

# FieldGenius Construction Inspection Guide

Reference for FieldGenius/Infotech Construction Inspection Module

MicroSurvey  
FieldGenius 11

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## Part 1 – Migrate AutoMap from Appia Software

The FieldGenius / Appia Integration feature in the Construction Inspection module is based on a bespoke format “AutoMap” file which defines billing items, units, item descriptions and specifics of each type of measurement taken during a description. This file must be migrated to the controller to enable Inspection events.

### Export AutoMap from Appia

- An AutoMap is a csv formatted file which serves as a code list in FieldGenius
- Infotech Appia software is used to generate an AutoMap which will serve as the foundation for Construction Inspection application



### Copy AutoMap to Field Controller

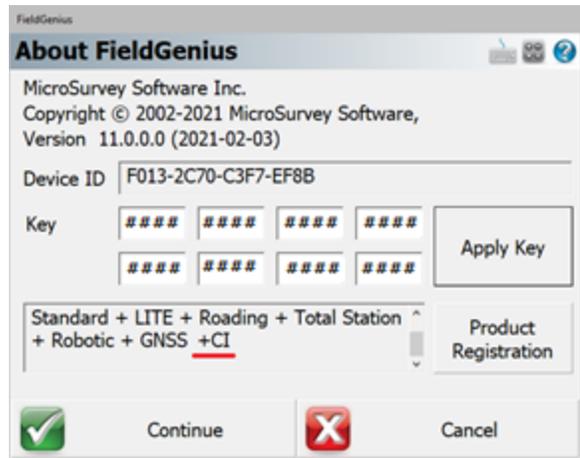
- Copy the AutoMap file into:

.\Documents\MicroSurvey\FieldGenius\FG Projects

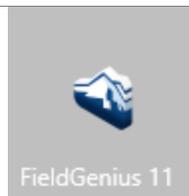
## Part 2 – Enable Construction Inspection Module

### Installation and Licensing:

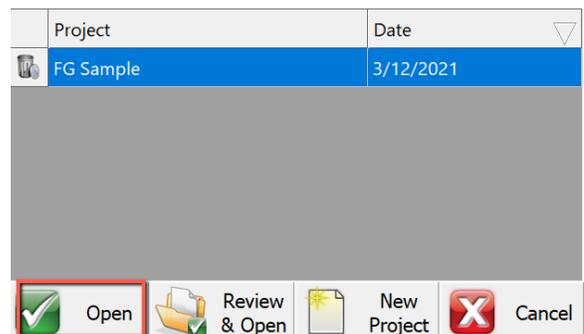
- The construction Inspection Module requires that FieldGenius is installed on a Windows 10 tablet controller
- Visit [helpdesk.microsurvey.com](https://helpdesk.microsurvey.com) to obtain an installation file or to update your version
- The Construction Inspection module can be tested and configured fully with either *No license* (30 point demo mode) or a license with the *Construction Inspection* module enabled



### Launch FieldGenius on the Controller

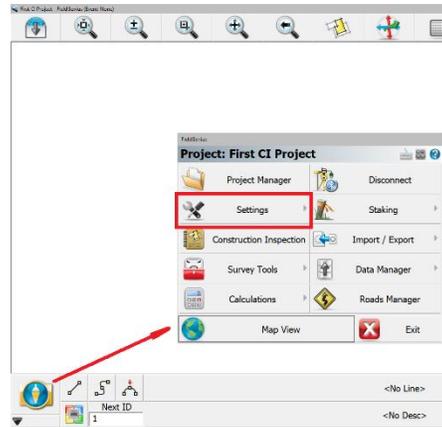


- Open the project “FG Sample”



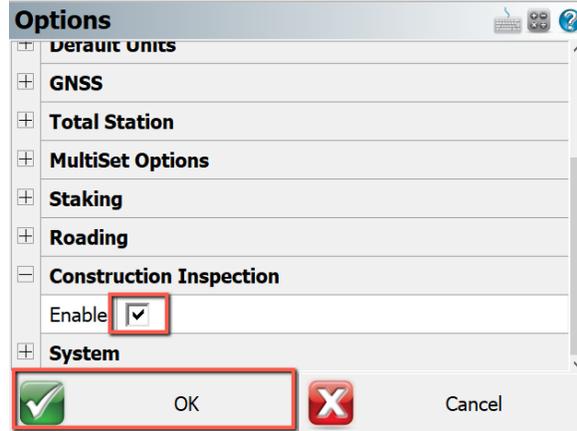
## Access Settings:

- Access the Main Menu from the Plumbob icon:
- Settings
- Options



## Enable “Construction Inspection”

- “OK”
- “Yes” to prompt that follows

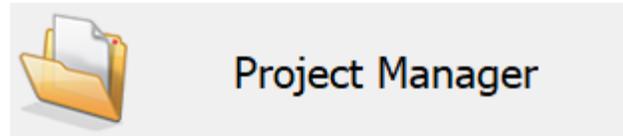


You're ready to start!

## Part 3 – Start your First Project and Set Defaults

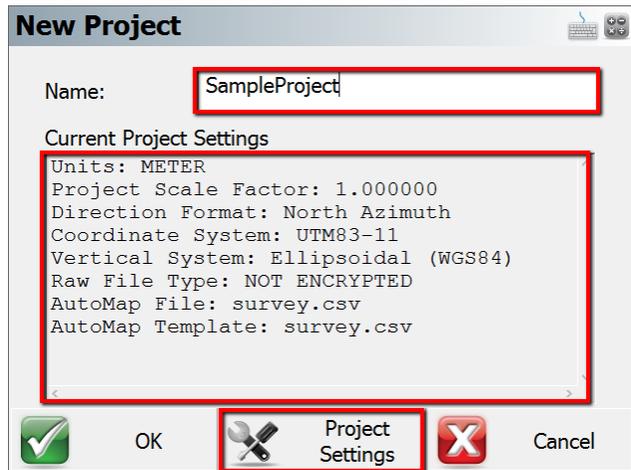
### Project Manager

- Access the Project manager from the Main Menu
- Use the project manager to create, re-open and remove old projects
- Select “New Project”



### Configure New Project

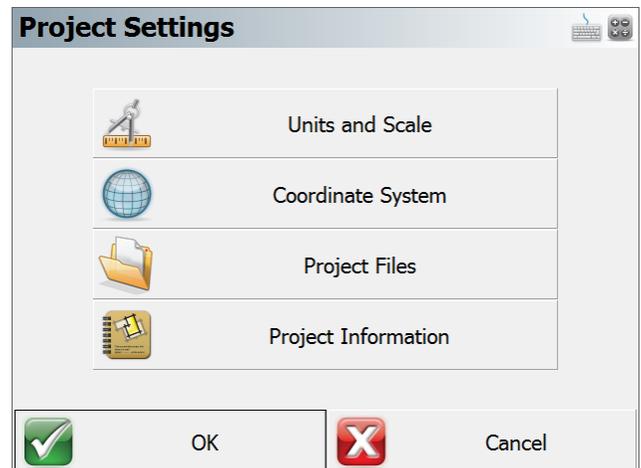
- Enter a name for your project
- Access Project Settings
- Follow directions below for first time configuration steps
- NOTE: *once defaults are set you won't need to visit Project Settings again*



### Project Settings

Select each category in order to configure

Select “Save as Default” whenever the option is displayed



## Units and Scale

The Distance and Angle Unit must be set when a project is created, and cannot be modified once created.

### *Distance Unit*

Choose from Meters, International Feet, or US Survey Feet.

### *Distance Format*

Choose from Decimal or Fractional format if the distance unit is set to International Feet or US Survey Feet. Meters are always decimal.

### *Distance Precision*

Choose distance precision for decimal format.

### *Angle Unit*

Choose from Degrees, Gons, or Radians.

### *Angle Format*

Choose from DDD°MM'SSs", DDD°MM.m' or DDD.d° format if the angle unit is set to Degrees. Gons and Radians are always decimal.

### *Angle Precision*

Choose angle display precision.

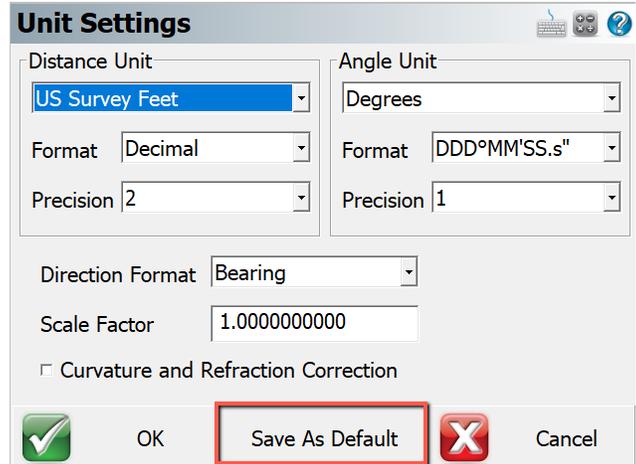
### *Direction Format*

Choose from North Azimuth, South Azimuth or Bearing for direction input/output format.

### *Scale Factor*

The Scale Factor value is applied to:

- Distances measured with a Total Station to compute scaled coordinates. Raw values are not affected.
- Distances entered for COGO calculations.
- Distances computed from COGO calculations, the inverse of the scale factor is applied.




---

Use the **Save As Default** option to permanently set the current settings as default values for future projects.

---

## Coordinate System

Coordinate system settings can be modified after a project is created, however setting the most suitable default eliminates the need to change it for each project.

### Horizontal System

Choose the horizontal projected coordinate system for your project from a list of coordinate systems.

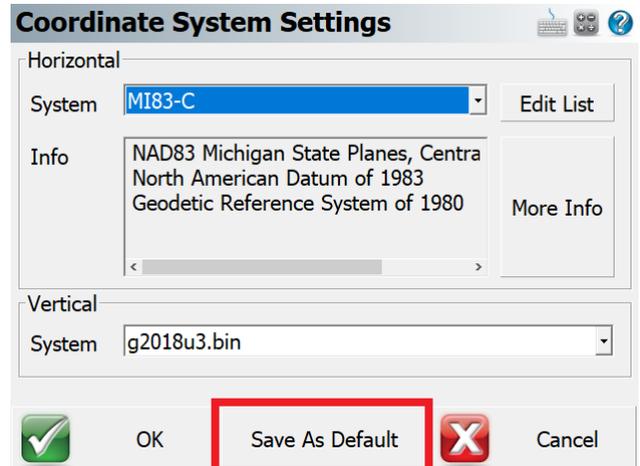
Use the **Edit List** option to add or remove coordinate systems from the list of favourites. Use the steps outlined below to add a coordinate system to the list.

### Vertical System

Choose the vertical datum for your project from a list of available options. The list will always contain Ellipsoidal (WGS84) and all available geoid models. Visit [helpdesk.microsurvey.com](http://helpdesk.microsurvey.com) to download available geoids and save in C:\ProgramData\MicroSurvey\FieldGenius\\*\*\Mapping.

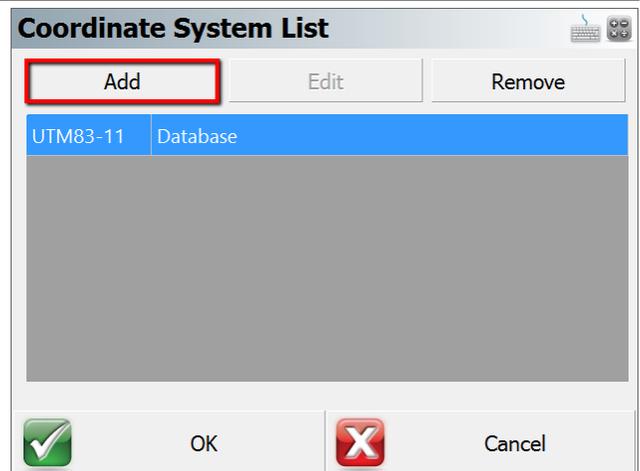
### Add Coordinate System to List

Pick **Edit List** to edit the Coordinate System list, then:



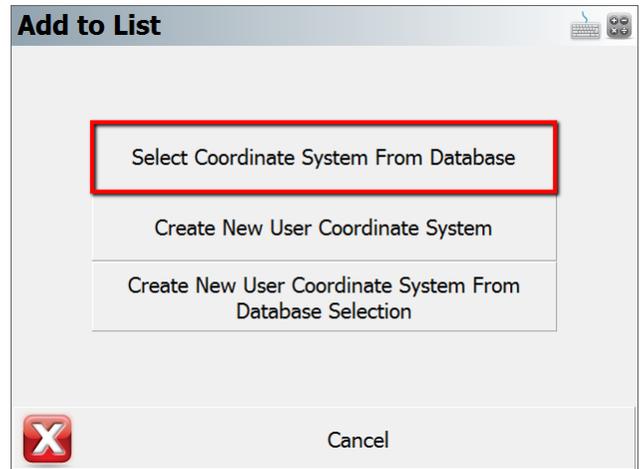
### Add New Coordinate System

- From the Coordinate System List choose "Add"



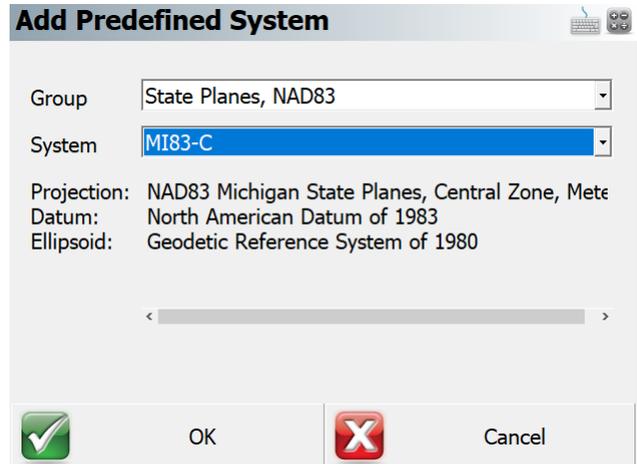
### Select Method

- Choose "Select Coordinate System From Database" to add a predefined coordinate system



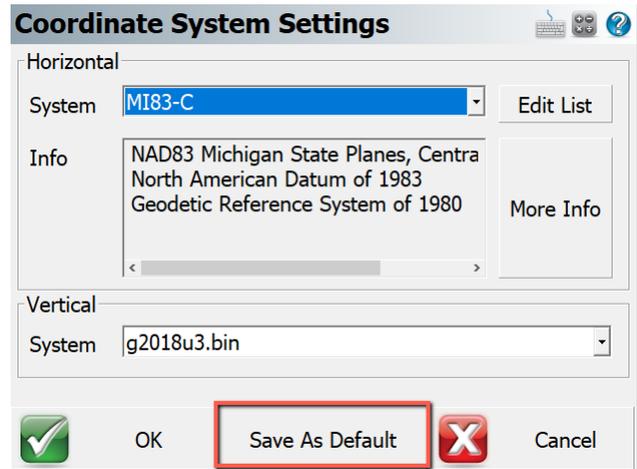
### Select System

- Choose the Group “State Planes NAD83” for the USA, or another group if required.
- Select the desired system
- OK
- OK



### Selecting Systems and saving to Defaults:

- Select required Horizontal and Vertical Systems
- “Save as Default”



Use the **Save As Default** option to permanently set the current settings as default values for future projects.

## Project Files

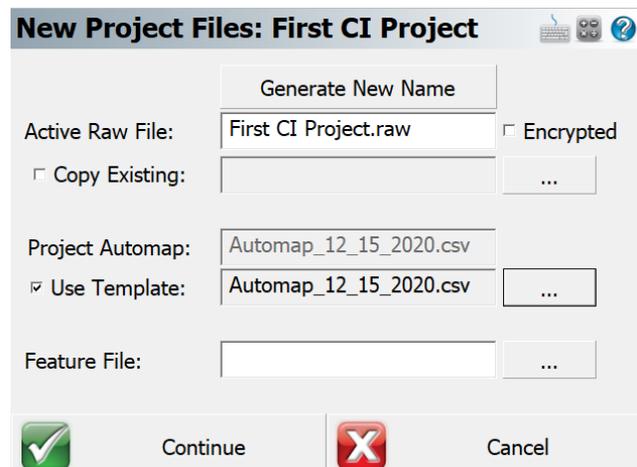
Each FieldGenius project is made up of multiple files, some of which can be copied from templates and/or another project. For many users, it may not be necessary to change any of these options when creating a new project.

### Active Raw File

- Leave Active Raw file entry unmodified.

### Appia Generated Project Automap

- Leave “Use Template” selected
- Select the Appia generated AutoMap

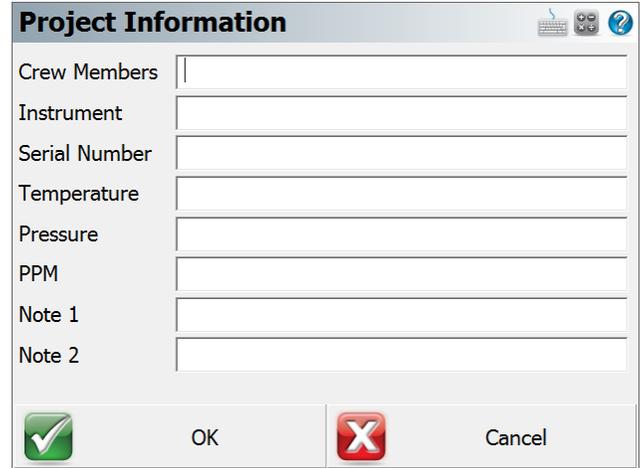


### Feature File

- A feature file is not required

### Project Information

The Project Information dialog is used to record information relevant to the project. This information is simply for record keeping.



The screenshot shows a dialog box titled "Project Information". It contains several input fields for recording project details. The fields are: Crew Members, Instrument, Serial Number, Temperature, Pressure, PPM, Note 1, and Note 2. At the bottom of the dialog, there are three buttons: a green checkmark icon, the text "OK", a red 'X' icon, and the text "Cancel".

Field	Value
Crew Members	
Instrument	
Serial Number	
Temperature	
Pressure	
PPM	
Note 1	
Note 2	

# Part 4 – First Time Rover Setup

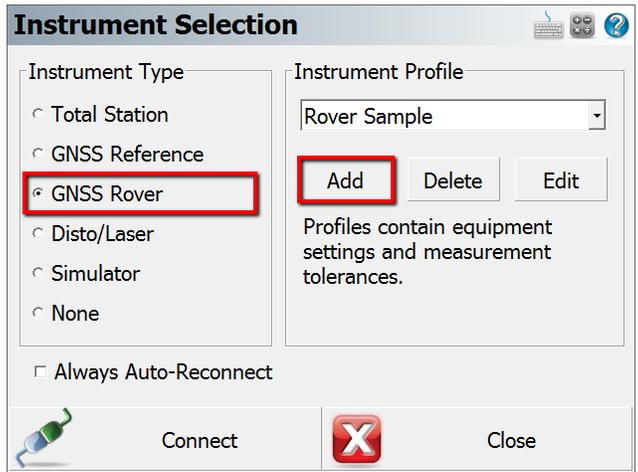
FieldGenius instrument profiles contain settings specific to each instrument. When selecting an instrument profile and connecting to the instrument, all these settings are automatically inherited.

## Create Instrument Connection Profile (Rover)

To create a new GNSS Rover profile:

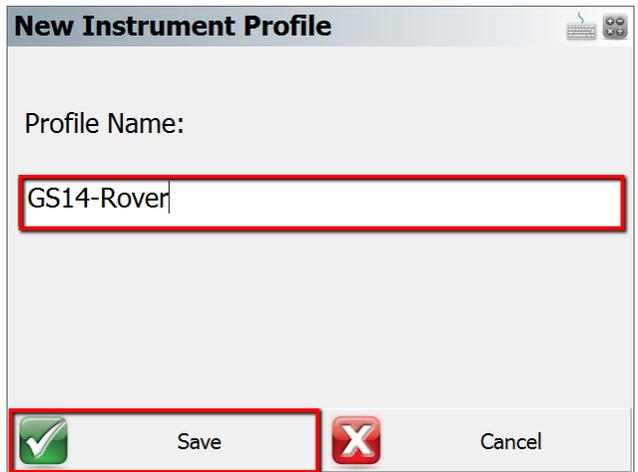
### Add a New Profile

- From the Instrument Selection dialog pick the GNSS Rover instrument type
- Pick “Add” to create a new profile



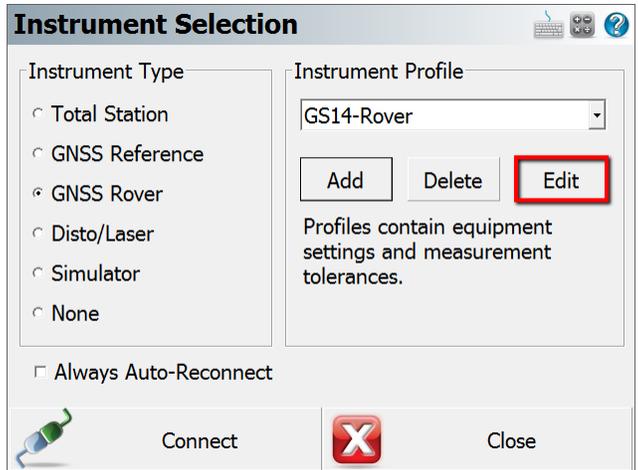
### Enter Name and Save

- Enter a name for your profile
- Pick “Save”



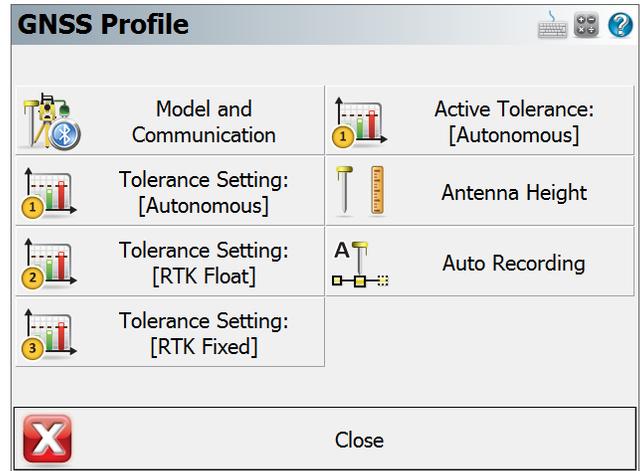
### Edit Profile

- With the new instrument profile selected, pick “Edit” to edit the profile



### Profile Setup

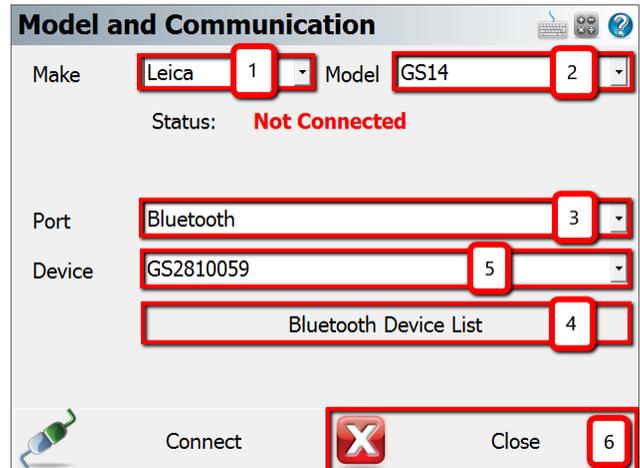
- Choose the profile component to configure



### Model and Communication

The main component of the instrument profile is the instrument driver itself, which is specified by picking the make and model of the device.

1. Pick the Make from the list
2. Pick the Model from the list
3. Select Bluetooth
4. Power on the instrument
5. Select “Bluetooth Device List” to perform a search for the serial number of your instrument
6. Select your instrument or “Refresh list” to try again
7. Pick Close to configure other components of the profile, the selections will be saved on Close



## Tolerance Settings Concepts

FieldGenius can be configured with three tolerance settings that determine the minimum requirements that must be met for storing a position when the tolerance setting is active. The user can change the active tolerance setting to suit the conditions and/or actions.

## Tolerance Setting: [Autonomous] / [RTK Float] / [RTK Fixed]

The three tolerance settings each have a default description and various options configured for specific conditions. The available options may vary between GNSS receivers.

### Real Time Settings

Configure the minimum requirements for real time positioning.

### Post Process Settings

Configure Raw Data Logging settings based on satellite availability.

### Action Settings

Configure tolerance override ability, automatic skipping of statistics screen, and automatic point storing.

- Tolerance Override allows the user to store a measurement even if it does not meet tolerance requirements
- Auto Skip Meas Stat suppresses display of measurement averaging dialog
- Auto Store Meas suppresses the Store Point dialog

## Active Tolerance

The active tolerance is used when measuring points to determine if minimum requirements are met and which actions will take place. It is a method of ensuring quality standards are met.

Tolerance 3	
Description	RTK Fixed
<input checked="" type="checkbox"/> Real Time	
Observations	5
Solution	RTK Fixed
Elevation	10°
PDOP	4.00
Satellites Computed	5
StdDev Horizontal	0.030m

Actions	
Tolerance Override	<input type="checkbox"/>
Auto Skip Meas Stat	<input type="checkbox"/>
Auto Store Meas	<input type="checkbox"/>

Select Tolerance	
Autonomous	
RTK Float	
<input checked="" type="checkbox"/> RTK Fixed	

## Antenna Height

The antenna height dialog allows the user to change the measured height of the receiver, and specifics about the receiver:

### *Model*

The preconfigured offsets information of the receiver is stored under the model name, pick “User Defined” to manually enter the offset values.

### *Measure Point*

Available options vary between receivers.

### *Offsets*

Generally, the preconfigured or user-definable values are displayed, for some receivers this information is provided by the firmware once connected.

**Antenna Height**

Model: GS14

Measured Height: 2.000m

Measure Point: Bottom of antenna mount

Offsets

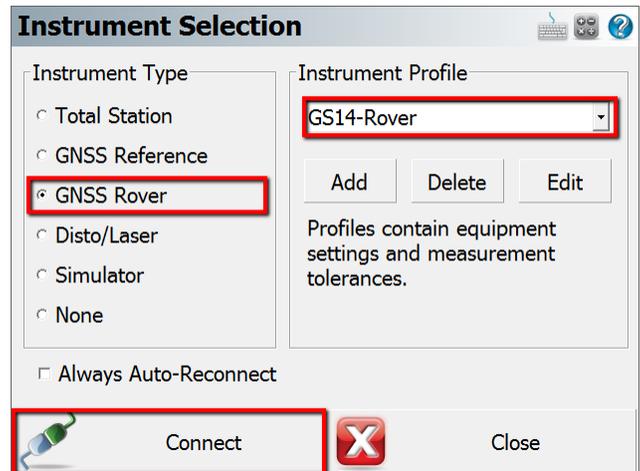
Measure Point to ARP Offset - Horizontal	TBD
Measure Point to ARP Offset - Vertical	TBD
ARP to APC (L1) Offset - Vertical	TBD

OK

# Part 5 - Connect and Configure Correction Link

## Connect to Instrument

To connect to an instrument, pick the predefined profile and choose “Connect”.



## Configure Correction Link

When connecting to a GNSS Rover device, the Link Configure dialog will be displayed following successful connection. Available options will vary depending on the device type selected.

### Device Settings

#### Device Type

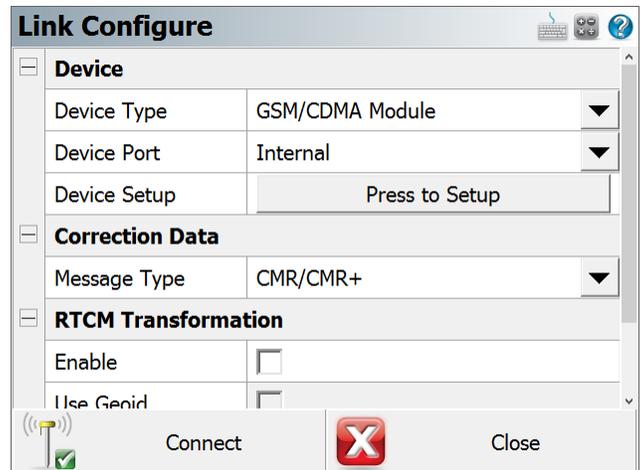
Select the appropriate Correction Link device type, such as GSM Module, UHF Radio Module, Data Collector Internet, or Other Device.

#### Device Port

Select the appropriate Port on the receiver when multiple options exist.

#### Device Setup

Setup the parameters for the Radio or Modem connection.



For radio corrections, choose the radio make and model from the pull-down and set the channel or frequency, the radio will be programmed by FieldGenius to the channel or frequency selected (on some models). Visit [Leica MyWorld](http://www.leica-geo.com/MyWorld) and enter the instrument Item number and Serial Number if unsure of a Leica modem or radio model.

For NTRIP or Network corrections, enter your internet and server credentials.

## Correction Data Settings

### Message Type

The message type is used in determining what data streams are sent from the reference station to the rover. They can be RTCM, CMR or a proprietary format.

## RTCM Transformation Settings

To receive horizontal and vertical coordinate system information from your network, enable RTCM Transformation message, otherwise disable the option (Recommended)

# Part 6 – Program Options and Interface

## Configuring Program Options

Program options are designed to help the user get the most out of FieldGenius. Options relevant to GNSS workflows are summarized. Program Options are accessed through:

### Interface Options

#### *Map Colour*

Set the background of the map screen to white or black.

#### *Map Orientation*

Set map orientation North or South.

#### *Arc Resolution*

Set the number of segments for drawing arcs on the map.

#### *Text Size (Info/Grid)*

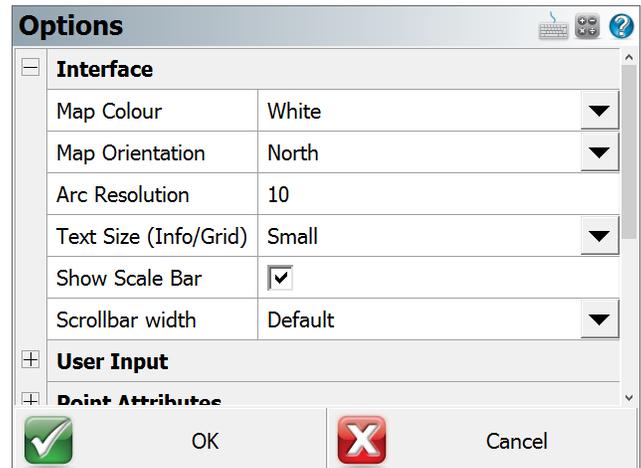
Set the size of text displayed on information screens.

#### *Show Scale Bar*

Toggle Scale Bar display on the map screen.

#### *Scrollbar Width*

On some devices, it is possible to change the width of scrollbars to improve touch experience.



### User Input Options

#### *Keypad Text Colour*

Set the colour of the text on the virtual keypad.

#### *Keypad Background Colour*

Set the colour of the background on the virtual keypad.

#### *Extended Edit Boxes*

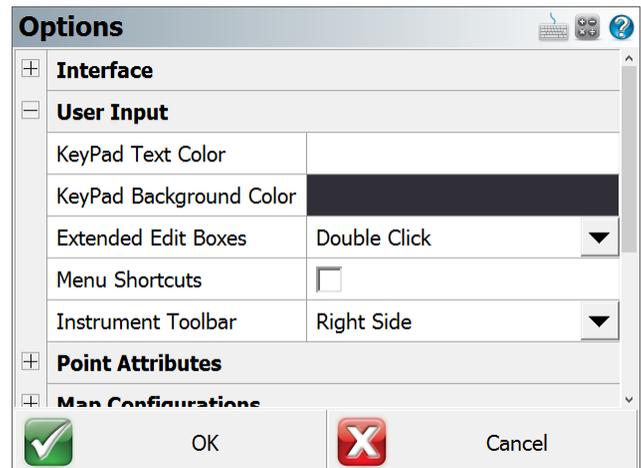
Set behaviour of the virtual keypad popping up. Recommended settings are Single Click for devices without a keyboard, Double Click for devices with a keyboard.

#### *Menu Shortcuts*

Toggle display of menu shortcuts for faster navigation with a keyboard.

#### *Instrument Toolbar*

Toggle which side of the screen the instrument toolbar will be displayed on. Left-handed users may prefer the left side of the screen.



## Point Attributes Options

### *Coordinate Order*

Select the coordinate order for display and ASCII Import/Export.

### *Alphanumeric IDs*

Setting to allow Alphanumeric Point IDs.

### *Alphanumeric Case Sensitive*

Setting to check if Point ID is unique when storing a point. When enabled a1 and A1 are handled as different values. This setting does not apply to coordinate imports.

### *Point ID Range – Minimum*

Enter a minimum value for a Point ID. Can be used to ensure Points are stored within a specific range.

### *Point ID Range – Maximum*

Enter a maximum value for a Point ID. A blank value will allow any maximum.

### *Point ID Intervals*

Auto-increment Point IDs by this interval.

### *LandXML Export – Prefix IDs*

Prefix Point ID with description during LandXML Export.

### *New Description Prompt*

Toggle whether to prompt to create a new Automap entry when using a point description that is not in the project's Automap library.

### *Time Stamp Saved Points*

Toggle to write a time stamp in the raw file when points are stored.

### *Write Notes to Raw Files*

Toggle to write text notes in the raw file if entered for a point.

## Map Configurations Options

### *Show ID / Description / Elevation*

Select the Point attributes to display on the map screen.

### *Level of Detail*

Toggle smart filter of Point information based on zoom level.

### *Text Size (Map View)*

Text size of Point information on the map screen.

### *Map Position Select*

Toggle ability to tap on the screen to store a point or other options from the Map Select Toolbar.

### *Map Point / Line / DXF Select*

Select which types of objects can be selected on the map screen.

Point Attributes	
Coordinate Order	N, E, H
Alphanumeric IDs	<input checked="" type="checkbox"/>
Alphanumeric Case Sensitive	<input checked="" type="checkbox"/>
Point ID Range - Minimum	1
Point ID Range - Maximum	999999
Point ID Interval	1
LXML Export - Prefix IDs	<input type="checkbox"/>
New Description Prompt	<input checked="" type="checkbox"/>

Buttons:  OK  Cancel

Map Configurations	
Show ID	<input checked="" type="checkbox"/>
Show Description	<input type="checkbox"/>
Show Elevation	<input type="checkbox"/>
Level of Detail	<input checked="" type="checkbox"/>
Text Size (Map View)	7
Map Position Select	<input type="checkbox"/>
Map Point Select	<input checked="" type="checkbox"/>
Map Line Select	<input checked="" type="checkbox"/>

Buttons:  OK  Cancel

## GNSS Options

### *EP+ Records*

Toggle the format of the EP record written to the raw file. The standard EP record contains a combined horizontal RMS value, while the EP+ record contains RMS values for Northing and Easting. EP+ records are required when seeding positions with regards to L-band correction services.

### *Post Processing Tagging*

Start and End times of GNSS measurements can be written to the raw file as comments. These values are required for post processing raw data with Effigis OnPOZ (EZSurv) software. **NOTE:** End times are captured when the user picks the **Store Position** button on the GNSS Measurement dialog.

### *Leap Seconds (GPS-UTC)*

Some receivers report UTC time instead of GPS time. When writing Start and End times for GNSS measurements, the Leap Seconds value will be applied to the UTC time to ensure GPS time is recorded. **NOTE:** This value will change over time and is the responsibility of the user to ensure it is current. This value only applies to those receivers that report UTC time.

### *Prompt Raw Logging*

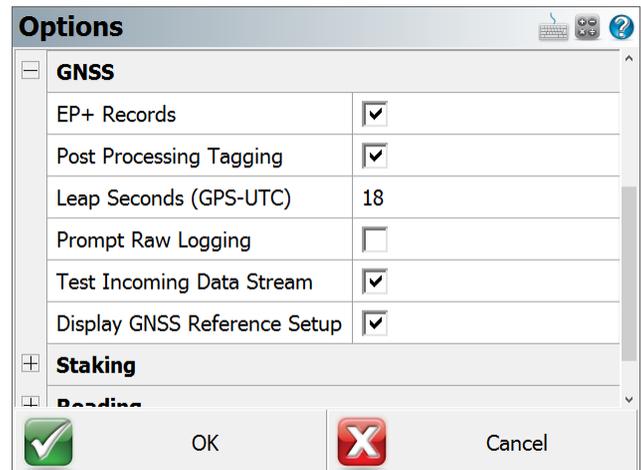
Raw data logging on most receivers must be manually initialized. A prompt can be displayed at connection time to remind the user to start raw data logging on the receiver.

### *Test Incoming Data Stream*

Some GNSS receivers automatically connect to the previous correction link. FieldGenius can test for incoming corrections at connection time to eliminate the Link Configure step.

### *Display GNSS Reference Setup*

When connecting to a reference receiver, a prompt can be displayed to remind the user of the steps to take to complete a reference setup.



## Staking Options

### *Tolerance*

The distance tolerance where staking residuals will be shown as green text versus red text.

### *Orientation – GNSS*

Choose the Staking direction orientation.

### *Compass Switch Threshold*

The distance from a point where the Compass will automatically switch to a grid display.

### *Attached User ID*

Value to add to Point ID when storing Staked Points.

### *Line Mode*

Method to use for calculating navigation distances.

### *Cut and Fill Slope (X:1)*

Slopes to use for Slope Staking.

### *DTM Staking*

Surface name for Surface Staking.

### *Fade Staked-Out Points*

Option to display staked points differently on the screen.

### *Display Point Staking Screen*

Toggle to show the Point Staking Screen when choosing the Point to stake.

### *Display Stake Results Screen*

Toggle to show the results of the Point Stake. This screen will always display if the results are outside of tolerance settings.

### *Store Stake Point*

Prompt to store Staked Point.

### *Show Staked-Stored Points*

Option to show Staked-Stored Points on the map screen.

### *Use Stake List*

Toggle to use a staking list to stake a predetermined list of points.

### *Find Next Nearest*

Toggle to automatically let FieldGenius search for the next nearest point to stake and suggest the Point for the next position to stake.

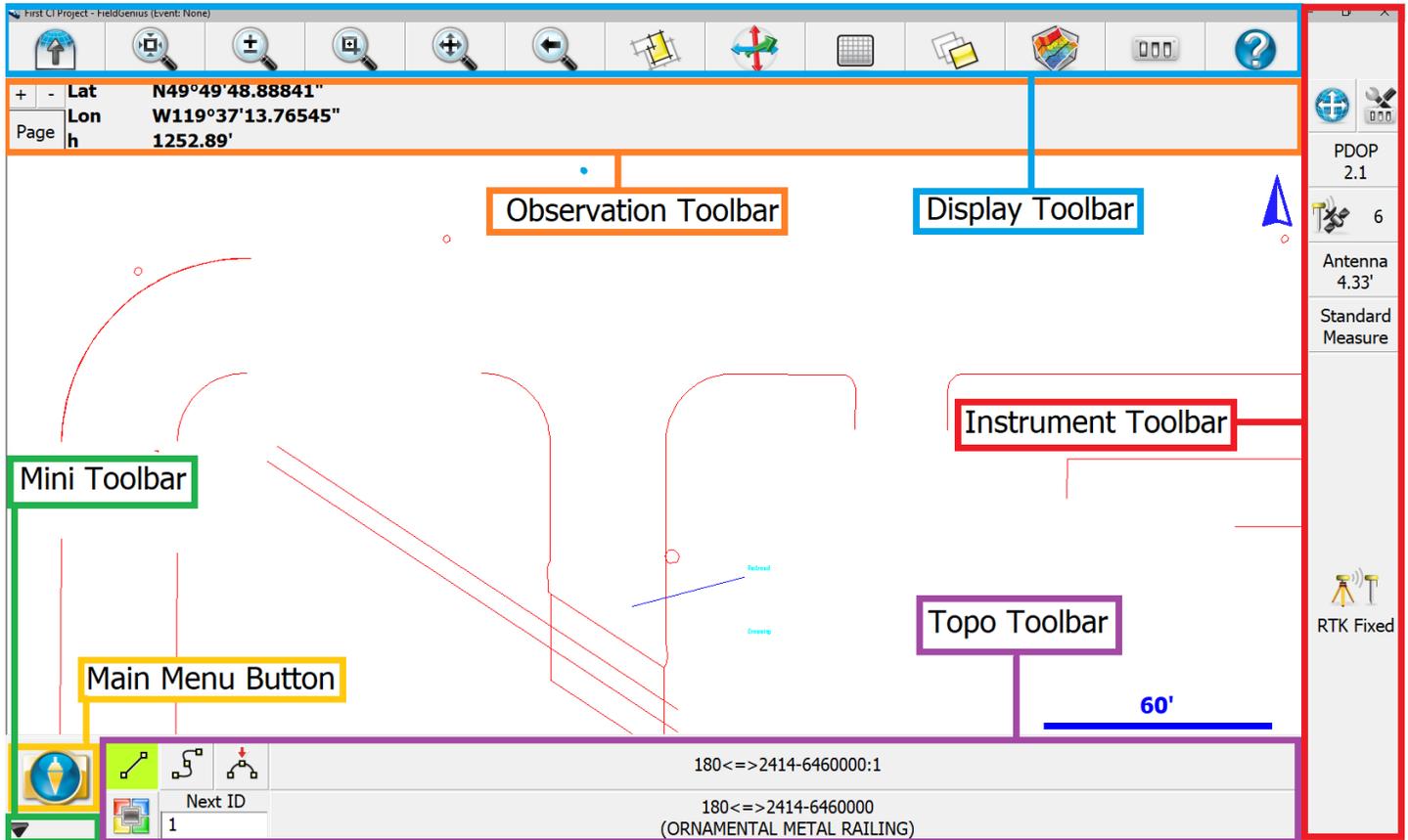
The screenshot shows the 'Options' dialog box with the 'Staking' section expanded. The settings are as follows:

Option	Value
Tolerance	0.030m
Orientation - Total Station	Instrument
Orientation - GNSS	North (Cardinal)
Compass Switch Threshold	4.000m
Attached User ID	
Line Mode	Auto
Robotic Prism Tracking	<input checked="" type="checkbox"/>
True Instrument Mode	2D (HA + VA)

At the bottom of the dialog, there are three buttons: a green checkmark icon, 'OK', and a red 'X' icon followed by 'Cancel'.

## Toolbars

The FieldGenius interface consists of multiple toolbars that display important information, in some cases the toolbars are also context-sensitive.



### Display Toolbar

The display toolbar at the top of the map screen features zoom and pan controls, and other display related features.



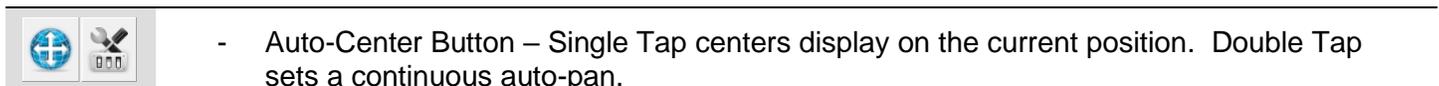
### Observation Toolbar

The observation toolbar shows information about the current position. Display size can be modified with the + and – buttons, while the **Page** button cycles through multiple pages of information. The second button on the display toolbar toggles the display of the observation toolbar.

+	-	Lat	N49°49'50.27814"
Page	h	Lon	W119°37'12.01511"
		h	384.057m

### Instrument Toolbar

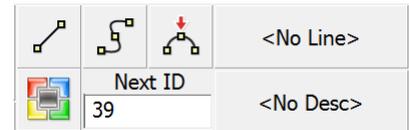
The instrument toolbar displays position information and provides access to settings and measure modes.



	- Instrument Settings Button – Opens the GNSS Settings screen which provides access to instrument specific settings.
PDOP 2.1	- PDOP Button – Displays the position DOP values. Tap to cycle through PDOP, HDOP, VDOP, and position Standard Deviation values.
 5	- Satellite Plot Button – Displays the number of satellites used for the current position solution. Tap to open the sky plot or to access the satellite list.
Antenna 0.000m	- Antenna Height Button – Displays the current antenna height set and provides access to the Antenna Height dialog.
Standard Measure	- Measure Mode Button – Displays the current measurement mode and provides access to the Measure Modes screen to select a measure mode.
 RTK Fixed	- Measure Button – Displays the current solution type and is used to begin a position measurement.

## Topo Toolbar

The Topo Toolbar features figure toggles to draw linework, displays the active figure name, the active description, the Next Point ID and features a user-definable button which by default is mapped to the Point Coordinate Database.



## Mini Toolbar

The Mini Toolbar can be used to maximize the map screen size by hiding any/all unwanted toolbars. 

## Main Menu Button

Access the Main Menu by selecting the Plumbob 

## Context Sensitive Menus from Mapview

The Map Select Toolbar is a context-sensitive toolbar that can be used to Store a Point at a position picked on the map, or measure a distance on the map between two picked positions. The [Map Configuration Options](#) can be accessed from the second page of the Display Toolbar to turn ON/OFF the ability to select a position on the map.

+	-	Lat	N49°49'48.59859"	0.018m
		Lon	W119°37'13.45744"	0.018m
Page		h	383.255m	

Location: N 5524024.485m E 312490.261m

## Point Toolbar

The Point Toolbar is displayed when a point is selected on the map screen.

Shortcuts on the top row of this toolbar are: *Points List*, *Inverse Tool*, *Store New Point*, *Edit Point*, *Delete Point*, *Offset Tool* and *Drawing Tool*.

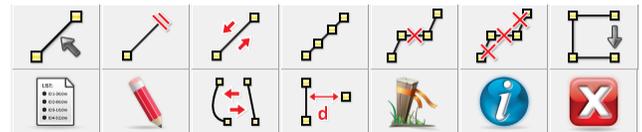


Shortcuts on the second row are: *Zoom to Point*, *Stake Point*, *Previous Point ID*, *Next Point ID*, and *Close*.

## Line Toolbar

The Line Toolbar is displayed when a line or arc figure is selected on the map screen.

Shortcuts on the top row of this toolbar are: *Set Figure Current*, *End Figure*, *Reverse Direction*, *Partition Figure*, *Delete Segment*, *Delete Figure*, and *Close Figure*.



Shortcuts on the second row are: *Open Figure List*, *Drawing Tool*, *Convert Line to Spline*, *Offset Tool*, *Stake Figure*, *Figure Information*, and *Close*.

## Part 7 – Construction Inspection (CI) Manager

Each billable items report will be linked to a Measurement Event stored within your project. The Inspection Event Manager allows you to Create, Edit or Generate Inspection Reports.

### Start New Event using the CI Manager

General Procedure is as shown in the table below.

Access Construction Inspection from the main menu:



Construction Inspection

- Start New Event
- Configure and save

Further Notes:

You May Use the Construction Inspection Manager to:

- Start another Inspection Event
- Select another Existing Event
- Generate Reports

**Start New Event**

Inspection Event ID: 20210312-01

Start Date: 2021-03-12T15:17:51-08:00

Device: F0132C70C3F7EF8B

User: HL + JJ

OK Cancel

FieldGenius

**Construction Inspection**

Start New Event

Select Existing Event

Create Event Report

Cancel

## Part 8 – Measuring Billing Items

The CI Module allows you to measure four types of billing Items:

- Points - (EACH Items) a single coordinate is stored along with information required to compute billing
- Lines – (Linear Items)
  - A single line will include location and a length value used to compute billing
  - A closed line will include location and an area value used to compute billing
- Volumes – A closed line is created, and the user prompted to set a vertical offset so a volume can be computed and used to compute billing

### Selecting a Code before Measurement

The type of billing item measured is set by the AutoMap code:

The first step for all Billing Item Measurements is to select a code from the Description button on the Topo Toolbar:



FieldGenius

**Automap Library: Automap\_12\_15\_2020.csv**

Search By Code Description

Code	Description	Unit
20<=>2102-2710070	EXCAVATION, CLASS 10, ROADWAY AND BORROW	CY
30<=>2105-8425005	TOPSOIL, FURNISH AND SPREAD	CY
50<=>2115-0100000	MODIFIED SUBBASE	CY
70<=>2301-1033080	STANDARD OR SLIP FORM PORTLAND CEMENT CONCRETE PAVEMENT, CLASS C, CLASS 3 DURABILITY, 8 IN.	SY
110<=>2401-6745356	REMOVAL OF CONCRETE FOOTINGS OF LIGHT POLES	EACH

### AutoMap Search Features

Code Option:

- Select Code radio button
- Type the code desired. The selection of available codes will decrease until you select the desired code

Description Option

- Select Description radio button
- Type a search string. The description column will be filtered until you select the desired code.

Once a code is chosen pick Select and you will be returned to the Mapview with the chosen code selected. User defined codes will not be possible while the CI module is active.

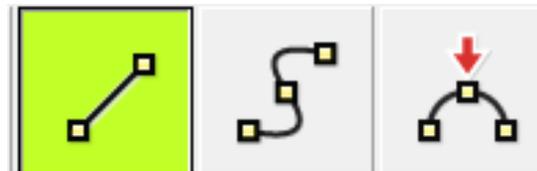
## Measuring a Point Billing Item

1. Select a Point code from the Automap
2. Example: REMOVAL OF LIGHT POLES
3. Take receiver to location a light pole has been removed
4. Ensure receiver is connected and is displaying an RTK fixed solution on the Measurement button
5. Level receiver
6. Select Measure
7. Review the measurement in the Store Point Dialog and select “OK” to store the measurement

*User Tip: To speed your progress when measuring many points with the same code, modify your current tolerance mode so that “Auto Skip Meas Stat” and “Auto Store Meas” are selected. See the [Tolerance Settings](#) section of this document for details.*

## Measuring a Linear, Area or Volume Billing Item

1. Select a Linear code from the Automap
2. Example: ORNAMENTAL METAL RAILING
3. Bring receiver to start of the linear feature and position and level as with point measurements
4. Configure linework toggles on Topo Toolbar:
  - Select the Line icon to start and continue a line segment
  - Select the Spline icon to start or continue a spline (curvey line) segment
  - Select the Arc Midpoint button before measuring the midpoint of an arc



5. Select Measure
6. Select “Store Position”
7. Review measurement and select “OK”

8. Note that the linework toggle is still activated. Leave it that way while measuring all points in this linear billing item
9. Select “Store Position”
10. Review measurement and select “OK”

## Ending a Linear Billing Item:

The procedure for ending a linear item varies by way it is to be billed. View the properties shown in the “Unit” column of the AutoMap for this information:

- LF, LY or LM items are billed by length
- SF, SY or SM items are billed by area units
- CY, CF or CM are are billed by volume units

## Procedure for Items Billed by Length:

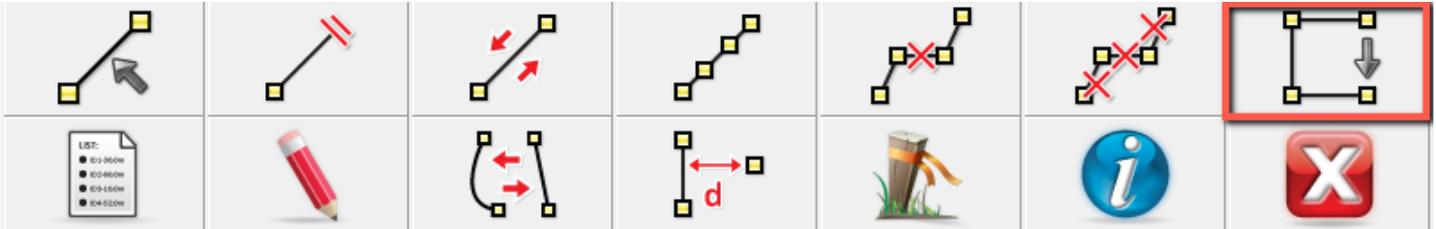
- After the last measurement, end the line by tapping the linework toggle to turn it off.
- The Billing Item is now stored as a line

180<=>2414-6460000:3
180<=>2414-6460000 (ORNAMENTAL METAL RAILING)

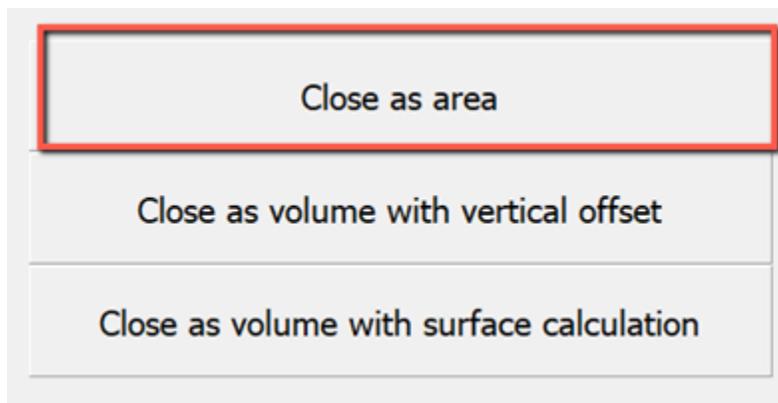
*Tap the linework toggle back on if you wish to start a new linear item with the same billing code.*

Procedure for Items Billed by Area:

- Perform all steps as above to end the line
- Select the line from the screen and select the “Close” button on the context sensitive toolbar shown below:



- Select “Close as Area” from the options:



- A dialog will display the properties:

```

Code:          70<=>2301-1033080
Description:   STANDARD OR SLIP FORM PORTLAND CE
Area ID:      7
Area:         45.288 SY

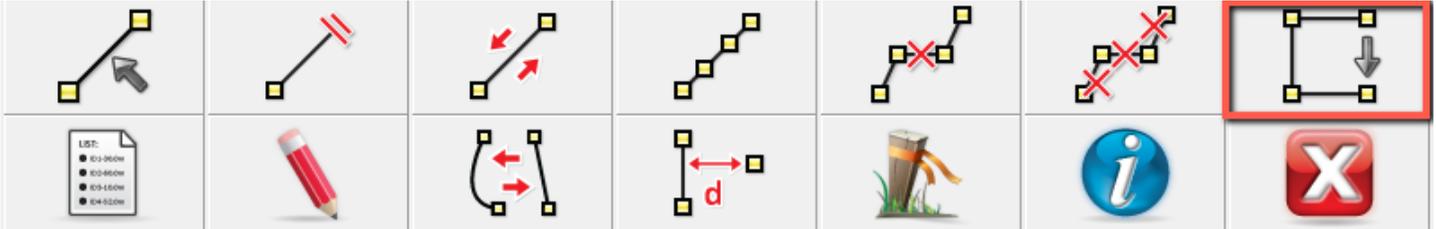
Additional Information:
PNT 20 to 19 (HD 19.39' @ N8°47'02"E)
SD 19.66' GR -16.7% VD -3.24'
Area:        407.590 Sq Ft
              0.009 Acres
Perimeter:   197.435 Ft
    
```

Procedure for Items Billed by Absolute Volume:

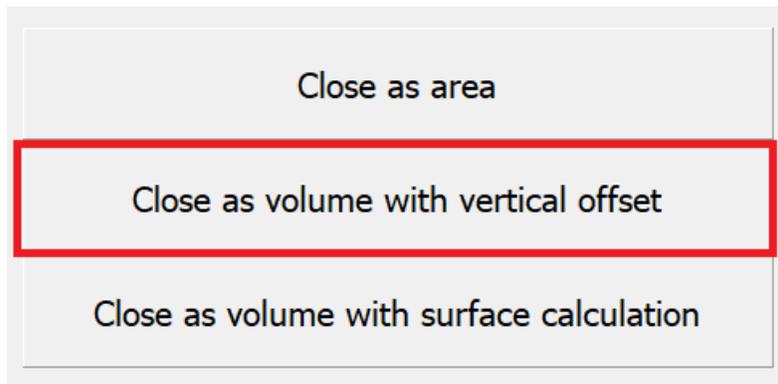
- Perform all steps as above to end the line

## Part 8 – Measuring Billing Items

- Select the line from the screen and select the “Close” button on the context sensitive toolbar shown below:



- Select “Close as volume with a vertical offset from the options:



- You will be prompted for a vertical offset (define the average depth or height of the billing item)

Provide a vertical offset to define a volume from an area.

 OK  Cancel

- A dialog will display the properties:

```
Code:          140<=>2402-0425030
Description:   GRANULAR BACKFILL
Area ID:       5
Area:          6.225 CY

Additional Information:
PNT 14 to 15 (HD 36.38' @ N30°10'34"E)
SD 36.38' GR 1.0% VD 0.37'
Area:         168.078 Sq Ft
              0.004 Acres
Perimeter:    81.881 Ft
```

Procedure for Items Billed by Volume relative to an existing surface:



**Map Data  
Layers**      **Surfaces**

A landxml surface must be loaded and active in FieldGenius for this function to be possible. *(Point database or qsb surfaces are not supported)* Surfaces can be imported from a landxml format file.

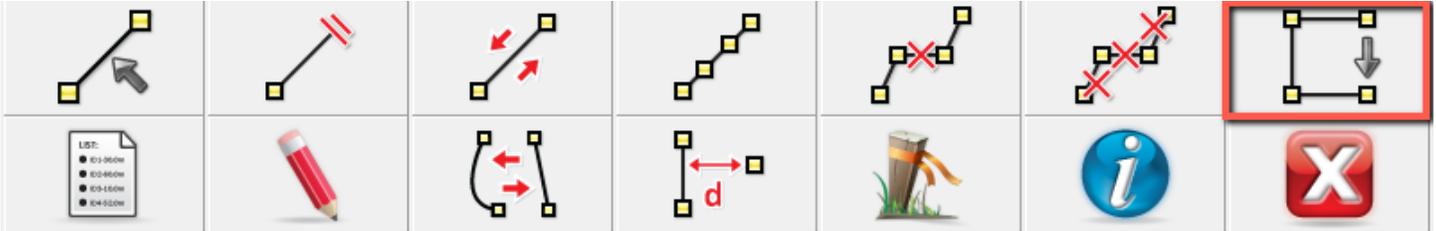
- Select the Map Data Layers button to import a landxml file.
- Select the Surfaces button to load, view and set a surface active.

---

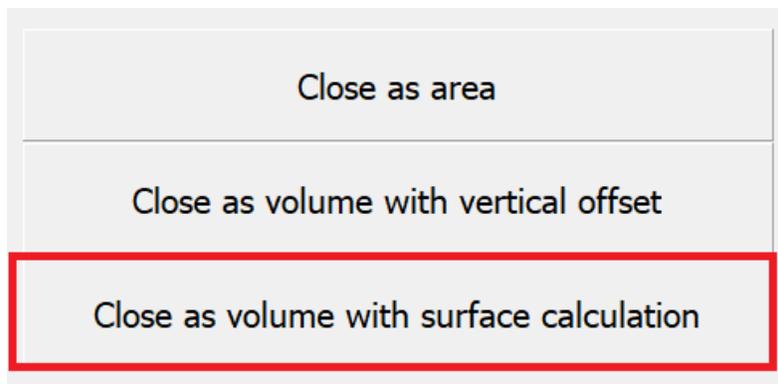
Please see Appendix B for information about importing landxml surfaces. See [Appendix B: Landxml surfaces](#) in this document for more information.

---

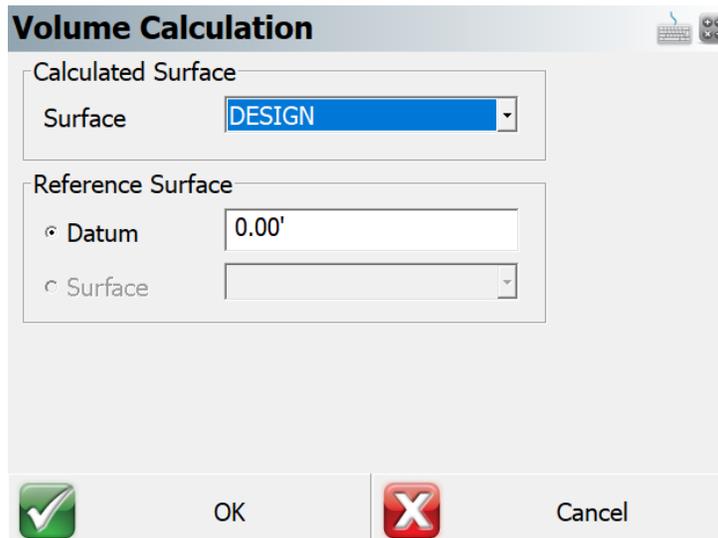
- Perform all steps as above to end the line
- Select the line from the screen and select the “Close” button on the context sensitive toolbar shown below:



- Select “Close as volume with surface calculation” from the options:



- You will see a prompt to select a surface or to define a specific datum elevation:



- A dialog will display the properties.

## Part 9 – Generating Billing Reports

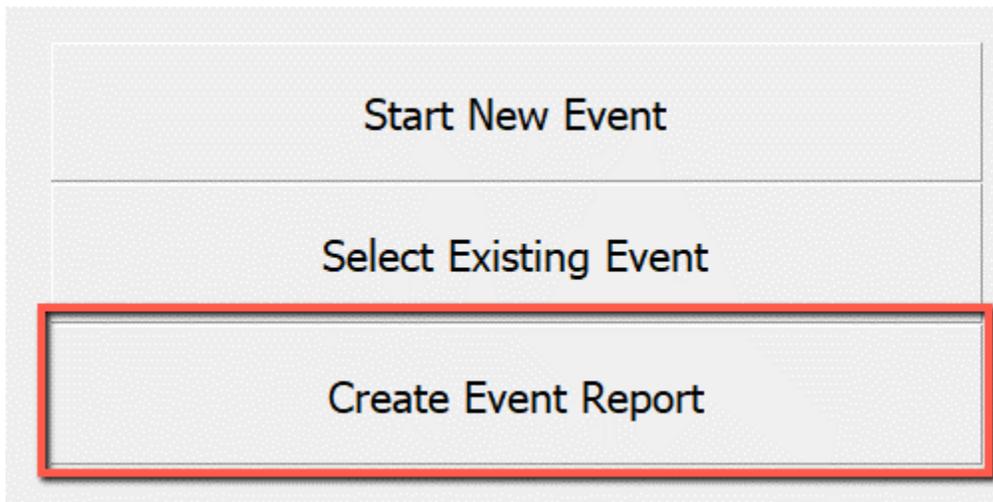
The CI Manager allows you to select a Measurement Event from your current project and configure a report

A report consists of two files:

- A json data file for transmission to InfoTech Appia Suite software
- A KML file to allow review of measurements in Google Earth or GIS software

### Create Event Report

- Open the project that has the CI Event you need to report on
- Access Main Menu | Construction Inspection
- If there are multiple events select the one you need to report
- Create Event Report



### Select Report Components

The report will contain all Point, Line, Area and Volume Billing Items by default. You can de-select items if required. *If measured items have been deleted, you will be alerted that these items are highlighted in red and will need to de-select them:*

First CI Project - FieldGenius (Event: 20210312-01)

FieldGenius

**Event Report: 20210312-01**

	Points	Lines	Areas	Volumes
	Code	Description	Unit	Point ID
<input checked="" type="checkbox"/>	130<=>2401-6745765	REMOVAL OF LIGHT POLES	EACH	9
<input checked="" type="checkbox"/>	190<=>2435-0130148	MANHOLE, SANITARY SEWER, SW-301, 48 IN.	EACH	18
<input checked="" type="checkbox"/>	190<=>2435-0130148	MANHOLE, SANITARY SEWER, SW-301, 48 IN.	EACH	5

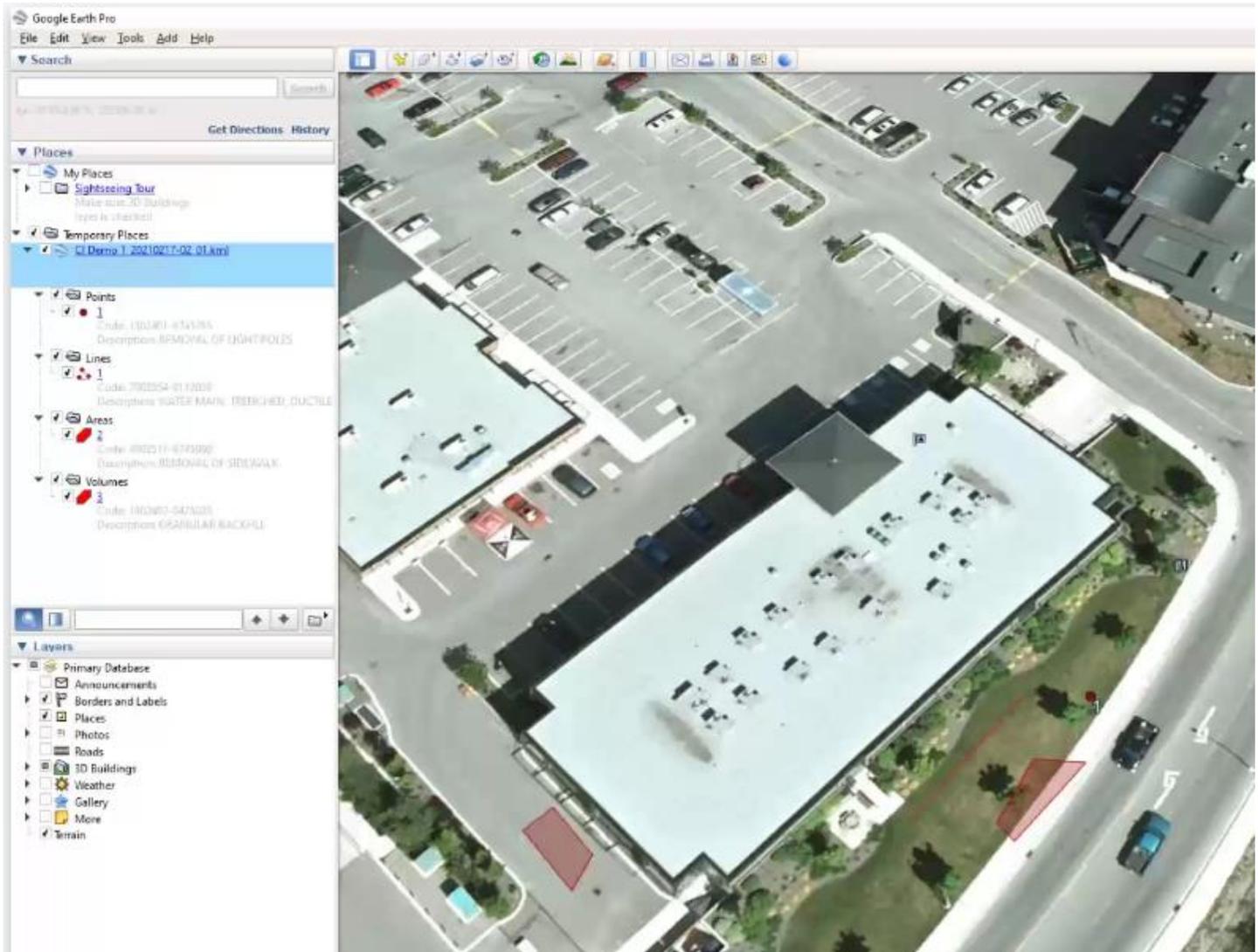
Select “Create Report” when satisfied

- A folder named “Event Reports” is created in your project and it contains all related Billing Reports.

..\Documents\MicroSurvey\FieldGenius\FG Projects\(\Projectname)\Event Reports\(\Reportname)

## Reviewing Reports

- A json file is created. This file can be imported into Infotech Appia to generate billing
- A kml file is created. This file can be opened in Google Earth or imported into GIS software to allow viewing of the location and properties of the report:



# Appendix

## Appendix A: Additional Resources for FieldGenius.

### Online Manual

A version of the complete FieldGenius manual is available online at:

<http://s3.microsurvey.com/fieldgenius/Help/Default.htm>

### Movies

A selection of instructional videos for FieldGenius are available online at:

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/149>

### Helpdesk

Contact MicroSurvey Support through the MicroSurvey Helpdesk at:

<http://helpdesk.microsurvey.com/>

### Geoid Models

MicroSurvey provides a collection of geoid models for FieldGenius, files and instructions are available at:

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/479>

### Grid Shift Files

MicroSurvey provides a collection of grid shift files for FieldGenius, files and instructions are available at:

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/499>

### Tutorials

[Base and Rover Setup](#)

[Line Staking](#)

[Area Calculations](#)

[Volume Calculations](#)

### Automap Libraries

The Automap system is used in InfoTech Appia, MicroSurvey field and office software:

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/1306>

<http://helpdesk.microsurvey.com/index.php?/Knowledgebase/Article/View/1350>

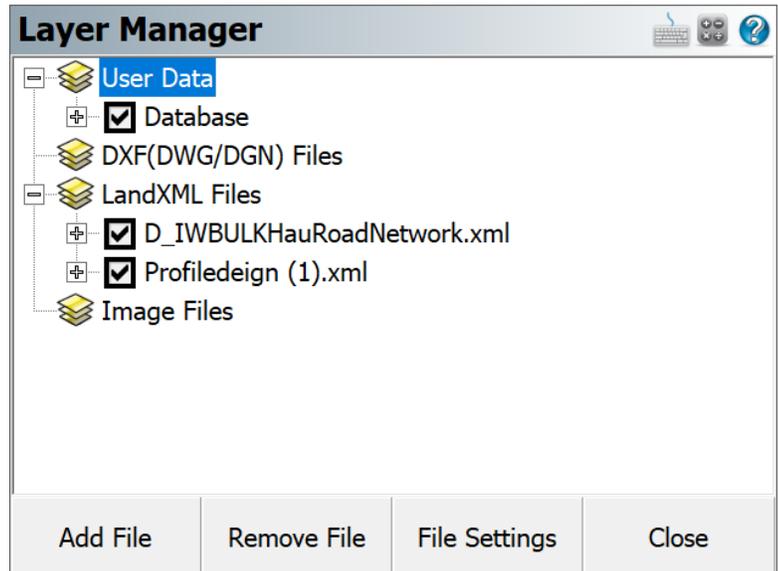
## Appendix B: Landxml Surfaces

### Map Data Layer Manager

The following section will explain how the map data layers manager can be used to import and control visibility of a variety of data types:

- Points, lines and layers of measured data
- Dwg, dxf and dgn CAD file underlays
- Georeferenced tiff and jpg image files
- Landxml files including data types:
  - CG points
  - Parcels
  - Horizontal alignments
  - Vertical alignments
  - Cross sections
  - SURFACES!

Open the map data manager to import a landxml file which includes a surface. The surface will be read from CGPoints and triangle faces only, boundaries and breaklines will not be read.



### Surfaces Manager

FieldGenius allows you to display a 3D surface representation of the points and lines in your project. This is done by turning on the Point Database surface.

### Supported DTM Files

You can import surface information into FieldGenius. Currently you can import a surface from an XML or QSB file.

#### LandXML Surface

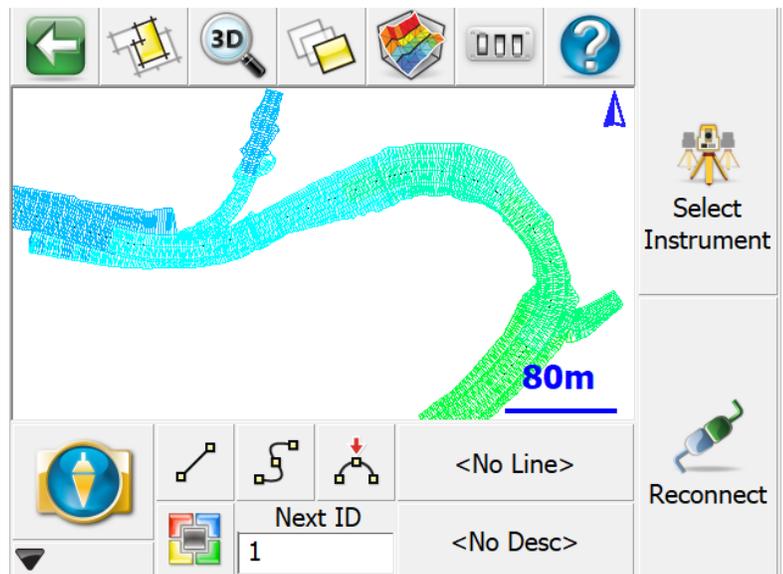
FieldGenius can import surface definitions from XML data sets. Only CgPoints and 3d faces will be imported. These surfaces can be used to display a TIN or shaded surface on the screen. The surface can also be used to perform real-time DTM staking.

To import a LandXML file, go to Map Data Layers and use the **Add File** command. Please see the [LandXML Import](#) topic for more information.

#### QSB Surface

Surfaces created and saved in MicroSurvey CAD or inCAD desktop products will have a QSB extension. These QSB files can be imported into FieldGenius and used to display a TIN, shaded surface or contours on the screen. The surface can also be used to perform real-time DTM staking.

To import a QSB file, use the Load button at the bottom of the Surface Manager screen.

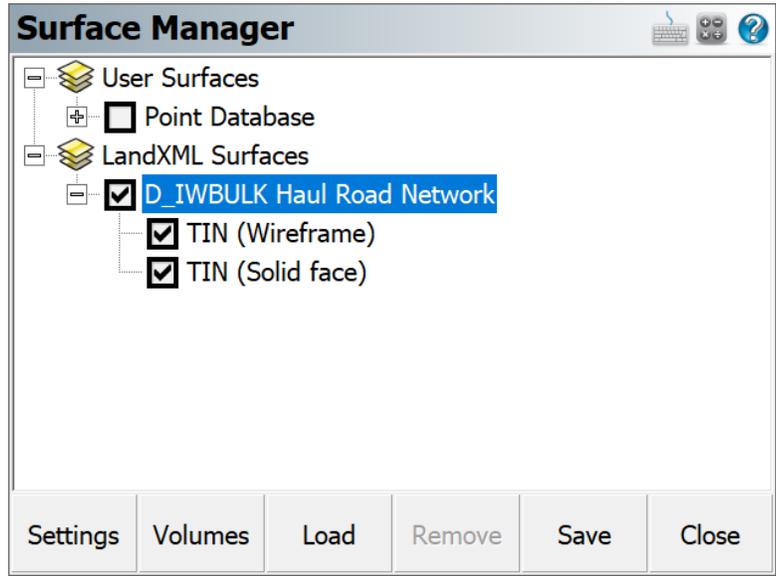


## DTM Surface Manager

The surface called Point Database represents the real-time DTM Surface made up from points and lines that are in your project. If you have imported any other surfaces from a QSB or LandXML file they will also appear in this list.

To use a surface you first need to load it into memory by checking inside the box before the name of the surface in the list. A surface is loaded if there is a checkmark shown before it. If you expand the surface you can control whether it is drawn as a wireframe TIN and/or a solid TIN.

- **Settings:** Surface settings allow you to specify settings that affect the surfaces or contours that are drawn.
- **Volumes:** Use this button to calculate a volume.
- **Load:** Use this button to load a .QSB surface file into your project.
- **Save:** Use this button to save a selected Point Database surface as a .QSB file which can be imported into FieldGenius, MicroSurvey CAD, embeddedCAD or inCAD desktop software. *NOTE: landxml surfaces must remain in landxml format.*
- **Close:** If you close the surfaces screen and return back to the map screen you will see the loaded surface drawn as a wireframe, solid, and/or with contours depending on what is set in the Settings screen.



## Surface Information

You can see additional statistics about the surface by double clicking on its name in the list. This will show the minimum and maximum bounding coordinates, the number of points, breaklines, and triangles in the surface, the minimum and maximum slopes in the surface, the plan and surface area, the positive and negative volumes calculated from a datum elevation of 0, and the amount of memory that the surface is using.

