

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

12d Model SCIRT Standards

Story: 12d – One-Stop Shop Design Tool

Theme: Design

A document which sets out the 12d standards at SCIRT.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit www.scirtlearninglegacy.org.nz



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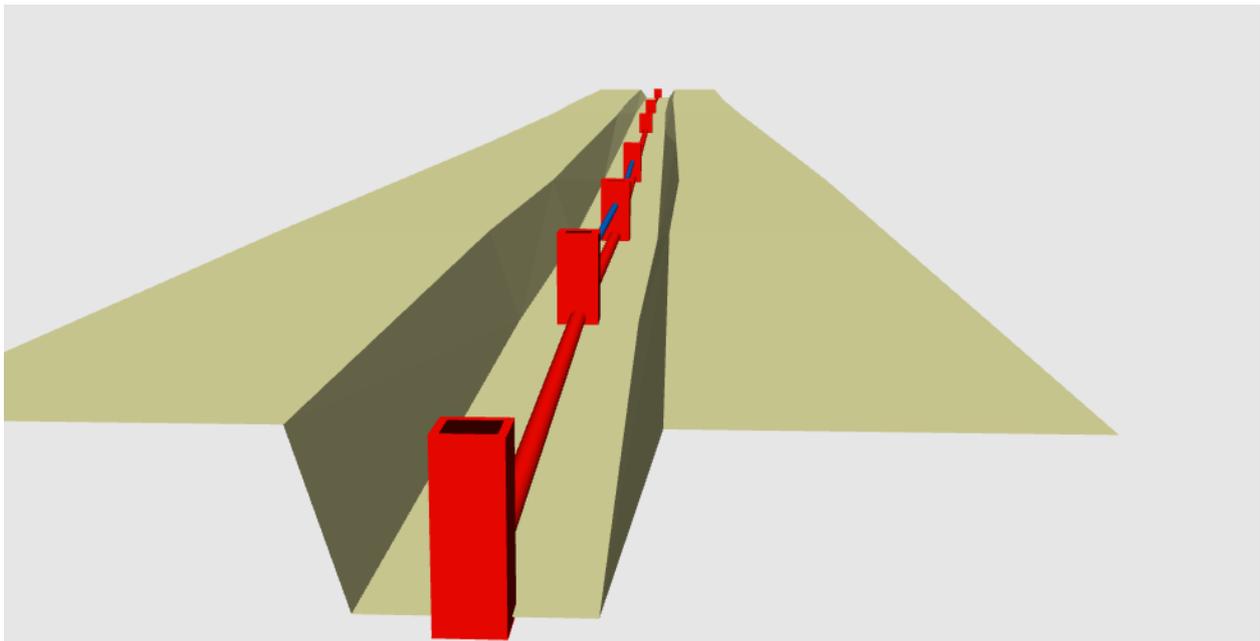
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12d Model SCIRT Standards

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Appendices

12d Training Documents:

Appendix A	Module S0 – Basic Training
Appendix B	Module S1 – Creating Your Design
Appendix C	Module S2 – Modify The Design
Appendix D	Module S3 – Retaining Walls
Appendix E	Module S4 – Drainage Part I & Module S5 – Drainage Part II
Appendix F	Module S6 – CAD Tools
Appendix G	Module S7 – Element Design
Appendix H	Module S8 – Element Advanced Design
Appendix I	Module 9 - Geotech

SCIRT 12d Design Guidelines:

Appendix J	Guideline No 24 – Publishing 12d data to Master Project and CED
Appendix K	Guideline No 25 – Drainage Quantities
Appendix L	Guideline No 26 – Set Out for Construction
Appendix M	Guideline No 35 – Roding Quantities
Appendix N	Guideline No 40 – Identifying Properties connecting to Pressure Systems
Appendix O	Guideline No 47 – Understanding Master Project Data
Appendix P	Guideline No 50 – SCIRT Asset Naming Conventions

Revision History

Revision	Date	Name	Brief Description of Change
1.0	10 Jan 2012	Charlie Dickson / Ken Atkins	Content added
2.0	02 Feb 2012	Charlie Dickson	Content added
3.0	27 Feb 2012	Charlie Dickson	Content added
4.0	23 Feb 2015	Charlie Dickson / Daniel Winter	Updated
5.0	03 Mar 2015	Charlie Dickson / Daniel Winter	Format Updated

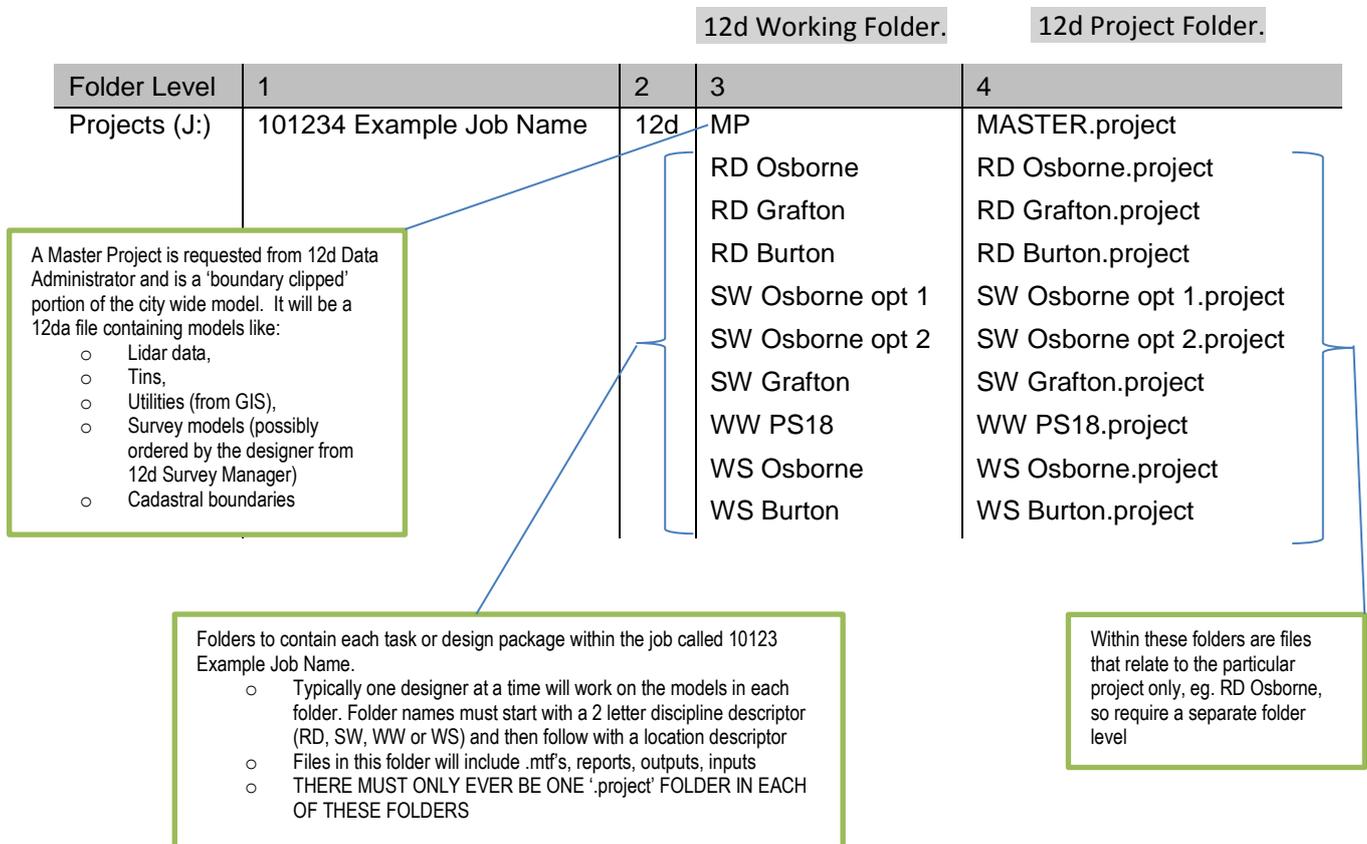
1 Introduction

Purpose of this manual is to standardize the way we work in 12d, ensuring common parameters and systems of design across all users and projects within Stronger Christchurch Rebuild Team (SCIRT).

While our project application of 12d is varied, there are common standards which must be maintained to ensure effective electronic design and documentation from the start to the end of the design process. This in turns facilitates project handover between designs and allows us to maintain standards of output, thus simplifying checking and verification procedures.

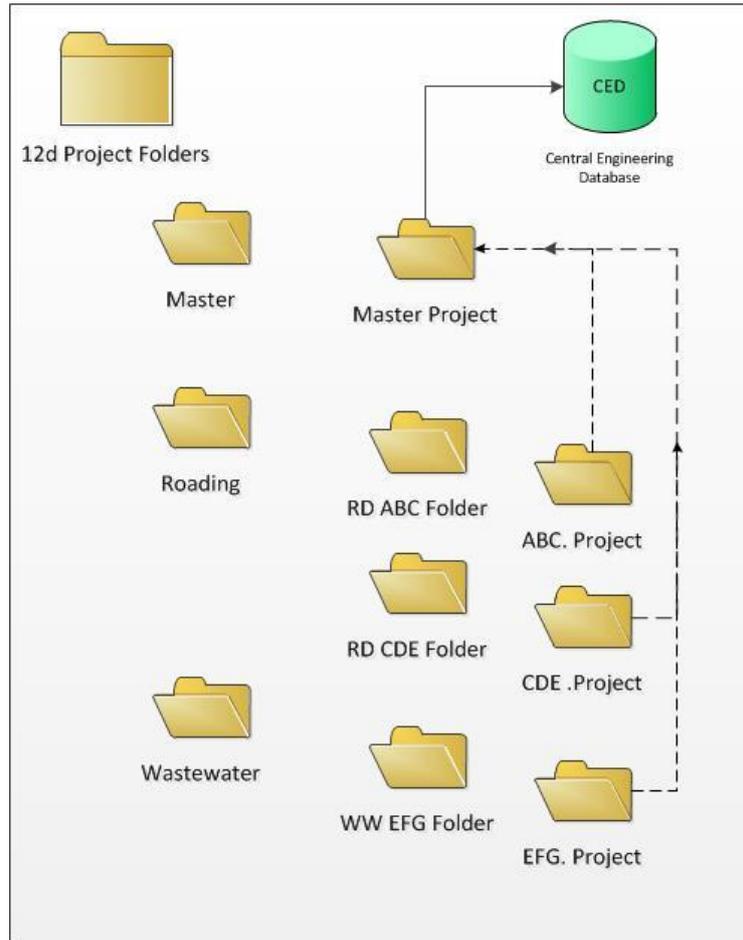
2 Project Folder and File Structure

Folder structure on the SCIRT network will be as follows:



Folder set ups allows the sharing paths form projects to a Master Folder which allows two things

- Data can be published from disipline folders which allows other disciplines to view .(Note data is view only as this is shared)
- Project data can then be transferred to CED (Central Engineering Database).



Overview of 12d Folder Structure

Regarding CED

The alliance has and is collecting all existing CCC Roading data including Utilities and Drainage into one Central Engineering database (CED). Existing data is a mixture of 2d, 3d and attributed information.

Refer to document – Central Engineering Database `CED` for further detail.

3 12d Project Design Steps

- Step 1 - Data Administrator prepares MASTER.project with copy of required data from CED (Central Engineering Database) clipped to the catchment boundary of the project
 - Data is shared into 12d projects broken down by either discipline and/or smaller area
 - MASTER.project is 'Read Only'
- Step 2 - Start new 12d Project for specific task within discipline subfolder and adds share master models to it
- Step 3 - Complete Design (concept/ detail/ final) as required
- Step 4 - Publish copy of data at any time from the TASK.project to the MASTER.project for sharing by other users (data must be Tagged with Approval information such as state:preliminary/PR/80p/Final, date, user name, approver name, etc.)
- Step 5 - Verify published data conforms 12d standards and allow sharing via the MASTER.project
- Step 6 - Add Published/Shared data to another TASK.project
- Step 7 - Prepare PPF plans, Cross Sections, Long Sections for Drafting or Plotting

3.1 12d Project Data Flow/Sharing

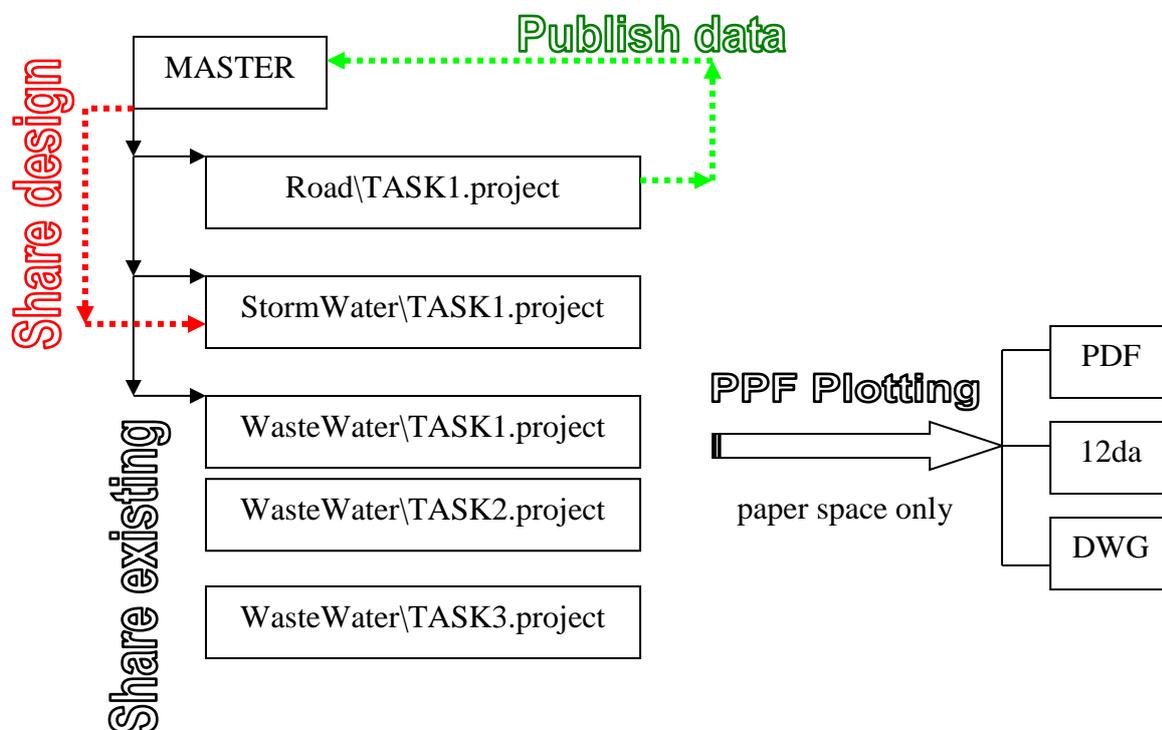


Figure 1: 12d Project data flow/sharing

3.2 Environment Structure

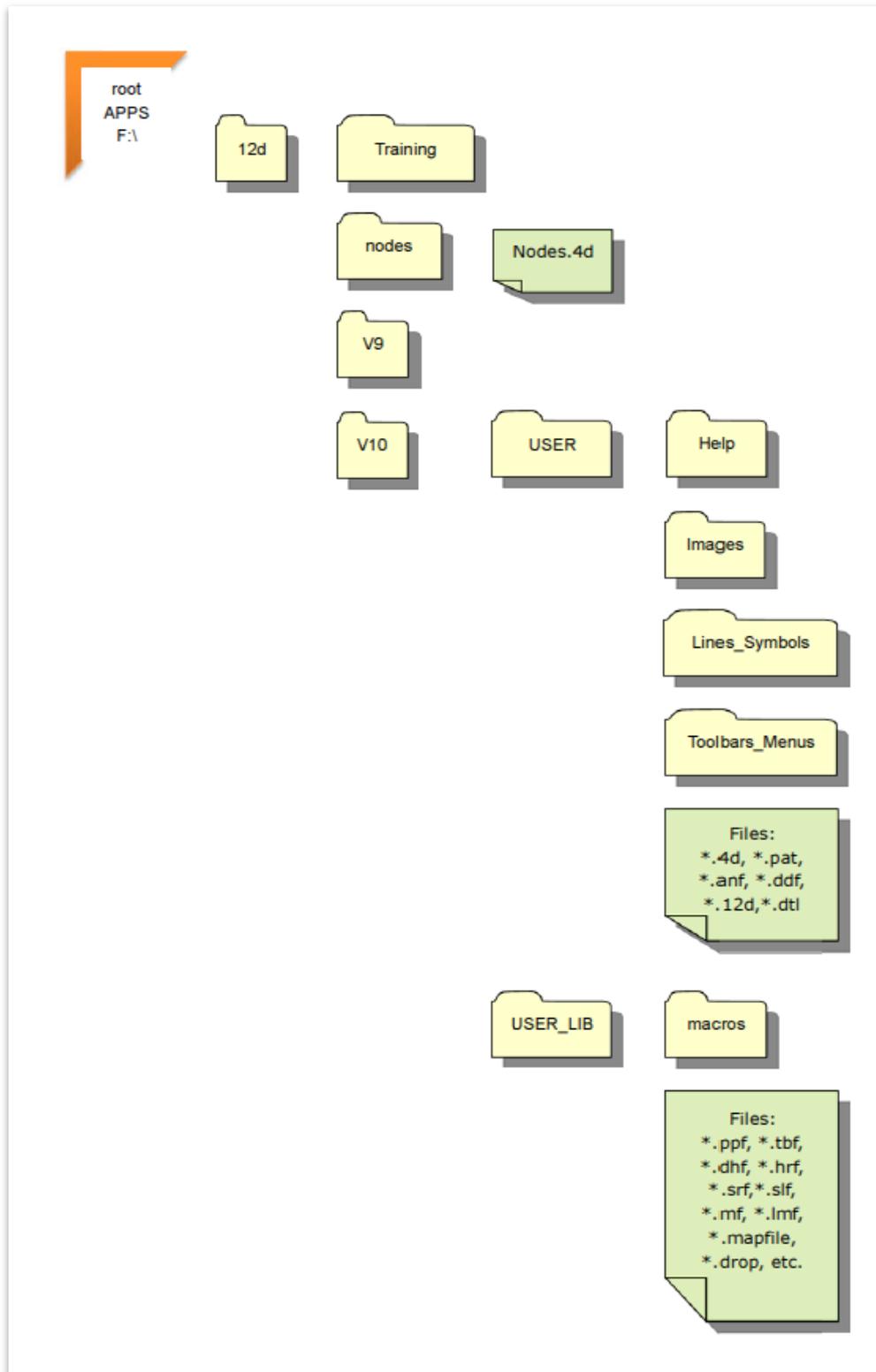


Figure 2: Configuration environment file structure – Read Only

3.3 Model and String Naming Convention

A thorough and consistent model naming convention in combination with the project functions, Triangulated Irregular Networks (TINs) and string naming conventions forms the basis of this user manual and ensures consistency across SCIRT.

Refer to Section 6.0 for string names and associated models.



3.4 Name File Setup

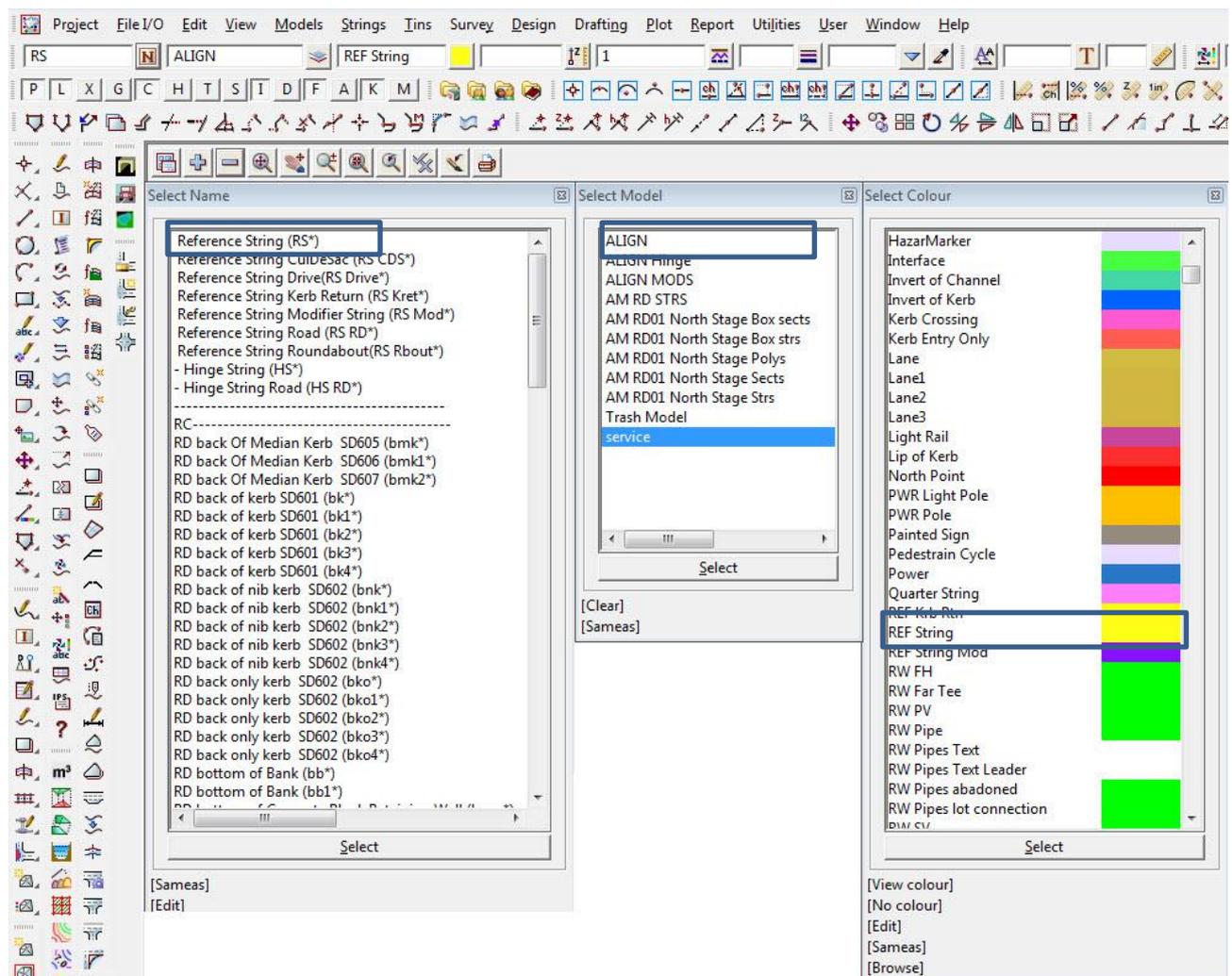


Figure 3: String naming file example

A Name file has been set up to automatically assign a model and colour when a string name is selected. After a string name has been selected from the 'Name' box, click ENTER. This will automatically populate the model and the colour. Note the 'Name' assigns the full name of the string as well as the colour.

4 Introduction Training

For Training Details refer to:

- S0** – Basic Training (Appendix A)
- S1** – Creating Your Design (Appendix B)
- S4** – Drainage I (Appendix E)
- S6** – CAD Tools (Appendix FAppendix F)

5 Rooding

Uniform feature naming is critical in effective electronic design, and allows the use of company standards to regulate the data supplied to other processes such as AutoCAD.

Refer too Reference String table and string naming diagram, additions /amendments

(I.e. features not listed into naming conventions) must be documented in the Project Description panel.

5.1 Reference String Naming

Field number	1	2	3	4	5
Field description	String Type	Feature Name	No.	No.	Location
Centreline Alignment	RS	RD	01		
e.g.	RS RD01				
Kerb Modifier Alignment	RSxx	ModKB	02		L
e.g.	RS01 ModKB 02L				
Kerb Return	RS	Kret	01	02	A
e.g.	RS Kret 0102A				
Hinge String	HS	RD	01	02	
e.g.	HS RD01				
Driveway Alignment	RSxx	Driv	01	02	
e.g.	RS01 Driv 01				

'xx' refers to related centreline alignment number

Refers to street block number

Approach road reference string unique number

Departure road reference string unique number

Corner of intersection letter

KEY	
KBXX	Section of kerb relating to block number within street
Kret	Kerb return
RS	Reference String
	Kerb Return Function: AKR Kref#Z#1A
	Apply Many Function: AM RD#1

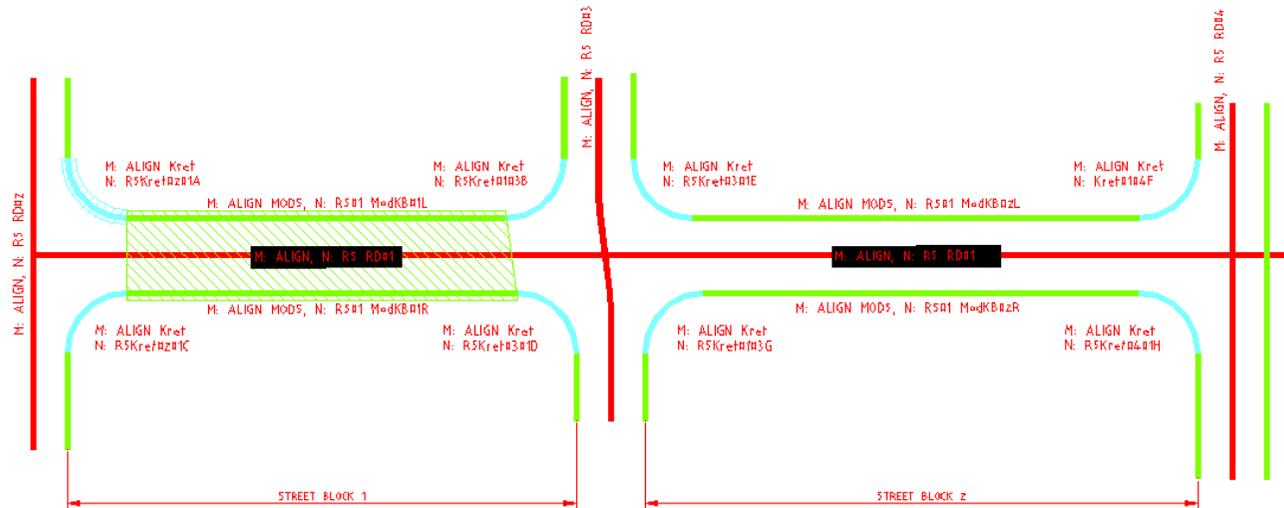


Figure 3 String naming diagram

5.2 Tin Naming Convention

All TINs created are to follow the naming convention using the following fields:

Field number	1	2	3
Field description	Type	Feature	Extra
Existing Surface	EXST	Rock	top
e.g.	EXST Rock top EXST Surv		
Interim Working Surface	INTM	RL26	
e.g.	INTM RL26		
Design Surface	DESN	Op01	
e.g.	DESN Op01		
Merged Surface	MERG		
e.g.	MERG		
Super TINs	SUPR		
e.g.			

4 letter upper case only

Alpha-numeric 3 or 4 characters

5.3 Labels for <type>

In naming TINs (Triangulated Irregular Network), the following labels have special meaning and shall not be used in any case other than specified here:

EXST	A TIN representing an existing surface. This is the default name used in several standard setups (eg PPFs). Unless the project otherwise requires it (eg large or complex projects) this shall be the name used for the TIN of the surveyed data. Existing surfaces are controlled tin the survey project and are read into design projects but the designer.
DESN	A TIN representing the design surface. This is the default name used in several standard setups (eg PPFs). Unless the project otherwise requires it (eg large or complex projects) this shall be the name used for the TIN of the designed data
MERG	A TIN representing multiple surfaces fenced and joined to create a single combined surface (eg at the completion of all relevant design works toward the end of the project and includes the existing surface outside the limits of works and the design surface within the limits of work).
SUPR	A Super TIN representing various merged previously created TINs. SUPR is a special <type> where you need to also specify what other <type> it is (eg SUPR EXST, SUPR INTM, SUPR DESN or SUPR MERG, but not MERG as this is a manually combined TIN).

Other interim design TINs will be created by various functions and the TIN name will be automatically generated. These are ‘working’ TINs and do not form part of the final design TIN. The TIN name generated by the function does not need to comply with a SCIRT convention.

e.g. Apply Many Function creates a TIN name based on the function name ‘AM RD01’ in a model called ‘tin AM RD01’

When a record of a TIN is required to form a certain point in time, a copy can be made of a the current TIN using the following naming convention : **<TIN name> YYYYMMDD**

Where:

YYYYMMDD is the important date that needs to be recorded:

For survey TINs it would be date when the survey was received

For design TINs it would be the date that the design was changed

Note: this convention is not permitted for current TIN

5.4 Summary Table

Table 1: Summary TIN table

TIN name	TIN Model Name	Example
EXST ROCK	tin EXST ROCK	tin EXST SAND Conts tin EXST SAND Conts lbls tin EXST SAND Conts lbls names tin EXST SAND Depth Conts tin EXST SAND Bdy excl tin EXST SAND Bdy incl ie: tin DESN RD03 Conts tin DESN RD03 Conts lbls tin DESN RD03 Depth Conts
INTM ROCK	tin EXST ROCK	
INTM RL26	tin INTM RL26	
DESN	tin DESN	
EXST Sand	tin EXST Sand	
DESN Dra	tin DESN Dra	
DESN Rail	tin DESN Rail	
DESN Rail 02	tin DESN Rail 02	
DESN RAIL opt05	tin DESN RAIL opt05	
MERG	tin MERG	
MERG Stg01	tin MERG Stg01	
SUPR EXST	tin SUPR EXST	
SUPR DESN	tin SUPR DESN	
SUPR DESN Rivr	tin SUPR DESN Rivr	

Note: All tin related models to be prefixed “tin” **lower case**. This includes Contours Volume shading etc.

5.5 Tin Boundaries

Each TIN should be in a model named: **tin <tin_name>**

This should be the only data within that model.

Note: the prefix “tin” for the TIN model shall be in lower case in all instances.

tin DESN RD01 Bdy excl

tin DESN RD01 Bdy incl

5.6 Contour Models

The model naming convention for contours at standard intervals are as follows;

Table 2: Example Contour Models

TIN Model Name	Contour Model Name	Interval Major/Minor
tin EXST	tin EXST Conts	1.0m/0.2m
tin EXST	tin EXST Conts 500 100	0.5m/0.1m
tin DESN	tin DESN Conts 500 50	0.5m/0.05m

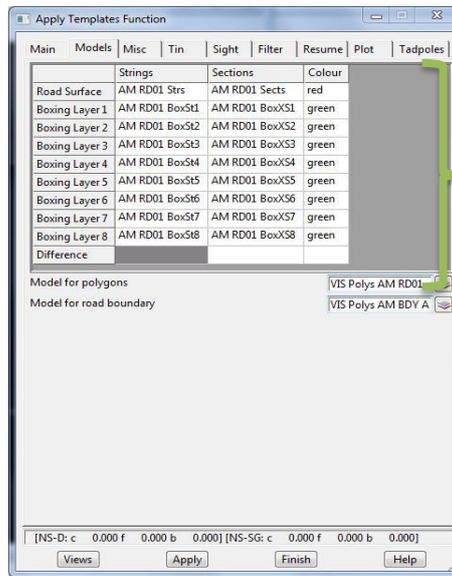
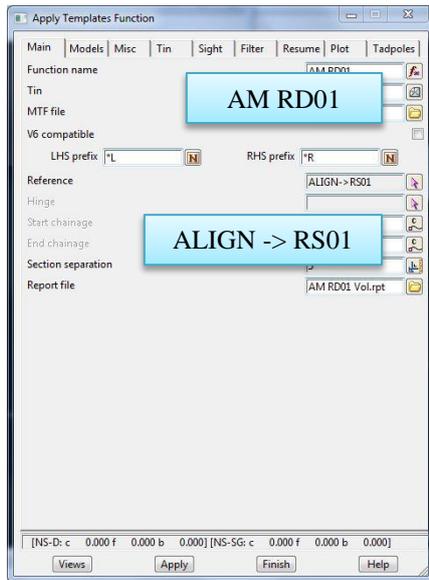
5.7 Function Naming Convention

The naming convention describes the function then the reference string then the unique identifier

Field number	1	2	3	4
Field description	Function Name	Feature Name	Unique Name	Model Created by Function
Apply Many	AM	RD	01	
e.g.	AM RD01			AM RD01 strs AM RD01 secs AM RD01 polys
Apply Kerb Return	AKR	Kret	0103A	
e.g.	AKR Kret 0103A			AM Kret 0103A strs AM Kret 0103A secs AM Kret 0103A polys
TIN Triangulate	tin	DESN	RD01	
e.g.	tin DESN RD01			tin tin DESN RD01
X-Section Filter	XSF	RD01		
e.g.	XSF RD01			XSF RD01
Road Widening	RW	RD01		
e.g.	RW RD01			RW RD01 strs RW RD01 secs RW RD01 polys
Tabulate Alignment IP's	TABIP	RD01		
e.g.	TABIP RD01			TABIP RD01
Tabulate Element	TABE	RD01		
e.g.	TABE RD01			TABE RD01
Tabulate Kerb Returns	TABKR	0103A		
e.g.	TABKR 0103A			TABKR 0103A

Table 3: Function naming convention

Report file to follow the same naming convention as for the models created by the function



Note – AM RD01 Strs and Sects automatically Filled in when function created.

Figure 6: Apply template function example

No Errors in functions

Chainages in modifiers are to be correctly applied to prevent unnecessary warnings this may

Mask other issues where application of modifier may have been incorrectly applied.

This may have lead to serious issues when upgrading to a new version where the mtf may not behave as expected.

6 Templates Naming Convention

SCIRT has standard templates located in the User directory. Read these files into your project using File I/O - Templates Input – Read Templates

This will transport the SCIRT templates for a specific discipline Road Templates etc.

The numbers in the template name refers to the Christchurch City Council Standard Details (CSS).

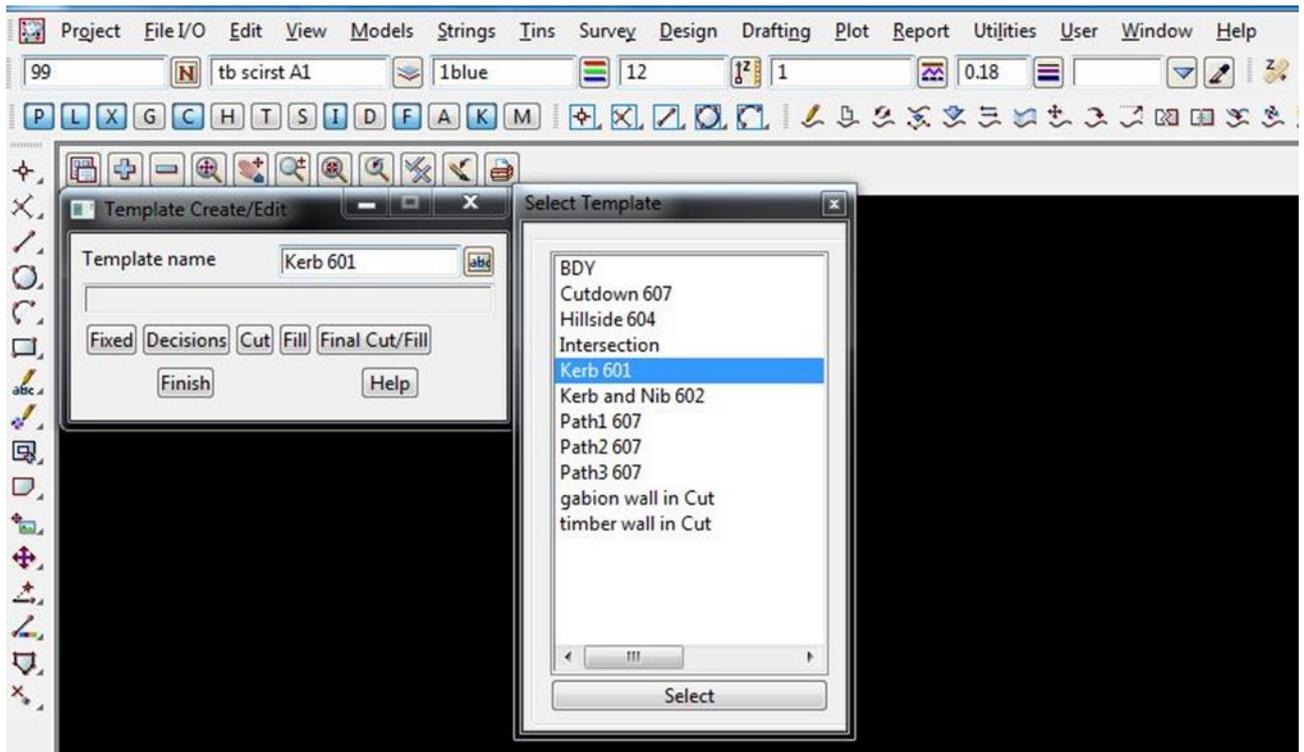


Figure 8: Template naming example)

7 Many Template Files “MTF’s”

The many templates file holds the information “data” for a function

- Templates used
- Special Chainages
- Modifiers
- Boxing

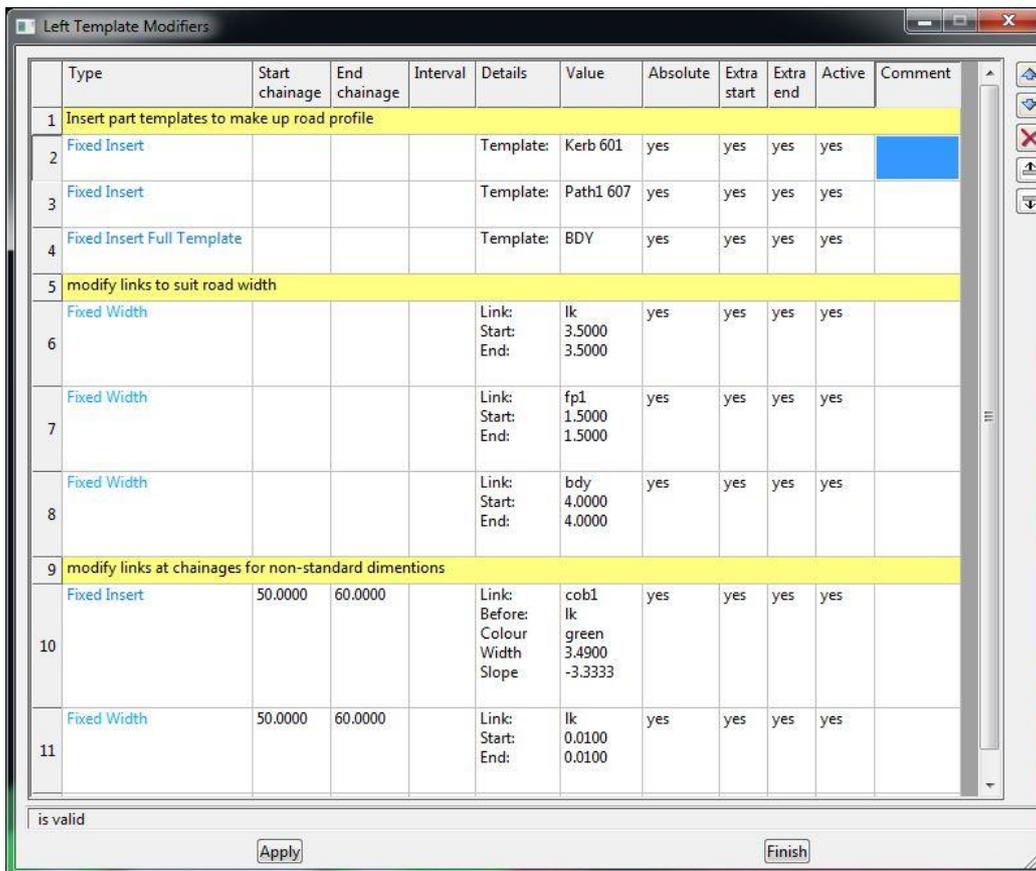
Many Templates files are stored as ASCII files (file extension .mtf) in the root folder.

It is possible to have several mtf files used on a single alignment by using separate Apply_Many functions, the names of the mtf files are defined by task and the mtf is used to perform by the name of the alignment that they are attached to.

ALIGN – RS RD01 Op5

ALIGN – RW RD07 Opt2

Panel below shows the layout of the mtf – Many Template File



Type	Start chainage	End chainage	Interval	Details	Value	Absolute	Extra start	Extra end	Active	Comment
1 Insert part templates to make up road profile										
Fixed Insert				Template:	Kerb 601	yes	yes	yes	yes	
Fixed Insert				Template:	Path1 607	yes	yes	yes	yes	
Fixed Insert Full Template				Template:	BDY	yes	yes	yes	yes	
5 modify links to suit road width										
Fixed Width				Link: Start: End:	lk 3.5000 3.5000	yes	yes	yes	yes	
Fixed Width				Link: Start: End:	fp1 1.5000 1.5000	yes	yes	yes	yes	
Fixed Width				Link: Start: End:	bdy 4.0000 4.0000	yes	yes	yes	yes	
9 modify links at chainages for non-standard dimentions										
Fixed Insert	50.0000	60.0000		Link: Before: Colour Width Slope	cob1 lk green 3.4900 -3.3333	yes	yes	yes	yes	
Fixed Width	50.0000	60.0000		Link: Start: End:	lk 0.0100 0.0100	yes	yes	yes	yes	

is valid

Apply Finish

Figure10: Template naming example inside the modifier

```

left_side = {
}

right_side = {
}

specials = {
}

hinge_modifier = {
}

left_side_modifier = {
    // Insert part templates to make up road profile
    insert_template $null $null "Kerb 601" "" absolute extra_start extra_end
    insert_template $null $null "Path1 607" "" absolute extra_start extra_end
    insert_full_template $null $null "BDY" "" absolute extra_start extra_end
    // modify links to suit road width
    width "lk" $null $null 3.5 3.5 absolute extra_start extra_end
    width "fpl" $null $null 1.5 1.5 absolute extra_start extra_end
    width "bdy" $null $null 4 4 absolute extra_start extra_end
    // modify links at chainages for non-standard dimentions
    insert "cob1" "green" 3.49 unknown -3.3333 50 60 "lk" absolute extra_start extra_end
    width "lk" 50 60 0.01 0.01 absolute extra_start extra_end
}

right_side_modifier = {
    // Insert part templates to make up road profile
    insert_template $null $null "Kerb 601" "" absolute extra_start extra_end
    insert_template $null $null "Path1 607" "" absolute extra_start extra_end
    insert_full_template $null $null "BDY" "" absolute extra_start extra_end
    // modify links to suit road width
    width "lk" $null $null 3.5 3.5 absolute extra_start extra_end
    width "fpl" $null $null 1.5 1.5 absolute extra_start extra_end
    width "bdy" $null $null 4 4 absolute extra_start extra_end
    // modify links at chainages for non-standard dimentions
    insert "cob1" "green" 3.49 unknown -3.3333 50 60 "lk" absolute extra_start extra_end
    width "lk" 50 60 0.01 0.01 absolute extra_start extra_end
}

stripping = {

```

Figure 9: Editing mtf file using text –file

Editing **mtf** using notepad – screen shot shows the layout in text format for both sides Left and Right hand side of the reference string

Please note that the ***.mtf file** is a ASCII file which means it can be edited in Note pad format - useful when copying large amounts of data between mtf's or within a mtf i.e. {Having set the left side modifier , simply copy the information and paste data – then modify to suit the right hand side}

Note – description comments // - describing the design process through the modifier panel – critical for design process and design check audit.

8 Long and Cross Section Plotting

The following standard plotting parameter files (PPF's) are copied to the User_Lib folder on project set up.

Long Section Plotting

- Please Don't
 - a) Change the order of boxes below the long section
 - b) Colours of boxes/text

- Items that need to be changed:
 - a) String/model to section
 - b) Tins
 - c) Offset strings
 - d) Plotter details
 - e) Title block details

- Items that may be added:
 - a) Multiple tins
 - b) Multiple offset strings

Roading Longplots (Examples at end of Road Section)

 SCIRT LS Coords.lplotppf	18/07/2013 5:17 p....	LPLOTPPF File	28 KB
 SCIRT LS Crown.lplotppf	6/07/2012 2:37 p.m.	LPLOTPPF File	17 KB
 SCIRT LS Ex kerbs.lplotppf	5/07/2012 2:32 p.m.	LPLOTPPF File	20 KB
 SCIRT LS Kerb Align Mods .lplotppf	6/07/2012 2:50 p.m.	LPLOTPPF File	23 KB
 SCIRT LS Kerb Returns.lplotppf	6/07/2012 2:28 p.m.	LPLOTPPF File	22 KB
 SCIRT LS KERBS GRADES EXPORT AutoCAD.lplotppf	21/08/2013 6:15 p....	LPLOTPPF File	33 KB
 SCIRT LS KERBS GRADES PLAN REVIEW.lplotppf	26/10/2012 9:29 a....	LPLOTPPF File	22 KB
 SCIRT LS KERBS GRADES PLAN.lplotppf	26/10/2012 9:30 a....	LPLOTPPF File	22 KB

Roading X - Sections

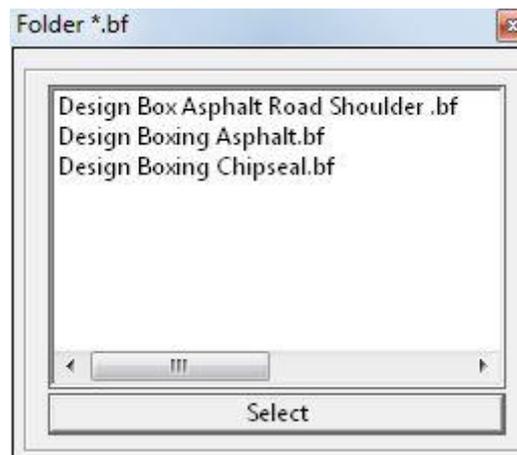
 SCIRT Longsection with Kerbs Grades.lplotppf.ppf	18/11/2011 12:39 ...	PPF File	18 KB
 SCIRT Existing Xsect.xplotppf.ppf	23/05/2013 3:09 p....	PPF File	14 KB
 SCIRT A0 Xsect For Export to AutoCAD.xplotppf.ppf	22/06/2012 3:42 p....	PPF File	6 KB
 Road Xsect.xplotppf.ppf	8/06/2012 5:46 p.m.	PPF File	6 KB

By default 12d organises section plots and text boxes with grades on the top lines and chainage/ distance on the lower lines. Any other strings/ tins are labeled between these two items. Please don't modify the order of the boxes.

9 Boxing

Boxing definitions are saved in ASCII files [* .bf] in the user folders

- The standard definitions that apply to the entire project are stored in the user folder in a global.bf , the file is referenced by each designer for the standard definitions
- Like templates, boxing definitions will vary and depend on the nature of the project.
- Extent of the definition is full carriageway and road shoulder



Design Box Asphalt Road Shoulder.bf (Left and Right)

- 50mm Asphaltic
- 100mm Design Sub Base
- 300mm Design Sub Grade

Design Boxing Asphalt.bf (Left and Right)

- 50mm Asphaltic
- 100mm Design Sub Base
- 300mm Design Sub Grade

Design Boxing Chipseal.bf (Left and Right)

- 100mm Design Sub Base
- 300mm Design Sub Grade

To edit boxing definitions

Go to

Design -> Boxing -> Edit

9.1 12d Rooding Design in SCIRT

Refer to Design Guidelines:

No24 – Publishing 12d data to Master Project and CED (Appendix J)

No26 – Set Out for Construction (Appendix L)

No35 – 12d Rooding Quantities (Appendix M)

No47 – Understanding Master Project Data (Appendix O)

For Training Details refer to:

S2 – Modifying the Design (Appendix C)

S7 – Element Design I (Appendix G)

S8 – Element Advanced Design II (Appendix H)

10 Drainage

Drainage Strings can be created in 12d in a number of ways. The two most common ways are creating (drawing) the strings in 12d, or importing the drawn string positions from another source e.g. Cad.

The imported strings must all be drawn in the same direction. Either all in the direction the water flows or all opposite the direction of flow.

Pits are created at all vertices on the strings.

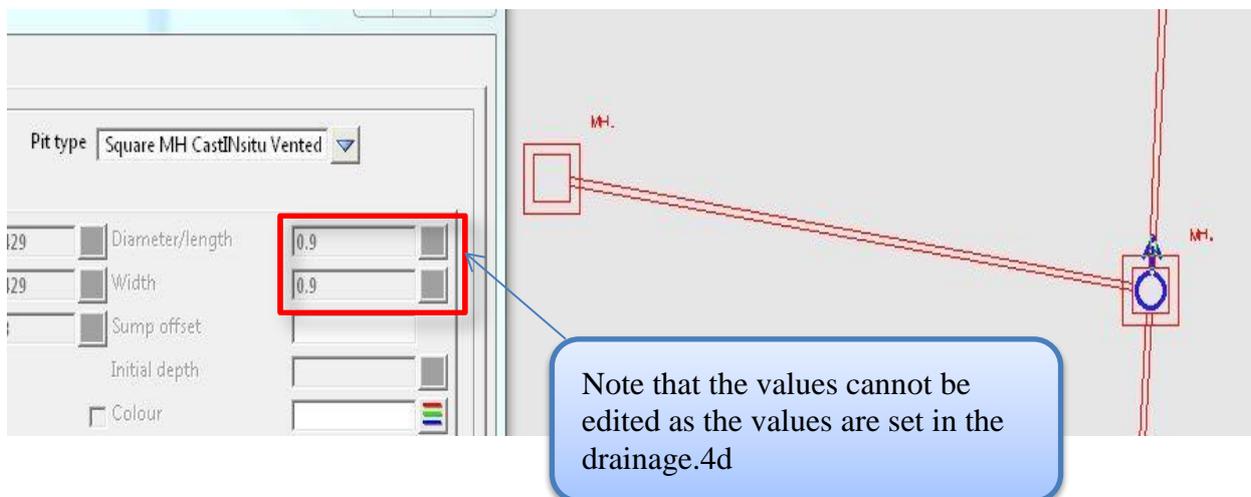
Trunk lines must have a vertex where the branch lines join.

10.1 Drainage (drainage.4d)

Settings in the drainage.4d have been developed in conjunction with IDS/CSS and supplied specifications from suppliers for pits and pipes.

mhsizes or mhdiam definition in the file overrides the user ability to manually change the pit size in the Pit tab of the DNE. An example of this definition in the drainage.4d file is shown below.

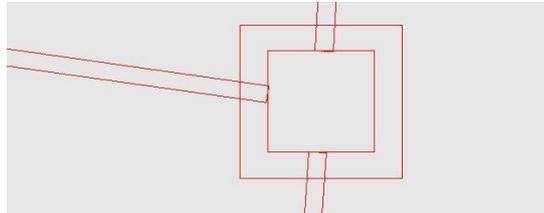
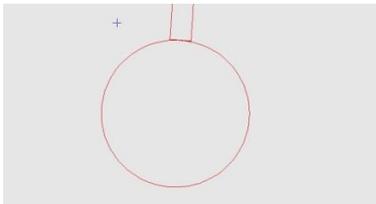
```
//-----
// Manhole types ... for pits, manholes, headwalls, junctions, outfalls ... (i.e. nodes)
//-----
Manhole "_____ " {} //Divider
Manhole "_____ CCC Standard Manholes " {} //Divider
Manhole "_____ " {} //Divider
Manhole "Square MH CastIn situ Vented SD302" {
  mhdesc "Square Manhole Cast In-situ Vented"
  mhnotes "SD302"
  mhsizes 0.900 0.900
  mhthickness {
  // diam thickness(all-bottom) [front] [back] [left] [right] (looking in the direction of chainage)
  diam_thickness 0.900 0.280 0.230 0.230 0.230 0.230
  }
  mhgroup "CCC"
```



10.2 Default Positions

If Preset positions are not defined then the pit connection points once selected will be

- Circular Pits: The perimeter of the nominal diameter.
- Rectangular pits: The midpoint of the sides



10.3 PPF Plotting (Drainage and Wastewater)

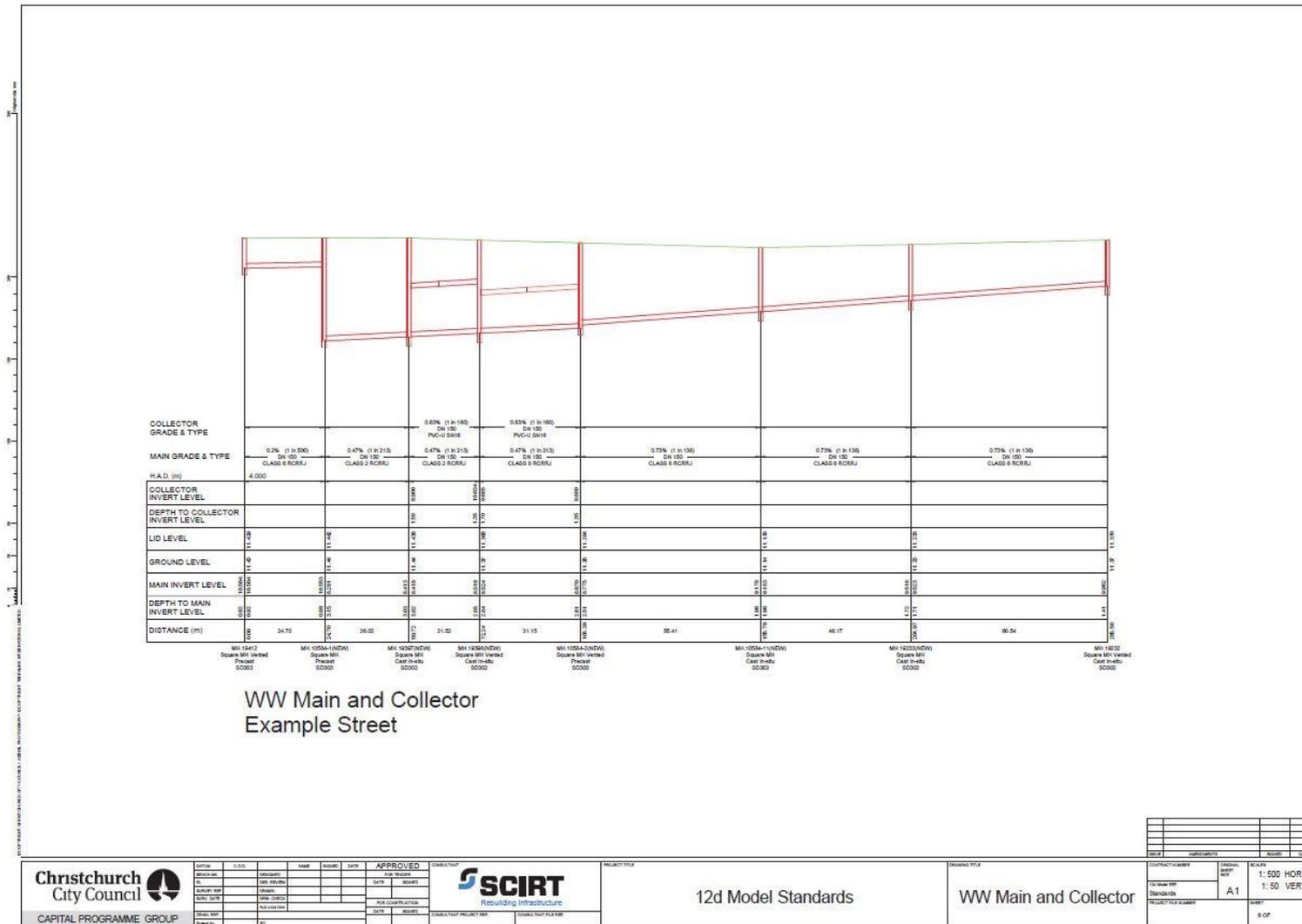
- Please Don't
 - a) Change the order of boxes below the longsection
 - b) Colours of boxes/text
- Items that need to be changed:
 - a) String/model to section
 - b) Tins
 - c) Offset strings
 - d) Plotter details
 - e) Title block details
- Items that may be added:
 - a) Multiple tins
 - b) Multiple offset strings

Drainage Plot PPF Editor - Network Longsection Profiles (Located in User_Lib)

WW_Multiple_Rows_per_sheet.drainppf	10/07/2013 4:45 p....	DRAINPPF File	34 KB
WW_collector_Multiple_Rows_per_sheet.drainppf	18/04/2013 9:45 a....	DRAINPPF File	38 KB
WW_collector_One_Row_per_sheet.drainppf	22/05/2013 12:10 ...	DRAINPPF File	40 KB
WW_One_Row_per_sheet.drainppf	10/07/2013 4:31 p....	DRAINPPF File	35 KB
SW_One_Row_per_sheet.drainppf	26/11/2013 2:27 p....	DRAINPPF File	32 KB

Drainage Plan Plot PPF Editor - Network Plan Plot (Located in User_Lib)

 WW_plan_plot.drainplanppf	11/11/2013 11:09 a...	DRAINPLANPPF File	32 KB
 SW_plan_plot.drainplanppf	11/11/2013 11:08 a...	DRAINPLANPPF File	30 KB
 AsBuiltWW.drainplanppf	12/01/2015 12:43 ...	DRAINPLANPPF File	8 KB
 AsBuiltSW.drainplanppf	12/01/2015 12:43 ...	DRAINPLANPPF File	8 KB
 AsBuilt Reveiw Pressure Main.drainplanppf	19/01/2015 9:55 a...	DRAINPLANPPF File	9 KB
 AsBuilt Reveiw Main and Collector.drainplanppf	15/12/2014 12:15 ...	DRAINPLANPPF File	10 KB



<p>Christchurch City Council CAPITAL PROGRAMME GROUP</p>	DESIGNER DATE	CHECKED DATE	APPROVED DATE	PROJECT TITLE 12d Model Standards	DRAWING TITLE WW Main and Collector	CONTRACT NUMBER 15/150	SHEET NUMBER A1	SCALE 1:500 HORIZ 1:50 VERT
	PROJECT NUMBER 15/150	PROJECT TITLE 12d Model Standards	DRAWING TITLE WW Main and Collector	CONTRACT NUMBER 15/150	SHEET NUMBER A1	SCALE 1:500 HORIZ 1:50 VERT	6 OF 6	

Example WW_Collector_One_Row_per_sheet.drainppf

10.4 12d Drainage Design in SCIRT

Refer to Design Guidelines:

No24 – Publishing 12d data to Master Project and CED (Appendix J)

No25 – Drainage Quantities (Appendix K)

No26 – Set Out for Construction (Appendix L)

No40 – Identifying Properties connecting to Pressure Systems (Appendix N)

No47 – Understanding Master Project Data (Appendix O)

No50 – SCIRT Asset Naming Convention (Appendix P)

For Training Details refer to:

S4 – Drainage I (Appendix E)

S5 – Drainage II (Appendix E)

11 String Naming Convention

* Indicates more than one string ie: Ik01, Ik02...

Name	Model Name	Colour by Name	Comment
RS Kret*	ALIGN KRET	REF Krb Rtn	Reference String Kerb Return (RS Kret*)
RS Mod*	ALIGN MODS	REF String Mod	Reference String Modifier String (RS Mod*)
RS CDS*	ALIGN	REF String	Reference String Cul-de-sac (RS CDS*)
RS Rbout*	ALIGN	REF String	Reference String Roundabout(RS Rbout*)
RS RD*	ALIGN	REF String	Reference String Road (RS RD*)
RS Drive*	ALIGN	REF String	Reference String Drive(RS Drive*)
RS*	ALIGN	REF String	Reference String (RS*)
d--	d-- cogo	white	-----
HS RD*	ALIGN Hinge	REF String	- Hinge String Road (HS RD*)
HS*	ALIGN Hinge	REF String	- Hinge String (HS*)
d--	d-- cogo	white	RC-----
xgrc*	AM RD STRS	Kerb Crossing	RD residential crossing SD611 (xgrc*)
xgrc1*	AM RD STRS	Kerb Crossing	RD residential crossing SD611 (xgrc1*)
xgcc*	AM RD STRS	Kerb Crossing	RD commercial crossing SD611 (xgcc*)
xgcc1*	AM RD STRS	Kerb Crossing	RD commercial crossing SD611 (xgcc1*)

Snippet from Names.4d file

12 String Naming Examples

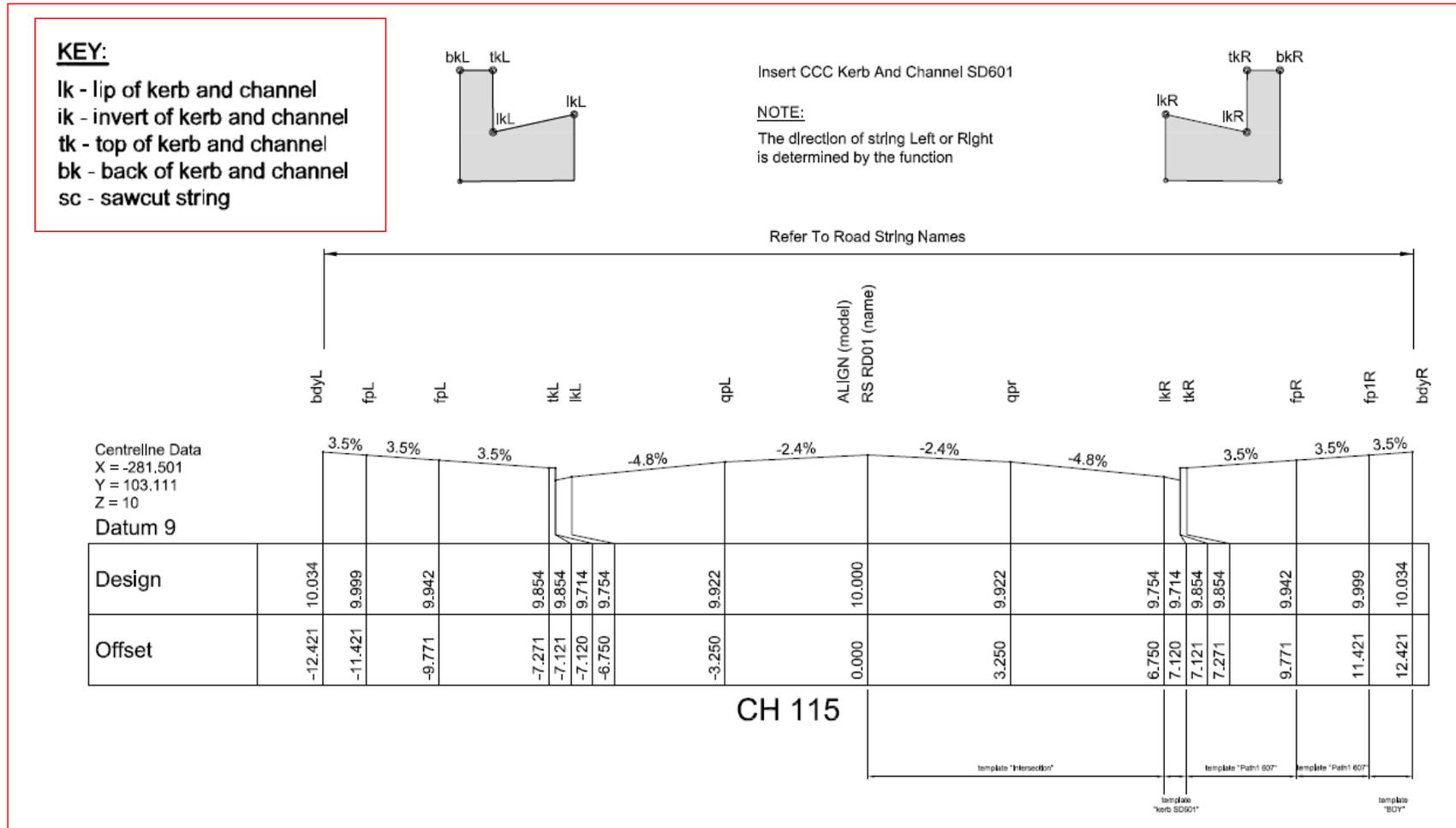


Figure 6: String road shoulder example

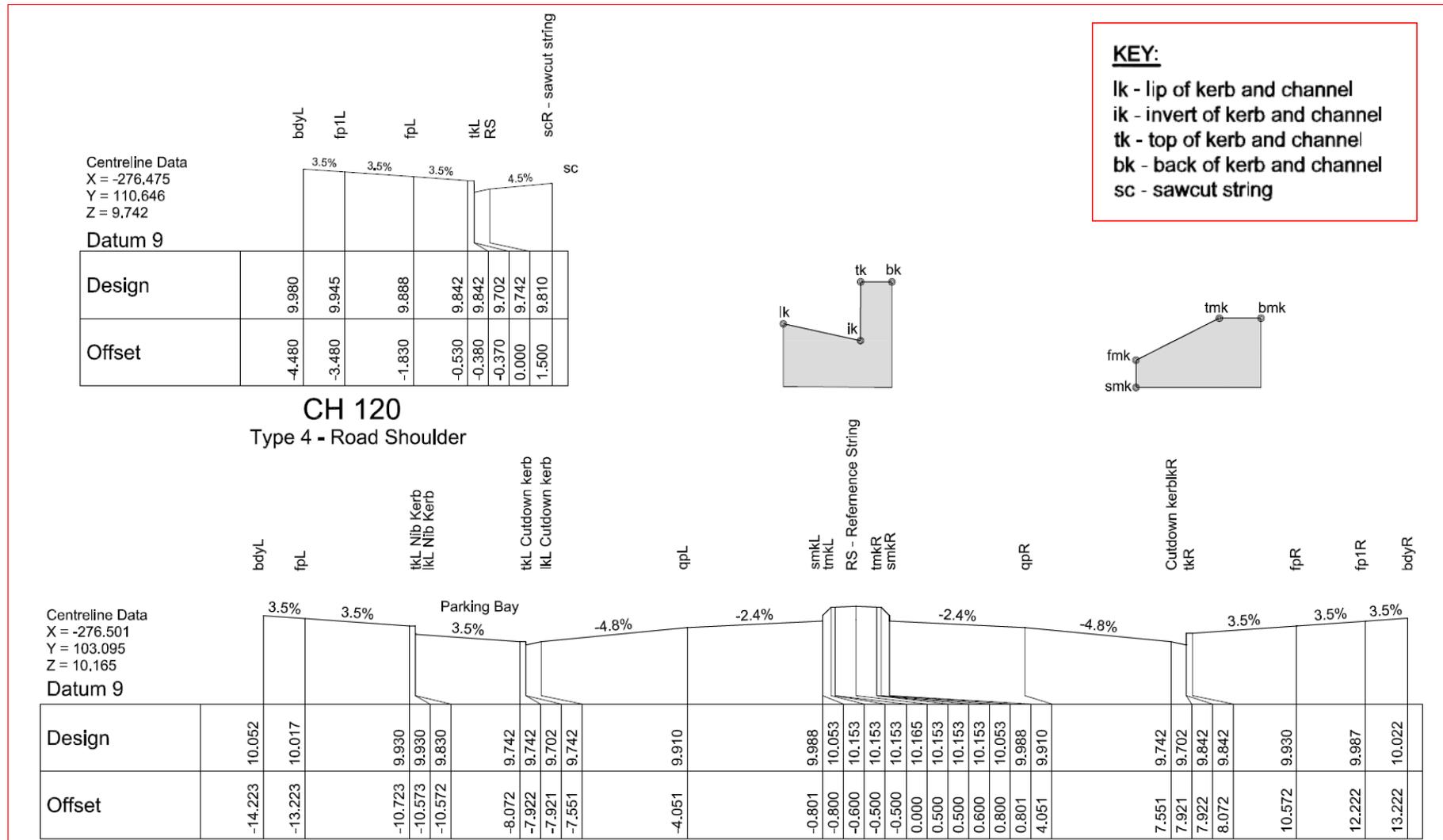


Figure 7: String median kerb example

13 Standard Views

A suggested naming structure for views is to name design views and leave temporary views with a number.

This can be useful in preventing accidental closing of an important views and design layouts

View Name	Models Displayed
Topo	Existing topo, services, and raster's
Design	Design layout, Apply Many strings
Design Control	Design alignment strings, reference strings and mod strings
Design LS	Longsection view
Design XS	Design x sections from apply many
Plot preview Plan	Plan plot prior to printing or exporting
Plot preview LS	Long plot prior to printing or exporting
Plot preview XS	X-section plot prior to printing or exporting

Table 9: Suggested View Names



14 12d Macro Library

Macros can be uploaded from <http://forums.12dmodel.com/macros.php>.

Additional macros appended to increase design and system efficiency

Macro Number	Name Of Macro	12d Download	Revision No	Updated By
01	Clip On Submain	http://forums.12dmodel.com/macro_view.php?m=62	03	Charlie
02	Colours Pits and Pipes	http://forums.12dmodel.com/macro_view.php?m=87	03	Charlie
03	Rename Attributes or Values	http://forums.12dmodel.com/macro_view.php?m=76	03	Charlie
04	DNE find and replace	http://forums.12dmodel.com/macro_view.php?m=80	04	Charlie
05	Rename DNE Pits	http://forums.12dmodel.com/macro_view.php?m=81	03	Charlie
06	Set Pit Names from SuperString points	http://forums.12dmodel.com/macro_view.php?m=79	03	Charlie
07	Set between on grade by Point	http://forums.12dmodel.com/macro_view.php?m=83	03	Charlie
08	Set Grade Between Points	http://forums.12dmodel.com/macro_view.php?m=83	03	Charlie

Macro Number	Name Of Macro	12d Download	Revision No	Updated By
09	Survey Points to Drainage Pits	http://forums.12dmodel.com/macro_view.php?m=77	07	Charlie
10	Camber Profile to CSS 623	http://forums.12dmodel.com/macro_view.php?m=84	03	Charlie
11	Export 12da tagged elements	http://forums.12dmodel.com/macro_view.php?m=68	03	Charlie
12	Quantities report	http://forums.12dmodel.com/macro_view.php?m=75	03	Charlie
13	Create Feature Codes Table	http://forums.12dmodel.com/macros_cat.php?cat_id=2	01	Charlie
14	Report Project Templates	http://forums.12dmodel.com/macro_view.php?m=28	01	Charlie
15	Add – Remove models from view	http://forums.12dmodel.com/macro_view.php?m=31	01	Charlie
16	Advanced Import-Export attributes tool	http://forums.12dmodel.com/macro_view.php?m=58	02	Charlie
17	Change String name	http://forums.12dmodel.com/macro_view.php?m=61	01	Charlie
18	Clear Output window for chains	http://forums.12dmodel.com/macro_view.php?m=60	01	Charlie

Macro Number	Name Of Macro	12d Download	Revision No	Updated By
19	Colour Super String Segments by slope	http://forums.12dmodel.com/macro_view.php?m=6	01	Charlie
20	Copy vertex xyz to clipboard	http://forums.12dmodel.com/macro_view.php?m=46	02	Charlie
21	Custom info panel	http://forums.12dmodel.com/macro_view.php?m=49	03	Charlie
22	Delete Duplicate 2pt strings	http://forums.12dmodel.com/macro_view.php?m=66	02	Charlie
23	Download Drop points on cross section	http://forums.12dmodel.com/macro_download.php?m=16&v=4 http://forums.12dmodel.com/macro_download.php?m=16&v=4	04	Charlie
24	Element Groups - using tags - similar to ACAD blocks	http://forums.12dmodel.com/macro_view.php?m=29	05	Charlie
25	Group elements - import BLOCKs from library	http://forums.12dmodel.com/macro_view.php?m=30	04	Charlie
26	How to make a table	http://forums.12dmodel.com/macro_view.php?m=22	01	Charlie
27	Label Segment Grade	http://forums.12dmodel.com/macro_view.php?m=4	03	Charlie
28	Label segment/string running distance offset to a point	http://forums.12dmodel.com/macro_view.php?m=9	03	Charlie

Macro Number	Name Of Macro	12d Download	Revision No	Updated By
29	Ldar import	http://forums.12dmodel.com/macro_view.php?m=57	03	Charlie
30	Paragraphs in 12d Cad	http://forums.12dmodel.com/macro_view.php?m=27	02	Charlie
31	Redraw single View	http://forums.12dmodel.com/macro_view.php?m=59	01	Charlie
32	Report on toolbars	http://forums.12dmodel.com/macro_view.php?m=23	03	Charlie
33	round text values or convert units in a model	http://forums.12dmodel.com/macro_view.php?m=45	02	Charlie
34	Send Data to back on a view	http://forums.12dmodel.com/macro_view.php?m=37	02	Charlie
35	Share Models and Tins	http://forums.12dmodel.com/macro_view.php?m=86	03	Charlie
36	Standard Detail Drawing import tool	http://forums.12dmodel.com/macro_view.php?m=26	02	Charlie
37	Set Start Chainage	http://forums.12dmodel.com/macro_view.php?m=64	01	Charlie
38	Set super string segment radius	http://forums.12dmodel.com/macro_view.php?m=24	01	Charlie

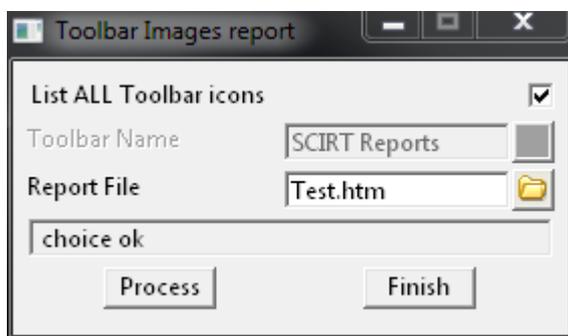
Macro Number	Name Of Macro	12d Download	Revision No	Updated By
39	V8_Plot_mngmnt.4dm	http://forums.12dmodel.com/macro_view.php?m=3	05	Charlie
40	view coordinates floating panel	http://forums.12dmodel.com/macro_view.php?m=69	01	Charlie
41	4d_Files_csv.4dm	http://forums.12dmodel.com/macro_view.php?m=50	03	Charlie
42	HEC RAS strings creator	http://forums.12dmodel.com/macro_view.php?m=2	01	Charlie
43	label points and grades on apply many strings	http://forums.12dmodel.com/macro_view.php?m=99	03	Charlie

15 SCIRT Toolbars

To ensure clarity around SCIRTs tool bars, a specific toolbar was created to identify all toolbars in SCIRTs 12d environment, which includes standard set ups and user created for specific disciplines.

View → Toolbars (Clicking on Toolbars brings up the Customize Toolbars panel)

SCIRT Report – Report on toolbars



Total number of toolbars: 84



Toolbars

version: V10.0C1k

Cad

	>>> FLYOUT >>>	Flyout Cad Point
	>>> FLYOUT >>>	Flyout Cad Intersect
	>>> FLYOUT >>>	Flyout Cad Line
	>>> FLYOUT >>>	Flyout Cad Circle
	>>> FLYOUT >>>	Flyout Cad Arc
	>>> FLYOUT >>>	Flyout Cad Polygon
	>>> FLYOUT >>>	Flyout Cad Text
	>>> FLYOUT >>>	Flyout Cad Symbol
	>>> FLYOUT >>>	Flyout Cad Hole
	>>> FLYOUT >>>	Flyout Cad Fill
	>>> FLYOUT >>>	Flyout Cad Image
	>>> FLYOUT >>>	Flyout Cad Modify
	>>> FLYOUT >>>	Flyout Cad Vertex
	>>> FLYOUT >>>	Flyout Cad Segment
	>>> FLYOUT >>>	Flyout Cad String
	>>> FLYOUT >>>	Flyout Cad Delete

Options

	>>> FLYOUT >>>	Flyout String Edits
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- Reports total Number of toolbars
- Current version of 12d
- Images of toolbars with description of use

12d Training Documents:

A

Appendix A Module S0 – Basic Training

B

Appendix B Module S1 – Creating Your Design

C

Appendix C Module S2 – Modify The Design

D

Appendix D Module S3 – Retaining Walls

E

**Appendix E Module S4 – Drainage Part I &
Module S5 – Drainage Part II**

Appendix F Module S6 – CAD Tools

G

Appendix G Module S7 – Element Design

H

Appendix H Module S8 – Element Advanced Design

Appendix I Module 9 - Geotech



SCIRT 12d Design Guidelines:

J

Appendix J Guideline No 24 – Publishing 12d data to Master Project and CED

K

Appendix K Guideline No 25 – Drainage Quantities

L

Appendix L Guideline No 26 – Set Out for Construction

M

Appendix M Guideline No 35 – Roading Quantities

N

Appendix N Guideline No 40 – Identifying Properties connecting to Pressure Systems



Appendix O Guideline No 47 – Understanding Master Project Data

Appendix P Guideline No 50 – SCIRT Asset Naming Conventions