

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.

G-File Overview Flowchart

Story: Data Governance – Standardise, Process and Deliver

Theme: Finance and Business Systems

A flowchart which illustrates where the G-File was used throughout the life cycle of asset data collection, processing and delivery.

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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Overview of G-File and key processes that use this data

1. The G-File
 G-file, data governance file. Determines the data structure features, fields, domain values required to create SCIRT Schema definitions. All of this detail is captured in an excel spreadsheet with many sheets defining the requirements for what needed to be captured as the existing CCC schema was not going to be able to accommodate these requirements for SCIRT. The spreadsheet can be updated, edited to add or remove features—a number of other processes will have to be updated as well if this happens as the G file has a number of functions:

- Defines how to survey asset data i.e. SAG/SAT;
- Defines the SCIRT schema;
- Maps CCC schema to SCIRT schema;
- Maps SCIRT schema to CCC schema;
- Maps 12d data to SAT data;
- Defines iForm format;

CCC asset data
 (update/create/delete & edit—features, fields, domains & specifications through business rules)

Download from WFS
 Assign UID's to features & inverts to pipes

G:\GIS\Data Incoming\From Council\Downloads\Services
Services.gdb

Webmaps
 Webmaps mobile

Correct US/DS nodes
 Infonet need this correct to be able to recreate the pipes correctly

Infonet
 12D
 CAD

Key GDB → G-File as an input
FME process → SAT as an input

CCC Schema Structure

G-File

SCIRT
 (capture asbuilt data and supply back to CCC)

1 G-File.xlsx
 (data structure, fields, features, domains)
 update/create/delete & edit—features, fields, domains if required

Create CCC GDB Schema from G File
CCC_Schema_GML
CCC_Schema_GML

SCIRT Schema G File File to Amazon.fmw
 Convert xlsx to gdb, this is what other processes read, also some tables created at this stage
SCIRT_Schema_G_File.gdb
SCIRT_Schema_G_File.mdb

Create SCIRT Schema Services.gdb
3 SCIRT_Schema_Services.gdb

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CCC Schema Structure

Create standard formats

4 Create SAG tables&12d mapping CSVs.fmw
 Other processes used to convert SAT to different guideline revisions *no longer being run

Diagrams.csv
 Defines how SAT data will display in 12d
Match tables.csv
 Defines domain values to be used 12d

5 SAG tables.xlsx
 SAG feature tables as what is in the SAG Guideline document

6 SAT template.xlsx
 Domain pick list Feature template
 Run macro to format and create updated SAT template

7 Spatial survey data
 Location of assets in the field

8 iForm app
 Create iForm from G-File.fmw
 Create 61 Forms with 1200 elements and 600 pick list values

9 SAT
 Survey location of assets and attribute information about what surveyed

SCIRT Schema Structure

Survey data x,y,z

7 Spatial survey data
 Location of assets in the field

Take any spatial file with coordinates and creates a skeleton SAT spreadsheet

File copy process to download the latest template

Complete SAT in office merge coordinate information with attribute information

8 iForm app data collection
 Attribute information relating to the surveyed locations of assets can be collected through a form that can be used on mobile devices, offline and in the field. It does require the corresponding SAT UID to provide the link between surveyed locations and attribute information. Update the iForm if new features have to be collected in the field, update iForm if new domain values have been added to the G-File and required in the field. iForm data collection does not require a pre-existing SAT, it will create the data collected automatically into the correct SAT format.

9 SAT
 Survey location of assets and attribute information about what surveyed

SCIRT Schema Structure

Survey data attributes

8 iForm app
 Create iForm from G-File.fmw
 Create 61 Forms with 1200 elements and 600 pick list values

iForm App
 Collect attribute information to SCIRT Schema standard

Create SAT from Mobile Device Data.fmw

Complete SAT in office merge coordinate information with attribute information

9 SAT
 Survey location of assets and attribute information about what surveyed

10 Validation/Review
 Validating/reviewing SAT data to make sure that it will meet the requirements as defined in the SAG and be in a complete state with all issues addressed before being passed to the IST for production stage.

SCIRT Schema Structure

Survey data validation

10 Validation/Review
 Validating/reviewing SAT data to make sure that it will meet the requirements as defined in the SAG and be in a complete state with all issues addressed before being passed to the IST for production stage.

SAT Validation Tool.fmw
 SAT Lining and Repairs Validation.fmw

Check data and update on the SAT in the office

Collector app
 Highlight missing information (attributes) with the spatial data

11 Collector app
 Highlight what geometries have missing attributes. Attributes shown as missing only what's on the SAT & some extra fields to show what's missing. The collector app needs an SAT as an input.

12 CCTV data validation/review
 Validating/reviewing CCTV AsBuilt footage

SCIRT Schema Structure

CCTV data validation

12 Validation/Review
 Validating/reviewing CCTV AsBuilt footage

Match CCTV to SAT.fmw
 Check CCTV Footage.fmw
 CCTV Footage Completeness Check.fmw

Check data and update on the SAT in the office

Collector app
 Highlight missing information (attributes) with the spatial data

13 Production set up
 GIS production takes the finalised SAT and uses the AAT (Auto Asbuilt Tool) to create the SAT into gdb format that GIS use to do further QA on the data set should have a clean SAT by now but can still be issues with data that need to query delivery team about

14 12d tab file
 12d needs to have all end points of a line defined to be able to recreate it, the SAT does not need to include all of these if they are existing data, this file has created dummy points into the file to allow 12d to recreate it before it exports it to CAD for Final Check Prints

SCIRT Schema Structure

GIS Production Phase

13 Production set up
 GIS production takes the finalised SAT and uses the AAT (Auto Asbuilt Tool) to create the SAT into gdb format that GIS use to do further QA on the data set should have a clean SAT by now but can still be issues with data that need to query delivery team about

AAT.fmw
 Create Longsections from AsBuilt.fmw
 SAT to Drafting Outputs.fmw

Take final SAT and apply it for production gdb format

Create geometries for repairs

14 12d tab file
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15 Final data checks
 Further round of tests all automated to make sure nothing has been missed, making sure everything is as it should be for supplying in the right format with right attributes for CCC.

SCIRT Schema Structure

GIS Testing Phase

15 Final data check
 Further round of tests all automated to make sure nothing has been missed, making sure everything is as it should be for supplying in the right format with right attributes for CCC.

01 AsbuiltTopology.fmw
 04 CheckFields.fmw
 08 Counterdata.fmw
 MatchCouncilDataback.fmw

Attribute checking WW/SWWS_Feature Mandatory, for to determine which fields to look for

Assign SCIRT ids Use UID prefixes tab to assign UID to each feature

16 Final Data supply
 Final data supply to CCC. The ReviewWorks.gdb is updated with all the info from the final checks and is the last time the final version of the SAT in SCIRT Schema format with all domain values and field names as specified in the G-File.

17 Constructed Services
 AsBuilt data all in one gdb, updated when anything new happens

SCIRT Schema Structure

GIS Completed Phase

16 Supply to CCC
 Final data supply to CCC. The ReviewWorks.gdb is updated with all the info from the final checks and is the last time the final version of the SAT in SCIRT Schema format with all domain values and field names as specified in the G-File.

Completed.gdb
 Completed.gml
 Final dataset Review-Works.gdb

CCC Schema Services format

SCIRT Schema Services format

17 Constructed Services
 AsBuilt data all in one gdb, updated when anything new happens

17 Constructed Services
 AsBuilt data all in one gdb, updated when anything new happens

SCIRT Schema Structure

CCC processing

Completed.gdb
 Completed.gml
 Final dataset Review-Works.gdb

CCC Schema Services format

SCIRT Schema Services format

Backup
 Temp for edit
 Stage
 Production
 WFS

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SCIRT Schema Structure

Some more notes

Create new/update existing iForm

Delete complete iForm
 Update iForm
 Add option list

If new features created in G-File that need to be surveyed, delete existing iForm

Create new iForm with all features as described in G-File

Can be run independently of delete/update. If new domain values added to G-File run this.

*The option list goes from 0-10 so might not always make sense as new values get added at end. The process figures out what order the options in and gets as close to alphabetical as possible

The Collector Schema

CreateCollectorGDB from G File_network.fmw → CollectorSATSchema.gdb

G-File maps to SAT, SAT maps to Collector

SCIRT Schema Structure

The Collector App

Data upload → Update Ftr service → Send to App

FME Server
 ArcGIS Rest Service
 Collector App

Make corrections

Data download ← Update Ftr service

The Collector App

Data upload → Update Ftr service → Send to App

FME Server
 ArcGIS Rest Service
 Collector App

Make corrections

SCIRT Schema Structure

CCC Schema Structure

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 Completed.gml
 Final dataset Review-Works.gdb

CCC Schema Services format

SCIRT Schema Services format

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