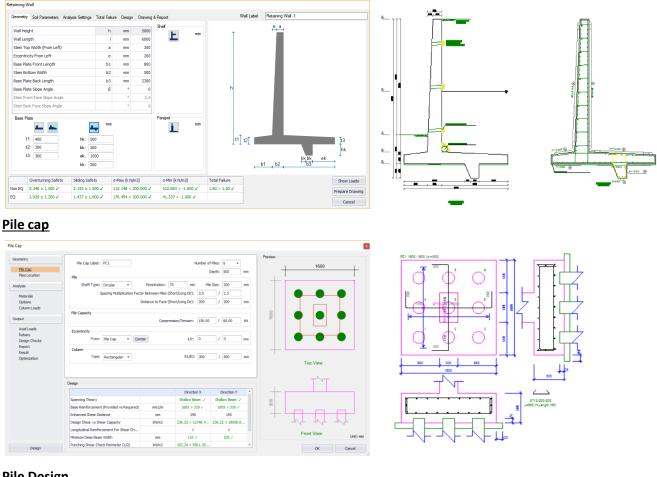
4	со	UMN APPLICATIONS QU	ANTITY TAKE OFF STOREYS: (4)
	8IZE	UNIT WEIGHT ((tom)	Length (m) T. WEIGHT (kg)
1	HS		
	H12	ProtaDetails	
	H20		Please specify the report name.
	EN 1		CATIONS QUANTITY
	2 3	••••	OK Cancel
	4 5	In	valid Characters: * . \" / \\ [ ] : ;   = ,
	0		



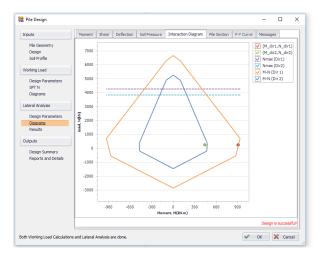
# **16.Engineering Design Libraries**

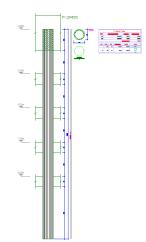
Structural components design & detailing such as the Cantilever Retaining Wall, Pile Cap, Pile Design, Engineering Utilities, Stairs, Corbel & Pool are available via Design Libraries (top menu). These powerful engineering modules provide full calculation report, detail drawings and quantities.

## **Cantilever retaining wall**



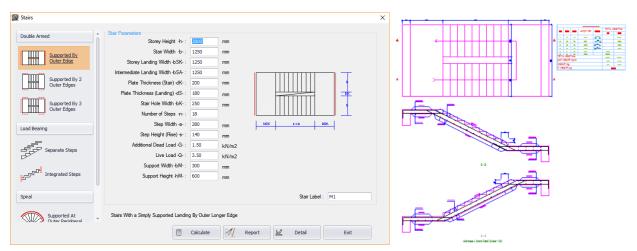
## Pile Design



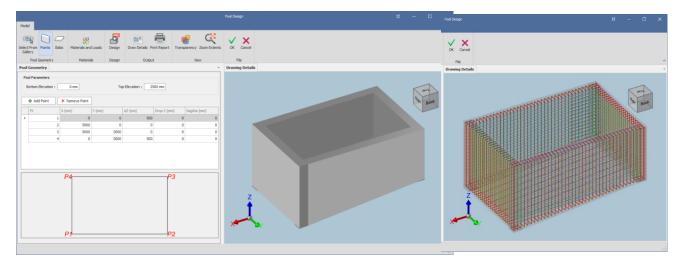




#### **Stairs Design**



## Pool Design



After running the design library, close the module and click on anywhere in the empty drawing to insert the detail & the quantity table (if applicable). The calculation will then be added in the **Macros** tab.

Details	Drawings	Macros	
- 🖉 St	airs		
	M1		Edit
- 📝 Sh	Corbel1	ers 🗙	Delete
- 💾 Re	taining Wall	s 🔍	Goto Detail
Retain	Retaining Wa	-1 📂	Open Drawing

If you right-click on a macro, there are additional options to **Edit**, **Delete**, **Goto Detail & Open Drawing** directly.

Save the drawing to ensure the engineering macros are retained when the drawing is closed.

These engineering libraries will be expanded continually to cater to your engineering needs. We encourage you to feedback to us what you would like to see next.

You may continue to run the engineering libraries as outlined in the following sections.



# 16.1 Engineering Utilities for quick engineering design & calculation

The handy **Engineering Utilities** can be used for quick engineering design. This includes a calculator for concrete cover, rebar anchorage & lap lengths; simple beam analysis tool to calculate maximum shear, moment and deflections; hydraulics calculator for uniform flow depth & gradually varied flow, etc.

## How to Use

 $\succ$  Go to **Design Library** (top dropdown menu) → **Engineering Utilities** 

🕼 Engineering Utils - 🗆 X 🐼 Engineering Util	×
Sited Bars         Cover and Anchrage Hokklangth Rebar Area Galadar         Others         Unit Conversion         Sted Bars         Unit Conversion         Subject Bars         Select Loading Type:         Unit Conversion         Subject Bars         Select Loading Type:         Unit Conversion         Length of the Boom:         Length of the Boom:         Length of the Boom:         Modulus of Elastochy (2):         200000.0Njmm2         Moment of Durits (2):         2.00 mil         Moment of Durits (2):         Vi = 15.00         Maximum Moment :         Unit ZSHUM         Maximum Moment :         Unit ZSHUM         Deflection + AtLoading Point :         Owm	arage Lalator Alator Al

The following is the complete list of the modules and their functions :

- 1. Cover and Anchorage Calculator
  - Calculates concrete cover, anchorage and lap lengths
- 2. Hook Length Calculator
  - Calculates rebar bending, extension & total hook length
- 3. Rebar Area Calculator
  - Calculates provided steel area per meter (e.g. 10H16 @ 100mm spacing) based on required steal area

## 4. Unit Conversion

- $\blacktriangleright$  Converts common engineering units, eg. Pascal (Pa)  $\rightarrow$  Kilopound Per Square Inch (ksi)
- 5. Simple Beam Analysis
  - Calculates maximum shear, moment & deflection for single span beam with various support condition such as simple, cantilever & fixed end

## 6. Uniform Flow Depth (Hydraulics)

Solves for discharge, flow depth, channel width or channel slope for rectangular, trapezoidal or circular channels under 'uniform flow depth' condition

## 7. Gradually Varied Flow (Hydraulics)

Solves for discharge, flow depth, channel width or channel slope for rectangular, trapezoidal or circular channels under 'gradually varied flow' condition



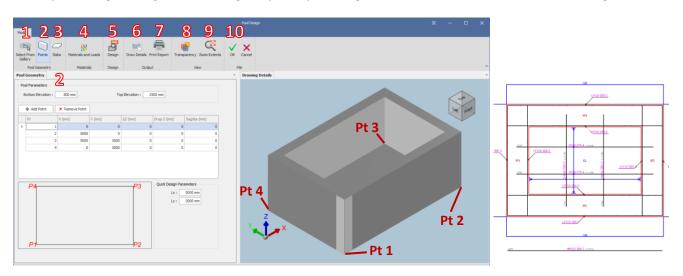
# 16.2 Pool Design / Tank Design

The Pool Design can be used to analyze, design and detail pool or tank of various shape and sizes. You define different soil profiles surrounding the pool walls and apply various surcharge loads on the soil.

## How to Use

#### $\blacktriangleright$ Go to **Design Library** (top dropdown menu) $\rightarrow$ **Pool Design**

In the pool design dialog start defining the pool by starting on the left most icon and move to the right.



#### 1. Select from Gallery

- Select the type of pool for the choices provided
- 2. Points : Defines the characteristic & shape of the walls of the tank
  - *Enter bottom* & *top elevation* of the tank. The difference is the tank depth.
  - *Points table* : Define the bottom joint coordinates of each tank wall. Also the curvature.
- 3. Slabs : Defines the characteristic & shape of the bottom slab(s) of the tank
  - *Points table* : Define the bottom joint coordinates of each slab. Also the edge curvature
- 4. Materials & Loads : Define material, code, soil model & surcharge loads.
  - > Material : Choose Concrete grade, rebar grade & diameter for design
  - Settings : Choose the design code & parameters
  - Soil Model : Choose active or passive load side, long or short term load, water table level, etc
  - Soil Profile : Define the soil profile & layers
  - Surcharge : Input surcharge loads (point, line, strip & surface load)
  - **Results & Report** : Print & review the analysis results of the walls, e.g. active pressure & forces
- 5. Design : Design the wall and base slab of the tank
  - > Change the wall & slab thickness & click **Renew Rebar Design** (if the first round of design fails)
  - > Pick load cases to consider, e.g. post construction, operations, maintenance & earthquake
- 6. Draw Details : Draw the reinforcement details in including plan and cut sections.
- 7. Print Report : Print the entire pool reporting including geometer, analysis and design.
- 8. Transparency : Shows the reinforcement in 3D.
- 9. Zoom Extent : Zoom to extent of the diagram
- **10. OK** : Click OK to exit and place the detail drawing into the current opened drawing.



# 17. Closing Summary

Congratulations! You have completed your first project of automated detailing & general arrangement drawings production & management in **ProtaDetails**.

In this Quick Start Guide, you had firsthand experience how easy it is to create all the detail reinforcement & layout drawings of the project model you first started in **ProtaStructure**. You also discovered how the engineering component design libraries (such as the retaining wall) enable you to efficiently produce comprehensive analysis & design reports and detail reinforcement drawings with quantity take-off.

We recommend you go through the *What's New* document on the new and enhanced features of ProtaDetails.

There are many more powerful detailing features such as intelligent objects in **ProtaDetails**. For more help and guidance, please refer to the help reference accessible from Help menu.

Alternatively, you can attend our training courses to obtain a more in-depth knowledge of the usage of the software. Please visit our website <u>www.protasoftware.com</u> for more information.